

Oracle Utilities Market Settlements Management Cloud Service

Overview Guide

Release 23C

F87683-02

December 2023

Contents

Chapter 1

Oracle Utilities Market Settlements Management Cloud Service Overview Guide	1-1
---	-----

Chapter 2

Oracle Utilities Market Settlements Management Cloud Service Overview	2-1
Welcome to Oracle Utilities Market Settlements Management Cloud Service	2-2
Oracle Utilities Market Settlements Management Cloud Service Applications	2-3
Oracle Utilities Market Settlements Management Cloud Service Documentation	2-4
Supported Client Platforms and Browsers	2-5
Supported Integrations	2-6
Using Oracle Utilities Testing Accelerator with Oracle Utilities Market Settlements Management Cloud Service	2-6
High-Level Roles and Responsibilities	2-8
Hardware, Storage, Technology, and Application Software	2-8
Security	2-8
Database	2-8
Implementation, Configuration, and Extensions	2-9
Patching and Upgrading	2-9
Batch Processing	2-9
Cloud Service Delivery and Performance	2-10
Support	2-10
Data Migration	2-11
Integration	2-11
Performance Guidelines	2-12
User Interfaces	2-12
General Topics	2-12
Functional Limitations and Restrictions	2-13
Common Functionality	2-13
Operational Readiness Advisory	2-16

Chapter 3

Implementation Support and Live Operate Services	3-1
Implementation Support Services	3-2
Live Operate Services	3-4

Chapter 4

Oracle Utilities Cloud Services	
Third Party Software and Licenses	4-1
Third Party Software Notices	4-2
Third Party Software Licenses	4-6
Third-Party Products	4-7
Notice Concerning Usage of ANTLR and ANTLR4	4-7
Notice Concerning Usage of Apache Software	4-7
Notice Concerning Usage of ASM	4-11

Notice Concerning Usage of CodeMirror.....	4-11
Notice Concerning Usage of DOM4J	4-12
Notice Concerning Usage of FullCalendar	4-13
Notice Concerning Usage of Hibernate ORM 5.6.15-FINAL	4-13
Notice Concerning Usage of ICU4J.....	4-20
Notice Concerning Usage of Jaxen	4-27
Notice Concerning Usage of JQuery (3.7.0)	4-28
Notice Concerning Usage of SLF4J	4-28
Notice Concerning Usage of Staxmate.....	4-29
Notice Concerning Usage of Swagger-UI	4-29
Notice Concerning Usage of XStream	4-29
Notice Concerning Usage of natCompare.js	4-30

Chapter 1

Oracle Utilities Market Settlements Management Cloud Service Overview Guide

Welcome to the Oracle Utilities Market Settlements Management Cloud Service Overview Guide. This document provides an overview of the Oracle Utilities Market Settlements Management Cloud Service, including:

- [Oracle Utilities Market Settlements Management Cloud Service Overview](#)
- [Implementation Support and Live Operate Services](#)
- [Oracle Utilities Cloud Services Third Party Software and Licenses](#)

Chapter 2

Oracle Utilities Market Settlements Management Cloud Service Overview

This chapter provides an overview of the Oracle Utilities Market Settlements Management Cloud Service, including:

- [Welcome to Oracle Utilities Market Settlements Management Cloud Service](#)
- [Oracle Utilities Market Settlements Management Cloud Service Applications](#)
- [Oracle Utilities Market Settlements Management Cloud Service Documentation](#)
- [Supported Client Platforms and Browsers](#)
- [Supported Integrations](#)
- [High-Level Roles and Responsibilities](#)
- [Performance Guidelines](#)
- [Functional Limitations and Restrictions](#)
- [Operational Readiness Advisory](#)

Welcome to Oracle Utilities Market Settlements Management Cloud Service

Oracle Utilities Market Settlements Management Cloud Service provides functionality for reconciling the difference between a supplier's energy purchases and its customer's usage.

Oracle Utilities Market Settlements Management Cloud Service comprises the following functional areas:

- **Settlement Units:** Definition of data dimensions for key market settlement processes to define the "lowest common denominator set" of aggregation dimensions for the market settlement processes.
- **Load Forecasting:** Creation and maintenance of usage forecasts and back cast forecasts based on weather data or other variables to make informed estimates of future usages.
- **Aggregation:** Aggregation of complex meter settlement data sets by market participants such as total consumption by supplier for an initial settlement period.
- **Usage Calculation:** Summarization and transformation of usage and settlement calculations.
- **Standalone Data:** Data received from external applications used in settlement calculations such as weather data from a weather station or zonal load data from an independent system operator (ISO).
- **Market Awards and Contracts:** Definition of awards used to allocate load to various market participants and agreements with market operators (such as an Independent System Operator, or ISO) related to how settlement calculation results are sent to the market.
- **Oracle Utilities Cloud Service Foundation:** tools used to orchestrate and automate infrastructure related processes and migrate data from legacy applications into the cloud service.
- **Oracle Utilities Analytics Visualization:** a suite of analytics applications that provides access to data for self service exploration, discovery, visualization, and analysis. It includes rich pre-built analytical data models, metrics, and key performance indicators that allow you to derive strategic insights from your data.

