

Using Oracle® SQL Developer Web



Release 18.1

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Using Oracle® SQL Developer Web, Release 18.1

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Primary Author: Celin Cherian

Contributing Authors: Chuck Murray, Mike Fitch

Contributors: Jeff Smith, Syme Kutz, Victor Martinez, Renato Uriel Gutierrez Salas, Antonio Hernandez, Sofia Isadora Padilla Munoz, Miguel Sanchez Villafan, Tulika Das, Eric Paapanen

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Preface

This online help provides information about Oracle SQL Developer Web, a browser-based product that enables you to browse, create, edit, and delete database objects, run SQL statements and scripts, edit PL/SQL code, and manipulate and export data.

Audience

The online help is intended for those using the Oracle SQL Developer Web user interface. SQL Developer Web is available for users with access to Database Services in the Oracle Public Cloud.

Documentation Accessibility

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

Access to Oracle Support

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Product Accessibility

Oracle SQL Developer Web provides features to support accessibility. See *SQL Developer Web Accessibility Guide*.

Related Documents

For the desktop version of Oracle SQL Developer, see the *Oracle SQL Developer User's Guide*.

To download release notes, installation documentation, white papers, or other collateral for SQL Developer, go to the Oracle Technology Network (OTN) at

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

For the PL/SQL page on OTN, see <http://www.oracle.com/technetwork/database/features/plsql/>

Conventions

The following text conventions are used in this document:

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

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colorpicker 1.2.13

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jQuery layout 1.4.3

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1

SQL Developer Web

This online help introduces the main features of the Oracle SQL Developer Web interface.

- [About Oracle SQL Developer Web](#)
- [Accessing SQL Developer Web](#)
- [About the SQL Developer Web User Interface](#)
- [About Home](#)
- [Using the Worksheet](#)
- [Using DBA Features](#)
- [Monitoring OS](#)
- [Using Data Modeler](#)

1.1 About Oracle SQL Developer Web

Oracle SQL Developer Web provides a development environment and a database administration interface for Oracle Database in the Oracle Public Cloud.

The main features of SQL Developer Web are:

- Run SQL statements and scripts in the worksheet
- Export data
- Design Data Modeler diagrams using existing objects
- Enable database administrators to monitor and manage the database
- Provide DBAs with a real-time SQL monitoring interface

SQL Developer Web is a browser-based interface of Oracle SQL Developer and provides a subset of the features of the desktop version. For a complete integrated development environment, see [Oracle SQL Developer User's Guide](#).


1.2 Accessing SQL Developer Web

SQL Developer Web is bundled with Database Services available in the Oracle Public Cloud. Currently, SQL Developer Web is only available with Oracle Database 11g, 12c, and 18c databases in the Oracle Database Cloud Service.

Access to SQL Developer Web in a cloud service is provided through schema-based authentication. When using Oracle SQL Developer Web in an Oracle Database Cloud Service database deployment, sign in as a database user. Before signing in, enable the database user's schema for SQL Developer Web. For information on enabling schemas for SQL Developer Web, see [Administering Oracle Database Cloud Service](#).

In the SQL Developer Web login page, enter the user name and the password of the database user for the enabled schema. Ensure that you enter the user name in

uppercase (and not lowercase) characters. Click **Sign In**. If the schema was enabled to support the DBA features of SQL Developer Web, the Database Cloud Service Dashboard page is displayed. Otherwise, the SQL Developer Home page is displayed.

To go to the SQL Developer Web Home page from the Dashboard, click the Profile Selector icon  at the top left of the screen, and then click **SQL Developer**. Alternatively, you can directly access the SQL Developer Web features by clicking the relevant icon in the Dashboard Quick Links box.

1.3 About the SQL Developer Web User Interface

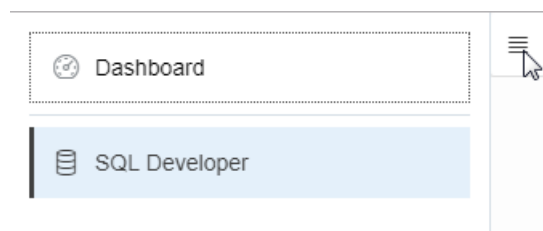
The following sections describe the header and the status bar of the SQL Developer Web user interface.

Header

The header contains the Profile Selector icon, the main menu and the schema drop-down list.



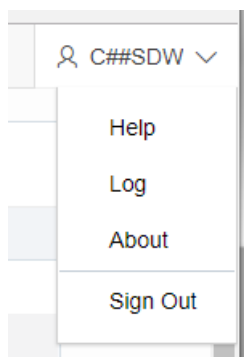
The Profile Selector icon provides options to select the profile that you want. Currently, the options are Dashboard and SQL Developer Web. If you are in the Dashboard page and want to go to SQL Developer Web, click the Profile Selector icon to select SQL Developer Web.



The main menu consists of the following tabs:

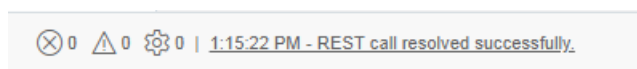
- **Home:** Displays widgets that provide a general overview of the activity and status in SQL Developer Web. See [About Home](#)
- **Worksheet:** Enables you to enter and execute SQL and PL/SQL commands. See [Using the Worksheet](#)
- **DBA:** Enables users with database administrator privileges to monitor and manage the Oracle database in the Cloud. See [Using DBA Features](#)
- **OS:** Provides monitoring information for the CPU utilization, memory, storage, and operating system processes for the compute node. See [Monitoring OS](#)
- **Data Modeler:** Enables you to create diagrams from existing database objects, generate DDL statements and create reports. See [Using Data Modeler](#)

The schema drop-down list includes a link to the help documentation, the log file (also available in the status bar), versions of the developer tools used for SQL Developer Web, and the option to sign out.



Status Bar

The status bar contains icons that link to log files. The three icons (Errors, Warnings, Processes) are filters that have been applied to the log file.



Errors, Warnings: Displays an Errors or Warnings dialog, which lists log entries from unsuccessful REST calls or from any other problem in the application.

Processes: Displays a Processes dialog, which logs REST calls that are either finished or ongoing.

Log notification link: Displays a Log dialog, containing log entries of the following types: Errors, Warnings, Processes, SQL History and SQL Result.

1.4 About Home

The Home page contains widgets that provide a general overview of the activity and status in SQL Developer Web.

- **Recently Modified Objects:** Displays a timeline of the created, modified, and dropped objects in the database.
- **Invalid Objects:** Displays the invalid objects in the database.
- **Table Stats Freshness:** Displays the time period since the tables were last analyzed.
- **My Worksheets:** Displays the worksheets that have been created or modified. You can click the name of the worksheet to open it in the Worksheet page.
- **My Diagrams:** Displays the Data Modeler diagrams that have been created or modified. You can click the name of the diagram to open it in the Data Modeler page.

1.5 Using the Worksheet

In SQL Developer Web, the worksheet is the code editor that is used to enter and execute SQL and PL/SQL statements.

You can use SQL and PL/SQL statements in the worksheet to create a table, insert data, create and edit a trigger, select data from a table, and save that data to a file. Some other features are syntax highlighting and error detection.

Database administrators can also access the worksheet from the Quick Links pane in the Dashboard.

The Worksheet page consists of the left pane for navigating worksheets and objects, the editor for executing SQL statements, and the output or result pane. These panes are described in the following sections.

- [Navigating Objects and Worksheets](#)
- [Executing SQL Statements in the Worksheet Editor](#)
 - [Shortcut Keys in the Worksheet](#)
 - [Creating or Editing a Table](#)
 - [Creating or Editing an Index](#)
 - [Creating or Editing a Sequence](#)
- [Viewing the Worksheet Output](#)

1.5.1 Navigating Objects and Worksheets

The Navigator tab in the left pane displays the saved objects for the selected schema. You can select the schema and object type, for which you want to view the objects, from the drop-down lists.

The Worksheets tab displays the worksheets that are saved in the browser. The worksheets displayed are dependent on the browser used (Internet Explorer, Mozilla Firefox, or Google Chrome) for the SQL Developer Web session at the time of saving the worksheet, and they will not be available in any other browser.

You can also search the contents of a saved worksheet or search for objects in the Navigator tab by name. The search functionality is not case-sensitive, retrieves all matching entries and does not require the use of wildcard characters.

To refresh the objects or worksheets list, click the Refresh icon next to the Search field. To display the help topic for the left pane, click the Help icon.

