

Oracle® Spatial Studio

Guide



Release 22.1
F53507-03
June 2022



Oracle Spatial Studio Guide, Release 22.1

F53507-03

Copyright © 2019, 2022, Oracle and/or its affiliates.

Primary Author: Lavanya Jayapalan

Contributors: Chuck Murray, Mamata Basapur, Daniel Cuadra, Honglei Zhu, Roberto Mercado Mariscal, Carol Palmer, L.J. Qian, David Lapp, Siva Ravada

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Contents

Preface

Audience	viii
Documentation Accessibility	viii
Related Resources	ix
Conventions	ix

Changes in this Release for this Guide

1 Introduction to Oracle Spatial Studio

1.1 About Oracle Spatial Studio	1-1
1.2 Spatial Studio Terminology	1-1
1.3 Spatial Studio Metadata and Connection Management	1-2
1.4 Spatial Studio Best Practices	1-3

2 Administering Oracle Spatial Studio

2.1 Prerequisites and Recommendations for Spatial Studio	2-2
2.2 Downloading and Installing Spatial Studio	2-2
2.2.1 Installing and Configuring the Spatial Studio Quick Start	2-3
2.2.2 Installing Spatial Studio to a WebLogic Server Domain	2-4
2.2.2.1 Preventing a Spatial Studio Admin User from General WLS Administration	2-5
2.2.3 Installing Spatial Studio from Oracle Cloud Marketplace	2-6
2.3 Setting Up the Spatial Studio Metadata Schema	2-6
2.4 Connection Requirements for Database Users of Spatial Studio	2-7
2.5 Changing the Configuration Using the sgtech_config.json File	2-8
2.5.1 Allow HTTPS-ONLY Access	2-8
2.5.2 Connecting to the Spatial Studio Metadata Schema	2-8
2.5.3 Caching Metadata Objects	2-10
2.5.4 Importing Additional Configuration Files in Spatial Studio	2-10
2.5.5 If the Spatial Studio Repository Schema Password Has Been Changed	2-13

2.6	Enabling IDCS as Identity Provider in Spatial Studio	2-14
2.6.1	Prerequisite Requirements for Setting Up IDCS with Spatial Studio	2-14
2.6.1.1	Determining the IDCS Console URL	2-15
2.6.2	Adding Spatial Studio Role as a Group in IDCS	2-16
2.6.3	Creating an Application in IDCS	2-19
2.6.4	Copying IDCS Settings into Spatial Studio's Configuration File	2-25
2.6.5	Testing IDCS Login	2-26

3 Using Oracle Spatial Studio

3.1	Getting Started Using Spatial Studio	3-3
3.2	Spatial Studio Active Project Page	3-4
3.3	Spatial Studio Projects Page	3-5
3.4	Spatial Studio Datasets Page	3-5
3.4.1	Creating a Dataset	3-7
3.4.2	Datasets with Issues	3-12
3.4.2.1	Enabling Spatial on a View-Based Dataset with Latitude and Longitude Columns	3-13
3.4.3	Geocoding a Dataset	3-14
3.4.4	Reverse Geocoding a Dataset	3-15
3.4.5	Preparing a Non-Spatial Dataset for Analysis	3-17
3.5	Spatial Studio Connections Page	3-18
3.6	Spatial Studio Administration Page	3-19
3.6.1	Adding a Custom Basemap	3-21
3.6.2	Editing a Custom Basemap	3-22
3.7	Spatial Studio Jobs Page	3-23
3.8	Visualization in Oracle Spatial Studio	3-24
3.8.1	Using a Table Visualization	3-25
3.8.2	Using a Map Visualization	3-26
3.8.2.1	Visualizing a Point Map	3-26
3.8.2.2	About GeoRaster Data Visualization	3-27
3.8.2.3	About Hexagonal Data Visualization Using H3 Aggregations	3-30
3.8.2.4	About Custom Map Regions Visualization	3-33
3.8.2.5	Visualizing a Moving Object	3-37
3.8.3	Using a Cesium Map Visualization	3-42
3.8.3.1	Visualizing a 3D Tiles Using a Cesium Map	3-43
3.8.3.2	Visualizing CZML Data Using a Cesium Map	3-44
3.8.4	Styling a Map Layer	3-45
3.8.4.1	Applying a Render Style For a Point Layer	3-46
3.8.4.2	Applying Style for a GeoRaster Layer	3-48
3.8.4.3	Applying Data-Driven Style to a Map with H3 Aggregations	3-49
3.8.4.4	Applying Predefined Colors to a Map Layer	3-50

3.8.4.5	Applying Predefined Symbols to a Map Layer	3-51
3.8.4.6	Setting Selection Tolerance on a Map Layer	3-53
3.8.4.7	Adding a Pin on a Map	3-54
3.8.4.8	Applying Map Backgrounds	3-55
3.8.5	Visualizing Map Data Over Time	3-56
3.9	Performing Analyses in Spatial Studio	3-58
3.9.1	Exploring a Proximity Filter	3-59
3.9.2	Editing a Spatial Analysis	3-61

4 Spatial Studio Accessibility Information

4.1	About Oracle Spatial Studio Accessibility	4-1
4.2	Oracle Spatial Studio Features that Support Accessibility	4-1
4.2.1	Keyboard Access with Spatial Studio	4-1
4.2.2	Screen Reader Readability with Spatial Studio	4-2
4.2.3	Flexibility in Font and Color Choices with Spatial Studio	4-2
4.2.4	No Audio-only Feedback with Spatial Studio	4-2
4.2.5	No Dependency on Blinking Cursor and Animation with Spatial Studio	4-2
4.2.6	Screen Magnifier Usability with Spatial Studio	4-2
4.3	Highly Visual Features of Oracle Spatial Studio	4-2

A REST API Endpoints for Oracle Spatial Studio

B Third-Party License Information for Spatial Studio

Index

List of Figures

2-1	WLS Admin Console for Deploying Spatial Studio	2-5
2-2	Workflow to Handle Multiple Configuration Files	2-11
2-3	Default IDCS Instance on the Federation Page	2-15
2-4	IDCS Console URL	2-16
2-5	IDCS Login	2-17
2-6	Adding an IDCS Group	2-17
2-7	Step-1: Group Details	2-18
2-8	Step2: Assign Users to a Group	2-19
2-9	List of Groups	2-19
2-10	Adding an Application	2-20
2-11	Add Application Dialog	2-21
2-12	Add Confidential Application: Details Page	2-21
2-13	Configuring Client Details	2-22
2-14	Configuring Token Issuance Policy	2-22
2-15	Configuring Authorization	2-23
2-16	Confirmation Dialog	2-23
2-17	Confirmation for Activating Application	2-24
2-18	Assigning Groups to an Application	2-24
2-19	Assigning Non-Admin Users	2-24
2-20	Profile Menu	2-27
3-1	Spatial Studio Main Page	3-1
3-2	Getting Started Page	3-3
3-3	Active Project Page	3-4
3-4	Active Project Page Icons	3-5
3-5	Datasets Page	3-6
3-6	Creating a Dataset	3-8
3-7	Select the Data Source	3-9
3-8	Options for Creating a Cesium Dataset	3-10
3-9	Creating a Dataset from GeoJSON	3-11
3-10	Warnings on a Dataset	3-12
3-11	Creating a Latitude/Longitude Index on a View-Based Dataset	3-14
3-12	Geocode Addresses	3-15
3-13	Reverse Geocoding	3-16
3-14	Joining to a Spatial Dataset	3-17
3-15	Appended Non-spatial and Spatial Properties	3-18

3-16	Connections Page	3-18
3-17	Administration Page	3-20
3-18	Adding a OGC WMS Map	3-22
3-19	Editing a Custom Basemap	3-23
3-20	Jobs Page	3-24
3-21	Tabular Visualization	3-26
3-22	Map Visualization	3-27
3-23	Creating a GeoRaster DataSet	3-28
3-24	GeoRaster Data Visualization	3-30
3-25	Creating an H3 Aggregation Dataset	3-31
3-26	Map Data Visualization Using Hexagonal Binning	3-32
3-27	Creating Custom Map Shapes	3-34
3-28	Create a Custom Region	3-35
3-29	Displaying the Custom Shape on the Target Dataset	3-36
3-30	Moving Objects Visualization	3-37
3-31	Enabling Spatiotemporal for a Dataset	3-39
3-32	Map Visualization Using a Spatiotemporal Dataset	3-40
3-33	Configuring Animation Settings	3-41
3-34	3D Cesium Map Visualization	3-44
3-35	Cesium Map Visualization Using a CZML Dataset	3-45
3-36	Applying a Cluster Style	3-46
3-37	Applying a HeatMap Style	3-47
3-38	Applying a Symbol Style	3-48
3-39	Applying Data-Driven Color Styling for H3 Map Layer	3-50
3-40	Color Coding a Map Layer	3-51
3-41	Symbols and Symbol Set	3-52
3-42	Custom Symbol Styling in Map Visualization	3-53
3-43	Setting the Selection Tolerance	3-54
3-44	Pin a Location on the Map	3-54
3-45	Changing a Map Background	3-56
3-46	Time slider Settings	3-57
3-47	Using a Time slider in Map Visualization	3-58
3-48	Spatial Analysis Operations	3-59
3-49	Spatial Analysis - Within Distance Configuration	3-60
3-50	Spatial Analysis - Within Distance Visualization	3-61
3-51	Modify Spatial Analysis Parameters	3-62

Preface

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Resources](#)
- [Conventions](#)

Audience

This document is intended for users of the Spatial Studio tool who have one or more of the following responsibilities:

- Administering Spatial Studio. Such users install the tool, and create and manage database users of the tool.
- Using Spatial Studio. Such users are typically data analysts or application developers, or both.

 **Tip:**

If you choose to print the PDF version of this book, and if you do not want to include the licensing details in the printout, print **only pages 1 (title page) through the last page of the last chapter**. (Most of the content of the book consists of license details in Appendix A.)

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Related Resources

For more information, see these Oracle resources:

- Oracle Technical Resources (formerly called Oracle Technology Network) page: <https://www.oracle.com/database/technologies/spatialandgraph.html> (and look for Spatial Studio)
- *Oracle Spatial Developer's Guide*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Changes in this Release for this Guide

New Features for Oracle Spatial Studio Release 22.1

- Added support for integrating the Spatial Studio application with Oracle Identity Cloud Service on Oracle Autonomous Database.
See [Enabling IDCS as Identity Provider in Spatial Studio](#) for more information.
- Added support for using multiple configuration files that can be imported into the main `sgtech_config.json` configuration file.
See [Importing Additional Configuration Files in Spatial Studio](#) for more information.
- Added support for visualizing moving objects using a spatiotemporal dataset.
See [Visualizing a Moving Object](#) for more information.
- Added support for Cesium map visualization using CZML data format.
See [Visualizing CZML Data Using a Cesium Map](#) for more information.
- Added support for creating a dataset by accessing GeoJSON data directly using an external service endpoint or URL.
See [Creating a Dataset from GeoJSON URL](#) for more information.
- Enhanced support for table visualization by replacing page-based navigation with infinite scrolling table.
See [Using a Table Visualization](#) for more information.
- Added support for editing a spatial analysis after creation.
See [Editing a Spatial Analysis](#) for more information.
- Added support for custom symbol styling using predefined symbol names which are stored in a dataset column.
See [Applying Predefined Symbols to a Map Layer](#)
- Added support for editing a custom basemap.
See [Editing a Custom Basemap](#) for more information.
- Enhanced Geocoding support to store the geocoding results in the latitude and longitude columns of the input source table.
See [Geocoding a Dataset](#) for more information.
- Enhanced user experience by refreshing Spatial Studio's frontend user interface to align with Oracle's standard Redwood theme.
- Improved the organization and layout of the different components on the Active Project page.
See [Figure 3-3](#) to view enhancements related to typography and reorganization of the setting panels of a map layer in the Active Project page.

Database Support

Support for Oracle Database 12.2 and 18c releases are desupported.

1

Introduction to Oracle Spatial Studio

Oracle Spatial Studio is a graphical tool for working with spatial data in Oracle Spatial and Graph format.

- [About Oracle Spatial Studio](#)
Oracle Spatial Studio, also referred to as Spatial Studio, is a free tool that lets you connect with, visualize, explore, and analyze geospatial data stored in and managed by Oracle Spatial.
- [Spatial Studio Terminology](#)
This section introduces the key concepts and domain objects of Oracle Spatial Studio.
- [Spatial Studio Metadata and Connection Management](#)
This section provides conceptual information about the metadata schema and the connections object in Spatial Studio.
- [Spatial Studio Best Practices](#)
This section describes the best practice recommendations when working with Spatial Studio.

1.1 About Oracle Spatial Studio

Oracle Spatial Studio, also referred to as Spatial Studio, is a free tool that lets you connect with, visualize, explore, and analyze geospatial data stored in and managed by Oracle Spatial.

Spatial Studio is a multiuser Java EE application that can be used as a standalone tool (Quick Start) or deployed to WebLogic Server.

Before you can use Spatial Studio, you must download the kit from Oracle Technical Resources (formerly called Oracle Technology Network), install the software, and perform certain administrative actions like creating database users that are authorized to use the tool, and managing those users.



Note:

Spatial Studio is **not** the Spatial map visualization component (formerly called "MapView"), which is not an end-user "tool" but rather a separate and distinct component.

The map visualization component is documented in [Spatial Map Visualization Guide](#).

1.2 Spatial Studio Terminology

This section introduces the key concepts and domain objects of Oracle Spatial Studio.

- **Connection:** Connections are user-created; they provide details so that the Spatial Studio can load user data from an external data source, typically a specific database schema.
- **Dataset:** A dataset is the basic organizational unit of a user's data.
- **Project:** A project is where data visualization and analysis occur. It represents a “workspace” that can be saved and reopened.
- **Published Project:** A published project is a snapshot of the visualizations and analyses that a user has created in a project. It provides an easy way of sharing what users have created within their organization.
- **Analysis:** An analysis is typically one or more (spatial) operations performed on one or more datasets. The operation types and their parameters for an analysis are all stored as part of a *project*. The result of any analysis can be visualized, just like any other dataset.
- **Metadata schema (repository):** The metadata schema for Spatial Studio is an Oracle Database that contains the repository where all Spatial Studio metadata is centrally managed.
- **User:** Spatial Studio's end users, which are typically business analysts and administrative users. These users are NOT database schema owners; rather they are application users, whose information is typically stored in an LDAP-like directory and whose authentication is carried out by WebLogic Server.
- **Public Dataset:** A public dataset is one with a GeoJSON endpoint that can be accessed without having to log onto the Spatial Studio first. A public dataset is always visible to all the Spatial Studio users and can be used in their projects.
- **Public Published Project (PPP):** A public published project is a published project where all the datasets involved are public datasets, and the published project itself is also made public. You can embed the visualizations of a public published project in other web applications, or can be viewed standalone in a web browser, without having to log onto Spatial Studio server first.

1.3 Spatial Studio Metadata and Connection Management

This section provides conceptual information about the metadata schema and the connections object in Spatial Studio.

Spatial Studio stores all of its own metadata (such as the definitions of all the datasets and connections created by different users) in a single Oracle Database schema known as the metadata schema, or repository.

This metadata schema is one that Spatial Studio must be able to connect to during initial start up, because all of its essential metadata and states are stored there. This metadata schema can be an Oracle Database devoted solely to Spatial Studio use, or it can be any schema potentially used for other purposes as well, as long as the schema is provisioned for use by Spatial Studio, with the minimum necessary privileges.

The main types of connections are created by Spatial Studio's end users so that they can gain access to a set of data tables stored in potentially several different database schemas, and explore them together in a single project. For each such user-created connection, only its connection details are stored in Spatial Studio's metadata schema, while no actual (raw) data is ever copied or extracted into the metadata schema.

If a schema user name and password are specified when a connection is created in Spatial Studio, this information is securely encrypted before being stored in the metadata schema tables. When a user opens a project that depends on datasets originated from such a connection, then the password is decrypted at that time and a new JDBC connection pool is established. This connection pool is then used by Spatial Studio to run queries against the target table(s) from that connection whenever needed.

By default a connection is **private**, meaning that only the user that created the connection can access it (either in a project or anywhere else). For example, if User A creates a connection, then User B will not be able to see or use that connection or any data from the connection. The only exception is if User B is an admin user, in which case all connections and datasets are fully accessible by User B.

1.4 Spatial Studio Best Practices

This section describes the best practice recommendations when working with Spatial Studio.

Standardize Longitude/Latitude Data on SRID 4326

In Oracle Database, spatial data includes a SRID (spatial reference identifier), which uniquely identifies the coordinate system associated with the data. If you want to perform any spatial analysis operations involving multiple data sets, it is recommended that the data sets have the same SRID.

Many SRIDs can be used for longitude/latitude data, but probably the most widely used is 4326. Oracle recommends that you use SRID 4326 for longitude/latitude geometries unless there is information to indicate otherwise. Also, if you have Oracle tables with longitude/latitude geometries and if the SRID is not consistent across the tables, you are advised to standardize on SRID 4326.

(For detailed information about SRIDs and coordinate system support in Oracle Spatial, see the Coordinate Systems (Spatial Reference Systems) chapter in the Spatial manual.)

The following example transforms geometries that do not use SRID 4326 so that they use SRID 4326. You would need to do these actions for each existing table that does not use SRID 4326. The example assumes a geometry table named TABLE_1 with a geometry column named GEOM. It also drops the existing spatial index named table_1_idx, and later re-creates it.

```
-- Drop the existing spatial index.
DROP INDEX table_1_idx FORCE;

-- Update the spatial metadata.
INSERT INTO user_sdo_geom_metadata
VALUES (
  'TABLE_1', -- table name
  'GEOM',    -- geometry column name
  SDO_DIM_ARRAY(
    SDO_DIM_ELEMENT('Longitude', -180, 180, 0.05), -- 0.05 meter tolerance
    SDO_DIM_ELEMENT('Latitude', -90, 90, 0.05) -- 0.05 meter tolerance
  ),
  4326 -- SRID for 'Longitude / Latitude (WGS 84)' coordinate system
);

-- Update (transform) geometry data to use SRID 4326.
update table_1 set geom = sdo_cs.transform(geom, 4326);
```

```
-- Re-create the spatial index.  
CREATE INDEX table_1_idx  
ON table_1 (geom)  
INDEXTYPE IS MDSYS.SPATIAL_INDEX_V2;
```

 **Note:**

In the CREATE INDEX statement, SPATIAL_INDEX_V2 is recommended if the Oracle Database is Release 18 or later. If it is earlier than Release 18, specify just SPATIAL_INDEX.

2

Administering Oracle Spatial Studio

Administering Oracle Spatial Studio involves certain actions that must be performed before non-administrative users can work with spatial data. If you are an administrative user of Spatial Studio, you must:

- Download the Oracle Spatial Studio application from Oracle Technical Resources (formerly called Oracle Technology Network) and install it.
- Set up a database schema to be the Spatial Studio schema, that is, to hold metadata for Spatial Studio.
The Spatial Studio schema can be either an existing database schema in which Spatial Studio metadata will be added, or a newly created schema that will be used only for Spatial Studio.
- Configure the newly installed Spatial Studio application.
When the installation and configuration actions are completed, users can connect to the database, start Spatial Studio, and use its features.

Note:

The Spatial Studio application can be downloaded in either of the following formats:

- Quick Start: A ready-to-run standalone application packaged in a zip file containing what you need to launch the Spatial Studio web application on your desktop. (You will still need to have JDK 8 64-bit, update 181 or later installed on your desktop, because no Java kit is bundled with this kit.) Quick Start is well suited for personal and development use.
- A WLS-optimized EAR (Enterprise Application aRchive) file. This `.ear` file can be deployed to an existing WebLogic Server domain administered by an organization's WLS or middleware administrator.
This is the recommended installation and deployment method if you intend for multiple end users to access the same Spatial Studio web application.

A given person or database user can be *both* an administrative user and a non-administrative user, *or* can be *only* an administrative user or a non-administrative user.

- [Prerequisites and Recommendations for Spatial Studio](#)
This section describes the prerequisites and recommendations that apply for using Spatial Studio.
- [Downloading and Installing Spatial Studio](#)
Spatial Studio must be downloaded and installed before anyone can use it to perform interesting work on spatial data.
- [Setting Up the Spatial Studio Metadata Schema](#)
You must set up a database schema to be the Spatial Studio schema, which will hold metadata used by the Spatial Studio application.

- [Connection Requirements for Database Users of Spatial Studio](#)
This section describes the connection requirements for database users to work on Spatial Studio.
- [Changing the Configuration Using the sgtech_config.json File](#)
This section describes the configuration of important properties in `sgtech_config.json` file.
- [Enabling IDCS as Identity Provider in Spatial Studio](#)
Starting from Oracle Spatial Studio Release 22.1, you can log into your Spatial Studio instance using users already managed by your own Oracle Cloud tenancy's IDCS identity domain.

2.1 Prerequisites and Recommendations for Spatial Studio

This section describes the prerequisites and recommendations that apply for using Spatial Studio.

Oracle Spatial must be installed on the database to which any users will connect to perform actions with Spatial Studio. (It is not sufficient to have only Oracle Locator installed.)

The following additional requirements and recommendations apply:

- Java versions: Java 8 (64-bit, update 181 or later); or JDK 11 (64-bit).
- Oracle Database 19c or later. This applies both to the Spatial Studio metadata schema and to all database connections that will be used by Spatial Studio users.

Note:

Oracle Spatial Studio Releases are backward compatible with supported Oracle Database versions.

- Oracle WebLogic Server 12.2.1.3 or later.
- All the privileges listed in section [Setting Up the Spatial Studio Metadata Schema](#) are required for each database user that works with Spatial Studio.
- Quota on the default tablespace for each database user that works with Spatial Studio. `ALTER USER` statement format: `ALTER USER [username] QUOTA [quota value] ON [default tablespace name];`
For example, for a user named `test_user` with default tablespace `users`:

```
ALTER USER test_user QUOTA unlimited ON users;
```
- The default tablespace for the Spatial Studio repository schema should not use compression.

2.2 Downloading and Installing Spatial Studio

Spatial Studio must be downloaded and installed before anyone can use it to perform interesting work on spatial data.

Go to <https://www.oracle.com/database/technologies/spatial-studio/get-started.html> to see more information for downloading and installing Spatial Studio.

- [Installing and Configuring the Spatial Studio Quick Start](#)
Quick Start is an easy method for getting started, and is well suited for personal and development use.
- [Installing Spatial Studio to a WebLogic Server Domain](#)
Spatial Studio can be deployed to a WebLogic Server domain, the recommended approach if multiple end users will access the same Spatial Studio application.
- [Installing Spatial Studio from Oracle Cloud Marketplace](#)
You can provision Spatial Studio to Oracle Cloud from Oracle Cloud Marketplace.

2.2.1 Installing and Configuring the Spatial Studio Quick Start

Quick Start is an easy method for getting started, and is well suited for personal and development use.

The Quick Start is packaged in a single zip that contains everything you need to start using Spatial Studio, except for Java 8 (64-bit, update 181 or later) and your own database schemas.

The following are general steps for getting started:

1. Download the Quick Start zip archive `OracleSpatialStudio_qs.zip`.
2. Unzip (extract) it, which results in a directory named `Oracle_Spatial_Studio`.
3. Ensure that the `JAVA_HOME` environment variable exists on your system, and points to a full JDK installation of Java SE Development Kit 8u181 (64-bit) or later. JDK 11 can also be used.
4. Ensure that the ports 8080 and 4040 are not being used by any other (web) applications. (You can direct Spatial Studio to use different ports, but 8080 and 4040 are the default.) Port 8080 is to used with the `http://` protocol, while port 4040 is for the `https://` protocol.
Note that by default, Spatial Studio only allows access using `https`.
5. From a command window (Windows) or terminal (Linux or Mac), go to (`cd`) the `Oracle_Spatial_Studio` directory. This directory contains several `.bat` or `.sh` files.
6. Use `start.sh` or `start.bat` to start the application. (On Linux or Mac you may need to ensure that the `.sh` files are executable by first running the command: `chmod u+x *.sh`) Leave the terminal or command window open.
7. In your browser, go to the URL: `https://localhost:4040/spatialstudio`
The default admin user login credentials are `admin/welcome1`. It is strongly recommended that you immediately change the password.

The admin user's and the two built-in regular users' passwords are all stored in encrypted form. For how to change the (encrypted) password of a Spatial Studio user, see the README file for the Quick Start. This README file also contains information about starting and restarting the Quick Start.

 **Note:**

The following considerations apply to using the Quick Start:

- The default port is 4040, but you can change it by editing the file `conf/server.json` in `Oracle_Spatial_Studio`. You will need to restart the application after you make any change. (The same applies if you change the HTTP port value from the default 8080.)
- The Quick Start provides several predefined web user login accounts named `admin`, `manager`, `author`, `consumer`, and `limited`. These users and their login passwords are defined in the configuration file `conf/jetty-realm.properties`. You should **change the passwords immediately** after you unzip the downloaded Quick Start kit. Because the Quick Start is intended for personal use, the passwords for the end user accounts **are not encrypted**. However, all other passwords, such as those used to log into the Spatial Studio metadata schema or for any user-created connections to database schemas, **are strongly encrypted** everywhere.
- To stop the application, the preferred approach is to start a second terminal or command window, then go to the same `Oracle_Spatial_Studio` folder and run the `stop.bat` or `stop.sh` script.

2.2.2 Installing Spatial Studio to a WebLogic Server Domain

Spatial Studio can be deployed to a WebLogic Server domain, the recommended approach if multiple end users will access the same Spatial Studio application.

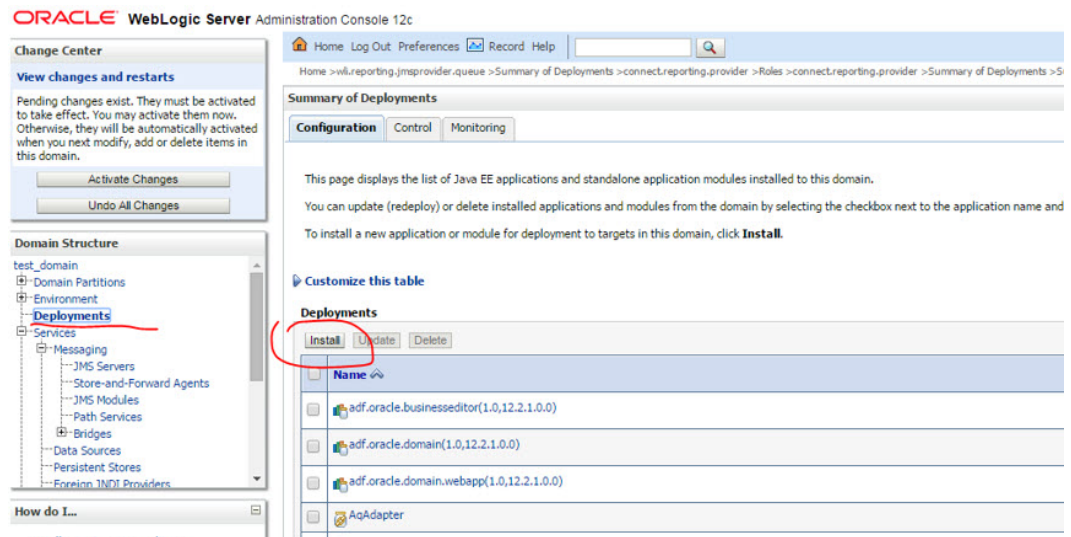
 **Note:**

A WebLogic Server license is required in order to host Spatial Studio in WebLogic Server for multiple end users.

The general approach for deploying Spatial Studio to WebLogic Server is no different from deploying any other Java EE EAR application. The easiest way to do so is by using the WebLogic Server's Admin console with the following steps. Note that in all or most steps you can accept the default values provided by the WLS Installation Application Wizard.

1. Download the Studio EAR archive from Oracle Technical Resources or eDelivery, and save it to your local system.
2. Log into the target WLS domain's Admin console.
3. Click the **Deployments** link on the left side.
4. Click **Install** button under the Deployments section, as shown in the following figure (note that the exact contents may be different for your instance of WLS).

Figure 2-1 WLS Admin Console for Deploying Spatial Studio



5. On the next page, , select the Spatial Studio EAR file downloaded previously, and install it as an application (not as a library).
 6. Click through the remaining steps, including selecting the proper target server. You should accept the default options in all cases unless you know exactly what you are doing. Finally, click **Save** to complete the deployment.
 7. If your WLS runs in production mode, you may need to activate the changes to ensure the deployment is activated.
 8. Make sure the newly deployed Spatial Studio application is marked Active; otherwise, you may need to explicitly start it from the WLS administrative console.
 9. Access the Studio application using your managed server's URL with the / spatialstudio context root. For example: `http://mycompany.com:7002/spatialstudio`
- [Preventing a Spatial Studio Admin User from General WLS Administration](#)
 If you want to prevent a Spatial Studio administrative user from performing other general WebLogic Server administrative operations, follow the instructions in this topic.

2.2.2.1 Preventing a Spatial Studio Admin User from General WLS Administration

If you want to prevent a Spatial Studio administrative user from performing other general WebLogic Server administrative operations, follow the instructions in this topic.

The Spatial Studio application by default allows all WebLogic managed admin users (those who are in WebLogic's **Administrators** group) to log into the Spatial Studio application and assume Admin role inside the Spatial Studio application as well.

However, in some scenarios, your organization may **not** want to provide the WebLogic Server admin account information to the user(s) that will be administering only the Spatial Studio application. In such cases, the WLS system administrator can create a new WLS group with the id value of "**SGTech_SystemAdmin**" in the default WLS security realm. Then, either create a new user or assign an existing non-WLS-admin user to this group. From then on, this user will assume the admin role of the Spatial Studio whenever logged in, but will not be able to administrate the WLS server in general.

Note that all WLS managed users will be able to log into Spatial Studio by default, but they will be limited to accessing only their own Spatial Studio objects such as connections, datasets, and projects. Administrative users of Spatial Studio will have full access to every Spatial Studio object created by everyone.

2.2.3 Installing Spatial Studio from Oracle Cloud Marketplace

You can provision Spatial Studio to Oracle Cloud from Oracle Cloud Marketplace.

See [Deploy Spatial Studio from Cloud Marketplace](#) for more information on deploying Spatial Studio from Cloud Marketplace.

2.3 Setting Up the Spatial Studio Metadata Schema

You must set up a database schema to be the Spatial Studio schema, which will hold metadata used by the Spatial Studio application.

The Spatial Studio schema can be either an existing database schema in which Spatial Studio metadata will be added, or a newly created schema that will be used only for Spatial Studio. The recommended practice is to create a new database user that will be used only by Spatial Studio. The database user for the Spatial Studio schema must have the following privileges:

- CONNECT
- CREATE PROCEDURE
- CREATE SEQUENCE
- CREATE SESSION
- CREATE SYNONYM
- CREATE TABLE
- CREATE TRIGGER
- CREATE TYPE
- CREATE VIEW

Note:

The `CREATE TRIGGER` privilege is required only if you intend to store and display GeoRaster data in the schema.

For example, when connected as a user with DBA privileges:

```
SQL> create user SPATIAL_STUDIO identified by <password>;
SQL> grant connect, create procedure, create sequence, create session,
create synonym, create table, create trigger, create type, create view
to SPATIAL_STUDIO;
```

When the Spatial Studio application starts running for the first time, it will generate a configuration file in a folder named **.sgtech** under the current user's operating system home folder. The configuration file is named `sgtech_config.json`. This is where

Spatial Studio application will be obtaining and storing the connection details in its metadata schema.

After the connection to the metadata schema is established, the Spatial Studio application will automatically check if the required tables and other database objects are already present, and if their versions are up to date with the latest Spatial Studio application software. If these tables are not found, or if the tables require migration, the Spatial Studio application will run the necessary SQL scripts to create or migrate them, all without any intervention from the user.

The Spatial Studio schema will contain the following tables and views:

- `SGTECH_OBJECT`: stores all the domain objects for Spatial Studio.
- `SGTECH_SYS_TYPE`: defines all the known types of domain objects of Spatial Studio.
- `SGTECH_SYS_JSON_SCHEMA`: stores JSON data schema.
- `SGTECH_TASK_QUEUE`: stores long-running jobs of Spatial Studio.
- `SGTECH_TASK_BROKER`: stores job brokers for Spatial Studio.

**Note:**

Do **not** add, delete, or edit any of the Spatial Studio tables or views or the data within them. They are automatically maintained by Spatial Studio, and should not be modified by users unless directed by Oracle Support.

Managing Metadata Schema when Running Multiple Instances of Spatial Studio

Spatial Studio prevents you from running multiple application instances each having its own `sgtech_config.json` file from using the same metadata schema. In case you want to run another instance, it is recommended that you copy the `sgtech_config.json` configuration file linked to the initial instance to the system where you want to start the new instance.

Otherwise, any attempt to connect to the same metadata schema from an instance running on a different system is prevented by Spatial Studio with the following warning:

```
The selected repository is already registered to another instance of Spatial Studio. Check the system logs for more details.
```

2.4 Connection Requirements for Database Users of Spatial Studio

This section describes the connection requirements for database users to work on Spatial Studio.

Each individual user must connect as a database user who is authorized to run Spatial Studio. A Spatial Studio administrator can enable access for the database users.

You can create new database users specifically for Spatial Studio access, or you can modify existing database users to enable Spatial Studio access, or you can do a combination of these approaches.

All database users must have a minimum set of privileges. In addition, each database user that works with Spatial Studio must have quota on its default tablespace. The privilege and quota requirements are explained in [Prerequisites and Recommendations for Spatial Studio](#).

2.5 Changing the Configuration Using the `sgtech_config.json` File

This section describes the configuration of important properties in `sgtech_config.json` file.

By default, Spatial Studio will create (if it does not already exist) and use a JSON file named `sgtech_config.json` for most of its essential configuration information.

This file is typically found in the operating system user's home directory, in a subfolder named `.sgtech`. This is true whether you deployed the Studio EAR to a WebLogic domain or are just using the Quick Start.

The following topics describe some important properties in the configuration file that a system administrator should be aware of.

- [Allow HTTPS-ONLY Access](#)
- [Connecting to the Spatial Studio Metadata Schema](#)
- [Caching Metadata Objects](#)
- [Importing Additional Configuration Files in Spatial Studio](#)
- [If the Spatial Studio Repository Schema Password Has Been Changed](#)

2.5.1 Allow HTTPS-ONLY Access

One of the top level properties in the `sgtech_config.json` config file is ***https_only***. When this value is set to **true** (the default), Oracle Spatial Studio will actively monitor all incoming requests and only allow requests that were made using SSL. Normal `http://` requests will be denied.

Thus, if you tried to access the Spatial Studio application using an `http://` URL such as `http://localhost:8080/spatialstudio`, and if the value of `https_only` is set to `true`, then you will not be able to log in. In fact, you will not even see the login page itself, because none of the page resources will be accessible by your browser. Similarly, all RESTful requests will be blocked unless accessed using HTTPS.

If your environment (such as WebLogic Server) supports only `http` access, then you can change the value of `https_only` to `false`, and make sure to restart the Spatial Studio application or the JavaEE container where Spatial Studio is deployed.

2.5.2 Connecting to the Spatial Studio Metadata Schema

Spatial Studio must have access to a set of metadata tables, such as `SGTECH_OBJECT`. These tables are collectively considered the repository of the Spatial Studio application. The database schema that hosts these tables is considered the metadata schema or repository schema of Spatial Studio.

Spatial Studio must be able to establish a connection to this metadata schema as the first step during startup, when the connection details are found in the `sgtech_config.json` file in the `metadata_schema` section.

In an emergency situation, you can also manually edit this section to change or correct the connection details. However, be careful whenever editing this file, because any syntax error can cause Spatial Studio to stop working or fail to restart.

When you manually enter the repository schema connection details in the `sgtech_config.json` file (in the `metadata_schema` section), you must first specify whether `CONTAINER` or `SPATIAL_STUDIO` is managing the physical JDBC connections:

```
"metadata_schema" : {
  "connection_manager": "CONTAINER"
}
```

Or

```
"metadata_schema" : {
  "connection_manager": "SPATIAL_STUDIO"
}
```

When `connection_manager` is set to `CONTAINER`, it means the JDBC connections to the Spatial Studio's repository schema are managed through a Java EE data source already created in Jetty (for Quick Start) or WebLogic Server. For example, if there is a data source named `jdbc/studioMetadata` in the WLS domain, and if you want Studio to connect to the target schema using this data source, the relevant section in `sgtech_config.json` should look like this:

```
"metadata_schema" {
  "connection_manager" : "CONTAINER",
  "container_managed":{
    "jndi_datasource_name" : "jdbc/studioMetadata"
  }
}
```



Note:

As of Spatial Studio Release 19.2, you cannot enter the container-managed connection details in the Spatial Studio application, so manually editing `sgtech_config.json` file is the only supported approach.

However, if you want Spatial Studio to manage the physical connections to its metadata schema, set `connection_manager` to `SPATIAL_STUDIO`, and supply the full set of JDBC connection details, which vary depending on whether the schema resides in an Oracle Autonomous database (which requires a database Wallet for establishing connections), or a regular database on-premises. You can check the inline comments inside the `sgtech_config.json` file for more details, but it is best if you simply log onto Spatial Studio as an admin user and then interactively supply the connection details for the repository schema.

Such details will then be automatically saved in `sgtech_config.json` after Spatial Studio verifies the connection.

2.5.3 Caching Metadata Objects

During run time as users create connections, datasets, and projects, Spatial Studio is creating, modifying, and storing a large amount of metadata (sometimes called Spatial Studio's "domain objects"), such as the definition of a dataset and all of its columns, or the definition of a project including the full layout of all of its visualizations.

All the metadata objects are permanently stored in the metadata table `SGTECH_OBJECT`, but if the database must be accessed frequently (such as every time you open a project or view the properties of a dataset), performance may suffer. If this occurs, the solution is to **cache** frequently accessed copies of such metadata objects in memory.

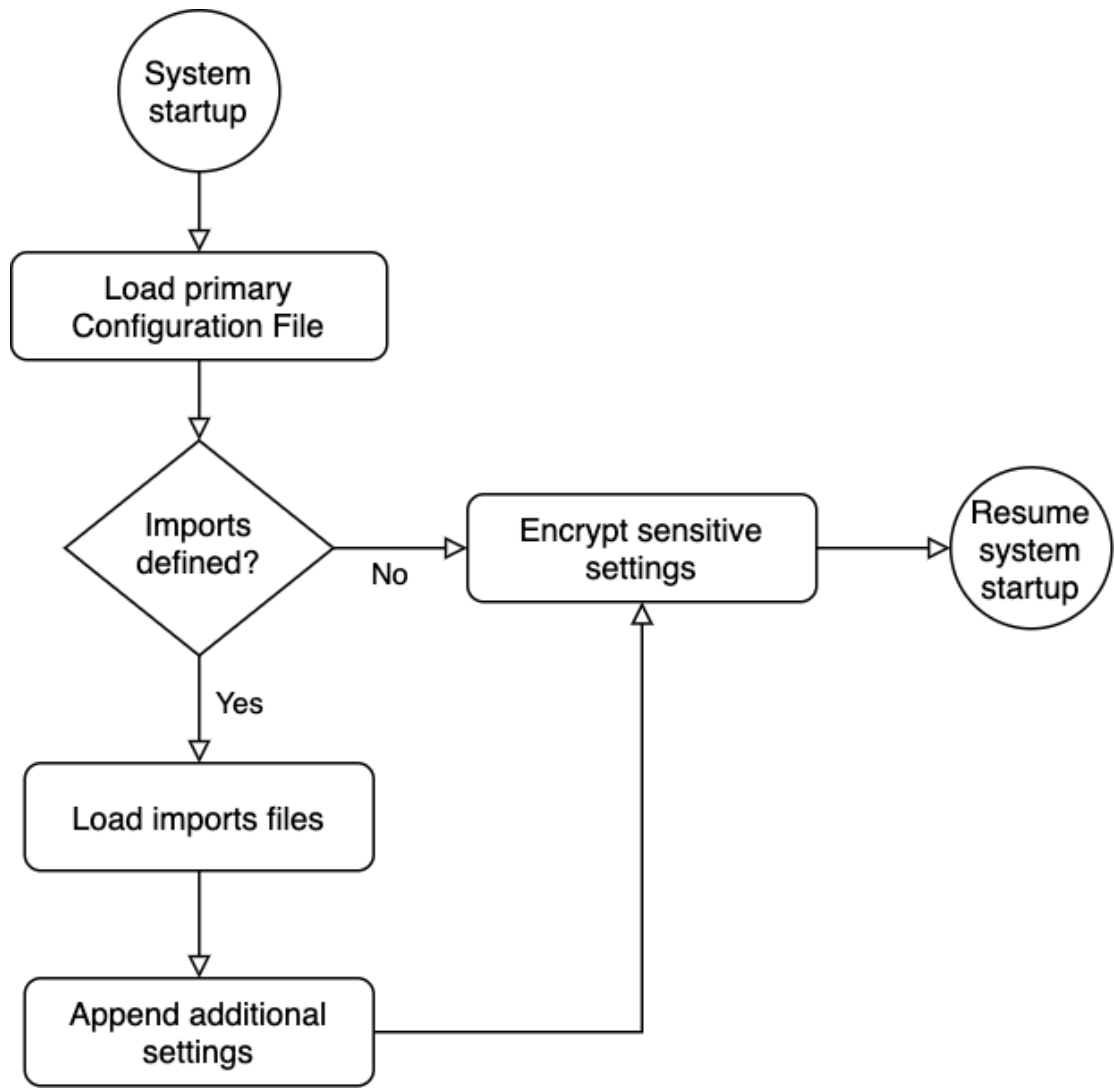
The `cache` section of the `sgtech_config.json` file lets you specify whether to enable such an in-memory cache of metadata objects. If the cache is enabled, then you can further specify how many such objects can be cached and for how long. A general rule is that `max_size` (the maximum number of metadata objects to be cached) should be no less than 1000, but probably should not exceed 10000 unless you have a very large amount of memory allocated to Spatial Studio.

2.5.4 Importing Additional Configuration Files in Spatial Studio

Spatial Studio 22.1 allows you to import different configuration files into the main `sgtech_config.json` configuration file.

The following describes the workflow for handling multiple configuration files:

Figure 2-2 Workflow to Handle Multiple Configuration Files



1. At startup, Spatial Studio loads the primary configuration file, `sgtech_config.json`. All the settings defined in `sgtech_config.json` are used as the *base settings*.
2. If the `sgtech_config.json` file contains the `imports` directive, then it loads the import files in the order (top to bottom) in which they are declared. For each loaded import file, the system reads and appends the settings to the *base settings*.
3. Once the *base settings* are all read in, the system encrypts any sensitive items and saves them back to their corresponding file.
4. Spatial Studio resumes loading the rest of the system.

Adding imports to `sgtech_config.json`

You can edit the `sgtech_config.json` file and add the new top-level `imports` directive as shown:

```
"imports" : {
  "<import_name>" : {
    "module" : "<import_file_path>",
    "description" : "<import_description>"
  }
}
```

In the preceding code:

- **<import_name>**: Name of the import file which must be unique. This is used mainly by Spatial Studio to report errors when loading `imports` files.
- **<import_file_path>**: The file path for the `imports` files must be relative to the containing directory of the main configuration file (`~/.sgtech/sgtech_config.json`).
- **<import_description>**: To describe the purpose of the import. `description` is an optional parameter for the `imports` property.

For example, configure the `metadata_schema` details as shown in the following code in **`sgtech_config.dbsettings.json`** file. The file path can be `~/.sgtech/extras/sgtech_config.dbsettings.json`:

```
{
  "metadata_schema" : {
    "connection_manager" : "CONTAINER",
    "container_managed" : {
      ...
    },
  }
}
```

Also, configure the `jobs` details separately in **`sgtech_config.jobs.json`** following the file path `~/.sgtech/extras/sgtech_config.jobs.json`:

```
{
  "jobs" : {
    "init_threads_count" : 45
  }
}
```

You can now include the preceding two configuration files in the `imports` directive in the main `sgtech_config.json` file (`~/.sgtech/sgtech_config.json`) as shown:

```
{
  "version" : "22.1.0",
  "work_dir" : "",
  "https_only" : true,
```

```

"master_seed" : "<somerandommasterseed>",
"logging" : {
  "level" : "INFO"
},
"imports" : {
  "jobs" : {
    "module" : "extras/sgtech_config.jobs.json"
  },
  "db" : {
    "module" : "extras/sgtech_config.dbsettings.json",
    "description" : "Database settings optimized for clustering"
  }
}
}

```

Import Files Requirements

It is important you adhere to the following requirements when handling multiple import files:

- Files for `imports` must be located inside the same directory as the primary `sgtech_config.json` file, or any of its subdirectories.
- Settings included in the `imports` files must not make collision with settings declared already in other configuration files, including the primary `sgtech_config.json` configuration file.
- Since `imports` files can contain sensitive data, only the file owner must have read, write or both access.
- `version`, `work_dir`, `master_seed` and `imports` are settings which are restricted to the primary configuration file, `sgtech_config.json`.

2.5.5 If the Spatial Studio Repository Schema Password Has Been Changed

If the Spatial Studio Repository Schema Password has been changed, you must update the `sgtech_config.json` configuration file, as follows:

1. Make a backup copy of the file. For example, copy `~/.sgtech/sgtech_config.json` to `~/.sgtech/sgtech_config.json_backup`.
2. On the Spatial Studio compute node, edit the file `~/.sgtech/sgtech_config.json`.
3. In the `metadata_schema` section, update `database_password` to the desired value.
4. Save the file and then restart the Spatial Studio deployment. To restart if you are using the Quick Start kit, see the `README` file for the Quick Start; to restart if this is a WebLogic Server deployment, use the WebLogic Server console.
5. Open the Studio Spatial Studio application. You should be able to log in.

You will still have all the artifacts you had created, including other (non-repository) connections, which you can edit as needed.

2.6 Enabling IDCS as Identity Provider in Spatial Studio

Starting from Oracle Spatial Studio Release 22.1, you can log into your Spatial Studio instance using users already managed by your own Oracle Cloud tenancy's IDCS identity domain.

The workflow to setup IDCS as the identity provider for Spatial Studio involves the following three steps:

1. Adding Spatial Studio roles as Groups in IDCS.
2. Creating an Application in IDCS.
3. Copying IDCS settings into Spatial Studio's configuration file.

Before you begin, see [Prerequisite Requirements for Setting Up IDCS with Spatial Studio](#) to ensure that you meet all the prerequisite requirements.

- [Prerequisite Requirements for Setting Up IDCS with Spatial Studio](#)
- [Adding Spatial Studio Role as a Group in IDCS](#)
You must add the system administrator role supported in Spatial Studio as a group in IDCS.
- [Creating an Application in IDCS](#)
This section describes the steps to add the Spatial Studio application in IDCS.
- [Copying IDCS Settings into Spatial Studio's Configuration File](#)
To integrate Spatial Studio with IDCS, you must add the IDCS settings into the `sgtech_config.json` configuration file.
- [Testing IDCS Login](#)
After all the setup steps are completed, you can test and verify the IDCS login.

2.6.1 Prerequisite Requirements for Setting Up IDCS with Spatial Studio

To integrate IDCS with Spatial Studio, you must obtain the following details:

- Identify your **IDCS tenant**: See [Retrieving IDCS Instance details](#) .
- Identify your **IDCS host**: See [Retrieving IDCS Instance details](#) .
- Identify the **Spatial Studio URL**: `https://localhost:4040/spatialstudio/` is the default.
- Setup an **IDCS admin account**: See [About Oracle Identity Cloud Service User Accounts and Groups](#) for details.
- Identify **IDCS console URL**: See [Determining the IDCS Console URL](#) for more information.

Retrieving IDCS Instance details

You can obtain the IDCS instance details by inspecting any of the IDCS URLs. For instance, you can inspect the IDCS login URL which you receive in the email when you are added as a user in IDCS. For example, consider the following sample IDCS cloud account login URL:

`https://idcs-54656e616e742d4578616d706c652121.identity.oraclecloud.com/ui/v1/signin`

You can now derive the IDCS instance details from the preceding URL as shown:

- **IDCS tenant:** `idcs-54656e616e742d4578616d706c652121`
- **IDCS host:** `identity.oraclecloud.com`
- [Determining the IDCS Console URL](#)
OCI tenancies include a default IDCS instance and you can obtain the IDCS console URL using the OCI console.