Oracle Utilities Market Settlements Management Cloud Service Applications

Oracle Utilities Market Settlements Management Cloud Service includes the following applications:

- Oracle Utilities Market Settlements Management
- Oracle Utilities Cloud Service Foundation
- Oracle Utilities Analytics Visualization
- Oracle Utilities Testing Accelerator
- Oracle Analytics Publisher
- Oracle REST Data Services

Oracle Utilities Market Settlements Management Cloud Service Documentation

Configuration and use of Oracle Utilities Market Settlements Management Cloud Service is described in the following documentation:

- Oracle Utilities Market Settlements Management Cloud Service User Guides, comprising:
 - Oracle Utilities Meter Solution v2.5.0.1.3 Business User Guide
 - Oracle Utilities Meter Solution v2.5.0.1.3 Administrative User Guide
- Oracle Utilities Cloud Services 23C documentation, including:
 - Oracle Utilities Cloud Service Foundation Administrative User Guide
 - Oracle Utilities Cloud Services Administration Guide
 - Oracle Utilities Cloud Services Database Changes Guide
 - Oracle Utilities Cloud Services Frequently Asked Questions Guide
 - Oracle Utilities Cloud Services Implementation Guide
 - Oracle Utilities Cloud Services Live Operations Guide
 - Oracle Utilities Cloud Services Security Guide
- Oracle Utilities Cloud Services Activation Guide
- Oracle Utilities Cloud Services Cloud Operations Guide
- Oracle Utilities Cloud Services Update Policy Guide
- Oracle Utilities Testing Accelerator documentation
- Oracle Utilities Analytics Visualization User Guide

Supported Client Platforms and Browsers

Users access Oracle Utilities Market Settlements Management Cloud Service via a supported web browser.

Oracle Utilities Market Settlements Management Cloud Service supports the following operating system & web browser combinations:

Operating System	Web Browser
Windows 10	Firefox ESR 102+ Google Chrome for Enterprise 106+ Microsoft Edge (Chromium-based) 106+ (see the Microsoft Edge Release Schedule for more information)

The recommended monitor resolution is 1920 X 1080 or higher with the browser zoom level set at 100%. The application can be used with lower resolution monitors and/or at a greater than 100% browser zoom level, but users may need to use horizontal scrolling on some pages.

Supported Integrations

Oracle Utilities Market Settlements Management Cloud Service supports integration with a number of other products. See the following sections for details:

- [Using Oracle Utilities Testing Accelerator with Oracle Utilities Market Settlements Management Cloud Service](#)

Using Oracle Utilities Testing Accelerator with Oracle Utilities Market Settlements Management Cloud Service

Oracle Utilities Testing Accelerator (OUTA) is a testing framework based on Java and Selenium used for automated testing of Oracle Utilities applications and cloud services. It allows for developing, managing and executing web service and user interface based automated tests, using meta-data based approach, without any programming language. Oracle Utilities Testing Accelerator has a user friendly graphical web interface that enables people without much programming knowledge to develop automated test flows.

Along with the automation framework, Oracle Utilities Testing Accelerator includes an accelerator that supports automated testing of Oracle Utilities cloud services, such as Oracle Utilities Customer Cloud Service and Oracle Utilities Work and Asset Cloud Service. The accelerator contains several hundred re-usable components that are the modular building blocks of an automated test flow. The Oracle Utilities Testing Accelerator user interface allows for these components to be laced together to form an automated test flow. The test data can then be coupled to the automated test flow and executed using the browser-based execution engine within the Oracle Utilities Testing Accelerator web application.

The browser-based test execution engine should be used for the execution of web service based test automation flows. In addition to the web interface, Oracle Utilities Testing Accelerator includes an eclipse IDE plugin that supports the execution of tests from local desktops or laptops. This mode should be used for executing user interface based tests that are developed using the Oracle Utilities Testing Accelerator web application. The script generation engine in the Oracle Utilities Testing Accelerator web interface auto generates the scripts for user interface based tests, which can then be executed via the Eclipse IDE (with the Oracle Utilities Testing Accelerator plugin).

The following features of Oracle Utilities Testing Accelerator have been enhanced so that they work with Oracle Utilities cloud services:

1. For executing the web service based test automation flows, the Flow Configuration that contains the web service URL along with additional properties such as smtp server, etc is pre-defined to work with Oracle Utilities cloud services. Users need not create a new Flow Configuration.

See the **Executing Test Flows** and **Executing Test Flows Using a Browser** sections in the *Oracle Utilities Testing Accelerator User Guide* for more information.

2. For generating components using the component generator tool, the complete WSDL URL need not be specified in the field, only the web service end point name needs to be provided.

See the **Development Accelerator Tools** and **Component Generation Tool** sections in the *Oracle Utilities Testing Accelerator User Guide* for more information.

-
3. For fetching test data from the Oracle Utilities cloud services, the WSDL URL need not be specified, only the web service end point name should be specified.

See the **Fetching Test Data From an Utilities Application** section in the *Oracle Utilities Testing Accelerator User Guide* for more information.

4. Oracle Utilities Testing Accelerator is integrated with Oracle Cloud Infrastructure Identity and Access Management (IAM) with Identity Domains when using it with cloud services. The management of users in Oracle Utilities Testing Accelerator web application should be done through IAM. See **Identity and Access Management with Identity Domains** in the *Oracle Utilities Cloud Services Administration Guide* for more information about creating and managing users.

High-Level Roles and Responsibilities

This section outlines high-level roles and responsibilities involved in the deployment, configuration, and maintenance of Oracle Utilities cloud services, and the party responsible for each. The **Owner** column in the tables below indicates the party responsible for each role and responsibility.