You can drag objects from the Navigator and drop them into the worksheet editor in the right pane:

- If you drag and drop a table or view, you are prompted to select one of the following SQL statements: Insert, Update, Select, or Delete. For example, if you choose Select, a Select statement is constructed with all columns in the table or view. You can then edit the statement, for example, modifying the column list or adding a WHERE clause.
- If you drag and drop a function or procedure, you can choose to insert the name or the PL/SQL code of the function or procedure in the worksheet. If you select the PL/SQL code, you can enter the parameters before inserting the code into the worksheet.

The context (right-click) menu for a worksheet consists of options such as Open and Delete.

The context menu for any object in the Navigator consists of:

- **Quick DDL:** Saves the DDL statements for creating the object, to a worksheet or to a text file.

- **Run:** Inserts the code for a selected function, procedure, or package into the worksheet. This command is available only for functions, procedures, and packages.

The context menu that is specific to object types consists of the following:

For a table:

- **New:** To create a new table for a specific schema.
- **Edit:** To edit an existing table for a specific schema.
- **Use as Template:** To create a new table by using an existing table for the initial content.
- **Add Index:** To create an index for a table.

See [Creating or Editing a Table](#).

For a sequence:

- **Add Sequence:** To create a sequence for a specific schema.
- **Edit Sequence:** To edit a sequence for a specific schema.

See [Creating or Editing a Sequence](#).

For an index:

- **Edit:** To edit an index for a specific table.

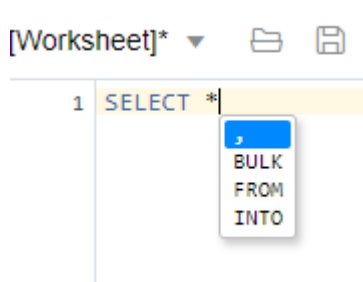
See [Creating or Editing an Index](#).

1.5.2 Executing SQL Statements in the Worksheet Editor

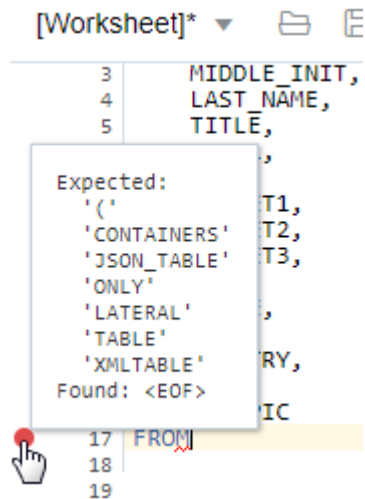
The worksheet editor in the right pane enables you to enter the SQL statements that you intend to execute. You can use SQL and PL/SQL statements to specify actions such as creating a table, inserting data, selecting data or deleting data from a table. For multiple statements, each non-PL/SQL statement must be terminated with either a semicolon or (on a new line) a slash (/), and each PL/SQL statement must be terminated with a slash (/) on a new line. SQL keywords are automatically highlighted.

For a list of the SQL*Plus statements that are supported by the SQL Worksheet, see [Supported SQL*Plus Statements](#).

If you press **Ctrl+Space**, the worksheet provides you with a list of possible completions at the insertion point that you can use to auto-complete code that you are editing. This list is based on the code context at the insertion point.



An error in the code is signified by a red dot or a squiggle line. When you hover over it, you see a pop-up displaying possible fixes for resolving the error.



The SQL Worksheet toolbar contains icons for the following operations:

- **Worksheet** enables you to create a worksheet, open or delete an existing worksheet, and save a worksheet.

Note:

The worksheets are saved in the browser. Therefore, if you do sensitive work on a computer in a public network, remember to clear the browser cache before you leave. Additionally, the saved worksheets will only be displayed in the browser that was used at the time of creating the worksheet.

- **Run Statement** executes the selected statements or the statement at the mouse pointer in the worksheet editor. The SQL statements can include bind variables and substitution variables of type VARCHAR2 (although in most cases, VARCHAR2 is automatically converted internally to NUMBER if necessary). A dialog box is displayed for entering variable values.
- **Run Script** executes all statements in the worksheet editor using the Script Runner. The SQL statements can include bind variables (but not substitution variables) of type VARCHAR2 (although in most cases, VARCHAR2 is automatically converted internally to NUMBER if necessary). A dialog box is displayed for entering bind variable values.
- **Explain Plan** generates the execution plan for the statement (internally executing the EXPLAIN PLAN statement). The execution plan is automatically displayed in the Explain Plan tab in the worksheet output pane.
- **Autotrace** runs the statement and collects runtime statistics and the actual execution plan. The Autotrace output is displayed in the Autotrace tab in the worksheet output pane. Currently, there are no preferences available.
- **Download Editor Content** downloads the content of the worksheet as a SQL file to the local system.
- **Format** formats the SQL statement in the editor, such as capitalizing the names of statements, clauses, keywords, and adding line breaks and indentation.
- **Clear** removes the statements from the editor.

For a list of shortcuts used in the worksheet, see [Shortcut Keys in the Worksheet](#).

1.5.2.1 Shortcut Keys in the Worksheet

The following table lists the shortcut keys for various user actions in the worksheet.

Table 1-1 Shortcut Keys for User Actions in the Worksheet

Shortcut	Action
Ctrl+Enter/ Cmd+Enter	Runs the code as query.
Ctrl+Down Arrow/ Cmd +Down Arrow	Moves to the next SQL code from history.
Ctrl+Up Arrow/ Cmd +Up Arrow	Moves to the previous SQL code from history.
Ctrl+D/ Cmd +D	Clears the editor.
Ctrl+S/ Cmd +S	Saves the current worksheet.
Ctrl+O/ Cmd +O	Opens the worksheet browser dialog.
Ctrl+I/ Cmd+I	Download the content of the editor.
F1	Opens the help topic.
F5	Runs code as script.
F6	Shows Autotrace.
F10	Shows Explain Plan.
Ctrl+F7/ Cmd +F7	Formats code in the editor.
Ctrl+Space/ Cmd+Space	Autocompletes code (shows hints).
Windows +Esc/ Cmd +Esc	Focuses outside the editor and navigates to the rest of the application using the Tab key.

1.5.2.2 Creating or Editing a Table

The Table Properties Dialog is displayed when you create a table, edit an existing table, or create a table using an existing one as a template. To create or edit a table, right-click a table object in the Navigator tab. The table options are also available when you right-click a table object in the Data Modeler Navigator tab. The table properties are grouped in several panes.

If you are editing an existing table, you can visit the panes in any order. If you click Create before you are finished creating the table, right-click the table name, select **Edit**, and continue creating the table.

Schema: Database schema in which to create the table.

Name: Name of the table.

The different panes in the dialog are described in the following sections:

- [Columns pane](#)
- [Primary Key pane](#)
- [Unique Keys pane](#)
- [Indexes pane](#)
- [Foreign Keys pane](#)
- [Table Constraints pane](#)
- [Comments pane](#)
- [Storage pane](#)
- [DDL pane](#)
- [Output pane](#)

Columns pane

Specifies properties for each column in the table.

General tab

Lists the columns currently in the table. To add a column, click the Add Column (+) icon, select the row that is added to the table below, and enter the details for each column in the fields at the bottom. To delete a column, select the row and click the Remove Column (-) icon; to move a column up or down in the table definition, select it and use the up-arrow and down-arrow buttons.

- **Name:** Name of the column.
- **Datatype:** Data type for the column.
- **Default:** If no value is specified, the default value inserted into the column when a row is inserted.
- **Default on NULL:** Applicable for Oracle Database 12c and later releases. If this option is selected, when a row is inserted into the table and the value specified for the column is NULL, the default value is inserted into the column.
- **Expression:** Expression for computing the value in the column.
- **Comments:** Optional descriptive comments about the column.
- **PK:** If this option is selected, the column becomes the primary key.
- **Identity Column:** If this option is selected, the column becomes an identity column. This is applicable only for Oracle Database 12c and later releases. For more details, see the Identity Column tab.

Constraints tab

Displays the Not Null and Check Constraints for a column. A check constraint requires values in a column to comply with a specified condition.

- **Not Null Constraint: Name:** Name for the Not Null constraint.
- **Not Null Constraint: Not Null:** If this option is selected, the column must contain data. You cannot specify no value or an explicit null value for this column when you insert a row. If this option is not checked, the column can contain either data or no data. A primary key column cannot be null.