2.6.1.1 Determining the IDCS Console URL

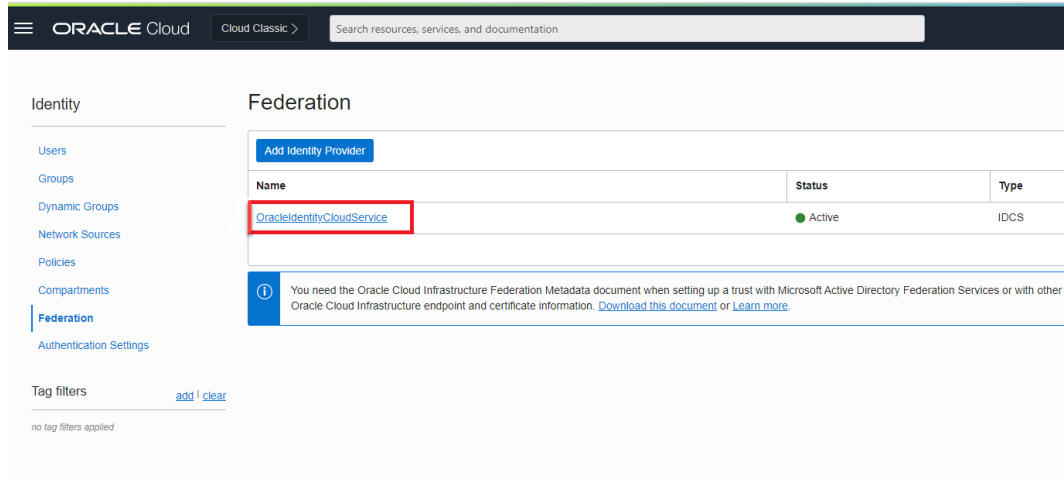
OCI tenancies include a default IDCS instance and you can obtain the IDCS console URL using the OCI console.

Perform the following steps to identify the URL to access IDCS console:

1. Sign in to the OCI console using your Oracle Cloud credentials.
2. Open the navigation menu and select **Identity and Security**.
3. Click **Federation** under **Identity**.

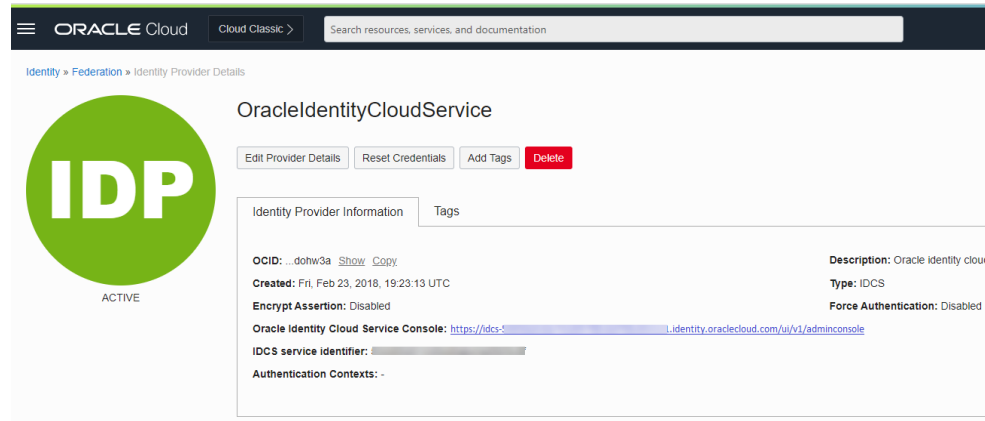
The Federation page opens as shown:

Figure 2-3 Default IDCS Instance on the Federation Page



4. Click on the default IDCS instance, shown highlighted in the preceding figure.
The **Identity Provider Details** page opens.
5. Note the IDCS console URL in the **Oracle Identity Cloud Service Console** field as shown:

Figure 2-4 IDCS Console URL



2.6.2 Adding Spatial Studio Role as a Group in IDCS

You must add the system administrator role supported in Spatial Studio as a group in IDCS.

The system administrator role in Spatial Studio is identified by **SGTech_SystemAdmin**. This implies that the administrator has full access to the entire system.

You need to add this role as an IDCS group. However, the following applies:

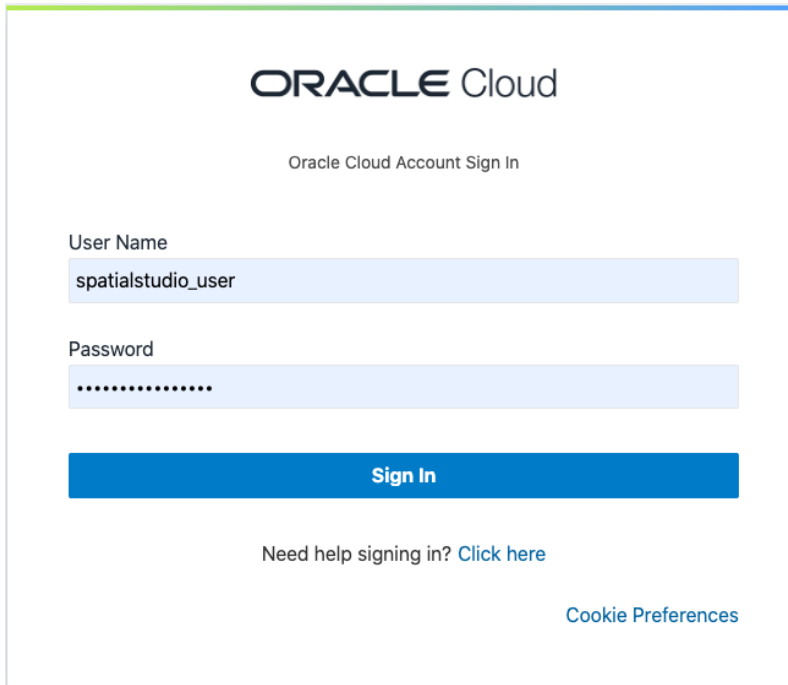
- Users assigned to this group will have admin rights in the Spatial Studio instance that is being set up.
- Users who do not belong to this group will have regular access to the Spatial Studio instance when added to the IDCS application.

As a prerequisite, you must obtain the IDCS console URL. See [Determining the IDCS Console URL](#) for details.

Perform the following steps to create the groups in IDCS:

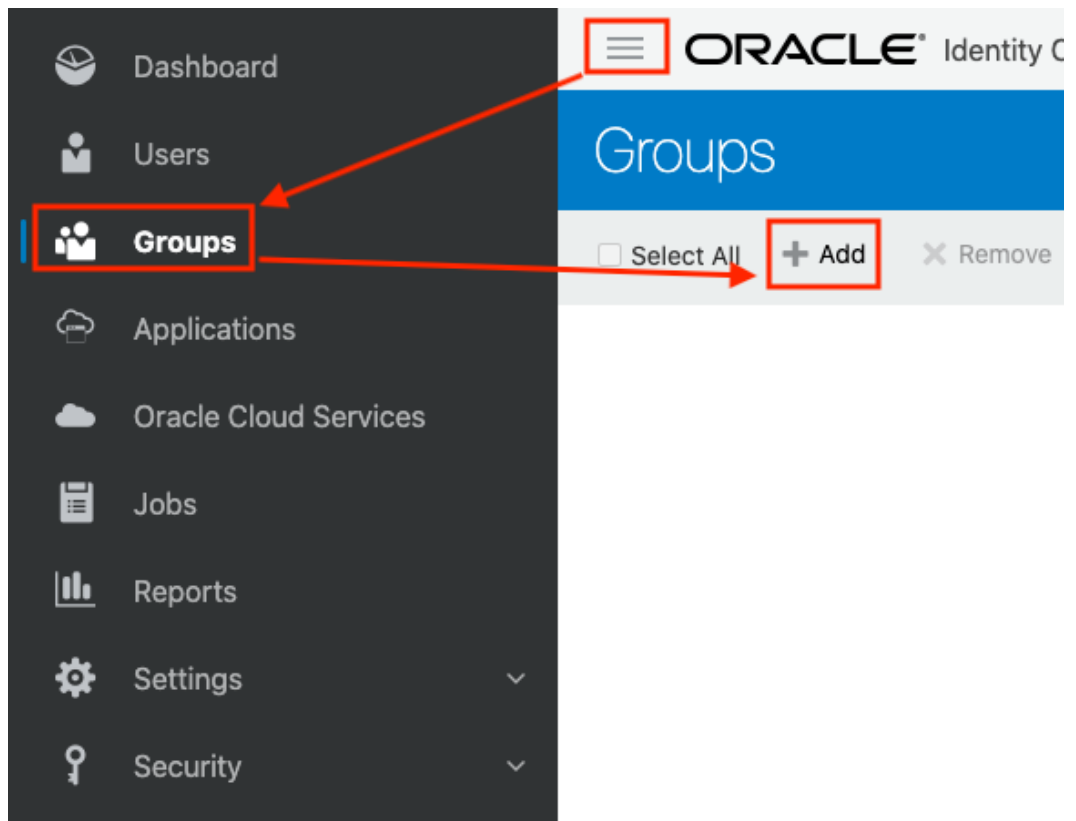
1. Open the IDCS login page using the IDCS console URL in your browser.
2. Enter the ADMIN user credentials and sign in as shown:

Figure 2-5 IDCS Login



3. Open the navigation menu on top left, select **Groups** and click **Add** to create a new group as shown:

Figure 2-6 Adding an IDCS Group



The **Add Group** dialog opens and displays the **Step 1: Group Details** page.

4. Enter **Name** as *SGTech_SystemAdmin*.
Note that the role name is case sensitive.
5. Optionally, enter a **Description**.
6. Click **Next** as shown:

Figure 2-7 Step-1: Group Details

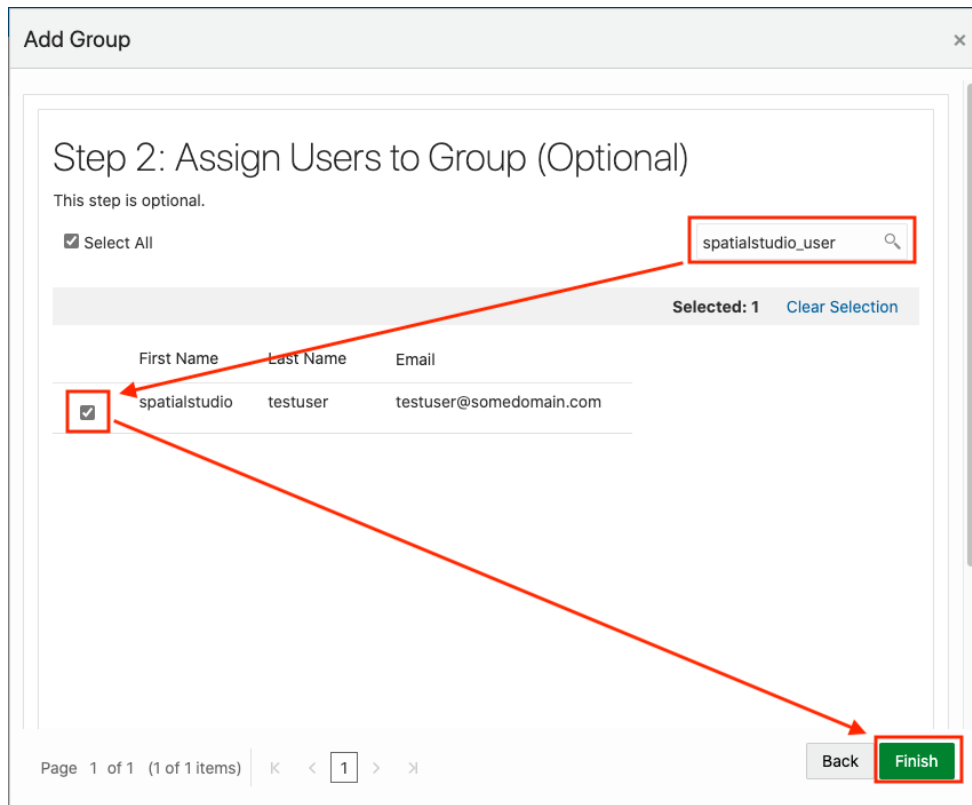
The screenshot shows a web interface for adding a group. At the top, there is a header 'Add Group'. Below it is a large white box titled 'Step 1: Groups Details'. Inside this box, there are two input fields: 'Name' with the value 'SGTech_SystemAdmin' and 'Description' with the value 'System Administrator Role'. Below these fields is a checkbox labeled 'User can request access' which is currently unchecked. At the bottom right of the dialog, there are two buttons: 'Next' and 'Finish'. The 'Next' button is highlighted with a red border.

Step 2: Assign Users to Group (Optional) page opens listing all the existing users.

7. Select the required user and click **Finish**.

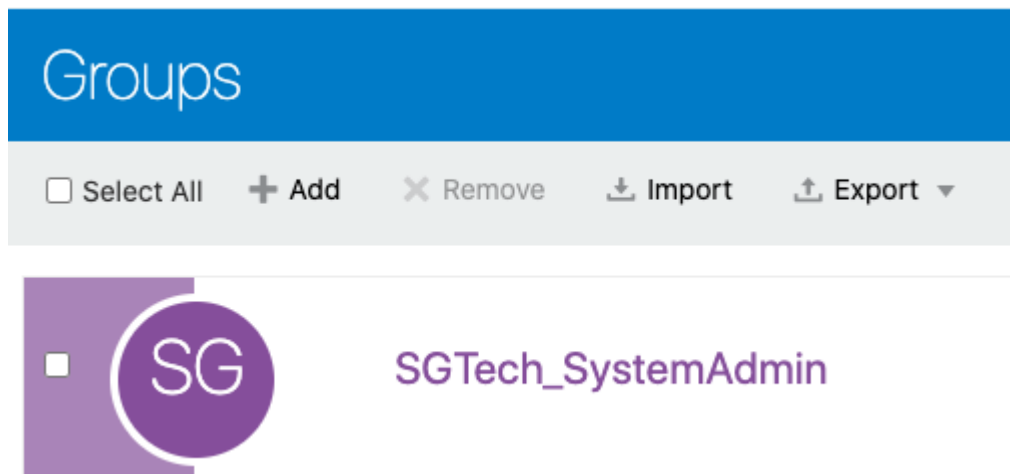
For example, the following figure shows assigning *spatialstudio_user* to the group role *SGTech_SystemAdmin*:

Figure 2-8 Step2: Assign Users to a Group



8. Verify that the newly added group is listed on the **Groups** page:

Figure 2-9 List of Groups



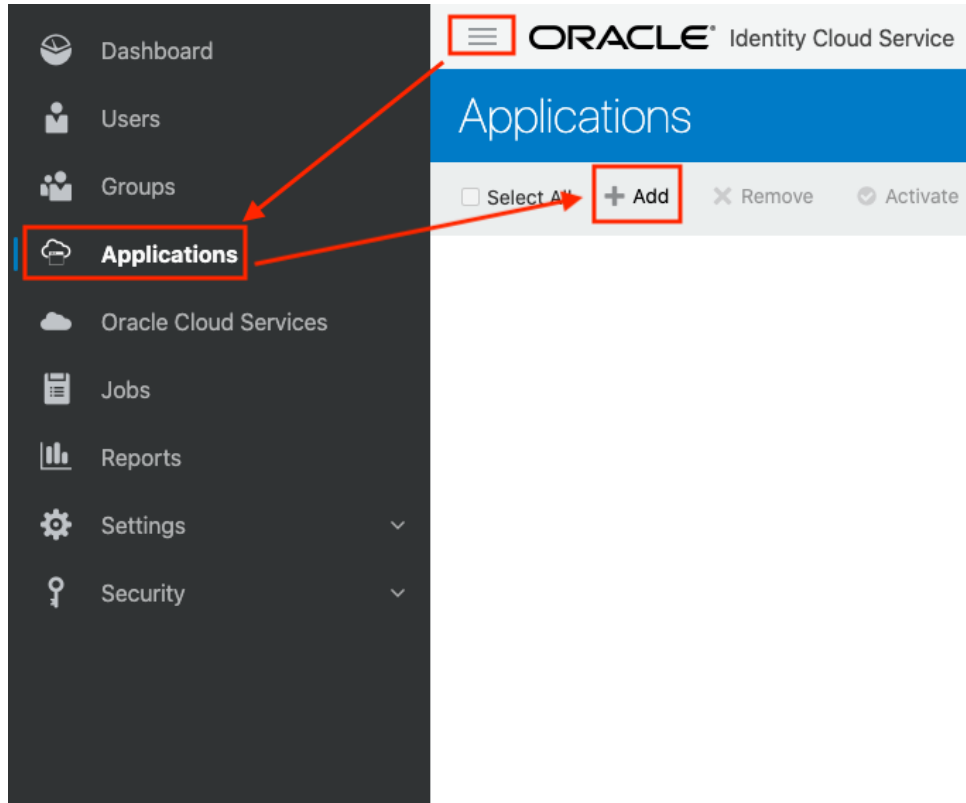
2.6.3 Creating an Application in IDCS

This section describes the steps to add the Spatial Studio application in IDCS.

1. Sign in to IDCS using ADMIN user credentials.

2. Open the navigation menu on top left, select **Applications** and click **Add** to add a new application as shown:

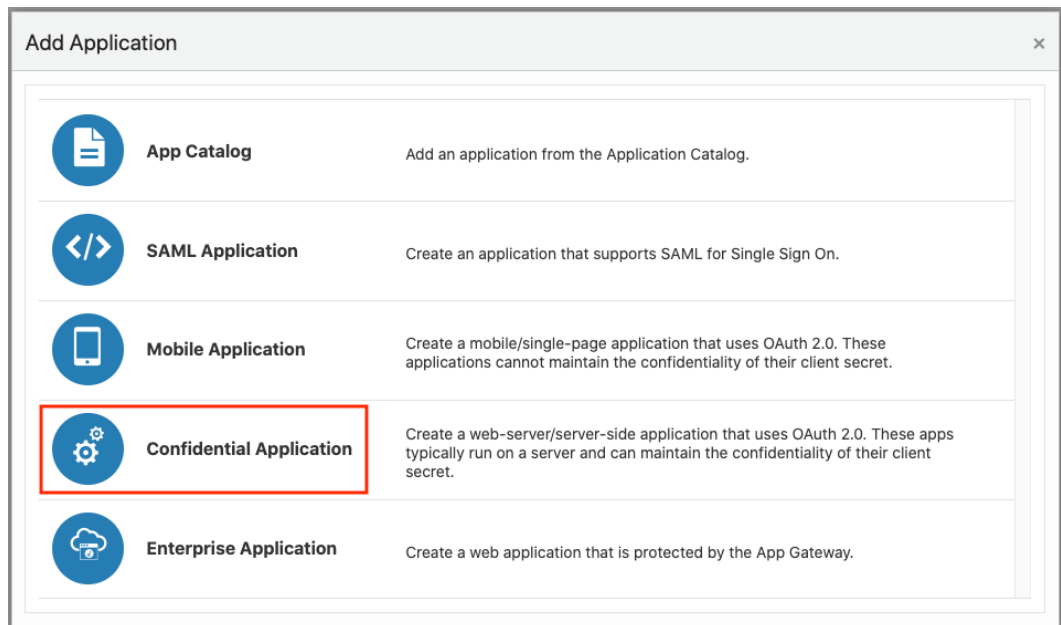
Figure 2-10 Adding an Application



The **Add Application** dialog opens.

3. Select **Confidential Application**.

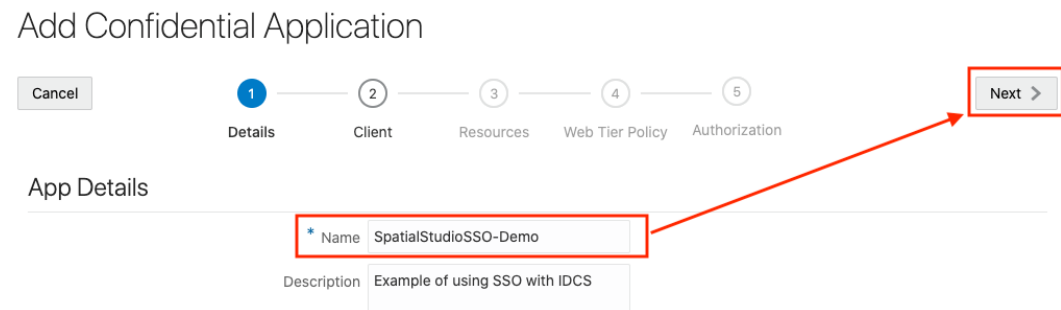
Figure 2-11 Add Application Dialog



The **Add Confidential Application** wizard opens displaying the **Details** page.

4. Enter the application **Name**.
5. Optionally, add a **Description** and click **Next**.

Figure 2-12 Add Confidential Application: Details Page



The **Client** page opens.

6. Click **Configure this application as a client now** to configure the authorization information for the new application.

Perform the following in the **Authorization** section:

- a. Enable **Client Credentials** and **Authorization Code** for **Allowed Grant Types**.
- b. Enter `<spatial_studio_url>/idcscallback` in **Redirect URL**.
- c. Enter `<spatial_studio_url>` in **Post Logout Redirect URL**.
- d. Optionally, for **Security**, you can enable **Trusted Client** to import a custom certificate.

Figure 2-13 Configuring Client Details

Configure this application as a client now Skip for later

Authorization

Allowed Grant Types Resource Owner Client Credentials JWT Assertion SAML2 Assertion Refresh Token

Authorization Code Implicit Device Code

TLS Client Authentication

Allow non-HTTPS URLs

* Redirect URL

Logout URL

Post Logout Redirect URL

Security Trusted Client Certificate

Allowed Operations Introspect On behalf Of

ID Token Encryption Algorithm

Bypass Consent

Allowed Client IP Address Anywhere In one or more of these network perimeters

Perform the following in the **Token Issuance Policy** section:

- a. Click **Add** under **Grant the client access to Identity Cloud Service Admin APIs** to enable the application to access IDCS APIs. The **Add App Role** window opens listing the application roles.
- b. Select *Me* and *Authenticator Client* and click **Add** to assign these application roles to the application as shown:

Figure 2-14 Configuring Token Issuance Policy

Token Issuance Policy ⓘ

Authorized Resources All Tagged Specific

Resources

Resource	Protected	Scope
No data to display.		

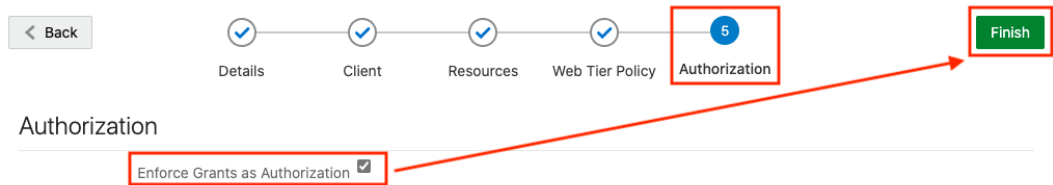
Grant the client access to Identity Cloud Service Admin APIs

App Roles	Protected	Scope
Authenticator Client	No	x
Me	No	x

- c. Click **Next** on the top right of the page to continue.

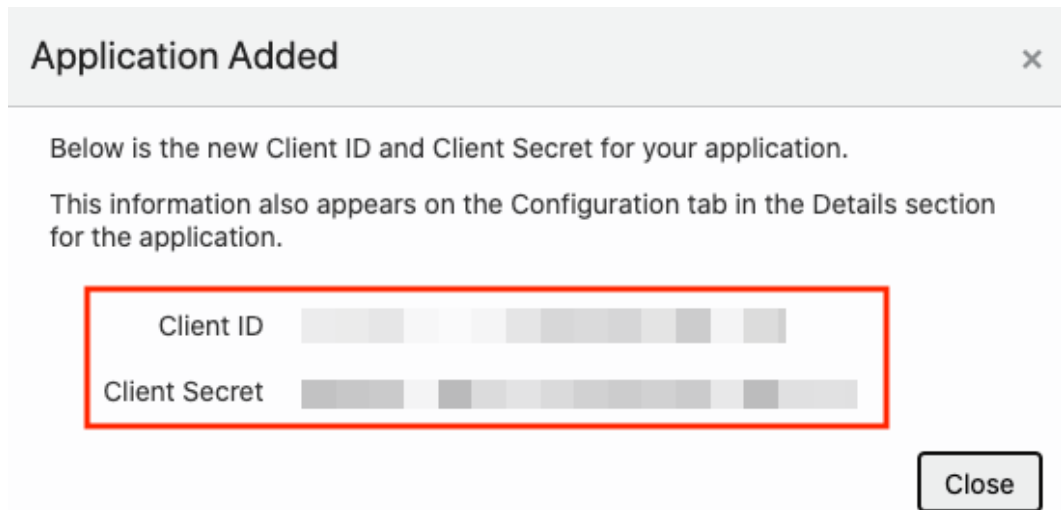
7. Skip **Resources** and **Web Tier Policy** by clicking the **Next** button and navigate to the **Authorization** page.
8. Enable the **Enforce Grants as Authorization** option.
9. Click **Finish**.

Figure 2-15 Configuring Authorization



The application is added and the **Application Added** dialog box opens.

Figure 2-16 Confirmation Dialog



10. Note the **Client ID** and **Client Secret** to be used later to complete the configuration.

Tip:

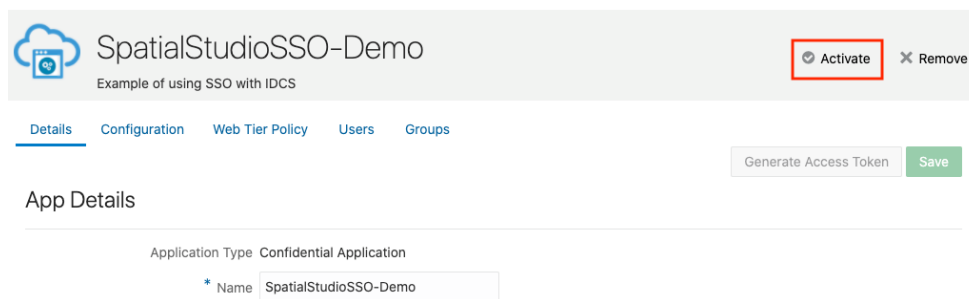
You can also obtain the client credentials for the application from the **Configuration** tab in the **General Information** section, once the application is activated.

11. Click **Close**.

The new application's **Details** page is displayed.

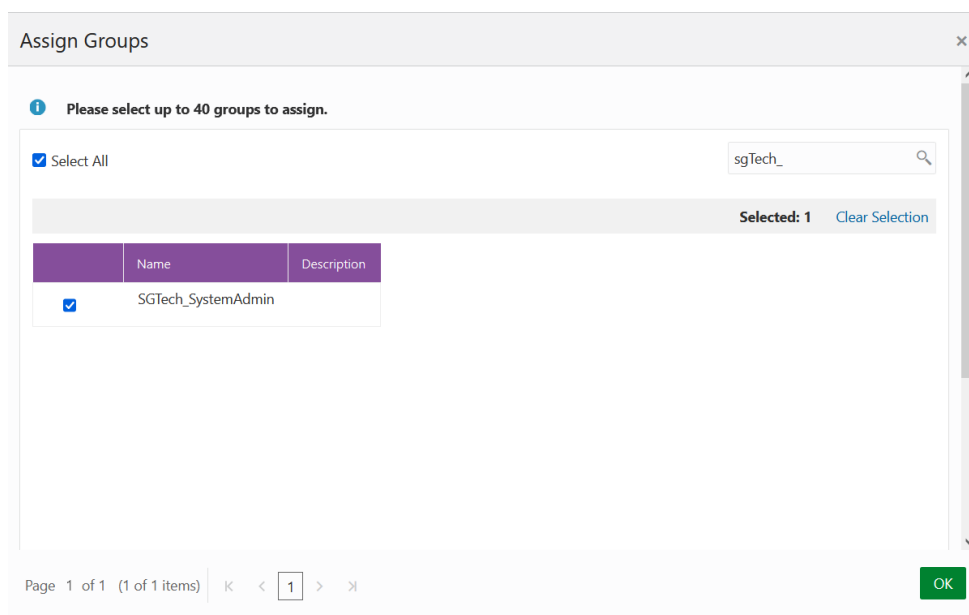
12. Click **Activate** to grant users access to the application and confirm the operation on the prompt that follows.

Figure 2-17 Confirmation for Activating Application



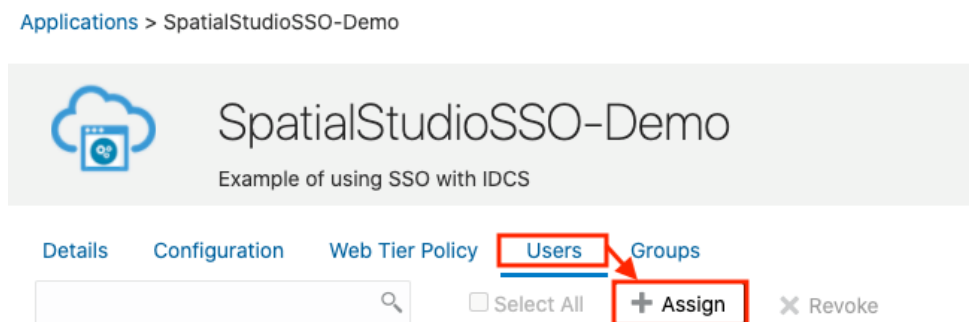
13. Click the **Groups** tab and then click **Assign** to add the group created in [Adding Spatial Studio Role as a Group in IDCS](#) as shown:

Figure 2-18 Assigning Groups to an Application



14. Optionally, add non-admin users through the **Users** tab or using other groups.

Figure 2-19 Assigning Non-Admin Users



2.6.4 Copying IDCS Settings into Spatial Studio's Configuration File

To integrate Spatial Studio with IDCS, you must add the IDCS settings into the `sgtech_config.json` configuration file.

The configuration file is located at `~/.sgtech/sgtech_config.json` path. You can directly append the IDCS settings into the `sgtech_config.json` file. However, the best practice is to have the IDCS settings in a separate configuration file and then import this file into the main configuration file.

Perform the following steps to create a configuration file for the IDCS settings and to import this configuration in `sgtech_config.json`:

1. Create a new empty JSON configuration file in the `~/.sgtech` directory.

For example:

```
~/.sgtech/sgtech_config.idcs.json
```

2. Edit the created file with a file editor of your choice and add the IDCS settings information as shown:

```
{
  "idcs" : {
    "Host" : "identity.oraclecloud.com",
    "ClientTenant" : "<tenant_id>",
    "ClientId" : "<client_id>",
    "ClientSecret" : "<client_secret>",
    "redirectURL" : "https://localhost:4040/spatialstudio/idcscallback",
    "postLogoutRedirectURL" : "https://localhost:4040/spatialstudio/"
  }
}
```

In the preceding file:

- **Host**: IDCS host.
 - **Client Tenant**: IDCS tenant.
 - **ClientId**: Generated when creating the IDCS application.
 - **ClientSecret**: Generated when creating the IDCS application.
 - **redirectURL**: Same as the Redirect URL used when creating the IDCS application.
 - **postLogoutRedirectURL**: Same as the Post Logout Redirect URL used when creating the IDCS application.
3. Save the `sgtech_config.idcs.json` file.
 4. Edit the main `sgtech_config.json` file and add the import configuration as shown:

```
{
  "version" : "22.1.0",
  "work_dir" : "",
  ...
  "jobs" : {
    "init_threads_count" : 15
  },
}
```

```
"imports" : {  
  "idcsclient" : {  
    "module" : "sgtech_config.idcs.json"  
  }  
}
```

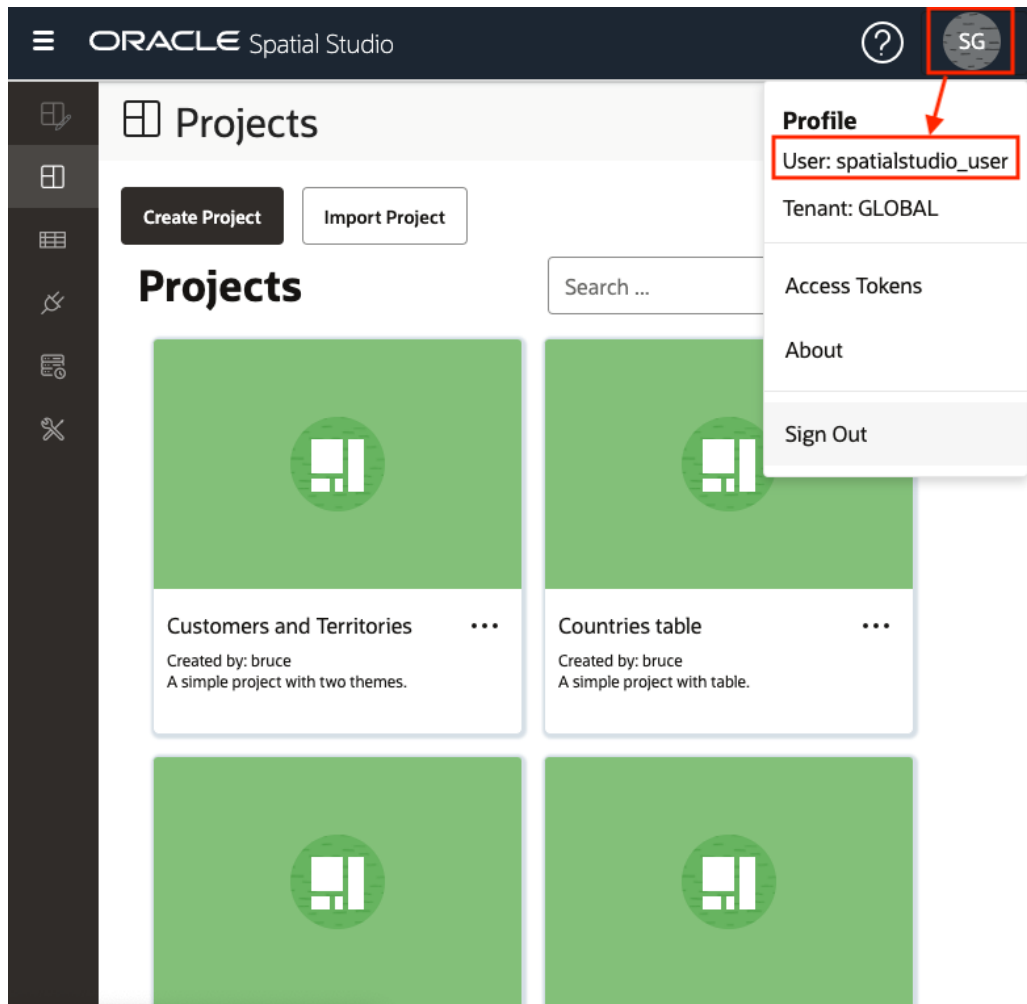
5. Save the `sgtech_config.json` file.

2.6.5 Testing IDCS Login

After all the setup steps are completed, you can test and verify the IDCS login.

1. Ensure you have logged out from IDCS.
2. Ensure all Spatial Studio instances are stopped.
You can stop a Spatial Studio instance by executing `stop.sh` for Linux and `stop.cmd` for Windows.
3. Run Spatial Studio by executing `start.sh` (Linux) or `start.cmd` (Windows).
4. Open the main URL in your browser, once Spatial Studio is running. For example:
`https://localhost:4040/spatialstudio/`
The IDCS login screen as shown in [Figure 2-5](#) opens instead of Spatial Studio's standard login screen.
5. Enter your credentials and click **Sign In**.
You will be automatically redirected to the Spatial Studio instance. You can verify the logged in user by clicking on the **Avatar** icon as shown:

Figure 2-20 Profile Menu



6. Click **Sign out** in the **Profile** menu to logout from Spatial Studio.
Note, this will also log you out from any other application that is running on IDCS.

3

Using Oracle Spatial Studio

Using Oracle Spatial Studio, you can create one or more projects, each of which can define one or more spatial datasets on which you can perform various spatial operations.

It is important you understand the following terminologies when working on Spatial Studio:

- A **project** contains Spatial Studio objects, such as datasets, that are logically related to some intended usage. For example, a project might be named New England Sales Territories, or Sales Territories and Customers, or Ohio Airports and Counties. When creating a project, you should know the purposes for which you want to identify and analyze spatial data in a geographic area.
- A **dataset** is a collection of spatial features of a specific usage type and geometry type. For example, datasets might include Airports represented by polygon geometries, or Roadways represented by LRS line string geometries, or Accidents represented by point geometries.
- A **connection** specifies information for connecting to an Oracle Database schema where spatial data of interest resides: user name, password, system, port, database name, and so on. (It is similar to a SQL Developer connection.)

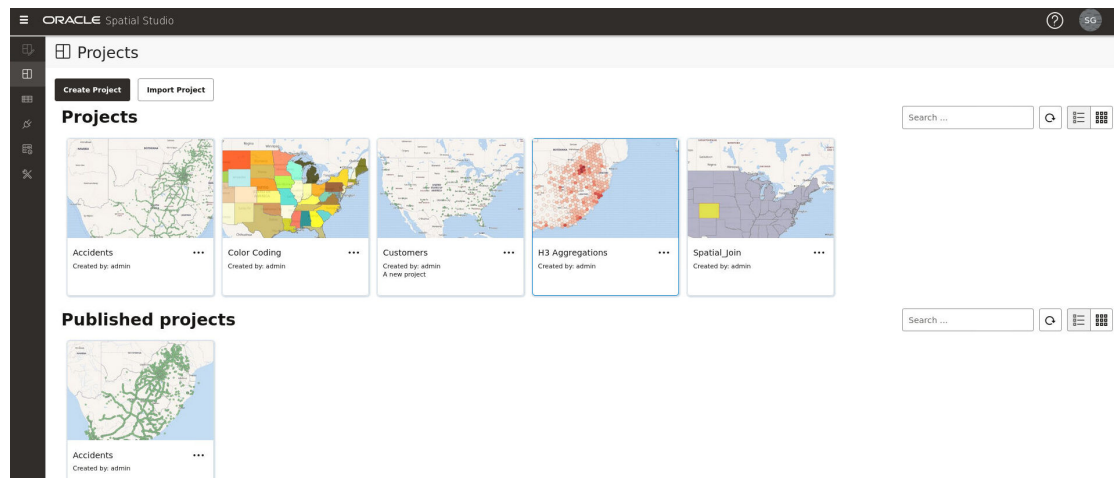


Note:




See also [Spatial Studio Terminology](#) for more information.

The main landing page for Spatial Studio for a new user is as shown:

Figure 3-1 Spatial Studio Main Page



The overall layout of the Spatial Studio user interface comprises of:

- **Header:** The header at the top of the page contains the following buttons:
 - : to display or hide the side navigation menu
 - : to help you get started on Spatial Studio by providing an overview of the tool and links to other tutorial resources
 - : displays the user profile details
- **Side Navigation Menu:** A navigation panel on the left displays the menu items. You can expand or collapse the navigation drawer.
- **User Workspace:** The page specific details for the selected menu option is displayed on the right.

The navigation menu consists of the following menu options:

- **Active Project:** Directs you to the Active Project page where your recent working project is displayed.
- **Projects:** Directs you to the Projects page where all your existing projects and published projects are listed.
- **Datasets:** Directs you to the Datasets page where all the datasets available to you are listed.
- **Connections:** Directs you to the Connections page where all the existing connections (data sources) available to you are listed.
- **Jobs:** Directs you to the Jobs page where the various background jobs started by Spatial Studio to process various requests are listed.
- **Administration:** Directs you to the Administration page where you can monitor the status and activity of Spatial Studio. It contains tabs for Settings, Maintenance, and Monitoring.
- [Getting Started Using Spatial Studio](#)
Spatial Studio includes a page with information and links to help you get started using the tool.
- [Spatial Studio Active Project Page](#)
The Active Project page displays your current working project.
- [Spatial Studio Projects Page](#)
The Projects page lists all the projects that have been created, both unpublished and published.
- [Spatial Studio Datasets Page](#)
The Datasets page lets you view and edit existing datasets, and create new ones.
- [Spatial Studio Connections Page](#)
The Connections page displays all the existing connections and also allows you to create a new connection.
- [Spatial Studio Administration Page](#)
You can monitor the status and activity of Spatial Studio in the Administration Page. You can also view server logs, change global system configurations, manage custom basemaps, and configure safe domains.
- [Spatial Studio Jobs Page](#)
The Jobs page displays details of all the background jobs that run in Spatial Studio.

- [Visualization in Oracle Spatial Studio](#)
You can visualize your spatial data in Oracle Spatial Studio using different modes of visualization.
- [Performing Analyses in Spatial Studio](#)
You can perform various spatial analyses (such as filtering by proximity, nearest neighbor analysis and so on) and visualize the results in Spatial Studio.

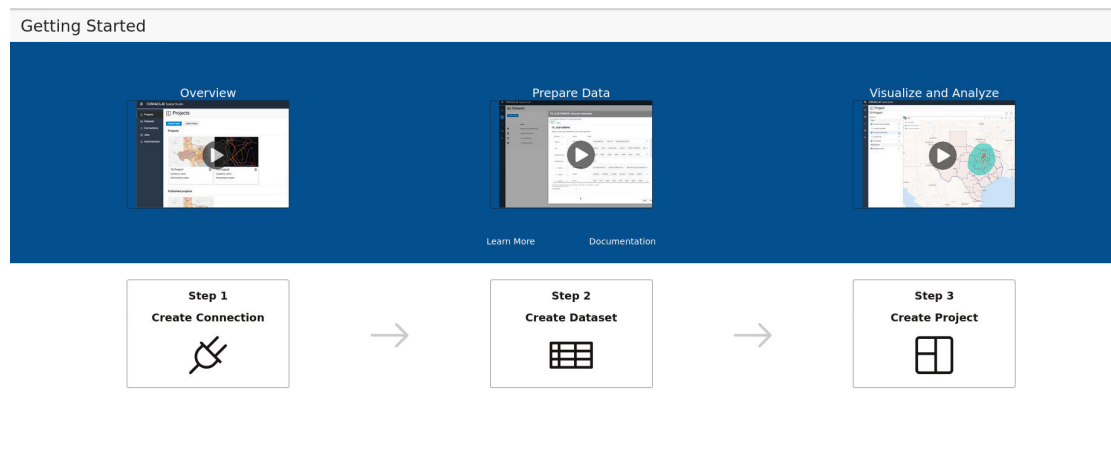
3.1 Getting Started Using Spatial Studio

Spatial Studio includes a page with information and links to help you get started using the tool.

To display this page, click the small question mark icon (?) in the top right area of most pages (above the Create button) and click **Getting Started** from the context menu.

The Getting Started page opens as shown:

Figure 3-2 Getting Started Page



You can learn more about Spatial Studio by clicking one of the following options:

- **Overview:** Watch this video to understand the user interface and see how to perform the available actions.
- **Prepare Data:** Enable your business data for mapping and spatial analysis.
- **Visualize and Analyze:** Explore geographic patterns and relationships in your business data.
- **Learn More:** Visit our video library to learn more about Oracle Spatial Cloud.
- **Documentation:** See *Oracle Spatial Studio Guide* documentation to learn more about administering and using Spatial Studio.
- Get started using Spatial Studio through the following workflow:
 1. **Step1 - Create Connection:** Begin by creating your database connection.
 2. **Step2 - Create Dataset:** Create a Dataset and load spatial data.
 3. **Step3 - Create Project:** Create a Project for visualizing and analyzing the spatial data.

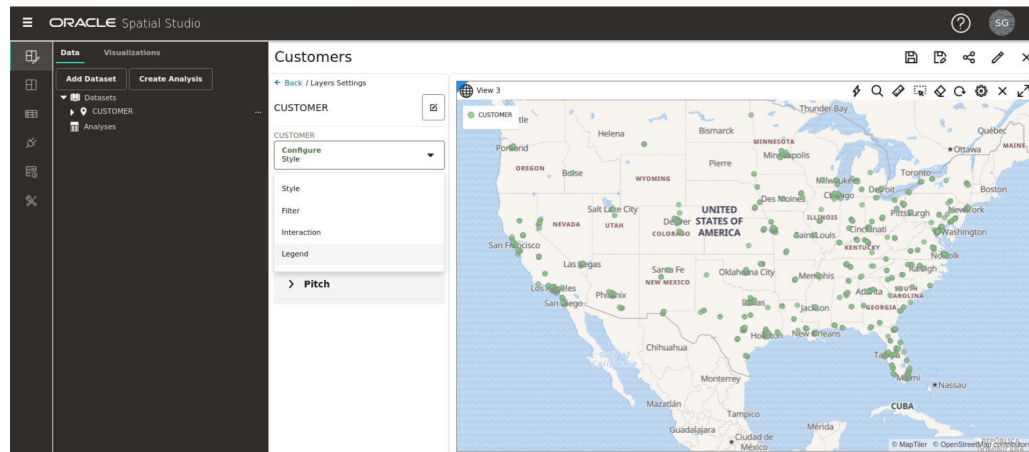
3.2 Spatial Studio Active Project Page

The Active Project page displays your current working project.

You can switch to your working project at any time from the other pages when working in Spatial Studio.

The following figure shows a layout of the Active Project page:

Figure 3-3 Active Project Page



You can perform the following actions on the Active Project page:

- Creating a table or map visualization.
- Adding or removing datasets from your project.
- Adding or removing data from a visualization layer.
- Adjusting the style setting or the zoom resolution for your visualization layer. You can click the menu selector next to the dataset name in the **Data** tab to display the following available options:
 - **Settings:** Shows display options for Style, Filter, Interaction, and Legend.
 - **Spatial Analysis:** Allows you to perform many spatial operations (All, or filtered by type: Filter, Combine, Transform, Measure), such as Add a buffer of a specified distance, Return shapes having spatial relationship to another, and Calculate area.
 - **Zoom to Layer:** Zooms the display (out or in) to fit the entire layer.
 - **Refresh Layer:** Refreshes the layer to reflect all user actions.
 - **Configure Animation:** Allows you to configure animation settings to visualize a moving object.
 - **Remove:** Removes the layer from the project.

The following icons are displayed on the top-right area of the Active Project page:

Figure 3-4 Active Project Page Icons

They are as follows:

- **Save Project** : Saves your updates to the project
- **Save Project as** : Creates a new copy of the project
- **Publish Project** : Publishes the project
- **Edit**: Allows you to edit the project details (such as, Name, Created By and Description)
- **Close Project**: Closes the project

3.3 Spatial Studio Projects Page

The Projects page lists all the projects that have been created, both unpublished and published.

Figure 3-1 shows the layout of the Projects page.

You can perform the following actions on the Projects page:

- You can select a project to work or for viewing the details.
- You can create a new project by clicking **Create Project**.
- You can import a project by clicking **Import** and selecting a project zip file in the **Import Project** dialog.
- You can open, export or delete a project by clicking the ******* icon for any of the listed projects.
- You can alter the display settings to have the projects listed as cards or in a tabular format.
- You can search for both unpublished and published projects.

Note:

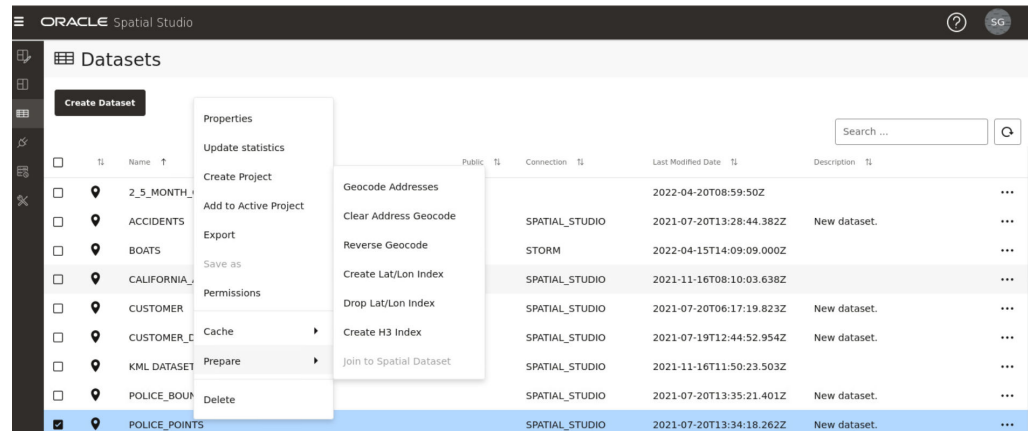
For the first two actions, the project will be opened in the **Active Project** page.

3.4 Spatial Studio Datasets Page

The Datasets page lets you view and edit existing datasets, and create new ones.

The following figure shows the Datasets page:

Figure 3-5 Datasets Page



You can perform the following actions on the Datasets page:

- You can create a new dataset, by clicking **Create Dataset**.
You can create a dataset from the following sources:
 - Oracle Database table or view using a database connection
 - By uploading dataset files with different formats to the database, such as :
 - * Spreadsheet file
 - * Shapefile
 - * GeoJSON file
 - * CSV file
 - * KML file
 - By importing 3D Tiles Tileset

By clicking ******* against any displayed dataset or by right-clicking a dataset row, you can perform the following actions :

- **Properties:** View or modify properties of the dataset
- **Update Statistics:** Update the dataset statistics
- **Create Project:** Create a new project using the dataset
- **Add to Active Project:** Add the dataset to the project in the Active Project page
- **Export:** Export the dataset (in GeoJSON or CSV file format)
- **Save as:** Make a new copy of the dataset
- **Permissions:** Configure dataset sharing and permissions
- **Cache:** Control map tiles pre-caching activities
- **Prepare:** Prepare a dataset for any of the following options:
 - **Geocode Addresses:** Add geocoded information such as geographic coordinates to the dataset
 - **Clear Address Geocode:** Remove geocoded information from the dataset

- **Reverse Geocode:** Add address information from a set of geographic coordinates to the dataset
- **Create Lat/Lon Index:** Create latitude/longitude index
- **Drop Lat/Lon Index:** Remove latitude/longitude index
- **Create H3 Index:** Prepare an H3 aggregation dataset
- **Join to Spatial Dataset:** Prepare a non-spatial dataset for map visualization by joining to a spatial dataset
- **Delete:** Delete the dataset
- [Creating a Dataset](#)
- [Datasets with Issues](#)
- [Geocoding a Dataset](#)
- [Reverse Geocoding a Dataset](#)
- [Preparing a Non-Spatial Dataset for Analysis](#)

3.4.1 Creating a Dataset

The following steps enable you to add a new dataset.