Hardware, Storage, Technology, and Application Software

Role and Responsibility	Owner
Provide, deploy and monitor hardware and storage	Oracle
Provide, deploy, run and monitor all required technology (e.g containers, operating systems, databases, clustering, monitoring, tracing)	Oracle
Provide, deploy, run and monitor all Oracle Utilities base application software	Oracle

Security

Role and Responsibility	Owner
Monitor cloud service infrastructure security	Oracle
Administer Oracle network security	Oracle
Administer customer network security, including integrating with the Oracle networks	Customer
Configure & maintain cloud service users and access	Customer
Integrate with Oracle networks	Customer
Pro-actively monitor and maintain unexpired, secured, and valid TLS / SSL Certificates on customer-specific DNS entries requested for outbound traffic from the Oracle Cloud Infrastructure (OCI) network.	Customer

Database

Role and Responsibility	Owner
Database administration services (monitoring, administration, etc)	Oracle
Backup and Restore	Oracle
Backup retention	Oracle
Data replication for Disaster Recovery (where applicable)	Oracle

Role and Responsibility	Owner
Disaster Recovery database fail-over	Oracle
Refresh of TEST DB from PROD (upon request and within prescribed limits)	Oracle
Information Lifecycle Management	Customer

Implementation, Configuration, and Extensions

Role and Responsibility	Owner
Plan and execute implementation project	Customer
Perform configuration of enterprise software features and functions	Customer
Execute functional, system, load and performance testing of configuration and extensions	Customer
Ensure operational readiness	Customer

Patching and Upgrading

Role and Responsibility	Owner
Patch and upgrade underlying infrastructure software	Oracle
Patch and upgrade Oracle Utilities base application software	Oracle
Decide the cloud service upgrade schedule (within prescribed limits)	Customer
Trigger environment upgrades (Development, Test and Production)	Customer
Perform regression testing of configuration and extensions after patching / upgrades	Customer
Make changes as needed in custom configuration and extensions after patching / upgrades	Customer

Batch Processing

Role and Responsibility	Owner
Monitor underlying batch infrastructure	Oracle
Provide infrastructure logs for batch incidents	Oracle
Resolve infrastructure batch issues	Oracle
Determine batch schedule	Customer

Role and Responsibility	Owner
Monitor batch stream/job completion	Customer
Perform first level investigation of batch issues	Customer
Provide customer logs of batch incidents	Customer
Resolve functional batch issues and stream/job restart	Customer
Resolve data issues	Customer

Cloud Service Delivery and Performance

Role and Responsibility	Owner
Provide scalable and elastic cloud services	Oracle
Provide core services and tools, including: <ul style="list-style-type: none"> • Embedded infrastructure and platform services • An extensible application framework • Highly configurable product features and functions • Configuration Migration Assistant • Data Migration Tools • Generalized/Specialized Data Extract 	Oracle
Ensure quality of maintenance packs and updates	Oracle
Resolve performance issues related to core services and tools	Oracle
Configure features, and implement extensions	Customer
Perform functional and performance testing of configuration and extensions	Customer
Perform analysis of performance issues	Customer
Resolve performance issues related to configuration, extensions and data	Customer
Subscribe to any additional resources required	Customer

Support

Role and Responsibility	Owner
Triage, analyze, and resolve issues with the cloud service	Oracle
Triage, analyze, and resolve issues with configuration and extensions	Customer
Raise Service Requests via My Oracle Support and provide all requested information	Customer

Data Migration

Role and Responsibility	Owner
Provide data migration tools (SQL Loader, validation batch controls and so on)	Oracle
Provide guidelines on data migration via online documentation	Oracle
Triage, analyze, and resolve issues with the data migration tools via My Oracle Support	Oracle
Define, review and execute data migration strategy in-line with the provided data migration tools	Customer
Review and follow documentation on data migration	Customer
Validate the Cloud Subscription Metrics with data migration scope metrics	Customer
Configuration and development work required for data migration	Customer
Data cleansing	Customer
Plan and execute data migration mock runs (Oracle suggests a minimum of three) to confirm successful testing results and ensure a clean data migration process.	Customer
Triage, analyze, and resolve data migration issues	Customer
Plan, review and execute cut-over activities	Customer
Create and execute plug-in driven batch programs to correct data errors during critical project milestones and after go-live, if needed	Customer

Integration

Role and Responsibility	Owner
Provide productized integrations (where explicitly agreed)	Oracle
Integrate Oracle Utilities cloud services with all other services or applications	Customer

Performance Guidelines

This section provides a number of performance-related guidelines and recommendations to take into account when implementing Oracle Utilities Market Settlements Management Cloud Service. This includes guidelines related to the following:

- [User Interfaces](#)
- [General Topics](#)

User Interfaces

- **Zones:** For better performance, user interface zones should be initially collapsed when not required for 90% or more of business processes. The initial state of zones (collapsed or not) can be controlled via the **Portal Preferences** tab on the **User** portal.
- **Number of Records:** The number of records returned to the user interface for a zone should be limited to 50 rows when building custom zones against large transactional tables.
- **Troubleshooting Screens:** To troubleshoot a screen in the user interface, click **Preferences** in the top right corner of the application and choose the **Portal Preferences** tab. Choose the appropriate portal and set all zones to "Initially Collapsed". Navigate back to the screen that has performance issues, expand the zones one by one, and measure the execution time of each zone. This should be an accurate step-by-step representation of the full screen execution.
- **Performance Optimization:** For optimal user interface performance, laptop users should ensure their computer is in high performance mode.

General Topics

- **Performance Tests:** Performance tests should be performed on all configurations to ensure daily processing windows are adequate. This includes configurations for: aggregations processes and settlement calculations.
- **Solution Changes:** Oracle should be consulted before significant solution changes are made. For example, adding new meter channels, adding a large number of meters, network changes, or new integrations, etc.

Functional Limitations and Restrictions

This section outlines some specific limitations and restrictions regarding the functionality of Oracle Utilities Market Settlements Management Cloud Service beyond those identified in the service description, including:

- [Common Functionality](#)

Common Functionality

Oracle Utilities Meter Solution Cloud Service includes functionality used by multiple Oracle Utilities cloud services. Some of the functionality provided with Oracle Utilities Meter Solution Cloud Service is restricted, and can only be used if specific cloud services have been licensed. The table below indicates the specific functional areas included with each of the listed cloud services.

- "Yes" indicates that the functional area is included with the product.
- "No" indicates that the functional area is not included with the product.

In order to use functionality listed as “not included”, customers must license the product that includes the desired functionality.