- **Check Constraint: Name:** Name for the check constraint definition.
- **Check Constraint: Constraint:** Condition that must be met for a column to fulfill the check constraint. You can use any valid CHECK clause (without the CHECK keyword). For example, to indicate that the value in a numeric column named RATING must be from 1 to 10, you can specify: rating >=1 and rating <= 10.
- **Enabled:** If this option is selected, the constraint is checked when data is entered or updated in the column.
- **Deferrable:** If this option is selected, you can defer checking the validity of the constraint until the end of a transaction.
- **Initially Immediate:** If this option is selected, the constraint is checked whenever you add, update, or delete data from the column.
- **Validate:** If this option is selected, the existing data is checked to see if it conforms to the constraint.

Identity Column tab

Applicable for Oracle Database 12c and later releases. The Identity Column tab lists the properties of the identity column. This tab becomes available only after the Identity Column checkbox is selected for the column in the General tab. An identity column is an autoincrement column that can be used to identify a table row. Only one identity column can be specified for a table.

- **Generate:** Always means that values cannot be explicitly included for the identity column in INSERT OR UPDATE statements, By Default means values for the identity column are generated automatically if no values are specified explicitly, By Default on Null means values are generated for the column only when a NULL value is supplied.
- **Start with:** Starting value of the sequence.
- **Increment:** Interval between successive numbers in a sequence.
- **Min value:** Lowest possible value for the sequence. The default is 1 for an ascending sequence and $-(10^{26})$ for a descending sequence.
- **Max value:** Highest possible value for the sequence. The default is 10^{27} for an ascending sequence and -1 for a descending sequence.
- **Cache and Cache size:** Cache causes sequence values to be preallocated in cache, which can improve application performance; Cache size indicates the number of sequence values preallocated in cache. No Cache causes sequence values not to be preallocated in cache.
- **Cycle:** Indicates whether the sequence "wraps around" to reuse numbers after reaching its maximum value (for an ascending sequence) or its minimum value (for a descending sequence). If cycling of values is not enabled, the sequence cannot generate more values after reaching its maximum or minimum value.
- **Order:** Indicates whether sequence numbers are generated in the order in which they are requested. If No Order is specified, sequence numbers are not guaranteed to be in the order in which they were requested.

Primary Key pane

Specifies the primary key for the table. The primary key is the column, or set of columns, that uniquely identifies each row in the table. If the Primary Key checkbox is selected for a column in the General tab, the corresponding fields are automatically populated in the Primary Key pane.

An index is automatically created on the primary key.

- **Name:** Name of the constraint to be associated with the primary key definition.
- **Enabled:** If this option is checked, the primary key constraint is enforced: that is, the data in the primary key column (or set of columns) must be unique and not null.
- **Index:** Name of the index to which the primary key refers.
- **Tablespace:** Name of the tablespace associated with the index.
- **Available Columns:** Lists the columns that are available to be added to the primary key definition.
- **Selected Columns:** Lists the columns that are included in the primary key definition.

To add a column to the primary key definition, select it in Available Columns and click the Add (>) icon; to remove a column from the primary key definition, select it in Selected Columns and click the Remove (<) icon. To move all columns from available to selected (or the reverse), use the Add All (>>) or Remove All (<<) icon. To move a column up or down in the primary key definition, select it in Selected Columns and use the arrow buttons.

Unique Keys pane

Specifies one or more unique constraints for the table. A unique constraint specifies a column, or set of columns, whose data values must be unique: each data value must not be null, and it must not be the same as any other value in the column.

To add a unique constraint, click the Add button; to delete a unique constraint, select it and click the Remove button.

- **Name:** Name of the unique constraint.
- **Enabled:** If this option is selected, the unique constraint is enforced.
- **Rely:** If this option is selected, the constraint in NOVALIDATE mode is taken into account during query rewrite.
- **Deferrable:** If this option is selected, in subsequent transactions, constraint checking can be deferred until the end of the transaction using the SET CONSTRAINT(S) statement.
- **Initially Immediate:** If this option is selected, the constraint is checked at the end of each subsequent SQL statement.
- **Validate:** If the option is selected, the existing data is checked to see if it conforms to the constraint.
- **Index:** Name of the index to which the unique key refers.
- **Tablespace:** Name of the tablespace associated with the index.
- **Available Columns:** Lists the columns that are available to be added to the unique constraint definition.
- **Selected Columns:** Lists the columns that are included in the unique constraint definition.

To add a column to the unique constraint definition, select it in Available Columns and click the Add (>) icon; to remove a column from the unique constraint definition, select it in Selected Columns and click the Remove (<) icon. To move all columns from

available to selected (or the reverse), use the Add All (>>) or Remove All (<<) icon. To move a column up or down in the unique constraint definition, select it in Selected Columns and use the arrow buttons.

Indexes pane

Lists the indexes currently defined on the table. To add an index, click the Add Index (+) icon; to delete an index, select it and click the Remove Index (-) icon.

- **Name:** Name of the index.
- **Type:** The type of Oracle index. *Non-unique* means that the index can contain multiple identical values; *Unique* means that no duplicate values are permitted; *Bitmap* stores rowids associated with a key value as a bitmap.
- **Tablespace:** Name of the tablespace for the index.
- **Expression:** A column expression is an expression built from columns, constants, SQL functions, and user-defined functions. When you specify a column expression, you create a function-based index.
- **Available Columns** and **Selected Columns:** Columns selected for the index. To select a column, click the column in the Available Columns box, and then click the Add Selected Columns icon to move it to the Selected Columns box.

Foreign Keys pane

Specifies one or more foreign keys for the table. A foreign key specifies a column ("local column"), each of whose data values must match a value in the primary key or unique constraint of another table.

- **Name:** Name of the foreign key definition.
- **Enabled:** If this option is checked, the foreign key is enforced.
- **Rely, Deferrable, Initially Immediate, Validate:** See the description of these fields in the Unique Keys pane.
- **Referenced Constraint: Schema:** Name of the schema containing the table with the primary key or unique constraint to which this foreign key refers.
- **Referenced Constraint: Table:** Name of the table with the primary key or unique constraint to which this foreign key refers.
- **Referenced Constraint: Constraint:** Name of the primary key or unique constraint to which this foreign key refers.
- **Referenced Constraint: On Delete:** Action to take automatically when a row in the referenced table is deleted and rows with that value exist in the table containing this foreign key: *NO ACTION* (shown by a crossing line in diagrams) performs no action on these rows; *CASCADE* (shown by an "X") deletes these rows; *SET NULL* (shown by a small circle) sets null all columns in those rows that can be set to a null value.
- **Associations: Local Column:** Lists the column in the currently selected (local) table that is included in the foreign key definition. For each referenced column in the foreign key definition, select the name of a column in the edited table.
- **Associations: Referenced Column:** For each local column, identifies the column in the other (foreign) table that must have a value matching the value in the local column.

Table Constraints pane

Specifies one or more check constraints for the table. A check constraint specifies a condition that must be met when a row is inserted into the table or when an existing row is modified.

- **Name:** Name of the check constraint definition.
- **Check Condition:** Condition that must be met for a row to fulfil the check constraint. You can use any valid CHECK clause (without the CHECK keyword). For example, to indicate that the value in a numeric column named RATING must be from 1 to 10, you can specify rating >=1 and rating <= 10.
- **Enabled:** If this option is checked, the check constraint is enforced.

Comments pane

Optional descriptive comments about the table.

Storage pane

Enables you to specify storage options for the table. When you create or edit a table or an index, you can override the default storage options.

- **Organization:** Specifies that the table is stored and organized with (Index) or without an index (Heap).
- **Tablespace:** Name of the tablespace for the table or index.
- **Logging:** ON means that the table creation and any subsequent INSERT operations against the table are logged in the redo log file. OFF means that these operations are not logged in the redo log file.

DDL pane

You can review and save the SQL statements that SQL Developer Web will use to create or edit the object, to reflect any changes you have made to the object's properties. If you want to make any changes, go back to the relevant panes and make the changes there.

For a new table, click **CREATE** to view the generated DDL statements. When you edit table properties, click **UPDATE** to view the generated ALTER statements. For a new table, the UPDATE tab will not be available.

When you are finished, click **Apply**.

Output pane

Displays the results of the DDL commands. If there are any errors, go to the appropriate pane, fix the errors, and run the commands again. You have options to save to a text file or to clear the output.

1.5.2.3 Creating or Editing an Index

The Index Properties dialog box is displayed when you create or edit an index. You can create and edit in three ways:

- Right-click a table in the worksheet Navigator tab, and select **Add Index**. To edit, right-click an index in the Navigator tab and select **Edit**.

