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Preface

Learn how to get started with Oracle Analytics Cloud – Essbase.

Topics

• Audience
• Documentation Accessibility
• Related Resources
• Conventions

Audience

Oracle Analytics Cloud – Essbase is intended for business users, analysts, modelers, and decision-makers across all lines of business within an organization who use Oracle Analytics Cloud – Essbase.

Documentation Accessibility

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

Access to Oracle Support

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

Related Resources

Use these related resources to expand your understanding of Oracle Analytics Cloud – Essbase.

Topics

• Oracle Public Cloud http://cloud.oracle.com
• Technical Reference for Oracle Analytics Cloud - Essbase
• Accessibility Guide for Oracle Analytics Cloud - Essbase
• Designing and Maintaining Essbase Cubes
• Getting Started with Oracle Analytics Cloud
Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><strong>monospace</strong></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
Get Started with Oracle Analytics Cloud – Essbase

Oracle Analytics Cloud – Essbase is a cloud-based business analytics solution that uses a proven, flexible, best-in-class architecture for analysis, reporting, and collaboration. This cloud service delivers instant value and greater productivity for your business users, analysts, modelers, and decision-makers, across all lines of business within your organization. You can interact with the cloud service, through a Web 2.0 or Microsoft Office interface, to analyze, model, collaborate, and report. Oracle Analytics Cloud – Essbase, is built to scale and uses the industry-standard Oracle Cloud infrastructure.

Overview of Oracle Analytics Cloud – Essbase

• Overview of Oracle Analytics Cloud – Essbase
• Access Oracle Analytics Cloud – Essbase
• Cloud Service, REST, and Smart View Client URLs
• Setting Up Your Client
• Manage your Password and Password Challenge Questions
• Oracle Learning Library

Overview of Oracle Analytics Cloud – Essbase

Proven Platform and Technology

Oracle Analytics Cloud – Essbase helps you to build your company’s cloud strategy efficiently by avoiding data and business process fragmentation. The cloud platform’s functional architecture optimizes Oracle Cloud resources, and is based on the proven Oracle Essbase platform, which is widely used to solve simple to complex business analytics use cases across all industries. It is designed to help you model business performance levels and deliver what-if analyses for varying conditions. Using Oracle Identity Cloud Service, Essbase can utilize enterprise-wide user profiles to work and integrate with Oracle Cloud.

Best-in-Class Functionality

Oracle Analytics Cloud – Essbase can be accessed on an intuitive Web 2.0 or Microsoft Office interface for all of your analytic and business modeling needs, from multi-dimensional analysis to complex procedural business logic applied to your data. You can easily create and share on-the-fly transient models or deliver enterprise-wide long-established databases. New agile forecasting functionality facilitates collaborative what-if analysis and modeling. A gallery of cube templates provided with Essbase helps you get started – see Exploring the Gallery Templates.

Scalable and Flexible

Oracle Analytics Cloud – Essbase is built on the Essbase platform. It leverages the best of the on-premises software and adds new functionality for the cloud. You can now increase the available size and complexity of your models, while reducing the
complexity for deploying them. The cloud platform service offers you specially built technology to facilitate your rapid deployment of on-the-fly analytic models, enabling them to be extended as your business needs evolve or discarded in favor of your new models. By creating and sharing these ad hoc models, you can quickly build and collaborate using Microsoft Excel and Web interfaces. The elasticity and scalability of the cloud platform means you can scale the service up or down depending on workloads and usage requirements.

**Enterprise Ready**

Oracle Analytics Cloud – Essbase is your one-stop cloud service to build, deploy, and manage analytic and reporting applications for any size organization and deployments. It supports data backup and migration, and can also distribute application templates throughout your organization without compromising ease of use or self-service options. The cloud platform service provides flat-file, Excel-based, and SQL-based import and export.

**Rapid Deployment**

With Oracle Analytics Cloud – Essbase, you can get started immediately, because it requires no initial investment. Your subscription includes everything that you need. You do not need to license, install, upgrade, or patch software. You do not have to buy, install, or configure hardware. Using the new application workbook upload, you can also leverage the deep product expertise of the worldwide Oracle Hyperion Partner network and the Essbase gallery templates to quickly develop and deploy cloud-based analytic models.

**Portability**

If you're an existing Essbase customer, you can leverage its built-in migration capabilities to port your on-premises Essbase applications to Oracle Analytics Cloud – Essbase. Migrating enables your organization to extend Oracle Analytics Cloud – Essbase usage across the enterprise to other lines of business, without additional demands on your IT resources, hardware, personnel or budget.

---

**Access Oracle Analytics Cloud – Essbase**

You can access Oracle Analytics Cloud – Essbase using credentials supplied by your Service Administrator.

You can also access the cloud service from Smart View. See [Access the Cloud Service from Smart View](#).

Accessibility is not enabled by default. If you’re using a screen reader, switch to Classic User Interface. See [Accessing the Classic User Interface](#).

To access the cloud platform service, you must have the following information:

- URL to the cloud platform service
- User name
- Password
- Identity domain to which you belong

The first time you log in, you need to:

- Check the email from your service administrator for the URL for accessing the cloud service.
• Check the email from the Oracle Cloud Administrator (oraclecloudadmin_ww@oracle.com) for your user name, temporary password, cloud instance name, and the identity domain to use.

After you log in, the Applications home page is displayed.

Use Service Credentials to Access the Cloud Service

1. Go to the URL, for the cloud service instance you are using, provided by your Service Administrator.
2. (Optional) Specify your identity domain.
   a. In Enter your Identity Domain, enter the name of the identity domain that services the instance.
   b. If you access only one identity domain, select Save your identity domain selection for future sign-ins to set it as the default domain.
      Because you are not prompted to specify an identity domain during future sign-in attempts, do not select this check box if you use cloud services that access different identity domains.
   c. Click Go.
3. Enter your user name and password.
4. Click Sign In.

If you have already reset your default password, the cloud service home page is displayed.

If you are accessing the cloud service for the first time, the Password Management screen is displayed to help you personalize your password.

   a. In Old Password, enter the temporary password that you received in the email from the Oracle Cloud Administrator (oraclecloudadmin_ww@oracle.com).
   b. In New Password and Re-Type Password, enter a new password that conforms to the password policy displayed on the page.
   c. In Register challenge questions for your account, select challenge questions and their answers to retrieve the password if you forget it.
   d. Click Submit.

Access the Classic User Interface

In Oracle Analytics Cloud – Essbase, you can select either Classic User Interface or Modern User Interface.

This guide describes how to use Essbase in the Modern User Interface. For description of how to use Essbase in the Classic User Interface, see Using Oracle Analytics Cloud - Essbase Classic User Interface.

To select the classic interface,
1. Log in using the credentials provided by your Service Administrator.
2. Click the drop-down menu associated with your user name.
3. Select Classic User Interface.
Access the Cloud Service from Smart View

When you access Smart View, the login screen is displayed. You must enter the credentials for a cloud service instance and identity domain, which you get from your Service Administrator.

1. Open Microsoft Excel.
2. Select Smart View, and then Panel.
3. Click Private Connections.
4. Enter your cloud service user name and password.
5. Enter the name of the identity domain that your cloud service instance uses.
6. Click Sign In.
7. In the Private Connections list, select Oracle Essbase Cloud Service.

See Cloud Service, REST, and Smart View Client URLs.

Cloud Service, REST, and Smart View Client URLs

Get the URL for the cloud service instance you are using from your Service Administrator. The basic format of the URL is:

https://cloud-instance-name.oraclecloud.com/essbase

In the URL, the values for instance_name and id_domain are provided by the customer when applying for the cloud service, and the data_center value is determined by the cloud service.

URL format:

https://instance_name-id_domain.analytics.data_center.oraclecloud.com/essbase

For example:

https://myEssbase-myDomain.analytics.us2.oraclecloud.com/essbase

Cloud service components, such as the Smart View client and the REST API, have their own URLs.

Smart View client URL:

cloud_service_url/essbase/smartview

You can access Smart View if you have valid credentials. You can also configure the Smart View URL. See Create Data Source Connections to the Cloud Service.

Discovery URL:
A discovery URL is the URL provided by your Service Administrator, with /agent appended to the end. You can use it to log in to the MaxL Client, and to access Essbase from Oracle BI and Data Visualization.

cloud_service_url/essbase/agent

REST API URL:

cloud_service_url/essbase/rest/v1

Set Up Your Client

In the Oracle Analytics Cloud – Essbase Console, you can download desktop tools to use for administration, import and export. Set up your local client computer using these tools. Be sure you are using the latest versions provided in the Console, as older, previously downloaded versions may not work correctly.

• Export Utility—Creates an application workbook from an existing cube. The workbook can be used to re-import the cube and its artifacts.

See Download the Cube Export Utility

• Smart View for Essbase—Provides a Microsoft Office interface for cloud data analysis.

You must synchronize the version of the Smart View client that you use to access the cloud service with the version of the servers deployed in the cloud service. The readme file available from the cloud service indicates whether you require a new client installation to access the cloud service.

See Download and Run the Smart View Installer and Create Data Source Connections to the Cloud Service.

• Life Cycle Management (LCM)—Backs up on-premise cubes and artifacts so they can be imported into the cloud.

See On-Premises Application Migration and Use Cases.

• Command Line Tool (CLI)—Provides a command line interface for common Essbase administrative tasks, including migration.

See Download and Use the Command-Line Interface.

• Migration Utility—Provides a command line interface for moving Essbase applications, cubes, artifacts, and users between cloud instances.

• Essbase MaxL Client—Provides an administrative, language-based interface for managing Essbase cubes and artifacts. This alternative to the CLI can be useful if you already have a library of MaxL scripts.

See Managing Essbase Using the MaxL Client.

• Essbase Java API—Enables development of Essbase client tools in Java.

• Sample Utility Scripts—Demonstrates automating operations using MaxL and CLI.

• Cube Designer Extension—Deploys Essbase cubes from formatted application workbooks. Cube Designer is an add on to Smart View. It can also be used to deploy cubes from tabular data in an Excel worksheet.
See Install the Smart View Cube Designer Extension.

Manage your Password and Password Challenge Questions

On your first login, you're prompted to personalize your password and set responses to challenge questions, so that you can retrieve your password if you forget it. Later, you can reset the password and change your challenge questions.

1. Enter your current or temporary password that you received in the email from the Oracle Cloud Administrator.
2. Enter and confirm a new password.
3. Register your challenge questions for your account, by selecting challenge questions and their answers.

To obtain a temporary password because you forgot your password:

1. Go to the URL for your cloud service instance.

   https://cloud-instance-name.oraclecloud.com/essbase

To view a list of URLs, see Cloud Service, REST, and Smart View Client URLs.

2. (Optional) If you did not set a default identity domain during a previous session, enter your identity domain, and then click Go.

3. In Sign In to Oracle Cloud, click the Can't access your account? link.

4. Enter your user ID and responses to your challenge questions.

Oracle Learning Library

The Oracle Learning Library (OLL) is dedicated to hosting free instructional content developed by Oracle subject-matter experts. Use the Search function to find tutorials, overview videos, and Oracle by Example (OBE) tutorials. For example, to find videos for related products such as Oracle Hyperion Smart View for Office, use the OLL Advanced Search and set the Product search filter to Smart View.
Top Tasks for Oracle Analytics Cloud – Essbase

These topics take you through a series of workflows that cover many of the top tasks that you can do in the cloud service and in Cube Designer, as a Service Administrator or Power User.

Service Administrator:
- Top Tasks Prerequisites
- Create Users in LDAP Identity Management Mode

Power User:
- Import and Export Bulk Users in LDAP Identity Management Mode
- Understand Application Workbooks
- Explore the Gallery Templates
- Create an Application in the Cloud Service and Provision a User to Access and Query the Cube
- Analyze an Application in Smart View
- Modify an Outline in the Cloud Service
- Manage Jobs
- Analyze Forecast Data in Smart View
- Create an Application and Cube in Cube Designer
- Analyze Data and Perform an Incremental Update in Cube Designer
- Transform Tabular Data into a Cube
- Export and Modify Metadata and Data
- Create a Hierarchy from a Measures Dimension
- Analyze Data with Drill Through Reports

Top Tasks Prerequisites

Before you start reviewing the top tasks topics, be sure you have met these prerequisites:

1. Be sure that you can log into the cloud service.
   See Access Oracle Analytics Cloud – Essbase.

2. Be sure that Smart View and Cube Designer extension are installed on client computers.
   See Set up Cube Designer.
Create Users in LDAP Identity Management Mode

When Oracle Identity Cloud Service (IDCS) is enabled for identity management, users and groups are created and managed in the IDCS administrator interface. Otherwise, in LDAP mode, users and groups are created and managed on the Security page of the cloud service, as described here.

In this task, for LDAP mode, you'll create a user and assign one of the predefined Oracle Analytics Cloud – Essbase roles to that user.

<table>
<thead>
<tr>
<th>Predefined User-Level Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Administrator</td>
<td>Can create applications, users, and run jobs.</td>
</tr>
<tr>
<td>Power User</td>
<td>Can create applications and cubes, and grant access to users to perform actions on these cubes.</td>
</tr>
<tr>
<td>User</td>
<td>Can access and perform actions on cubes for which access has been granted.</td>
</tr>
</tbody>
</table>

1. Log into Oracle Analytics Cloud – Essbase using the default Oracle Analytics Cloud administrative user, admin. Note that only users with Service Administrator role can create users.

2. On the Applications page, without selecting an application or cube, click Security.

3. On the Users tab, click Add User to add and provision Oracle Analytics Cloud – Essbase users.

4. On the Add User dialog box, provide the following information:
   a. Enter a user ID for a Service Administrator role: server_admin.
   b. Enter the user's name.
   c. Enter the user's e-mail address.
   d. Select the role Service Administrator.
   e. Create and confirm a password.
   f. Click in the Groups box to add the user to groups, or remove from groups.