1. Navigate to the **Datasets** page.
2. Click **Create Dataset**.

The **Create Dataset** window opens:

Figure 3-6 Creating a Dataset

Create Dataset

From file upload
Upload to database and create dataset


Spreadsheet, Shapefile, GeoJSON, CSV, KML

Selected files:

From table/view
 From Cesium datasets
 From GeoJSON URL

3. Click on one of the data source options and perform the steps appropriate to your selection as shown in the following:

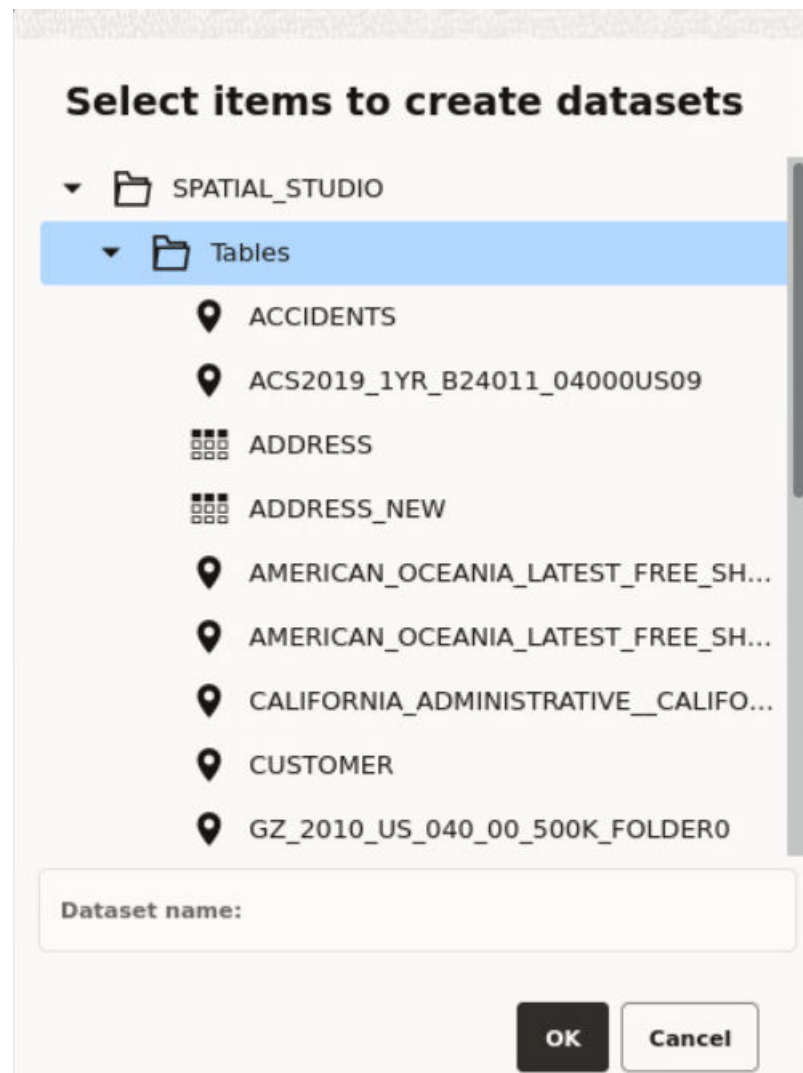
From file upload:

- a. Upload one of the supported file types.
- b. Click **Create**.

From table/view:

- a. Select a connection from the **Select Connection** drop-down.
- b. Click **Create**.
The **Select items to create datasets** window opens listing all the tables, views and GeoRaster data present in the database.

Figure 3-7 Select the Data Source



- c. Select an item from the list and click **OK**.

From Cesium datasets:

- a. Create a dataset for Cesium map visualization by selecting a 3D dataset file or a CZML file.

Figure 3-8 Options for Creating a Cesium Dataset

From Cesium datasets
Select a dataset that already on the server or upload a new one. Supported formats are .b3dm (Batched 3D Model), .pnts (Point Cloud), and .czml

3D dataset location
--Select--

Upload czml file

Upload tileset

Czml file located on server

Tileset located on server

You can choose one of the following options:

- **Upload czml file:** Upload a .czml file.
- **Upload tileset:** Upload a tileset zip file. The supported formats are:
 - .b3dm: Batched
 - .pnts: Point Cloud

 **Tip:**

You can increase the default size limit for zip files larger than 50 MB by updating the `dataset_max_size` attribute for the `upload` property defined in `<user_home_folder>/sgtech/sgtech_config.json` file.

- **Czml file located on server:** Specify the czml file to be uploaded from the server by entering the **Name** of the .czml file and the **Directory** path.
- **Tileset located on server:** Specify the tileset file to be uploaded from the server by entering the **Name** of the `tileset.json` file and the **Directory** path.

 **Note:**

When uploading a CZML file or a tileset file from the server:

- If the file is not under `<SGTECH_HOME>/cesiumdata` or `<SGTECH_HOME>/3d-tilesets` as it may apply, then you must manually migrate the datasets when migrating Spatial Studio.
- You can update the unzipped file limits in the General tab in the Administration page. The following two advanced settings parameters need to be modified:
 - Maximum unzipped item
 - Maximum unzipped total

- b. Click **Create**.


From GeoJSON URL:

It is important to note the following prior to creating a GeoJSON URL dataset:

- A GeoJSON URL based dataset accesses its data directly from the source URL. There is no database table managed in Spatial Studio for this dataset.
- A GeoJSON URL based dataset does not support Spatial Analysis.
- A GeoJSON URL based dataset is subject to the same upload size limit, or 100MB, whichever is smaller.
- If a GeoJSON URL does not support CORS (Cross-Origin Resource Sharing), then Spatial Studio will act as a proxy to the browser requesting the GeoJSON URL data.

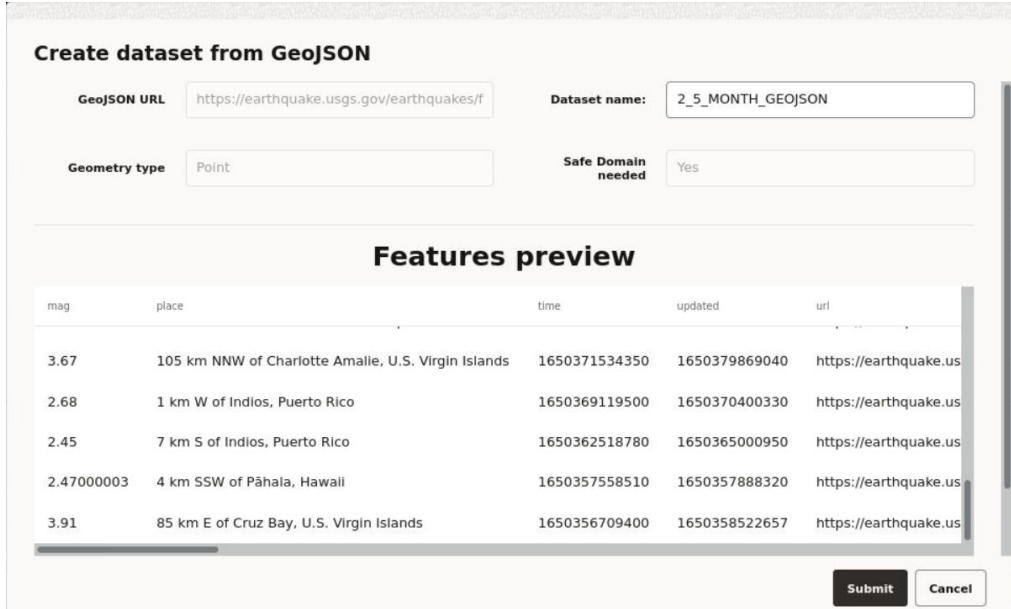
The following steps enable you to create a GeoJSON URL dataset:

- a. Specify the **GeoJSON URL** to access GeoJSON data from an external domain for map visualization.

 **Note:**
Ensure you add the external domain used for accessing GeoJSON data to the list of entries in the Safe Domains list.

- b. Click **Create**.
Create dataset from GeoJSON window opens as shown:

Figure 3-9 Creating a Dataset from GeoJSON



Create dataset from GeoJSON

GeoJSON URL: Dataset name:

Geometry type: Safe Domain needed:

Features preview

mag	place	time	updated	url
3.67	105 km NNW of Charlotte Amalie, U.S. Virgin Islands	1650371534350	1650379869040	https://earthquake.us
2.68	1 km W of Indios, Puerto Rico	1650369119500	1650370400330	https://earthquake.us
2.45	7 km S of Indios, Puerto Rico	1650362518780	1650365000950	https://earthquake.us
2.47000003	4 km SSW of Pāhala, Hawaii	1650357558510	1650357888320	https://earthquake.us
3.91	85 km E of Cruz Bay, U.S. Virgin Islands	1650356709400	1650358522657	https://earthquake.us

- c. Optionally, enter a **Dataset name**.
- d. Click **Submit**.
The GeoJSON URL dataset gets created with the warning, No key column was found. You must resolve the warning in order to use the dataset as a map layer for visualization. See [Datasets with Issues](#) for more details to resolve the warning.

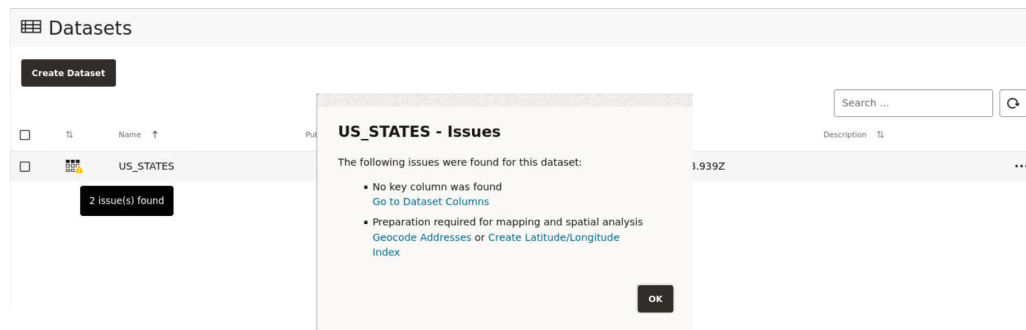
The new dataset is added and listed on the Datasets page.

3.4.2 Datasets with Issues

All datasets must meet certain data requirements in order to be used for map visualization and analysis. Otherwise, Spatial Studio highlights these datasets with a warning on the Datasets page.

You may click on the warning icon to view the issues. You can then click on the resolution link under the issue to prepare the dataset as required for analysis, as shown:

Figure 3-10 Warnings on a Dataset



The following table lists a few common issues that are highlighted on a dataset.

Table 3-1 Selected List of Dataset Issues

Issue	Cause	Spatial Studio Resolution
No key column was found	Primary key is missing on the dataset.	<ul style="list-style-type: none"> Click Go to Dataset Columns to create a dataset key. The Dataset Properties configuration window opens. Select a column containing unique values and switch ON Use as Key. Click Validate key. Click Apply.
This dataset needs spatial metadata and index	The geometry column in the dataset does not have the spatial metadata or a spatial index or both.	Click Create Spatial Metadata and Index to create the spatial metadata and index for the geometry column.

Table 3-1 (Cont.) Selected List of Dataset Issues

Issue	Cause	Spatial Studio Resolution
Preparation Required for mapping and spatial analysis	<p>It can be due to one of the following reasons:</p> <ul style="list-style-type: none"> The dataset contains address information but the geographic coordinates are missing. Latitude and Longitude index are missing for latitude/longitude data in the dataset. 	<p>Depending on the cause, you may need to perform one of the following:</p> <ul style="list-style-type: none"> Click Geocode Addresses Click Create Latitude/Longitude Index

- [Enabling Spatial on a View-Based Dataset with Latitude and Longitude Columns](#)

3.4.2.1 Enabling Spatial on a View-Based Dataset with Latitude and Longitude Columns

Spatial Studio allows you to create spatial index on a dataset created from a view containing latitude and longitude columns, thereby enabling you to visualize and analyze views.

The following steps enable you to create latitude/longitude index on a view-based dataset. The instructions assume:

- You have created a dataset from a view having latitude and longitude columns. See [Creating a Dataset](#) for more information on creating a dataset from a view.
 - This view-based dataset is listed on the Datasets page with a warning icon since the dataset is not spatially enabled for visualization.
1. Navigate to the **Datasets** page.
 2. Click on the warning icon to view the issues on the view-based dataset.
 3. Click **Create Latitude/Longitude Index**.

The **Latitude and Longitude Columns** window opens as shown:

Figure 3-11 Creating a Latitude/Longitude Index on a View-Based Dataset

STATES_VIEW: Latitude & Longitude Columns

Creating spatial index for the following pair of latitude/longitude columns.

Latitude Column
LATITUDE

Longitude Column
LONGITUDE

Reuse lat/lon index on the base table

* Ensure the base table has a lat/lon index on the selected columns

OK Cancel

4. Select the **Latitude Column**.
5. Select the **Longitude Column**.
6. Select the **Reuse lat/lon index on the base table** checkbox.

As displayed in the preceding figure, ensure that the base table on which the view is created has a spatial index on the latitude and longitude columns.

7. Click **OK**.

A background task of type **Create lon-lat** index gets executed. A successful completion of this task on the **Jobs** page indicates that the dataset is spatially enabled for visualization.

You can now use this view-based dataset for visualization on the **Active Project** page.

3.4.3 Geocoding a Dataset

Geocoding is the process of deriving the latitude and longitude coordinates from location details that are geo address types.

You can geocode a dataset in Spatial Studio to store the resulting latitude and longitude information as a `SDO_GEOMETRY` column. Optionally, you can also store them in a latitude and longitude numeric columns in the underlying database table referenced by the dataset.

Prior to geocoding a dataset, if the Spatial Studio server is running behind a firewall, then ensure you have the correct **Web Proxy** information configured in the Administration page. This is because the Spatial Studio application uses an external Oracle hosted geocoding service which is on the public internet.

You can perform the following steps to geocode a dataset.

The instructions assume that a dataset containing location columns such as address details is already existing in Spatial Studio .

1. Navigate to the **Datasets** page.

2. Right-click on the **dataset name** on which you want to apply geocoding.
3. Select **Geocode Addresses** from the **Prepare** context menu.

Geocode Addresses dialog opens as shown:

Figure 3-12 Geocode Addresses

CUSTOMER_DATA: Geocode Addresses

Use address attributes to create geometries

Setup Status

Save coordinates in columns

Latitude column
LATITUDE

Longitude column
LONGITUDE

Verify or adjust geo-attributes to be used to geocode

Geo-type	Column	Values
Postal Code	POSTALCODE	14225 33680 34615 38197 >
Country	COUNTRY	United States
--- Select ---	ID	664 665 666 667 668 669 >
--- Select ---	LAST_NAME	Connachan Daton Deans >
--- Select ---	FIRST_NAME	Amaleta Andromache Cecile >

Apply Close

4. Select the **Geo-type** for the geo-attributes to be used for geocoding.
5. Optionally, switch ON **Save coordinates in columns** to save the geocoordinates to the dataset and to the underlying database table.
6. Optionally, enter **Latitude column** name and **Longitude column** name, if you switched ON **Save coordinates in columns** in the preceding step.
7. Click **Apply**.

You can monitor the **Geocode dataset** background task on the **Jobs** page. A successful completion of the job indicates that geocoding is applied for the data in the dataset.

You can verify that geocoding has been applied by viewing the latitude and longitude columns in the dataset properties and in the input source database table along with the `GC_GEOMETRY` column of data type `SDO_GEOMETRY`.

3.4.4 Reverse Geocoding a Dataset

Reverse geocoding is the process of deriving the address information from a set of latitude and longitude coordinates.

You can reverse geocode a dataset in Spatial Studio to add address information to the dataset's table using the following steps.



Note:

Reverse Geocoding is supported only in point or latitude and longitude datasets.

The instructions assume that a dataset containing the coordinates details is already existing in your database schema.

1. Navigate to the **Datasets** page.
2. Right-click on the **dataset name** on which you want to apply reverse geocoding.
3. Select **Reverse Geocode** from the **Prepare** context menu.
4. Optionally select and modify the required **Location attributes** as shown in [Figure 3-13](#).

The Input text fields for Location attributes are the column names to be created in the underlying database table for the target dataset.

5. Click **Apply**.

You can monitor the **Reverse geocode dataset** background task on the **Jobs** page. A successful completion of the job indicates that reverse geocoding is applied for the data in the dataset.

By viewing the dataset properties, you can verify that reverse geocoding has been applied to your dataset as shown in the following figure:

Figure 3-13 Reverse Geocoding

The screenshot shows the 'ACCIDENT: Reverse Geocode' dialog box with the following configuration:

- Point locations:** Sdo_Geometry point (selected), GEOM
- Location attributes:**
 - Street (STREET)
 - House number (HOUSE_NUMBER)
 - Settlement (City, Town) (SETTLEMENT)
 - Municipality (County, District) (MUNICIPALITY)
 - Region (State, Province) (REGION)

Buttons: Apply, Close

Before Reverse Geocoding

ACCIDENT_ID	NUMBER
DATE_TIME	DATE
GEOM	SDO_GEOMETRY
NR_VEHICLES	VARCHAR2
SEVERITY	VARCHAR2

After Reverse Geocoding

HOUSE_NUMBER	VARCHAR2
MUNICIPALITY	VARCHAR2
NR_VEHICLES	VARCHAR2
POSTAL_CODE	VARCHAR2
REGION	VARCHAR2

3.4.5 Preparing a Non-Spatial Dataset for Analysis

Spatial Studio allows you to prepare a non-spatial dataset for mapping and analysis by joining to a spatial dataset.

Also, note the following highlights about joining two datasets:

- You can only join a non-spatial dataset to a spatial dataset and not conversely.
- It is essential that the non-spatial data in one dataset is linked to the spatial data in the other dataset through a common primary key column.
- You can choose the columns for the newly created joined dataset from the attributes of the datasets associated in the join operation.

The instructions assume that a spatial dataset and a non-spatial dataset having a common primary key data is already existing in your database schema.

1. Navigate to the **Datasets** page.
2. Right-click on the non-spatial **dataset** which you want to join to a spatial dataset.
3. Select **Join to Spatial Dataset** from the **Prepare** context menu.

The following window opens:

Figure 3-14 Joining to a Spatial Dataset

Join Non-spatial Dataset to Spatial Dataset

Prepare a non-spatial dataset for mapping and spatial analysis by joining to a spatial dataset

Name of join result dataset
US_STATES_POPULATION_JOINED

Non-spatial dataset *
US_STATES_POPULATION

Spatial dataset *
US_STATES(SSUSER)

Non-spatial dataset join-column *
CODE

Spatial dataset join column *
STATE_CODE

▼ Select columns from non-spatial dataset

<input type="checkbox"/>	Column Name	Data Type
<input checked="" type="checkbox"/>	POPULATION	NUMBER
<input type="checkbox"/>	NAME	VARCHAR2

▼ Select columns from spatial dataset

<input type="checkbox"/>	Column Name	Data Type
<input checked="" type="checkbox"/>	LONGITUDE	NUMBER
<input type="checkbox"/>	STATE_CODE	VARCHAR2

OK Cancel

4. Optionally, enter a dataset name for **Name of join result dataset**.
5. Select the **Spatial dataset** for the join.

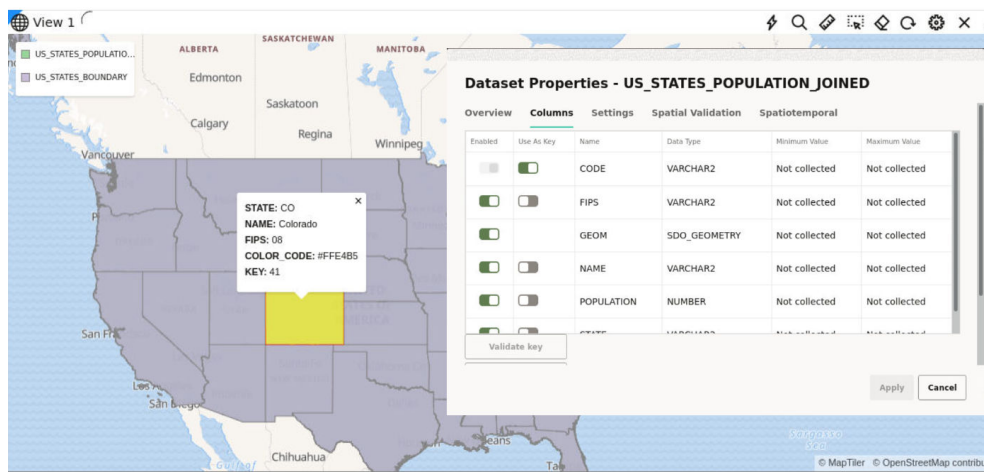
On selection, the primary key associated with the spatial dataset is validated against the non-spatial dataset key. If the datasets key values are not suitable for a join operation, then the following error is displayed:

Dataset key columns to join must be the same data type

6. Optionally, select the required columns for the joined result dataset from the non-spatial and spatial datasets.
7. Click **OK**.

The joined dataset is created and it appears as a row on the Datasets Page. This dataset will contain all the column properties selected from both the spatial and non-spatial datasets. You can verify the properties of the joined dataset both in the **Dataset Properties** window on the Datasets page and when using the dataset for map visualization and analysis on the Active Projects page, as shown:

Figure 3-15 Appended Non-spatial and Spatial Properties

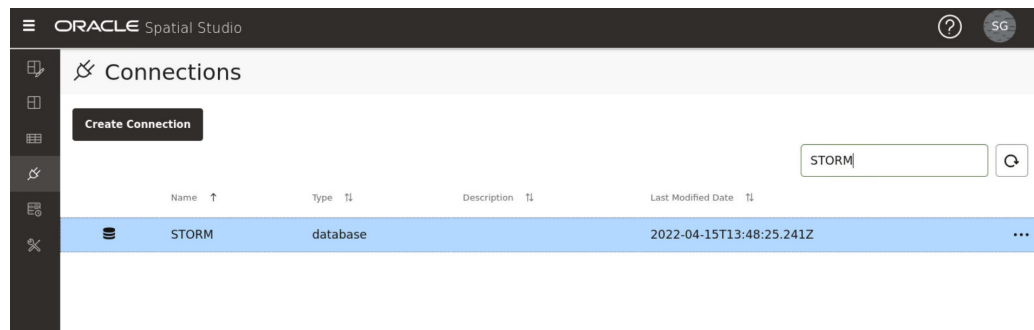


3.5 Spatial Studio Connections Page

The Connections page displays all the existing connections and also allows you to create a new connection.

The following figure shows a layout of the Connections page:

Figure 3-16 Connections Page



You can perform the following actions on the Connections page:

- You can create a new connection, by clicking **Create Connection**. You can create a connection from the following sources:

- **Oracle Database:** by providing host, port, schema, and other database authentication details
- **Oracle Autonomous Database:** by providing wallet details
- You can also perform the following actions by clicking the hamburger icon against any displayed connection or by right-clicking a connection row :
 - **Properties:** View or modify properties of the connection
 - **Edit:** Update the connection details

 **Note:**

You cannot edit the SPATIAL_STUDIO connection on the Connections page. Instead, refer to [If the Spatial Studio Repository Schema Password Has Been Changed](#) section.

- **Test:** Validate the connection
- **Delete:** Delete the connection along with all its datasets

 **Note:**

You cannot delete the SPATIAL_STUDIO connection.

3.6 Spatial Studio Administration Page

You can monitor the status and activity of Spatial Studio in the Administration Page. You can also view server logs, change global system configurations, manage custom basemaps, and configure safe domains.

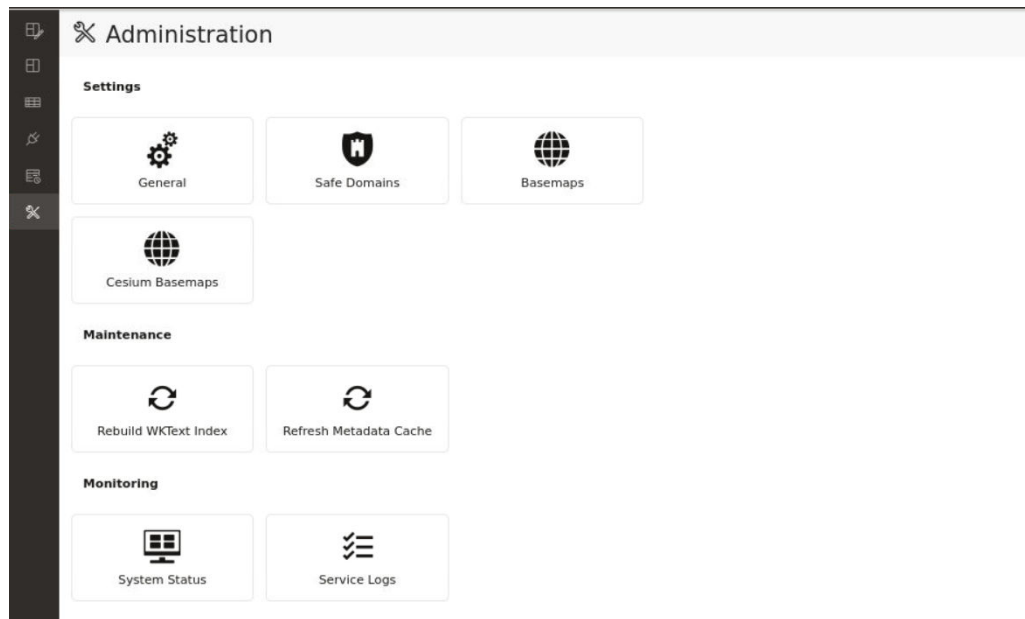
The Administration menu link directs you to the Administration page.

 **Note:**

You must be logged in as an administrator of Spatial Studio to access this menu option.

The layout the Administration page is as shown:

Figure 3-17 Administration Page



The Studio console page comprises of the following sections:

Settings

- **General:** This section allows changing the GeoCoding service URL, the web proxy used by the Studio server. It also allows you to customize the frontend branding area of the application.
- **Safe Domains:** This section allows the administrator to manage the white listing of the domains (host names or IP addresses) that are considered safe for loading various types of the resources from the Studio application. Typically, it is used to add the domain of a custom basemap to the Content Security Policy directives of the Studio. After making the changes to the safe domains list, you must reload or refresh the browser page to reload the new Content Security Policy.
- **Basemaps:** This section allows a quick view of the existing custom basemaps, and in adding or editing custom basemaps. Custom basemaps can be made of either raster or vector tiles, typically hosted on a third party tile server. Additionally, you can also create a custom basemap using a WMS OGC web service.
- **Cesium Basemaps:** This section gives you a quick view of the existing custom basemaps used exclusively for the 3D Cesium Map visualization. It also allows you to add new basemaps to be used by the 3D Map visualizations.

Note:

Each listed host entry for Basemaps and Cesium Basemaps must be present as one of the entries in the Safe Domains list. If the host basemap comes from a domain that is not present in the Safe Domains list, then the basemap may not render correctly when visualizing the map.

Maintenance

- **Rebuild WKText Index:** Use this only when needed to rebuild the text index of the repository database schema's supported Spatial Reference Well Known text definitions. For the shapefile upload, this well known text index is used to automatically match the best SRID.
- **Refresh Metadata Cache:** Spatial Studio typically caches all of the frequently used metadata such as the definitions of Datasets, Connections, and Projects. Sometimes it is required to refresh the whole cache in case some cached metadata becomes stale or out of sync in rare events.

Monitoring

- **System Status:** This section provides read-only information about the general health and system status of the Spatial Studio server.
- **Service Logs:** This section allows loading and viewing a desired number of server-side logs. To reduce the clutter, you can filter the result using the desired logging level .

In a cluster deployment, both the preceding options display only the information of the particular Spatial Studio instance to which the current session is connected.

- [Adding a Custom Basemap](#)
- [Editing a Custom Basemap](#)

3.6.1 Adding a Custom Basemap

The following steps enable you to add a custom basemap.

1. Navigate to the **Administration** page.
2. Click **Basemaps** under Settings.
The **Basemaps** window listing all the available basemaps opens.
3. Click **Add Basemap** and click on one of the following basemap types:
 - XYZ Raster tiles
 - OGC WMS
 - Vector tiles
4. Enter **Name** and **URL** for the selected basemap type.
5. Optionally enter **Attribution** and **API Key**.

Tip:

Once you have entered all the required fields, you can preview the basemap by clicking **Quick View**.

6. Click **Save** to add the base map.

For example, the following figure show the **OGC WMS** basemap configuration window:

Figure 3-18 Adding a OGC WMS Map

OGC WMS

Add an OGC WMS basemap.

i The WMS service must support coordinate system EPSG:3857. The service URL entered below should be a normal WMS request with "bbox={bbox-epsg-3857}"

Name
Weather

Attribution

OGC WMS URL
https://nowcoast.noaa.gov/arcgis/services/nowcoast/
https://my.sample.com/{apikey}/mywms?bbox={bbox-epsg-3857}&service=WMS&...

API Key

Save Cancel

 **Note:**

It is important to add the domain name to **Safe Domains** in order to enable the Spatial Studio application to access the required service for the basemap.

3.6.2 Editing a Custom Basemap

The following steps enable you to edit a custom basemap.

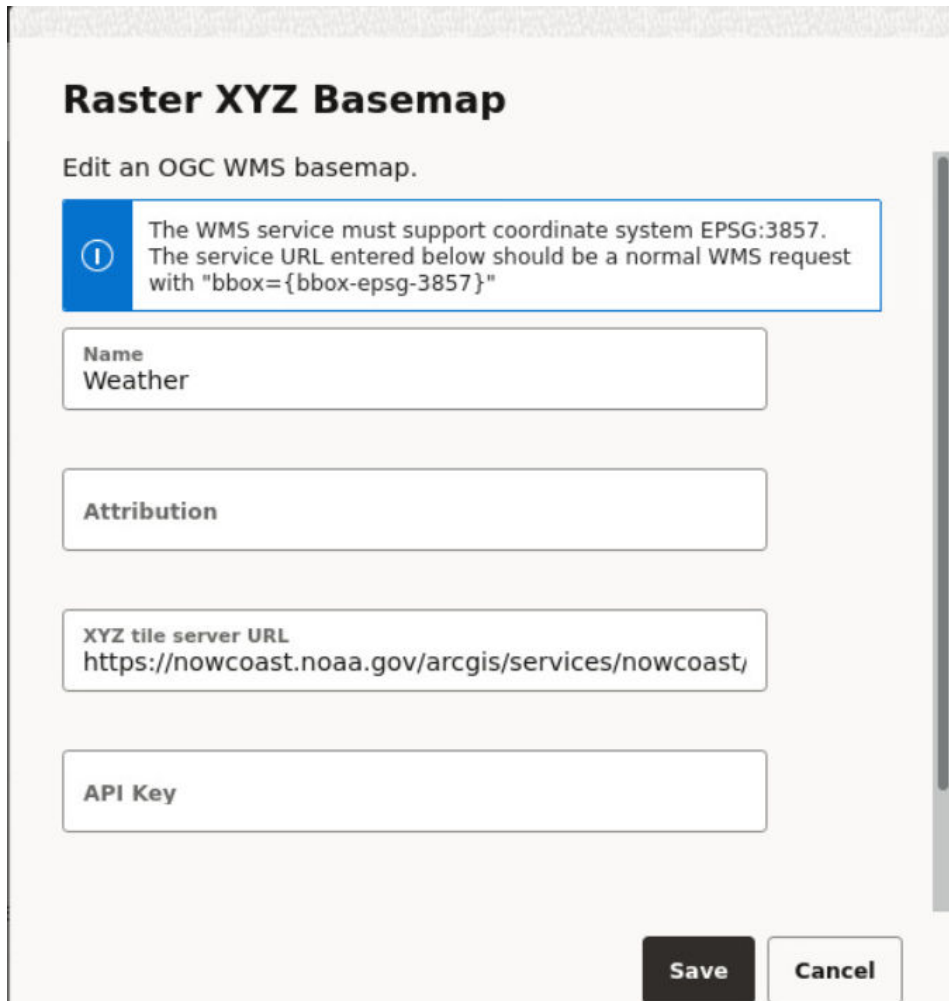
1. Navigate to the **Administration** page.
2. Click **Basemaps** under Settings.
The **Basemaps** window listing all the available basemaps opens.
3. Click ******* against the required custom basemap and click **Edit** from the context menu.

 **Note:**

Edit is disabled for predefined Spatial Studio maps.

The custom basemap configuration details are displayed for editing as shown:

Figure 3-19 Editing a Custom Basemap



Raster XYZ Basemap

Edit an OGC WMS basemap.

i The WMS service must support coordinate system EPSG:3857. The service URL entered below should be a normal WMS request with "bbox={bbox-epsg-3857}"

Name
Weather

Attribution

XYZ tile server URL
https://nowcoast.noaa.gov/arcgis/services/nowcoast/

API Key

Save **Cancel**

4. Modify the required parameters, such as **Name**, **Attribution**, **URL** or **API Key**.
5. Click **Save**.

The custom basemap details are modified and the updates are shown in the **Basemaps** window.

3.7 Spatial Studio Jobs Page

The Jobs page displays details of all the background jobs that run in Spatial Studio.

The following figure shows a layout of the Jobs page:

Figure 3-20 Jobs Page

Type	Object	Created By	Status	Start Time	End Time	Details
Create lon-lat index	US_STATES	SSUSER	DONE	Today, 12:30 PM	Today, 12:30 PM	
Reverse geocode dataset	ACCIDENT	SSUSER	DONE	Today, 12:04 PM	Today, 12:09 PM	
Create lon-lat index	STATES_VIEW	SSUSER	DONE	Today, 11:47 AM	Today, 11:48 AM	

You can perform the following actions on the Jobs page:

- Select a job to be displayed in the grid: **Active**, **Past** or **All**.
- Select a refresh interval for the jobs grid.

The grid table displays the following properties for each job entry row:

- **Type:** The job type, such as Geocode dataset, Create lon-lat index and so on.
- **Object:** The entity being altered by the job, which can be a Dataset, Table, Index or other.
- **Created by:** The user that submitted the job.

 **Note:**

System maintenance jobs are created by “\$system” account

- **Status:** Indicates the state or progress of a job, which can be:
 - PENDING
 - RUNNING
 - DONE
 - FAILED
 - ABORTED
- **Start Time:** The scheduled next run time for jobs with PENDING status, or the actual job start time for the other status.
- **End Time:** The time at which a job completed.
- **Details:** Provides extra feedback on which step a RUNNING job is currently executing, or error details for FAILED or ABORTED jobs.

3.8 Visualization in Oracle Spatial Studio

You can visualize your spatial data in Oracle Spatial Studio using different modes of visualization.

Spatial Studio supports the following visualization methods:

- Table

- Map
- Cesium-Map

You can save your visualization as a Project in Spatial Studio. You can rework on a project or publish a project to share the results with other users.

The following sections explain in detail how you can use the various visualization techniques:

- [Using a Table Visualization](#)
- [Using a Map Visualization](#)
- [Using a Cesium Map Visualization](#)
- [Styling a Map Layer](#)
- [Visualizing Map Data Over Time](#)

3.8.1 Using a Table Visualization

Spatial Studio allows you to visualize your data from the dataset in tables.

To display your data in a tabular view, you must perform the following steps.

The instructions assume that the dataset for visualization is already added to the project in the Active Project page.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Table** from the list to the visualization window on the right to create a table visualization.
This opens an empty layer in the visualization window.
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **dataset** from the list to the empty layer on the right.

 **Note:**

You can view only one dataset in a table view. If you want to view multiple datasets, you must create one table view for each dataset.

This opens the data in tabular format for visualization as shown:

Figure 3-21 Tabular Visualization

ACCIDENT_ID	DATE_TIME	NR_VEHICLES	SEVERITY	HOUSE_NUMBER	COUNTRY	POSTAL_CODE	SETTLEMENT	STREET
2	2019-06-03T09:25:23.000	2	1		ZA	2337	Ekulindeni	
5	2019-05-07T12:43:09.000	6	4		ZA	null	Chief Albert Luthuli	
7	2019-04-24T19:05:28.000	1	2	36	ZA	7945	Lakeside	Main Rd
9	2019-03-15T08:17:22.000	1	4		ZA	8005	Camps Bay	M6
12	2019-06-26T08:27:41.000	9	2		ZA	8001	Cape Town	Kasteel
14	2019-01-22T03:00:34.000	8	2	70	ZA	8001	Cape Town	Corporation St
16	2018-07-27T10:22:16.000	0	2		ZA	0081	Pretoriuspark	
19	2019-03-23T15:18:15.000	5	4		ZA	7975	Fish Hoek	
21	2019-01-01T20:08:52.000	8	4		ZA	7550	Kenever	Kenridge Cntr
23	2019-02-17T19:35:53.000	0	3	79	ZA	8001	Cape Town	Church St

You can easily scroll up or down the table to view the data rows as the table supports infinite scrolling.

You can delete the table visualization by clicking the X icon on the top-right.

3.8.2 Using a Map Visualization

Spatial Studio supports the following types of map visualizations:

- Geometry Data Visualization:
 - Point type
 - Line type
 - Polygon / Area type
- GeoRaster Data Visualization
- Hexagonal Data Visualization using H3 Aggregations

The following sections describe how to get started on these visualizations:

- [Visualizing a Point Map](#)
- [About GeoRaster Data Visualization](#)
- [About Hexagonal Data Visualization Using H3 Aggregations](#)
- [About Custom Map Regions Visualization](#)
- [Visualizing a Moving Object](#)
Starting from Oracle Spatial Studio Release 22.1.0, you can visualize moving objects using a spatiotemporal dataset.

3.8.2.1 Visualizing a Point Map

Spatial Studio allows you to visualize the location of geographic data as points on maps.

To display your geographic data as maps, you must perform the following steps.

The instructions assume that the dataset for visualization is already added to the project in the Active Project page.

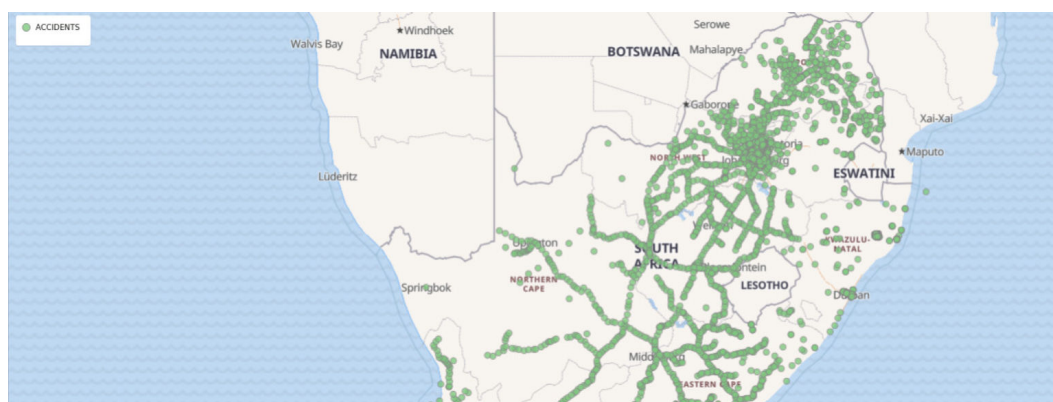
1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Map** from the list to the visualization window on the right to create a map visualization.
A default base map is displayed with no data visualization layers.
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **dataset** from the list to the map view on the right.

 **Tip:**

You can drag and drop multiple datasets in a single action to your map view.

The map gets updated with the data points for visualization as shown:

Figure 3-22 Map Visualization



You can render your map using different rendering styles. See [Applying a Render Style For a Point Layer](#) for more information.

You can delete the map visualization by clicking the **X** icon on the top right.

3.8.2.2 About GeoRaster Data Visualization

Oracle Spatial Studio allows you to visualize GeoRaster data stored in spatial GeoRaster type in Oracle Database.

Geo-referenced raster data, including satellite imagery, aerial photos from drones, and gridded data, is very useful for mapping applications. It can be directly analyzed, or layered with vector data as a background map for additional context. See [Spatial GeoRaster Developer's Guide](#) for more information on GeoRaster data.

The following sections describe how you can create and visualize GeoRaster data in Spatial Studio.

- [Creating a GeoRaster Dataset](#)

- [Visualizing GeoRaster Data on a Map](#)

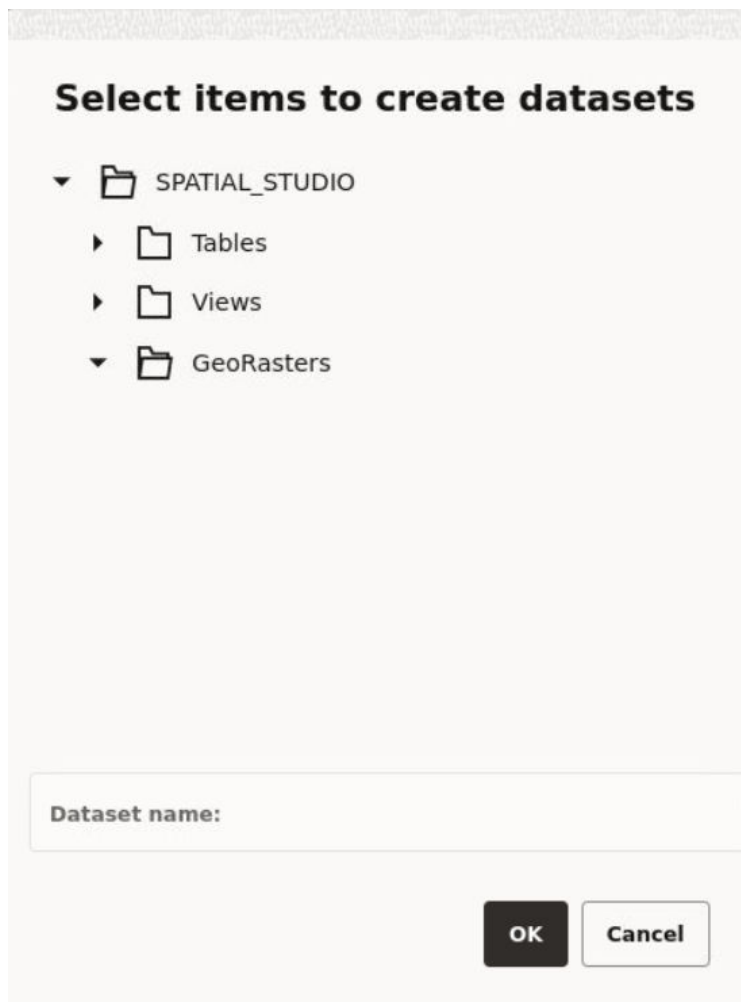
3.8.2.2.1 Creating a GeoRaster Dataset

You can create a GeoRaster dataset using the following steps.

The instructions assume that the GeoRaster data is already existing in your database schema.

1. Navigate to the **Datasets** page and click **Create Dataset**.
2. Click **From table/view**, select a **Connection** and click **Create**.
3. Click **GeoRasters**, select the required **GeoRaster** table and click **OK** as shown:

Figure 3-23 Creating a GeoRaster DataSet



The **Geo-raster Configuration** dialog opens.

4. Choose a **Selection Mode**.

The values for the selection mode are:

- Single Raster

- Virtual Mosaic
5. Select the GeoRaster column for visualization if you have chosen the **Single Raster** mode. Otherwise, you can skip this step.

 **Note:**

If you have chosen the **Virtual Mosaic** mode, all the Georaster columns are included in the visualization.

6. Click **OK**.

The GeoRaster dataset is configured and the newly created GeoRaster dataset is displayed as a row in the Datasets page.

3.8.2.2.2 Visualizing GeoRaster Data on a Map

You can visualize georaster data on a map using the following steps.

The instructions assume that the GeoRaster dataset is already added to the project in the Active Project page. To create a GeoRaster dataset, see [Creating a GeoRaster Dataset](#) for more information.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Map** from the list to the visualization window on the right to create a map visualization.
A default base map is displayed with no data visualization layers.
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **GeoRaster dataset** from the list to the map view on the right.
A GeoRaster layer is created on the map as shown:

Figure 3-24 GeoRaster Data Visualization



You can delete the map visualization by clicking the X icon on the top right.

 **Tip:**

You can enhance your visual display by modifying your Layer Settings using the **Style** tab and **Raster** tab. See [Applying Style for a GeoRaster Layer](#) for more information.

3.8.2.3 About Hexagonal Data Visualization Using H3 Aggregations

Oracle Spatial Studio allows you to visualize point-type map data using hexagons with H3 (Hexagonal Hierarchical Spatial Index) aggregations.

Visualizing your map data as hexagons has several advantages:

- It helps you to identify patterns or clusters in a larger point dataset
- Easier interpretation of data, as in a hexagonal cell, all the points are equidistant from the hexagon center-point
- Hexagonal cells are color coded based on the number of datapoints they hold, which enables you to easily understand data patterns

The following sections describe how you can use H3 aggregations in Spatial Studio:

- [Preparing an H3 Aggregation Dataset](#)
- [Visualizing Data With H3 Aggregations](#)

3.8.2.3.1 Preparing an H3 Aggregation Dataset

You can prepare an H3 aggregation dataset by performing the following steps.

The instructions assume that a dataset containing geometric data columns is already loaded to Spatial Studio.

1. Navigate to the **Datasets** page.
All the datasets loaded to Spatial Studio are shown listed on this page.
2. Select the required dataset **name** and right-click to open the context menu.
3. Click **Create H3 Index** on the **Prepare** submenu.

The **Creating H3 Index** dialog opens as shown:

Figure 3-25 Creating an H3 Aggregation Dataset

Creating H3 Index: POLICE_POINTS

Geometry Column
GEOM

Summarize using

Count

Sum

Column to sum

H3 Index Name
POLICE_POINTS_H3

OK Cancel

4. Select the **Geometry Column** for H3 aggregations.
5. Click a **Summarize using** option.
The values for summarizing are:
 - **Count:** buckets the number of datapoints in each hexagon
 - **Sum:** adds up the values for a specific column in the data set, for all the points that fall in a specific hexagon
6. Select the **Column to sum**, if you have chosen **Sum** to summarize your dataset. Otherwise, you can skip this step.
7. Optionally, modify the **H3 Index Name**.
8. Click **OK**.

An H3 aggregation dataset is created and added as a new row in the Datasets page.

3.8.2.3.2 Visualizing Data With H3 Aggregations

To visualize your map data with H3 aggregations, you must perform the following steps.

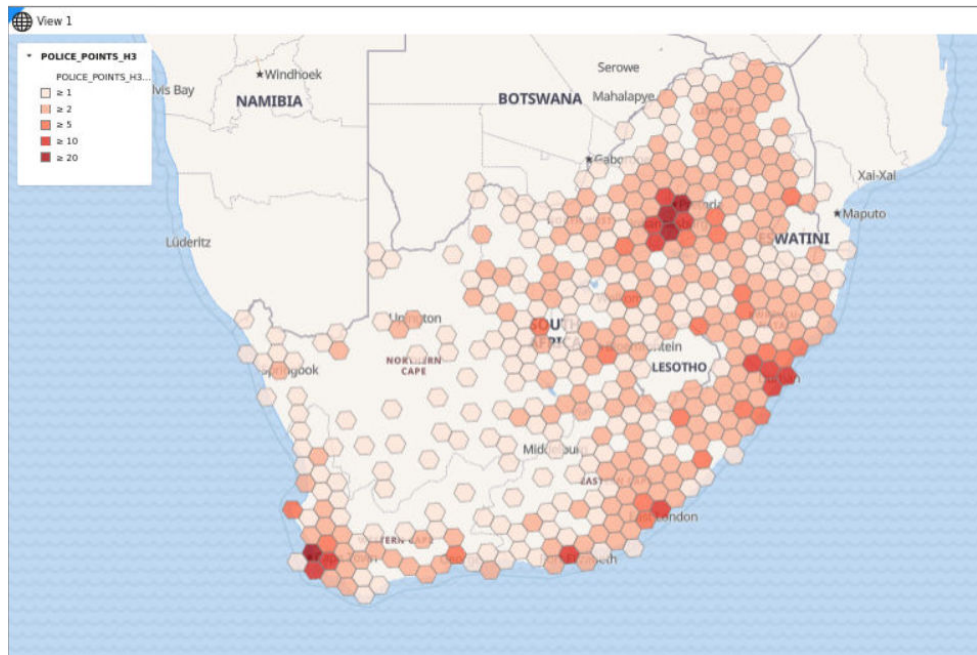
The instructions assume that an H3 aggregation dataset is already added to the project in the Active Project page.