- Right-click a table object in the Data Modeler Navigator tab, and select **Add Index**.
- Create and edit an index in the Table Properties Dialog. See [Creating or Editing a Table](#)

Definition pane

- **Schema:** Database schema that owns the table associated with the index.
- **Table:** Name of the table associated with the index.
- **Schema:** Database in which to create the index.
- **Tablespace:** Tablespace for the index.
- **Name:** Name of the index.
- **Type:** The type of Oracle index. `Non-unique` means that the index can contain multiple identical values; `Unique` means that no duplicate values are permitted; `Bitmap` stores rowids associated with a key value as a bitmap.
- **Expression:** A column name or column expression. A column expression is an expression built from columns, constants, SQL functions, and user-defined functions. When you specify a column expression, you create a function-based index.
- **Available Columns:** Columns available in the table.
- **Selected Columns:** Columns selected for the index. Click the Add Selected Columns icon to move columns from the Available Columns list.
- **Order:** ASC for an ascending index (index values sorted in ascending order); DESC for a descending index (index values sorted in descending order).

DDL pane

You can review and save the SQL statements that SQL Developer Web will use to create or edit the index, to reflect any changes you have made to the object's properties. If you want to make any changes, go back to the Definition pane and make the changes there. For a new index, click **CREATE** to view the generated DDL statements. When you edit index properties, click **UPDATE** to view the generated ALTER statements. For a new index, the UPDATE tab will not be available. When you are finished, click **Apply**.

Output pane

Displays the results of the DDL commands. If there are any errors, go to the Definition pane, fix the errors, and run the commands again. You have options to save to a text file or to clear the output.

1.5.2.4 Creating or Editing a Sequence

This Sequence Properties Dialog is displayed when you right-click a sequence object in the worksheet Navigator tab and select **Add Sequence** or **Edit Sequence**. These options are also available when you right-click a table object in the Data Modeler Navigator tab.

A sequence is an object from which multiple users may generate unique integers. You can use sequences to automatically generate primary key values.

Properties pane

- **Schema:** Database schema in which to create the sequence.

- **Name:** Name of the sequence.
- **Start with:** Starting value of the sequence.
- **Increment:** Interval between successive numbers in a sequence.
- **Min value:** Lowest possible value for the sequence. The default is 1 for an ascending sequence and $-(10^{26})$ for a descending sequence.
- **Max value:** Highest possible value for the sequence. The default is 10^{27} for an ascending sequence and -1 for a descending sequence.
- **Cache and Cache size:** *Cache* causes sequence values to be preallocated in cache, which can improve application performance; Cache size indicates the number of sequence values preallocated in cache. *No Cache* causes sequence values not to be preallocated in cache.
- **Cycle:** Indicates whether the sequence "wraps around" to reuse numbers after reaching its maximum value (for an ascending sequence) or its minimum value (for a descending sequence). If cycling of values is not enabled, the sequence cannot generate more values after reaching its maximum or minimum value.
- **Order:** Indicates whether sequence numbers are generated in the order in which they are requested. If *No Order* is specified, sequence numbers are not guaranteed to be in the order in which they were requested.

DDL pane

You can review and save the SQL statements that SQL Developer Web will use to create or edit the sequence. If you want to make any changes, go back to the Properties pane and make the changes there. For a new sequence, click **CREATE** to view the generated DDL statements. When you edit a sequence, click **UPDATE** to view the generated ALTER statements. For a new sequence, the UPDATE tab will not be available. When you are finished, click **Apply**.

Output pane

Displays the results of the DDL commands. If there are any errors, go to the Properties pane, fix the errors, and run the commands again. You have options to save to a text file or to clear the output.

1.5.3 Viewing the Worksheet Output

The bottom right pane of the Worksheet screen has tabs that display the following panes:

- **Query Result:** Displays the results of the most recent Run Statement operation in a display table.
- **Script Output:** Displays the text output from your statements executed as a script using SQL Developer Web's script engine.
- **DBMS Output:** Displays the output of DBMS_OUTPUT package statements.
- **Explain Plan:** Displays the plan for your query using the Explain Plan command.
- **Autotrace:** Displays the session statistics and execution plan from `v$sql_plan` when executing a SQL statement using the Autotrace feature. Displays the output if you clicked the Autotrace icon.
- **SQL History:** Displays the SQL statements and scripts that you have executed. To re-enter a previously executed query in the worksheet, double-click the query in

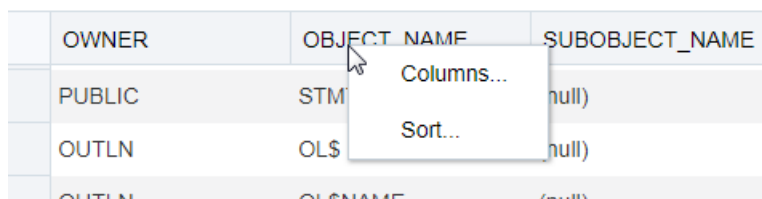
the history list. You can search for specific statements by clicking the Search icon. The Search functionality is case-sensitive, retrieves all entries that contain the search text, and does not require wildcard characters.

The icons in this pane are:

- **Clear output:** Clears the output.
- **Show info:** Displays the SQL statement for which the output is displayed.
- **Open in new tab:** Opens the query result or explain plan in a new window.

In the Query Result tab, in the display table, the context menu (right-click) for the row header consists of the following:

- **Columns** enables you to select columns to hide.
- **Sort** displays a dialog box for selecting columns to sort by. For each column, you can specify ascending or descending order, and you can specify that null values be displayed first.



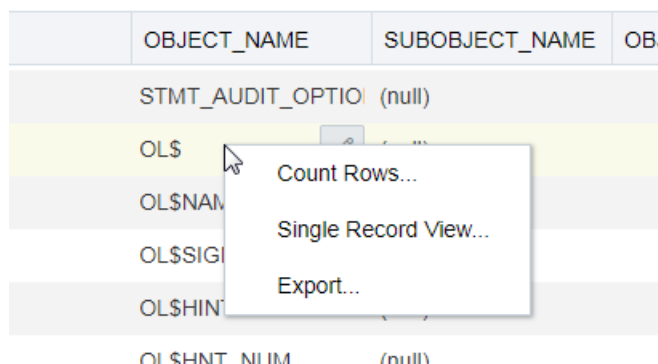
OWNER	OBJECT_NAME	SUBOBJECT_NAME
PUBLIC	STM	(null)
OUTLN	OL\$	(null)
OUTLN	OL\$NAME	(null)

The context menu for the rest of the display table consists of the following commands:

- **Count Rows** displays the number of rows in the result set for your query.
- **Single Record View** enables you to view data for a table or view, one record at a time.
- **Export** generates the file for download based on the format selected, which can be XML, CSV (comma-separated values including a header row for column identifiers), Insert , Delimited, Fixed, HTML, JSON, or TEXT.

 **Note:**

If a popup blocker is enabled, it will prevent the file from downloading.



OBJECT_NAME	SUBOBJECT_NAME	OB
STMT_AUDIT_OPTIO	(null)	
OL\$		
OL\$NAM		
OL\$SIG		
OL\$HIN		
OL\$HNT NIIM	(null)	

1.6 Using DBA Features

SQL Developer Web enables users with DBA (database administrator) privileges to monitor and manage the Oracle database in the Oracle Cloud. To configure a DBA user, see *Administering Oracle Database Cloud Service*.

The DBA tab provides quick and easy access to a variety of information about the database instance. The management capabilities include changing the TDE (Transparent Data Encryption) Keystore Password, and creating, dropping, plugging in, unplugging, cloning, and modifying the state of a pluggable database.

- [Overview](#)
- [Managing Pluggable Databases](#)
- [Viewing Listener Status](#)
- [Viewing Backup Logs](#)
- [Viewing Alert Log Entries](#)
- [Viewing Sessions Information](#)
- [Viewing Tablespace and Segment Space Usage](#)
- [Viewing Wait Events](#)
- [Monitoring SQL Developer PDB Uploads](#)
- [Viewing Initialization Parameters](#)
- [Viewing Real Time SQL Monitor](#)

1.6.1 Overview

The Overview page displays generic information about the database instance. For Oracle Database 12c and later databases, you can filter the information displayed by selecting CDB or the required PDB from the drop-down list at the top of the page.