5. Click Save. The new Service Administrator user is added to the list of users.

In Import and Export Bulk Users in LDAP Identity Management Mode, you will import and export batches of users.

Import and Export Bulk Users in LDAP Identity Management Mode

In Create Users in LDAP Identity Management Mode, you learned about creating a user and assigning a role.

Now you'll learn how to run bulk imports and exports of files with multiple users and roles. This is only applicable for LDAP identity mode. When Oracle Identity Cloud Service (IDCS) is enabled for identity management, users and groups are created and managed in the IDCS administrator interface.

Importing a bulk file of users and roles:
1. Create a comma-separated Excel file (saved as .csv) that contains the user ID, first and last names, email address, password, and role type (User, Power User, or Service Administrator). Note that although some field content may be optional, comma delimiters are required even for empty fields.

2. Log into Oracle Analytics Cloud – Essbase as a Service Administrator, server_admin.


5. Browse to the local .csv file created in Step 1, and click Open and then OK.

6. Click Search icon to refresh the page and view the users and roles imported to the cloud service from the .csv file.

7. If any users were imported without a password, the service administrator must create one prior to the user’s first login.

Exporting bulk users and roles:

1. On the Security page, on the Users tab, click Export.

2. Save the .csv file to a local directory.

3. You can open the .csv file in Excel to view the exported user data. Passwords are not exported, so that column does not contain values. You can enter a password in this column, to assign an initial user password for users imported from this file.

In Understand Application Workbooks, you’ll download a sample application workbook.

Understand Application Workbooks

The gallery section of the File Catalog provides a collection of sample application workbooks that you can modify for your own use to quickly deploy an application and cube.

Now you’ll learn about the structure of an application workbook.

Download the Sample Dynamic Application Workbook

In the Block Storage Sample (Dynamic) application workbook, all non-leaf level members in the cube are dynamically calculated. Dynamically calculated values are not stored in the cube; the values are recalculated and rendered for each user retrieval.

To download the Block Storage Sample (Dynamic) application workbook:

1. On the Applications page, click Files, then click Gallery, Cubes, and General.

2. On the General page, click the Actions menu next to Sample_Basic_Dynamic.xlsx.

3. Save the application workbook file, Sample_Basic_Dynamic.xlsx, to a local drive.

Examine the Structure of the Sample Dynamic Application Workbook

Application workbooks contain a number of worksheets that define the metadata for the cube.
1. In Microsoft Excel, open `Sample_Basic_Dynamic.xlsx`.

2. On the Essbase.Cube worksheet, the application name (Sample_Dynamic), cube name (Basic), the names of 10 dimensions, and other information about the dimensions, are defined.

3. Each dimension has a separate worksheet, Dim.dimname, in which the dimension is further defined with information such as the build method and incremental mode. Because the build method for each dimension in this sample application workbook is PARENT-CHILD, members are defined in PARENT and CHILD columns.

   On the Dim.Year worksheet, months roll up to quarters, and quarters roll up to years. For example, child members Jan, Feb, Mar roll up to parent member Qtr1. Child member Qtr1 rolls up to parent member Year.

   The Dim.Product and Dim.Market worksheets are similarly structured. In Dim.Product, SKUs roll up to product families, and product families roll up to Product. For example, child members 100-10, 100-20, and 100-30 (SKUs) roll up to parent member 100 (product family). Child member 100 rolls up to parent member Product.
4. This sample application workbook includes data. Scroll to the last worksheet, Data.Basic, to review the structure of the columns and the data.

In this topic, you learned about the structure of an application workbook. Next, learn how to access additional templates using the Gallery section of the File Catalog.

Explore the Gallery Templates

Gallery templates are application workbooks that you can use to build fully functional Essbase cubes. Think of these templates as starter kits you can use not only to build cubes, but to learn about Essbase features, and to model a variety of analytical problems across business domains.

The gallery templates include README worksheets, describing the purpose and usage of the workbook and cube.

Gallery templates are packaged in the form of an application workbook, and may also have additional supporting files. You use an application workbook to create an application and cube using either of these methods: the import button in the Oracle Analytics Cloud – Essbase web interface, or the Build Cube button on the Cube Designer ribbon in Excel. To access the gallery from the Oracle Analytics Cloud – Essbase web interface, click Files and navigate to the gallery section. To access the gallery from Cube Designer, use the Cloud button on the Cube Designer ribbon.

The gallery templates are grouped into the following categories:

- Applications Templates
- Technical Templates
- System Performance Templates
Applications Templates

Gallery templates in the Applications folder demonstrate various business use cases for Essbase across several organizational domains.

The following cubes, located in the gallery/Applications/Sales and Operations Planning folder, connect together to perform their respective aspects of sales and operational planning tasks:

- Forecast Consensus—develop and maintain an agreed-upon forecast shared across departments
- Demand Consolidation—forecast customer demand
- Production Schedule—compute a weekly master production schedule for all products and locations
- Capacity Utilization—ensure that existing plant capacity can handle the production schedule

Compensation Analytics illustrates how Human Resources analysts can perform headcount and compensation analysis, analyze attrition, and allocate compensation increases.

Organization Restatements demonstrates how operational expenses can be restated, after organizational changes, for internal management reporting.

Opportunity Pipe demonstrates how to manage a sales pipeline.

Spend Planning shows how procurement analysts can manage operational spending using top-down and bottom-up forecasting methods.

Project Analytics demonstrates project planning risk analysis, accounting for factors such as workforce skills and costs, revenue, margin, inventory, and schedule.

RFM Analysis demonstrates how to identify the most profitable customers based on metrics.

Consolidation Eliminations is a financial analysis application demonstrating how to identify and eliminate balances between two companies.

Organization Restatements is a financial analysis application demonstrating how to restate expenses after an organizational change.

In addition to these business applications, the Applications grouping of templates also includes:

- Demo Samples—simple examples of block storage and aggregate storage cubes commonly referenced in Essbase documentation.
- Utilities—cubes that may be utilized by other sample cubes. For example, the Currency Rates template takes currency symbols and returns the exchange rate to USD. The Currency Triangulation template uses a calculation script to triangulate currencies.

Technical Templates

The Technical templates demonstrate the use of specific Essbase features.

- Calc: Allocation Tracing—perform allocations and debug calculation scripts
• Calc: Sample Basic RTSV—pass member names into a calculation script using runtime substitution variables
• Calc: Zigzag Calculation—learn how Essbase performs complex calculations across a time dimension
• Calc: CalcTuple Tuple—optimize asymmetric grid calculations across dimensions
• Drill Through: Drillthrough Basic—drill through to external sources to analyze data outside of the cube
• Filters: Efficient Filters—design and use variable data-access filters
• MDX: AllocationMDX Insert—allocate and insert missing values
• Partitions: Realtime CSV Updates—access real-time data
• Solve Order: UnitPrice SolveOrder—use and understand solve order in a hybrid aggregation cube
• Solve Order: Solve Order Performance—compare query performance using dynamic calculations versus using stored members and a calculation script
• Table Format—build Essbase cubes from tabular data
• UDA: Flip Sign—learn how to flip signs of data values during a data load to meet reporting requirements

System Performance Templates

System performance templates monitor system status for optimization purposes.

The Health and Performance Analyzer template helps you monitor usage and performance statistics of your Essbase applications.

Create an Application in the Cloud Service and Provision a User to Access and Query the Cube

In Understand Application Workbooks, you learned about the structure of an application workbook by exploring Sample_Basic_Dynamic.xlsx.

Now, you use this workbook to learn how to create an application in the cloud service and provision a user to access and query the cube.

Create an Application in the Cloud Service

First, you use this workbook to learn how to create an application in the cloud service.

1. In the web interface, on the Applications page, click Import.
2. On the Import dialog box, click File Browser (as the workbook was downloaded to the local file system). Open the Block Storage Sample (Dynamic) application workbook, Sample_Basic_Dynamic.xlsx, that you saved in Understand Application Workbooks.
3. Expand Advanced Options and Build Option, select Create Database, and then check the box to load data. You do not need to select Execute Scripts, because all measures and aggregations along hierarchies in the cube are dynamically calculated at query time.
4. Click **OK**. In a few moments, the Sample_Dynamic application and Basic cube are created.

5. On the Applications page, expand the **Sample_Dynamic** application, and select the cube, **Basic**.

6. In the Actions list for the cube, select **Outline**. The outline is a representation of the dimensions in the Basic cube as defined in the application workbook. The outline opens in a separate browser tab, allowing you to navigate between the outline and other web interface actions.

7. View a cube dimension, and then drill down into the children of that dimension:
   a. Expand the **Year** dimension to view the quarters.
   b. Expand the individual quarters to view months.

Now all of the information from the application workbook is represented in the new cube.

**Provision a User to Access and Query the Cube**

Now, you provision a user to access and query the cube.

1. Log in as a power user. This allows you to provision other users to the applications you have created.

2. Return to the web interface browser tab and go to **Applications**.

3. Select the application for which you want to provision the user; in this example, select **Sample_Dynamic**. If you select the cube instead of the application, then you won't be able to provision user roles.

4. Use the Actions menu to open the application inspector.

5. Select the **Permissions** tab within the application inspector.

6. Select **+** to see the list of users on the system and select the **+** next to each user to assign their access.

7. Use the radio button controls next to each user to assign their access. Select **Database Manager** for each added user. The Database Manager has full control of the cube, but no control over the application.

8. Click **Close**.

In **Analyze an Application in Smart View**, you’ll go to Smart View, log in as the user you just provisioned, and then query a cube.

**Analyze an Application in Smart View**

In **Create an Application in the Cloud Service and Provision a User to Access and Query the Cube**, you created an application and a cube with data, and provisioned users.

Now you'll learn how to connect to the cube from Smart View, and do some analysis of the data.

This task assumes that you installed Smart View. See **Download and Run the Smart View Installer**.
Connect to a Cube in Smart View

Connect to a cube from Smart View so that you can perform analysis.

1. Open Microsoft Excel.
   If Smart View is installed, you can see the Smart View ribbon.

2. On the Smart View ribbon, click Panel.

3. On the Smart View Home dialog box, click the arrow next to the Home button, then select Private Connections.

4. Make a private connection using the same cloud service instance URL that you used to connect to Oracle Analytics Cloud – Essbase and append /essbase/smartview to the end of that URL. For example, https://myEssbase-test-myDomain.analytics.us2.oraclecloud.com/essbase/smartview.

5. Log in as the user you created.


7. Highlight the Basic cube under the Sample_Dynamic application, and click Connect.

Perform an Ad hoc Analysis

Once you’re connected to the Basic cube, you’re ready to begin analyzing the data.

You can specify the ancestor position for a hierarchy as top or bottom, in the Member Options tab of the Options dialog in Smart View. SSANCESTORONTOP must first be enabled by an administrator in application configuration in the Essbase web interface. You can see the change in an existing grid when you perform a zoom-in operation. Here, just use the default bottom position.

1. On the EssbaseCluster tree, under Sample_Dynamic, select the Basic cube, then click Ad hoc analysis.

2. In the resulting grid, you can see one aggregated data value for all five dimensions of this dynamic cube.

<table>
<thead>
<tr>
<th>Product</th>
<th>Market</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>105522</td>
<td></td>
</tr>
</tbody>
</table>
3. Navigate into the member Scenario and narrow it down to a specific scenario type of Actual data.
   a. Click the cell containing Scenario.
   b. On the Essbase ribbon, click Member Selection.
   c. In the Member Selection dialog box, check the box next to the Actual member.
   d. Click Add to move Actual to the right pane.
   e. If Scenario is already included in the right pane, highlight it and use the left arrow to remove it, and then click OK.

On the Essbase ribbon, click Refresh. The grid should now look like this:

<table>
<thead>
<tr>
<th>Product</th>
<th>Market</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>105522</td>
<td></td>
</tr>
</tbody>
</table>

4. Navigate into Measures and narrow it down to the Sales member, to look at sales data.
   a. Highlight the cell containing Measures.
   b. On the Essbase ribbon, click Zoom In.
   c. Highlight the cell containing Profit, and click Zoom In.
   d. Highlight the cell containing Margin, and click Zoom In.
   e. Highlight the cell containing Sales, and click Keep Only.