To prepare a dataset for H3 aggregation, see [Preparing an H3 Aggregation Dataset](#) for more information.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Map** from the list to the visualization window on the right to create a map visualization.
A default base map is displayed with no data visualization layers.
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **H3 Aggregation dataset** from the list to the map view on the right.

A layer showing the hexagonal binning of the data points is displayed on the map as shown:

Figure 3-26 Map Data Visualization Using Hexagonal Binning



See [Applying Data-Driven Style to a Map with H3 Aggregations](#) for more information on applying styling for a H3 map layer.

3.8.2.4 About Custom Map Regions Visualization

Oracle Spatial Studio allows you to create custom map regions on map layers that support polygon type geometry.

You can create a new map region by selecting multiple polygon shapes and combining them with a new key-value. You can then append or insert this new map region with the new key-value into a target dataset containing all of your other custom map regions.

These newly created custom shapes are persisted on the underlying database table of the target dataset, and therefore can be used for data visualization or reporting just like any other dataset.

The following are the main characteristics for this feature support:

- The source dataset, that is the dataset whose polygon shapes you will be selecting and then combining into a custom map region, must always be based on an Oracle Database table.
Datasets from Oracle views and Studio's Analyses are not currently supported.
- The new regions may or may not be contiguous.
- The target dataset, that is the dataset on which you want to store the newly created custom map regions, will store them in its geo-reference system.
- Only the key value and new geometry value are inserted into the target table.
- The target dataset must meet the following requirements:
 - The geometry metadata information for the target dataset must be available in the SDO_GEOM_METADATA view.
 - A spatial index must exist on the geometry column.

Note:

If a spatial index is not created on the geometry column, then the target data layer cannot be dragged on to the map visualization canvas. See [Creating a Target Dataset](#) for more information.

- [Creating Custom Regions for Visualization](#)
- [Creating a Target Dataset](#)

3.8.2.4.1 Creating Custom Regions for Visualization

You can create custom polygon regions on the source dataset that contains polygon type geometries and apply them on a target dataset using the follow steps:

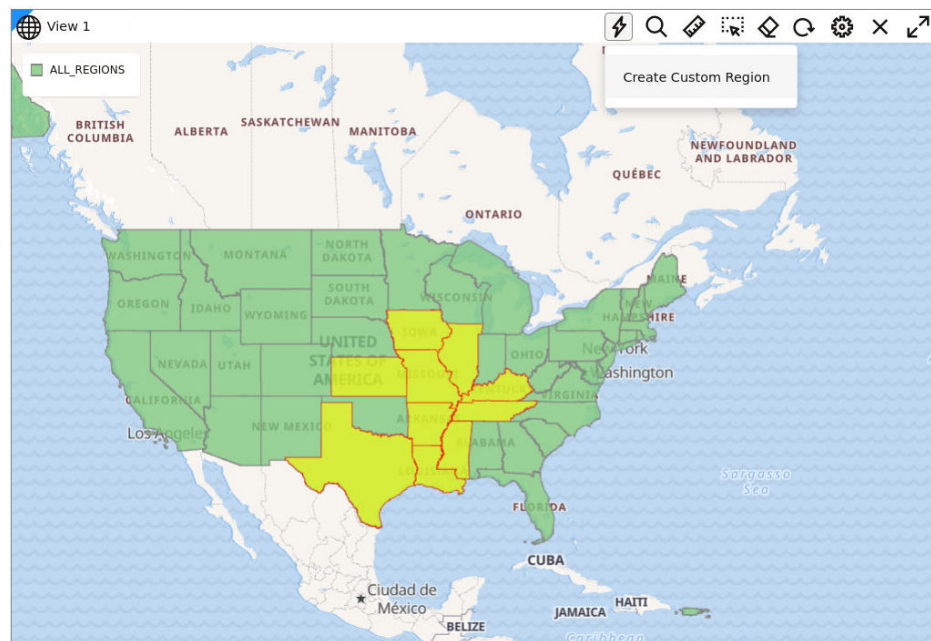
The instructions assume that the source and target datasets are already added to your Project in the ActiveProject page.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Map** from the list to the visualization window on the right to create a map visualization.

A default base map is displayed with no data visualization layers.


3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **source dataset** from the list to the map view on the right.
A map layer with polygon shapes is created.
5. Create the required custom regions by performing the following steps as many times as required:
 - a. Select the regions for aggregation using the polygon selection tool in the map tool bar.

Figure 3-27 Creating Custom Map Shapes



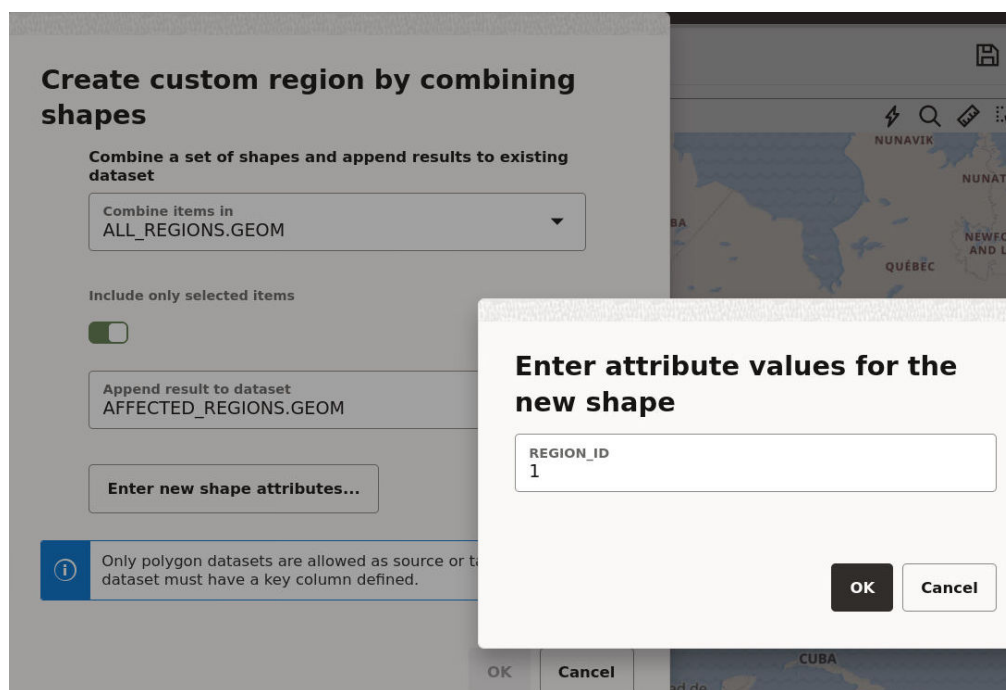
Tip:

Alternatively, you can also select multiple polygons by using the keyboard shortcut **Ctrl + Click** on a Windows system.

- b. Click  , **Merge Polygons Menu** icon on the map tool bar and click **Create Custom Region**.

Create custom region by combining shapes opens as shown:

Figure 3-28 Create a Custom Region



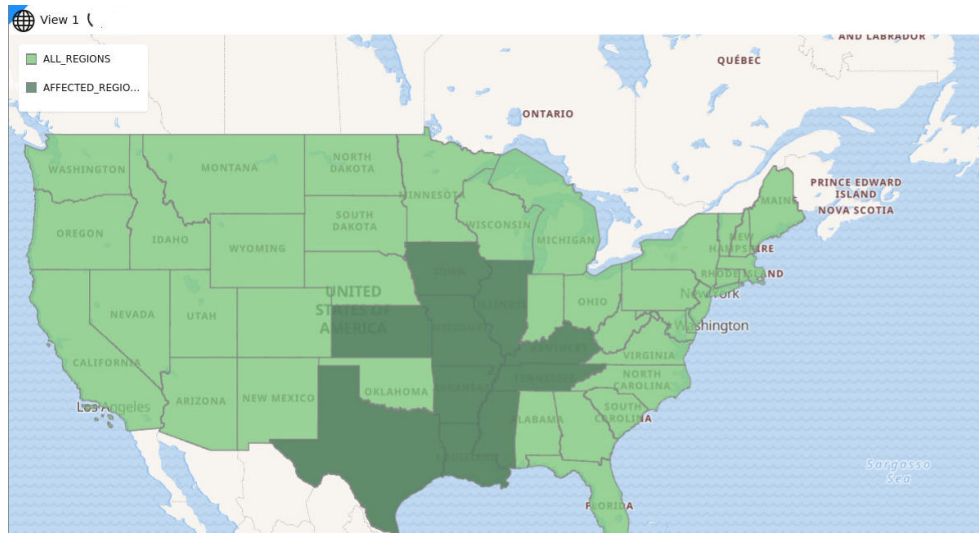
- c. Select the source and target dataset and optionally switch on or off the **Include only selected items** toggle button:
 - **Combine items in:** source dataset
 - **Append result to dataset:** target dataset

⚠ Caution:

The whole source dataset may be aggregated into one region if **Include only selected items** is switched off. In this case the process may run for a long time depending on the number of features in the source dataset. Therefore, use this option only if required.

- d. Click **Enter new shape attributes** and enter a unique number for **REGION_ID**.
 - e. Click **OK** to create the custom map region.
- Repeat steps **a** to **d** until you create the number of required custom regions.
6. Drag and drop the **target dataset** to the map view on the right to view the newly created custom regions.

The following figure shows the newly defined custom region that was inserted into the target dataset.

Figure 3-29 Displaying the Custom Shape on the Target Dataset

3.8.2.4.2 Creating a Target Dataset

You can create a target dataset by performing the following steps:

1. Connect to an Oracle database schema using SQL Developer or any other tools.
2. Create a spatial table as shown:

```
CREATE TABLE affected_regions (region_id NUMBER PRIMARY KEY, geom
SDO_GEOMETRY);
```

3. Insert the spatial table into USER_SDO_GEOM_METADATA view. For example:

```
INSERT INTO USER_SDO_GEOM_METADATA VALUES (
'affected_regions', -- TABLE_NAME
'geom', -- COLUMN_NAME
SDO_DIM_ARRAY -- DIMINFO attribute for storing dimension bounds,
0.5 m as tolerance
(SDO_DIM_ELEMENT ('LONGITUDE', -180, 180, 0.5 ),
SDO_DIM_ELEMENT ( 'LATITUDE', -90, 90, 0.5 )),
4326 -- SRID value for specifying a geodetic coordinate system
);
COMMIT;
```

4. Create a spatial index on the SDO_GEOMETRY column.

```
CREATE INDEX affected_regions_sidx ON affected_regions(geom)
INDEXTYPE IS MDSYS.SPATIAL_INDEX_V2;
```

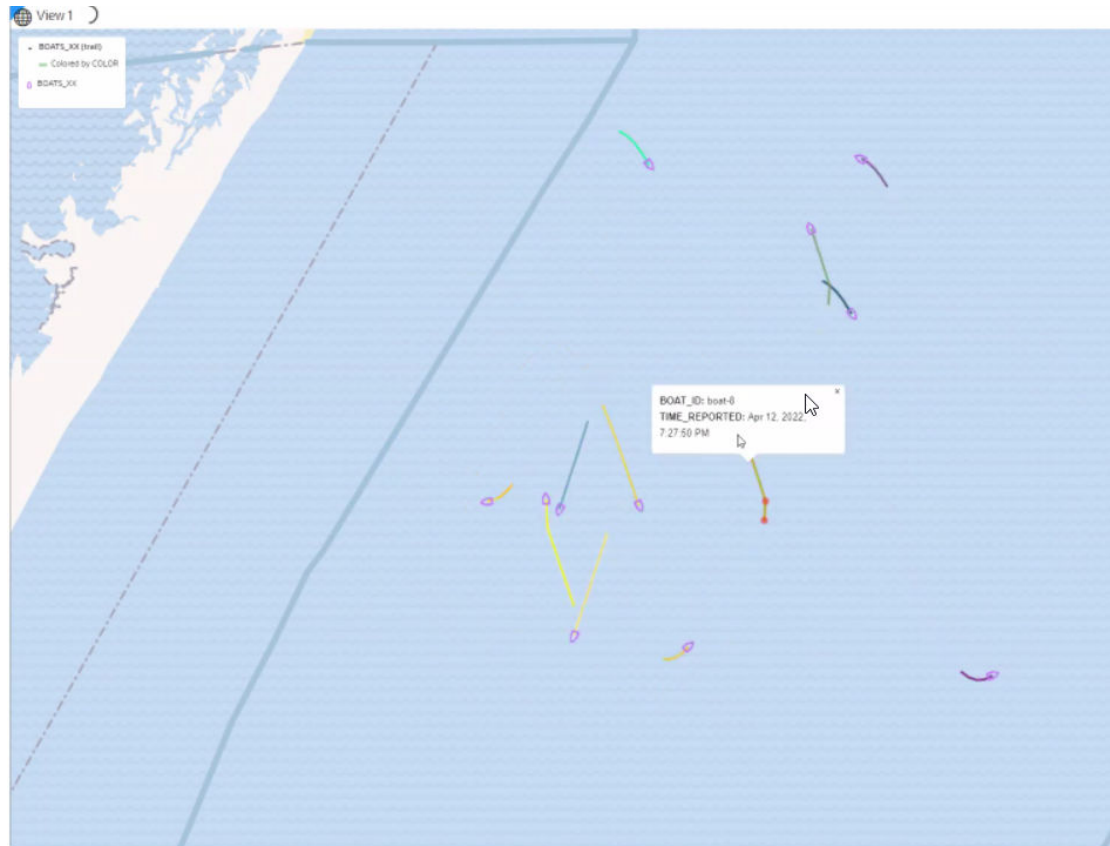
5. Create a dataset in Spatial Studio from the database schema used in the preceding steps.

The required target dataset is created. You may use this data layer on to which you can apply the newly created custom map regions.

3.8.2.5 Visualizing a Moving Object

Starting from Oracle Spatial Studio Release 22.1.0, you can visualize moving objects using a spatiotemporal dataset.

Figure 3-30 Moving Objects Visualization



To get started on visualizing moving objects in Spatial Studio, you must:

1. Enable a dataset as a spatiotemporal dataset by defining the essential space, time and entity information.
2. Configure animation settings after adding the spatiotemporal dataset to a map for visualization.

The following sections describe in detail how you can perform the preceding two steps:

- [Enabling Spatiotemporal for a Dataset](#)
In order to visualize and animate moving objects, you must enable **Spatiotemporal** for the dataset containing spatiotemporal data on the Datasets page.
- [Configuring Animation for a Moving Object](#)
To visualize moving objects on a map in Spatial Studio, you must configure the animation settings on the map layer.

- [Characteristics of Spatiotemporal Map Layers](#)
This section describes the distinct characteristics of the spatiotemporal map layers when visualizing a spatiotemporal dataset.

3.8.2.5.1 Enabling Spatiotemporal for a Dataset

In order to visualize and animate moving objects, you must enable **Spatiotemporal** for the dataset containing spatiotemporal data on the Datasets page.

Spatial Studio considers a dataset to contain spatiotemporal data only if it meets the following requirements:

- It must be based on a geometry table or view with a geometry column or pair of latitude/longitude columns.
- There must be one or more “moving objects” or entities uniquely identified by one of the columns.
- There must be a column of the type `TIMESTAMP`, that stores the UTC datetime of the entities as they are being observed and recorded.
- The dataset's underlying table or view must have ongoing inserts with recently obtained location data of entities being observed or monitored.

You can perform the following steps to enable spatiotemporal for a dataset. The instructions assume that the dataset containing spatiotemporal data is already existing in your database schema.

1. Navigate to the **Datasets** page.
2. Right-click on the spatiotemporal dataset and click **Properties**.
The **Dataset Properties** dialog opens.
3. Click the **Spatiotemporal** tab.
The tab display opens as shown:

Figure 3-31 Enabling Spatiotemporal for a Dataset

Dataset Properties - BOATS

Overview Columns Settings Spatial Validation **Spatiotemporal**

Enable Spatiotemporal

Entity ID Column
BOAT_ID

Timestamp Column
TIME_REPORTED

i Only UTC timestamp values are supported

Data Change Rate
1,000

i Spatiotemporal datasets are based on tables/views with constant ongoing inserts including location (SDO_GEOMETRY or coordinates) and time (UTC TIMESTAMP). Only datasets meeting this condition may be enabled as a spatiotemporal dataset.

Apply Cancel

4. Switch ON **Enable Spatiotemporal**.
5. Select the **Entity_ID Column** that identifies a set of unique entities.

The **Entity_ID Column** is not a unique column as each entity can have many recordings of its locations in the same table.

6. Select the **Timestamp Column**.

Spatial Studio supports only UTC (Coordinated Universal Time) or GMT (Greenwich Mean Time) time zone for visualizing moving objects.

7. Specify **Data Change Rate** to indicate the approximate frequency of the live feed updates in the table.
8. Click **Apply**.

Your dataset is now enabled for spatiotemporal data visualization.

3.8.2.5.2 Configuring Animation for a Moving Object

To visualize moving objects on a map in Spatial Studio, you must configure the animation settings on the map layer.

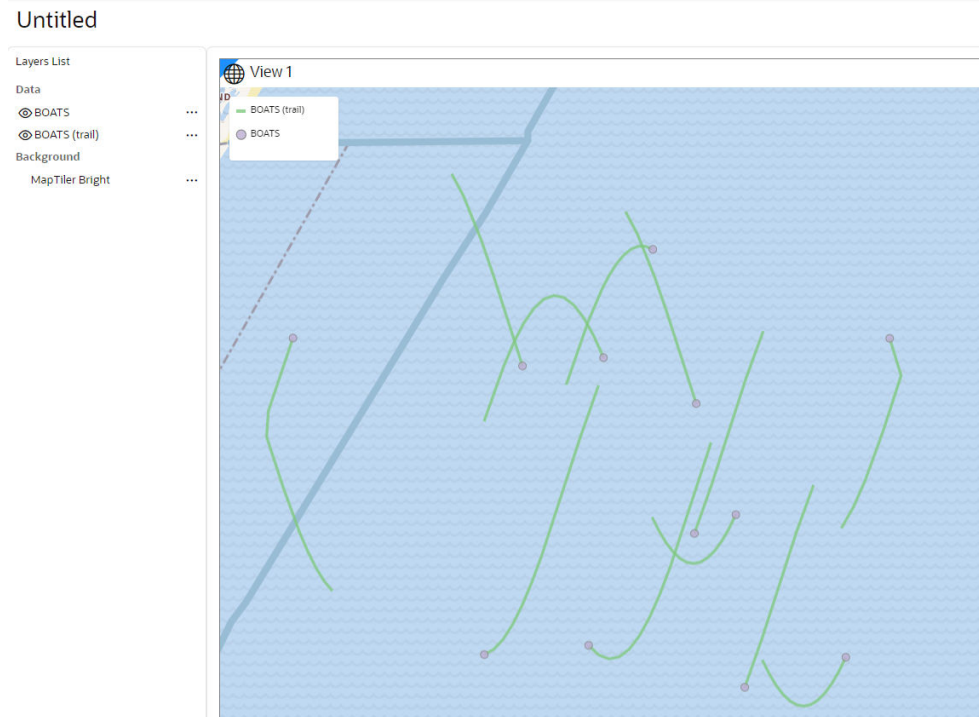
The following instructions assume that you have enabled spatiotemporal for the dataset and the dataset is already added to the project in the Active Project page. See [Enabling Spatiotemporal for a Dataset](#) for more information.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Map** from the list to the visualization window on the right to create a map visualization.

A default base map is displayed with no data visualization layers.

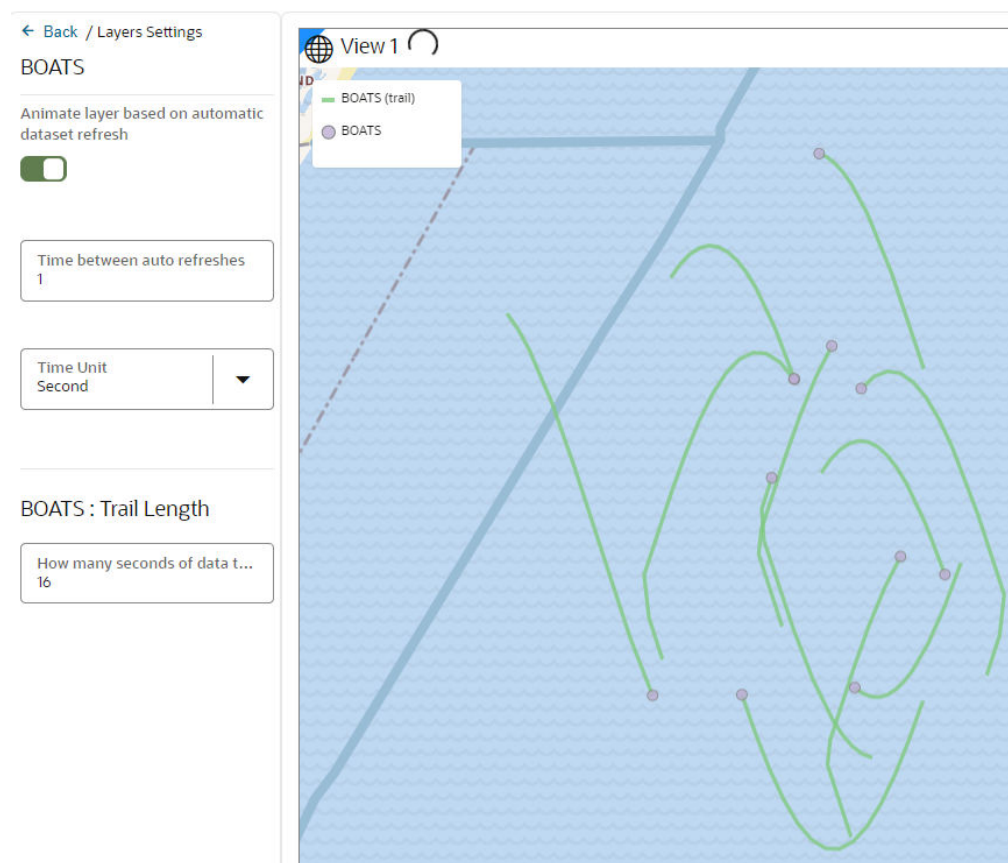
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired spatiotemporal dataset from the list to the map view on the right. Two map layers are created on the map as shown:

Figure 3-32 Map Visualization Using a Spatiotemporal Dataset



The second layer representing the trails of the moving object is added automatically in Spatial Studio. See [Characteristics of Spatiotemporal Map Layers](#) for more information on the two map layers.

5. Perform the following steps to enable animation of the object along the trails:
 - Click **...** against the initial layer in the **Data** tab of the **Layers** list.
 - Select **Settings** in the context menu and click **Configure Animation**.
The animation settings for the map layer opens as shown:

Figure 3-33 Configuring Animation Settings

- Switch ON **Animate layer based on automatic dataset refresh**.
- Specify **Time between auto refreshes** to indicate the frequency of data refresh from the backend. This configuration also determines the smoothness and speed of the temporal animation.
Note that Spatial Studio displays a default frequency value which is same as the **Data Change Rate** value configured on the Spatiotemporal dataset used for the visualization.
- Specify a **Time Unit**.
- Specify the **Trail Length** of your moving object. A trail length value of N indicates that Spatial Studio must fetch the recent N seconds of data of the moving object during every refresh.

 **Tip:**

If the underlying database table or view contains millions of records, you can limit the map animation to display only the most recent N seconds of data as configured in **Trail Length**.

Note that Spatial Studio displays a default trail length value which is 15 times the **Data Change Rate** value configured on the Spatiotemporal dataset and is rounded to the nearest integer.

The animation settings are configured and you can view the animation of moving objects on the map.

 **Note:**

You can choose a symbol and color for your moving object. However, ensure that the symbol you select adheres to the conditions explained in [Characteristics of Spatiotemporal Map Layers](#).

3.8.2.5.3 Characteristics of Spatiotemporal Map Layers

This section describes the distinct characteristics of the spatiotemporal map layers when visualizing a spatiotemporal dataset.

- The trails map layer is considered the *secondary* layer to the main layer. If you delete the main layer from the map, then the trails map layer is automatically deleted as well.
- The main layer which shares the same name as the dataset is always a Point-type layer, that you can visualize using either as circle or using symbols or icons. When you use symbols, Spatial Studio will also automatically rotate the symbol based on the direction your object is moving. Also note, the current release of Spatial Studio supports only those symbols that naturally point North (or point up) or those that do not represent an inherent direction or angle, such as any rounded symbols.
- The main layer will keep its animation even when you toggle the secondary layer invisible. However, if you toggle the main layer invisible, the trail layer will remain static as no new data is fetched from the backend.
- You cannot switch the main layer to Heatmap or Cluster type.
- You cannot use sticky Tooltip or popup as they cannot stick to the moving object when it moves to new locations.
- Spatial Studio drives the animation of moving objects and their trails by constantly refreshing the main layer's data from the backend. This implies that the base table is queried and the last *N* seconds of data is fetched by filtering the records based on the `TIMESTAMP` column.
- If you are working in a multi-user or multi-visualization environment or both, you must take care to avoid overloading the database with many animating layer's data refresh queries. For instance, ensure a layer is not refreshing its data too frequently, or fetching too many seconds of data on each refresh, or both.

3.8.3 Using a Cesium Map Visualization

Spatial Studio uses a CesiumJS plugin to enable you to view 3D visualizations using 3D Tiles or CZML data on a Cesium map.

Cesium map allows you to display your real-world geospatial 3D data in a 3D environment. In order to build interactive 3D visualizations using Cesium maps, you can upload one of the following files to Spatial Studio:

- **3D Tileset:** Supports formats are:
 - Point Cloud (.pnts)

- Batched 3D Model (.b3dm)
- **CZML file:** CZML formatted data in .czml files

It is important to note the following when using a Cesium map visualization:

- Generating 3D Tiles or CZML formatted data file for your geospatial 3D data must be carried out using any third party software outside of Oracle Spatial Studio.
- 3D Tiles and CZML files are stored in the file system on Spatial Studio's server, not in Oracle Database.
- Currently this feature supports only displaying 3D Tiles and CZML data on maps. It does not support 3D analysis.
- [Visualizing a 3D Tileset Using a Cesium Map](#)
- [Visualizing CZML Data Using a Cesium Map](#)

3.8.3.1 Visualizing a 3D Tileset Using a Cesium Map

You can visualize your dataset with 3D Tiles on a Cesium map using the following steps.

The instructions assume that the 3D Tiles are uploaded and the dataset is already added to the project in the Active Project page. To create a dataset with 3D Tiles, see [Creating a Dataset](#) for more information.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.
2. Click and drag **Cesium-Map** from the list to the visualization canvas on the right to create a Cesium map visualization.

A default Cesium map is displayed.

Tip:

You can configure new background Cesium maps by adding maps from the following two sources:

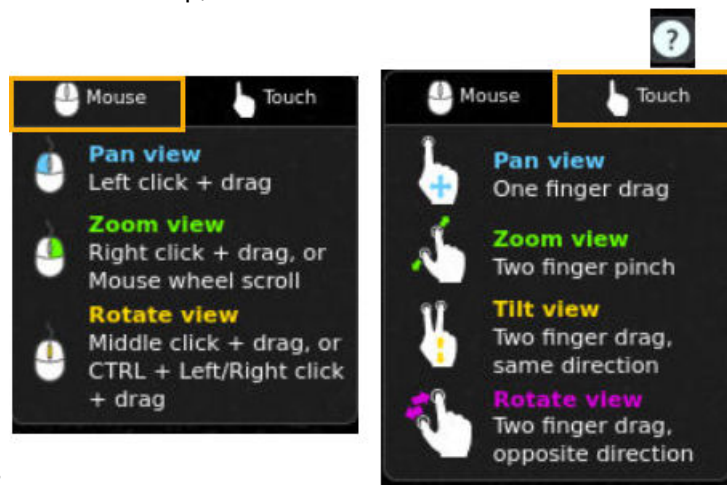
- URL template
- WMTS service

3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **3D Tiles dataset** from the list to the map view on the right.
A 3D layer is created on the map as shown:

Figure 3-34 3D Cesium Map Visualization



To interact with the map, click the ? icon and use either of the following options



shown:

3.8.3.2 Visualizing CZML Data Using a Cesium Map

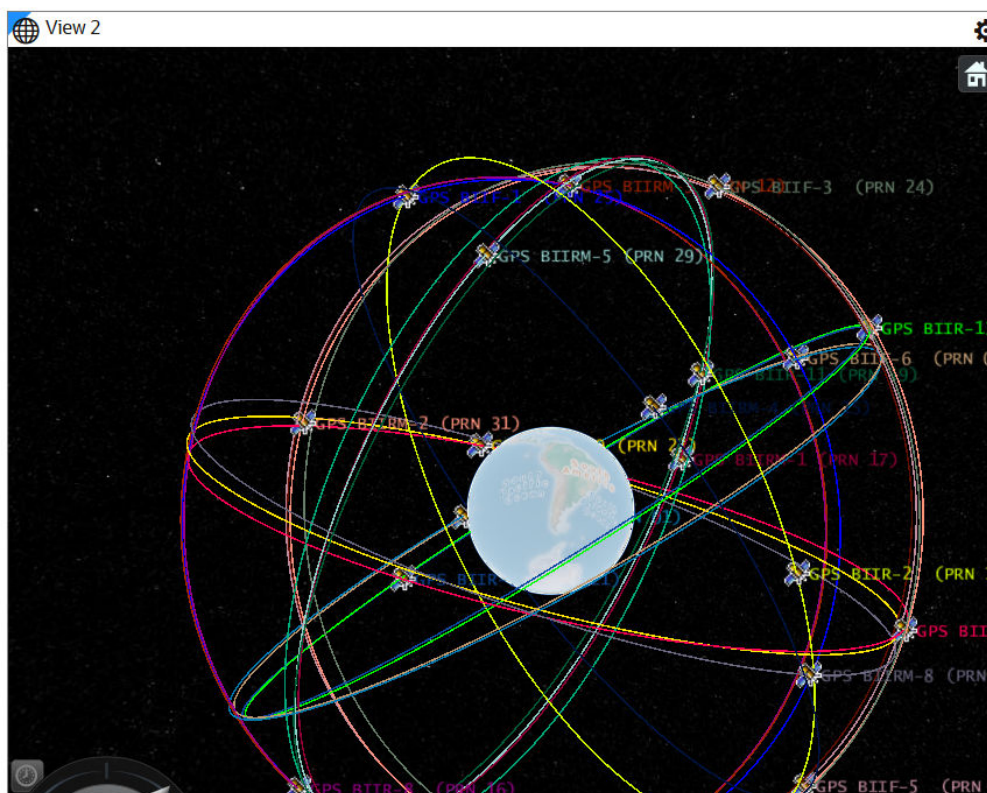
You can visualize your CZML dataset on a Cesium map using the following steps.

The instructions assume that the CZML formatted data is uploaded and the CZML dataset is already added to the project in the Active Project page. To create a dataset using .czml file, see [Creating a Dataset](#) for more information.

1. Click the **Visualizations** tab on the left pane in the Active Project page.
This lists the various visualization options.

2. Click and drag **Cesium-Map** from the list to the visualization canvas on the right to create a Cesium map visualization.
3. Click the **Data** tab on the left pane in the Active Project page.
This lists all the **Datasets** that are loaded for the project.
4. Click and drag the desired **CZML dataset** from the list to the map view on the right.
A 3D layer is created on the map as shown:

Figure 3-35 Cesium Map Visualization Using a CZML Dataset



3.8.4 Styling a Map Layer

Spatial Studio allows you to explore different styling options for your map layers, in order to enhance visualization and analysis.

The styling options provided to you may vary depending on the type of data you are mapping.

The following sections describe a few styling techniques for the different data types:

- [Applying a Render Style For a Point Layer](#)
- [Applying Style for a GeoRaster Layer](#)
- [Applying Data-Driven Style to a Map with H3 Aggregations](#)
- [Applying Predefined Colors to a Map Layer](#)
- [Applying Predefined Symbols to a Map Layer](#)
- [Setting Selection Tolerance on a Map Layer](#)

- [Adding a Pin on a Map](#)
- [Applying Map Backgrounds](#)

3.8.4.1 Applying a Render Style For a Point Layer

You can render a point map layer using one of the following render style options:

- Circle (default)
- Symbol
- Heatmap
- Cluster

The following steps enable you to apply your preferred render style option.

The instructions assume that you have point map layer displayed on your Active Project page.

1. Click ******* against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu.
3. Configure **Style** and select a **Render Style** option from the drop-down list.

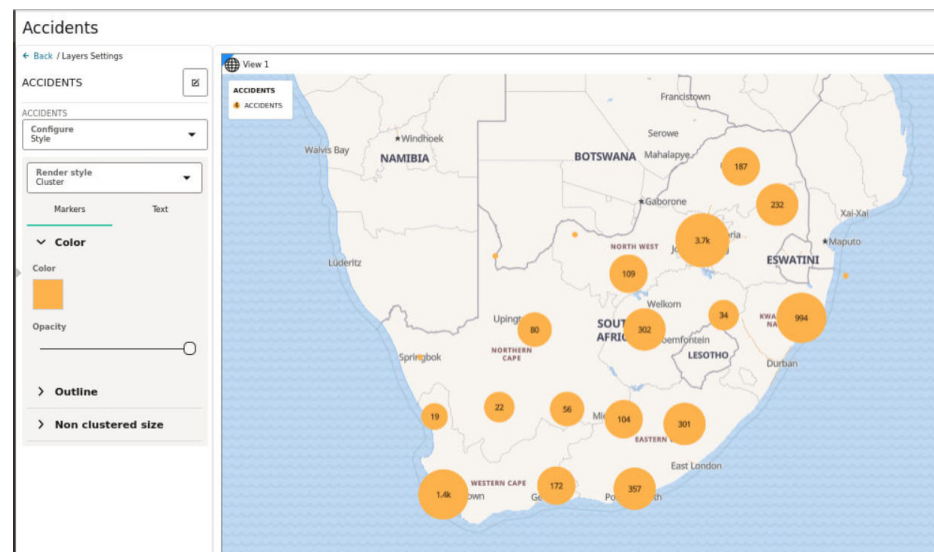
By default, a point map layer always uses Circle to represent the data points.

 **Note:**

Each render style has its own settings.

- If you select **Cluster** as the render style option, the data points on your map are shown clustered depending on the cluster circle size.

Figure 3-36 Applying a Cluster Style



Optionally, you can change the color and the style of the text labels representing the number of points in each cluster.

- If you select **HeatMap** as the render style option, the data points on your map are rendered with continuous colors based on the concentration of points as shown:

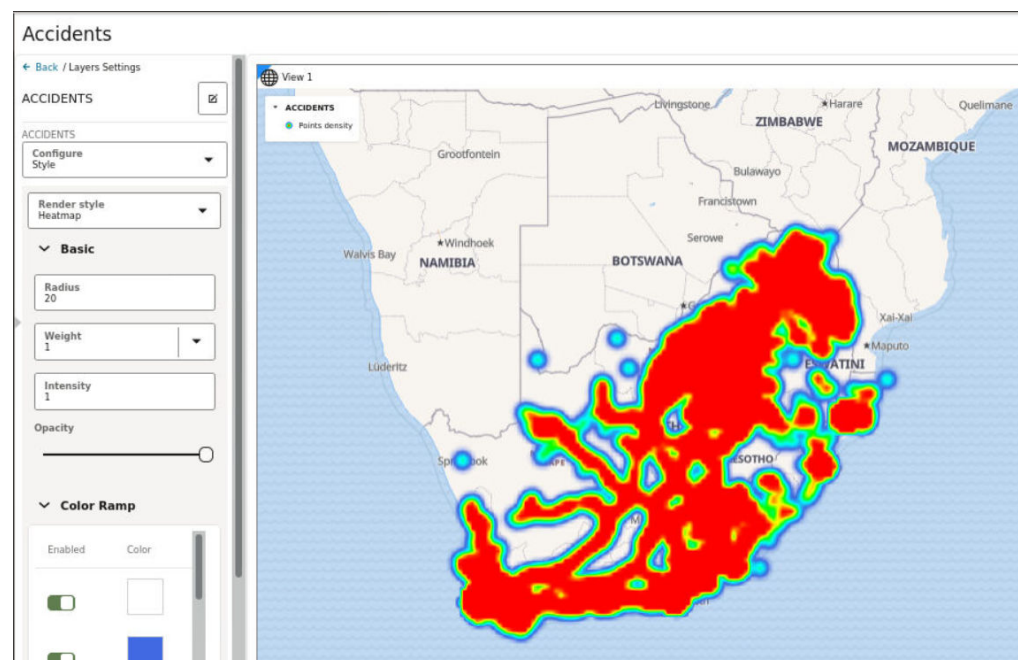
 **Note:**

Hot colors represent concentration of points, and cool colors represent sparsity of points.

 **Tip:**

It is recommended that you reduce the default value of the **Radius** parameter to observe a more localized view of point concentrations.

Figure 3-37 Applying a HeatMap Style

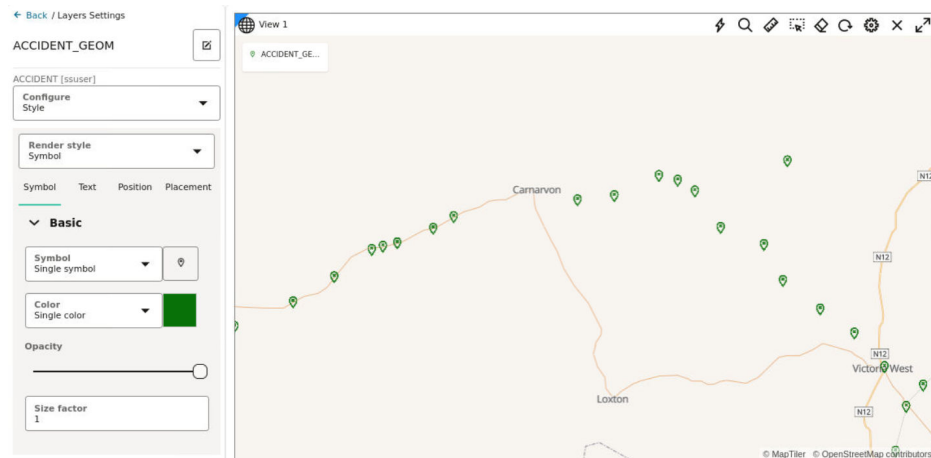


- If you select **Symbol** as the render style option, the data points on your map are rendered with your chosen symbol as shown:

 **Tip:**

You can optionally select a color for your symbol.

Figure 3-38 Applying a Symbol Style



The map layer gets rendered with the appropriate style.

3.8.4.2 Applying Style for a GeoRaster Layer

You can style a GeoRaster map layer using the following steps.

The instructions assume that you have a GeoRaster map layer displayed on your Active Project page.

1. Click **...** against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu.
The **Layer Settings** panel opens.
3. Optionally, modify any of the following options in the **Style**:
 - **Opacity**
 - **Maximum Brightness**
 - **Minimum Brightness**
 - **Saturation**
 - **Contrast**
 - **Hue Rotate**
 - **Fade Duration**
4. Optionally, modify any of the following rendering options in the **Raster** tab:
 - **Bands:** Spatial Studio, by default supports the following bands:
 - Red
 - Blue
 - Green
 - Alpha

For GeoRaster images that have more than three layers, you can choose which three layers you want to visualize.

- **Reprojection:** represents the interpolation method to be used when transforming an image from one SRS (Spatial Reference System) to another.

- **Image Processing:** represents the subprogram to be used to enhance the visual quality of the images.
- **Rendering Hints:** represents the image interpolation value that determines how each image cell's value on a view port is interpolated using the original image pixels. For example:
 - **NEAREST NEIGHBOR:** This option has no interpolation by taking the nearest image pixel's value directly.
 - **BI-LINEAR:** This option will consider 4 neighboring pixels to determine the image cell's value on a view port.

Additionally, you can also switch on or off the **Transparent NODATA** toggle, which determines if the image cells are to be transparent or not. If the switch is on, then the layers underneath will be visible for areas that have NODATA in the image.

The GeoRaster map layer is rendered with the updated settings.

3.8.4.3 Applying Data-Driven Style to a Map with H3 Aggregations

You can apply different resolutions to your H3 map layer to enhance your visualization.

In case of an H3 aggregation dataset, the hexagonal cells and the distribution of points in these hexagons automatically change at each resolution level, as you zoom in and out of the map. This implies that the color bins for one level might not be the same as for another level.

Spatial Studio provides an option to automatically calculate color bins as you alter your resolutions. You can also turn this option off if you want to test against a set of specific thresholds.

The following steps enable you to apply a data-driven styling option for your H3 map layer.

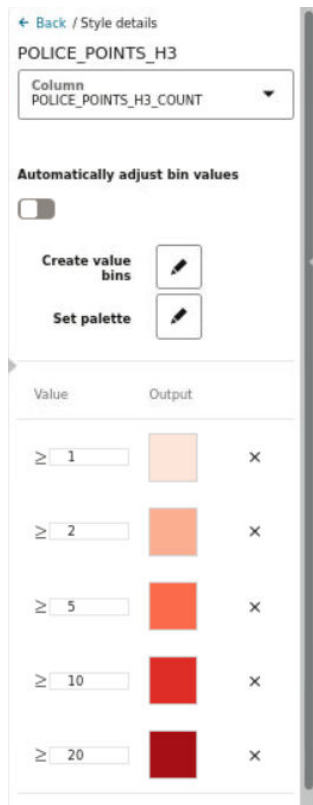
The instructions assume that you have a H3 map layer displayed on your Active Project page.

1. Click **☰** against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu.
3. Configure **Style**.
4. Select **Based on Data** for the **Color** value under **Fill**.

The **Style details** panel is displayed.

5. Select the **Column** to control styling.
6. Switch on or off the **Automatically adjust bin values** toggle button.
 - If turned on, the bin values will automatically update as you zoom in or out on the map.
 - If turned off, **Create value bins** option appears.
7. Assign colors to the bins based on data values and then click the **Back** link to return to the Layers List.

The following figure shows the Style details panel options:

Figure 3-39 Applying Data-Driven Color Styling for H3 Map Layer

The color bins on the H3 map layer gets rendered appropriately for different resolutions as shown in the preceding figure.

3.8.4.4 Applying Predefined Colors to a Map Layer

Using a column with predefined color codes or values, you can create accurate and consistent choropleth map layers.

You can store a color-coded value in a column of your dataset and then use this column property to color code your map.

The following steps enable you to color code your map layer.

The instructions assume that the map layer displayed on your Active Project page uses a dataset having a column property that contains color-coded values.

1. Click **...** against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu.
3. Configure **Style** by selecting **Column with color codes** for the **Color** value under **Fill**.
4. Select the **Column** that contains the color value.

The following figure shows the styling of the map layer using the color variable in the dataset:

Figure 3-40 Color Coding a Map Layer



The color code gets applied to the map layer.

3.8.4.5 Applying Predefined Symbols to a Map Layer

Using a column with predefined symbol values, you can apply data-driven symbol styling to your map layer.

However, the symbol must belong to one of the supported symbol sets. Symbols in Spatial Studio are grouped into three sets and each set is identified by a *Symbol set id* as described in the following table:

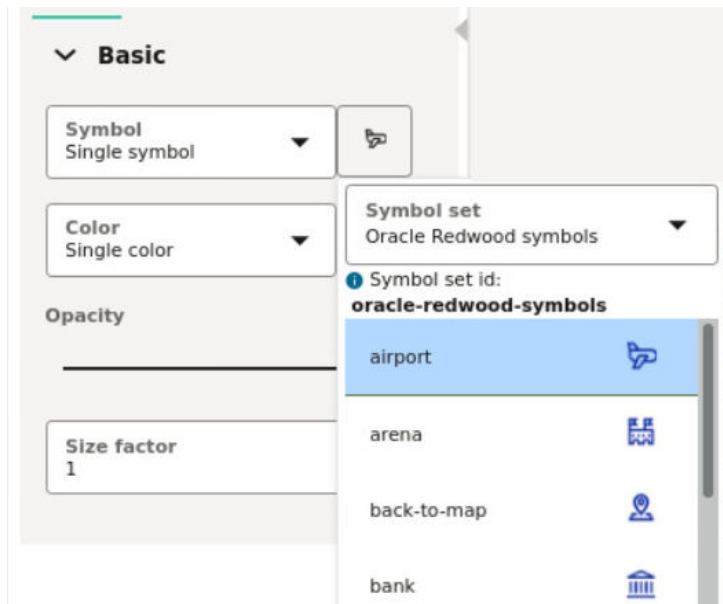
Table 3-2 Symbol Set

Symbol Set	Symbol set id
Spatial Studio default	studio
Oracle Redwood symbols	oracle-redwood-symbols
Airfields	airfields

You can store a symbol name and the symbol set to which it belongs in a column of your dataset and then use this column property to assign symbols to your map.

For example, assume you want to use the `airport` icon as shown in the following figure:

Figure 3-41 Symbols and Symbol Set



You must then use `oracle-redwood-symbols/airport` as the symbol name in your dataset column. In this case:

- `oracle-redwood-symbols`: is the symbol set id
- `airport`: is the name for the icon to be used on the map layer

The following steps enable you to apply data driven symbol styling for your map layer.

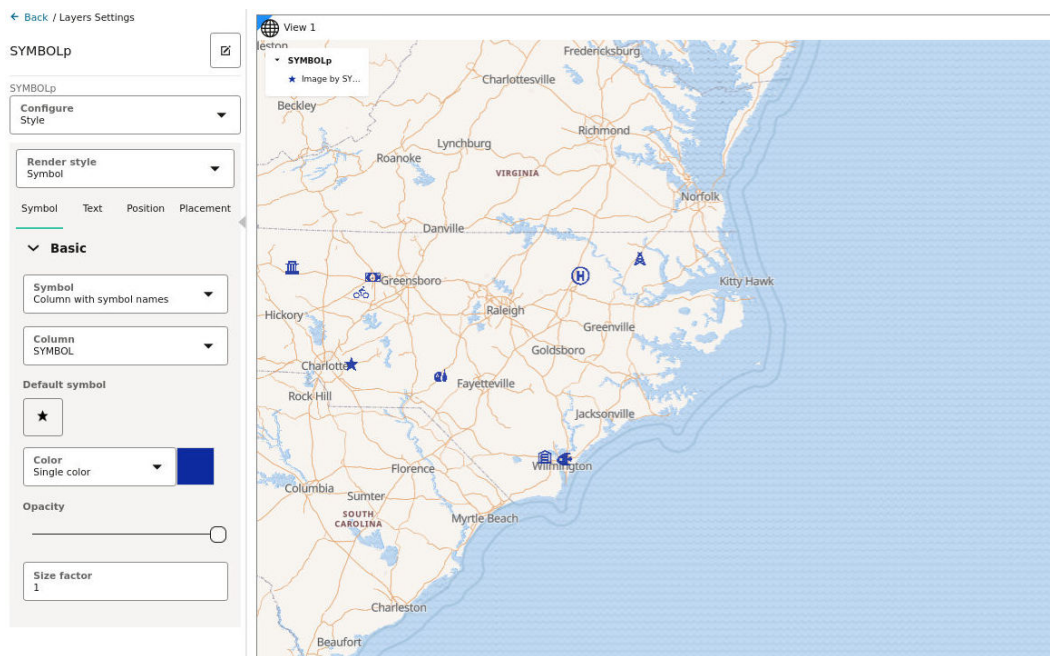
The instructions assume that the map layer displayed on your Active Project page uses a dataset having a column property that contains symbol names following the convention as explained earlier in this section.

1. Click **⋮** against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu.
3. Configure **Style** and select **Symbol** as the **Render Style**.
4. Select **Column with symbol names** from the **Symbol** drop-down list in the **Basic** section of the **Symbol** tab.
5. Select the **Column** that contains the symbol name value.

The following figure shows the styling of the map layer using the symbol name variables in the dataset:

 **Note:**

If incorrect symbol names are present in the dataset column, then for those data points, the **Default symbol** is displayed on the map layer.

Figure 3-42 Custom Symbol Styling in Map Visualization

The symbols gets applied to the map layer.

3.8.4.6 Setting Selection Tolerance on a Map Layer

Spatial Studio allows you to increase or decrease the selection tolerance on a map layer, so that selecting small and linear geometry features is easier.

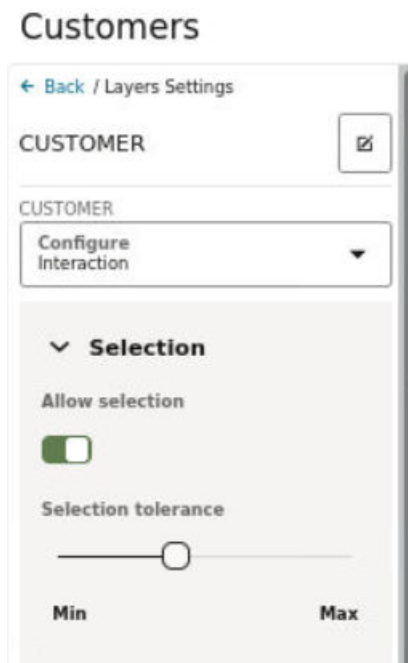
The following steps enable you to adjust and set the selection tolerance on a map.