Functionality	Oracle Utilities Meter Solution Cloud Service	Oracle Utilities Market Settlements Management Cloud Service
Measurement and Service Data Model	Yes	Yes
Validation and Editing Functionality	Yes	Yes
Estimation and Forecasting Functionality	Yes	Yes
Measurement Services and Aggregations	Yes	Yes
Consumer Level Usage and Bill Determinant Calculations	Yes	No
Wholesale Usage Bill Determinant Calculations	Yes	Yes
Usage Calculations for Settlement Processes	No	Yes
Usage and Event Upload Statistics Processing	Yes	Yes
Smart Meter Command Processing	Yes	No
Outage Integration	Yes	No
Service Order Management	Yes	No
DataConnect	Yes	No
Settlement Processes	No	Yes
Wholesale Gas Operations	No	Yes

Functional Areas

The table below describes the functional areas provided with the Oracle Utilities meter solution products.

Functional Area	Description
Measurement and Service Data Model	The measurement and service data model contains database tables and related functionality used to define and store meters, devices, unmetered items, service points, and measurement data.
Validation and Editing Functionality	The engine that provides the core functionality used to run validation and editing rules on usage data. This does not include technical validations such as valid format, valid number of readings, and so on.
Estimation and Forecasting Functionality	Processes to estimate missing usage and forecast future energy use.
Measurement Services and Aggregation	Measurement services are used to process meter reading data and manipulate measurements to support billing or other downstream processes.
Consumer Level Usage and Bill Determinant Calculations	The usage engine and usage rules provide the core functionality used to perform consumer usage and bill determinant calculations based on measurement data.
Wholesale Usage Bill Determinant Calculations	The usage engine and usage rules provide the core functionality used to perform settlement and wholesale billing calculations based on measurement data. The term wholesale relates to purchasing and selling large quantities of energy between energy companies.
Usage Calculations for Settlement Processes	The usage engine and usage rules provide the core functionality used to perform settlement.
Usage and Event Upload Statistics Processing	Processing and compiling upload statistics related to upload of usage and device events.
Smart Meter Command Processing	Executing smart meter commands and communicating with a head-end system for purposes of issuing commands such as remote connect, commission meter, etc.
Outage Integration	Communicating with Oracle Utilities Network Management System, including sending/receiving bulk ping commands, receiving device events from Oracle Utilities Meter Solution Cloud Service, and suppression of device event notifications (allowing a suppression activity to be configured for a meter or service point so that specified device event notifications will not be sent to Oracle Utilities Network Management System).
Service Order Management	Orchestration of service orders that involve field work and/or smart meter commands through integration with customer information systems, mobile field work systems, and head-end systems.
DataConnect	Components used to extract interval measurements data and master data for integration with external energy management systems.

Functional Area	Description
Settlement Processes	Components used for settlement processes: schedules, unaccounted for energy (UFE) calculations, capacity calculations, procurement, and true up processes.
Wholesale Gas Operations	Components used for wholesale gas operations: nominations, bids, scheduling and transportation.
Forecasting Rules	Rules used to forecast future energy use.

Operational Readiness Advisory

This section outlines suggested validations as part of operational readiness testing:

- Confirm batch stability, day over day execution according to your production schedule, and that performance is within acceptable production window.
- Leverage production converted data, along with actual production files for critical batch inputs
- Review daily To Do entry volumes and confirm them to be acceptable based on available staffing
- Refresh database partitioning prior to go live

Chapter 3

Implementation Support and Live Operate Services

This chapter describes implementation support and live operate services for Oracle Utilities Market Settlements Management Cloud Service:

- [Implementation Support Services](#)
- [Live Operate Services](#)

Implementation Support Services

Implementation Support Services are services that relate to the initial set up of Oracle Utilities cloud services. If Implementation Support Services are included in your Oracle Utilities cloud service(s), it will be stated in the relevant services descriptions.

The scope of the Implementation Support Services provided by Oracle is limited and currently includes (but it not limited to) the following:

Oracle will work to:

- Provide pre-configured templates (where available). These templates may be limited in scope (and may not completely align with the scope of the implementation project) and may only be available in the English language.
- Provide Utility Reference Model and other documentation describing the business processes that are the basis for the template configuration.
- To the extent necessary and under exceptional circumstances, execute scripts (authored by the customer) to resolve data issues.
 - Scripts submitted for execution to correct data issues will be subject to review for compliance with Oracle's Software Security Assurance standards. Scripts that do not comply will be returned for correction; resubmission will require a further compliance review with approval before execution will be scheduled.
 - There is a limit of four (4) script reviews in any calendar month. Review requests beyond this entitlement may be subject to additional fees.

Customers/Implementers retain complete responsibility for all other aspects of implementing the cloud service, including (but not limited to):

- Overall setup project management, including responsibility for management of the scope, the project plan/schedule and budget.
- End-user training activities and organizational change management.
- Leading and managing the user system review.
- Designing and testing all configurations and extensions to ensure they do not adversely affect performance.
- Identifying, designing, documenting and implementing any business process changes and system operation processes.
- Coordinating with external vendors or service providers to manage dependencies that could impact the overall project scope and schedule.
- Designating a project manager who shall be responsible for coordinating all customer/implementation related activities and responsibilities with respect to provisioning these Oracle Cloud Services.
- Business process change activities including end-user communication (e.g., status updates, newsletters, forums, etc.).
- Planning and executing all testing activities.
- All cut-over and roll-out activities.
- Business intelligence or data warehouse implementation/integration (if required).