The grid should now look like this:

<table>
<thead>
<tr>
<th>Product</th>
<th>Market</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>400855</td>
<td></td>
</tr>
</tbody>
</table>

5. Zoom in to Year by double-clicking the cell containing Year.
The grid should now look like this:
6. Zoom in to Product by double-clicking the cell containing Product. The grid should now look like this:

<table>
<thead>
<tr>
<th>Product</th>
<th>Market</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qtr1</td>
<td>95820</td>
<td></td>
</tr>
<tr>
<td>Qtr2</td>
<td>101679</td>
<td></td>
</tr>
<tr>
<td>Qtr3</td>
<td>105215</td>
<td></td>
</tr>
<tr>
<td>Qtr4</td>
<td>98141</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>400855</td>
<td></td>
</tr>
</tbody>
</table>

7. Enhance your data display to show time periods per product. Pivot Qtr1 of Colas by highlighting it, right-clicking and holding, then dragging it from B3 to C3. The grid should now look like this:

<table>
<thead>
<tr>
<th>Market Sales</th>
<th>Qtr1</th>
<th>Qtr2</th>
<th>Qtr3</th>
<th>Qtr4</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colas</td>
<td>25048</td>
<td>27187</td>
<td>28544</td>
<td>25355</td>
<td>106134</td>
</tr>
<tr>
<td>Root Beer</td>
<td>26627</td>
<td>27401</td>
<td>27942</td>
<td>27116</td>
<td></td>
</tr>
<tr>
<td>Cream Soda</td>
<td>23997</td>
<td>25736</td>
<td>26650</td>
<td>25022</td>
<td>101405</td>
</tr>
<tr>
<td>Fruit Soda</td>
<td>20148</td>
<td>21355</td>
<td>22079</td>
<td>20648</td>
<td></td>
</tr>
<tr>
<td>Water Beve</td>
<td>#Missing</td>
<td>#Missing</td>
<td>#Missing</td>
<td>#Missing</td>
<td></td>
</tr>
</tbody>
</table>
8. Look at each product by region. Double-click Market in B1. The grid should now look like this:

<table>
<thead>
<tr>
<th>Market</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
</tr>
<tr>
<td></td>
<td>Qtr1</td>
</tr>
<tr>
<td></td>
<td>Qtr2</td>
</tr>
<tr>
<td>Colas</td>
<td>25048</td>
</tr>
<tr>
<td></td>
<td>27187</td>
</tr>
<tr>
<td>Root Beer</td>
<td>26627</td>
</tr>
<tr>
<td></td>
<td>27401</td>
</tr>
<tr>
<td>Cream Soda</td>
<td>23997</td>
</tr>
<tr>
<td></td>
<td>25736</td>
</tr>
<tr>
<td>Fruit Soda</td>
<td>20148</td>
</tr>
<tr>
<td></td>
<td>21355</td>
</tr>
<tr>
<td>Water Beve</td>
<td>#Missing</td>
</tr>
<tr>
<td></td>
<td>#Missing</td>
</tr>
<tr>
<td>Product</td>
<td>95820</td>
</tr>
<tr>
<td></td>
<td>101679</td>
</tr>
<tr>
<td></td>
<td>105215</td>
</tr>
<tr>
<td></td>
<td>98141</td>
</tr>
<tr>
<td></td>
<td>400855</td>
</tr>
</tbody>
</table>

9. Drill in to a region to view product sales by state. Double-click East in A4. Because not every product is sold in every state, some cells have the #Missing label instead of a data value.

In this task, you navigated through a data grid easily, zooming in and pivoting by clicking in the grid itself. You can also use the tools on the Essbase ribbon to perform the same actions. For more help on using Smart View, click the Smart View tab, and then click Help.

In Modify an Outline in the Cloud Service, you'll go back to the Oracle Analytics Cloud – Essbase web interface and modify an outline.

Modify an Outline in the Cloud Service

In Analyze an Application in Smart View, you analyzed an application in Smart View. Now you'll modify a cube outline in the web interface.

Creating a New Member

You start by creating a new member.

1. In the web interface, on the Applications page, select the Basic cube in the Sample_Dynamic application.
2. Click the **Actions menu**, and select **Outline**.

3. Click **Edit**.

4. Expand the Scenario dimension by clicking the arrow next to **Scenario**.

5. Insert a member:
   a. Click the **menu** that you see when you hover over the **Budget** member.
   b. Click **Add sibling**.

6. Enter the member name, **Forecast**, and press **Tab**.

7. Select the tilde (⁻) consolidation operator from the list.
   The Forecast member does not aggregate with the other members in its dimension.

8. Leave the data storage type as **Store Data** because we want users to be able to input forecast data.

9. Click **Save**.

**Seeding the Forecast Member with Data**

To seed the Forecast member with data, we'll create a calculation script and calculate forecast data.

1. In the web interface, on the Applications page, select **Basic** cube in the **Sample_Dynamic** application, click the **Actions menu**, and select **Inspect**.

2. In the Basic dialog box, select the **Scripts** tab, with **Calculation Scripts** selected, click ✨ to add a calculation script.

3. In the **Script Name** field, enter `salesfcst`.

4. In the **Script Content** box, enter a simple formula:

   ```plaintext
   Forecast(Sales=Sales->Actual*1.03;)
   ```

   Forecast for sales is equal to actual sales multiplied by 1.03, which seeds the Forecast member for Sales with a value 3% higher than the actual sales.

5. Click **Save and Close**.

6. Close the database inspector by clicking **Close** until all tabs are closed.

**Executing the Script**

Calculation scripts are executed as jobs.

1. In the Web interface, select the Jobs page.

2. Click **New Job**, and select **Run Calculation**.

3. On the Run Calculation dialog box, in the **Application** field, select **Sample_Dynamic** application.
   Notice that the **Database** field automatically populates the **Basic** cube.

4. On the **Scripts** menu, select the `salesfcst` calculation script that you created.

5. Click **OK**.

6. Click **Refresh** to see that the job completes.
In **Analyze Forecast Data in Smart View**, you'll analyze this new forecast data in Excel. But first, let's take a closer look at managing jobs.

**Manage Jobs**

Jobs are operations such as loading data, building dimensions, exporting cubes, running MaxL scripts, running calculations, and clearing data. Jobs are asynchronous, meaning they are run in the background as a unique thread. Each job has a unique id.

**Viewing Job Status**

Because jobs are run in the background, you must refresh the Jobs page to view their status. Users have access to job listings based on the role they are assigned in the cloud service. For example, if you are a user with the Service Administrator role can see all jobs; if you have the User role, you can see only the jobs you ran.

The job listing by default shows all the jobs for all the applications provisioned to the logged in user. You can scroll down to see the history of all the jobs that you ran.

1. On the Applications page, click **Jobs**.
2. Click **Refresh** to refresh once, or click **Auto Refresh** to refresh the jobs every few seconds. In Cube Designer, job status is refreshed automatically.

**Viewing Job Details**

You can also view details for an individual job. To view job details, click the **Actions** menu, and select **Job Details** to see input and output details for a job.

Job details include information such as script names, data file names, user names, number of records processed and rejected, and completion status.

---

**Analyze Forecast Data in Smart View**

In **Analyze an Application in Smart View**, you learned to analyze data in Smart View. In **Modify an Outline in the Cloud Service**, you added a Forecast member to the outline, and seeded it with data.

Now you'll reconnect to the cube in Smart View, and do further analysis of the data.

1. Open Excel and create a worksheet like the following one, by typing the member names in these cells: A3=Market, B3=Product, C1=Year, C2=Actual, D1=Sales, D2=Forecast.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Year</td>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Actual</td>
<td>Forecast</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Market</td>
<td>Product</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. On the Smart View ribbon, reconnect to Basic cube in the Sample_Dynamic application.
Your previous connection URL should be shown in the list of Private Connections.

3. When prompted to log in, connect as the user you provisioned.

4. To populate cells with data values, click **Ad hoc analysis**. In the resulting grid, you should be able to see the results of your calculation. The yearly sales data refreshes for both Actual and Forecast, and the forecast is about 3% higher than the actual:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Year</td>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Actual</td>
<td>Forecast</td>
</tr>
<tr>
<td>3</td>
<td>Market</td>
<td>Product</td>
<td>400511</td>
<td>412526.3</td>
</tr>
</tbody>
</table>

5. To test that the calculation is correct, create this Excel formula, =D3/C3, in cell E3, which divides the forecast data by the actual data, to ensure that D3 is 3% higher than C3.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Year</td>
<td>Sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Actual</td>
<td>Forecast</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Market</td>
<td>Product</td>
<td>400511</td>
<td>412526.3</td>
<td>=D3/C3</td>
</tr>
</tbody>
</table>

The test result should confirm the 3% increase, in which Actual is 400511, Forecast is 412526.3, and E3 is 1.0.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Year</td>
<td>Sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Actual</td>
<td>Forecast</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Market</td>
<td>Product</td>
<td>400511</td>
<td>412526.3</td>
<td>1.03</td>
</tr>
</tbody>
</table>

6. Zoom in on Product and Market. You can see that for all products and all markets, the forecast data is present and is 3% higher than the actual.
7. Now, build a worksheet that you will use to do a data analysis on the forecast, and make some changes.

   a. Click the cell containing Forecast, then click **Keep Only**.

   b. Select cells A3-B3 containing East and Colas, then click **Keep Only**. The grid should now look like this:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>East</td>
<td>Colas</td>
<td>28572.2</td>
</tr>
<tr>
<td>4</td>
<td>East</td>
<td>Root Beer</td>
<td>24382.16</td>
</tr>
<tr>
<td>5</td>
<td>East</td>
<td>Cream Soda</td>
<td>20848.23</td>
</tr>
<tr>
<td>6</td>
<td>East</td>
<td>Fruit Soda</td>
<td>16217.35</td>
</tr>
<tr>
<td>7</td>
<td>East</td>
<td>Diet Drinks</td>
<td>8156.57</td>
</tr>
<tr>
<td>8</td>
<td>East</td>
<td>Product</td>
<td>90019.94</td>
</tr>
<tr>
<td>9</td>
<td>West</td>
<td>Colas</td>
<td>29155.18</td>
</tr>
<tr>
<td>10</td>
<td>West</td>
<td>Root Beer</td>
<td>35226</td>
</tr>
<tr>
<td>11</td>
<td>West</td>
<td>Cream Soda</td>
<td>36452.73</td>
</tr>
<tr>
<td>12</td>
<td>West</td>
<td>Fruit Soda</td>
<td>36085.02</td>
</tr>
<tr>
<td>13</td>
<td>West</td>
<td>Diet Drinks</td>
<td>37515.69</td>
</tr>
<tr>
<td>14</td>
<td>West</td>
<td>Product</td>
<td>136918.9</td>
</tr>
<tr>
<td>15</td>
<td>South</td>
<td>Colas</td>
<td>16768.4</td>
</tr>
</tbody>
</table>

   c. With cells A3-B3 still selected, click **Zoom In** to view per-state information for detailed product SKUs. The grid should now look like this:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Year</td>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Forecast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>East</td>
<td>Colas</td>
<td>28572.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>New Yo</td>
<td>Cola</td>
<td>9208.2</td>
</tr>
<tr>
<td>4</td>
<td>New Yo</td>
<td>Diet Cola</td>
<td>#Missing</td>
</tr>
<tr>
<td>5</td>
<td>New Yo</td>
<td>Caffeine Free Cola</td>
<td>#Missing</td>
</tr>
<tr>
<td>6</td>
<td>New Yo</td>
<td>Colas</td>
<td>9208.2</td>
</tr>
<tr>
<td>7</td>
<td>Massac</td>
<td>Cola</td>
<td>6713.54</td>
</tr>
<tr>
<td>8</td>
<td>Diet Cola</td>
<td>#Missing</td>
<td></td>
</tr>
</tbody>
</table>
d. Pivot the Year dimension down into the columns. Highlight member **Year**, and select the arrow next to **zoom in** on the Essbase ribbon. Select **Zoom to bottom** to see the bottom level of the months.

The grid should now look like this:

![Excel grid with months and sales data](image)


e. Enter some monthly values to create a Diet Cola forecast. For example, enter 500 in each of the cells in the range C5:H5.

![Excel grid with forecast values](image)

f. Click **Submit Data**, and notice that the full year forecast in cell O5 changes to 3000, which is the sum of 500 in each of 6 months.

In this task, you learned how easy it is to analyze and edit the cube in Smart View, as long as you have the correct provisioning.

In **Create an Application and Cube in Cube Designer**, you’ll get familiar with Cube Designer.

### Create an Application and Cube in Cube Designer

In **Analyze Forecast Data in Smart View**, you analyzed data in Excel. Users working in Excel can design and deploy applications using Cube Designer.

Now you’ll use Cube Designer to create an application and cube, similar to what we did in the web interface service in a previous task.

### Open the Application Workbook in Cube Designer

Log in as a Power User and download Sample_Basic.xlsx from the Gallery.

1. In Excel, on the Cube Designer ribbon, click **Cloud**.

   If you are prompted to log in, then log in as a Power User.

2. Click **Gallery**, then **Applications/Demo Samples/Block Storage**, and double-click **Sample_Basic.xlsx**.
The Sample Basic application workbook is different from the Sample Basic Dynamic application workbook in that the Product and Market dimensions do not have dynamically calculated members.

For example, go to the Dim.Market worksheet in Sample_Basic.xlsx. Look at the Storage column. There are no X characters, which indicates that the members are stored. X characters in the Storage column indicate dynamically calculated members.

Therefore, after creating the dimensions and loading the data, you also need to calculate the cube.

Creating, loading, and calculating the cube can all be done in one step in the Build Cube dialog box.

Create, Load, and Calculate the Cube

Use Cube Designer to create, load, and calculate a cube from the Sample_Basic.xlsx application workbook.

1. On the Cube Designer ribbon, with the Sample Basic application workbook (Sample_Basic.xlsx) still open, click Build Cube.

2. On the Build Option menu, select Create Cube.

3. Click Run.

If there is an existing application with the same name, you are prompted to overwrite the application and cube. Click Yes to delete the original application and build this new application.

4. Click Yes to confirm your selection.

The View Jobs icon displays an hourglass while the job is in progress. The job runs in the background, and Cube Designer notifies you when the job is completed, which should display Success.

5. Click Yes to launch the Job Viewer and see the status of the job.

View the Application in the Cloud Service

View and inspect the new application in the web interface.

1. Log into the web interface.

2. On the Applications page, expand the Sample application and select the Basic cube.

3. Click the Actions menu to the right of the Basic cube and select Outline.

View the outline, and see that the expected dimensions are present.

4. Return to the Applications page, expand the Sample application, and select the Basic cube.

5. Click the Actions menu to the right of the Basic cube and select Inspect.

6. In the inspector, select Statistics.

7. On the General tab, in the Storage column, you see that both level 0 and upper-level blocks exist, showing that the cube is fully calculated.
In Analyze Data and Perform an Incremental Update in Cube Designer, you'll analyze data in this cube and perform incremental updates from Excel.