The instructions assume that a project is open on the Active Project page.

1. Click **☰** against the **dataset** in the **Data** tab of the **Layers** list.
2. Select **Settings** in the context menu and configure **Interaction**.
3. Switch on the **Allow selection** toggle button.
4. Adjust the **Selection tolerance** slider as required.

The following figure shows the **Selection** section for setting the tolerance:

Figure 3-43 Setting the Selection Tolerance



The custom selection tolerance gets applied to the map layer.

3.8.4.7 Adding a Pin on a Map

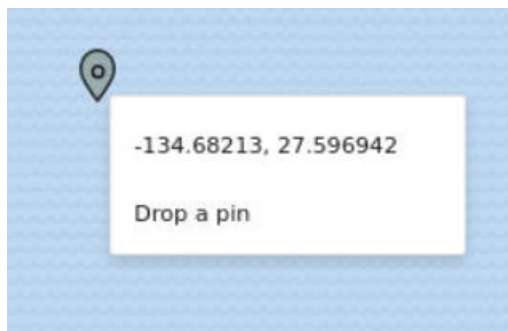
The following steps enable you to inspect the current mouse pointer's latitude and longitude coordinates and pin a location on the map layer.

The instructions assume that you have a project opened on your Active Project page and the map layer is displayed for visualization.

1. Right-click on any area on the map layer.

The coordinates for the location gets displayed as shown:

Figure 3-44 Pin a Location on the Map



2. Click **Drop a pin** to add a location marker.

The pin gets displayed on the map. Additionally, you can also copy the coordinates by clicking on the marker and then clicking the **Longitude, Latitude: click to copy** icon.

3.8.4.8 Applying Map Backgrounds

Spatial Studio provides ready-to-use map backgrounds to enhance your visualization.

You can select one of the following map backgrounds for your project visualization:

- MapTiler Vector Basemaps
- Oracle Raster Basemaps
- Blank Basemaps
- User-defined Basemaps

As an administrator, you can also register custom basemaps and use them in map visualizations. They may be raster or vector tiles that are typically hosted on third party servers, or they be created using a WMS OGC web service. See [Spatial Studio Administration Page](#) for more information on adding basemaps.

The following section describes how to apply a specific map background for your project:

- [Changing Map Backgrounds](#)

3.8.4.8.1 Changing Map Backgrounds

The following steps enable you to apply different map backgrounds in your project visualization.

The instructions assume that you have a project opened on your Active Project page.

1. Click **☰** in the **Background** tab of the **Layers** list.
2. Select **Settings** in the context menu.
3. Click the **Change the Background Map Style** drop-down and select your required background map as shown.

Figure 3-45 Changing a Map Background



All custom basemaps appear under **User-defined Basemaps** in the drop-down list.

The selected map background gets applied to your project visualization.

3.8.5 Visualizing Map Data Over Time

Spatial Studio allows you to perform dynamic map visualizations. In order to visualize map data over time, your dataset must contain a date column or a time column or both. You can then use the time slider feature to interact with the map.

The following steps allow you to configure and use a time slider for your map visualization.

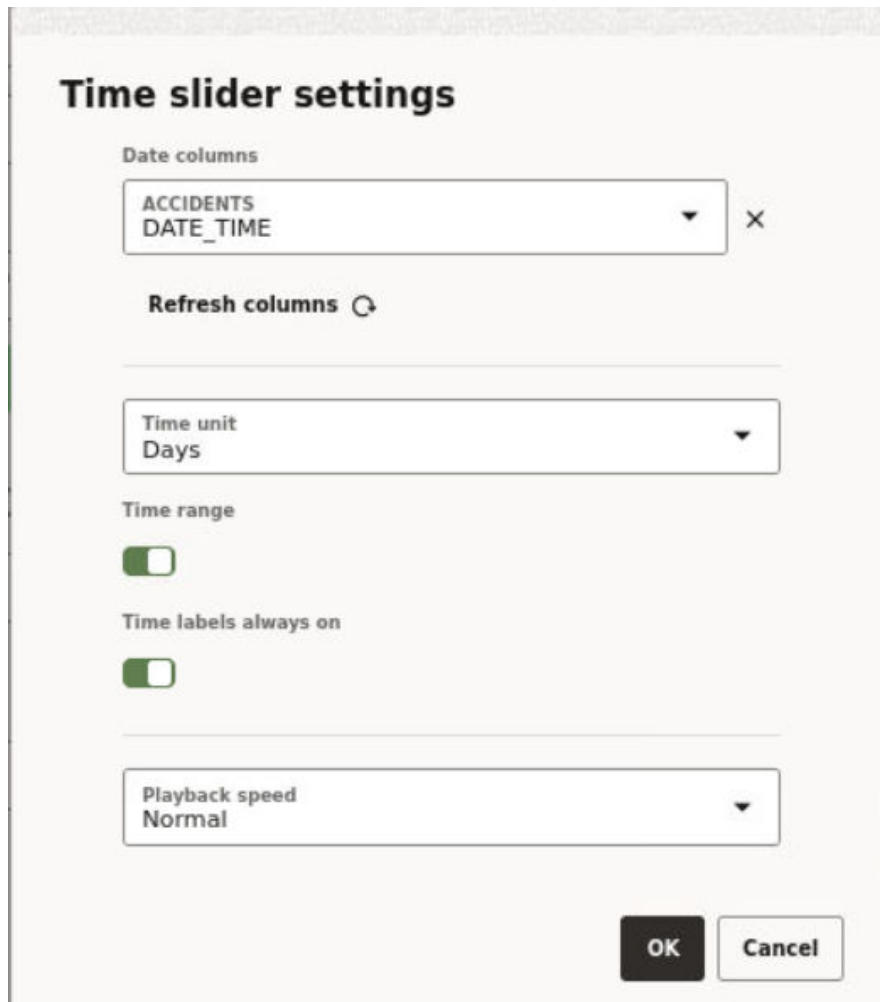
The instructions assume that you have a project linked to a dataset containing date or time data and the project is opened on your Active Project page.

1. Click the **Settings** icon in your map tool bar.
2. Switch on the **Show time slider** toggle button and click **OK**.

A time slider bar appears at the bottom of the map visualization canvas.

3. Click the **Time slider settings** icon on the time slider bar.

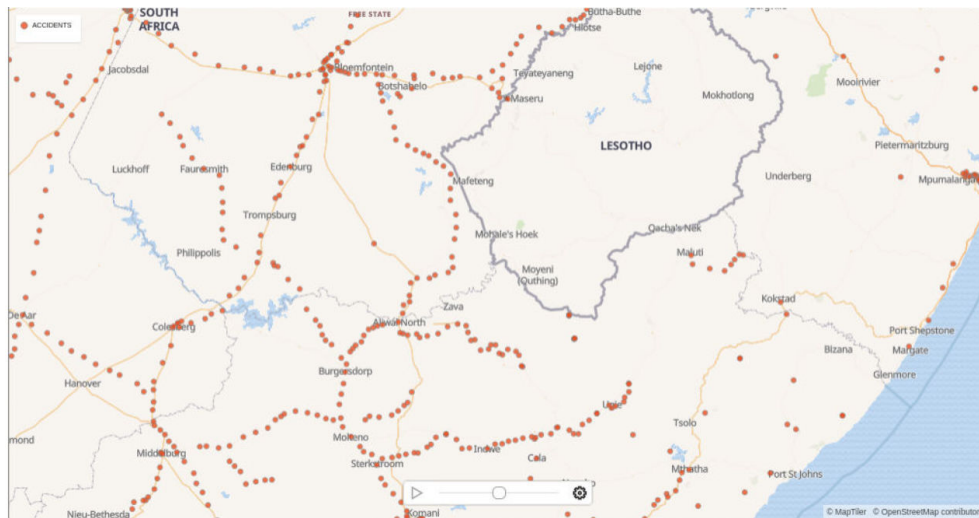
Figure 3-46 Time slider Settings



4. Select the **Date columns** and the **Time unit** to be applied for visualization.
5. Optionally, switch on or off the **Time range** and **Time labels always on** toggle buttons.
6. Optionally, select **Playback speed**.
7. Click **OK**.

You can now interact with your map using the time slider to view the change of your data over time.

Figure 3-47 Using a Time slider in Map Visualization



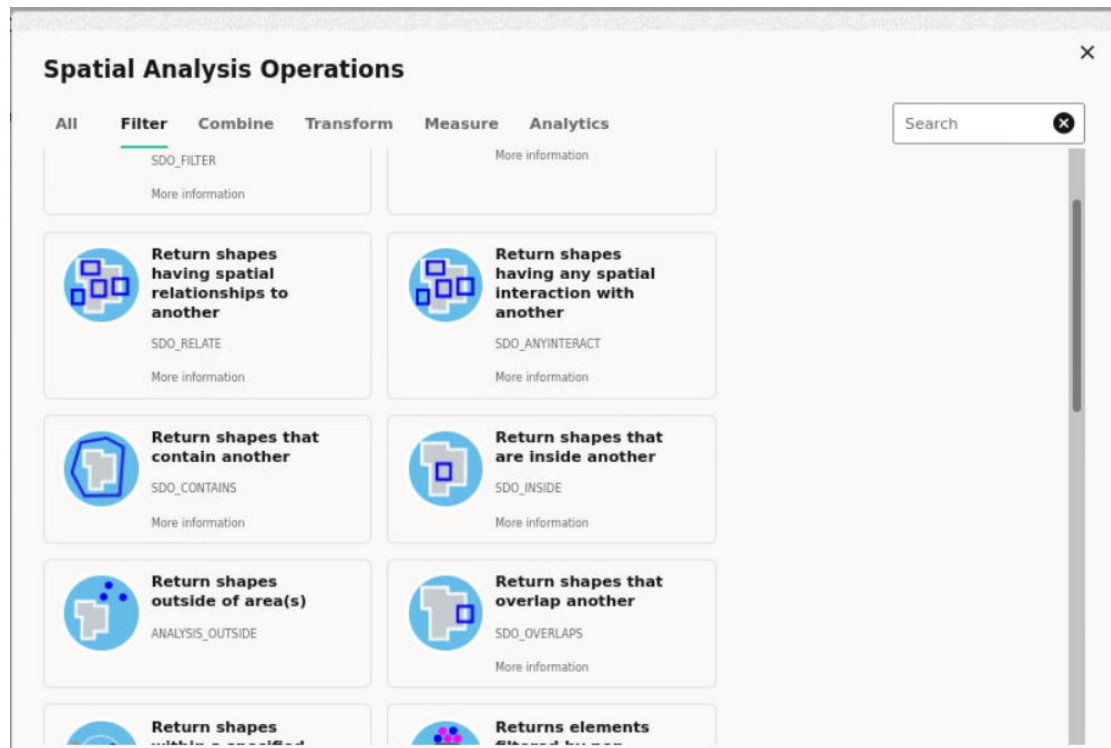
3.9 Performing Analyses in Spatial Studio

You can perform various spatial analyses (such as filtering by proximity, nearest neighbor analysis and so on) and visualize the results in Spatial Studio.

These spatial analyses are grouped under the following categories in Spatial Studio :

- Filter
- Combine
- Transform
- Measure
- Analytics

Figure 3-48 Spatial Analysis Operations



The following topics describe the use of `SDO_WITHIN_DISTANCE` operation as an example.

- [Exploring a Proximity Filter](#)
- [Editing a Spatial Analysis](#)

3.9.1 Exploring a Proximity Filter

Using a spatial filter, you can filter coordinates that are within a specific distance from a point on map layer.

To filter points based on proximity, you must perform the following steps.

The instructions assume that you have the layer to be filtered and the map layer to be used as a filter displayed on your Active Project page.

1. Click **...** against the **dataset** whose coordinates needs to be filtered in the **Data** tab of the **Layers** list.
2. Select **Spatial Analysis**.
The **Spatial Analysis Operations** window as shown in opens.
3. Click on the **Filter** tab and select **Return shapes within a specific distance of another**.
Within distance dialog box opens as shown:

Figure 3-49 Spatial Analysis - Within Distance Configuration

Within distance ✕

Uses the spatial index to identify the set of spatial objects that are within some specified distance of a given object, such as an area of interest or point of interest.

[More information](#)

Analysis name
ACCIDENTS WITHIN DISTANCE

Layer to be filtered
ACCIDENTS.GEOM

Include only selected items in the layer above

Layer to be used as the filter
POLICE_POINTS.GEOM

Include only selected items in the layer above

distance
200

unit
Meter

> Advanced

Run Run in background Cancel

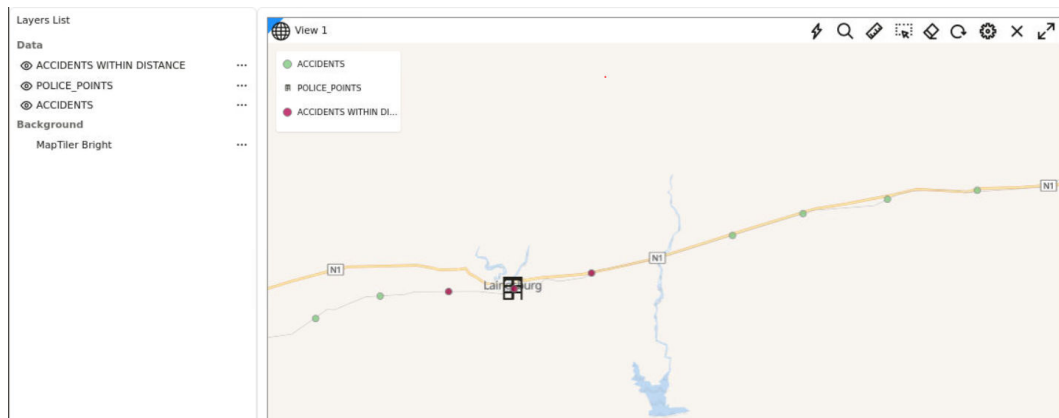
4. Enter **Analysis name**.
5. Select the **Layer to be filtered**.
6. Select the **Layer to be used as the filter**.
7. Enter **distance** and **unit**.
8. Click **Run**.

The Analysis result is listed under **Analyses** in the **Data** elements panel on the left pane of the Active Project page.

9. Drag and drop the analysis result on the map view.

This creates a new map layer highlighting the filtered coordinates within a specific distance from a point as shown:

Figure 3-50 Spatial Analysis - Within Distance Visualization



3.9.2 Editing a Spatial Analysis

You can edit an existing spatial analysis to modify certain essential parameters.

However, only the following list of spatial analysis operations allow their parameters to be modified after creation:

Filter

- SDO_FILTER
- SDO_NN
- SDO_RELATE
- SDO_WITHIN_DISTANCE

Combine

- Spatial Join

Transform

- SDO_BUFFER
- SDO_MBC
- SDO_UTIL.AT_BEARING
- SDO_UTIL.SIMPLIFY
- SDO_SAM.SIMPLIFY_GEOMETRY

Measure

- SDO_GEOM.SDO_AREA
- SDO_GEOM.SDO_DIAMETER
- SDO_GEOM.SDO_LENGTH
- SDO_GEOM.WITHIN_DISTANCE
- SDO_GEOM.SDO_MAXDISTANCE
- SDO_GEOM.SDO_MAX_MBR_ORDINATE
- SDO_GEOM.SDO_MBC_RADIUS

- SDO_GEOM.SDO_MIN_MBR_ORDINATE

Analytics

- Summarize within distance
- Summarize by region

To modify the parameters in a spatial analysis, you must perform the following steps.

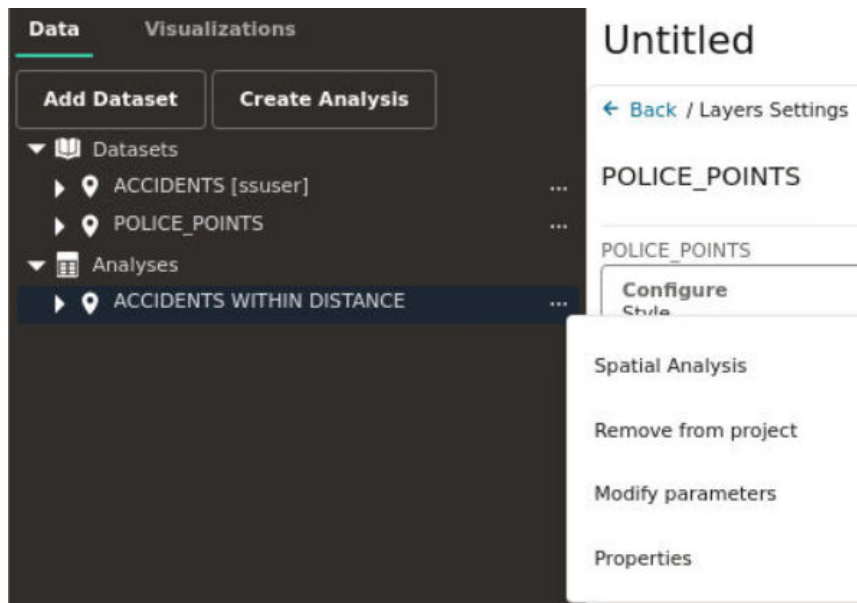
The instructions assume that the analysis to be edited is present in the Active Project page.

1. Click **...** against the analysis to be edited under **Analyses** tab in the **Data** elements pane of the Active Project page.
2. Select **Modify Parameters** as shown:

 **Note:**

Modify Parameters in the context menu will be disabled for spatial analysis operations that cannot be modified.

Figure 3-51 Modify Spatial Analysis Parameters



The dialog box displaying the original definition for the specific spatial analysis opens.

3. Modify the required parameters and click **Run**.

The analysis gets updated and the updates can be visualized in the map view.

4

Spatial Studio Accessibility Information

This topic provides information on the accessibility features for Oracle Spatial Studio.

It includes the following.

- [About Oracle Spatial Studio Accessibility](#)
- [Oracle Spatial Studio Features that Support Accessibility](#)
- [Highly Visual Features of Oracle Spatial Studio](#)

4.1 About Oracle Spatial Studio Accessibility

It is our goal to make Oracle Products, Services, and supporting documentation accessible to the disabled community.

Oracle Spatial Studio is based on the Oracle JET components. For more information about accessibility of Oracle JET components, see the [Oracle JET Documentation](#).

For additional accessibility information for Oracle products, see the Oracle Accessibility Program page at:

<http://www.oracle.com/accessibility/>

4.2 Oracle Spatial Studio Features that Support Accessibility

Oracle Spatial Studio provides features that are designed to support accessibility.

- [Keyboard Access with Spatial Studio](#)
- [Screen Reader Readability with Spatial Studio](#)
- [Flexibility in Font and Color Choices with Spatial Studio](#)
- [No Audio-only Feedback with Spatial Studio](#)
- [No Dependency on Blinking Cursor and Animation with Spatial Studio](#)
- [Screen Magnifier Usability with Spatial Studio](#)

4.2.1 Keyboard Access with Spatial Studio

Oracle Spatial Studio features support keyboard access to the product's functionality; a summary is provided in this section. The following menu and toolbar functionality is provided through keyboard access:

- Users can navigate to and invoke all menu items.
- All toolbar functions are accessible through menu items.
- All menus and menu items have unique and functioning mnemonic keys.
- All context menus within the navigators and source editor can be invoked.

- Frequently used menu items have unique accelerator keys.

4.2.2 Screen Reader Readability with Spatial Studio

Here is a summary of screen readability in Spatial Studio, when it is used with a screen reader.

When used with menus and toolbars:

- All menus and menu items are read.
- All toolbar items are read.
- The hint text on all toolbar items is read.

4.2.3 Flexibility in Font and Color Choices with Spatial Studio

The user interface in Spatial Studio improves usability for people who are visually impaired by offering flexibility in color and font choices. The following font and color features are included:

- Users can specify both the font and the size in which the font displays for code editors.
- All features of the product have black text on a white or gray background.
- Colored text, underlining, or images are never used as the only method of conveying information.

4.2.4 No Audio-only Feedback with Spatial Studio

In Spatial Studio, there is no situation in which the only feedback a user receives is audible feedback. All audible feedback is accompanied by a visual indicator. For example, a prompt accompanies the bell sound that occurs when an error or illegal action has taken place.

4.2.5 No Dependency on Blinking Cursor and Animation with Spatial Studio

Spatial Studio makes minimal use of a blinking cursor and animation:

- No features in Spatial Studio use blinking indicators, with the exception of the cursor in the source editor.
- No features rely on animated sequences.

4.2.6 Screen Magnifier Usability with Spatial Studio

The Spatial Studio user interface works well with screen magnifiers. All features of the product can be magnified by a screen magnifier.

4.3 Highly Visual Features of Oracle Spatial Studio

Spatial Studio includes features that are highly visual, and these features have equivalent functionality that is available to people who are blind or visually impaired,

except for the generated maps, which are only visual. However, results of an analysis can also be generated as JSON and tables, as an alternative format to the visual map.

All of the functionality is available through REST APIs.

In Spatial Studio, it is possible to create, edit, and generate an analysis result using only keystrokes.

A

REST API Endpoints for Oracle Spatial Studio

This appendix contains the OpenAPI 3.0 YAML documentation of the REST API endpoints for the Spatial Studio. You can invoke these endpoints to perform various Spatial Studio operations programmatically or through a command line tool such as curl using access tokens of the Spatial Studio.

OpenAPI 3.0 YAML Document containing the REST API Endpoints

```
openapi: 3.0.0
info:
  title: Oracle Spatial Studio REST API
  description: This file lists supported RESTful API endpoints of the Oracle
  Spatial Studio
  application. It is for advanced user only. All endpoints are subject to
  change without notification in
  future releases. To invoke a REST endpoint, ensure that the
  corresponding path is prepended with the Studio root
  context path and the /oauth part. For instance, to get the system
  status, the full URL of the endpoint should
  look like "https://localhost:4040/spatialstudio/oauth/v1/systemStatus".

  version: "1.0"
paths:
  /v1/systemStatus:
    get:
      operationId: getSystemStatus
      responses:
        default:
          description: default response
          content:
            application/json: {}
  /v1/logs:
    get:
      operationId: getSystemLogs
      parameters:
        - name: entries
          in: query
          schema:
            type: integer
            format: int32
            default: 30
        - name: entrylength
          in: query
          schema:
            type: integer
            format: int32
            default: 600
```

```

- name: cropentries
  in: query
  schema:
    type: boolean
    default: true
- name: filterlevel
  in: query
  schema:
    type: string
    default: INFO
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/softwareVersion:
  get:
    operationId: getVersionAndBuild
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/ping:
  get:
    operationId: ping
  responses:
    default:
      description: default response
      content:
        '*/*': {}
/v1/safe_domains:
  get:
    operationId: getSafeDomains
    parameters:
      - name: reload
        in: query
        schema:
          type: boolean
          default: false
  responses:
    default:
      description: default response
      content:
        application/json: {}
  post:
    operationId: updateSafeDomains
    requestBody:
      content:
        '*/*':
          schema:
            type: string
  responses:
    default:
      description: default response

```

```

        content:
          application/json: {}
/v1/settings/{typeString}:
  get:
    operationId: getSGTechSettings
    parameters:
      - name: typeString
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/connections/validate:
  post:
    operationId: isValidConnection
    requestBody:
      content:
        application/json:
          schema:
            type: object
            additionalProperties:
              type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/settings/update/{typeString}:
  put:
    operationId: updateSGTechSettings
    parameters:
      - name: typeString
        in: path
        required: true
        schema:
          type: string
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/repository/status:
  get:
    operationId: getMetaDataSchemaStatus
    responses:
      default:

```

```
        description: default response
        content:
          application/json: {}
/v1/world_readable/{id}:
get:
  operationId: isWorldReadable
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
put:
  operationId: setWorldReadable
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
delete:
  operationId: removeWorldReadable
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/adhocdatasets:
post:
  operationId: createNewAdHocDataset
  requestBody:
    content:
      application/x-www-form-urlencoded:
        schema:
          type: object
          properties:
            query:
              type: string
            name:
```

```

        type: string
      description:
        type: string
        default: Spatial Analysis dataset.
      operator:
        type: string
      datasourceId:
        type: string
      datasetIds:
        type: string
      keyColumn:
        type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/admin/cache:
  delete:
    operationId: cacheRebuild
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/{id}/columns:
  get:
    operationId: getColumns
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: datasetFields
        in: query
        schema:
          type: string
      - name: columnFields
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/size/{id}:
  get:
    operationId: getDatasetSize
    parameters:
      - name: id
        in: path
        required: true
        schema:

```

```

        type: string
      - name: exactValue
        in: query
        schema:
          type: boolean
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/{id}:
  get:
    operationId: getDataset
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: fields
        in: query
        schema:
          type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  delete:
    operationId: deleteDataSet
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: deleteDataTable
        in: query
        schema:
          type: boolean
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/row/{id}:
  delete:
    operationId: deleteDataSetRow
    parameters:
      - name: id
        in: path

```



```

        required: true
        schema:
          type: string
    - name: row_id
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/datasets:
  get:
    operationId: getDataSets
    parameters:
      - name: fields
        in: query
        schema:
          type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  post:
    operationId: createDataSet
    parameters:
      - name: validateGeoms
        in: query
        schema:
          type: boolean
    requestBody:
      content:
        application/json:
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/rows/{id}:
  get:
    operationId: getDatasetRows
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string

```

```

- name: columns
  in: query
  schema:
    type: string
- name: filter
  in: query
  schema:
    type: string
- name: orderBy
  in: query
  schema:
    type: string
- name: offset
  in: query
  schema:
    type: integer
    format: int64
- name: limit
  in: query
  schema:
    type: integer
    format: int64
- name: totalResults
  in: query
  schema:
    type: boolean
- name: jetResponse
  in: query
  schema:
    type: boolean
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/datasets/create_key_column/{datasetId}:
  post:
    operationId: createKeyColumn
    parameters:
      - name: datasetId
        in: path
        required: true
        schema:
          type: string
      - name: columnName
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/function_based_index/{id}:
  post:

```

```

    operationId: createFunctionBasedIndex
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
    - name: lon
      in: query
      schema:
        type: string
    - name: lat
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
delete:
  operationId: deleteFunctionBasedIndex
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
    - name: lon
      in: query
      schema:
        type: string
    - name: lat
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/datasets/update_statistics/{id}:
  post:
    operationId: updateDataSetStatistics
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}

```

```
/v1/datasets/statistics/{id}:
  get:
    operationId: getDatasetStatistics
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/cachesettings/{id}:
  get:
    operationId: getDatasetCacheSettings
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/refresh/{id}:
  post:
    operationId: getDatasetLastModified
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: lastModified
        in: query
        schema:
          type: integer
          format: int64
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasets/export/{id}:
  get:
    operationId: downloadExportedDataset
    parameters:
      - name: id
        in: path
        required: true
        schema:
```

```

        type: string
    - name: client_token
      in: query
      schema:
        type: string
    - name: format
      in: query
      schema:
        type: string
    - name: file_name
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/zip: {}
  post:
    operationId: exportDatasetAsGeoJson
    parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
    - name: format
      in: query
      schema:
        type: string
    - name: simplify_geoms
      in: query
      schema:
        type: string
    - name: coord_precision
      in: query
      schema:
        type: string
    - name: columns
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/datasets/geom_metadata/{id}:
  post:
    operationId: createGeometryMetadata
    parameters:
    - name: id
      in: path
      required: true
      schema:

```

```

        type: string
      responses:
        default:
          description: default response
          content:
            application/json: {}
/v1/datasets/columns/{id}:
  get:
    operationId: getDatasetColumnsContentInASingleRow
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: columns
        in: query
        schema:
          type: string
      - name: offset
        in: query
        schema:
          type: integer
          format: int64
      - name: limit
        in: query
        schema:
          type: integer
          format: int64
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasources/validate/{id}:
  post:
    operationId: validateDatasource
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasources:
  get:
    operationId: getDatasources
    parameters:
      - name: fields
        in: query
        schema:

```

```

        type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  post:
    operationId: createDataSource
    parameters:
      - name: uploadToken
        in: query
        schema:
          type: string
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/datasources/{id}:
  get:
    operationId: getDatasource
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: fields
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  put:
    operationId: updateDataSource
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    requestBody:
      content:

```

```

    '*/*':
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
  delete:
    operationId: deleteDataSource
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/enrichment/geocode/{id}:
  put:
    operationId: enrichDataSet
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  delete:
    operationId: clearEnrichment
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/geojsons/{uploadToken}/rows:
  get:

```



```

operationId: getGeoJsonRows
parameters:
- name: uploadToken
  in: path
  required: true
  schema:
    type: string
- name: fromrow
  in: query
  schema:
    type: integer
    format: int32
- name: torow
  in: query
  schema:
    type: integer
    format: int32
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/jsonstream/{id}:
get:
  operationId: streamDatasetAsGeoJson
  parameters:
  - name: id
    in: path
    required: true
    schema:
      type: string
  - name: geo
    in: query
    schema:
      type: string
  responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/public/vt/{id}/{geo}/{z}/{x}/{y}.mvt:
get:
  operationId: streamDatasetAsVectorTilePublic
  parameters:
  - name: id
    in: path
    required: true
    schema:
      type: string
  - name: geo
    in: path
    required: true
    schema:
      type: string
  - name: z

```

```

    in: path
    required: true
    schema:
      type: integer
      format: int32
  - name: x
    in: path
    required: true
    schema:
      type: integer
      format: int32
  - name: "y"
    in: path
    required: true
    schema:
      type: integer
      format: int32
responses:
  default:
    description: default response
    content:
      application/vnd.mapbox-vector-tile: {}
/v1/vt/{id}/{geo}/{z}/{x}/{y}.mvt:
get:
  operationId: streamDatasetAsVectorTile
  parameters:
  - name: id
    in: path
    required: true
    schema:
      type: string
  - name: geo
    in: path
    required: true
    schema:
      type: string
  - name: z
    in: path
    required: true
    schema:
      type: integer
      format: int32
  - name: x
    in: path
    required: true
    schema:
      type: integer
      format: int32
  - name: "y"
    in: path
    required: true
    schema:
      type: integer
      format: int32
responses:

```

```

        default:
            description: default response
            content:
                application/vnd.mapbox-vector-tile: {}
/v1/public/jsonstream/{id}:
get:
    operationId: streamDatasetAsGeoJsonPublic
    parameters:
        - name: id
          in: path
          required: true
          schema:
              type: string
        - name: geo
          in: query
          schema:
              type: string
    responses:
        default:
            description: default response
            content:
                application/json: {}
/v1/it/{id}/{z}/{x}/{y}.png:
get:
    operationId: streamDatasetAsImageTile
    parameters:
        - name: id
          in: path
          required: true
          schema:
              type: string
        - name: z
          in: path
          required: true
          schema:
              type: integer
              format: int32
        - name: x
          in: path
          required: true
          schema:
              type: integer
              format: int32
        - name: "y"
          in: path
          required: true
          schema:
              type: integer
              format: int32
    responses:
        default:
            description: default response
            content:
                image/png: {}
/v1/enrichment/geotag:

```

```

get:
  operationId: getGeonameTag
  parameters:
    - name: query
      in: query
      schema:
        type: string
        default: "{}"
    - name: simpleResponse
      in: query
      schema:
        type: boolean
        default: false
    - name: matchThreshold
      in: query
      schema:
        type: number
        format: float
        default: 10
  responses:
    default:
      description: default response
      content:
        application/json:
          schema:
            type: string
post:
  operationId: postGeonameTag
  requestBody:
    content:
      application/x-www-form-urlencoded:
        schema:
          type: object
          properties:
            query:
              type: string
              default: "{}"
            simpleResponse:
              type: boolean
              default: false
            matchThreshold:
              type: number
              format: float
              default: 10
  responses:
    default:
      description: default response
      content:
        application/json:
          schema:
            type: string
/v1/enrichment/geotag/datasets:
get:
  operationId: getGeonameTagDatasets
  parameters:

```

```

- name: query
  in: query
  schema:
    type: string
    default: "{}"
- name: simpleResponse
  in: query
  schema:
    type: boolean
    default: false
- name: matchThreshold
  in: query
  schema:
    type: number
    format: float
    default: 10
responses:
  default:
    description: default response
    content:
      application/json:
        schema:
          type: string
post:
  operationId: postGeonameTagDatasets
  requestBody:
    content:
      application/x-www-form-urlencoded:
        schema:
          type: object
          properties:
            query:
              type: string
              default: "{}"
            simpleResponse:
              type: boolean
              default: false
            matchThreshold:
              type: number
              format: float
              default: 10
  responses:
    default:
      description: default response
      content:
        application/json:
          schema:
            type: string
/v1/mapstyles/{id}:
  delete:
    operationId: deleteMapStyle
    parameters:
      - name: id
        in: path
        required: true

```

```

    schema:
      type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/mapstyles:
  post:
    operationId: createMapStyle
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/public/mapstyles/{id}:
  get:
    operationId: getMapStyle
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/public/cesiummapstyles/{id}:
  get:
    operationId: getCesiumMapStyle
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/public/mapstyles:
  get:
    operationId: getMapStyleList
    parameters:
      - name: fields
        in: query
        schema:

```

```

        type: string
      responses:
        default:
          description: default response
          content:
            application/json: {}
/v1/public/cesiummapstyles:
  get:
    operationId: getCesiumMapStyleList
    parameters:
      - name: fields
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/cesiummapstyles:
  post:
    operationId: createCesiumMapStyle
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/cesiummapstyles/{id}:
  delete:
    operationId: deleteCesiumMapStyle
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/cache/precache/{id}:
  put:
    operationId: updateDatasetOrColumnBodyFields_1
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string

```

```
requestBody:
  content:
    '*/*':
      schema:
        type: string
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/cache/zoomLevels/{x1}/{y1}/{x2}/{y2}:
get:
  operationId: calculateZoomLevelsForBounds
  parameters:
    - name: x1
      in: path
      required: true
      schema:
        type: number
        format: double
    - name: y1
      in: path
      required: true
      schema:
        type: number
        format: double
    - name: x2
      in: path
      required: true
      schema:
        type: number
        format: double
    - name: y2
      in: path
      required: true
      schema:
        type: number
        format: double
    - name: maxTiles
      in: query
      schema:
        type: integer
        format: int32
        default: 25000
    - name: maxZoomLevel
      in: query
      schema:
        type: integer
        format: int32
        default: 14
  responses:
    default:
      description: default response
      content:
        application/json: {}
```



```
/v1/cache/purge/{id}:
  delete:
    operationId: purgeVectorTileCache
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/projects:
  get:
    operationId: getProjects
    parameters:
      - name: fields
        in: query
        schema:
          type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  post:
    operationId: createProject
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/projects/{id}:
  get:
    operationId: getProject
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: fields
        in: query
        schema:
```

```

        type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  put:
    operationId: updateProject
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  delete:
    operationId: deleteProject
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/projects/import/{file_type}:
  post:
    operationId: importProject
    parameters:
      - name: file_type
        in: path
        required: true
        schema:
          type: string
    requestBody:
      content:
        '*/*':
          schema:
            type: string

```

```

responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/projects/export/{id}:
get:
  operationId: downloadExportedProject
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
    - name: client_token
      in: query
      schema:
        type: string
    - name: file_name
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/zip: {}
post:
  operationId: createExportedProject
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/publishedprojects{id}:
delete:
  operationId: deleteProject_1
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/publishedprojects/{id}:

```

```
get:
  operationId: getPublishedProject
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
    - name: fields
      in: query
      schema:
        type: string
    - name: expand
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
put:
  operationId: refreshProject
  parameters:
    - name: id
      in: path
      required: true
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/publishedprojects:
get:
  operationId: getPublishedProjects
  parameters:
    - name: fields
      in: query
      schema:
        type: string
    - name: expand
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
post:
  operationId: createPublishedProject
  requestBody:
    content:
```

```

    '*/*':
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/public/publishedprojects/{id}:
  get:
    operationId: getPublicProject
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
      - name: fields
        in: query
        schema:
          type: string
      - name: expand
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/shapefiles/{uploadToken}/srids:
  get:
    operationId: getShapefileMatchingSRIDs
    parameters:
      - name: uploadToken
        in: path
        required: true
        schema:
          type: string
      - name: maxResults
        in: query
        schema:
          type: integer
          format: int32
          default: 10
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/shapefiles/wktext/search:
  get:
    operationId: queryWKTextMatchingSRIDs
    parameters:
      - name: query

```

```

    in: query
    schema:
      type: string
  - name: maxResults
    in: query
    schema:
      type: integer
      format: int32
      default: 10
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/uploads/shapefiles/wktext/srids:
get:
  operationId: getWKTextMatchingSRIDs
  parameters:
  - name: wkText
    in: query
    schema:
      type: string
  - name: maxResults
    in: query
    schema:
      type: integer
      format: int32
      default: 10
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/uploads/shapefiles/{uploadToken}/rows:
get:
  operationId: getShapefileRows
  parameters:
  - name: uploadToken
    in: path
    required: true
    schema:
      type: string
  - name: fromrow
    in: query
    schema:
      type: integer
      format: int32
  - name: torow
    in: query
    schema:
      type: integer
      format: int32
  responses:
    default:
      description: default response

```

```

        content:
          application/json: {}
/v1/uploads/shapefiles/wktext/rebuild:
  post:
    operationId: rebuildWKTextIndex
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/spreadsheets/{uploadToken}/rows:
  get:
    operationId: getSpreadsheetRows
    parameters:
      - name: uploadToken
        in: path
        required: true
        schema:
          type: string
      - name: fromrow
        in: query
        schema:
          type: integer
          format: int32
      - name: torow
        in: query
        schema:
          type: integer
          format: int32
      - name: includeHeaders
        in: query
        schema:
          type: boolean
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/settings/system/unzipper/{settingName}:
  get:
    operationId: getZipUtilsSetting
    parameters:
      - name: settingName
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
  post:
    operationId: setZipUtilsSetting
    parameters:

```

```

- name: settingName
  in: path
  required: true
  schema:
    type: string
requestBody:
  content:
    '*/*':
      schema:
        type: object
        additionalProperties:
          type: string
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/tables:
  get:
    operationId: getTableNames
    parameters:
      - name: datasource
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/tables/exist:
  get:
    operationId: tableExists
    parameters:
      - name: datasource
        in: query
        schema:
          type: string
      - name: table
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/tables/{table}:
  get:
    operationId: getTableColumnNamesAndTypes
    parameters:
      - name: table
        in: path
        required: true
        schema:

```



```

        type: string
    - name: datasource
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/tables/delete:
  delete:
    operationId: deleteTable
    parameters:
    - name: datasourceId
      in: query
      schema:
        type: string
    - name: tableName
      in: query
      schema:
        type: string
    - name: tableType
      in: query
      schema:
        type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/tables/rows:
  get:
    operationId: getRows
    parameters:
    - name: datasource
      in: query
      schema:
        type: string
    - name: table
      in: query
      schema:
        type: string
    - name: columns
      in: query
      schema:
        type: string
    - name: filter
      in: query
      schema:
        type: string
    - name: orderby
      in: query
      schema:
        type: string

```

```

- name: offset
  in: query
  schema:
    type: integer
    format: int64
- name: limit
  in: query
  schema:
    type: integer
    format: int64
- name: totalResults
  in: query
  schema:
    type: boolean
- name: jetResponse
  in: query
  schema:
    type: boolean
responses:
  default:
    description: default response
    content:
      application/json: {}
/v1/tasks:
  get:
    operationId: getTasks
    parameters:
      - name: status
        in: query
        schema:
          type: string
      - name: maxAge
        in: query
        schema:
          type: integer
          format: int32
      - name: maxTasks
        in: query
        schema:
          type: integer
          format: int32
      - name: includeSystem
        in: query
        schema:
          type: boolean
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/tasks/{taskId}:
  get:
    operationId: getTaskById
    parameters:
      - name: taskId

```

```

    in: path
    required: true
    schema:
      type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
/v1/uploads/{uploadToken}/stats:
  get:
    operationId: getStats
    parameters:
      - name: uploadToken
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/store:
  post:
    operationId: storeUploadedFileInDB
    requestBody:
      content:
        '*/*':
          schema:
            type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/uploads/threedtileset/{uploadToken}/stats:
  get:
    operationId: get3DTilesetStats
    parameters:
      - name: uploadToken
        in: path
        required: true
        schema:
          type: string
      - name: filename
        in: query
        schema:
          type: string
      - name: setTilesetJsonDir
        in: query
        schema:
          type: boolean
    responses:
      default:

```

```

        description: default response
        content:
          application/json: {}
/v1/user/token:
  get:
    operationId: getUserTokens
    parameters:
      - name: fields
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/user/token/{id}:
  delete:
    operationId: deleteAccessToken
    parameters:
      - name: id
        in: path
        required: true
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/views/{view}:
  get:
    operationId: getViewColumnNamesAndTypes
    parameters:
      - name: view
        in: path
        required: true
        schema:
          type: string
      - name: datasource
        in: query
        schema:
          type: string
    responses:
      default:
        description: default response
        content:
          application/json: {}
/v1/views:
  get:
    operationId: getViewNames
    parameters:
      - name: datasource
        in: query
        schema:

```

```
    type: string
  responses:
    default:
      description: default response
      content:
        application/json: {}
```

B

Third-Party License Information for Spatial Studio

Oracle Spatial Studio contains third-party code. Oracle is required to provide the following notices.

Note, however, that the Oracle program license that accompanied this product determines your right to use the Oracle program, including the third-party software, and the terms contained in the following notices do not change those rights.

Lucene

Vendor: The Apache Software Foundation

Version: 8.5.1

```
-----  
-----  
Lucene 8.5.0 License.txt  
-----  
-----
```

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition,

"control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation,

and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

- (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
- (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
- (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
- (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

- 5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
- 6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
- 7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
- 8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise,

unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Some code in core/src/java/org/apache/lucene/util/UnicodeUtil.java was derived from unicode conversion examples available at <http://www.unicode.org/Public/PROGRAMS/CVTUTF>. Here is the copyright from those sources:

```
/*
 * Copyright 2001-2004 Unicode, Inc.
 *
 * Disclaimer
 *
 * This source code is provided as is by Unicode, Inc. No claims are
```

```

* made as to fitness for any particular purpose. No warranties of any
* kind are expressed or implied. The recipient agrees to determine
* applicability of information provided. If this file has been
* purchased on magnetic or optical media from Unicode, Inc., the
* sole remedy for any claim will be exchange of defective media
* within 90 days of receipt.
*
* Limitations on Rights to Redistribute This Code
*
* Unicode, Inc. hereby grants the right to freely use the information
* supplied in this file in the creation of products supporting the
* Unicode Standard, and to make copies of this file in any form
* for internal or external distribution as long as this notice
* remains attached.
*/

```

Some code in `core/src/java/org/apache/lucene/util/ArrayUtil.java` was derived from Python 2.4.2 sources available at <http://www.python.org>. Full license is here:

<http://www.python.org/download/releases/2.4.2/license/>

Some code in `core/src/java/org/apache/lucene/util/UnicodeUtil.java` was derived from Python 3.1.2 sources available at <http://www.python.org>. Full license is here:

<http://www.python.org/download/releases/3.1.2/license/>

Some code in `core/src/java/org/apache/lucene/util/automaton` was derived from Brics automaton sources available at www.brics.dk/automaton/. Here is the copyright from those sources:

```

/*
 * Copyright (c) 2001-2009 Anders Moeller
 * All rights reserved.
 *
 * Redistribution and use in source and binary forms, with or without
 * modification, are permitted provided that the following conditions
 * are met:
 * 1. Redistributions of source code must retain the above copyright
 *    notice, this list of conditions and the following disclaimer.
 * 2. Redistributions in binary form must reproduce the above copyright
 *    notice, this list of conditions and the following disclaimer in the
 *    documentation and/or other materials provided with the distribution.
 * 3. The name of the author may not be used to endorse or promote products
 *    derived from this software without specific prior written permission.
 *
 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

The levenshtein automata tables in `core/src/java/org/apache/lucene/util/automaton`

were automatically generated with the moman/finenight FSA package.
Here is the copyright for those sources:

```
# Copyright (c) 2010, Jean-Philippe Barrette-LaPierre,
#
# Permission is hereby granted, free of charge, to any person
# obtaining a copy of this software and associated documentation
# files (the "Software"), to deal in the Software without
# restriction, including without limitation the rights to use,
# copy, modify, merge, publish, distribute, sublicense, and/or sell
# copies of the Software, and to permit persons to whom the
# Software is furnished to do so, subject to the following
# conditions:
#
# The above copyright notice and this permission notice shall be
# included in all copies or substantial portions of the Software.
#
# THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND,
# EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES
# OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
# NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT
# HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY,
# WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING
# FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR
# OTHER DEALINGS IN THE SOFTWARE.
```

Some code in core/src/java/org/apache/lucene/util/UnicodeUtil.java was
derived from ICU (<http://www.icu-project.org>)

The full license is available here:

<http://source.icu-project.org/repos/icu/icu/trunk/license.html>

```
/*
 * Copyright (C) 1999-2010, International Business Machines
 * Corporation and others. All Rights Reserved.
 *
 * Permission is hereby granted, free of charge, to any person obtaining a copy
 * of this software and associated documentation files (the "Software"), to deal
 * in the Software without restriction, including without limitation the rights
 * to use, copy, modify, merge, publish, distribute, and/or sell copies of the
 * Software, and to permit persons to whom the Software is furnished to do so,
 * provided that the above copyright notice(s) and this permission notice appear
 * in all copies of the Software and that both the above copyright notice(s) and
 * this permission notice appear in supporting documentation.
 *
 * THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR
 * IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,
 * FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS.
 * IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE
 * LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR
 * ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER
 * IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT
 * OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.
 *
 * Except as contained in this notice, the name of a copyright holder shall not
 * be used in advertising or otherwise to promote the sale, use or other
 * dealings in this Software without prior written authorization of the
 * copyright holder.
 */
```

The following license applies to the Snowball stemmers:

Copyright (c) 2001, Dr Martin Porter
Copyright (c) 2002, Richard Boulton
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of the copyright holders nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The following license applies to the KStemmer:

Copyright © 2003,
Center for Intelligent Information Retrieval,
University of Massachusetts, Amherst.
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The names "Center for Intelligent Information Retrieval" and "University of Massachusetts" must not be used to endorse or promote products derived from this software without prior written permission. To obtain permission, contact info@ciir.cs.umass.edu.

THIS SOFTWARE IS PROVIDED BY UNIVERSITY OF MASSACHUSETTS AND OTHER CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The following license applies to the Morfologik project:

Copyright (c) 2006 Dawid Weiss
Copyright (c) 2007-2011 Dawid Weiss, Marcin Miłkowski
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Morfologik nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The dictionary comes from Morfologik project. Morfologik uses data from Polish ispell/myspell dictionary hosted at <http://www.sjp.pl/slownik/en/> and is licenced on the terms of (inter alia) LGPL and Creative Commons ShareAlike. The part-of-speech tags were added in Morfologik project and are not found in the data from sjp.pl. The tagset is similar to IPI PAN tagset.

The following license applies to the Morfeusz project, used by org.apache.lucene.analysis.morfologik.

BSD-licensed dictionary of Polish (SGJP)
<http://sgjp.pl/morfeusz/>

Copyright © 2011 Zygmunt Saloni, Włodzimierz Gruszczyński,
Marcin Woliński, Robert Wołosz

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright

notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY COPYRIGHT HOLDERS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-----
Lucene 8.4.0 Notice.txt
-----
-----
```

Apache Lucene
Copyright 2001-2019 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

Includes software from other Apache Software Foundation projects,
including, but not limited to:

- Apache Ant
- Apache Jakarta Regexp
- Apache Commons
- Apache Xerces

ICU4J, (under analysis/icu) is licensed under an MIT styles license
and Copyright (c) 1995-2008 International Business Machines Corporation and others

Some data files (under analysis/icu/src/data) are derived from Unicode data such
as the Unicode Character Database. See <http://unicode.org/copyright.html> for more
details.

Brics Automaton (under core/src/java/org/apache/lucene/util/automaton) is
BSD-licensed, created by Anders Møller. See <http://www.brics.dk/automaton/>

The levenshtein automata tables (under core/src/java/org/apache/lucene/util/automaton)
were
automatically generated with the moman/finenight FSA library, created by
Jean-Philippe Barrette-LaPierre. This library is available under an MIT license,
see <http://sites.google.com/site/rrettesite/moman> and
<http://bitbucket.org/jpbarrette/moman/overview/>

The class org.apache.lucene.util.WeakIdentityMap was derived from
the Apache CXF project and is Apache License 2.0.