-
- Procuring, setting up or otherwise provisioning any additional hardware, software or services as required.
 - Providing any network hardware and/or software that may be required to connect to the Oracle Utilities cloud service(s).
 - All data conversion/migration/cleansing activities such as:
 - Extracting, transforming and loading data into migration staging tables
 - Using cloud service data conversion tools (where available) to load data into the production environment
 - Creating or updating any required validation scripts
 - Any/all data cleansing activities that may be required (NB: these must be done in the source application(s) and not directly in the cloud service environment(s))
 - Providing all in-scope data conversions and interfaces in formats supported by the relevant Oracle Utilities cloud service(s).
 - The following interface/integration related activities:
 - Building and testing of any interfaces to or from the Oracle Utilities cloud service(s) (unless stated otherwise)
 - Any ongoing synchronization and interface monitoring activities between customer owned Customer Information System(s) (CIS) and Oracle Utilities cloud service(s)
 - Complete end to end integration flows using template interfaces
 - Any configuration of interfaces external to the Oracle Utilities cloud service(s) that are required to match the published specification for interfacing with the Oracle Utilities cloud service(s)

The provision of these Implementation Support Services is contingent on the following:

- Any integration middleware used to implement any integration will not be hosted within any Oracle Utilities cloud service(s).
- Turnaround time will be no longer than two (2) working days unless otherwise agreed. Turnaround time refers to time taken by the customer/implementation team to respond to and confirm design elements and decision points during the performance of the Implementation Support Services.

Live Operate Services

Live Operate services are services that Oracle provides to assist you with the ongoing operation of supported Oracle Utilities cloud services, once live and in production. If Live Operate Services are included in your Oracle Utilities cloud service(s), it will be stated in the relevant services descriptions.

The scope of the Live Operate Services provided by Oracle is limited and currently includes the following:

Oracle will work to:

- Assign a Service Delivery Manager ("SDM") to manage delivery of the Oracle Utilities cloud service(s). The SDM will be the primary point of contact, will act as the first point for escalations, will monitor the progress of any related service requests ("SR") and confirm that all Oracle Utilities cloud services are performed in accordance with targets.
- Provide access to information about incidents and changes made to any of your Oracle Utilities cloud service environment(s).
- Upon request, create and deliver a Quarterly Status Report summarizing the activities undertaken over the past quarter and those scheduled as major future events.
- Upon request, offer quarterly meetings with customer/implementation oversight team to present, review and discuss the Quarterly Status Report.
- Monitor infrastructure and application availability and resolve any incident that is within Oracle's scope or responsibility.
- Provide primary Help Desk Services from 08:00 to 17:00 your local time on Oracle working days.
- Respond to severity 1 incidents 24 hours per day, 365 days per year.
- Provide incident management and problem management services for events related to Oracle Utilities Cloud Services, including:
 - Analyzing issues and resolving any incidents that are within Oracle's scope or responsibility
 - Escalating any issues not within Oracle's scope or responsibility to you for resolution
 - Provide infrastructure logs to assist in the diagnosis and remediation of incidents within your scope or responsibility. NB: these logs may be scrubbed for security purposes and other sensitive data.

Customers remain completely responsible for all other aspects of using or otherwise operating the cloud service. Examples of customer obligations in this regard would be to:

- Assign a manager to act as the primary conduit for all issues relating to the delivery of these services.
- Provide Oracle with the dates for key business and technology events (i.e. testing calendar, refresh schedule etc.) at least thirty (30) days prior to the event.
- Assign appropriate resources to support your activities.
- Support scheduling of meetings as required.
- Participate in all scheduled meetings.

-
- Manage all activities, including:
 - Prioritizing work activities
 - Providing coordination across any teams and/or interested parties external to Oracle.
 - Escalation of issues to the Oracle SDM in a timely manner.
 - Providing any information required to progress service requests. Oracle is not responsible for meeting any agreed (or stated) targets or objectives if required or requested information is not forthcoming in a timely manner.
 - Assigning appropriate resources to conduct all required acceptance testing for all software packages delivered.
 - Accepting all software packages prior to promotion to the Production environment.
 - Maintaining a contact list for all persons performing governance functions.
 - Participating in Oracle's internal quality assurance processes on a mutually agreed schedule.
 - Manage the Oracle Utilities cloud services, including:
 - Defining and (as necessary) modifying batch schedules to meet business needs.
 - Monitoring batch and interface processes to confirm and verify completion.
 - Defining, implementing, testing and deploying any changes to the configuration and extensions required to:
 - Resolve incidents or problems within the customers scope or responsibility
 - Meet evolving business needs
 - Conform with upgrades, patches or any other Oracle Utilities cloud service requirements or prerequisites.
 - Notify Oracle of any incidents detected.
 - Action each SR in accordance with the relevant Oracle Cloud Hosting and Delivery Policies.
 - Establish the method of communication between the incident management team and the Oracle team for each incident.
 - Redirect any SRs to the correct (non- Oracle) support team if the SR is not within the scope of the Oracle Utilities cloud service(s).
 - Assist the Oracle team with SR analysis of data originating outside the applications.
 - Correct business data as reasonably requested by Oracle to achieve closure of an identified problem.
 - Monitor customer network and network connections to ensure sufficient bandwidth and performance.
 - Conduct all functional, regression, performance, system integration, acceptance and/or user acceptance testing as appropriate, and accept and approve all software changes, prior to the production roll out of any change, in accordance with any agreed-on release management process, for any change resulting from:

-
- An incident remedy or fix, or
 - Any service pack update or upgrade.
 - Provide authorizations and/or validations for data correction and/or adjustments to the supported environments.
 - Apply configuration changes that are within the customer's or implementation's scope as recommended by Oracle to prevent recurring incidents.
 - At Oracle's request, provide approval through the environment change management process for the installation of fixes to prevent recurring incidents.
 - Initiate documented escalation processes when the urgency of the incident has increased due to business requirements.
 - Provide incident support where the remediation is within Oracle's scope or responsibility, specifically:
 - Provide Oracle with access to the user who reported the problem.
 - Provide all information as reasonably requested by Oracle and participate in diagnostics.
 - Provide a test case and access to an environment where the SR incident is reproducible.
 - Provide Oracle, as necessary, with access to any other support teams.
 - Acknowledge that the supplied break-fix resolves the incident or problem and accept the SR closure.
 - Provide internal approvals to Oracle before the migration of any change recommended by Oracle into a production environment.
 - When an incident or problem is determined by Oracle to be unrelated to an Oracle Utilities cloud service or to be caused by data problems arising from data conversion or some other error, a separate, paid contract may be required to cover Oracle's time spent investigating and, if relevant, correcting the problem at Oracle's prevailing time and materials rates, and to reimburse Oracle for all reasonable out of pocket expenses.