### Analyze Data and Perform an Incremental Update in Cube Designer

In Create an Application and Cube in Cube Designer, you executed a cube build, loaded data, and ran the calculation script defined in the workbook.

Now you'll analyze data, and then perform an incremental cube update.

### Analyze Data in the Sample Basic Cube

Validate that the cube build was successful and take a quick look at how to analyze data.

1. In Excel, on the Cube Designer ribbon, click **Analyze**.
2. On the **Analyze** menu, select **Connect Query Sheets**.
   - If you are prompted to log in, then enter your cloud service user name and password.
3. You're connected to the Basic cube in the Sample application.
4. You can now analyze the data.
   a. Use the Essbase ribbon to zoom in on **Cream Soda** to see all of the low-level products that are part of the Cream Soda family.
   b. Zoom out on **New York** to see all of the East region, and zoom out again to see all Markets.

### Perform an Incremental Update on the Sample Basic Cube

Add a hierarchy to the product dimension and see the results in Smart View.

1. Go to the Dim.Product worksheet, where you'll update the product dimension with some extra products.
2. Insert new members into the workbook, following the 400 product family.
   a. Create a new parent Product with child 500 and give it the Alias Default name **Cane Soda**.
   b. Create three new SKUs with parent 500: 500-10, 500-20, and 500-30.
   c. Give Alias Default names to the new SKUs. Call them Cane Cola, Cane Diet Cola, and Cane Root Beer.
3. Save the updated workbook.

4. Using the Cube Designer ribbon, click **Build Cube**.
   
   The build option will default to **Update Cube – Retain All Data** since the application already exists on the server and you are the application owner who created it.

5. Click **Run**.

6. When the job completion notice is displayed, click **Yes** to launch the **Job Viewer**.

7. You should see **Success**. If the job returns **Error**, then you can double-click the job for more information.

8. Close the **Job Viewer**.

9. With the Dim.Product sheet active, click **Hierarchy Viewer** in the Cube Designer ribbon.

10. On the Dimension Hierarchy dialog box, see that the Cane Soda product group was created.
11. Go to the query worksheet, Query.Sample.

12. Navigate to the top of the Product dimension by highlighting Dark Cream and zooming out using the Essbase ribbon. Then zoom out on Cream Soda.

13. Select Product again and click **Zoom In**.

14. Select Cane Soda and click **Keep Only**.

15. Select Cane Soda and **Zoom In** to see the children members.

Adding members to the Product dimension does not populate those members with data. Data can be submitted using Smart View or by performing a data load.

Application workbooks are convenient tools for designing Essbase cubes when you already understand the elements needed to build a cube or when you have a sample.

In **Transform Tabular Data into a Cube**, you will create an application using a columnar Excel worksheet without any Essbase-specific structure.

**Transform Tabular Data into a Cube**

You’ve learned to create cubes from application workbooks. You can also create cubes from tabular data. The tabular data can be from any source system (such as an ERP) or data warehouse, as long as the data contains facts and dimension information, and is contained in one worksheet in an Excel file.

In this task, you’ll use the Cube Designer to create a cube from a Sales report and analyze the outline.
1. In Excel, select the Cube Designer ribbon, then click **Cloud**.

2. On the Cloud Files dialog box, in the **Gallery/Technical/Table Format** folder, double click **Sample_Table.xlsx**.

   The **Sample_Table.xlsx** file contains a worksheet, Sales, which represents a common, simple sales report that you might receive from someone in your organization. The column headings indicate that there are measures (such as Units and Discounts), time representations (such as Time.Month and Time.Quarter), geographic regions (such as Regions.Region and Regions.Areas), and products (such as Product.Brand and Product.LOB).

   From this report, you can create an application and cube by using introspection, which is a method of inspecting a physical data source (in this case, the **Sample_Table.xlsx** file) for Essbase metadata elements.

3. On the Cube Designer ribbon, click **Transform Data**.

4. On the Transform Data dialog box, you can accept the default names for the application (Sample_Table) and cube (Sales) or you can change them.

5. Cube Designer inspects the tabular data to detect relationships that determine appropriate dimensionality.

6. Click **Run** and, when prompted to create the cube, click **Yes**.

7. When the job is completed, you'll see the Job Viewer dialog box.

   Click **Yes** until the status is **Success**.

8. Close the Job Viewer.

9. Log into the web interface.

10. On the Applications page, expand the **Sample_Table** application and select the **Sales** cube.

11. Click the Actions menu to the right of the **Sales** cube and select **Inspect**.

12. Select **Statistics**, and on the **General** tab, under **Storage**, the number 4928 for **Existing level 0 blocks** indicates that data has been loaded into the cube.

13. Use the General tab at the top of the database inspector to launch the outline.

   In the outline editor, you can see that the Sales cube has the following dimensions: Measures, Time, Years, Geo, Channel and Product.

14. Click **Measures** to zoom in on the members in that dimension.

   You'll notice that Units, Discounts, Fixed Costs, Variable Costs, and Revenue are in a flat hierarchy.

   In **Export and Modify Metadata and Data**, you'll create a hierarchy for these Measures so that you can see Revenue net of Discounts, and total costs (fixed and variable).

---

**Export and Modify Metadata and Data**

In **Transform Tabular Data into a Cube**, you created an application and cube from tabular data.

In this task, you'll export the newly created application and cube to an application workbook.
1. In the cloud service, on the Applications page, expand the Sample_Table application, and select the Sales cube.

2. From the Actions menu, select Export to Excel.

3. On the Export To Excel dialog box, select the Export Build Method (Parent-Child or Generation).

4. Select Export Data and click OK.
   - If the data size is less than 400 MB, this exports the metadata and data to an Excel file called an application workbook. Save the application workbook, Sample_table.xlsx to your Downloads area. The application workbook defines the cube that you exported.
   - If the data size exceeds 400 MB, the data file is saved in a compressed file and is not included in the exported Excel file. The ZIP file containing the data and the application workbook can be downloaded from Files page.

5. Open Sample_Table.xlsx. If your data is larger than 400 MB, Sample_Table.xlsx is in the ZIP file created Sales.zip in Files page. Download Sales.zip and extract the contents to access Sample_Table.xlsx.

6. Scroll to the Data.Sales worksheet, which is the data worksheet for the cube.
   The worksheet has the required dimensions, and the expected Measures names, and the data.

In Create a Hierarchy from a Measures Dimension, you’ll create a new hierarchy for the Measures dimension.

Create a Hierarchy from a Measures Dimension

In Export and Modify Metadata and Data, you exported to an application workbook and opened the Measures dimension.

In this task, you’ll create a new hierarchy for the Measures dimension and analyze the results.

1. In Excel, open the Sample_Table.xlsx application workbook, then go to the Dim.Measures worksheet.
   You’ll now create a member to be a new parent and create a new hierarchy.


3. On the inserted row, enter Net Revenue in the CHILD column, and Measures in the PARENT and PARENTID columns.

4. Enter Measures.Net Revenue in the MEMBERID column to define the member ID in the Parent.Child format.

5. Move the Discounts row to the bottom row.
   The parent of Revenue and Discounts is now Net Revenue. Therefore, change their MEMBERID values to Measures.Net Revenue.


7. Enter X for Storage for Net Revenue.Revenue and tilde (～) for Consolidation for Net Revenue.
Net Revenue will be dynamically calculated and will not consolidate with the other members in the dimension.

8. Enter the **Consolidation** value of + for Revenue and - for Discounts. Net Revenue is defined as the difference between Revenue and Discount.

9. Change the **Incremental Mode** to **Remove Unspecified.** Any existing relationships will no longer be kept.

10. Click **Save** to save the application workbook.

11. On the Cube Designer ribbon, click the **Build Cube** icon and select **Update Cube - Retain All Data.**

12. Click **Run** to run the update and then **Yes.**

13. When the job is completed, you’ll see the status in the Job Viewer dialog box. Click **Close.**

14. Open a blank Excel workbook, then click **Analyze**, then **Create Smart View Ad Hoc Query.**

15. On the Smart View pane, select the **Sales** workbook in the hierarchy and then **Ad Hoc analysis.**

16. Select the **Measures** dimension.

17. On the outline, click **Measures** to zoom in on the members in that dimension and to view the created hierarchy of Revenue and Discounts.

---

**Analyze Data with Drill Through Reports**

In this task, you'll see how to define and execute Drill Through Reports so that you can analyze additional detailed data retrieved from external data sources.

Using this application workbook, a comma-separated (.csv) data source file, and Cube Designer, learn how to create a sample cube to use for drill through. You upload a data source file, create a connection to it, and save the data source and the connection as part of the application's scope. you then create drill through reports, and use them to analyze a cube that accesses the data source.

1. First build a cube.
   a. In Essbase, browse to Files > gallery > Technical > Drill Through. Select the gallery workbook, Drillthrough_Basic.xlsx, and in the **Actions** menu to the right, click **Download.** Open the gallery workbook
   b. On the Cube Designer ribbon, click **Connections.** Ensure that you are connected to the correct Essbase Cloud Service URL. Click **Save.** Your connection is saved on the Server area of the ribbon.
   c. Click **Build Cube**, log in as a power user, and build it using the **Create Cube** option. Select the options to load data sheets, but not to run calculation sheets.
   d. Click **View Jobs** to view the status of the build. When the build cube job completes, go to a web browser and log in, as the same user, to Oracle Analytics Cloud - Essbase. On the Applications page, check that the application named DrillThrough was created, with a cube named Basic.
e. Move the accessory data source file, DrillthroughDS.csv, from the gallery section to the DrillThrough application's file catalog. Click Files and navigate to gallery > Technical > Drill Through. Select DrillthroughDS.csv. and in the Actions menu to the right, click Copy. Navigate to Files > All Files > applications > Drillthrough > Basic, and click Paste.

2. Now create a connection to the data source file.
   a. Click the application, then Actions > Inspect > Sources > Create Connection > File.
   b. Give the connection file a name; for example, DrillThru_Conn. Provide the catalog path by browsing to the location of DrillthroughDS.csv that you uploaded to the catalog: /applications/Drillthrough/DrillthroughDS.csv.
   c. Click Test to validate the connection, and if it is successful, optionally add a description and click Create. For the description, you might enter: This is a saved connection from application Drillthrough to its external data source DrillthroughDS.csv.

3. Now define the .csv file as a data source for the DrillThrough application.
   a. If you're still on the Sources page, click Datasources and then Create Datasource. Otherwise, click the application, then Actions > Inspect > Sources > Datasources > Create Datasource.
   b. On the Create Datasource dialog, select the saved connection that you created, DRILLTHROUGH.DrillThru_Conn. Things to notice: The connection name has a prefix of the application name, because it was defined in the application's scope. Essbase detects and fills out details about the data source, including that it has a header row, and that it is comma-delimited.
   c. Give the data source a name; for example, DrillThru_DS. Optionally add a description; for example: Flat data source for application Drillthrough. Click Next.
   d. On the columns list, where relevant, change the column types of all the measures to Double, because they are numbers, not strings. Change these to Double: SALES, COGS, MARKETING, PAYROLL, MISC, BEGINV, and ADDITIONS. Click Next.

4. Next, create a drillthrough report to analyze the external data.
   a. Under the DrillThrough application, navigate to the cube Basic, and launch the inspector. Click Scripts and then Drill Through Reports.
   b. Click Create and then Datasource to base this drill through report on the data source, rather than a URL.
   c. Give the report a name; for example, SalesDT. Select the data source you created: DRILLTHROUGH.DrillThru_DS. The columns of the data source are displayed.
   d. Select the columns that you want in the report, map them to dimensions, and designate the appropriate generation or level. Select PRODUCT, map it to Product, and select Level0. Repeat for more columns: MARKET/Market/Level0, YEAR/Year/Months, SCENARIO/Scenario/Level0. Select SALES and STATENAME, but leave them mapped to None.
e. Click **Drillable Regions** to define regions that should access (or drill through to) the external data source. Click + to add a region based on actual sales. Click in the empty row, and add this Essbase calculation expression to define its area:
   \[
   \text{Sales,Actual,Year,@DESCENDANTS(Year),Product,Market,@CHILDREN(Market)}.
   \]

f. Click + to add another region, based on budgeted sales. Use this Essbase calculation expression to define its area:
   \[
   \text{Sales,Budget,Year,@DESCENDANTS(Year),Product,@DESCENDANTS(Product),Market}.
   \]

g. Click **Save and Close**. You have created a drill through report named SalesDT.

5. Create another drill through report named AllLeavesDT, against the same data source, with columns for Product, Market, Year, Scenario, Sales, Statename, and COGS. Map the columns to the dimensions as follows: MARKET/Market/Level0, YEAR/Year/Months, SCENARIO/Scenario/Level0. Select SALES, STATENAME, and COGS to include them in the report, but leave them mapped to None. For the drillable region, use this area specification: Actual,Sales,@LEVMBRS(Product,0),@LEVMBRS(Year,0),@LEVMBRS(Scenario,0),@LEVMBRS(Market,0).