The Google Code Prettify is Apache License 2.0.
See <http://code.google.com/p/google-code-prettify/>

JUnit (junit-4.10) is licensed under the Common Public License v. 1.0
See <http://junit.sourceforge.net/cpl-v10.html>

This product includes code (JaspellTernarySearchTrie) from Java Spelling Checking Package (jaspell): <http://jaspell.sourceforge.net/>
License: The BSD License (<http://www.opensource.org/licenses/bsd-license.php>)

The snowball stemmers in
analysis/common/src/java/net/sf/snowball
were developed by Martin Porter and Richard Boulton.
The snowball stopword lists in
analysis/common/src/resources/org/apache/lucene/analysis/snowball
were developed by Martin Porter and Richard Boulton.
The full snowball package is available from
<http://snowball.tartarus.org/>

The KStem stemmer in
analysis/common/src/org/apache/lucene/analysis/en
was developed by Bob Krovetz and Sergio Guzman-Lara (CIIR-UMass Amherst)
under the BSD-license.

The Arabic, Persian, Romanian, Bulgarian, Hindi and Bengali analyzers (common) come with a default
stopword list that is BSD-licensed created by Jacques Savoy. These files reside in:

analysis/common/src/resources/org/apache/lucene/analysis/ar/stopwords.txt,
analysis/common/src/resources/org/apache/lucene/analysis/fa/stopwords.txt,
analysis/common/src/resources/org/apache/lucene/analysis/ro/stopwords.txt,
analysis/common/src/resources/org/apache/lucene/analysis/bg/stopwords.txt,
analysis/common/src/resources/org/apache/lucene/analysis/hi/stopwords.txt,
analysis/common/src/resources/org/apache/lucene/analysis/bn/stopwords.txt
See <http://members.unine.ch/jacques.savoy/clef/index.html>.

The German, Spanish, Finnish, French, Hungarian, Italian, Portuguese, Russian and Swedish light stemmers
(common) are based on BSD-licensed reference implementations created by Jacques Savoy and
Ljiljana Dolamic. These files reside in:
analysis/common/src/java/org/apache/lucene/analysis/de/GermanLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/de/GermanMinimalStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/es/SpanishLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/fi/FinnishLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/fr/FrenchLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/fr/FrenchMinimalStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/hu/HungarianLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/it/ItalianLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/pt/
PortugueseLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/ru/RussianLightStemmer.java
analysis/common/src/java/org/apache/lucene/analysis/sv/SwedishLightStemmer.java

The Stempel analyzer (stempel) includes BSD-licensed software developed by the Egothor project <http://egothor.sf.net/>, created by Leo Galambos, Martin Kvapil, and Edmond Nolan.

The Polish analyzer (stempel) comes with a default
stopword list that is BSD-licensed created by the Carrot2 project. The file resides
in stempel/src/resources/org/apache/lucene/analysis/pl/stopwords.txt.
See <http://project.carrot2.org/license.html>.

The SmartChineseAnalyzer source code (smartcn) was provided by Xiaoping Gao and copyright 2009 by www.imdict.net.

WordBreakTestUnicode_*.java (under modules/analysis/common/src/test/) is derived from Unicode data such as the Unicode Character Database. See <http://unicode.org/copyright.html> for more details.

The Morfologik analyzer (morfologik) includes BSD-licensed software developed by Dawid Weiss and Marcin Miłkowski (<http://morfologik.blogspot.com/>).

Morfologik uses data from Polish ispell/myspell dictionary (<http://www.sjp.pl/slownik/en/>) licenced on the terms of (inter alia) LGPL and Creative Commons ShareAlike.

Morfologic includes data from BSD-licensed dictionary of Polish (SGJP) (<http://sgjp.pl/morfeusz/>)

Servlet-api.jar and javax.servlet-*.jar are under the CDDL license, the original source code for this can be found at <http://www.eclipse.org/jetty/downloads.php>

=====
 Kuromoji Japanese Morphological Analyzer - Apache Lucene Integration
 =====

This software includes a binary and/or source version of data from

mecab-ipadic-2.7.0-20070801

which can be obtained from

<http://atilika.com/releases/mecab-ipadic/mecab-ipadic-2.7.0-20070801.tar.gz>

or

<http://jaist.dl.sourceforge.net/project/mecab/mecab-ipadic/2.7.0-20070801/mecab-ipadic-2.7.0-20070801.tar.gz>

=====
 mecab-ipadic-2.7.0-20070801 Notice
 =====

Nara Institute of Science and Technology (NAIST), the copyright holders, disclaims all warranties with regard to this software, including all implied warranties of merchantability and fitness, in no event shall NAIST be liable for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits, whether in an action of contract, negligence or other tortuous action, arising out of or in connection with the use or performance of this software.

A large portion of the dictionary entries originate from ICOT Free Software. The following conditions for ICOT Free Software applies to the current dictionary as well.

Each User may also freely distribute the Program, whether in its original form or modified, to any third party or parties, PROVIDED that the provisions of Section 3 ("NO WARRANTY") will ALWAYS appear on, or be attached to, the Program, which is distributed substantially in the same form as set out herein and that such intended distribution, if actually made, will neither violate or otherwise contravene any of the laws and regulations of the countries having jurisdiction over the User or the intended distribution itself.

NO WARRANTY

The program was produced on an experimental basis in the course of the research and development conducted during the project and is provided to users as so produced on an experimental basis. Accordingly, the program is provided without any warranty whatsoever, whether express, implied, statutory or otherwise. The term "warranty" used herein includes, but is not limited to, any warranty of the quality, performance, merchantability and fitness for a particular purpose of the program and the nonexistence of any infringement or violation of any right of any third party.

Each user of the program will agree and understand, and be deemed to have agreed and understood, that there is no warranty whatsoever for the program and, accordingly, the entire risk arising from or otherwise connected with the program is assumed by the user.

Therefore, neither ICOT, the copyright holder, or any other organization that participated in or was otherwise related to the development of the program and their respective officials, directors, officers and other employees shall be held liable for any and all damages, including, without limitation, general, special, incidental and consequential damages, arising out of or otherwise in connection with the use or inability to use the program or any product, material or result produced or otherwise obtained by using the program, regardless of whether they have been advised of, or otherwise had knowledge of, the possibility of such damages at any time during the project or thereafter. Each user will be deemed to have agreed to the foregoing by his or her commencement of use of the program. The term "use" as used herein includes, but is not limited to, the use, modification, copying and distribution of the program and the production of secondary products from the program.

In the case where the program, whether in its original form or modified, was distributed or delivered to or received by a user from any person, organization or entity other than ICOT, unless it makes or grants independently of ICOT any specific warranty to the user in writing, such person, organization or entity, will also be exempted from and not be held liable to the user for any such damages as noted above as far as the program is concerned.

```
=====
Nori Korean Morphological Analyzer - Apache Lucene Integration
=====
```

This software includes a binary and/or source version of data from

mecab-ko-dic-2.0.3-20170922

which can be obtained from

<https://bitbucket.org/eunjeon/mecab-ko-dic/downloads/mecab-ko-dic-2.0.3-20170922.tar.gz>

```
-----
-----
antlr4-runtime-LICENSE-BSD.txt
-----
-----
```

[The "BSD license"]
Copyright (c) 2015 Terence Parr, Sam Harwell

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-----
asm-commons-LICENSE-BSD_LIKE.txt
-----
-----
```

Copyright (c) 2012 France Télécom
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holders nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-----
asm-LICENSE-BSD_LIKE.txt
```


 Copyright (c) 2012 France Télécom
 All rights reserved.

Redistribution and use in source and binary forms, with or without
 modification, are permitted provided that the following conditions
 are met:

1. Redistributions of source code must retain the above copyright
 notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright
 notice, this list of conditions and the following disclaimer in the
 documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holders nor the names of its
 contributors may be used to endorse or promote products derived from
 this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS"
 AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
 IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
 ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE
 LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
 CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF
 SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS
 INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN
 CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
 ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF
 THE POSSIBILITY OF SUCH DAMAGE.

 commons-codec-NOTICE.txt

Apache Commons Codec
 Copyright 2002-2011 The Apache Software Foundation

This product includes software developed by
 The Apache Software Foundation (<http://www.apache.org/>).

 src/test/org/apache/commons/codec/language/DoubleMetaphoneTest.java contains
 test data from <http://aspell.sourceforge.net/test/batch0.tab>.

Copyright (C) 2002 Kevin Atkinson (kevina@gnu.org). Verbatim copying
 and distribution of this entire article is permitted in any medium,
 provided this notice is preserved.

 commons-compress-NOTICE.txt

Apache Commons Compress
 Copyright 2002-2011 The Apache Software Foundation

This product includes software developed by
 The Apache Software Foundation (<http://www.apache.org/>).

commons-logging-NOTICE.txt

Apache Commons Logging
Copyright 2003-2013 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

hppc-NOTICE.txt

httpclient-NOTICE.txt

Apache HttpComponents Client
Copyright 1999-2011 The Apache Software Foundation

This product includes software developed by
The Apache Software Foundation (<http://www.apache.org/>).

This project contains annotations derived from JCIP-ANNOTATIONS
Copyright (c) 2005 Brian Goetz and Tim Peierls. See <http://www.jcip.net>

httpcore-NOTICE.txt

Apache HttpComponents Client
Copyright 1999-2011 The Apache Software Foundation

This product includes software developed by
The Apache Software Foundation (<http://www.apache.org/>).

This project contains annotations derived from JCIP-ANNOTATIONS
Copyright (c) 2005 Brian Goetz and Tim Peierls. See <http://www.jcip.net>

icu4j-LICENSE-BSD_LIKE.txt

ICU License - ICU 1.8.1 and later

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1995-2012 International Business Machines Corporation and others

All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

All trademarks and registered trademarks mentioned herein are the property of their respective owners.

icu4j-NOTICE.txt

ICU4J, (under lucene/analysis/icu) is licensed under an MIT style license (modules/analysis/icu/lib/icu4j-LICENSE-BSD_LIKE.txt) and Copyright (c) 1995-2012 International Business Machines Corporation and others

jetty-NOTICE.txt

Eclipse Foundation Software User Agreement March 17, 2005
Usage Of Content
THE ECLIPSE FOUNDATION MAKES AVAILABLE SOFTWARE, DOCUMENTATION, INFORMATION AND/OR OTHER MATERIALS FOR OPEN SOURCE PROJECTS
(COLLECTIVELY "CONTENT"). USE OF THE CONTENT IS GOVERNED BY THE TERMS AND CONDITIONS OF THIS AGREEMENT AND/OR THE TERMS AND CONDITIONS OF LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW.
BY USING THE CONTENT, YOU AGREE THAT YOUR USE OF THE CONTENT IS GOVERNED BY THIS AGREEMENT AND/OR THE TERMS AND CONDITIONS OF ANY APPLICABLE LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT AND THE TERMS AND CONDITIONS OF ANY APPLICABLE LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW, THEN YOU MAY NOT USE THE CONTENT.
Applicable Licenses
Unless otherwise indicated, all Content made available by the

Eclipse Foundation is provided to you under the terms and conditions of the Eclipse Public License Version 1.0 ("EPL"). A copy of the EPL is provided with this Content and is also available at <http://www.eclipse.org/legal/epl-v10.html>.

For purposes of the EPL, "Program" will mean the Content. Content includes, but is not limited to, source code, object code, documentation and other files maintained in the Eclipse.org CVS repository ("Repository") in CVS modules ("Modules") and made available as downloadable archives ("Downloads"). Content may be structured and packaged into modules to facilitate delivering, extending, and upgrading the Content. Typical modules may include plug-ins ("Plug-ins"), plug-in fragments ("Fragments"), and features ("Features"). Each Plug-in or Fragment may be packaged as a sub-directory or JAR (Java™ ARchive) in a directory named "plugins". A Feature is a bundle of one or more Plug-ins and/or Fragments and associated material. Each Feature may be packaged as a sub-directory in a directory named "features". Within a Feature, files named "feature.xml" may contain a list of the names and version numbers of the Plug-ins and/or Fragments associated with that Feature. Features may also include other Features ("Included Features"). Within a Feature, files named "feature.xml" may contain a list of the names and version numbers of Included Features. The terms and conditions governing Plug-ins and Fragments should be contained in files named "about.html" ("Abouts"). The terms and conditions governing Features and Included Features should be contained in files named "license.html" ("Feature Licenses"). Abouts and Feature Licenses may be located in any directory of a Download or Module including, but not limited to the following locations: The top-level (root) directory Plug-in and Fragment directories Inside Plug-ins and Fragments packaged as JARs Sub-directories of the directory named "src" of certain Plug-ins Feature directories Note: if a Feature made available by the Eclipse Foundation is installed using the Eclipse Update Manager, you must agree to a license ("Feature Update License") during the installation process. If the Feature contains Included Features, the Feature Update License should either provide you with the terms and conditions governing the Included Features or inform you where you can locate them. Feature Update Licenses may be found in the "license" property of files named "feature.properties" found within a Feature. Such Abouts, Feature Licenses, and Feature Update Licenses contain the terms and conditions (or references to such terms and conditions) that govern your use of the associated Content in that directory. THE ABOUTS, FEATURE LICENSES, AND FEATURE UPDATE LICENSES MAY REFER TO THE EPL OR OTHER LICENSE AGREEMENTS, NOTICES OR TERMS AND CONDITIONS. SOME OF THESE OTHER LICENSE AGREEMENTS MAY INCLUDE (BUT ARE NOT LIMITED TO): Common Public License Version 1.0 (available at <http://www.eclipse.org/legal/cpl-v10.html>) Apache Software License 1.1 (available at <http://www.apache.org/licenses/LICENSE>) Apache Software License 2.0 (available at <http://www.apache.org/licenses/LICENSE-2.0>) IBM Public License 1.0 (available at <http://oss.software.ibm.com/developerworks/opensource/license10.html>) Metro Link Public License 1.00 (available at <http://www.opengroup.org/openmotif/supporters/metrolink/license.html>) Mozilla Public License Version 1.1 (available at <http://www.mozilla.org/MPL/MPL-1.1.html>) IT IS YOUR OBLIGATION TO READ AND ACCEPT ALL SUCH TERMS AND CONDITIONS PRIOR TO USE OF THE CONTENT. If no About, Feature License, or Feature Update License is provided, please contact the Eclipse Foundation to determine what terms and conditions govern that particular Content. Cryptography Content may contain encryption software. The country in which you are currently may have restrictions on the import, possession, and use,

and/or re-export to another country, of encryption software. BEFORE using any encryption software, please check the country's laws, regulations and policies concerning the import, possession, or use, and re-export of encryption software, to see if this is permitted. Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

```
-----
-----
jts-core-LICENSE-BSD_LIKE.txt
-----
-----
```

Eclipse Distribution License - v 1.0

Copyright (c) 2007, Eclipse Foundation, Inc. and its licensors.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

Neither the name of the Eclipse Foundation, Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-----
jts-core-NOTICE.txt
-----
-----
```

JTS Topology Suite Licensing

May 30th, 2017

Project Licenses

The Eclipse Foundation makes available all content in this project ("Content"). Unless otherwise indicated below, the Content is provided to you under the terms and conditions of either the [Eclipse Public License 1.0] (<https://www.eclipse.org/legal/epl-v10.html>) ("EPL") or the [Eclipse Distribution License 1.0] (<http://www.eclipse.org/org/documents/edl-v10.php>) (a BSD Style License). For purposes of the EPL, "Program" will mean the Content.

If you did not receive this Content directly from the Eclipse Foundation, the Content is being redistributed by another party ("Redistributor") and different terms and conditions may apply to your use of any object code in the Content. Check the Redistributor's license that was provided with the Content. If no such license exists, contact the Redistributor. Unless otherwise indicated below, the terms and conditions of the EPL still apply to any source code in the Content and such source code may be obtained at <http://www.eclipse.org>.

Third Party Content

The Content includes items that have been sourced from third parties as set out below. If you did not receive this Content directly from the Eclipse Foundation, the following is provided for informational purposes only, and you should look to the Redistributor's license for terms and conditions of use.

Jdom-contrib version 1.1.3

The JTS tests module contains source from JDOM Contrib 1.1.3 which is available under the Jdom License [1]. The two files are `LineNumberElement.java` and `LineNumberSAXHandler.java`.

Typical users of this library will not need to depend on this module.

[1] <https://github.com/hunterhacker/jdom/blob/master/LICENSE.txt>

GeoTools

JTS includes some code from the GeoTools project. This code has been licensed to the JTS project under the OSGeo BSD License [2] by the GeoTools PSC [3,4].

[2] <https://www.osgeo.org/sites/osgeo.org/files/Page/osgeo-bsd-license.txt>

[3] <https://github.com/geotools/geotools/wiki/JTS-ORA-Contribution>

[4] <https://github.com/geotools/geotools/wiki/JTS-Shapefile-Contribution>

 morfologik-fsa-LICENSE-BSD.txt

Copyright (c) 2006 Dawid Weiss
 Copyright (c) 2007-2016 Dawid Weiss, Marcin Miłkowski
 All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Morfologik nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED

WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR
ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
(INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON
ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
(INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

morfologik-fsa-NOTICE.txt

This product includes BSD-licensed software developed by Dawid Weiss and Marcin
Milkowski
(<http://morfologik.blogspot.com/>).

morfologik-polish-LICENSE-BSD.txt

BSD-licensed dictionary of Polish (Morfologik)

VERSION: 2.1 PoliMorf
BUILD: 2016-02-13 19:37:50+01:00
GIT: 6e63b53

Copyright (c) 2016, Marcin Milkowski
All rights reserved.

Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this
list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice,
this list of conditions and the following disclaimer in the documentation
and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND
ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED
WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR
ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
(INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND
ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
(INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

morfologik-polish-NOTICE.txt

This product includes data from BSD-licensed dictionary of Polish (Morfologik,
PoliMorf)

(<http://morfologik.blogspot.com/>)

```
-----
-----
morfologik-stemming-LICENSE-BSD.txt
-----
-----
```

Copyright (c) 2006 Dawid Weiss
 Copyright (c) 2007-2016 Dawid Weiss, Marcin Miłkowski
 All rights reserved.

Redistribution and use in source and binary forms, with or without modification,
 are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice,
 this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice,
 this list of conditions and the following disclaimer in the documentation
 and/or other materials provided with the distribution.
- * Neither the name of Morfologik nor the names of its contributors
 may be used to endorse or promote products derived from this software
 without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND
 ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED
 WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
 DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR
 ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES
 (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
 LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON
 ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
 (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
 SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
-----
morfologik-stemming-NOTICE.txt
-----
-----
```

This product includes BSD-licensed software developed by Dawid Weiss and Marcin
 Miłkowski
 (<http://morfologik.blogspot.com/>).

```
-----
-----
morfologik-ukrainian-search-NOTICE.txt
-----
-----
```

morfologik-ukrainian-search is a POS tag dictionary in morfologik format adjusted for
 searching.
 It's part of dict_uk project (https://github.com/brown-uk/dict_uk)

Note: to better fit into full-text search model this dictionary has all word forms in
 lower case but keeps lemmas for proper nouns in upper case.

Licensed under Apache License 2.0.

opennlp-tools-NOTICE.txt

Apache OpenNLP Tools
Copyright 2015 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

s2-geometry-library-java-NOTICE.txt

slf4j-LICENSE-MIT.txt

Copyright (c) 2004-2008 QOS.ch
All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

slf4j-NOTICE.txt

=====
== SLF4J Notice -- <http://www.slf4j.org/license.html> ==
=====

Copyright (c) 2004-2008 QOS.ch
All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining

a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

```

-----
-----
spatial4j-NOTICE.txt
-----
-----
# about.md file

## About This Content

May 22, 2015

### License

The Eclipse Foundation makes available all content in this plug-in ("Content"). Unless otherwise indicated below, the Content is provided to you under the terms and conditions of the Apache License, Version 2.0. A copy of the Apache License, Version 2.0 is available at [http://www.apache.org/licenses/LICENSE-2.0.txt] (http://www.apache.org/licenses/LICENSE-2.0.txt)

If you did not receive this Content directly from the Eclipse Foundation, the Content is being redistributed by another party ("Redistributor") and different terms and conditions may apply to your use of any object code in the Content. Check the Redistributor's license that was provided with the Content. If no such license exists, contact the Redistributor. Unless otherwise indicated below, the terms and conditions of the Apache License, Version 2.0 still apply to any source code in the Content and such source code may be obtained at [http://www.eclipse.org] (http://www.eclipse.org).

# notice.md file

Note: the below Eclipse user agreement is standard. It says "Unless otherwise indicated, "... before referring to the EPL. We indicate above that all content is licensed under the ASLv2 license. -- David Smiley

## Eclipse Foundation Software User Agreement

April 9, 2014

```

Usage Of Content

THE ECLIPSE FOUNDATION MAKES AVAILABLE SOFTWARE, DOCUMENTATION, INFORMATION AND/OR OTHER MATERIALS FOR OPEN SOURCE PROJECTS (COLLECTIVELY "CONTENT"). USE OF THE CONTENT IS GOVERNED BY THE TERMS AND CONDITIONS OF THIS AGREEMENT AND/OR THE TERMS AND CONDITIONS OF LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW. BY USING THE CONTENT, YOU AGREE THAT YOUR USE OF THE CONTENT IS GOVERNED BY THIS AGREEMENT AND/OR THE TERMS AND CONDITIONS OF ANY APPLICABLE LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT AND THE TERMS AND CONDITIONS OF ANY APPLICABLE LICENSE AGREEMENTS OR NOTICES INDICATED OR REFERENCED BELOW, THEN YOU MAY NOT USE THE CONTENT.

Applicable Licenses

Unless otherwise indicated, all Content made available by the Eclipse Foundation is provided to you under the terms and conditions of the Eclipse Public License Version 1.0 ("EPL"). A copy of the EPL is provided with this Content and is also available at <http://www.eclipse.org/legal/epl-v10.html>. For purposes of the EPL, "Program" will mean the Content.

Content includes, but is not limited to, source code, object code, documentation and other files maintained in the Eclipse Foundation source code repository ("Repository") in software modules ("Modules") and made available as downloadable archives ("Downloads").

- * Content may be structured and packaged into modules to facilitate delivering, extending, and upgrading the Content.
Typical modules may include plug-ins ("Plug-ins"), plug-in fragments ("Fragments"), and features ("Features").
- * Each Plug-in or Fragment may be packaged as a sub-directory or JAR (Java™ ARchive) in a directory named "plugins".
- * A Feature is a bundle of one or more Plug-ins and/or Fragments and associated material. Each Feature may be packaged as a sub-directory in a directory named "features". Within a Feature, files named "feature.xml" may contain a list of the names and version numbers of the Plug-ins and/or Fragments associated with that Feature.
- * Features may also include other Features ("Included Features"). Within a Feature, files named "feature.xml" may contain a list of the names and version numbers of Included Features.

The terms and conditions governing Plug-ins and Fragments should be contained in files named "about.html" ("Abouts").

The terms and conditions governing Features and Included Features should be contained in files named "license.html" ("Feature Licenses"). Abouts and Feature Licenses may be located in any directory of a Download or Module including, but not limited to the following locations:

- * The top-level (root) directory
- * Plug-in and Fragment directories
- * Inside Plug-ins and Fragments packaged as JARs
- * Sub-directories of the directory named "src" of certain Plug-ins

* Feature directories

Note: if a Feature made available by the Eclipse Foundation is installed using the Provisioning Technology (as defined below), you must agree to a license ("Feature Update License") during the installation process. If the Feature contains Included Features, the Feature Update License should either provide you with the terms and conditions governing the Included Features or inform you where you can locate them. Feature Update Licenses may be found in the "license" property of files named "feature.properties" found within a Feature. Such Abouts, Feature Licenses, and Feature Update Licenses contain the terms and conditions (or references to such terms and conditions) that govern your use of the associated Content in that directory.

THE ABOUTS, FEATURE LICENSES, AND FEATURE UPDATE LICENSES MAY REFER TO THE EPL OR OTHER LICENSE AGREEMENTS, NOTICES OR TERMS AND CONDITIONS. SOME OF THESE OTHER LICENSE AGREEMENTS MAY INCLUDE (BUT ARE NOT LIMITED TO):

- * Eclipse Distribution License Version 1.0 (available at <http://www.eclipse.org/licenses/edl-v1.0.html> (<http://www.eclipse.org/licenses/edl-v10.html>))
- * Common Public License Version 1.0 (available at <http://www.eclipse.org/legal/cpl-v10.html> (<http://www.eclipse.org/legal/cpl-v10.html>))
- * Apache Software License 1.1 (available at <http://www.apache.org/licenses/LICENSE> (<http://www.apache.org/licenses/LICENSE>))
- * Apache Software License 2.0 (available at <http://www.apache.org/licenses/LICENSE-2.0> (<http://www.apache.org/licenses/LICENSE-2.0>))
- * Mozilla Public License Version 1.1 (available at <http://www.mozilla.org/MPL/MPL-1.1.html> (<http://www.mozilla.org/MPL/MPL-1.1.html>))

IT IS YOUR OBLIGATION TO READ AND ACCEPT ALL SUCH TERMS AND CONDITIONS PRIOR TO USE OF THE CONTENT. If no About, Feature License, or Feature Update License is provided, please contact the Eclipse Foundation to determine what terms and conditions govern that particular Content.

Use of Provisioning Technology

The Eclipse Foundation makes available provisioning software, examples of which include, but are not limited to, p2 and the Eclipse Update Manager ("Provisioning Technology") for the purpose of allowing users to install software, documentation, information and/or other materials (collectively "Installable Software"). This capability is provided with the intent of allowing such users to install, extend and update Eclipse-based products. Information about packaging Installable Software is available at http://eclipse.org/equinox/p2/repository_packaging.html (http://eclipse.org/equinox/p2/repository_packaging.html) ("Specification").

You may use Provisioning Technology to allow other parties to install Installable Software. You shall be responsible for enabling the applicable license agreements relating to the Installable Software to be presented to, and accepted by, the users of the Provisioning Technology in accordance with the Specification. By using

Provisioning Technology in such a manner and making it available in accordance with the Specification, you further acknowledge your agreement to, and the acquisition of all necessary rights to permit the following:

1. A series of actions may occur ("Provisioning Process") in which a user may execute the Provisioning Technology on a machine ("Target Machine") with the intent of installing, extending or updating the functionality of an Eclipse-based product.
2. During the Provisioning Process, the Provisioning Technology may cause third party Installable Software or a portion thereof to be accessed and copied to the Target Machine.
3. Pursuant to the Specification, you will provide to the user the terms and conditions that govern the use of the Installable Software ("Installable Software Agreement") and such Installable Software Agreement shall be accessed from the Target Machine in accordance with the Specification. Such Installable Software Agreement must inform the user of the terms and conditions that govern the Installable Software and must solicit acceptance by the end user in the manner prescribed in such Installable Software Agreement. Upon such indication of agreement by the user, the provisioning Technology will complete installation of the Installable Software.

Cryptography

Content may contain encryption software. The country in which you are currently may have restrictions on the import, possession, and use, and/or re-export to another country, of encryption software. BEFORE using any encryption software, please check the country's laws, regulations and policies concerning the import, possession, or use, and re-export of encryption software, to see if this is permitted.

Java and all Java-based trademarks are trademarks of Oracle Corporation in the United States, other countries, or both.

Commons Lang

Vendor: The Apache Software Foundation

Version: 3.12.0

Apache Commons Lang
Copyright 2001-2020 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction,

and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the

Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work

by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.

You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

Commons IO

Vendor: The Apache Software Foundation

Version: 2.11.0

Copyright 2002-2021 The Apache Software Foundation
This product includes software developed at
The Apache Software Foundation (<https://www.apache.org/>).

--

Apache License

Version 2.0, January 2004

<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted"

means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution." "Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and

- may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.
5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
 6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
 7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
 8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
 9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

```
Copyright [yyyy] [name of copyright owner]
Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
http://www.apache.org/licenses/LICENSE-2.0
```

MapLibre GL**Vendor: MapLibre**

```
=== ===== Public License Template =====
=== =====
```

```
----- Top-level license -----
BSD 3-Clause
```

Copyright (c) 2020, Mapbox

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Mapbox GL JS nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
-----
Contains code from glfx.js
```

Copyright (C) 2011 by Evan Wallace

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,

OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

 Contains a portion of d3-color <https://github.com/d3/d3-color>

Copyright 2010-2016 Mike Bostock
 All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of the author nor the names of contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=== =====

=== =====

Fourth-Party Dependencies

mapbox/geojson-rewind 0.5.0
 ISC License
 Copyright (c) 2020, Mapbox

----- (separator) -----

mapbox/geojson-types 1.0.2
 ISC License
 Copyright (c) 2018 Mapbox

----- (separator) -----

mapbox/point-geometry 0.1.0
 ISC License
 Copyright (c) 2015, Mapbox

----- (separator) -----

mapbox/whoots-js 3.1.0
 ISC License
 Copyright (c) 2017, Mapbox

----- (separator) -----

earcut 2.2.2
 ISC License
 Copyright (c) 2016, Mapbox

----- (separator) -----

geojson-vt 3.2.1
 ISC License

```

Copyright (c) 2015, Mapbox
----- (separator) -----
grid-index 1.1.0
ISC License
Copyright (c) 2016, Mapbox
----- (separator) -----
potpack 1.0.1
ISC License
Copyright (c) 2018, Mapbox
----- (separator) -----
Quickselect 2.0.0
ISC License
----- (separator) -----
supercluster 7.1.0
ISC License
Copyright (c) 2016, Mapbox
----- (separator) -----
Tinyqueue 2.0.3
ISC License
  Copyright (c) 2017, Vladimir Agafonkin

```

All Rights Reserved.

Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

```

----- (separator) -----
mapbox/jsonlint-lines-primitives
MIT License
Copyright (C) 2012 Zachary Carter
----- (separator) -----
csscolorparser 1.0.3
MIT License
(c) Dean McNamee dean@gmail.com, 2012
----- (separator) -----
gl-matrix 3.3.0
MIT License
Copyright (c) 2015-2020, Brandon Jones, Colin MacKenzie IV
----- (separator) -----
minimist 1.2.5
MIT License
----- (separator) -----
murmurhash-js 1.0.0
MIT License
Copyright (c) 2011 Gary Court
----- (separator) -----
vt-pbf 3.1.1
MIT License
Copyright (c) 2015 Anand Thakker

```


All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

----- (separator) -----

mapbox-gl-supported 1.5.0
 BSD 3-Clause License
 Copyright (c) 2017, Mapbox

----- (separator) -----

mapbox/vector-tile 1.3.1
 BSD 3-Clause License
 Copyright (c) 2014, Mapbox

----- (separator) -----

pbk 3.2.1
 BSD 3-Clause License
 Copyright (c) 2017, Mapbox

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

----- (separator) -----

mapbox/tiny-sdf 1.1.1

BSD 2-Clause License
 Copyright © 2016-2017 Mapbox, Inc.
 All Rights Reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

----- (separator) -----
 mapbox/unitbezier 0.0.0
 BSD-2-Clause
 Copyright (C) 2008 Apple Inc. All Rights Reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY APPLE INC. ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL APPLE INC. OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Ported from Webkit
<http://svn.webkit.org/repository/webkit/trunk/Source/WebCore/platform/graphics/UnitBezier.h>

----- (separator) -----
 rw 1.3.3
 BSD 3 Clause
 Copyright (c) 2014-2016, Michael Bostock
 All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * The name Michael Bostock may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL MICHAEL BOSTOCK BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Protocol Buffers (aka Google protobuf)

Provider: Google

Version: 3.19.3

From the LICENSE file in the download packages
URL for License and Copyright Notice -
<https://github.com/protocolbuffers/protobuf/blob/master/LICENSE>

Copyright 2008 Google Inc. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Google Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Code generated by the Protocol Buffer compiler is owned by the owner of the input file used when generating it. This code is not

standalone and requires a support library to be linked with it. This support library is itself covered by the above license.

OAuth 2.0 SDK with OpenID Connect extensions

Vendor: Nimbus DS

Version: 9.9.1

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted"

means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and

wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

----- Copyright notices -----
 === =====

.Nimbus OAuth 2.0 SDK with OpenID Connect extensions

Copyright 2012-2022, Connect2id Ltd and contributors.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<https://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

.
.

----- Fourth-party information -----

== NAME OF DEPENDENCY 1

jcip-annotations

== License

Apache License - See above

----- (separator) -----

== NAME OF DEPENDENCY 2

content-type

== License

Apache License - See above

== Copyright

Nimbus Content Type

Copyright 2020, Connect2id Ltd.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

----- (separator) -----

== NAME OF DEPENDENCY 3

lang-tag

== License

Apache License - See Above

== Copyright

Nimbus Language Tags

Copyright 2012-2022, Connect2id Ltd.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

----- (separator) -----

== NAME OF DEPENDENCY 4

nimbus-jose-jwt

== License

Apache License - See above

==Copyright

Nimbus JOSE + JWT

Copyright 2012 - 2022, Connect2id Ltd.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<https://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

----- (separator) -----
 == NAME OF DEPENDENCY 5
 json-smart

== License
 Apache License - See above

----- (separator) -----
 == NAME OF DEPENDENCY 6
 accessors-smart

== License
 Apache License - See above

----- (separator) -----
 == NAME OF DEPENDENCY 7
 ASM
 == License
 ASM is released under the following 3-Clause BSD License:
 ASM: a very small and fast Java bytecode manipulation framework
 Copyright (c) 2000-2011 INRIA, France Telecom
 All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holders nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

== Copyright
 Copyright (c) 2000-2011 INRIA, France Telecom
 All rights reserved.

Guava

Vendor: Google

Version: 31.1

Copyright (C) 2020 The Guava Authors

Licensed under the Apache License, Version 2.0 (the "License");
 you may not use this file except in compliance with the License.
 You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Apache License Version 2.0

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally

submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed

as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability

incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

=====

+--- 4th party: com.google.guava:failureaccess

Copyright (C) 2018 The Guava Authors

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

< Apache License Version 2.0 >

=====

+--- 4th party: com.google.guava:listenablefuture

Copyright (C) 2018 The Guava Authors

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

< Apache License Version 2.0>

=====

+--- 4th party: com.google.code.findbugs:jsr305

The JSR-305 reference implementation (lib/jsr305.jar) is distributed under the terms of the New BSD license:

<http://www.opensource.org/licenses/bsd-license.php>

See the JSR-305 home page for more information:

<http://code.google.com/p/jsr-305/>

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====

+--- 4th party: jcip-annotations

Copyright (c) 2005, Brian Goetz and Tim Peierls

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior

written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```
=====
+--- 4th party: com.google.errorprone:error_prone_annotations
```

Copyright 2015 The Error Prone Authors.

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

< Apache License Version 2.0 >

```
=====
+--- 4th party: com.google.j2objc:j2objc-annotations
```

Google Inc.
Daniel Connelly

Copyright 2012 Google Inc. All Rights Reserved.

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

< Apache License Version 2.0 >

```
=====
+--- 4th party: org.checkerframework:checker-qual
```

Copyright 2004-present by the Checker Framework developers

MIT License:

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

+--- 4th party: org.codehaus.mojo:animal-sniffer-annotations

MIT License:

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Copyright (c) 2009 codehaus.org.

=====

jackson-annotations

Vendor: FasterXML, LLC

Version: 2.13.2

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction,

and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the

Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work

by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.

You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Copyright © 2007–2022 FasterXML. All rights reserved.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

jackson-core

Vendor: FasterXML, LLC

Version: 2.13.2

Copyright © 2008–2022 FasterXML. All rights reserved.

Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007. It is currently developed by a community of developers.

Licensing

Jackson 2.x core and extension components are licensed under Apache License 2.0 To find the details that apply to this artifact see the accompanying LICENSE file.

Credits

A list of contributors may be found from CREDITS(-2.x) file, which is included in some artifacts (usually source distributions); but is always available from the source code management (SCM) system project uses.

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all

other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made,

use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS,

WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

jackson-databind

Vendor: FasterXML, LLC

Version: 2.13.2.2

----- Top-level license -----
 Apache License
 Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner

or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or

documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason

of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

```
----- Copyright notices -----
# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers.

## Licensing

Jackson 2.x core and extension components are licensed under Apache License 2.0
To find the details that apply to this artifact see the accompanying LICENSE
file.

## Credits

A list of contributors may be found from CREDITS(-2.x) file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.
----- Fourth-party information -----
== jackson-core
== License
Apache 2.0
== Copyright Notices
Copyright (c) 2007- Tatu Saloranta, tatu.saloranta@iki.fi

# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers.
```

```
## Licensing
```

```
Jackson 2.x core and extension components are licensed under Apache License 2.0
To find the details that apply to this artifact see the accompanying LICENSE file.
```

```
## Credits
```

```
A list of contributors may be found from CREDITS(-2.x) file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.
```

```
----- (separator) -----
```

```
== jackson-annotations
```

```
== License
```

```
Apache 2.0
```

```
== Copyright Notices
```

```
----- (separator) -----
```

jackson-module-jaxb-annotations

Vendor: FasterXML, LLC

Version: 2.13.2

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works

that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

- (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all

other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. **Accepting Warranty or Additional Liability.** While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

=====
component=====

Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007. It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

Licensing

Jackson core and extension components may be licensed under different licenses. To find the details that apply to this artifact see the accompanying LICENSE file.

For more information, including possible other licensing options, contact FasterXML.com (<http://fasterxml.com>).

Credits

A list of contributors may be found from CREDITS file, which is included in some artifacts (usually source distributions); but is always available from the source code management (SCM) system project uses.

```

=====
Fourth Party Dependency #1 Name : jackson-core
Fourth Party Dependency #1 License : Apache 2.0
Fourth Party Dependency #1 Copyright : Copyright
=====
Fourth Party Dependency #2 Name : jackson-annotations
Fourth Party Dependency #2 License : Apache 2.0
Fourth Party Dependency #2 Copyright : Copyright
=====
Fourth Party Dependency #3 Name : jackson-databind
Fourth Party Dependency #3 License : Apache 2.0
Fourth Party Dependency #3 Copyright : Copyright
=====
Fourth Party Dependency #4 Name : jakarta.activation-api
Fourth Party Dependency #4 License : EDL 1.0
Fourth Party Dependency #4 Copyright : Copyright

```

Copyright (c) 2007, Eclipse Foundation, Inc. and its licensors.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

Neither the name of the Eclipse Foundation, Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS

FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```

=====
Fourth Party Dependency #5 Name : jakarta.xml.bind-api
Fourth Party Dependency #5 License : EDL 1.0
Fourth Party Dependency #5 Copyright : Copyright

```

Copyright (c) 2007, Eclipse Foundation, Inc. and its licensors.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are

permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

Neither the name of the Eclipse Foundation, Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS

FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

jackson-jaxrs-json-provider

Vendor: FasterXML, LLC

Version: 2.13.2

jackson-jaxrs-json-provider

Copyright (c) Fasterxml 2020

NOTICE file text:

```
# Jackson JSON processor
```

```
Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers, as well as supported
commercially by FasterXML.com.
```

```
## Licensing
```

```
Jackson core and extension components may be licensed under different licenses.
To find the details that apply to this artifact see the accompanying LICENSE
file.
```

```
For more information, including possible other licensing options, contact
FasterXML.com (http://fasterxml.com).
```

```
## Credits
```

```
A list of contributors may be found from CREDITS file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.
```

```
=====
LICENSE: Apache 2.0
```

```
Apache License
Version 2.0, January 2004
http://www.apache.org/licenses/
```

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or

for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier

identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.

=====

Dependencies:

jackson-core
Copyright © 2008-2019 FasterXML. All rights reserved.

This copy of Jackson JSON processor streaming parser/generator is licensed under
the
Apache (Software) License, version 2.0 ("the License").
See the License for details about distribution rights, and the
specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

jackson-jaxrs-base
Copyright (c) Fasterxml 2020

This copy of Jackson JSON processor databind module is licensed under the
Apache (Software) License, version 2.0 ("the License").
See the License for details about distribution rights, and the
specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

jackson-module-jaxb-annotations
Copyright (c) Fasterxml 2020

This copy of Jackson JSON processor `jackson-module-jaxb-annotations` module is
licensed under the
Apache (Software) License, version 2.0 ("the License").
See the License for details about distribution rights, and the
specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

jackson-annotations
Copyright (c) Fasterxml 2020

This copy of Jackson JSON processor annotations is licensed under the Apache (Software) License, version 2.0 ("the License"). See the License for details about distribution rights, and the specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

jackson-databind
Copyright (c) Fasterxml 2020

This copy of Jackson JSON processor databind module is licensed under the Apache (Software) License, version 2.0 ("the License"). See the License for details about distribution rights, and the specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

jakarta.xml.bind-api
Eclipse Distribution License 1.0

Copyright (c) 2017, 2018 Oracle and/or its affiliates. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the Eclipse Foundation, Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NOTICE file text for jakarta.xml.bind-api

```
# Notices for Eclipse Project for JAXB

This content is produced and maintained by the Eclipse Project for JAXB project.

* Project home: https://projects.eclipse.org/projects/ee4j.jaxb

## Trademarks

Eclipse Project for JAXB is a trademark of the Eclipse Foundation.

## Copyright

All content is the property of the respective authors or their employers. For
more information regarding authorship of content, please consult the listed
source code repository logs.

## Declared Project Licenses

This program and the accompanying materials are made available under the terms
of the Eclipse Distribution License v. 1.0 which is available
at http://www.eclipse.org/org/documents/edl-v10.php.

SPDX-License-Identifier: BSD-3-Clause

## Source Code

The project maintains the following source code repositories:

* https://github.com/eclipse-ee4j/jaxb-api

## Third-party Content

This project leverages the following third party content.

None

## Cryptography

Content may contain encryption software. The country in which you are currently
may have restrictions on the import, possession, and use, and/or re-export to
another country, of encryption software. BEFORE using any encryption software,
please check the country's laws, regulations and policies concerning the import,
possession, or use, and re-export of encryption software, to see if this is
permitted.

-----
jakarta.activation-api
Copyright (c) 2018 Oracle and/or its affiliates. All rights reserved.
Eclipse Distribution License 1.0

NOTICE file text for jakarta.activation-api:

# Notices for Eclipse Project for JAF

This content is produced and maintained by the Eclipse Project for JAF project.

* Project home: https://projects.eclipse.org/projects/ee4j.jaf

## Copyright

All content is the property of the respective authors or their employers. For
```

more information regarding authorship of content, please consult the listed source code repository logs.

Declared Project Licenses

This program and the accompanying materials are made available under the terms of the Eclipse Distribution License v. 1.0, which is available at <http://www.eclipse.org/org/documents/edl-v10.php>.

SPDX-License-Identifier: BSD-3-Clause

Source Code

The project maintains the following source code repositories:

* <https://github.com/eclipse-ee4j/jaf>

jackson-jaxrs-base

Vendor: FasterXML, LLC

Version: 2.13.2

This copy of Jackson JSON processor databind module is licensed under the Apache (Software) License, version 2.0 ("the License"). See the License for details about distribution rights, and the specific rights regarding derivate works.

You may obtain a copy of the License at:

<http://www.apache.org/licenses/LICENSE-2.0>

Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007. It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

Licensing

Jackson core and extension components may licensed under different licenses. To find the details that apply to this artifact see the accompanying LICENSE file. For more information, including possible other licensing options, contact FasterXML.com (<http://fasterxml.com>).

Credits

A list of contributors may be found from CREDITS file, which is included in some artifacts (usually source distributions); but is always available from the source code management (SCM) system project uses.

jackson-jaxrs-base v2.13.2

COPYRIGHT: Copyright FasterXML.com
LICENSE: Apache 2.0

Apache License
Version 2.0, January 2004

<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and

subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions

for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

=====

4P Dependencies:

jackson-core
jackson-annotations
jackson-databind

COPYRIGHT:

Copyright (c) 2007- Tatu Saloranta, tatu.saloranta@iki.fi
Copyright (c) Fasterxml

LICENSE: Apache 2.0

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems,

and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution

notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

```

-----FOURTH PARTY
DEPENDENCY 1-----
jackson-core
== License
Apache 2.0
== Copyright Notice
# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers.

## Licensing

Jackson 2.x core and extension components are licensed under Apache License 2.0
To find the details that apply to this artifact see the accompanying LICENSE
file.

## Credits

A list of contributors may be found from CREDITS(-2.x) file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.

-----FOURTH PARTY
DEPENDENCY 2-----
jackson-databind
== License
Apache 2.0
== Copyright Notice
# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers.

## Licensing

Jackson 2.x core and extension components are licensed under Apache License 2.0
To find the details that apply to this artifact see the accompanying LICENSE
file.

## Credits

A list of contributors may be found from CREDITS(-2.x) file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.

```

jackson-datatype-jdk8**Vendor:** FasterXML, LLC**Version:** 2.13.2

```

jackson-datatype-jdk8
==License
Apache License

```

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use,

reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. **Submission of Contributions.** Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. **Trademarks.** This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. **Disclaimer of Warranty.** Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. **Limitation of Liability.** In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. **Accepting Warranty or Additional Liability.** While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "{}" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright {yyyy} {name of copyright owner}

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.

```
----- Fourth-party information -----
== jackson-core
== License
Apache 2.0
== Copyright Notices (1)
Copyright (c) 2007- Tatu Saloranta, tatu.saloranta@iki.fi

# Jackson JSON processor

Jackson is a high-performance, Free/Open Source JSON processing library.
It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has
been in development since 2007.
It is currently developed by a community of developers.

## Licensing

Jackson 2.x core and extension components are licensed under Apache License 2.0
To find the details that apply to this artifact see the accompanying LICENSE
file.