Chapter 4

Oracle Utilities Cloud Services Third Party Software and Licenses

This chapter information regarding third-party software used in Oracle Utilities cloud services, including:

- [Third Party Software Notices](#)
- [Third Party Software Licenses](#)

Third Party Software Notices

Required notices for open source or other separately licensed software products or components distributed in this product are identified in the following table along with the applicable licensing information. Additional notices and/or licenses may be found in the included documentation or readme files of the individual third party software.

Note: A copy of each license appears in the Third-Party License section, unless otherwise noted

Provider	Component	Version	License Information
Adam Shaw	FullCalendar	5.11.5	Copyright (c) 2021 Adam Shaw
Apache Software Foundation	Ant	1.10.11	Copyright 1999-2021 The Apache Software Foundation The <sync> task is based on code Copyright (c) 2002, Landmark Graphics Corp that has been kindly donated to the Apache Software Foundation.
Apache Software Foundation	cglib	3.3.0-975e481	
Apache Software Foundation	Commons Beanutils	2.0.0-ca7cf2c	Copyright 2000-2019 The Apache Software Foundation
Apache Software Foundation	Commons CLI	1.5.0	Copyright 2002-2021 The Apache Software Foundation
Apache Software Foundation	Commons Codec	744c1c9	Copyright 2002-2022 The Apache Software Foundation
Apache Software Foundation	commons collections	3.2.2	Copyright 2001-2015 The Apache Software Foundation
Apache Software Foundation	Commons Fileupload	1.5	Copyright 2002-2021 The Apache Software Foundation
Apache Software Foundation	Commons IO	2.11.0	Copyright 2002-2021 The Apache Software Foundation
Apache Software Foundation	Commons Lang	3.12.0	Copyright 2001-2023 The Apache Software Foundation
Apache Software Foundation	Commons Logging	1.2-1e55e8f	Copyright 2003-2016 The Apache Software Foundation
Apache Software Foundation	Commons Text	1.10.0	Copyright 2014-2022 The Apache Software Foundation

Provider	Component	Version	License Information
Apache Software Foundation	Groovy	3.0.7	Copyright 2003-2020 The Apache Software Foundation
Apache Software Foundation	HttpCore	5.1.3	Copyright 2005-2020 The Apache Software Foundation
Apache Software Foundation	HttpComponents Client	5.1.13	Copyright 1999-2022 The Apache Software Foundation
Apache Software Foundation	Log4j Core	2.17.1	Copyright 1999-2021 Apache Software Foundation
Apache Software Foundation	Log4j API	2.17.1	Copyright 1999-2021 Apache Software Foundation
Apache Software Foundation	Velocity Engine	2.3	
Apache Software Foundation	XMLBeans	4.0.0	
Apache Software Foundation	XMLSchema Core	2.3.0	Copyright 2004-2015 The Apache Software Foundation
Codehaus	Jettison	1.5.4	Copyright 2006 Envoi Solutions LLC 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
Connect2id Ltd	Nimbus JOSE+JWT	9.31	Copyright 2012-2022, Connect2id Ltd.
FasterXML, LLC	jackson-annotations	2.14.0-rc2	Copyright © 2007–2022 FasterXML. All rights reserved.
FasterXML, LLC	jackson-core	2.14.0-rc2	Copyright © 2008–2022 FasterXML. All rights reserved.
FasterXML, LLC	jackson-databind	2.14.0-rc2	Copyright © 2007–2022 FasterXML. All rights reserved.
INRIA, France Telecom	ASM	9.3	Copyright (c) 2000-2011 INRIA, France Telecom All rights reserved.
Joe Walnes	XStream	1.4.20	Copyright (c) 2003-2006, Joe Walnes Copyright (c) 2006-2020, XStream Committers All rights reserved.

Provider	Component	Version	License Information
JS Foundation and other contributors	jQuery	3.7.0	Copyright JS Foundation and other contributors, https://js.foundation/
JSON-SMART authors	accessors-smart	2.4.11	Copyright 2011-2023 JSON-SMART authors
JSON-SMART authors	json-smart	2.4.11	Copyright 2011-2023 JSON-SMART authors
Marijn Haverbeke	CodeMirror	5.65.10	Copyright (C) 2017 by Marijn Haverbeke <marijnh@gmail.com> and others
Mario Heiderich	DOMPurify	2.4.5	Copyright 2015 Mario Heiderich
Martin Pool	natCompare.js	b7da2dc	Copyright (C) 2005 by SCK-CEN (Belgian Nuclear Research Centre)
MetaStuff, Ltd.	Dom4j	2.1.3	Copyright 2001-2016 (C) MetaStuff, Ltd. All Rights Reserved.
Oracle	JavaScript Extension Toolkit (JET)	14.1.4	Copyright (c) 2014, 2023 Oracle and/or its affiliates
Public Domain	tz_database	2023c	
Quality Open Software (QOS.ch)	slf4j-api	2.0.3	Copyright (c) 2004-2007 QOS.ch All rights reserved.
Red Hat, Inc., JBoss Community	JBoss Logging	3.4.3	
Red Hat Middleware LLC	hibernate-core	5.6.15.Final	Copyright (c) 2001-2021 Red Hat, Inc. All Rights Reserved. Copyright (c) 2008, Red Hat Middleware LLC or third-party contributors indicated by the @author tags or express copyright attribution statements applied by the authors. All third-party contributions are distributed under license by Red Hat Inc.
Red Hat Middleware LLC	hibernate-ehcache	5.6.15.Final	Copyright (c) 2008, Red Hat Middleware LLC or third-party contributors indicated by the @author tags or express copyright attribution statements applied by the authors. All third-party contributions are distributed under license by Red Hat Inc.
SmartBear Software	swagger-ui	4.14.3	Copyright 2020-2021 SmartBear Software Inc.
Tatu Saloranta	StaxMate	2.4.0	Copyright (c) 2007, Tatu Saloranta All rights reserved.
Terence Parr	ANTLR	2.7.7	Copyright (c) 2005-2009 Terence Parr All rights reserved. BSD License: http://opensource.org/licenses/BSD-3-Clause .
Terence Parr	ANTLR4	4.9.2	Copyright (c) 2012-2017 The ANTLR Project. All rights reserved.