The widgets on this page show snapshot information about the database status, listener status, online database storage, alerts, sessions, wait events, movements, latest backup status, and a list of the executed SQL statements on the database, ordered by the most CPU time consumed. Click a widget to go to its page where you can see a more detailed view of the data. If a PDB is selected, the Listener, Backups, Movements and Parameters widgets are not available. For a PDB in mounted mode, only the Manage option is available.

The widgets on this page are:

- **Database Status:** See [Managing Pluggable Databases](#)
- **Online Database Storage:** See [Viewing Tablespace and Segment Space Usage](#)
- **Sessions:** See [Viewing Sessions Information](#)
- **Waits:** See [Viewing Wait Events](#)
- **Listener Status:** See [Viewing Listener Status](#)
- **Latest Backup:** See [Viewing Backup Logs](#)
- **Users:** See [Users](#)

- **Alerts:** See [Viewing Alert Log Entries](#)
- **Expiring Passwords:** See [Expiring Passwords](#)
- **Movements:** See [Monitoring SQL Developer PDB Uploads](#)
- **Top SQL:** See [Top SQL](#)

Users

You can view how many user accounts are in the following states for the entire database or for a specific pluggable database:

- **Open:** This status indicates that the user's account is unlocked and access to the database is enabled.
- **Locked:** This status indicates that the user's account is locked and access to the database is disabled. The account must be unlocked to enable access to the database.
- **Expired:** This status indicates that the user's password has expired and must be changed before the user can log in to the database.

Expiring Passwords

In the Expiring Accounts Password box, you see a list of user accounts and whether a user account password has expired or the number of days before it will expire.

Top SQL

Top SQL lists the most expensive SQL statements executed in the database, in terms of CPU time consumed. It enables you to focus your SQL tuning efforts on the statements that can have the most impact on database performance. Click a query to see a formatted view of the SQL statement, its execution plan, its runtime history from Active Session History, and a SQL Tuning Advisor report

1.6.2 Managing Pluggable Databases

To reach the Manage page, from the DBA drop-down menu, click **Manage**. In the Manage page, you can see the status of the database instance. For Oracle Database 12c and later databases, the status of pluggable databases are also displayed. You can also create, clone, plug, unplug, or drop pluggable databases.

- [Changing the TDE Keystore Password](#)
- [Creating a Pluggable Database](#)
- [Plugging in a Pluggable Database](#)
- [Cloning a Pluggable Database](#)
- [Dropping a Pluggable Database](#)
- [Unplugging a Pluggable Database](#)
- [Modifying the Pluggable State](#)

1.6.2.1 Changing the TDE Keystore Password


You can change the password of the TDE (Transparent Data Encryption) keystore in the Manage page. When a database deployment is created in the Oracle Cloud, a local autologin software keystore is created. The keystore is local to the compute node

and is protected by a system-generated password. The keystore is part of the key-based architecture that is used to transparently encrypt (and decrypt) tablespaces.

**Note:**

This feature is only available for Oracle Database 12c and later versions.

To change the TDE keystore password:

1. From the DBA drop-down menu, click **Manage**.
2. Click the  icon at the top right of the Database box to see the context menu.
3. Click **Change TDE Keystore Password**.
4. In the Change TDE Keystore Password dialog box, enter the current keystore password and the new keystore password.

To view the SQL statements for the operation, click **Show SQL**.

1.6.2.2 Creating a Pluggable Database

To create a pluggable database:

1. From the DBA drop-down menu, click **Manage**.
2. Click **Create PDB**.
3. In the Create PDB dialog box, enter the following fields:

New PDB Name: Name of the PDB.

Admin Username: Administrative user who has or can be granted the privileges required to perform administrative tasks on the PDB.

Admin Password: Password for the Admin Name database user.

Filename Conversion: Determine how the database generates the names of files (such as data files and wallet files) for the PDB.

- **None:** The database first attempts to use Oracle Managed Files to generate file names. If you are not using Oracle Managed Files, then the database uses the PDB_FILE_NAME_CONVERT initialization parameter to generate file names.
- **Custom Names:** Select a Source Files/Target Files pair.
- **Custom Expressions:** Specify one or more Source File Expression/Target File Expression pairs. Each pair item is a string found in names of files associated with the seed (when creating a PDB by using the seed), associated with the source PDB (when cloning a PDB), or listed in the XML file (when plugging a PDB into a container database).

Unlimited Storage and Reuse Temp File: Specify storage limits for the PDB total size or temporary tablespace usage, or both; or unlimited storage for either or both.

Create TDE Key: Specify whether to create the TDE Key.

Keystore Password: Enter the password that was specified during the database deployment creation process.

To view the SQL statements for the create PDB operation, click **Show SQL**.

4. Click **OK**.

1.6.2.3 Plugging in a Pluggable Database

Plugging in consists of creating a pluggable database (PDB) based on specifications in the XML file, from when the original PDB was unplugged.

1. From the DBA drop-down menu, click **Manage**.
2. Click **Plug in PDB**.
3. In the Plug in PDB dialog box, enter the following fields:

New PDB Name: Name of the PDB.

Plug as Clone: Specify only if the target container database already contains a PDB that was created using the same set of data files. The source files remain as an unplugged PDB and can be used again. Specifying AS CLONE also ensures that Oracle Database generates new identifiers, such as DBID and GUID, for the new PDB. If you specify AS CLONE, then you cannot specify the MOVE or NOCOPY clauses.

XML Filename: Specify the XML file containing the metadata for the PDB to be plugged in.

Source File Name Conversion: Determines how the database generates the names of files (such as data files and wallet files) for the PDB.

- **None:** The database first attempts to use Oracle Managed Files to generate file names. If you are not using Oracle Managed Files, then the database uses the PDB_FILE_NAME_CONVERT initialization parameter to generate file names.
- **Custom Names:** Select a Source Files/Target Files pair.
- **Custom Expressions:** Specify one or more Source File Expression/Target File Expression pairs. Each pair item is a string found in names of files associated with the seed (when creating a PDB by using the seed), associated with the source PDB (when cloning a PDB), or listed in the XML file (when plugging a PDB into a CDB).

Copy Action: Determines how the database generates the names of files (such as data files and wallet files) for the PDB.

- **Don't copy:** The files for the PDB remain in their current locations. Use this option if there is no need to copy or move the files required to plug in the PDB.
- **Copy:** The files listed in the XML file are copied to the new location and used for the new PDB. You can also specify Source File Names Conversions to use pattern replacement in the new file names.
- **Move:** The files listed in the XML file are moved, rather than copied, to the new location and used for the new PDB. You can also specify Source File Names Conversions to use pattern replacement in the new file names.

Unlimited Storage and Reuse Temp File: You can specify storage limits for the PDB total size or temporary tablespace usage, or both; or unlimited storage for either or both.

Import TDE Key: Specify whether to import the TDE Key.


Keystore Password: Enter the password that was specified during the database deployment creation process.

To view the SQL statements for the plug in operation, click **Show SQL** .

4. Click **OK**.

1.6.2.4 Cloning a Pluggable Database

Cloning a pluggable database (PDB) is to create a new PDB from (using basic specifications of) a specified PDB.

1. From the DBA drop-down menu, click **Manage**.
2. Click the  icon at the top right of the PDB box, and click **Clone**.
3. Enter the following fields:

New PDB Name: Name of the new PDB.

Source PDB: Source PDB for the cloning operation.

Filename Conversion: Determines how the database generates the names of files (such as data files and wallet files) for the PDB.

- **None:** The database first attempts to use Oracle Managed Files to generate file names. If you are not using Oracle Managed Files, then the database uses the PDB_FILE_NAME_CONVERT initialization parameter to generate file names.
- **Custom Names:** Select a Source Files/Target Files pair.
- **Custom Expressions:** Specify one or more Source File Expression/Target File Expression pairs. Each pair item is a string found in names of files associated with the seed (when creating a PDB by using the seed), associated with the source PDB (when cloning a PDB), or listed in the XML file (when plugging a PDB into a CDB).

Snapshot Copy: Indicates whether to create a snapshot copy of the database. If you select Snapshot Copy, enter the path for the snapshot copy to be saved in the Snapshot Copy Path.

Unlimited Storage and Reuse Temp File: You can specify storage limits for the PDB total size or temporary tablespace usage, or both; or unlimited storage for either or both. By default, unlimited storage and reuse temp file are selected for the PDB.

Clone TDE Key: Specify whether to clone the TDE Key.

Keystore Password: Enter the password that was specified during the database deployment creation process.


To view the SQL statements for the clone operation, click **Show SQL** .