6. Now that you have set up an application and cube for drill through, and created some reports, you are ready to analyze some data in a spreadsheet. But first, set up Smart View to show drill through members and data cells in a different style.

   a. In this gallery workbook, Drillthrough_Basic.xlsx, on the the Smart View ribbon, click **Options**.

   b. Under Formatting, ensure that **Use Cell Styles** is selected.

   c. Under Cell Styles, expand Essbase, then Member Cells. Select **Member Drill-through**, then right-click and choose a style (for example, a blue background). Expand Data Cells. Select **Drill-through**, then right-click and choose the same style.

   d. On the Cube Designer ribbon, click **Analyze** and then **Connect Query Sheets**. If prompted, select **Reuse sheet contents and POV**. This connects you to your drill through cube, moves the workbook focus to the first query sheet, and selects the Essbase ribbon.

   e. The drillable regions are displayed in blue (or whichever style you chose). Drill through one of the cells to see the data source for the cell; for example, select cell E2 and click **Drill Through**.

   f. In the new sheet, examine the drill through report. You have drilled through to the external data source to see the state level data. Select the entire SALES column (E) in the new sheet. In the lower right of Excel, notice the sum. This number matches the value of the cell you drilled through from.

   g. Return to the Query.AtProduct sheet, select cell H9, and click **Drill Through**. Notice the SALES sum in the new report also matches the cell you drilled through from. Notice that since you drilled through from Qtr2, and you had selected Months to report on, the second quarter data is broken down into months.

   h. Optionally, click the **Data** ribbon to filter data in the drill through report. You can experiment more with drill through using the additional query sheets provided in this workbook.
Manage Users and Roles

Oracle Analytics Cloud – Essbase integrates with security layers managed by Oracle to create a highly secure environment for the cloud. Service Administrators can add user accounts for everyone expected to use the service. Following user account creation, users are assigned to suitable user and application roles in Essbase.

- About User and Role Management
- User and Application Roles
- Use Cases for Assigning Access
- Manage Users
- Provision Roles
- About Filters

About User and Role Management

To provide access to Essbase users in the Oracle Analytics Cloud, the following steps are required:

- Create Essbase user
- Assign Essbase user role
- Assign Essbase application-level role

Access to Essbase cloud service instances is restricted by security, and managed by either Oracle Identity Cloud Service (IDCS) or WebLogic LDAP. You must import or created users, or user groups, in either IDCS or WebLogic LDAP.

IDCS Mode

You enable IDCS in the Oracle Analytics Cloud service management interface. If enabled, you created users and user groups in the IDCS administration interface. If you create users created in IDCS, they have a user role specific to IDCS; IDCS users who are granted Essbase access must have an IDCS Service Administrator or IDCS Service User role.

Users with a Service Administrator role in IDCS can directly log into Essbase, and are automatically provisioned with an Essbase Service Administrator user role. IDCS users with a Service User role require further user role provisioning on the Essbase cloud service, by an Essbase Service Administrator.

IDCS doesn't support creating nested groups (assigning a group to a parent group).

LDAP Mode

In LDAP identity management mode, you create users and user groups on the Security page of the Essbase cloud service. As part of the user creation process in Essbase, you assign users to Essbase user roles.
Once you’re an authorized user, you’re granted access according to your assigned Essbase cloud service user role.

**User and Application Roles**

**User Roles**

According to your assigned user role in Essbase, you can work with and possibly administer applications and cubes. Your user role links you to the business activities that you’re permitted to perform within an Essbase instance and the application data that you can access.

User roles are hierarchical; access granted to lower-level roles is inherited by higher-level roles. For example, Service Administrators, in addition to the access that only they have, inherit the access granted to Power User and User roles.

Essbase users have application-specific roles to provide the most granular control over each user or group’s responsibility, within an application or cube.

**Table 3-1  User-Level Roles**

<table>
<thead>
<tr>
<th>User-Level Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Administrator</td>
<td>Full access to administer users, applications, and cubes.</td>
</tr>
<tr>
<td>Power User</td>
<td>Ability to create and delete applications and cubes that were created by this user. Ability to be granted access to, and to perform, some administrative tasks in applications and cubes created by others and provisioned to this user.</td>
</tr>
<tr>
<td>User</td>
<td>Ability to access any provisioned application, or a cube that has a minimum access permission. This user role has no access to administrative tasks in applications or cubes.</td>
</tr>
</tbody>
</table>

**Application Roles**

You can access Essbase features and functionality only after you’re assigned a role at both user and application levels.

Application roles in Essbase determine more than simply which user and groups can see an application or cube. They also determine whether the user can view data, update data, or manage the cube or application.

Essbase application roles are assigned to users and groups in one of two places:

- On the Security page (available only to the Service Administrator role)
- On the Permissions tab within the Application Inspector (available to Service Administrator or Power User roles)

**Table 3-2  Application-Level Roles**

<table>
<thead>
<tr>
<th>Application-Level Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Manager</td>
<td>Ability to create, delete, and modify cubes and application settings within the assigned application; assign users to an application; create and delete scenarios, and give permission to run calculation scripts.</td>
</tr>
</tbody>
</table>
Table 3-2  (Cont.) Application-Level Roles

<table>
<thead>
<tr>
<th>Application-Level Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Manager</td>
<td>Ability to manage cubes, cube elements, locks, and sessions within the assigned application; create and delete scenarios, execute calculation scripts, and assign permissions to run calculation scripts.</td>
</tr>
<tr>
<td>Database Update</td>
<td>Ability to read and update data values based on assigned scope. Ability to create and delete scenarios. The permission to execute calculation scripts necessitates write access; however, filters may be assigned with None or Read permission to block access to certain cells.</td>
</tr>
<tr>
<td>Database Access</td>
<td>Ability to access scenarios, read data values in all cells, and access specific data and metadata, unless further overridden by filters. Can update values in specific cells, if granted write access to those cells through filters.</td>
</tr>
</tbody>
</table>

Use Cases for Assigning Access

The following are common use cases for assigning access:

- Users can view and access cubes for which they were assigned access to the related applications.
- Power Users can create enterprise-level cubes and grant other users access to applications for which they have an Application Manager role.
- Service Administrators can assign users at all levels and manage all aspects of the applications, databases, and users.
- Service Administrators can assign a Database Update role for users who need to update data in a cube.

The following are common user management tasks:

- Create, edit, and delete users and groups, change the default user password policy (for LDAP identity mode), and assign access to run specific calculation scripts.
- Import and export users and groups, on the Users and Groups pages on the cloud service interface (for LDAP identity mode).

See Import and Export Bulk Users in LDAP Identity Management Mode.

- Provision roles and related reports.

See Provisioning Roles.

Manage Users

If you’re a Service Administrator or Power User, you can create users and users groups, and assign them to applications. Power users can only assign users to applications for which they have been granted an Application Manager role.

If Oracle Identity Cloud Service (IDCS) is enabled, users and groups are created and managed in the IDCS administrator interface. Otherwise, in LDAP mode, users and
groups are created and managed on the Security page of the cloud service, as described here.

You can easily import or export user and user group data files using the corresponding buttons. See Import and Export Bulk Users in LDAP Identity Management Mode.

You can't create users and groups with the same name. The following special characters: < > # , " ) ; \ + = can't be included within a user or group ID.

Create a user (in LDAP mode):
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications page, without selecting an application or cube, click Security.
3. On the Users tab, click Add User to create a user.
4. On the Add User dialog box, enter the ID, Name, Email, select a Role, and enter a Password for the user.
5. Click the Groups box to add user group assignments.
6. Click Save.

Edit a user:
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications page, without selecting an application or cube, click Security.
3. On the Users tab, select a user row, click Actions icon to the right, and then select Edit.
4. On the Update User dialog box, modify the user details and click Save.

Delete a user:
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications home page, without selecting an application or cube, click Security.
3. On the Users tab, select a user row, click Actions icon to the right, and then select Delete.
4. Click OK to confirm.

Create a group:
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications page, without selecting an application or cube, click Security.
3. On the Groups tab, click Add Group. Groups, whose security is handled by IDCS, have access defined as None in the cloud service, and must be manually provisioned.
4. On the Add Group dialog box, enter the Name and Description for the group, and then select a Role.
5. Click the Parent Groups box to add parent group assignments for the group. Parent Groups are not relevant to, and not supported for, groups whose security is handled by IDCS.
6. Click Save.

Edit a group:
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications page, without selecting an application or cube, click Security.
3. On the Groups tab, select a group row, click Actions icon to the right, and then select Edit.
4. On the Update Group dialog box, modify the group details and click Save.

Delete a group:
1. Log into the Essbase web interface as a service administrator or power user.
2. On the Applications page, without selecting an application or cube, click Security.
3. On the Groups tab, select a row for a group, click Actions, and then select Delete.
4. Click OK to confirm.

Modify password policy details:
You can customize the password policy applied to new users created in the service or when resetting passwords.

This is only applicable for LDAP mode, and for Oracle customer managed.
1. Log into the Essbase web interface as a service administrator or power user.
2. Connect to the service instance using Secure Shell (SSH) client software.
3. Switch to the Oracle user using the following: sudo su - oracle
4. Edit the policy file, in the PSM service instance, as follows:
   vi /u01/data/domains/esscs/config/fmwconfig/essconfig/essbase/essbase-password-validation-rules.xml
   The following is the current default policy file:

   <!xml version="1.0" encoding="UTF-8"?>
   <essbase-password-validation-rules>
   <cannot-contain-spaces>true</cannot-contain-spaces>
   <cannot-contain-username>true</cannot-contain-username>
   <maximum-password-length>20</maximum-password-length>
   <minimum-alphabetic-chars>0</minimum-alphabetic-chars>
   <minimum-password-length>8</minimum-password-length>
   <minimum-lowercase-chars>0</minimum-lowercase-chars>
   <minimum-numeric-chars>0</minimum-numeric-chars>
   <minimum-special-chars>0</minimum-special-chars>
   <minimum-uppercase-chars>0</minimum-uppercase-chars>
   </essbase-password-validation-rules>
5. Exit from the editor using the following: :wq
   If you modify the policy file, it is dynamically updated, and you do not need to restart the service.

Provision Roles

If you’re a Service Administrator or Power User, you can provision roles and assign users or groups to an application. Roles are hierarchical. Upper-level roles include the privileges of lower-level roles.
1. In the Essbase web interface, on the Applications page, select an application row, and then in the **Actions** menu, select **Inspect**.

2. On the **Permission** tab, use the + to open a menu for selecting users or groups to provision for access to the application.

3. Use the radio buttons to select the appropriate role(s) for the relevant users and groups.

4. Click **Close**.

---

### About Filters

Filters control security access to data values in a cube. Filters are the most granular form of security available.

When you create a filter, you designate a set of restrictions on particular cube cells or on a range of cells. You can then assign the filter to users or groups.

Your own security role determines if you can create, assign, edit, copy, rename, or delete filters:

- If you have the Application Manager role, then you can manage any filter for any user or group. Filters do not affect you.
- If you have the Database Update role, then you can manage filters for the applications that you created.
- If you have the Database Manager role, then you can manage filters within your applications or cubes.
- If you have the Database Access role (default), then you have read access to data values in all cells, unless your access is further restricted by filters.

### Create Filters

You can create multiple filters for a cube. If you edit a filter, modifications made to its definition are inherited by all users of that filter.

See Controlling Access to Database Cells Using Security Filters in *Designing and Maintaining Essbase Cubes*.

1. On the Applications home page, expand the application.

2. From the Actions menu, to the right of the cube name, launch the inspector.

3. Select the **Filters** tab.

4. Click **Add** +.

5. Under **Access**, double click and use the drop-down menu to select an access level.

   - None: No data can be retrieved or updated
   - Read: Data can be retrieved but not updated
   - Write: Data can be retrieved and updated
   - MetaRead: Metadata (dimension and member names) can be retrieved and updated
The MetaRead access level overrides all other access levels. Additional data filters are enforced within existing MetaRead filters. Filtering on member combinations (using AND relationships) does not apply to MetaRead. MetaRead filters each member separately (using an OR relationship).

6. Select the row under Member Specification and enter member names.
   You can filter members separately, or you can filter member combinations. Specify dimension or member names, alias names, member combinations, member sets that are defined by functions, or substitution variable names, which are preceded by an ampersand (&). Separate multiple entries with commas.

7. Create additional rows for the filter as needed.
   If filter rows overlap or conflict, more detailed cube area specifications apply over less detailed, and more permissive access rights apply over less permissive. For example, if you give a user Read access to Actual and Write access to Jan, then the user would have Write access to Jan Actual.

8. Click Verify to ensure that the filter is valid.

9. Click Save.
   You can edit a filter by clicking the filter name and making your changes in the Filter Editor.
   You can copy, rename, or delete a filter by clicking the Actions menu to the right of the filter name and choosing an option.

Create Efficient Dynamic Filters

You can create dynamic filters based on external source data to reduce the number of filter definitions needed.

Instead of managing a set of hard-coded data-access filters for many users, you can filter access to cube cells from external source data, based on member and user names.

You do this using dynamic filter definition syntax, including the method @datasourceLookup and the variables $LoginUser and $LoginGroup. Your external source data is a csv file or a relational table. For relational source data, you can load the .csv to a relational table.

• Dynamic Filter Syntax
• Workflow to Create Dynamic Filters
• Example of a Dynamic Filter

Dynamic Filter Syntax

Use dynamic filter syntax to create flexible filters you can assign to multiple users and groups.

Filter rows can contain the following elements as part of their definition, in addition to member expressions.

$loginuser

This variable stores the value of the current logged in user at runtime. It can be used in conjunction with the @datasourceLookup method.
**Slogingroup**

This variable stores the value of all the groups that current logged-in user belongs to. It includes both direct and indirect groups. When used in conjunction with the @datasourcelookup method, each group is individually looked up against the Datasource.

**@datasourcelookup**

This method fetches records from a Datasource.