Provider	Component	Version	License Information
Terracotta, Inc.	Ehcache	2.5.2	Copyright 2001-2004 The Apache Software 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 .
The Unicode Consortium	ICU4J	69.1	Copyright © 1991-2020 Unicode, Inc. All rights reserved. Distributed under the Terms of Use in https://www.unicode.org/copyright.html .
The Werken Company	Jaxen	1.2.0	Copyright 2003-2006 The Werken Company. All Rights Reserved.

Third Party Software Licenses

This section provides license and copyright information for the associated products. This includes the following:

- [Notice Concerning Usage of ANTLR and ANTLR4](#)
- [Notice Concerning Usage of Apache Software](#)
- [Notice Concerning Usage of ASM](#)
- [Notice Concerning Usage of CodeMirror](#)
- [Notice Concerning Usage of DOM4J](#)
- [Notice Concerning Usage of FullCalendar](#)
- [Notice Concerning Usage of Hibernate ORM 5.6.15-FINAL](#)
- [Notice Concerning Usage of ICU4J](#)
- [Notice Concerning Usage of Jaxen](#)
- [Notice Concerning Usage of JQuery \(3.7.0\)](#)
- [Notice Concerning Usage of SLF4J](#)
- [Notice Concerning Usage of Staxmate](#)
- [Notice Concerning Usage of Swagger-UI](#)
- [Notice Concerning Usage of XStream](#)
- [Notice Concerning Usage of natCompare.js](#)

Third-Party Products

The following sections provide notices and information about the third party products indicated.

Notice Concerning Usage of ANTLR and ANTLR4

[The BSD License]

Copyright (c) 2012-2017 The ANTLR Project. All rights reserved.

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 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.

Notice Concerning Usage of Apache Software

The following files are covered under the Apache 2.0 license:

- accessors-smart-2.4.11.jar
- apache-xmlbeans-4.0.0.jar
- cglib-3.3.jar
- commons-beanutils-core-2.0.0-ca7cf2c.jar
- commons-cli-5.1.3.jar
- commons-codec-744c1c9.jar
- commons-collections-3.2.2.jar

-
- commons-fileupload-1.5.jar
 - commons-io-2.11.0.jar
 - commons-lang-3.12.jar
 - commons-logging-1.2.jar
 - commons-text-1.10.0.jar
 - DOMPurify 2.4.5.zip
 - ehcache-core-2.5.2.jar
 - groovy-3.0.7.jar
 - httpcore-5.1.3.jar
 - jboss-logging-3.4.3.jar
 - jackson-annotations-2.14.0
 - jackson-core-2.14.0
 - jackson-databind-2.14.0
 - jettison-1.5.4.jar
 - json-smart-v2.4.11.jar
 - jcl-over-slf4j-2.0.3.jar
 - log4j-api-2.17.1.jar
 - log4j-core-2.17.1.jar
 - nimbus-jose-jwt-9.31.jar
 - velocity-2.3.jar
 - xmlschema-core-2.3.0.jar

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:

You must give any other recipients of the Work or Derivative Works a copy of this License; and

You must cause any modified files to carry prominent notices stating that You changed the files; and

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

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

Notice Concerning Usage of ASM

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.

Notice Concerning Usage of CodeMirror

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.

Notice Concerning Usage of DOM4J

Copyright 2001-2016 (C) MetaStuff, Ltd. All Rights Reserved.

Redistribution and use of this software and associated documentation ("Software"), with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain copyright statements and notices. Redistributions must also contain a copy of this document.
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 "DOM4J" must not be used to endorse or promote products derived from this Software without prior written permission of MetaStuff, Ltd. For written permission, please contact dom4j-info@metastuff.com.
4. Products derived from this Software may not be called "DOM4J" nor may "DOM4J" appear in their names without prior written permission of MetaStuff, Ltd. DOM4J is a registered trademark of MetaStuff, Ltd.
5. Due credit should be given to the DOM4J Project - <http://dom4j.sourceforge.net>

THIS SOFTWARE IS PROVIDED BY METASTUFF, LTD. AND CONTRIBUTORS "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 METASTUFF, LTD. OR ITS 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 Concerning Usage of FullCalendar

Copyright (c) 2021 Adam Shaw

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.

Notice Concerning Usage of Hibernate ORM 5.6.15-FINAL

Copyright (c) 2001-2021 Red Hat, Inc. All Rights Reserved.

Copyright (c) 2008, Red Hat Middleware LLC or third-party contributors indicated by the @author tags or express copyright attribution statements applied by the authors. All third-party contributions are distributed under license by Red Hat Inc.

This copyrighted material is made available to anyone wishing to use, modify, copy, or redistribute it subject to the terms and conditions of the GNU Lesser General Public License, as published by the Free Software Foundation.

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 Lesser General Public License for more details.

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

Notice Concerning Usage of ICU4J

COPYRIGHT AND PERMISSION NOTICE (ICU 58 and later)

Copyright © 1991-2020 Unicode, Inc. All rights reserved.