4. Click **OK**.

1.6.2.5 Dropping a Pluggable Database

To drop a pluggable database:


1. From the DBA drop-down menu, click **Manage**.

2. Click the  icon at the top right of the PDB box, and click **Drop PDB**.
3. Enter the following fields:
 - Database Name:** Name of the PDB.
 - Datafiles Action:** Determines whether to retain or delete the data files associated with the PDB after the PDB is dropped.
 - **Keep:** Retains the data files associated with the PDB after the PDB is dropped. The temp file for the PDB is deleted because it is no longer needed. Keeping data files may be useful in scenarios where a PDB that is unplugged from one CDB is plugged into another CDB, with both CDBs sharing storage devices.
 - **Including:** Deletes the data files associated with the PDB being dropped. The temp file for the PDB is also deleted. (Including must be specified if the PDB was created with the SNAPSHOT COPY clause).To view the SQL statements for the drop PDB operation, click **Show SQL**.
4. Click **OK**.

1.6.2.6 Unplugging a Pluggable Database


When you unplug a pluggable database (PDB), Oracle stores metadata for the PDB in an XML file. You can use this XML file to subsequently plug the PDB into a container database (CDB).

To unplug a PDB from a CDB:

1. From the DBA drop-down menu, click **Manage**.
2. Click the  icon at the top right of the PDB box, and click **Unplug PDB**.
3. Enter the following fields:
 - Database Name:** Name of the PDB.
 - XML File Name:** The full path of the XML file in which to store the metadata for the unplugged PDB.
 - Export TDE Key:** Specify whether to export the TDE key.
 - Keystore Password:** Enter the password that was specified during the database deployment creation process.To view the SQL statement for the unplug PDB operation, click **Show SQL**.
4. Click **OK**.

1.6.2.7 Modifying the Pluggable State

To modify the state of a pluggable database (PDB):

1. From the DBA drop-down menu, click **Manage**.
2. Click the  icon at the top the right of the PDB box, and click **Modify State**.
3. Enter the following fields:
 - PDB:** Name of the PDB.

State: Contains OPEN if the PDB is closed, or CLOSE if the PDB is open.

Option: List of options relevant to the New State value: Read Write, Read Only, or Restricted for OPEN; Normal or Immediate for CLOSE.

- **Read Write:** Allows queries and user transactions to proceed and allows users to generate redo logs.
- **Read Only:** Allows queries only.
- **Restricted:** The PDB is accessible only to users with the RESTRICTED SESSION privilege in the PDB.
- **Normal:** Is the PDB equivalent of the SQL*Plus SHUTDOWN command with the normal mode (waits for users to disconnect from the database).
- **Immediate:** Is the PDB equivalent of the SQL*Plus SHUTDOWN command with the immediate mode (does not wait for current calls to complete or users to disconnect from the database).

To view the SQL statements for the modify state operation, click **Show SQL**.

4. Click **OK**.

1.6.3 Viewing Listener Status

The Listener page shows the status of the listener and the output of the `lsnrctl` command.

The Oracle Net Listener (the listener) is a process that resides on the database server. It listens for incoming client connection requests and manages traffic to the server.

To review listener status information:

- From the DBA drop-down menu, click **Listener**.

The Listener page shows the following information:

- Status of the listener, including start time
- Protocol addresses the listener is configured to listen on
- Summary of the database services registered with the listener and the service handlers allocated to each service
- Registered database services (service name), database instance associated with the service, and connection status

1.6.4 Viewing Backup Logs

The Backups page shows the logs for the automatic backups that have been attempted on this server. These backups include both the database and the configuration files.

In the display table, if you right-click the header row, you see:

Columns: Enables you to select columns to show or hide.

Sort: Displays a dialog box for selecting columns to sort by. For each column, you can specify ascending or descending order, and you can specify that null values be displayed first.

If you right-click any other part of the display table, you see:

Count Rows: Displays the number of rows in the table.

Single Record View: Enables you to view data for a table or view, one record at a time.

1.6.5 Viewing Alert Log Entries

The Alerts page is a chronological log of messages and errors and is commonly used to learn whether the background processes have encountered errors. You can review the alert log periodically to verify that your database system is operating normally.

The alert log includes the following:

- Nondefault initialization parameters used at startup
- Administrative operations, such as STARTUP, SHUTDOWN, ARCHIVE LOG, RECOVER, and CREATE/ALTER/ DROP DATABASE/TABLESPACE
- Messages and errors relating to the functions of certain background processes, such as LGWR
- Internal errors (ORA-600), block corruption errors (ORA-1578), and deadlock errors (ORA-60)

For Oracle Database 12c and later releases, you can use the CDB/PDB drop-down list to filter the information displayed for the container or pluggable database.

You can search for a specific value in the log by selecting the display column in the first drop-down list, selecting the condition in the second drop-down list, entering the search value in the box, and clicking the search icon.

In the display table, if you right-click the header row, you see:

Columns: Enables you to select columns to show or hide.

Sort: Displays a dialog box for selecting columns to sort by. For each column, you can specify ascending or descending order, and you can specify that null values be displayed first.

If you right-click any other part of the display table, you see:

Count Rows: Displays the number of rows in the table.

Single Record View: Enables you to view data for a table or view, one record at a time.

1.6.6 Viewing Sessions Information

The Sessions page shows information about all currently open sessions in the database. The data is automatically refreshed at intervals ranging from 10 seconds to 2 minutes. You can also refresh the data by clicking the Refresh icon at the top right of the screen.

For Oracle Database 12c and later databases, you can use the CDB/PDB drop-down list to filter the information displayed for the container or pluggable database.

The table shows summarized data about each open session. Select a session in the table to see more detailed data in the Session Details table below, such as the last SQL statement, explain plan, waits, contention, and so on. You can use the Column, Operator and Value fields to search for the required sessions.

In the display table, if you right-click the header row, you see:

Columns: Enables you to select columns to show or hide.

Sort: Displays a dialog box for selecting columns to sort by. For each column, you can specify ascending or descending order, and you can specify that null values be displayed first.

If you right-click any other part of the display table, you see:

Count Rows: Displays the number of rows in the table.

Single Record View: Enables you to view data for a table or view, one record at a time.

1.6.7 Viewing Tablespace and Segment Space Usage

The Storage page shows the storage used based on the current allocation of tablespaces along with additional drill-down capabilities to view segments. You can refine the list of segments shown by using the filter feature. Click **View Datafiles** to view the datafiles in each tablespace.

You can view tablespace and segment space usage.

A tablespace is a database storage unit that groups related logical structures together. A tablespace is comprised of datafiles. A segment is a set of extents allocated from a tablespace for a specific database object such as a table or index.

To view space usage information

1. From the Database drop-down menu, click **Storage** .

The Storage page displays. If the Oracle database is version 12c or later, the Storage page shows the used and allocated storage space for all tablespaces in the container in the root, and the used and allocated storage space for tablespaces in any pluggable databases. If the Oracle database is version 11g, the Storage page shows the used and allocated space for the entire database.

2. For an Oracle database version 12c or later, you can click **show tablespaces** for the container database, or click **show tablespaces** for each pluggable database.
3. When you click **show tablespaces**, a list of tablespaces appears. You can click a tablespace to view its storage information. An interactive report appears, showing the segments that exist within the tablespace. Most segments are user objects, and they include tables, LOBs, and indexes.
4. On the Segments page, you can refine the list of segments shown by using the filter feature.

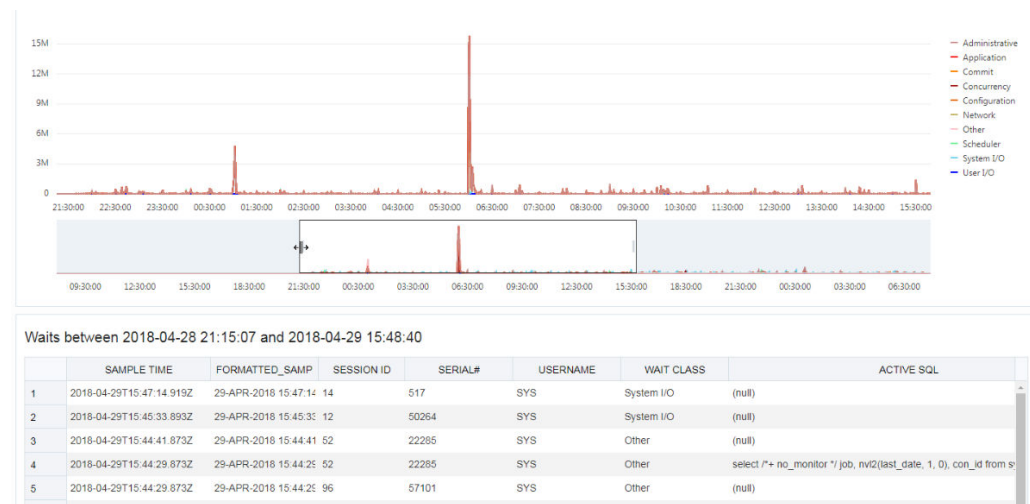
For example, you can search for all the segments for a specific owner (schema) by selecting OWNER from the first drop-down list, entering the owner (schema) name in the box, and clicking the search icon.