## Credits

A list of contributors may be found from CREDITS(-2.x) file, which is included
in some artifacts (usually source distributions); but is always available
from the source code management (SCM) system project uses.
----- (separator) -----
== jackson-annotations
== License
Apache 2.0
== Copyright Notices (1)
----- (separator) -----
== jackson-databind
== License
Apache 2.0
== Copyright Notices (1)
```

POI-OOXML

Vendor: The Apache Software Foundation

Version: 5.2.2

Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements. See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0

(the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

=====

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions

to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one

of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. **Submission of Contributions.** Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. **Trademarks.** This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. **Disclaimer of Warranty.** Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. **Limitation of Liability.** In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. **Accepting Warranty or Additional Liability.** While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify,

defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

APACHE POI SUBCOMPONENTS:

Apache POI includes subcomponents with separate copyright notices and license terms. Your use of these subcomponents is subject to the terms and conditions of the following licenses:

Office Open XML schemas (poi-ooxml-full-*.jar)

The Office Open XML schema definitions used by Apache POI are a part of the Office Open XML ECMA Specification (ECMA-376, [1]). As defined in section 9.4 of the ECMA bylaws [2], this specification is available to all interested parties without restriction:

9.4 All documents when approved shall be made available to all interested parties without restriction.

Furthermore, both Microsoft and Adobe have granted patent licenses to this work [3,4,5].

[1] <http://www.ecma-international.org/publications/standards/Ecma-376.htm>

[2] <http://www.ecma-international.org/memento/Ecmabylaws.htm>

[3] <http://www.microsoft.com/openspecifications/en/us/programs/osp/default.aspx>

[4] <http://www.ecma-international.org/publications/files/ECMA-ST/Ecma%20PATENT/>

[Patent%20statements%20ok/](http://www.ecma-international.org/publications/files/ECMA-ST/Patent%20statements%20ok/)

[ECMA-376%20Edition%20%20Microsoft%20Patent%20Declaration.pdf](http://www.ecma-international.org/publications/files/ECMA-ST/ECMA-376%20Edition%20%20Microsoft%20Patent%20Declaration.pdf)

[5] <http://www.ecma-international.org/publications/files/ECMA-ST/>

Ecma%20PATENT/
Patent%20statements%20ok/ECMA-376%20Adobe%20Patent%20Declaration.pdf

Bouncy Castle library (bcprov-*.jar, bcpq-*.jar, bcpkix-*.jar)

Copyright (c) 2000 - 2021 The Legion of the Bouncy Castle Inc.
(<https://www.bouncycastle.org>)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

CurvesAPI / Curve API

BSD License

Copyright (c) 2000-2015 www.hamcrest.org
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. Neither the name of Hamcrest nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Log4j 2 library (log4j-api-*.jar)

Apache License Version 2.0

inbot-utils (<https://github.com/Inbot/inbot-utils>)

The MIT License (MIT)

Copyright (c) 2015 Inbot

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

Apache POI

Copyright 2003-2021 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<https://www.apache.org/>).

This product contains parts that were originally based on software from BEA.
Copyright (c) 2000-2003, BEA Systems, (dead link),
which was acquired by Oracle Corporation in 2008.

This product contains W3C XML Schema documents. Copyright 2001-2003 (c)
World Wide Web Consortium (Massachusetts Institute of Technology, European
Research Consortium for Informatics and Mathematics, Keio University)

This product contains the chunks_parse_cmds.tbl file from the vsdump program.
Copyright (C) 2006-2007 Valek Filippov (frob@df.ru)

This product contains parts of the eID Applet project
and .

Copyright (c) 2009-2018

FedICT (federal ICT department of Belgium), e-Contract.be BVBA (<https://www.e-contract.be>),

Bart Hanssens from FedICT

----- Fourth-party information -----

Apache Commons Collections4 (commons-collections-*.jar)

Apache License Version 2.0

Apache Commons Collections
 Copyright 2001-2022 The Apache Software Foundation

This product includes software developed at
 The Apache Software Foundation (<http://www.apache.org/>).

----- (separator) -----

POI
 Apache License Version 2.0 (see above)
 Copyright (see above)

----- (separator) -----

POI-ooxml-lite
 Apache License Version 2.0 (see above)
 Copyright (see above)

----- (separator) -----

Apache Commons Compress (commons-compress-*.jar)

Apache License Version 2.0

Apache Commons Compress
 Copyright 2002-2022 The Apache Software Foundation

This product includes software developed at
 The Apache Software Foundation (<https://www.apache.org/>).

The files in the package org.apache.commons.compress.archivers.sevenz
 were derived from the LZMA SDK, version 9.20 (C/ and CPP/7zip/),
 which has been placed in the public domain:

"LZMA SDK is placed in the public domain." (<http://www.7-zip.org/sdk.html>)

The test file lbzip2_32767.bz2 has been copied from libbzip2's source
 repository:

This program, "bzip2", the associated library "libbzip2", and all
 documentation, are copyright (C) 1996-2019 Julian R Seward. All
 rights reserved.

Redistribution and use in source and binary forms, with or without
 modification, are permitted provided that the following conditions
 are met:

1. Redistributions of source code must retain the above copyright
 notice, this list of conditions and the following disclaimer.
2. The origin of this software must not be misrepresented; you must
 not claim that you wrote the original software. If you use this
 software in a product, an acknowledgment in the product
 documentation would be appreciated but is not required.
3. Altered source versions must be plainly marked as such, and must
 not be misrepresented as being the original software.
4. The name of the author may not be used to endorse or promote
 products derived from this software without specific prior written
 permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Julian Seward, jseward@acm.org

----- (separator) -----

Apache Commons IO (commons-io-*.jar)

Apache License Version 2.0

Apache Commons IO
Copyright 2002-2022 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<https://www.apache.org/>).

----- (separator) -----

Apache XMLBeans (xmlbeans-*.jar)

Apache License Version 2.0

```
=====
== NOTICE file corresponding to section 4(d) of the Apache License, ==
== Version 2.0, in this case for the Apache XmlBeans distribution. ==
=====
```

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

Portions of this software were originally based on the following:
- software copyright (c) 2000-2003, BEA Systems, .

Aside from contributions to the Apache XMLBeans project, this software also includes:

- one or more source files from the Apache Xerces-J and Apache Axis products, Copyright (c) 1999-2003 Apache Software Foundation
- W3C XML Schema documents Copyright 2001-2003 (c) World Wide Web Consortium (Massachusetts Institute of Technology, European Research Consortium for Informatics and Mathematics, Keio University)
- resolver.jar from Apache Xml Commons project, Copyright (c) 2001-2003 Apache Software Foundation

----- (separator) -----

Osgi-core
== License
Apache License - See above
== Copyright Notices

Copyright (c) Contributors to the Eclipse Foundation
 Licensed under the Apache License, Version 2.0 (the "License");
 you may not use this file except in compliance with the License.
 You may obtain a copy of the License at
<http://www.apache.org/licenses/LICENSE-2.0>
 Unless required by applicable law or agreed to in writing, software
 distributed under the License is distributed on an "AS IS" BASIS,
 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 See the License for the specific language governing permissions and
 limitations under the License.

SPDX-License-Identifier: Apache-2.0

----- (separator) -----

SparseBitSet

== License

Apache License - See above

== Copyright Notices

This software is the work of Paladin Software International, Incorporated,
 based upon previous work done for and by Sun Microsystems, Inc.

----- (separator) -----

Commons-codec

== License

Apache License - See above

== Copyright Notices

Apache Commons Codec

Copyright 2002-2020 The Apache Software Foundation

This product includes software developed at
 The Apache Software Foundation (<https://www.apache.org/>).

`src/test/org/apache/commons/codec/language/DoubleMetaphoneTest.java`

contains test data from <http://aspell.net/test/orig/batch0.tab>.

Copyright (C) 2002 Kevin Atkinson (kevina@gnu.org)

=====

The content of package `org.apache.commons.codec.language.bm` has been translated
 from the original php source code available at <http://stevemorse.org/phoneticinfo.htm>
 with permission from the original authors.

Original source copyright:

Copyright (c) 2008 Alexander Beider & Stephen P. Morse.

----- (separator) -----

Commons-math

== License

Apache License - See above

== Copyright Notices

Apache Commons Math

Copyright 2001-2016 The Apache Software Foundation

This product includes software developed at
 The Apache Software Foundation (<http://www.apache.org/>).

This product includes software developed for Orekit by

CS Systèmes d'Information (<http://www.c-s.fr/>)

Copyright 2010-2012 CS Systèmes d'Information

----- (separator) -----

Log4j-api

== License

Apache License - See above

```

== Copyright Notices
Apache Log4j
Copyright 1999-2021 Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (http://www.apache.org/).

ResolverUtil.java
Copyright 2005-2006 Tim Fennell

Dumbster SMTP test server
Copyright 2004 Jason Paul Kitchen

TypeUtil.java
Copyright 2002-2012 Ramnivas Laddad, Juergen Hoeller, Chris Beams

picocli (http://picocli.info)
Copyright 2017 Remko Popma
----- (separator) -----
Osgi.annotation
== License
Apache License - See above
== Copyright Notices
Copyright (c) Contributors to the Eclipse Foundation
Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
http://www.apache.org/licenses/LICENSE-2.0
Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
SPDX-License-Identifier: Apache-2.0
----- (separator) -----
Apache PDFBox
== License
Apache License - See above
== Copyright Notices
Copyright 2014 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (http://www.apache.org/).

Based on source code originally developed in the PDFBox and
FontBox projects.

Copyright (c) 2002-2007, www.pdfbox.org

Based on source code originally developed in the PaDaF project.
Copyright (c) 2010 Atos Worldline SAS

Includes the Adobe Glyph List
Copyright 1997, 1998, 2002, 2007, 2010 Adobe Systems Incorporated.

Includes the Zapf Dingbats Glyph List
Copyright 2002, 2010 Adobe Systems Incorporated.

Includes OSXAdapter
Copyright (C) 2003-2007 Apple, Inc., All Rights Reserved
----- (separator) -----

```

```

curvesapi
== License
Copyright (c) 2005, Graph Builder
All rights reserved.

```

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

-Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

-Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

-Neither the name of Graph Builder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

```

== Copyright Notices
Copyright (c) 2005, Graph Builder
All rights reserved.

```

----- (separator) -----

```

Ant
== License
/*
 *                               Apache License
 *                               Version 2.0, January 2004
 *                               http://www.apache.org/licenses/
 *
 * TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION
 *
 * 1. Definitions.
 *
 *    "License" shall mean the terms and conditions for use, reproduction,
 *    and distribution as defined by Sections 1 through 9 of this document.
 *
 *    "Licensor" shall mean the copyright owner or entity authorized by
 *    the copyright owner that is granting the License.
 *
 *    "Legal Entity" shall mean the union of the acting entity and all
 *    other entities that control, are controlled by, or are under common
 *    control with that entity. For the purposes of this definition,
 *    "control" means (i) the power, direct or indirect, to cause the
 *    direction or management of such entity, whether by contract or
 *    otherwise, or (ii) ownership of fifty percent (50%) or more of the
 *    outstanding shares, or (iii) beneficial ownership of such entity.
 *
 *    "You" (or "Your") shall mean an individual or Legal Entity
 *    exercising permissions granted by this License.

```

- *
* "Source" form shall mean the preferred form for making modifications,
* including but not limited to software source code, documentation
* source, and configuration files.
*
- * "Object" form shall mean any form resulting from mechanical
* transformation or translation of a Source form, including but
* not limited to compiled object code, generated documentation,
* and conversions to other media types.
*
- * "Work" shall mean the work of authorship, whether in Source or
* Object form, made available under the License, as indicated by a
* copyright notice that is included in or attached to the work
* (an example is provided in the Appendix below).
*
- * "Derivative Works" shall mean any work, whether in Source or Object
* form, that is based on (or derived from) the Work and for which the
* editorial revisions, annotations, elaborations, or other modifications
* represent, as a whole, an original work of authorship. For the purposes
* of this License, Derivative Works shall not include works that remain
* separable from, or merely link (or bind by name) to the interfaces of,
* the Work and Derivative Works thereof.
*
- * "Contribution" shall mean any work of authorship, including
* the original version of the Work and any modifications or additions
* to that Work or Derivative Works thereof, that is intentionally
* submitted to Licensor for inclusion in the Work by the copyright owner
* or by an individual or Legal Entity authorized to submit on behalf of
* the copyright owner. For the purposes of this definition, "submitted"
* means any form of electronic, verbal, or written communication sent
* to the Licensor or its representatives, including but not limited to
* communication on electronic mailing lists, source code control systems,
* and issue tracking systems that are managed by, or on behalf of, the
* Licensor for the purpose of discussing and improving the Work, but
* excluding communication that is conspicuously marked or otherwise
* designated in writing by the copyright owner as "Not a Contribution."
*
- * "Contributor" shall mean Licensor and any individual or Legal Entity
* on behalf of whom a Contribution has been received by Licensor and
* subsequently incorporated within the Work.
*
- * 2. Grant of Copyright License. Subject to the terms and conditions of
* this License, each Contributor hereby grants to You a perpetual,
* worldwide, non-exclusive, no-charge, royalty-free, irrevocable
* copyright license to reproduce, prepare Derivative Works of,
* publicly display, publicly perform, sublicense, and distribute the
* Work and such Derivative Works in Source or Object form.
*
- * 3. Grant of Patent License. Subject to the terms and conditions of
* this License, each Contributor hereby grants to You a perpetual,
* worldwide, non-exclusive, no-charge, royalty-free, irrevocable
* (except as stated in this section) patent license to make, have made,
* use, offer to sell, sell, import, and otherwise transfer the Work,
* where such license applies only to those patent claims licensable
* by such Contributor that are necessarily infringed by their
* Contribution(s) alone or by combination of their Contribution(s)
* with the Work to which such Contribution(s) was submitted. If You
* institute patent litigation against any entity (including a
* cross-claim or counterclaim in a lawsuit) alleging that the Work
* or a Contribution incorporated within the Work constitutes direct
* or contributory patent infringement, then any patent licenses

* granted to You under this License for that Work shall terminate
* as of the date such litigation is filed.
*

* 4. Redistribution. You may reproduce and distribute copies of the
* Work or Derivative Works thereof in any medium, with or without
* modifications, and in Source or Object form, provided that You
* meet the following conditions:
*

* (a) You must give any other recipients of the Work or
* Derivative Works a copy of this License; and
*

* (b) You must cause any modified files to carry prominent notices
* stating that You changed the files; and
*

* (c) You must retain, in the Source form of any Derivative Works
* that You distribute, all copyright, patent, trademark, and
* attribution notices from the Source form of the Work,
* excluding those notices that do not pertain to any part of
* the Derivative Works; and
*

* (d) If the Work includes a "NOTICE" text file as part of its
* distribution, then any Derivative Works that You distribute must
* include a readable copy of the attribution notices contained
* within such NOTICE file, excluding those notices that do not
* pertain to any part of the Derivative Works, in at least one
* of the following places: within a NOTICE text file distributed
* as part of the Derivative Works; within the Source form or
* documentation, if provided along with the Derivative Works; or,
* within a display generated by the Derivative Works, if and
* wherever such third-party notices normally appear. The contents
* of the NOTICE file are for informational purposes only and
* do not modify the License. You may add Your own attribution
* notices within Derivative Works that You distribute, alongside
* or as an addendum to the NOTICE text from the Work, provided
* that such additional attribution notices cannot be construed
* as modifying the License.
*

* You may add Your own copyright statement to Your modifications and
* may provide additional or different license terms and conditions
* for use, reproduction, or distribution of Your modifications, or
* for any such Derivative Works as a whole, provided Your use,
* reproduction, and distribution of the Work otherwise complies with
* the conditions stated in this License.
*

* 5. Submission of Contributions. Unless You explicitly state otherwise,
* any Contribution intentionally submitted for inclusion in the Work
* by You to the Licensor shall be under the terms and conditions of
* this License, without any additional terms or conditions.
* Notwithstanding the above, nothing herein shall supersede or modify
* the terms of any separate license agreement you may have executed
* with Licensor regarding such Contributions.
*

* 6. Trademarks. This License does not grant permission to use the trade
* names, trademarks, service marks, or product names of the Licensor,
* except as required for reasonable and customary use in describing the
* origin of the Work and reproducing the content of the NOTICE file.
*

* 7. Disclaimer of Warranty. Unless required by applicable law or
* agreed to in writing, Licensor provides the Work (and each
* Contributor provides its Contributions) on an "AS IS" BASIS,
* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or


```
*      implied, including, without limitation, any warranties or conditions
*      of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A
*      PARTICULAR PURPOSE. You are solely responsible for determining the
*      appropriateness of using or redistributing the Work and assume any
*      risks associated with Your exercise of permissions under this License.
*
* 8. Limitation of Liability. In no event and under no legal theory,
*      whether in tort (including negligence), contract, or otherwise,
*      unless required by applicable law (such as deliberate and grossly
*      negligent acts) or agreed to in writing, shall any Contributor be
*      liable to You for damages, including any direct, indirect, special,
*      incidental, or consequential damages of any character arising as a
*      result of this License or out of the use or inability to use the
*      Work (including but not limited to damages for loss of goodwill,
*      work stoppage, computer failure or malfunction, or any and all
*      other commercial damages or losses), even if such Contributor
*      has been advised of the possibility of such damages.
*
* 9. Accepting Warranty or Additional Liability. While redistributing
*      the Work or Derivative Works thereof, You may choose to offer,
*      and charge a fee for, acceptance of support, warranty, indemnity,
*      or other liability obligations and/or rights consistent with this
*      License. However, in accepting such obligations, You may act only
*      on Your own behalf and on Your sole responsibility, not on behalf
*      of any other Contributor, and only if You agree to indemnify,
*      defend, and hold each Contributor harmless for any liability
*      incurred by, or claims asserted against, such Contributor by reason
*      of your accepting any such warranty or additional liability.
*
*      END OF TERMS AND CONDITIONS
*
*      APPENDIX: How to apply the Apache License to your work.
*
*      To apply the Apache License to your work, attach the following
*      boilerplate notice, with the fields enclosed by brackets "[]"
*      replaced with your own identifying information. (Don't include
*      the brackets!) The text should be enclosed in the appropriate
*      comment syntax for the file format. We also recommend that a
*      file or class name and description of purpose be included on the
*      same "printed page" as the copyright notice for easier
*      identification within third-party archives.
*
*      Copyright [yyyy] [name of copyright owner]
*
*      Licensed under the Apache License, Version 2.0 (the "License");
*      you may not use this file except in compliance with the License.
*      You may obtain a copy of the License at
*
*          https://www.apache.org/licenses/LICENSE-2.0
*
*      Unless required by applicable law or agreed to in writing, software
*      distributed under the License is distributed on an "AS IS" BASIS,
*      WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
*      See the License for the specific language governing permissions and
*      limitations under the License.
*/
```

W3C SOFTWARE NOTICE AND LICENSE

<https://www.w3.org/Consortium/Legal/2002/copyright-software-20021231>

This work (and included software, documentation such as READMEs, or other

related items) is being provided by the copyright holders under the following license. By obtaining, using and/or copying this work, you (the licensee) agree that you have read, understood, and will comply with the following terms and conditions.

Permission to copy, modify, and distribute this software and its documentation, with or without modification, for any purpose and without fee or royalty is hereby granted, provided that you include the following on ALL copies of the software and documentation or portions thereof, including modifications:

1. The full text of this NOTICE in a location viewable to users of the redistributed or derivative work.
2. Any pre-existing intellectual property disclaimers, notices, or terms and conditions. If none exist, the W3C Software Short Notice should be included (hypertext is preferred, text is permitted) within the body of any redistributed or derivative code.
3. Notice of any changes or modifications to the files, including the date changes were made. (We recommend you provide URIs to the location from which the code is derived.)

THIS SOFTWARE AND DOCUMENTATION IS PROVIDED "AS IS," AND COPYRIGHT HOLDERS MAKE NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR THAT THE USE OF THE SOFTWARE OR DOCUMENTATION WILL NOT INFRINGE ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADEMARKS OR OTHER RIGHTS.

COPYRIGHT HOLDERS WILL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY USE OF THE SOFTWARE OR DOCUMENTATION.

The name and trademarks of copyright holders may NOT be used in advertising or publicity pertaining to the software without specific, written prior permission. Title to copyright in this software and any associated documentation will at all times remain with copyright holders.

This formulation of W3C's notice and license became active on December 31 2002. This version removes the copyright ownership notice such that this license can be used with materials other than those owned by the W3C, reflects that ERCIM is now a host of the W3C, includes references to this specific dated version of the license, and removes the ambiguous grant of "use". Otherwise, this version is the same as the previous version and is written so as to preserve the Free Software Foundation's assessment of GPL compatibility and OSI's certification under the Open Source Definition. Please see our Copyright FAQ for common questions about using materials from our site, including specific terms and conditions for packages like libwww, Amaya, and Jigsaw. Other questions about this notice can be directed to site-policy@w3.org.

Joseph Reagle

This license came from: <http://www.megginson.com/SAX/copying.html>
However please note future versions of SAX may be covered
under <http://saxproject.org/?selected=pd>

SAX2 is Free!

I hereby abandon any property rights to SAX 2.0 (the Simple API for XML), and release all of the SAX 2.0 source code, compiled code, and documentation contained in this distribution into the Public Domain. SAX comes with NO WARRANTY or guarantee of fitness for any purpose.

David Megginson, david@megginson.com
2000-05-05

== Copyright Notices
Apache Ant
Copyright 1999-2021 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<https://www.apache.org/>).

The task is based on code Copyright (c) 2002, Landmark
Graphics Corp that has been kindly donated to the Apache Software
Foundation.

=====
=====

JavaScript Extension Toolkit (JET) 6.0.0

Oracle JET

Copyright (c) 2020 Oracle and/or its affiliates.

The Universal Permissive License (UPL), Version 1.0

Subject to the condition set forth below, permission is hereby granted to any person obtaining a copy of this software, associated documentation and/or data (collectively the "Software"), free of charge and under any and all copyright rights in the Software, and any and all patent rights owned or freely licensable by each licensor hereunder covering either (i) the unmodified Software as contributed to or provided by such licensor, or (ii) the Larger Works (as defined below), to deal in both

(a) the Software, and
(b) any piece of software and/or hardware listed in the lrgrwrks.txt file if one is included with the Software (each a "Larger Work" to which the Software is contributed by such licensors),

without restriction, including without limitation the rights to copy, create derivative works of, display, perform, and distribute the Software and make, use, sell, offer for sale, import, export, have made, and have sold the Software and the Larger Work(s), and to sublicense the foregoing rights on either these or other terms.

This license is subject to the following condition:

The above copyright notice and either this complete permission notice or at a minimum a reference to the UPL must be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

DO NOT TRANSLATE OR LOCALIZE.

```

*****
Oracle elects to use only the GNU Lesser General Public License version 2.1
(LGPL) for any software where a choice of LGPL/GPL license versions are made
available with the language indicating that LGPLv2.1/GPLv2 or any later version
may be used, or where a choice of which version of the LGPL/GPL is applied is
unspecified.
*****

```

THIRD-PARTY COMPONENT FILE (path in the installation)	LICENSE (see license text reproduced below)
js/libs/crossroads/crossroads.js	MIT
js/libs/es6-promise/es6-promise.js	MIT
js/libs/hammer/hammer-2.0.8.js	MIT
js/libs/history/history.iegte8.js	MIT
js/libs/js-signals/signals.js	MIT
js/libs/jquery/jquery-3.5.1.js	MIT
js/libs/jquery/jquery-ui-1.12.1.custom.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/core.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/draggable.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/mouse.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/position.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/sortable.js	MIT
js/libs/jquery/jqueryui-amd-1.12.1/widget.js	MIT
js/libs/knockout/knockout-3.5.0.js	MIT
js/libs/knockout/knockout-mapping-latest.js	MIT
js/libs/oj/v8.3.0/min/ojcspepressionevaluator.js (cspexpressionevaluator.js)	MIT
js/libs/oj/v8.3.0/min/ojexpparser.js (expparser.js)	MIT
js/libs/oj/v8.3.0/min/ojknockout.js (knockout-fast-foreach.js)	MIT
js/libs/oj/v8.3.0/min/ojselectcombobox.js (Select2.js)	Apache 2.0
js/libs/oj/v8.3.0/min/ojtree.js (jsTree.js)	MIT
js/libs/oj/v8.3.0/ojL10n.js (requireJS il18n)	MIT
js/libs/proj4js/dist/proj4.js	Proj4js
js/libs/require/require.js	MIT
js/libs/require/text.js	MIT
js/libs/require-css/css.min.js (require-css)	MIT
js/libs/webcomponents/custom-elements.min.js	custom-elements
scss/oj/v8.3.0/3rdparty/normalize/normalize.scss	MIT
js/libs/touchr/touchr.js	MIT
js/libs/oj/v8.3.0/min/ojvcomponent.js (petit-dom.js)	MIT
/*	
* expression-eval - v2.0.0	
* https://github.com/donmccurdy/expression-eval	
* Copyright (c) 2017 Don McCurdy	
* Licensed under the MIT license	
*/	
/*	
* jsep - v0.3.4	
* https://github.com/sony/jsep	
* Copyright (c) 2013 Stephen Oney, http://jsep.from.so/	
* Licensed under the MIT license	
*/	
/*!	
Knockout Fast Foreach v0.6.0 (2016-07-28T11:02:54.197Z)	
By: Brian M Hunt (C) 2015 License: MIT	
*/	

```
/*
 * petit-dom - v0.2.2
 * https://github.com/yelouafi/petit-dom
 * Copyright (C) 2017 Yassine Elouafi;
 * Licensed under the MIT license
 */

/**
 * webcomponents/custom-elements - v1.1.2
 *
 * Copyright (c) 2015 The Polymer Authors. All rights reserved.
 * Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:
 *
 * Redistributions of source code must retain the above copyright notice, this
list of conditions and the following disclaimer.
 * Redistributions in binary form must reproduce the above copyright notice,
this list of conditions and the following disclaimer
 * in the documentation and/or other materials provided with the distribution.
 * Neither the name of Google Inc. nor the names of its contributors may be used
to endorse or promote products derived from this software
 * without specific prior written permission.
 *
 * THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS"
AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING,
 * BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR
A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT
 * SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT,
INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN
 * ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY
OF SUCH DAMAGE.
 */

/*
 * proj4js - v2.5.0
 * http://proj4js.org/
 * Copyright (C) 2014 Mike Adair, Richard Greenwood, Didier Richard, Stephen
Irons, Olivier Terral and Calvin Metcalf;
 * Licensed under the Proj4js license
 */

/*
 * require-css - v0.1.10
 * https://github.com/guybedford/require-css
 * Copyright (C) 2013 Guy Bedford;
 * Licensed under the MIT license
 */

/*! Hammer.JS - v2.0.4 - 2014-09-28
 * http://hammerjs.github.io/
 *
 * Copyright (c) 2014 Jorik Tangelder;
 * Licensed under the MIT license */

/*
 * Foundation Responsive Library
```

```

* http://foundation.zurb.com
* Copyright 2014, ZURB
* Free to use under the MIT license.
* http://www.opensource.org/licenses/mit-license.php
*/

Normalize.scss
Copyright (c) Nicolas Gallagher and Jonathan Neal

/*
RequireJS i18n 2.0.2 Copyright (c) 2010-2012, The Dojo Foundation All Rights Reserved.
Available via the MIT or new BSD license.
see: http://github.com/requirejs/i18n for details
*/

/* This component is based on original code from:
jsTree 1.0-rc3 http://jstree.com/
"Copyright (c) 2010 Ivan Bozhanov (vakata.com)
Licensed same as jquery - under the terms of either the MIT License or
the GPL Version 2 License
http://www.opensource.org/licenses/mit-license.php
http://www.gnu.org/licenses/gpl.html"
*/

/**
 * @preserve Copyright 2012 Igor Vaynberg
 *
 * This software is licensed under the Apache License, Version 2.0 (the "Apache
License") or the GNU
 * General Public License version 2 (the "GPL License"). You may choose either license
to govern your
 * use of this software only upon the condition that you accept all of the terms of
either the Apache
 * License or the GPL License.
 *
 * You may obtain a copy of the Apache License and the GPL License at:
 *
 * http://www.apache.org/licenses/LICENSE-2.0
 * http://www.gnu.org/licenses/gpl-2.0.html
 *
 * Unless required by applicable law or agreed to in writing, software distributed
under the
 * Apache License or the GPL Licesnse is distributed on an "AS IS" BASIS, WITHOUT
WARRANTIES OR
 * CONDITIONS OF ANY KIND, either express or implied. See the Apache License and the
GPL License for
 * the specific language governing permissions and limitations under the Apache
License and the GPL License.
 */

/** @license
 * crossroads <http://millermedeiros.github.com/crossroads.js/>
 * Author: Miller Medeiros | MIT License
 * v0.12.0 (2013/01/21 13:47)
 */

ES6-Promise
Copyright (c) 2014 Yehuda Katz, Tom Dale, Stefan Penner and contributors

```

```
/*!
 * History API JavaScript Library v4.1.0
 *
 * Support: IE8+, FF3+, Opera 9+, Safari, Chrome and other
 *
 * Copyright 2011-2013, Dmitrii Pakhtinov ( spb.piksel@gmail.com )
 *
 * http://spb-piksel.ru/
 *
 * Dual licensed under the MIT and GPL licenses:
 *   http://www.opensource.org/licenses/mit-license.php
 *   http://www.gnu.org/licenses/gpl.html
 *
 * Update: 2014-03-24 13:14
 */

/*! jQuery UI - v1.11.4 - 2015-03-18
 * http://jqueryui.com
 * Includes: core.js, widget.js, mouse.js, position.js, draggable.js, sortable.js
 * Copyright 2015 jQuery Foundation and other contributors; Licensed MIT */

/*!
 * jQuery JavaScript Library v2.2.3
 * http://jquery.com/
 *
 * Includes Sizzle.js
 * http://sizzlejs.com/
 *
 * Copyright 2005, 2014 jQuery Foundation, Inc. and other contributors
 * Released under the MIT license
 * http://jquery.org/license
 *
 * Date: 2014-12-18T15:11Z
 */

/** @license
 * JS Signals <http://millermedeiros.github.com/js-signals/>
 * Released under the MIT license
 * Author: Miller Medeiros
 * Version: 1.0.0 - Build: 268 (2012/11/29 05:48 PM)
 */

/**
 * @license RequireJS text 2.0.12 Copyright (c) 2010-2014, The Dojo Foundation
 * All Rights Reserved.
 * Available via the MIT or new BSD license.
 * see: http://github.com/requirejs/text for details
 */

/*
 * RequireJS 2.3.6 Copyright (c) 2010-2015, The Dojo Foundation All Rights
 * Reserved.
 * Available via the MIT or new BSD license.
 * see: http://github.com/jrburke/requirejs for details
 */

/*!
 * Knockout JavaScript library v3.5.0
 * (c) Steven Sanderson - http://knockoutjs.com/
```

* License: MIT (<http://www.opensource.org/licenses/mit-license.php>)
*/

===
=====

===== Apache-2.0 =====

The following applies to all products licensed under the Apache 2.0 License:

You may not use the identified files except in compliance with the Apache License, Version 2.0 (the "License.")

You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0>. A copy of the license is also reproduced below.

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or

Derivative Works a copy of this License; and

- (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
- (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
- (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly

negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

===

=====

===== MIT =====

The MIT License

Copyright (c) __YEARS__, __NAMES__

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is

furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

===

=====

=====
 ===== Proj4js =====
 Mike Adair madairATdmsolutions.ca
 Richard Greenwood richATgreenwoodmap.com
 Didier Richard didier.richardATign.fr
 Stephen Irons stephen.ironstclear.net.nz
 Olivier Terral oterralATgmail.com
 Calvin Metcalf cmetcalfATappgeo.com

Copyright (c) 2014, Mike Adair, Richard Greenwood, Didier Richard, Stephen Irons, Olivier Terral and Calvin Metcalf

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Apache Commons Math 3.6.1

Apache Commons Math
 Copyright 2001-2012 The Apache Software Foundation

This product includes software developed by
 The Apache Software Foundation (<http://www.apache.org/>).

Licensed to the Apache Software Foundation (ASF) under one or more contributor license agreements. See the NOTICE file distributed with this work for additional information regarding copyright ownership. The ASF licenses this file to You under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software

distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to

communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and

do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Apache Commons Math includes the following code provided to the ASF under the Apache License 2.0:

- The inverse error function implementation in the Erf class is based on CUDA code developed by Mike Giles, Oxford-Man Institute of Quantitative Finance, and published in GPU Computing Gems, volume 2, 2010 (grant received on March 23th 2013)
- The LinearConstraint, LinearObjectiveFunction, LinearOptimizer, Relationship, SimplexSolver and SimplexTableau classes in package org.apache.commons.math3.optimization.linear include software developed by Benjamin McCann (<http://www.benmccann.com>) and distributed with the following copyright: Copyright 2009 Google Inc. (grant received on March 16th 2009)
- The class "org.apache.commons.math3.exception.util.LocalizedFormatsTest" which is an adapted version of "OrekitMessagesTest" test class for the Orekit library
- The "org.apache.commons.math3.analysis.interpolation.HermiteInterpolator" has been imported from the Orekit space flight dynamics library.

=====

APACHE COMMONS MATH DERIVATIVE WORKS:

The Apache commons-math library includes a number of subcomponents whose implementation is derived from original sources written in C or Fortran. License terms of the original sources are reproduced below.

=====

For the lmder, lmpar and qrsolv Fortran routine from minpack and translated in the LevenbergMarquardtOptimizer class in package org.apache.commons.math3.optimization.general
Original source copyright and license statement:

Minpack Copyright Notice (1999) University of Chicago. All rights reserved

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The end-user documentation included with the redistribution, if any, must include the following acknowledgment:

"This product includes software developed by the University of Chicago, as Operator of Argonne National Laboratory.

Alternately, this acknowledgment may appear in the software itself, if and wherever such third-party acknowledgments normally appear.

4. WARRANTY DISCLAIMER. THE SOFTWARE IS SUPPLIED "AS IS" WITHOUT WARRANTY OF ANY KIND. THE COPYRIGHT HOLDER, THE UNITED STATES, THE UNITED STATES DEPARTMENT OF ENERGY, AND THEIR EMPLOYEES: (1) DISCLAIM ANY WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE OR NON-INFRINGEMENT, (2) DO NOT ASSUME ANY LEGAL LIABILITY OR RESPONSIBILITY FOR THE ACCURACY, COMPLETENESS, OR USEFULNESS OF THE SOFTWARE, (3) DO NOT REPRESENT THAT USE OF THE SOFTWARE WOULD NOT INFRINGE PRIVATELY OWNED RIGHTS, (4) DO NOT WARRANT THAT THE SOFTWARE WILL FUNCTION UNINTERRUPTED, THAT IT IS ERROR-FREE OR THAT ANY ERRORS WILL BE CORRECTED.

5. LIMITATION OF LIABILITY. IN NO EVENT WILL THE COPYRIGHT HOLDER, THE UNITED STATES, THE UNITED STATES DEPARTMENT OF ENERGY, OR THEIR EMPLOYEES: BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND OR NATURE, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS OR LOSS OF DATA, FOR ANY REASON WHATSOEVER, WHETHER SUCH LIABILITY IS ASSERTED ON THE BASIS OF CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE, EVEN IF ANY OF SAID PARTIES HAS BEEN WARNED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGES.

=====

Copyright and license statement for the odex Fortran routine developed by E. Hairer and G. Wanner and translated in GraggBulirschStoerIntegrator class in package org.apache.commons.math3.ode.nonstiff:

Copyright (c) 2004, Ernst Hairer

Redistribution and use in source and binary forms, with or without

modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====
 Copyright and license statement for the original Mersenne twister C routines translated in MersenneTwister class in package org.apache.commons.math3.random:

Copyright (C) 1997 - 2002, Makoto Matsumoto and Takuji Nishimura, All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The names of its contributors may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====
 The initial code for shuffling an array (originally in class "org.apache.commons.math3.random.RandomDataGenerator", now replaced by

a method in class "org.apache.commons.math3.util.MathArrays") was inspired from the algorithm description provided in "Algorithms", by Ian Craw and John Pulham (University of Aberdeen 1999). The textbook (containing a proof that the shuffle is uniformly random) is available here:

<http://citeseerx.ist.psu.edu/viewdoc/download;?doi=10.1.1.173.1898&rep=rep1&type=pdf>

=====
License statement for the direction numbers in the resource files for Sobol sequences.

Licence pertaining to sobol.cc and the accompanying sets of direction numbers

Copyright (c) 2008, Frances Y. Kuo and Stephen Joe
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the names of the copyright holders nor the names of the University of New South Wales and the University of Waikato and its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====
The initial commit of package "org.apache.commons.math3.ml.neuralnet" is an adapted version of code developed in the context of the Data Processing and Analysis Consortium (DPAC) of the "Gaia" project of the European Space Agency (ESA).

=====
The initial commit of the class "org.apache.commons.math3.special.BesselJ" is an adapted version of code translated from the netlib Fortran program, rjbesl <http://www.netlib.org/specfun/rjbesl> by R.J. Cody at Argonne National Laboratory (USA). There is no license or copyright statement included with the original Fortran sources.

=====
The BracketFinder (package org.apache.commons.math3.optimization.univariate)

and PowellOptimizer (package org.apache.commons.math3.optimization.general) classes are based on the Python code in module "optimize.py" (version 0.5) developed by Travis E. Oliphant for the SciPy library (<http://www.scipy.org/>) Copyright B© 2003-2009 SciPy Developers.

SciPy license
Copyright B© 2001, 2002 Enthought, Inc.
All rights reserved.

Copyright B© 2003-2013 SciPy Developers.
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Enthought nor the names of the SciPy Developers may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS **ВЪНАС ИСВЪК** AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====

CesiumJS

Copyright 2011-2020 CesiumJS Contributors Apache
License
Version 2.0, January 2004
<http://www.apache.org/licenses/> TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION
Definitions. "License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document. "Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License. "Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means
(i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity. "You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this

License. "Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files. "Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types. "Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below). "Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof. "Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution." "Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell,

import, and
otherwise transfer the Work, where such license applies only to those patent
claims licensable
by such Contributor that are necessarily infringed by their Contribution(s)
alone or by
combination of their Contribution(s) with the Work to which such Contribution(s)
was
submitted. If You institute patent litigation against any entity (including a
cross-claim or
counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated
within the
Work constitutes direct or contributory patent infringement, then any patent
licenses granted
to You under this License for that Work shall terminate as of the date such
litigation is
filed. Redistribution. You may
reproduce and distribute copies of the Work or Derivative Works thereof in any
medium, with or
without modifications, and in Source or Object form, provided that You meet the
following
conditions: (a) You must give any other
recipients of the Work or Derivative Works a copy of this License; and (b)
You must cause any
modified files to carry prominent notices stating that You changed the files;
and (c) You must retain, in the
Source form of any Derivative Works that You distribute, all copyright, patent,
trademark, and
attribution notices from the Source form of the Work, excluding those notices
that do not
pertain to any part of the Derivative Works; and (d) If the Work includes a
"NOTICE" text file as part of its distribution, then any Derivative Works that
You
distribute must include a readable copy of the attribution notices contained
within such
NOTICE file, excluding those notices that do not pertain to any part of the
Derivative Works,
in at least one of the following places: within a NOTICE text file distributed
as part of the
Derivative Works; within the Source form or documentation, if provided along
with the
Derivative Works; or, within a display generated by the Derivative Works, if and
wherever such
third-party notices normally appear. The contents of the NOTICE file are for
informational
purposes only and do not modify the License. You may add Your own attribution
notices within
Derivative Works that You distribute, alongside or as an addendum to the NOTICE
text from the
Work, provided that such additional attribution notices cannot be construed as
modifying the
License. You may add Your own copyright
statement to Your modifications and may provide additional or different license
terms and
conditions for use, reproduction, or distribution of Your modifications, or for
any such
Derivative Works as a whole, provided Your use, reproduction, and distribution
of the Work
otherwise complies with the conditions stated in this License. Submission of
Contributions.
Unless You explicitly state otherwise, any Contribution intentionally submitted
for inclusion

in the Work by You to the Licensor shall be under the terms and conditions of this License,
without any additional terms or conditions. Notwithstanding the above, nothing herein shall
supersede or modify the terms of any separate license agreement you may have executed with
Licensor regarding such Contributions. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of
the Licensor, except as required for reasonable and customary use in describing the origin of
the Work and reproducing the content of the NOTICE file. Disclaimer of Warranty. Unless
required by applicable law or agreed to in writing, Licensor provides the Work (and each
Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR
CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any
warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A
PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or
redistributing the Work and assume any risks associated with Your exercise of permissions
under this License. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or
otherwise, unless required by applicable law (such as deliberate and grossly negligent acts)
or agreed to in writing, shall any Contributor be liable to You for damages, including any
direct, indirect, special, incidental, or consequential damages of any character arising as a
result of this License or out of the use or inability to use the Work (including but not
limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or
any and all other commercial damages or losses), even if such Contributor has been advised of
the possibility of such damages. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works
thereof, You may
choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other
liability obligations and/or rights consistent with this License. However, in accepting such
obligations, You may act only on Your own behalf and on Your sole responsibility, not on
behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each
Contributor harmless for any liability incurred by, or claims asserted against, such
Contributor by reason of your accepting any such warranty or additional liability. END OF TERMS AND CONDITIONS APPENDIX: How to apply the Apache License to your work. To apply the Apache License to
your work, attach the following boilerplate notice, with the fields enclosed by brackets "{}" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed
in the
appropriate comment syntax for the file

format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives. Copyright 2011-2020 CesiumJS Contributors Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0> Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License. Patents US9153063B2 US9865085B1 US10592242 Patents pending US15/829,786 US16/850,266 US16/851,958 Third-Party Code CesiumJS includes code from the following third-parties. * Copyright (c) 2014-2015, NVIDIA CORPORATION. All rights reserved. * * Redistribution and use in source and binary forms, with or without * modification, are permitted provided that the following conditions * are met: * * Redistributions of source code must retain the above copyright * notice, this list of conditions and the following disclaimer. * * Redistributions in binary form must reproduce the above copyright * notice, this list of conditions and the following disclaimer in the * documentation and/or other materials provided with the distribution. * * Neither the name of NVIDIA CORPORATION nor the names of its * contributors may be used to endorse or promote products derived * from this software without specific prior written permission. * * THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS ``AS IS'' AND ANY * EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR * CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, * EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, * PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR * PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY * OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE * OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. */Sean O'Neil <http://sponenil.net/> Copyright (c) 2000-2005, Sean O'Neil (s_p_oneil@hotmail.com) All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. * Neither the name of the project nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS

SOFTWARE IS PROVIDED BY
THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED
WARRANTIES,
INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY
AND FITNESS FOR A
PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER
OR CONTRIBUTORS BE
LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
CONSEQUENTIAL DAMAGES
(INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
SERVICES; LOSS OF USE,
DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
THEORY OF LIABILITY,
WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
OTHERWISE) ARISING IN
ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
POSSIBILITY OF SUCH
DAMAGE. Grauw Uri utilities <http://hg.grauw.nl/grauw-lib> Laurens Holst
(<http://www.grauw.nl/>) Copyright 2012 Laurens
Holst Licensed under the Apache
License, Version 2.0 (the "License"); you may not use this file except in
compliance with
the License. You may obtain a copy of the License at
<http://www.apache.org/licenses/LICENSE-2.0> Unless required by
applicable
law or agreed to in writing, software distributed under the License is
distributed on an "AS
IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
implied. See the
License for the specific language governing permissions and limitations
under the
License. when.js <https://github.com/cujojs/when> Licensed under the MIT
License
at: <http://www.opensource.org/licenses/mit-license.php> MIT License (c)
copyright B
Cavalier & J Hann Permission is hereby granted,
free of charge, to any person obtaining a copy of this software and
associated documentation
files (the "Software"), to deal in the Software without restriction,
including without
limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
sell copies of the Software, and to permit persons to whom the Software is
furnished to do so,
subject to the following conditions: The above copyright notice and
this permission notice shall be included in all copies or substantial
portions of the
Software. THE SOFTWARE IS PROVIDED "AS
IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT
LIMITED TO THE
WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
NONINFRINGEMENT. IN NO
EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM,
DAMAGES OR OTHER
LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING
FROM, OUT OF OR IN
CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
zip.js <https://github.com/gildas-lormeau/zip.js> Copyright (c) 2013 Gildas
Lormeau. All rights reserved. Redistribution and use in
source and binary forms, with or without modification, are permitted
provided that the

following conditions are met: Redistributions of
 source code must retain the above copyright notice, this list of conditions and
 the following
 disclaimer. Redistributions in
 binary form must reproduce the above copyright notice, this list of conditions
 and the
 following disclaimer in the documentation and/or other materials provided with
 the
 distribution. The names of the
 authors may not be used to endorse or promote products derived from this
 software without
 specific prior written permission. THIS SOFTWARE IS PROVIDED ``AS
 IS'' AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
 IMPLIED
 WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE
 DISCLAIMED. IN NO EVENT
 SHALL JCRAFT, INC. OR ANY CONTRIBUTORS TO THIS SOFTWARE BE LIABLE FOR ANY
 DIRECT, INDIRECT,
 INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT
 LIMITED TO,
 PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR
 BUSINESS
 INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN
 CONTRACT, STRICT
 LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF
 THE USE OF
 THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Autolinker.js
<https://github.com/gregjacobs/Autolinker.js> The MIT License (MIT) Copyright (c)
 2015 Gregory
 Jacobs (<http://greg-jacobs.com>) Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and associated
 documentation
 files (the "Software"), to deal in the Software without restriction, including
 without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial portions
 of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 tween.js <https://github.com/sole/tween.js> Copyright (c) 2010-2012
 Tween.js authors. Easing equations Copyright (c)
 2001 Robert Penner <http://robertpenner.com/easing/> Permission is hereby
 granted,
 free of charge, to any person obtaining a copy of this software and associated
 documentation
 files (the "Software"), to deal in the Software without restriction, including
 without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or

sell copies of the Software, and to permit persons to whom the Software is furnished to do so,
subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the
Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO
EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER
LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN
CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
php.js <https://github.com/kvz/phpjs> php.js is copyright 2013 Kevin van Zonneveld. Portions copyright Brett Zamir
(<http://brett-zamir.me>), Kevin van Zonneveld (<http://kevin.vanzonneveld.net>), Onno Marsman,
Theriault, Michael White (<http://getsprink.com>), Waldo Malqui Silva, Paulo Freitas, Jack,
Jonas Raoni Soares Silva (<http://www.jsfromhell.com>), Philip Peterson, Legaev Andrey, Ates
Goral (<http://magnetiq.com>), Alex, Ratheous, Martijn Wieringa, Rafa? Kukawski
(<http://blog.kukawski.pl>), lmeyrick (<https://sourceforge.net/projects/bcmath-js/>), Nate,
Philippe Baumann, Enrique Gonzalez, Webtoolkit.info (<http://www.webtoolkit.info/>), Carlos R.
L. Rodrigues (<http://www.jsfromhell.com>), Ash Searle (<http://hexmen.com/blog/>), Jani
Hartikainen, travc, Ole Vrijenhoek, Erkekjetter, Michael Grier, Rafa? Kukawski
(<http://kukawski.pl>), Johnny Mast (<http://www.phpvrouwen.nl>), T.Wild, d3x,
<http://stackoverflow.com/questions/57803/how-to-convert-decimal-to-hex-in-javascript>, Rafa?
Kukawski (<http://blog.kukawski.pl/>), stag019, pilus, WebDevHobo
(<http://webdevhobo.blogspot.com/>), marrtins, GeekFG (<http://geekf.blogspot.com>), Andrea
Giammarchi (<http://webreflection.blogspot.com>), Arpad Ray (<mailto:arpad@php.net>), gorthaur,
Paul Smith, Tim de Koning (<http://www.kingsquare.nl>), Joris, Oleg Eremeev, Steve Hilder,
majak, gettimeofday, KELAN, Josh Fraser
(<http://onlineaspect.com/2007/06/08/auto-detect-a-time-zone-with-javascript/>), Marc Palau,
Martin (<http://www.erlenwiese.de/>), Breaking Par Consulting Inc
(<http://www.breakingpar.com/bkp/home.nsf/0/87256B280015193F87256CFB006C45F7>), Chris, Mirek
Slugen, saulius, Alfonso Jimenez (<http://www.alfonsojimenez.com>), Diplom@t
(<http://difane.com/>), felix, Mailfaker (<http://www.weedem.fr/>), Tyler Akins
(<http://rumkin.com>), Caio Ariede (<http://caioariede.com>), Robin, Kankrelune
(<http://www.webfactory.info/>), Karol Kowalski, Imgen Tata (<http://www.myipdf.com/>), mdsjack
(<http://www.mdsjack.bo.it>), Dreamer, Felix Geisendoerfer (<http://www.debuggable.com/felix>),
Lars Fischer, AJ, David, Aman Gupta, Michael White, Public Domain
(<http://www.json.org/json2.js>), Steven Levithan (<http://blog.stevenlevithan.com>), Sakimori,
Pellentesque Malesuada, Thunder.m, Dj
(http://phpjs.org/functions/htmlentities:425#comment_134018), Steve Clay,

David James,
 Francois, class_exists, nobbler, T. Wild, Itsacon (<http://www.itsacon.net/>),
 date, Ole
 Vrijenhoek (<http://www.nervous.nl/>), Fox, Raphael (Ao RUDLER), Marco, noname,
 Mateusz
 "loonquawl" Zalega, Frank Forte, Arno, ger, mkttime, john (<http://www.jd-tech.net>), Nick
 Kolosov (<http://sammy.ru>), marc andreu, Scott Cariss, Douglas Crockford
 (<http://javascript.crockford.com>), madipta, Slawomir Kaniecki, ReverseSyntax,
 Nathan, Alex
 Wilson, kenneth, Bayron Guevara, Adam Wallner (<http://web2.bitbaro.hu/>), paulo
 kuong, jmweb,
 Lincoln Ramsay, djmix, Pyerre, Jon Hohle, Thiago Mata (<http://thiagomata.blog.com>), lmeyrick
 (<https://sourceforge.net/projects/bcmath-js/this.>), Linuxworld, duncan, Gilbert,
 Sanjoy Roy,
 Shingo, sankai, Oskar Larsson H?gfeldt (<http://oskar-lh.name/>), Denny Wardhana,
 Om3r,
 Everlasto, Subhasis Deb, josh, jd, Pier Paolo Ramon ([http://www.mastersoup.c /](http://www.mastersoup.c/)),
 P, merabi,
 Soren Hansen, Eugene Bulkin (<http://doubleaw.com/>), Der Simon
 (<http://innerdom.sourceforge.net/>), echo is bad, Ozh, XoraX (<http://www.xorax.info>), EdorFaus,
 JB, J A R, Marc Jansen, Francesco, LH, Stoyan Kyosev (<http://www.svest.org/>),
 nord_ua,omid
 (http://phpjs.org/functions/380:380#comment_137122), Brad Touesnard, MeEtc
 (<http://yass.meetcweb.com>), Peter-Paul Koch (<http://www.quirksmode.org/js/beat.html>), Olivier
 Louvignes (<http://mg-crea.com/>), T0bsn, Tim Wiel, Bryan Elliott, Jalal Berrami,
 Martin, JT,
 David Randall, Thomas Beaucourt (<http://www.webapp.fr>), taith, vlado houba,
 Pierre-Luc Paour,
 Kristof Coomans (SCK-CEN Belgian Nuclear Research Centre), Martin Pool, Kirk
 Strobeck, Rick
 Waldron, Brant Messenger (<http://www.brantmessenger.com/>), Devan Penner-Woelk,
 Saulo Vallory,
 Wagner B. Soares, Artur Tchernychev, Valentina De Rosa, Jason Wong (<http://carrot.org/>),
 Christoph, Daniel Esteban, strftime, Mick@el, reza, Simon Willison
 (<http://simonwillison.net>), Anton Ongson, Gabriel Paderni, M rco van Oort,
 penutbutterjelly,
 Philipp Lenssen, Bjorn Roesbeke (<http://www.bjornroesbeke.be/>), Bug?, Eric
 Nagel, Tomasz
 Wesolowski, Evertjan Garretsen, Bobby Drake, Blues (<http://tech.bluesmoon.info/>), Luke
 Godfrey, Pul, uestla, Alan C, Ulrich, Rafal Kukawski, Yves Sucaet, sowberry,
 Norman "zEh"
 Fuchs, hitwork, Zahlil, johnrembo, Nick Callen, Steven Levithan
 (stevenlevithan.com),
 ejsanders, Scott Baker, Brian Tafoya (<http://www.premasolutions.com/>), Philippe
 Jausions
 (<http://pear.php.net/user/jausions>), Aidan Lister (<http://aidanlister.com/>),
 Rob, e-mike, HKM,
 ChaosNo1, metjay, strcasecmp, strcmp, Taras Bogach, jpfle, Alexander Ermolaev
 (<http://snippets.dzone.com/user/AlexanderErmolaev>), DxGx, kilops, Orlando,
 dptr1988, Le Torbi,
 James (<http://www.james-bell.co.uk/>), Pedro Tainha (<http://www.pedrotainha.com>),
 James, Arnout
 Kazemier (<http://www.3rd-Eden.com>), Chris McMacken, gabriel paderni, Yannoo,
 FGFEmpereor, baris
 ozdil, Tod Gentile, Greg Frazier, jakes, 3D-GRAF, Allan Jensen (<http://www.3rd-Eden.com>)

www.winternet.no), Ho
 ard Yeend, Benjamin Lupton, davook, daniel airton wermann (<http://wermann.com.br>), Atli T??r,
 Maximusya, Ryan W Tenney (<http://ryan.10e.us>), Alexander M Beedie,
 fearphage
 (<http://http/my.opera.com/fearphage/>), Nathan Sepulveda, Victor, Matteo,
 Billy, stensi, Cord,
 Manish, T.J. Leahy, Riddler (<http://www.frontierwebdev.com/>), Rafa?
 Kukawski, FremyCompany,
 Matt Bradley, Tim de Koning, Luis Salazar (<http://www.freaky-media.com/>),
 Diogo Resende,
 Rival, Andrej Pavlovic, Garagoth, Le Torbi (<http://www.letorbi.de/>), Dino,
 Josep Sanz
 (<http://www.ws3.es/>), rem, Russell Walker (<http://www.nbill.co.uk/>), Jamie
 Beck
 (<http://www.terabit.ca/>), setcookie, Michael, YUI Library:
<http://developer.yahoo.com/yui/docs/YAHOO.util.DateLocale.html>, Blues at
<http://hacks.bluesmoon.info/strftime/strftime.js>, Ben (<http://benblume.co.uk/>), DtTvB
 (<http://dt.in.th/2008-09-16.string-length-in-bytes.html>), Andreas,
 William, meo, incidence,
 Cagri Ekin, Amirouche, Amir Habibi (<http://www.residence-mixte.com/>), Luke
 Smith
 (<http://lucassmith.na>), Kheang Hok Chin (<http://www.distantia.ca/>), Jay
 Klehr, Lorenzo
 Pisani, Tony, Yen-Wei Liu, Greenseed, mk.keck, Leslie Hoare, dude,
 boeeyOH, Ben
 Bryan Licensed under the MIT
 (MIT-LICENSE.txt) license. Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and
 associated documentation
 files (the "Software"), to deal in the Software without restriction,
 including without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial
 portions of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT
 LIMITED TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL KEVIN VAN ZONNEVELD BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER
 LIABILITY, WHETHER
 IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN
 CONNECTION WITH THE
 SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE. fontmetrics.js
<https://github.com/Pomax/fontmetrics.js> Copyright (C) 2011 by Mike
 "Pomax" Kamermans Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and
 associated documentation
 files (the "Software"), to deal in the Software without restriction,
 including without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and

this permission notice shall be included in all copies or substantial portions
 of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 almond <https://github.com/jrburke/almond> Copyright (c) 2010-2011, The
 Dojo Foundation Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and associated
 documentation
 files (the "Software"), to deal in the Software without restriction, including
 without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial portions
 of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 RequireJS <https://github.com/jrburke/requirejs> Copyright (c) 2010-2015, The
 Dojo Foundation Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and associated
 documentation
 files (the "Software"), to deal in the Software without restriction, including
 without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial portions
 of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 Knockout <http://knockoutjs.com/> (c) The Knockout.js team -
<http://knockoutjs.com/> License: MIT
<http://www.opensource.org/licenses/mit-license.php> Permission is hereby

granted,
 free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Knockout ES5 plugin <https://github.com/SteveSanderson/knockout-es5> Copyright (c) Steve Sanderson
 MIT license Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

topojson <https://github.com/mbostock/topojson> Copyright (c) 2012, Michael Bostock All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

The name Michael Bostock may not be used to endorse or promote products derived from this software without

specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL MICHAEL BOSTOCK BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. mersenne-twister.js <https://gist.github.com/banksean/300494> Copyright (C) 1997 - 2002, Makoto Matsumoto and Takuji Nishimura, All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. The names of its contributors may not be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. NoSleep.js <https://github.com/richttr/NoSleep.js> NoSleep.js v0.5.0 - [git.io/vfn01](https://github.com/vfn01) Rich Tibbett MIT license [jsep https://github.com/sony/jsep](https://github.com/sony/jsep) Copyright (c) 2013 Stephen Oney, <http://jsep.from.so/> Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so,

subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the

Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

earcut <https://github.com/mapbox/earcut> Copyright (c) 2016, Mapbox Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

kdbush <https://github.com/mourner/kdbush> Copyright (c) 2016, Vladimir Agafonkin Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

rbush <https://github.com/mourner/rbush> MIT License Copyright (c) 2016 Vladimir Agafonkin Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial

portions of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 quickselect <https://github.com/mourner/quickselect> ISC License Copyright (c)
 2018, Vladimir
 Agafonkin Permission to use, copy,
 modify, and/or distribute this software for any purpose with or without fee is
 hereby granted,
 provided that the above copyright notice and this permission notice appear in all
 copies. THE SOFTWARE IS PROVIDED "AS
 IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE
 INCLUDING ALL
 IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR
 BE LIABLE FOR
 ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES
 WHATSOEVER RESULTING
 FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE
 OR OTHER
 TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF
 THIS
 SOFTWARE. crunch <https://github.com/BinomialLLC/crunch> crunch/crnlib uses
 the ZLIB
 license: <http://opensource.org/licenses/Zlib> Copyright (c) 2010-2016
 Richard Geldreich, Jr. and Binomial LLC This software is provided
 'as-is', without any express or implied warranty. In no event will the authors
 be held liable
 for any damages arising from the use of this software. Permission is granted
 to
 anyone to use this software for any purpose, including commercial applications,
 and to alter
 it and redistribute it freely, subject to the following restrictions:
 The origin of this
 software must not be misrepresented; you must not claim that you wrote the
 original software.
 If you use this software in a product, an acknowledgment in the product
 documentation would be
 appreciated but is not required. Altered source
 versions must be plainly marked as such, and must not be misrepresented as being
 the original
 software. This notice may not be
 removed or altered from any source distribution. crunch_lib.cpp https://github.com/Apress/html5-game-dev-insights/blob/master/jones_ch21/crunch_webgl/crunch_js/crunch_lib.cpp Copyright (c) 2013, Evan
 Parker, Brandon Jones. All rights reserved. Redistribution and use in
 source and binary forms, with or without modification, are permitted provided
 that the
 following conditions are met: Redistributions of
 source code must retain the above copyright notice, this list of conditions and
 the following
 disclaimer. Redistributions in
 binary form must reproduce the above copyright notice, this list of conditions
 and the
 following disclaimer in the documentation and/or other materials provided with

the

distribution. THIS SOFTWARE IS PROVIDED BY
 THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED
 WARRANTIES,
 INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY
 AND FITNESS FOR A
 PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER
 OR CONTRIBUTORS BE
 LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
 CONSEQUENTIAL DAMAGES
 (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
 SERVICES; LOSS OF USE,
 DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
 THEORY OF LIABILITY,
 WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
 OTHERWISE) ARISING IN
 ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
 POSSIBILITY OF SUCH DAMAGE.

*/ texture-tester <https://github.com/toji/texture-tester> Copyright (c)
 2014, Brandon
 Jones. All rights reserved. Redistribution and use in
 source and binary forms, with or without modification, are permitted
 provided that the
 following conditions are met: Redistributions of
 source code must retain the above copyright notice, this list of
 conditions and the following
 disclaimer. Redistributions in
 binary form must reproduce the above copyright notice, this list of
 conditions and the
 following disclaimer in the documentation and/or other materials provided
 with the
 distribution. THIS SOFTWARE IS PROVIDED BY
 THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED
 WARRANTIES,
 INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY
 AND FITNESS FOR A
 PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER
 OR CONTRIBUTORS BE
 LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
 CONSEQUENTIAL DAMAGES
 (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
 SERVICES; LOSS OF USE,
 DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
 THEORY OF LIABILITY,
 WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
 OTHERWISE) ARISING IN
 ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
 POSSIBILITY OF SUCH
 DAMAGE. pako <https://github.com/nodeca/pako> (The MIT
 License) Copyright (C) 2014-2017 by
 Vitaly Puzrin and Andrei Tuputcyn Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and
 associated documentation
 files (the "Software"), to deal in the Software without restriction,
 including without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial

portions of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
 OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
 OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
 protobuf <https://github.com/dcodeIO/ProtoBuf.js> Copyright (c) 2016, Daniel
 Wirtz All rights reserved. Redistribution and use in
 source and binary forms, with or without modification, are permitted provided
 that the
 following conditions are met: Redistributions of
 source code must retain the above copyright notice, this list of conditions and
 the following
 disclaimer. Redistributions in
 binary form must reproduce the above copyright notice, this list of conditions
 and the
 following disclaimer in the documentation and/or other materials provided with
 the
 distribution. Neither the name of
 its author, nor the names of its contributors may be used to endorse or promote
 products
 derived from this software without specific prior written permission. THIS
 SOFTWARE IS PROVIDED BY
 THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED
 WARRANTIES,
 INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND
 FITNESS FOR A
 PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR
 CONTRIBUTORS BE
 LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
 CONSEQUENTIAL DAMAGES
 (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
 LOSS OF USE,
 DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF
 LIABILITY,
 WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
 OTHERWISE) ARISING IN
 ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
 SUCH
 DAMAGE. gltf-WebGL-PBR <https://github.com/KhronosGroup/gltf-WebGL-PBR> The
 MIT License Copyright (c) 2016-2017
 Mohamad Moneimne and Contributors Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and associated
 documentation
 files (the "Software"), to deal in the Software without restriction, including
 without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial portions
 of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
 TO THE

WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

ShaderFastLibs <https://github.com/michalrobot/ShaderFastLibs> The MIT License
 (MIT) Copyright (c) <2014> Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE.

Draco <https://github.com/google/draco> Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0> Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

DOMPurify <https://github.com/cure53/DOMPurify> DOMPurify Copyright 2015 Mario Heiderich DOMPurify is free software; you can redistribute it and/or modify it under the terms of either: a) the Apache License Version 2.0, or b) the Mozilla Public License Version 2.0 Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0> Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the

License. LERC <http://github.com/Esri/lerc/> Copyright 2015
Esri Licensed under the Apache
License, Version 2.0 (the "License"); you may not use this file except in
compliance with
the License. You may obtain a copy of the License at
<http://www.apache.org/licenses/LICENSE-2.0> Unless required by applicable
law or agreed to in writing, software distributed under the License is
distributed on an "AS
IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
implied. See the
License for the specific language governing permissions and limitations under the
License. A copy of the license and
additional notices are located with the source distribution at:
[http://github.com/Esri/lerc/ Tests](http://github.com/Esri/lerc/Tests) The CesiumJS tests use the following third-
party libraries and
data.Jasmine <http://jasmine.github.io/> Copyright (c) 2008-2014 Pivotal Labs
Permission is hereby granted,
free of charge, to any person obtaining a copy of this software and associated
documentation
files (the "Software"), to deal in the Software without restriction, including
without
limitation the rights to use, copy, modify, merge, publish, distribute,
sublicense, and/or
sell copies of the Software, and to permit persons to whom the Software is
furnished to do so,
subject to the following conditions: The above copyright notice and
this permission notice shall be included in all copies or substantial portions
of the
Software. THE SOFTWARE IS PROVIDED "AS
IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED
TO THE
WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
NONINFRINGEMENT. IN NO
EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR
OTHER
LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
OUT OF OR IN
CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
CesiumJS Documentation The CesiumJS documentation files include the following third-
party
content.Source Sans Pro (Font) Source® Sans Pro, Adobe's first open source
typeface family, was designed
by Paul D. Hunt. It is a sans serif typeface intended to work well in user
interfaces. SIL Open Font License, 1.1 (text)Example Applications The CesiumJS
example applications include the following third-party
libraries and data.Dojo Toolkit <http://dojotoolkit.org/> Copyright (c)
2005-2015, The
Dojo Foundation All rights
reserved. Redistribution and use in
source and binary forms, with or without modification, are permitted provided
that the
following conditions are met: Redistributions of
source code must retain the above copyright notice, this list of conditions and
the following
disclaimer. Redistributions in
binary form must reproduce the above copyright notice, this list of conditions
and the
following disclaimer in the documentation and/or other materials provided with
the
distribution. Neither the name of
the Dojo Foundation nor the names of its contributors may be used to endorse or

promote
 products derived from this software without specific prior written
 permission. THIS SOFTWARE IS PROVIDED BY
 THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED
 WARRANTIES,
 INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY
 AND FITNESS FOR A
 PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER
 OR CONTRIBUTORS BE
 LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR
 CONSEQUENTIAL DAMAGES
 (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR
 SERVICES; LOSS OF USE,
 DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
 THEORY OF LIABILITY,
 WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
 OTHERWISE) ARISING IN
 ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
 POSSIBILITY OF SUCH
 DAMAGE. CodeMirror <http://codemirror.net/> Copyright (C) 2017 by Marijn
 Haverbeke marijnh@gmail.com and others Permission is hereby granted,
 free of charge, to any person obtaining a copy of this software and
 associated documentation
 files (the "Software"), to deal in the Software without restriction,
 including without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial
 portions of the
 Software. THE SOFTWARE IS PROVIDED "AS
 IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT
 LIMITED TO THE
 WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
 NONINFRINGEMENT. IN NO
 EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM,
 DAMAGES OR OTHER
 LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING
 FROM, OUT OF OR IN
 CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE
 SOFTWARE. Please note that some
 subdirectories of the CodeMirror distribution include their own LICENSE
 files, and are
 released under different licences. clipboard.js [https://
 clipboardjs.com/](https://clipboardjs.com/) The MIT License (MIT)
 Copyright © 2018 Zeno Rocha hi@zenorocha.com Permission is hereby
 granted,
 free of charge, to any person obtaining a copy of this software and
 associated documentation
 files (the "Software"), to deal in the Software without restriction,
 including without
 limitation the rights to use, copy, modify, merge, publish, distribute,
 sublicense, and/or
 sell copies of the Software, and to permit persons to whom the Software is
 furnished to do so,
 subject to the following conditions: The above copyright notice and
 this permission notice shall be included in all copies or substantial
 portions of the
 Software. THE SOFTWARE IS PROVIDED "AS

IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

JSHint <http://www.jshint.com/> JSHint, by JSHint Community. Licensed under the same slightly modified MIT license that JSLint is. It stops evil-doers everywhere. JSHint is a derivative work of JSLint: Copyright (c) 2002 Douglas Crockford (www.JSLint.com) Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. The Software shall be used for Good, not Evil. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

JSHint was forked from the 2010-12-16 edition of JSLint. [bitmap-sdf https://github.com/dy/bitmap-sdf](https://github.com/dy/bitmap-sdf) (c) 2017 Dima Yv. MIT License Development supported by plot.ly. Public domain data from Natural Earth Free vector and raster map data @ naturalearthdata.com Terms of use: <http://www.naturalearthdata.com/about/terms-of-use/Data> from JHT's Planetary Pixel Emporium Copyright (c) by James Hastings-Trew <http://planetpixelemporium.com/> Copyright Information: <http://planetpixelemporium.com/planets.html> Sky box images from NASA <http://maps.jpl.nasa.gov/stars.html> <http://svs.gsfc.nasa.gov/vis/a000000/a003500/a003572/> Terms of use: http://www.nasa.gov/audience/formedia/features/MP_Photo_Guidelines.html Some vector icons from (or inspired by) Raphaël JS <http://raphaeljs.com/icons/> <http://raphaeljs.com/license.html> Mouse and gesture vector icons made by Freepik from Flaticon.com Creative Commons Attribution 3.0 <https://web.archive.org/web/20140419110558/http://www.flaticon.com/terms-of-use> Maki icon set from Mapbox <https://www.mapbox.com/maki/> <https://github.com/mapbox/maki> Big Buck Bunny trailer Creative Commons Attribution 3.0 (c) copyright 2008, Blender Foundation www.bigbuckbunny.org [population909500.json https://github.com/dataarts/webgl-globe](https://github.com/dataarts/webgl-globe) Copyright 2011 Google Data Arts Team Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in

compliance with
the License. You may obtain a copy of the License at
<http://www.apache.org/licenses/LICENSE-2.0> Unless required by
applicable
law or agreed to in writing, software distributed under the License is
distributed on an "AS
IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
implied. See the
License for the specific language governing permissions and limitations
under the
License. Wooden Watch Tower Creative Commons Attribution 3.0 (c) copyright
2012, Dennis Haupt
<http://www.blendswap.com/blends/view/61653GitHub> logo [https://github.com/](https://github.com/logosFont)
logosFont Awesome Icon Font Awesome by Dave Gandy - [http://](http://fontawesome.io)
fontawesome.io GraphemeSplitter <https://github.com/orling/grapheme-splitter>
The MIT License
(MIT) Copyright (c) 2015 Orlin
Georgiev Permission is hereby granted,
free of charge, to any person obtaining a copy of this software and
associated documentation
files (the "Software"), to deal in the Software without restriction,
including without
limitation the rights to use, copy, modify, merge, publish, distribute,
sublicense, and/or
sell copies of the Software, and to permit persons to whom the Software is
furnished to do so,
subject to the following conditions: The above copyright notice and
this permission notice shall be included in all copies or substantial
portions of the
Software. THE SOFTWARE IS PROVIDED "AS
IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT
LIMITED TO THE
WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND
NONINFRINGEMENT. IN NO
EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM,
DAMAGES OR OTHER
LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING
FROM, OUT OF OR IN
CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

CodeMirror 5.40.0

<https://codemirror.net/LICENSE>

MIT License

Copyright (C) 2017 by Marijn Haverbeke <marijnh@gmail.com> and others

Permission is hereby granted, free of charge, to any person obtaining a copy
of this software and associated documentation files (the "Software"), to deal
in the Software without restriction, including without limitation the rights
to use, copy, modify, merge, publish, distribute, sublicense, and/or sell
copies of the Software, and to permit persons to whom the Software is
furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in
all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR
IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,
FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE

AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Commons Beanutils 1.9.4

Apache Commons BeanUtils 1.9.3

COPYRIGHT: Copyright 2000-2016 The Apache Software Foundation

LICENSE: Apache 2.0

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner

or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.
4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or

documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason

of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

=====

4P Dependencies:

commons-collections 3.2.2
COPYRIGHT: Copyright 2001-2015 The Apache Software Foundation
LICENSE: Apache 2.0 <https://github.com/apache/commons-collections/blob/collections-3.2.2/LICENSE.txt>

commons-logging 1.2
COPYRIGHT: Copyright 2003-2014 The Apache Software Foundation
LICENSE: Apache 2.0 https://github.com/apache/commons-logging/blob/LOGGING_1_2/LICENSE.txt

Commons Codec 1.13

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable

(except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software

distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

HttpComponents HttpClient 4.5.12

Apache HttpComponents Client
Copyright 1999-2017 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

You may not use the identified files except in compliance with the Apache License, Version 2.0 (the "License.")

You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0>. A copy of the license is also reproduced below.

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

1. You must give any other recipients of the Work or Derivative Works a copy of this License; and

2. You must cause any modified files to carry prominent notices stating that You changed the files; and

3. You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

4. If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain

to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