**Syntax**

```plaintext
@datasourcelookup (dataSourceName, columnName, columnValue, returnColumnNam e)
```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dataSourceName</code></td>
<td>The name of the external Datasource defined in Essbase. For an application- level Datasource, prefix the name with the application name and a period.</td>
</tr>
<tr>
<td><code>columnName</code></td>
<td>The name of the Datasource column to search for a given <code>columnValue</code>.</td>
</tr>
<tr>
<td><code>columnValue</code></td>
<td>The value to search for in <code>columnName</code>.</td>
</tr>
<tr>
<td><code>returnColumnName</code></td>
<td>The name of the Datasource column from which to return a list of values.</td>
</tr>
</tbody>
</table>

**Description**

A @datasourcelookup call is equivalent to the following SQL query:

```sql
select returnColumnName from dataSourceName where columnName=columnValue
```

@datasourcelookup looks up the given Datasource and searches for records where `columnName contains columnValue`. If you specify `columnValue` as `$loginuser`, this method will search for records where `columnName contains the name of the currently logged in user.`

Essbase forms the filter definition row by combining the list elements as a comma-separated string. If any record contains special characters, spaces, or only numbers, they are enclosed in quotation marks.

**Examples**

Enclose the parameters within quotation marks.

The following call looks up a global Datasource, and returns a list of store names where Mary is the store manager.

```plaintext
@datasourceLookup("StoreManagersDS","STOREMANAGER","Mary","STORE")
```

The following call looks up an application-level Datasource, and returns a list of store names where the currently logged in user is the store manager.

```plaintext
@datasourceLookup("Sample.StoreManagersDS","STOREMANAGER","$loginuser","STORE")
```
The following call looks up an application-level Datasource, and returns a list of store names where the store department matches any of the groups to which the logged in user belongs.

```plaintext
@datasourceLookup("Sample.StoreManagersDS","STORE_DEPARTMENT","$logingroup","STORE")
```

If the logged in user belongs to 3 groups, then the above `@datasourceLookup` method returns all the matching column values for each group.

**Workflow to Create Dynamic Filters**

Use the following general workflow to create dynamic filters.

This dynamic filters workflow assumes you already have a cube, and have provisioned users and groups.

1. Identify a source of data, whether it is a file or a relational source.
2. Define the connection and the Datasource in Essbase, either globally or at the application level.
3. Create filters at the cube level, using the Filters section of the database inspector.
4. Define filter rows for each filter, using the dynamic filter syntax to employ the `$loginuser` variable, the `$logingroup` variable, and the `@datasourceLookup` method as needed.
5. Assign the filters to users or groups.
6. If you assigned the filter to a group, assign the group to the application to be filtered, using the Permissions section of the application inspector.

**Example of a Dynamic Filter**

The following dynamic filter works with the cube called Efficient.UserFilters, available in the gallery as a sample template.

To learn how to create and apply this dynamic filter, download the workbook template, `Efficient_Filters.xlsx`, from the Technical section of the gallery, and follow the README instructions in the workbook. The gallery is available in the Files section of the Oracle Analytics Cloud – Essbase web interface.
Design and Create Cubes Using Application Workbooks

You can design, create, and modify fully functional cubes using Excel-based application workbooks. You can design the cube within the application workbook, quickly import the workbook to the cloud service to create a cube, load data into the cube, and calculate the cube. You can also work with application workbooks in Cube Designer, which is a Smart View extension.

- About Application Workbooks
- Download a Sample Application Workbook
- Create a Cube from an Application Workbook
- Connect to a Cube in Smart View

About Application Workbooks

Application workbooks comprise a series of worksheets, which can appear in any order, and define a cube, including cube settings and dimensional hierarchies. Optionally, you can define data worksheets to be loaded automatically when you create the cube, and calculation worksheets to be executed after you load the data. There are strict layout and syntax requirements for application workbooks, and there are many validations to ensure that workbook contents are complete and formatted correctly. If the application workbook contents are not correct, then the cube building process will not be successful.

You can modify the worksheets directly in Microsoft Excel or by using the Designer Panel.

The cloud service provides application workbook templates for creating block storage and aggregate storage applications and cubes.

- Block Storage Sample (Stored): Block storage application workbook. File name: Sample_Basic.xlsx.
- Block Storage Sample (Dynamic): Block storage application workbook. All non-leaf level members are dynamic. File name: Sample_Basic_Dynamic.xlsx.
- Block Storage Sample (Scenario): Block storage application workbook with scenarios enabled. All non-leaf level members are dynamic. File name: Sample_Basic_Scenario.xlsx.
- Aggregate Storage Sample: Aggregate storage application workbook. File name: ASO_Sample.xlsx.
- Aggregate Storage Sample Data: Data for the aggregate storage application workbook. File name: ASO_Sample_DATA.txt.
- Tabular Data Sample: Tabular data Excel file. File name: Sample_Table.xlsx.
Oracle recommends that you download a sample application workbook and examine the worksheets. See Application Workbooks Reference.

Download a Sample Application Workbook

Using a sample application workbook provided in the cloud service, you can quickly create sample applications and cubes. The cubes are highly portable, because they are quickly and easily imported and exported.

1. On the Applications page, select a cube and then click Files.
2. Decide if you want to download a sample aggregate storage application workbook, or a sample block storage application workbook:
   a. To download a sample aggregate storage application workbook, under All Files, click Gallery, Applications, Demo Samples, and Aggregate Storage.
   b. To download a sample block storage application workbook, under All Files, click Gallery, Applications, Demo Samples, and Block Storage.
3. From the Actions menu to the right of the file you want to download, select Download.
4. Optionally, if you download the aggregate storage application workbook, ASO_Sample.xlsx, you can also download a data file, ASO_Sample_Data.txt.
5. Save the file to a local drive.
6. Open the file and examine the worksheets to understand how you can use the workbook to create an application and cube.

Create a Cube from an Application Workbook

1. In the cloud service, on the Applications page, click Import.
2. In the Import dialog box, select File Browser to browse to a sample application workbook you previously downloaded.

   You cannot import Excel files that contain spaces in the filename.

3. Your application and cube names are populated based on the names you specified in the application workbook on the Essbase.Cube worksheet.
   • (Optional) You can change the application and cube names on this screen.
   • (Required) If an existing application in the cloud service matches the name of the application you are importing, then you must ensure that the cube name is unique. For example, if the name of the application and cube in the Excel workbook is Sample Basic and the cloud service already has a Sample Basic cube, then you’re prompted to rename the cube.
4. (Optional) Select Advanced Options, which allows you to choose a build option and whether to load data and execute calculation scripts.
5. (Optional) Select View Dimensions, which allows you to view the mapping of workbook columns to the dimensions to be created.
6. Click OK.

   The application and cube are listed on the Applications page.
7. To view the outline, expand the application; then click the Actions menu to the right of the cube name, and launch the outline editor.
When you import an application workbook that was created using the command-line Export Utility, some member names might be rejected. See Review Member Names Before you Import an Application Workbook Created by the Cube Export Utility.

If you import an application workbook and then export the cube you created to a new application workbook, the layout of the dimension sheets in the new application workbook might differ from the original, however the new workbook functions the same as the original workbook.

Connect to a Cube in Smart View

In Smart View, you can create a private connection using the quick connection method if you know the URL. The private connection URL is a concatenation of the cloud service instance URL that you use to log into Oracle Analytics Cloud – Essbase and the string /essbase/smartview appended to it. For example, http://example/essbase/smartview.

1. From the Smart View ribbon, click Panel.
2. From the Smart View panel, click Home and then select Private Connections.
3. In the text box, enter the URL with the /essbase/smartview string appended to it, for example, https://myEssbase-test-myDomain.analytics.us2.oraclecloud.com/essbase/smartview.
4. Click the connect arrow.
5. On the Login dialog box, enter your Oracle Analytics Cloud – Essbase user name and password, then click Sign In.
Design and Create Cubes from Tabular Data

You can create a cube from tabular data by extracting fact tables from a relational database into an Excel file and then deploying the cube.

Topics:
- Transform Tabular Data to Cubes
- Create and Update a Cube from Tabular Data

Transform Tabular Data to Cubes

You can create a cube from tabular data by extracting fact tables from a relational database into an Excel file and then deploying the cube.

Patterns in the relationships between column headers and data are detected to deploy a multidimensional cube. The process for transforming tabular data into a structure that can be used in a multidimensional cube include these concepts:

- Correlations between columns
- Correlations between column types (such as date, number, and text)
- Header text analysis for common prefixes and business intelligence-related terms (such as cost, price, account)
- Report structure (such as merged cells and empty cells)
- (Optional) Forced-designation headers that are used to explicitly define the shape of a cube and can include formulas to create measures dimensions.
- Measures hierarchies (which can also be generated in Transform Data in Cube Designer).

Sample tabular data Excel files are provided to demonstrate the concepts of intrinsic and forced-designation headers.

When working with tabular data, you should analyze the data before you create a cube from it. Then, after the cube is created, you should determine if the cube outline is the way you want it.

You can create a cube from tabular data in the cloud service or in Cube Designer. See Create and Update a Cube from Tabular Data.

Use Intrinsic Headers to Transform Tabular Data to Cubes

Intrinsic headers use table.column format, which is demonstrated in the Sample_Table.xlsx file. In this sample file, the column headers have names such as Units, Discounts, Time.Month, Regions.Region, and Product.Brand.
The transformation process creates this hierarchy:

Units
Discounts
Fixed Costs
Variable Costs
Revenue
Time
  Month
  Quarter
Years
Regions
  Region
  Area
  Country
Channel
Product
  Brand
...

Use Forced-designation Headers to Transform Tabular Data Into Cubes

With forced-designation headers (hints), you can specify how tabular data should be handled during the transformation process.

For example, you can force a column to be treated as a measures or an attributes dimension. Most forced-designation headers require a keyword in brackets [ ]. Forced-designation headers are demonstrated in the Modified_Sample_Table.xlsx file (available in the Cube Designer Gallery only).

Supported forced-designation header formats:

| Table 5-1 Forced-designation Header Formats
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Designation</strong></td>
</tr>
<tr>
<td>Alias</td>
</tr>
<tr>
<td>Measures</td>
</tr>
</tbody>
</table>

Top-most parent, if unique, is the account dimension name. If not unique, this member is auto-generated in the account dimension.
### Table 5-1  (Cont.) Forced-designation Header Formats

<table>
<thead>
<tr>
<th>Designation</th>
<th>Header Format</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures formula</td>
<td>MeasureName[=&quot;formula_syntax&quot;]</td>
<td>profit[=&quot;price&quot;-&quot;cost&quot;]; profit[=&quot;D1&quot;-&quot;E1&quot;]; price[=IF (&quot;S1&quot; == #MISSING) &quot;R1&quot;; ELSE &quot;S1&quot;; ENDIF];</td>
</tr>
<tr>
<td>Measures consolidation</td>
<td>MeasureName[+] : add to parent</td>
<td>price.shipment[+]</td>
</tr>
<tr>
<td></td>
<td>MeasureName[-] : subtract from parent</td>
<td>Consolidation can be defined only for measure dim</td>
</tr>
<tr>
<td></td>
<td>MeasureName[~] : no consolidation (equivalent to [measure])</td>
<td>The default is no consolidation.</td>
</tr>
<tr>
<td>Formula consolidation</td>
<td>FormulaName[+=&lt;formula&gt;] : add to parent</td>
<td>profit[+=price-cost]</td>
</tr>
<tr>
<td></td>
<td>FormulaName[=&lt;formula&gt;] : subtract from parent</td>
<td>cost.external[+=ExternalWork +ExternalParts]</td>
</tr>
<tr>
<td>UDA</td>
<td>ReferenceGeneration[uda]</td>
<td>Product[uda]</td>
</tr>
<tr>
<td>Skip</td>
<td>ColumnName[skip]</td>
<td>column[skip]</td>
</tr>
<tr>
<td>Recur</td>
<td>ColumnName[recur]</td>
<td>Product[recur]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Product[uda,recur]</td>
</tr>
</tbody>
</table>

You can specify columns to be measures dimensions and you can use formulas to create measures dimensions with calculated data during the transformation process. The measures and measures formula forced-designation headers are specified with the name for the measures dimension, followed by a keyword or formula that is enclosed in square brackets and appended to the measures dimension name.

You can also consolidate measures and formulas by adding them to, or subtracting from, the parent.

To specify a column to be a measures dimension, in the column header, you enter the name of the measures dimension and then append the keyword [measure]. For example, you can specify the Units and Fixed Costs columns as measures dimensions by using this syntax: Units[measure] and Fixed Costs[measure].
The transformation process creates this hierarchy, with Units, Discounts, Fixed Costs, Variable Costs, and Revenue as measures:

Time
  Year
    Quarter
    Month
Regions
  Region
    Area
    Country
...
Product
  Brand
...
Units
Discounts
Fixed Costs
Variable Costs
Revenue

You can create a measure generation hierarchy (parent.child[measure] hierarchy), in a similar way that you create regular dimension generations.

For example, to create a measure hierarchy, you enter Measures.profit[measure], profit.cost[measure] and cost.price[measure], which produces the following hierarchy:

Measures
  profit
    cost
      price

To create measures dimensions from formulas, in the column header, you enter the name of the measures dimension and then append the formula syntax in brackets[]. Within the brackets, start the formula with an equal sign (=) and end the formula with a semicolon (;). The arguments in the formula correspond to column names or cell coordinates, which must be enclosed in quotes. You can use Essbase calculation functions and commands in the formula.

Assume that you have an Excel file named Spend_Formulas.xlsx with tabular data on the SpendHistory worksheet, which has many columns. For example, there are dimensions named Year (column A) and Quarter (column B), and measures dimensions named Spend (column J) and Addressable Spend (column K). These columns have data. Then there are column headers that use formulas to create a measures dimensions. These columns do not have data. For example, to create the Total Spend dimension, the header in column O uses this Essbase formula: Measure.Total Spend[="Addressable Spend" + "Non-Addressable Spend";]. To create the AddSpendPercent dimension, the header in column P uses this Essbase formula: Measure.AddSpendPercent[="Addressable Spend"/"Total Spend";].