1.6.8 Viewing Wait Events

The Waits page shows a chart with the distribution of wait events in real time. For Oracle Database 12c and later databases, you can use the CDB/PDB drop-down list to filter the information displayed for the container or pluggable database.

Use the slider controls in the small chart to zoom in on a specific time period in the chart above. To use the slider controls, place the cursor over the handles at both sides of the box and drag the sides to the time period required. The chart above will refresh to the selected time period. The table will also automatically refresh and the wait events will filter to that period of time enabling you to easily identify the problem SQL statement.

Figure 1-1 Distribution of Wait Events Chart



When you place the cursor over data points in the chart, a pop-up box displays details about the wait event.

Figure 1-2 Display Wait Event Details



1.6.9 Monitoring SQL Developer PDB Uploads

The Movements page enables you to monitor current and past SQL Developer pluggable database uploads to the database server. See [Using Pluggable Databases \(PDBs\) to Load Data into the Database](#).

From the DBA drop-down menu, select **Movements**.

1.6.10 Viewing Initialization Parameters

Initialization parameters configure the database instance, including memory structures, and define locations for database files. Values for initialization parameters are stored in a text-based initialization parameter file (PFILE) or binary server parameter file (SPFILE). The initialization parameter file is read at database instance startup.



Note:

For more information, see “Initialization Parameters” in [Oracle Database Reference](#).

To perform a search, enter values in the search criteria columns and click the search icon to locate the initialization parameter.

In the display table, if you right-click the header row, you see:

Columns: Enables you to select columns to show or hide.

Sort: Displays a dialog box for selecting columns to sort by. For each column, you can specify ascending or descending order, and you can specify that null values be displayed first.

If you right-click any other part of the display table, you see:

Count Rows: Displays the number of rows in the table.

Single Record View: Enables you to view data for a table or view, one record at a time.

1.6.11 Viewing Real Time SQL Monitor

The Real Time SQL Monitor page shows in real time the SQL statements that are being monitored in the database. In the Auto Refresh drop-down list, you can select the time (in seconds) to periodically refresh the data. Select `0 seconds` to disable the auto-refresh. For Oracle Database 12c and later databases, you can use the CDB/PDB drop-down list to filter the information displayed for the container or pluggable database.

To review the SQL statements being monitored:

- From the DBA drop-down menu, click **Real Time SQL Monitor**.

This tool helps identify run-time issues for SQL statements and monitor their behavior, by providing two major functions:

- General view of monitored statements
- View of SQL execution details

General View of Monitored Statements

The page contains a table of SQL statements currently running. This table shows the following information:

- **Status:** Current state of the SQL statement execution. For example, a SQL statement that has already finished its execution will show a status of "DONE".
- **Duration:** Amount of time a SQL statement is taking, or has taken, to execute.
- **SQL ID:** SQL identifier of the statement being monitored.
- **Session ID:** Session identifier that is executing, or has executed, the SQL statement.
- **Session Serial Number:** Uniquely identifies a session's objects.
- **Instance Degree of Parallelism:** This Degree of Parallelism (DOP) column shows how many instances and parallel execution servers are allocated. It is shown in the form of "number of instances" | "number of parallel servers".
- **Database Time:** Place the cursor over the database time to see a breakdown of the time and wait events.
- **CPU Time:** CPU time consumed by the execution of the query.
- **I/O Time:** I/O time consumed by the execution of the query.
- **Start Time:** Time in which the execution of the SQL statement started.
- **SQL Statement:** SQL statement being monitored.

Figure 1-3 Real Time SQL Monitoring Table

DBA /
Real Time SQL Monitoring

Monitored statements Auto Refresh 0 seconds

	STATUS	DURATION	TYPE	SQL ID	PLAN HASH	USERNAME	PARALLEL	DATABASE TIME	IO REI
1	✓ DONE	21 s	SQL	g6px76dmjv1jy	3702721588			19.81 s	
2	✓ DONE	20 s	SQL	g6px76dmjv1jy	3702721588			19.85 s	
3	✓ DONE	20 s	SQL	g6px76dmjv1jy	3702721588			19.7 s	
4	✓ DONE	20 s	SQL	g6px76dmjv1jy	3702721588			19.35 s	
5	✓ DONE	20 s	SQL	g6px76dmjv1jy	3702721588			19.57 s	
6	✓ DONE	20 s	SQL	g6px76dmjv1jy	3702721588			19.54 s	
7	✓ DONE	21 s	SQL	g6px76dmjv1jy	3702721588			20.09 s	
8	✓ DONE	22 s	SQL	g6px76dmjv1jy	3702721588			19.96 s	
9	✓ DONE	22 s	SQL	g6px76dmjv1jy	3702721588			19.23 s	
10	✓ DONE	21 s	SQL	g6px76dmjv1jy	3702721588			19.46 s	
11	✓ DONE	21 s	SQL	g6px76dmjv1jy	3702721588			18.96 s	
12	✓ DONE	21 s	SQL	g6px76dmjv1jy	3702721588			19.22 s	

View of SQL Execution Details

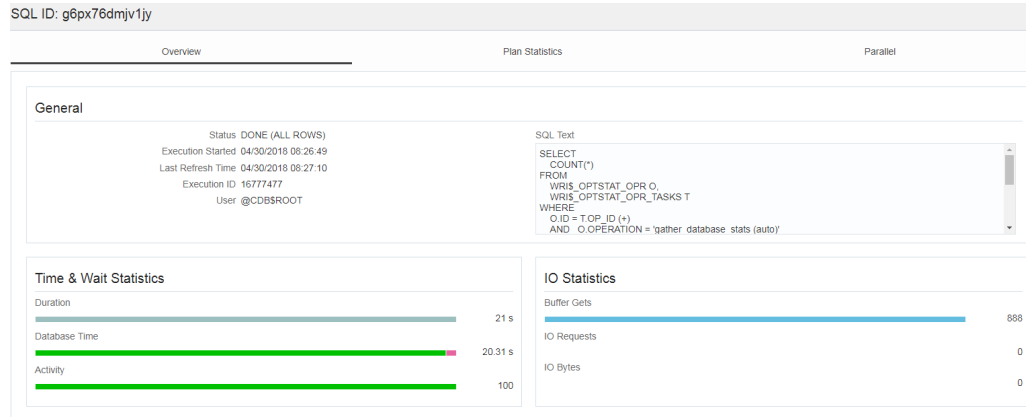
When a SQL statement is drilled down from the main monitor table, a detailed view is shown. The SQL ID, Start Time and the SQL Execution ID represent the execution key that uniquely identify this SQL statement. A detail view consists of the general characteristics that integrate the execution of a SQL statement.

General information about the query execution is provided:

- **Execution Plan:** Degree of Parallelism of the SQL statement
- **Execution Started:** Time that the SQL statement execution started
- **Last Refresh Time:** Last update time of the SQL monitor registry for the SQL statement
- **Execution ID:** Execution identifier

- **User:** User in the format USER@CONTAINER
- **SQL Text:** Formatted view of the SQL statement that is being executed.

Figure 1-4 SQL Execution Details in Real Time SQL Monitor



General statistics of the SQL statement are provided: total duration of execution, the number of buffered gets, number of Input/Output requests and bytes.

Detailed information of the statement: This space holds the information corresponding to the explain plan, parallel behavior and CPU activity involved in the execution of the statement:

- **Plan Statistics:** Explain plan of the execution of the SQL statement in the form of a table. Each row is a different operation involved in the execution of the SQL statement and it shows hierarchy dependency by adding a space at the beginning of the text in the Operation column.
- **Parallelism Details for the SQL statement:** Each execution consists of a parallel coordinator and one or more parallel sets. Each set can have one or more processes. When a row has dependents, each of its columns will be the sum of the values of its dependants. When this happens, a sigma symbol will appear to show that a value consists of the sum of others.