```
Copyright [yyyy] [name of copyright owner]
Licensed under the Apache License, Version 2.0 (the "License"); you may not use this
file except in compliance with the License. You may obtain a copy of the License at
```

```
http://www.apache.org/licenses/LICENSE-2.0
```

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

```
=====LIST OF 7 FOURTH PARTY DEPENDENCIES=====
Apache Commons Codec (commons-codec:commons-codec:1.10 - http://commons.apache.org/
proper/commons-codec/)
Apache Commons Logging (commons-logging:commons-logging:1.2 - http://
commons.apache.org/proper/commons-logging/)
Apache HttpCore (org.apache.httpcomponents:httpcore:4.4.9 - http://hc.apache.org/
httpcomponents-core-ga)
Objenesis (org.objenesis:objenesis:2.1 - http://objenesis.org)
```

```
(Apache License Version 2.0) - SEE FULL TEXT ABOVE
```

```
=====
JUnit (junit:junit:4.11 - http://junit.org)
(Eclipse Public License Version 1.0)
----- ECLIPSE PUBLIC LICENSE VERSION 1.0
FULL TEXT -----
Eclipse Public License - v 1.0
```

THE ACCOMPANYING PROGRAM IS PROVIDED UNDER THE TERMS OF THIS ECLIPSE PUBLIC LICENSE ("AGREEMENT"). ANY USE, REPRODUCTION OR DISTRIBUTION OF THE PROGRAM CONSTITUTES RECIPIENT'S ACCEPTANCE OF THIS AGREEMENT.

1. DEFINITIONS

"Contribution" means:

a) in the case of the initial Contributor, the initial code and documentation distributed under this Agreement, and

b) in the case of each subsequent Contributor:

i) changes to the Program, and

ii) additions to the Program;

where such changes and/or additions to the Program originate from and are distributed by that particular Contributor. A Contribution 'originates' from a Contributor if it was added to the Program by such Contributor itself or anyone acting on such Contributor's behalf. Contributions do not include additions to the Program which: (i) are separate modules of software distributed in conjunction with the Program under their own license agreement, and (ii) are not derivative works of the Program.

"Contributor" means any person or entity that distributes the Program.

"Licensed Patents" mean patent claims licensable by a Contributor which are necessarily infringed by the use or sale of its Contribution alone or when combined with the Program.

"Program" means the Contributions distributed in accordance with this Agreement.

"Recipient" means anyone who receives the Program under this Agreement, including all Contributors.

2. GRANT OF RIGHTS

a) Subject to the terms of this Agreement, each Contributor hereby grants Recipient a non-exclusive, worldwide, royalty-free copyright license to reproduce, prepare derivative works of, publicly display, publicly perform, distribute and sublicense the Contribution of such Contributor, if any, and such derivative works, in source code and object code form.

b) Subject to the terms of this Agreement, each Contributor hereby grants Recipient a non-exclusive, worldwide, royalty-free patent license under Licensed Patents to make, use, sell, offer to sell, import and otherwise transfer the Contribution of such Contributor, if any, in source code and object code form. This patent license shall apply to the combination of the Contribution and the Program if, at the time the Contribution is added by the Contributor, such addition of the Contribution causes such combination to be covered by the Licensed Patents. The patent license shall not apply to any other combinations which include the Contribution. No hardware per se is licensed hereunder.

c) Recipient understands that although each Contributor grants the licenses to its Contributions set forth herein, no assurances are provided by any Contributor that the Program does not infringe the patent or other intellectual property rights of any other entity. Each Contributor disclaims any liability to Recipient for claims brought by any other entity based on infringement of intellectual property rights or otherwise. As a condition to exercising the rights and licenses granted hereunder, each Recipient hereby assumes sole responsibility to secure any other intellectual property rights needed, if any. For example, if a third party patent license is required to allow Recipient to distribute the Program, it is Recipient's responsibility to acquire that license before distributing the Program.

d) Each Contributor represents that to its knowledge it has sufficient copyright rights in its Contribution, if any, to grant the copyright license set forth in this Agreement.

3. REQUIREMENTS

A Contributor may choose to distribute the Program in object code form under its own license agreement, provided that:

a) it complies with the terms and conditions of this Agreement; and

b) its license agreement:

i) effectively disclaims on behalf of all Contributors all warranties and conditions, express and implied, including warranties or conditions of title and non-infringement, and implied warranties or conditions of merchantability and fitness for a particular purpose;

ii) effectively excludes on behalf of all Contributors all liability for damages, including direct, indirect, special, incidental and consequential damages, such as lost profits;

iii) states that any provisions which differ from this Agreement are offered by that Contributor alone and not by any other party; and

iv) states that source code for the Program is available from such Contributor, and informs licensees how to obtain it in a reasonable manner on or through a medium customarily used for software exchange.

When the Program is made available in source code form:

a) it must be made available under this Agreement; and

b) a copy of this Agreement must be included with each copy of the Program.

Contributors may not remove or alter any copyright notices contained within the Program.

Each Contributor must identify itself as the originator of its Contribution, if any, in a manner that reasonably allows subsequent Recipients to identify the originator of the Contribution.

4. COMMERCIAL DISTRIBUTION

Commercial distributors of software may accept certain responsibilities with respect to end users, business partners and the like. While this license is intended to facilitate the commercial use of the Program, the Contributor who includes the Program in a commercial product offering should do so in a manner which does not create potential liability for other Contributors. Therefore, if a Contributor includes the Program in a commercial product offering, such Contributor ("Commercial Contributor") hereby agrees to defend and indemnify every other Contributor ("Indemnified Contributor") against any losses, damages and costs (collectively "Losses") arising from claims, lawsuits and other legal actions brought by a third party against the Indemnified Contributor to the extent caused by the acts or omissions of such Commercial Contributor in connection with its distribution of the Program in a commercial product offering. The obligations in this section do not apply to any claims or Losses relating to any actual or alleged intellectual property infringement. In order to qualify, an Indemnified Contributor must: a) promptly notify the Commercial Contributor in writing of such claim, and b) allow the Commercial Contributor to control, and cooperate with the Commercial Contributor in, the defense and any related settlement negotiations. The Indemnified Contributor may participate in any such claim at its own expense.

For example, a Contributor might include the Program in a commercial product offering, Product X. That Contributor is then a Commercial Contributor. If that Commercial Contributor then makes performance claims, or offers warranties related to Product X, those performance claims and warranties are such Commercial Contributor's responsibility alone. Under this section, the Commercial Contributor would have to defend claims against the other Contributors related to those performance claims and warranties, and if a court requires any other Contributor to pay any damages as a result, the Commercial Contributor must pay those damages.

5. NO WARRANTY

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, THE PROGRAM IS PROVIDED ON AN "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, EITHER EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR CONDITIONS OF TITLE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Each Recipient is solely responsible for determining the appropriateness of using and distributing the Program and assumes all risks associated with its exercise of rights under this Agreement, including but not limited to the risks and costs of program errors, compliance with applicable laws, damage to or loss of data, programs or equipment, and

unavailability or interruption of operations.

6. DISCLAIMER OF LIABILITY

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, NEITHER RECIPIENT NOR ANY CONTRIBUTORS SHALL HAVE ANY LIABILITY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION LOST PROFITS), HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OR DISTRIBUTION OF THE PROGRAM OR THE EXERCISE OF ANY RIGHTS GRANTED HEREUNDER, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

7. GENERAL

If any provision of this Agreement is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this Agreement, and without further action by the parties hereto, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.

If Recipient institutes patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Program itself (excluding combinations of the Program with other software or hardware) infringes such Recipient's patent(s), then such Recipient's rights granted under Section 2(b) shall terminate as of the date such litigation is filed.

All Recipient's rights under this Agreement shall terminate if it fails to comply with any of the material terms or conditions of this Agreement and does not cure such failure in a reasonable period of time after becoming aware of such noncompliance. If all Recipient's rights under this Agreement terminate, Recipient agrees to cease use and distribution of the Program as soon as reasonably practicable. However, Recipient's obligations under this Agreement and any licenses granted by Recipient relating to the Program shall continue and survive.

Everyone is permitted to copy and distribute copies of this Agreement, but in order to avoid inconsistency the Agreement is copyrighted and may only be modified in the following manner. The Agreement Steward reserves the right to publish new versions (including revisions) of this Agreement from time to time. No one other than the Agreement Steward has the right to modify this Agreement. The Eclipse Foundation is the initial Agreement Steward. The Eclipse Foundation may assign the responsibility to serve as the Agreement Steward to a suitable separate entity. Each new version of the Agreement will be given a distinguishing version number. The Program (including Contributions) may always be distributed subject to the version of the Agreement under which it was received. In addition, after a new version of the Agreement is published, Contributor may elect to distribute the Program (including its Contributions) under the new version. Except as expressly stated in Sections 2(a) and 2(b) above, Recipient receives no rights or licenses to the intellectual property of any Contributor under this Agreement, whether expressly, by implication, estoppel or otherwise. All rights in the Program not expressly granted under this Agreement are reserved.

This Agreement is governed by the laws of the State of New York and the intellectual property laws of the United States of America. No party to this Agreement will bring a legal action under this Agreement more than one year after the cause of action arose. Each party waives its rights to a jury trial in any resulting litigation.

=====
Hamcrest Core (org.hamcrest:hamcrest-core:1.3 - <https://github.com/hamcrest/JavaHamcrest/hamcrest-core>)

(The 3-Clause BSD License)

----- FULL TEXT -----

The 3-Clause BSD License

Note: This license has also been called the "New BSD License" or "Modified BSD License". See also the 2-clause BSD License.

Copyright <YEAR> <COPYRIGHT HOLDER>

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

=====
Mockito (org.mockito:mockito-core:1.10.19 - <http://www.mockito.org>)

The MIT License

Copyright (c) 2007 Mockito contributors

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

GeoNames

This distribution includes and/or the service uses a modified version of the GeoNames geographical database {For distributions: which may be found in the following file: INSERT FILE NAME}. The original GeoNames database is available at www.geonames.org under the license set forth below.

CREATIVE COMMONS CORPORATION IS NOT A LAW FIRM AND DOES NOT PROVIDE LEGAL SERVICES. DISTRIBUTION OF THIS LICENSE DOES NOT CREATE AN ATTORNEY-CLIENT RELATIONSHIP. CREATIVE COMMONS PROVIDES THIS INFORMATION ON AN "AS-IS" BASIS. CREATIVE COMMONS MAKES NO WARRANTIES REGARDING THE INFORMATION PROVIDED, AND DISCLAIMS LIABILITY FOR DAMAGES RESULTING FROM ITS USE.

License

THE WORK (AS DEFINED BELOW) IS PROVIDED UNDER THE TERMS OF THIS CREATIVE COMMONS PUBLIC LICENSE ("CCPL" OR "LICENSE"). THE WORK IS PROTECTED BY COPYRIGHT AND/OR OTHER APPLICABLE LAW. ANY USE OF THE WORK OTHER THAN AS AUTHORIZED UNDER THIS LICENSE OR COPYRIGHT LAW IS PROHIBITED.

BY EXERCISING ANY RIGHTS TO THE WORK PROVIDED HERE, YOU ACCEPT AND AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE. TO THE EXTENT THIS LICENSE MAY BE CONSIDERED TO BE A CONTRACT, THE LICENSOR GRANTS YOU THE RIGHTS CONTAINED HERE IN CONSIDERATION OF YOUR ACCEPTANCE OF SUCH TERMS AND CONDITIONS.

1. Definitions

"Adaptation" means a work based upon the Work, or upon the Work and other pre-existing works, such as a translation, adaptation, derivative work, arrangement of music or other alterations of a literary or artistic work, or phonogram or performance and includes cinematographic adaptations or any other form in which the Work may be recast, transformed, or adapted including in any form recognizably derived from the original, except that a work that constitutes a Collection will not be considered an Adaptation for the purpose of this License. For the avoidance of doubt, where the Work is a musical work, performance or phonogram, the synchronization of the Work in timed-relation with a moving image ("synching") will be considered an Adaptation for the purpose of this License.

"Collection" means a collection of literary or artistic works, such as encyclopedias and anthologies, or performances, phonograms or broadcasts, or other works or subject matter other than works listed in Section 1(f) below, which, by reason of the selection and arrangement of their contents, constitute intellectual creations, in which the Work is included in its entirety in unmodified form along with one or more other contributions, each constituting separate and independent works in themselves, which together are assembled into a collective whole. A work that constitutes a Collection will not be considered an Adaptation (as defined above) for the purposes of this License.

"Distribute" means to make available to the public the original and copies of the Work or Adaptation, as appropriate, through sale or other transfer of ownership.

"Licensor" means the individual, individuals, entity or entities that offer(s) the Work under the terms of this License.

"Original Author" means, in the case of a literary or artistic work, the individual, individuals, entity or entities who created the Work or if no individual or entity can be identified, the publisher; and in addition (i) in the case of a performance the actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret or otherwise perform

literary or artistic works or expressions of folklore; (ii) in the case of a phonogram the producer being the person or legal entity who first fixes the sounds of a performance or other sounds; and, (iii) in the case of broadcasts, the organization that transmits the broadcast.

"Work" means the literary and/or artistic work offered under the terms of this License including without limitation any production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression including digital form, such as a book, pamphlet and other writing; a lecture, address, sermon or other work of the same nature; a dramatic or dramatico-musical work; a choreographic work or entertainment in dumb show; a musical composition with or without words; a cinematographic work to which are assimilated works expressed by a process analogous to cinematography; a work of drawing, painting, architecture, sculpture, engraving or lithography; a photographic work to which are assimilated works expressed by a process analogous to photography; a work of applied art; an illustration, map, plan, sketch or three-dimensional work relative to geography, topography, architecture or science; a performance; a broadcast; a phonogram; a compilation of data to the extent it is protected as a copyrightable work; or a work performed by a variety or circus performer to the extent it is not otherwise considered a literary or artistic work.

"You" means an individual or entity exercising rights under this License who has not previously violated the terms of this License with respect to the Work, or who has received express permission from the Licensor to exercise rights under this License despite a previous violation.

"Publicly Perform" means to perform public recitations of the Work and to communicate to the public those public recitations, by any means or process, including by wire or wireless means or public digital performances; to make available to the public Works in such a way that members of the public may access these Works from a place and at a place individually chosen by them; to perform the Work to the public by any means or process and the communication to the public of the performances of the Work, including by public digital performance; to broadcast and rebroadcast the Work by any means including signs, sounds or images.

"Reproduce" means to make copies of the Work by any means including without limitation by sound or visual recordings and the right of fixation and reproducing fixations of the Work, including storage of a protected performance or phonogram in digital form or other electronic medium.

2. Fair Dealing Rights. Nothing in this License is intended to reduce, limit, or restrict any uses free from copyright or rights arising from limitations or exceptions that are provided for in connection with the copyright protection under copyright law or other applicable laws.

3. License Grant. Subject to the terms and conditions of this License, Licensor hereby grants You a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) license to exercise the rights in the Work as stated below:

to Reproduce the Work, to incorporate the Work into one or more Collections, and to Reproduce the Work as incorporated in the Collections;

to create and Reproduce Adaptations provided that any such Adaptation, including any translation in any medium, takes reasonable steps to clearly label, demarcate or otherwise identify that changes were made to the original Work. For example, a translation could be marked "The original work was translated from English to Spanish," or a modification could indicate "The original work has been modified.";

to Distribute and Publicly Perform the Work including as incorporated in Collections; and,

to Distribute and Publicly Perform Adaptations.

For the avoidance of doubt:

Non-waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme cannot be waived, the Licensor reserves the exclusive right to collect such royalties for any exercise by You of the rights granted under this License;

Waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme can be waived, the Licensor waives the exclusive right to collect such royalties for any exercise by You of the rights granted under this License; and,

Voluntary License Schemes. The Licensor waives the right to collect royalties, whether individually or, in the event that the Licensor is a member of a collecting society that administers voluntary licensing schemes, via that society, from any exercise by You of the rights granted under this License.

The above rights may be exercised in all media and formats whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats. Subject to Section 8(f), all rights not expressly granted by Licensor are hereby reserved.

4. Restrictions. The license granted in Section 3 above is expressly made subject to and limited by the following restrictions:

You may Distribute or Publicly Perform the Work only under the terms of this License. You must include a copy of, or the Uniform Resource Identifier (URI) for, this License with every copy of the Work You Distribute or Publicly Perform. You may not offer or impose any terms on the Work that restrict the terms of this License or the ability of the recipient of the Work to exercise the rights granted to that recipient under the terms of the License. You may not sublicense the Work. You must keep intact all notices that refer to this License and to the disclaimer of warranties with every copy of the Work You Distribute or Publicly Perform. When You Distribute or Publicly Perform the Work, You may not impose any effective technological measures on the Work that restrict the ability of a recipient of the Work from You to exercise the rights granted to that recipient under the terms of the License. This Section 4(a) applies to the Work as incorporated in a Collection, but this does not require the Collection apart from the Work itself to be made subject to the terms of this License. If You create a Collection, upon notice from any Licensor You must, to the extent practicable, remove from the Collection any credit as required by Section 4(b), as requested. If You create an Adaptation, upon notice from any Licensor You must, to the extent practicable, remove from the Adaptation any credit as required by Section 4(b), as requested.

If You Distribute, or Publicly Perform the Work or any Adaptations or Collections, You must, unless a request has been made pursuant to Section 4(a), keep intact all copyright notices for the Work and provide, reasonable to the medium or means You are utilizing: (i) the name of the Original Author (or pseudonym, if applicable) if supplied, and/or if the Original Author and/or Licensor designate another party or parties (e.g., a sponsor institute, publishing entity, journal) for attribution ("Attribution Parties") in Licensor's copyright notice, terms of service or by other reasonable means, the name of such party or parties; (ii) the title of the Work if supplied; (iii) to the extent reasonably practicable, the URI, if any, that Licensor specifies to be associated with the Work, unless such URI does not refer to the copyright notice or licensing information for the Work; and (iv) , consistent with Section 3(b), in the case of an Adaptation, a credit identifying the use of the Work in the Adaptation (e.g., "French translation of the Work by Original Author," or

"Screenplay based on original Work by Original Author"). The credit required by this Section 4 (b) may be implemented in any reasonable manner; provided, however, that in the case of a Adaptation or Collection, at a minimum such credit will appear, if a credit for all contributing authors of the Adaptation or Collection appears, then as part of these credits and in a manner at least as prominent as the credits for the other contributing authors. For the avoidance of doubt, You may only use the credit required by this Section for the purpose of attribution in the manner set out above and, by exercising Your rights under this License, You may not implicitly or explicitly assert or imply any connection with, sponsorship or endorsement by the Original Author, Licensor and/or Attribution Parties, as appropriate, of You or Your use of the Work, without the separate, express prior written permission of the Original Author, Licensor and/or Attribution Parties.

Except as otherwise agreed in writing by the Licensor or as may be otherwise permitted by applicable law, if You Reproduce, Distribute or Publicly Perform the Work either by itself or as part of any Adaptations or Collections, You must not distort, mutilate, modify or take other derogatory action in relation to the Work which would be prejudicial to the Original Author's honor or reputation. Licensor agrees that in those jurisdictions (e.g. Japan), in which any exercise of the right granted in Section 3(b) of this License (the right to make Adaptations) would be deemed to be a distortion, mutilation, modification or other derogatory action prejudicial to the Original Author's honor and reputation, the Licensor will waive or not assert, as appropriate, this Section, to the fullest extent permitted by the applicable national law, to enable You to reasonably exercise Your right under Section 3(b) of this License (right to make Adaptations) but not otherwise.

5. Representations, Warranties and Disclaimer

UNLESS OTHERWISE MUTUALLY AGREED TO BY THE PARTIES IN WRITING, LICENSOR OFFERS THE WORK AS-IS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND CONCERNING THE WORK, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR THE ABSENCE OF LATENT OR OTHER DEFECTS, ACCURACY, OR THE PRESENCE OF ABSENCE OF ERRORS, WHETHER OR NOT DISCOVERABLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO SUCH EXCLUSION MAY NOT APPLY TO YOU.

6. Limitation on Liability. EXCEPT TO THE EXTENT REQUIRED BY APPLICABLE LAW, IN NO EVENT WILL LICENSOR BE LIABLE TO YOU ON ANY LEGAL THEORY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF THIS LICENSE OR THE USE OF THE WORK, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

7. Termination

This License and the rights granted hereunder will terminate automatically upon any breach by You of the terms of this License. Individuals or entities who have received Adaptations or Collections from You under this License, however, will not have their licenses terminated provided such individuals or entities remain in full compliance with those licenses. Sections 1, 2, 5, 6, 7, and 8 will survive any termination of this License.

Subject to the above terms and conditions, the license granted here is perpetual (for the duration of the applicable copyright in the Work). Notwithstanding the above, Licensor reserves the right to release the Work under different license terms or to stop distributing the Work at any time; provided, however that any such election will not serve to withdraw this License (or any other license that has been, or is required to be, granted under the terms of this License), and this License will continue in full force and effect unless terminated as stated above.

8. Miscellaneous

Each time You Distribute or Publicly Perform the Work or a Collection, the Licensor

offers to the recipient a license to the Work on the same terms and conditions as the license granted to You under this License.

Each time You Distribute or Publicly Perform an Adaptation, Licensor offers to the recipient a license to the original Work on the same terms and conditions as the license granted to You under this License.

If any provision of this License is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this License, and without further action by the parties to this agreement, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.

No term or provision of this License shall be deemed waived and no breach consented to unless such waiver or consent shall be in writing and signed by the party to be charged with such waiver or consent.

This License constitutes the entire agreement between the parties with respect to the Work licensed here. There are no understandings, agreements or representations with respect to the Work not specified here. Licensor shall not be bound by any additional provisions that may appear in any communication from You. This License may not be modified without the mutual written agreement of the Licensor and You.

The rights granted under, and the subject matter referenced, in this License were drafted utilizing the terminology of the Berne Convention for the Protection of Literary and Artistic Works (as amended on September 28, 1979), the Rome Convention of 1961, the WIPO Copyright Treaty of 1996, the WIPO Performances and Phonograms Treaty of 1996 and the Universal Copyright Convention (as revised on July 24, 1971). These rights and subject matter take effect in the relevant jurisdiction in which the License terms are sought to be enforced according to the corresponding provisions of the implementation of those treaty provisions in the applicable national law. If the standard suite of rights granted under applicable copyright law includes additional rights not granted under this License, such additional rights are deemed to be included in the License; this License is not intended to restrict the license of any rights under applicable law.

Creative Commons Notice

Creative Commons is not a party to this License, and makes no warranty whatsoever in connection with the Work. Creative Commons will not be liable to You or any party on any legal theory for any damages whatsoever, including without limitation any general, special, incidental or consequential damages arising in connection to this license. Notwithstanding the foregoing two (2) sentences, if Creative Commons has expressly identified itself as the Licensor hereunder, it shall have all rights and obligations of Licensor.

Except for the limited purpose of indicating to the public that the Work is licensed under the CCPL, Creative Commons does not authorize the use by either party of the trademark "Creative Commons" or any related trademark or logo of Creative Commons without the prior written consent of Creative Commons. Any permitted use will be in compliance with Creative Commons' then-current trademark usage guidelines, as may be published on its website or otherwise made available upon request from time to time. For the avoidance of doubt, this trademark restriction does not form part of this License.

Creative Commons may be contacted at <http://creativecommons.org/>.

Commons FileUpload 1.4

Apache Commons FileUpload
Copyright 2002-2017 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in

writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

1. You must give any other recipients of the Work or Derivative Works a copy of this License; and

2. You must cause any modified files to carry prominent notices stating that You changed the files; and

3. You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

4. If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

```
Copyright [yyyy] [name of copyright owner]
Licensed under the Apache License, Version 2.0 (the "License"); you may not use this
file except in compliance with the License. You may obtain a copy of the License at
```

```
http://www.apache.org/licenses/LICENSE-2.0
```

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Quartz Job Scheduler 2.3.0

Quartz is licensed under Apache License 2.0 with an associated notice file. Quartz has a mandatory dependency on slf4j-api which is licensed under an MIT license.

Quartz has an optional dependency on c3p0 which is licensed under LGPL.

The Quartz distribution ZIP includes log4j which is licensed under Apache License 2.0.

The Quartz distribution ZIP includes slf4j-log4j12 which is licensed under an MIT license.

Notice file for Quartz:

Copyright Declaration:

Copyright © 2003-2016 Software AG, Darmstadt, Germany and/or Software AG USA Inc., Reston, VA, USA, and/or its subsidiaries and/or its affiliates and/or their licensors.

Trademark and Patent declaration

The name Software AG and all Software AG product names are either trademarks or registered trademarks of Software AG and/or Software AG USA Inc. and/or its subsidiaries and/or its affiliates and/or their licensors. Other company and product names mentioned herein may be trademarks of their respective owners.

Detailed information on trademarks and patents owned by Software AG and/or its subsidiaries is located at <http://softwareag.com/licenses>.

Third Party declaration

This software may include portions of third-party products. For third-party copyright notices, license terms, additional rights or restrictions, please refer to "License Texts, Copyright Notices and Disclaimers of Third Party Products". For certain specific third-party license restrictions, please refer to section E of the Legal Notices available under "License Terms and Conditions for Use of Software AG Products / Copyright and Trademark Notices of Software AG Products". These documents are part of the product documentation, located at <http://softwareag.com/licenses> and/or in the root installation directory of the licensed product(s).

Confidentiality Disclaimer:

Use, reproduction, transfer, publication or disclosure is prohibited except as specifically provided for in your License Agreement with Software AG.

Apache 2.0 License file:

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by

the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of

this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify

the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

slf4j-api and slf4j-log4j12 MIT License:

Copyright (c) 2004-2013 QOS.ch All rights reserved. Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

log4j version 1.2.16 is provided under the standard Apache 2.0 license with the following copyright notices from the associated NOTICE file:

Apache log4j
Copyright 2007 The Apache Software Foundation

This product includes software developed at
The Apache Software Foundation (<http://www.apache.org/>).

LGPL License for c3p0:

GNU LESSER GENERAL PUBLIC LICENSE
Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some

specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it

does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

GNU LESSER GENERAL PUBLIC LICENSE
TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not

covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or

collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN

WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the library's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

```
This library is free software; you can redistribute it and/or
modify it under the terms of the GNU Lesser General Public
License as published by the Free Software Foundation; either
version 2.1 of the License, or (at your option) any later version.
```

```
This library is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
Lesser General Public License for more details.
```

```
You should have received a copy of the GNU Lesser General Public
License along with this library; if not, write to the Free Software
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301
USA
```

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the
library `Frob' (a library for tweaking knobs) written by James Random Hacker.
```

```
<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice
```

That's all there is to it!

Supercluster 3.0.2

<https://github.com/mapbox/supercluster/blob/master/LICENSE>

ISC License

Copyright (c) 2016, Mapbox

Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Fourth party:

<https://github.com/mourner/kdbush/blob/master/LICENSE>
ISC License

Copyright (c) 2017, Vladimir Agafonkin

Permission to use, copy, modify, and/or distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

ajv 6.5.3

<https://github.com/epoberezkin/ajv/blob/0020556493f3d443002596697768f3f047782198/LICENSE>

The MIT License (MIT)

Copyright (c) 2015-2017 Evgeny Poberezkin

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

colorbrewer 2.0

<http://colorbrewer2.org/export/LICENSE.txt>

Apache-Style Software License for ColorBrewer software and ColorBrewer Color Schemes

Copyright (c) 2002 Cynthia Brewer, Mark Harrower, and The Pennsylvania State University.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions as source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. The end-user documentation included with the redistribution, if any, must include the following acknowledgment: "This product includes color specifications and designs developed by Cynthia Brewer (<http://colorbrewer.org/>)."
Alternately, this acknowledgment may appear in the software itself, if and wherever such third-party acknowledgments normally appear.
4. The name "ColorBrewer" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact Cynthia Brewer at cbrewer@psu.edu.
5. Products derived from this software may not be called "ColorBrewer", nor may "ColorBrewer" appear in their name, without prior written permission of Cynthia Brewer.

flyway 6.4.2

Flyway Community Edition License

Apache License

Version 2.0, January 2004
<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common

control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work,

where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
 - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
 - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
 - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
 - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade

names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

Copyright 2010-2020 Redgate Software Ltd

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

JQuery UI Layout 1.4.3

From <http://plugins.jquery.com/layout/>

MIT License

UI Layout
The Ultimate Page Layout Plugin for jQuery

Copyright (c) 2014 Kevin Dalman

Based on work by Fabrizio Balliano (<http://www.fabrizioballiano.net>)

Download: <http://layout.jquery-dev.com/download.cfm>

Documentation: <http://layout.jquery-dev.com/documentation.cfm>

Support: <http://groups.google.com/group/jquery-ui-layout>

Email Contact: development@jquery-dev.com

LICENSE SUMMARY

Dual licensed under the GNU GPL (<http://www.gnu.org/licenses/gpl.html>) and MIT (<http://www.opensource.org/licenses/mit-license.php>) licenses.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

THE MIT LICENSE (MIT)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

GNU GENERAL PUBLIC LICENSE Version 3, 29 June 2007

Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works.

The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to

share and change all versions of a program--to make sure it remains free software for all its users. We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors. You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's

System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and

appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

a) The work must carry prominent notices stating that you modified it, and giving a relevant date.

b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".

c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as

long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the

User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

- a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or
- b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or
- c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or
- d) Limiting the use for publicity purposes of names of licensors or authors of the material; or
- e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do

not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version".

A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so

available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

Index