The transformation process creates this hierarchy:
The transformation process can also identify measures dimensions when a dimension name is duplicated. Assume that you have a column header that uses this formula, Meas.profit=['a1''-''b1'], which creates the Meas dimension. If, in another column header, you use the Meas dimension name as the top parent, such as Meas.Sales, the Sales dimension is also considered a measures dimension.

Create and Update a Cube from Tabular Data

In this workflow, you’re using the sample tabular data Excel file named Sample_Table.xlsx, which uses intrinsic column headers. See Transform Tabular Data to Cubes.

1. In Oracle Analytics Cloud – Essbase, click Files.
2. On the Files page, click Gallery, then Technical, Table Format, and then Sample table.
3. From the Actions menu, next to Sample_Table.xlsx click Download.
4. Save the file to a local drive.
5. To create a cube: On the Applications page, click Import.
   a. On the Import dialog box, click File Browser and browse to Sample_Table.xlsx.
   b. On the Import Cube - Excel File dialog box, browse to Sample_Table.xlsx

The application and cube names are pre-populated. The application name is based on the source file name without the extension (in this example, Sample_Table) and the cube name is based on the worksheet name (in this example, Sales).
   • (Optional) You can change the application and cube names on this dialog box.
   • (Required) If an existing application in the cloud service matches the name of the application that you’re importing, then you must ensure that the cube name is unique. For example, if there is already an application
named Sample_Table with a cube named Sales, then you’re prompted to rename the cube.

c. (Optional) Click Advanced Options to modify the cube type and the type of dimensions to be created.

You can perform these actions:

- Change the cube type. By default, cubes are set to BSO (block storage) with the Hybrid BSO option. You can keep the block storage type but remove the hybrid block storage option, or you can select the ASO (aggregate storage).
- Select Enable Sandboxing, if applicable.
- Click Show Transformations and, on the Transformations pane in the Import dialog box, enter names for the dimensions you want to rename.
- Change the dimension types.

If you make any changes, then click OK before proceeding.

The application and cube are listed on the Applications home page.

d. (Optional) To view the cube outline, expand the application. From the Actions menu, to the right of the cube name, launch the outline editor.

6. To update a cube with new members or additional data (as an incremental load), from an Excel file: on the Applications page, click Import.

The tabular data must have forced designation headers, and the Excel properties must have two custom properties selected: database name and application name. Otherwise, it will use the Excel name as the application name, and sheet name as the cube name.

a. To do the incremental load, select the file with the incremental data and load it to the cube in the application, which are specified in the Import dialog. On the Import dialog box, click File Browser, select the file to add, and click Open. A message reminds you that the cube already exists in the application.

b. Click Advanced Options. For Build Option, select any update cube option, or keep the default, Update Cube — Retain All Data. Click OK.

The cube and corresponding tabular data are updated.
Create and Manage Cube Outlines Using the Web Interface

An outline defines the structure of the cube through dimensions, members, attributes, and their properties. The outline structure, along with consolidation operators and formulas, determines how data is stored and calculated.

- About Cube Outlines
- View and Edit Outline Properties for a Newly Created Cube
- Create a Sample Cube to Explore Outline Properties
- Add Dimensions and Members to Outlines
- Work with Attributes
- About Duplicate Member Names
- Set Dimension and Member Properties
- Name Generations and Levels
- Set Advanced Cube Properties
- Unlock Objects
- Remove Data Locks

About Cube Outlines

Dimensions and members represent data hierarchies. In an outline, each dimension consists of one or more members. The members, in turn, may have child members. This ancestral rollup is called a hierarchy. Unary operators (such as +, -, *, /), assigned to each member in a hierarchy define how a child member consolidates to its parent.

View and Edit Outline Properties for a Newly Created Cube

Outline properties, in part, control the functionality available in an Essbase cube, but they also control member naming and member formatting for attribute dimensions, alias tables and text measures.

1. Log into the web interface as a power user.
2. On the Applications page, click Create to create a new application.
3. Give the application a unique name.
4. Name the cube.
5. (Optional) Click Advanced Options to select a database type, allow duplicate member names, or enable scenarios.
6. Click OK.
7. On the Applications page, expand the new application.
8. From the Actions menu, to the right of the cube name, select **Outline**.

9. Click **Edit**.

10. Click **Outline Properties**.

---

**Work with General and Attribute-related Outline Properties**

Outline properties-General tab shows what outline features are enabled for your cube and how they are formatted. Some fields on this tab can be changed and others cannot be changed and are for your information.

**Table 6-1  General Outline Properties**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>View or Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow Duplicate Member Names</td>
<td>Enabling a cube for duplicate member names is an option when a new application is created. If you migrate an on-premises Essbase application with a unique member outline to a cloud service instance, you cannot change the outline to allow duplicate members. To allow duplicate member names in your cloud service instance, convert the on-premises unique member outline to a duplicate member outline before migrating the application.</td>
<td>This field cannot be changed and is for your information.</td>
</tr>
<tr>
<td>Typed Measures Enabled</td>
<td>All Oracle Analytics Cloud – Essbase applications are enabled for typed measures by default. If typed measures is disabled and you want to enable it, select True. If typed measures is enabled, you cannot change the setting and this field is for your information.</td>
<td></td>
</tr>
<tr>
<td>Date Format</td>
<td>You can change the date format if you plan to use typed measures that are dates. Use the dropdown list to select the date format that will be displayed when you query text measures that are dates.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 6-2  Attribute Settings – Prefix and Suffix Format**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>View or Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>A prefix or suffix may be required for your attribute member names to support member name uniqueness. Prefix or suffix values display when attribute dimension members are included in a query.</td>
<td>To enable prefix or suffix values for your cube, make a selection in the Value dropdown menu. The default value of None disables all prefix or suffix options.</td>
</tr>
</tbody>
</table>
### Table 6-2  (Cont.) Attribute Settings – Prefix and Suffix Format

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>View or Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>You can define unique names by attaching a prefix or suffix to member names in Boolean, date, and numeric attribute dimensions in the outline. After selecting a prefix or suffix Value, such as Parent, you can select the format.</td>
<td></td>
</tr>
<tr>
<td>Separator</td>
<td>Select a separator (to place between the prefix or suffix and the original name). Options are underscore ( _ ), pipe (</td>
<td>), or caret ( ^ ).</td>
</tr>
</tbody>
</table>

### Table 6-3  Boolean, Date and Numeric

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>View or Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>True Member Name</td>
<td>Although your cube can contain more than one Boolean attribute dimension, all Boolean attribute dimensions will share the same value for True Member Name and False Member Name. By default, Oracle Analytics Cloud – Essbase assigns member names of True and False. If you want to change these names, you must change them before you add the first Boolean attribute to your cube. Once the first Boolean attribute dimension is created, you cannot change these names.</td>
<td>This field can only be changed before you add the first Boolean attribute dimension to your cube.</td>
</tr>
<tr>
<td>False Member Name</td>
<td>Although your cube can contain more than one Boolean attribute dimension, all Boolean attribute dimensions will share the same value for True Member Name and False Member Name. By default, Oracle Analytics Cloud – Essbase assigns member names of True and False. If you want to change these names, you must change them before you add the first Boolean attribute to your cube. Once the first Boolean attribute dimension is created, you cannot change these names.</td>
<td>This field can only be changed before you add the first Boolean attribute dimension to your cube.</td>
</tr>
<tr>
<td>Date Member Names</td>
<td>You can change the format of members of date attribute dimensions.</td>
<td>Select Month First or Day First formatting convention for Date Member Names.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
<td>View or Edit</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Numeric Range</td>
<td>Members of numeric attribute dimensions can be defined in dimension build rules to represent date ranges. Here, you can define these ranges to be Top or Bottom of Ranges. All numeric attribute dimensions built using ranges will have the same numeric range setting.</td>
<td>Options are Tops of Ranges and Bottoms of Ranges.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>View or Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Every Oracle Analytics Cloud – Essbase cube containing attribute dimensions contains a dimension containing standard math functions that can be applied to attribute queries. You can edit the name of this dimension, and the name of each standard math function. You cannot change which math functions are automatically calculated.</td>
<td>Type a name for the attribute calculations dimension, if you want to change it.</td>
</tr>
<tr>
<td>Sum Member</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting sum data.</td>
<td>Type a name for the Sum member in the attribute calculations dimension, if you want to change it.</td>
</tr>
<tr>
<td>Count Member</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting count data.</td>
<td>Type a name for the Count member in the attribute calculations dimension, if you want to change it.</td>
</tr>
<tr>
<td>Minimum Member</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting minimum data.</td>
<td>Type a name for the Minimum member in the attribute calculations dimension, if you want to change it.</td>
</tr>
<tr>
<td>Maximum Member</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting maximum data.</td>
<td>Type a name for the Maximum member in the attribute calculations dimension, if you want to change it.</td>
</tr>
<tr>
<td>Average Member</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting average data.</td>
<td>Type a name for the Average member in the attribute calculations dimension, if you want to change it.</td>
</tr>
</tbody>
</table>
Understand and Create Alias Tables

Aliases are stored in one or more tables as part of a database outline. An alias table maps a specific, named set of alias names to member names.

To create an alias table:

1. On the Applications page, expand the application.
2. Click the Actions menu to the right of the cube name and click Outline.
3. Click Edit.
4. Click Outline Properties.
5. Select the Aliases tab.
6. Enter the name of the alias table you want to create and click Add.
   You can have a maximum of 56 alias tables.
7. Click Apply and Close.
See Create Aliases and Setting Aliases.
You cannot delete or rename the default alias table.

Understand and Create Textual Measures Outline Properties

Textual Measures serve as string masks for numeric values stored in Essbase. Since all data stored in Essbase must be numeric, textual measures provide the ability for users to select text strings as input to Essbase.

For example, assume that a user is to provide an input indicating risk assessment. It might be best for the user to select from a list of strings: low, medium, high. To accomplish this in Essbase, you would create a textual measure list and assign the appropriate strings to numeric values stored in the database.

To add textual measures:

1. On the Applications page, expand the application.
2. Click the Actions menu to the right of the cube name and click Outline.
3. Click Edit.
   To view outline properties, simply click Outline Properties. You don't need to click Edit first.
4. Click Outline Properties.
5. Click Textual Measures.
6. Type a textual measures name and click Add.
7. (Optional) Select Auto Generate IDs to automatically generate numeric IDs for the strings.
8. (Optional) Rename the #Missing or #OutOfRange Names.
9. Click .
10. Assign a numeric ID (unless you auto-generated the IDs) and a string name.
11. Repeat steps 4 & 5 until all strings are identified.
12. Click Apply and Close.

13. Click Save.

Once you have created a textual measure list, you can create a measure member on your outline and assign to it type “text.”

To select a textual measure for a member, select the member and then select a textual measure from the Type drop-down menu in the properties panel to the right of the outline. All textual measures are shown with the prefix, “Text.”

Create a Sample Cube to Explore Outline Properties

Throughout this chapter, you will work with a copy of the Sample.Basic gallery template that you create on your server. You must be a power user to create the application.

If you aren’t a power user, ask one to create an application for you and provision you as Database Manager for the application.

1. Log into the web interface as a power user.
2. On the Applications page, click Import.
3. Select Catalog.
5. Double-click Applications.
6. Double-click Demo Samples.
7. Double-click Block Storage.
8. Highlight Sample_Basic.xlsx and click Select.
9. Type a unique Application Name and click OK.

If the application name you choose isn’t unique, you will receive an error message asking you to change the name.

For the remainder of the chapter, when we refer to <yourapplication>, you should use the application you just created.

Set Outline Properties in your Sample Cube

You can set outline properties in <yourapplication>.

1. On the Applications home page, expand <yourapplication>.
2. From the Actions menu, to the right of the cube name select Outline.
3. Click Edit.
4. Select Outline Properties.

Add Dimensions and Members to Outlines

The top level members of any hierarchy in an outline are called dimension names or dimensions. There are two types of dimensions: standard dimensions and attribute dimensions.
You can add dimensions and members to a cube using any of the following methods:

- Add dimensions and members manually with the outline in edit mode.
- Import an Excel file containing dimension definitions (either tabular data or an application workbook).
- Build dimensions using a datasource and rules file.

In this chapter, we focus on manual outline updates.

Add Dimensions to Outlines Manually

In block storage or partial hybrid cubes (which have one or more stored dimensions), if you add, delete, or move members in dimensions and then save the outline, then the cube is restructured. After restructuring is complete, recalculate the data. Aggregate storage and fully hybrid cubes do not need to be recalculated because they are dynamic (upper level data is not stored).

If you add a dimension that is virtual (dynamic calc or label only), then any data existing in the cube is stored with the first level-0 stored member in the new dimension. There must be at least one stored member in the hierarchy.

Dimension names must always be unique in the outline, even if the outline allows duplicate member names. To add a dimension to an outline:

1. On the Applications page, expand `<yourapplication>`.
2. Click the Actions to the right of the cube name and then choose Outline.
3. Click Unlock. This is only needed if the outline is locked. Otherwise, proceed to step 4.
4. Click Edit and then select a dimension.
5. From the menu for that dimension, choose Add Sibling.
6. Enter a name for the new dimension and press Tab.
   
   Use no more than 1024 characters when naming dimensions, members, or aliases.
7. In the properties pane on the right hand side, select the properties that you want.
8. Click Save.

Add Members to Outlines Manually

Unless the cube is enabled for duplicate member names, each member has a unique name.