Note:

For more information, see "Monitoring the Database" in the [Oracle Database Administrator's Guide](#).

1.7 Monitoring OS

You can use SQL Developer Web to monitor the CPU utilization, memory, storage, and operating system processes for the compute node.

The widgets in the Overview page are:

- Used and free RAM at the OS level.

- CPU utilization information
- Operating system process information.
- Used and total storage space available on local mounted file systems. The displayed total space for the file systems does not consider the unusable space in each file system.

Memory

The columns in the OS/Memory screen are:

- **USER:** User that is the owner of the process.
- **PR:** Priority of the process.
- **NI:** "NICE" value of the process.

The Linux niceness scale goes from -20 to 19. The lower the number, the more priority that task gets. The default nice value is zero.

- **VIRT:** Virtual memory used by the process.
- **RES:** Physical memory used from the process.
- **SHR:** Shared memory of the process.
- **S:** Indicates the status of the process: S=sleep R=running Z=zombie.
- **%CPU :** Percentage of CPU used by this process.
- **%MEM:** Percentage of RAM used by the process.
- **TIME+:** Total time of activity of this process.
- **COMMAND:** Actual command being monitored.

CPU

The columns in the OS/CPU screen are:

- [First two columns]: Time that mpstat was run.
- **CPU:** "all" for all CPUs, or the specific number.
- **%USR:** Percentage of CPU utilization that occurred while executing at the user level (application).
- **%NICE:** Percentage of CPU utilization that occurred while executing at the user level with nice priority.
- **%SYS:** Percentage of CPU utilization that occurred while executing at the system level (kernel).
- **%IOWAIT:** Percentage of time that the CPUs were idle during which the system had an outstanding disk I/O request.
- **%IRQ:** Percentage of time spent by the CPUs to service hardware interrupts.
- **%SOFT:** Percentage of time spent by the CPUs to service software interrupts.
- **%STEAL:** Percentage of time spent in involuntary wait by the virtual CPUs while the hypervisor was servicing another virtual processor.
- **%GUEST:** Percentage of time spent by the CPUs to run a virtual processor.
- **%IDLE:** Percentage of time that the CPUs were idle and the system did not have an outstanding disk I/O request.

Processes

The columns in the OS/Processes screen are:

- **USER:** User owning the process.
- **PID:** Process ID
- **%CPU:** CPU time used divided by the time the process has been running.
- **%MEM:** Ratio of the process's resident set size to the physical memory on the machine.
- **VSZ:** Virtual memory usage of entire process (in bytes).
- **RSS:** Resident set size, the non-swapped physical memory that a task has used (in KiB).
- **TTY:** Controlling terminal (TeleTYpewriter) of the process.
- **STAT:** Multi-character process state.

Process state codes (STAT column):

- **R:** running or runnable (on run queue)
- **D:** uninterruptible sleep (usually IO)
- **S:** interruptible sleep (waiting for an event to complete)
- **Z:** defunct/zombie, terminated but not reaped by its parent
- **T:** stopped, either by a job control signal or because it is being traced

Extra modifiers:

- **<** is high-priority (not nice to other users)
- **N** is low-priority (nice to other users)
- **L** has pages locked into memory (for real-time and custom IO)
- **s** is a session leader
- **I** is multi-threaded (using CLONE_THREAD like NPTL pthreads do)
- **+** is in the foreground process group
- **START:** Starting time or date of the process.
- **TIME:** Cumulative CPU time.
- **COMMAND:** Command being run (with all its arguments).

1.8 Using Data Modeler

SQL Developer Web includes an integrated version of SQL Developer Data Modeler with basic reporting features. You can create diagrams from existing database objects, retrieve data dictionary information, generate DDL statements, and export diagrams.



Note:

You can create and edit objects for your schema in the Data Modeler interface.

- [Navigating Diagrams and Objects](#)
- [About the Data Modeling Editor](#)

1.8.1 Navigating Diagrams and Objects

The **Diagrams** tab lists the Data Modeler diagrams that have been saved. When you right-click a diagram, you have options to open, save, delete, and view properties. When you click a diagram in the list, a thumbnail preview is shown with the option to open the diagram.

Diagrams are stored in the database, in the SQL Developer Web user schema. When you use Data Modeler for the first time, a OSDDMW_DIAGRAMS table is created.

- To create a new diagram, in the Diagrams tab, click the New Diagram icon next to the Search field.
- To open an existing diagram, in the Diagrams tab, select or right-click the diagram, and then click **Open**.

The **Navigator** tab lists the objects that are available for each schema. You can select the schema and object type from the drop-down lists. For a particular schema, if a tables object is selected, the left pane displays all the tables that belong to the particular schema. You can expand a table to view its columns. You can drag and drop an object into a selected diagram in the right pane. You can also add objects to the diagram by clicking the Add Objects to Diagram icon in the editor pane.

You can also search the contents of a saved diagram or search for objects in the Navigator tab by name. The search functionality is not case-sensitive, retrieves all matching entries and does not require the use of wildcard characters.

The context menu for a table or view consists of:

Add Object to Diagram: Adds the selected object to the selected diagram.

Add Object with dependencies to Diagram: Adds the selected parent object and other dependent objects that are associated through the foreign key constraints to the selected diagram.

For a table, there are a few more options:

New, Edit, Use as Template: Creates a new table for a specific schema, edits an existing table, or creates a new table by using an existing table for the initial content. See [Creating or Editing a Table](#).

Add/Edit Sequence: To create or edit a sequence for a selected schema. See [Creating or Editing a Sequence](#).

Add Index: To create an index for a table. See [Creating or Editing an Index](#).

1.8.2 About the Data Modeling Editor

You can create and work with relational diagrams in the editor pane.

When an object is selected, you can inspect the properties of the object in the right pane. The only properties that you can edit are background and border color. For example, when a table is selected, the properties displayed are Columns, Primary Key, Unique Constraints, Indexes, Foreign Keys, Comments, and Colors. You can edit

the background and border color by selecting from the color palette in the Pick a Color dialog box. Click the Reset icon next to the Background and Border Color fields to return to the default colors.

When creating diagrams, you can do the following:

- Move objects around by dragging with the mouse.
- Adjust or move objects with the relationships intact.
- Add elbows to relationship lines to avoid intersecting with lines from other objects. Right-click the relationship line and drag to create the elbow. Click the X icon to restore to the original shape.
- Resize objects by dragging the handles that are positioned around the box.

The Data Modeler toolbar icons are:

- **Save Diagram:** Saves the currently selected diagram. Diagrams are stored in a table that are created in the schema of the user.
- **Print Diagram:** Prints the selected diagram.
- **Save to SVG:** Saves the currently selected diagram to an image file in SVG format.
- **Add Objects to Diagram:** A dialog is displayed where you can select one or more objects from a specific schema into the selected diagram. Type * or a few characters in the search field to list the objects from the selected schema.
- **Add Note:** Adds notes to the selected diagram. Select the note to see the associated properties in the right pane, such as Text and Colors.
 - To enter text, expand the TEXT box and type information.
 - To select the background, border, or text color for the note, click the box and select the required color. To revert to the default color, click the Reset icon.
- **Delete:** Deletes the selected object or objects from the diagram. To select multiple objects, press the CTRL key and select the objects.
- **Zoom In:** Displays more detail, and potentially fewer objects, in the currently selected diagram.
- **Zoom Out:** Displays less detail, and potentially more objects, in the currently selected diagram.
- **Fit Screen:** Makes all relevant objects fit in the window for the currently selected diagram, adjusting the sizes of shapes and text labels as needed.
- **Actual Size:** Adjusts the shapes and text labels in the currently selected diagram to the default sizes.
- **Auto Layout):** Rearranges the objects in the diagram to a layout that may be more meaningful and attractive. If you do not like the rearrangement, you can restore the previous layout by clicking Undo.
- **DDL Preview:** Shows the DDL statements that would be generated to create the object. You can preview the DDL for selected objects by dragging the cursor over the objects that you want to preview and clicking **DDL Preview**. You have the option to save or send the DDL statements to the worksheet. To specify options on how to generate the DDL, click **Options**.

- **DDL Preview for Current Schema:** Shows the DDL statements that would be generated for the current schema. You can send the DDL statements to the worksheet. To specify DDL options for the schema, click **Options**.
- **Diagram Report:** Generates a report for tables and views in the selected diagram.
- **Schema Report:** Generates a report for tables and views in the selected schema.
- **Help:** Displays the help for the Data Modeling editor.