Distributed under the Terms of Use in <http://www.unicode.org/copyright.html>.

Permission is hereby granted, free of charge, to any person obtaining a copy of the Unicode data files and any associated documentation (the "Data Files") or Unicode software and any associated documentation (the "Software") to deal in the Data Files or Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Data Files or Software, and to permit persons to whom the Data Files or Software are furnished to do so, provided that either

(a) this copyright and permission notice appear with all copies of the Data Files or Software, or

(b) this copyright and permission notice appear in associated Documentation.

THE DATA FILES AND SOFTWARE ARE 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 THE DATA FILES OR 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 these Data Files or Software without prior written authorization of the copyright holder.

Third-Party Software Licenses

This section contains third-party software notices and/or additional terms for licensed third-party software components included within ICU libraries.

1. ICU License - ICU 1.8.1 to ICU 57.1

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1995-2016 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.

2. Chinese/Japanese Word Break Dictionary Data (cjdict.txt)

The Google Chrome software developed by Google is licensed under the BSD license. Other software included in this distribution is provided under other licenses, as set forth below.

The BSD License

<http://opensource.org/licenses/bsd-license.php>

Copyright (C) 2006-2008, 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.

The word list in cjdict.txt are generated by combining three word lists listed below with further processing for compound word breaking. The frequency is generated with an iterative training against Google web corpora.

Libtabe (Chinese)

- https://sourceforge.net/project/?group_id=1519
- Its license terms and conditions are shown below.

* IPADIC (Japanese)

- <http://chasen.aist-nara.ac.jp/chasen/distribution.html>
- Its license terms and conditions are shown below.

-----COPYING.libtabe ---- BEGIN-----

Copyright (c) 1999 TaBE Project.

Copyright (c) 1999 Pai-Hsiang Hsiao.

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 TaBE 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 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 (c) 1999 Computer Systems and Communication Lab,
Institute of Information Science, Academia
Sinica. 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 Computer Systems and Communication Lab 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 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 1996 Chih-Hao Tsai @ Beckman Institute,
University of Illinois

c-tsai4@uiuc.edu <http://casper.beckman.uiuc.edu/~c-tsai4>

-----COPYING.libtabe-----END-----

-----COPYING.ipadic-----BEGIN-----

Copyright 2000, 2001, 2002, 2003 Nara Institute of Science and Technology. All Rights Reserved.

Use, reproduction, and distribution of this software is permitted.

Any copy of this software, whether in its original form or modified, must include both the above copyright notice and the following paragraphs.

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.

-----COPYING.ipadic-----END-----

3. Lao Word Break Dictionary Data (laodict.txt)

Copyright (c) 2013 International Business Machines Corporation and others. All Rights Reserved.

Project: <http://code.google.com/p/lao-dictionary/>

Dictionary: <http://lao-dictionary.googlecode.com/git/Lao-Dictionary.txt>

License: <http://lao-dictionary.googlecode.com/git/Lao-Dictionary-LICENSE.txt>

(copied below)

This file is derived from the above dictionary, with slight modifications.

Copyright (C) 2013 Brian Eugene Wilson, Robert Martin Campbell.

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.

4. Burmese Word Break Dictionary Data (burmesedict.txt)

Copyright (c) 2014 International Business Machines Corporation and others. All Rights Reserved.

This list is part of a project hosted at:

github.com/kanyawtech/myanmar-karen-word-lists

Copyright (c) 2013, LeRoy Benjamin Sharon

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 Myanmar Karen Word Lists, 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.

5. Time Zone Database

ICU uses the public domain data and code derived from Time Zone Database for its time zone support. The ownership of the TZ database is explained in BCP 175: Procedure for Maintaining the Time Zone Database section 7.

7. Database Ownership

The TZ database itself is not an IETF Contribution or an IETF document. Rather it is a pre-existing and regularly updated work that is in the public domain, and is intended to remain in the public domain. Therefore, BCPs 78 [RFC5378] and 79 [RFC3979] do not apply to the TZ Database or contributions that individuals make to it. Should any claims be made and substantiated against the TZ Database, the organization that is providing the IANA Considerations defined in this RFC, under the memorandum of understanding with the IETF, currently ICANN, may act in accordance with all competent court orders. No ownership claims will be made by ICANN or the IETF Trust on the database or the code. Any person making a

contribution to the database or code waives all rights to future claims in that contribution or in the TZ Database.

6. Google double-conversion

Copyright 2006-2011, the V8 project 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.

Notice Concerning Usage of Jaxen

Copyright 2003-2006 The Werken Company. 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 Jaxen 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.

Notice Concerning Usage of JQuery (3.7.0)

Copyright JS Foundation and other contributors, <https://js.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.

Notice Concerning Usage of SLF4J

SLF4J source code and binaries are distributed under the MIT license.

Copyright (c) 2004-2007 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.

Notice Concerning Usage of Staxmate

Copyright (c) 2007, Tatu Saloranta

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 <organization> 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 <copyright holder> ``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 holder> 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 Concerning Usage of Swagger-UI

Copyright 2020-2021 SmartBear Software Inc.

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 apache.org/licenses/LICENSE-2.0

Notice Concerning Usage of XStream

XStream is open source software, made available under a BSD license.

Copyright (c) 2003-2006, Joe Walnes

Copyright (c) 2006-2020 XStream Committers

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 XStream 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 Concerning Usage of natCompare.js

Copyright (C) 2005 by SCK-CEN (Belgian Nuclear Research Centre)

Written by Kristof Coomans

Based on the Java version by Pierre-Luc Paour, of which this is more or less a straight conversion.

Copyright (C) 2003 by Pierre-Luc Paour

The Java version was based on the C version by Martin Pool.

Copyright (C) 2000 by Martin Pool

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:

1. 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.
2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.
3. This notice may not be removed or altered from any source distribution.