1. On the Applications page, expand `<yourapplication>`.
2. From the Actions menu, to the right of the cube name, select Outline.
3. Click Edit.
4. To view and select lower-level members in a dimension, drill down in the dimension by expanding the dimension name and subsequent member names.
5. When you reach the member to which you want to add a child or sibling member, select it.
6. From the menu for that member, select **Add Child** or **Add Sibling**.

7. Enter the name for the new member and press Tab.
   Use no more than 1024 characters when naming dimensions, members, or aliases.

8. In the properties pane on the right hand side, select the properties that you want.

9. Click **Save**.

### Work with Attributes

Attributes describe characteristics of data, such as the size and color of products. You can use attributes to group and analyze members of dimensions based on their characteristics. For example, you can analyze product profitability based on size or packaging, and you can make more effective conclusions by incorporating market attributes, such as the population size of each market region, into your analysis.

When manually working with attributes, use the outline editor and the Attributes tab in the outline inspector.

**Workflow for manually building attribute dimensions:**

1. Create attribute dimensions.

2. Tag the dimensions as attribute dimensions and set the attribute dimension type (text, numeric, Boolean, or date).
   Use the outline inspector, general tab to set the dimension as an attribute dimension, and to set the attribute dimension type.

3. Add members to attribute dimensions.

4. Associate a standard dimension with an attribute dimension, thereby defining the base dimension of the attribute dimension. Use the Attributes tab in the outline inspector to associate an attribute dimension to a base dimension.

When creating an attribute dimension, by default, a base dimension is associated with the newly created attribute dimension. The associated base dimension is either a newly created last sparse dimension or the last existing sparse dimension.

For example, if you create two sparse dimensions, dim1 and dim2, and then create an attribute dimension attr1, attr1 is associated with dim2 (the last sparse dimension that was created). If no sparse dimension was created recently, attr1 is associated with the last sparse dimension.

See Working with Attributes in *Designing and Maintaining Essbase Cubes*.

### About Duplicate Member Names

When you create a cube, you can specify that duplicate (non-unique) member names and aliases are allowed in a cube outline, with some restrictions.

1. From the web interface, log in as a power user, and click **Create**.

2. Enter a unique application name and any cube name.

3. Expand **Advanced Options** and select **Allow Duplicate Member Names**.

4. Click **OK**.
A duplicate member outline might, for example have a Market dimension and require two members named New York: one as a child member of the dimension parent member, Market, and one as a child of the member, New York. The member names are displayed as New York. The qualified member names are:

- [Market].[New York]
- [Market].[New York].[New York]

To add a duplicate member name, enter the duplicate member in the outline. There are no additional requirements for adding a duplicate member.

1. On the Applications page, expand the application you just created.
2. Click the Actions menu for that cube and then choose Outline.
3. Click Edit.
4. Type Market and press Tab.
5. Using the menu for Market, select Add Child.
6. Type New York and press Tab.
8. Type New York and press Tab.
9. Highlight the last member you created and look at the Member Properties, Name, and Path. Notice that the fully qualified member name of [Market].[New York].[New York] is displayed, but the outline member is called New York.

Duplicate Naming Restrictions:

- If the outline is not enabled for duplicate members, then an error is returned when a duplicate member name is entered.
- Dimension names, generation names, and level names must always be unique, and sibling members under a parent member must always be unique.
- You must enable duplicate member names at the time you create the application. You cannot convert a unique member outline to a duplicate member outline.
- Duplicate member names applies to the entire outline and cannot be assigned only to a single dimension, for example.
- After you migrate an on-premises cube with a unique member outline to a cloud service instance, you cannot change the outline to allow duplicate members. If you want your on-premises cube to allow duplicate members in your cloud service instance, you must convert the unique member outline to a duplicate member outline in your on-premises installation before migrating the application to a cloud service instance.

Set Dimension and Member Properties

To set dimension and member properties, open the outline in edit mode. Once in edit mode, you can set dimension and member properties:

- By double-clicking on a member name or in a column next to a member name on the outline.
- By highlighting a member and using the panel to the right of the outline.
Open the Outline in Edit Mode

Before you can change or set member properties, you need to open the outline in Edit mode.

1. From the Applications page, expand <yourapplication>.
2. Click the Actions menu to the right of the cube name and select Outline.
3. Click Edit.

Set Member Properties while in Edit Mode

With the outline in Edit mode, you can set properties for individual members. Using the keyboard or the member inspector, you can make changes quickly and efficiently.

To enable inline editing, double click on a member or in one of the columns to the right of the member name in the outline. For example, if you click along a row for a member you want to edit in the Data Storage Type column, you can use a menu to select a storage type for the highlighted member. If you double-click in the formula column, you can type a member formula.

With inline editing enabled you can:

- Type member names, or rename existing members.
- Use the Tab key to move from left to right between columns.
- Use the Enter key to move down in the outline tree.
- Use the space bar to expand menus, and use the up and down arrows to navigate the menu items.

Set Properties in the Member Inspector

You can view and set outline properties in the member inspector.

To open the Member Inspector:

1. On the Applications page, expand the application.
2. Click the Actions menu to the right of the cube name and select Outline.
3. Click Edit.
4. Drill into the outline to find the member you want to update and select it.
5. From the menu, select Inspect.
6. In the Member Inspector, choose a tab on which to make your modifications:
   - General
   - Aliases
   - Formula
   - Attributes
   - User-defined Attributes
See Setting Dimension and Member Properties in *Designing and Maintaining Essbase Cubes*.

## Set General Properties

On the General tab, you can view or modify basic dimension or member information (such as consolidation properties, storage properties, and comments).

The options available on the tab vary, depending on the outline type, and the dimension and member type. For example, the items available vary depending on whether the cube is block storage or aggregate storage, or whether you selected a dimension name or a member within a dimension.

The following is a partial list of properties. For background information on the various properties, see *Designing and Maintaining Essbase Cubes*.

### Table 6-5 Dimension and Member General Properties

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
<th>Applies to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter a dimension or member name.</td>
<td>• Aggregate storage dimensions and members</td>
</tr>
<tr>
<td></td>
<td>Use no more than 1024 bytes when naming dimensions, members, or aliases.</td>
<td>• Block storage dimensions and members</td>
</tr>
<tr>
<td>Comment</td>
<td>Enter a comment.</td>
<td>• Aggregate storage dimensions and members</td>
</tr>
<tr>
<td></td>
<td>Comments can contain up to 255 characters.</td>
<td>• Block storage dimensions and members</td>
</tr>
<tr>
<td>Dimension type</td>
<td>For a dimension within an aggregate storage outline, select:</td>
<td>• Aggregate storage dimensions</td>
</tr>
<tr>
<td></td>
<td>• None</td>
<td>• Block storage dimensions</td>
</tr>
<tr>
<td></td>
<td>• Accounts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Attribute</td>
<td></td>
</tr>
<tr>
<td>Consolidation</td>
<td>For a member that is not a dimension or an attribute, select a consolidation operator:</td>
<td>• Aggregate storage members</td>
</tr>
<tr>
<td></td>
<td>• + (addition)</td>
<td>• Block storage members</td>
</tr>
<tr>
<td></td>
<td>• – (subtraction)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• * (multiplication)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• / (division)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• % (percentage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ~ (ignore)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ^ (nonconsolidating)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Addition (+) is the default. The ^ (nonconsolidating) operator applies only to block storage cubes.</td>
<td></td>
</tr>
<tr>
<td>Two-Pass</td>
<td>Select the <strong>Two-Pass calc</strong> check box to calculate the member during a second pass through the outline.</td>
<td>• Block storage stored members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For dynamic members, set solve order instead</td>
</tr>
</tbody>
</table>
Table 6-5  (Cont.) Dimension and Member General Properties

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
<th>Applies to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Storage</td>
<td>Select an option to determine how data values for the current dimension or member are stored:</td>
<td>• Aggregate storage dimensions and members</td>
</tr>
<tr>
<td></td>
<td>• Store data</td>
<td>• Block storage dimensions and members</td>
</tr>
<tr>
<td></td>
<td>• Dynamic calc (This option does not apply to aggregate storage cubes.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Never share</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Label only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Shared member</td>
<td></td>
</tr>
<tr>
<td>Member solve order</td>
<td>Specify a solve order between 0 and 127 to indicate the priority in which the member is calculated.</td>
<td>• Aggregate storage members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Dynamic block storage members</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Specify <strong>Stored</strong> (the default) or <strong>Dynamic</strong> or, for a dimension within an aggregate storage outline, select the <strong>Multiple hierarchy enabled</strong> option (which equates to selecting both <strong>Stored</strong> and <strong>Dynamic</strong>).</td>
<td>• Aggregate storage dimensions</td>
</tr>
<tr>
<td></td>
<td>The storage option that you select is applied to the hierarchy headed by the dimension or generation 2 member.</td>
<td>• Generation 2 aggregate storage members</td>
</tr>
<tr>
<td>Level Usage for Aggregation</td>
<td>Select one of these options to provide a way for an administrator to influence both default and query-based view selection:</td>
<td>Aggregate storage dimensions</td>
</tr>
<tr>
<td></td>
<td>• Default: Internal mechanisms decide how to create aggregations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No aggregation: Aggregation is not performed along this hierarchy. All views selected are at the input level.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Top level only: (Applies to primary hierarchies.) Queries are answered directly from input data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No intermediate levels: (Applies to primary hierarchies.) This selects top and bottom levels only.</td>
<td></td>
</tr>
</tbody>
</table>
Table 6-5  (Cont.) Dimension and Member General Properties

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
<th>Applies to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance reporting expense</td>
<td>Members from the dimension tagged as type Accounts can have an Expense property value of True or False. When @VAR or @VARPER formulas are evaluated, Account members whose expense property is False will have opposite sign to those whose expense property is True. Example: Scenario dimension member Variance with formula @VAR(Actual, Budget). For Account dimension member Sales [with Expense property False], Variance member will be calculated as Actual-Budget. For Account dimension member COGS [with Expense property True], Variance member will be calculated as Budget-Actual.</td>
<td>Block storage accounts dimension and members</td>
</tr>
</tbody>
</table>
Table 6-5  (Cont.) Dimension and Member General Properties

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
<th>Applies to...</th>
</tr>
</thead>
</table>
| Account information| Time Balance: To use time balance properties, you must have a dimension tagged as Accounts and a dimension tagged as Time.  
  • None: Apply no time balance property. Member values are calculated in the default manner.  
  • Average: A parent value represents the average value of a time period.  
  • First: A parent value represents the value at the beginning of a time period.  
  • Last: A parent value represents the value at the end of a time period.  
  Skip option: Select an option (None or Missing) to determine what values are ignored during time balance calculations. If you select None, then no values are ignored, and, if you select Missing, then #MISSING values are ignored. You can specify skip settings only if the time balance property is set as first, last, or average.  
  • None  
  • Missing | Block storage Accounts dimension only                                          |

Create Aliases

On the Aliases tab, you can assign alternate names, or aliases, to a dimension, member, or shared member. For example, in the <yourapplication>.Basic cube outline, members of the Product dimension are identified by product codes, such as 100, and by descriptive aliases, such as Cola.

1. On the Applications page, expand the application.
2. From the Actions menu, to the right of the cube name, select Outline.
3. Click Edit.
4. Drill into the outline to find the member you want to update and select it.
5. From the menu for that member, select **Inspect**.

6. Click **Aliases**.

7. In the field for the alias table you want to use, enter the value of the alias.

8. Click **Apply and Close**.

9. Click **Save**.

See **Understand and Create Alias Tables** and Setting Aliases.

### Create Member Formulas

On the Formula tab of the Member Inspector, you can create and edit member formulas for both block storage and aggregate storage cubes. These formulas are calculated through default cube calculations and calculation-script calculations.

You can construct block storage member formulas from operators, functions, dimension names, member names, substitution variables, and numeric constants. To write formulas for block storage outlines, a set of calculation functions and operators, known as the Calculator, or Calc, language, is provided. For descriptions of calculation commands and functions, see **Technical Reference for Oracle Analytics Cloud - Essbase**

Aggregate storage member formulas cannot be created using Calculator language. Instead, create them using Multidimensional Expression Language (MDX).

Let’s create an example member formula. Suppose you have a dynamic calc member called “Watchlist Products” and you want it to be the sum of products “100-10”, “200-10” and “300-10.”

1. On the Applications page, expand `<yourapplication>` and select the Basic cube.

2. Click the **Actions** menu and select **Outline**.

3. Click **Edit**.

4. Select the Product dimension, add a child called Watchlist_Products, and press the Tab key.

5. Click menu for Watchlist_Products and select **Inspect**.

6. Select the **Formula** tab.

7. In the member tree, in the left panel of the Formula Editor, drill into Product to find the first product member to add to your formula, “100-10.” Right click the member name and click **Insert Name** to insert it into your formula.

8. Place the cursor after “100-10” and press the + key.

9. Use the member tree to pick the next product member to insert, 200-10. Right click the member name and click **Insert Name** to insert it into your formula.

10. Repeat for the last product member, 300-10 and put a semi-colon (;) at the end of the formula.
    The formula should look like this: "100-10"+"200-10"+"300-10";

11. Click **Verify** and fix any errors.

12. Click **Apply and Close**.
13. In the Data Storage Type column for Watchlist_Products, select **Dynamic Calculation**.

14. Click **Save** to save the outline.

Member formulas like the one you just created can also include Essbase functions. When using Essbase functions in member formulas, use the **Function Name** menu on the right side of the formula editor to find and add calculation functions the script. See the Function description under the menu to read descriptions of each function.

See Developing Formulas for Block Storage Databases in *Designing and Maintaining Essbase Cubes*.

To write formulas for block storage outlines, a set of calculation functions and operators, known as the Calculator, or Calc, language, is provided. For descriptions of calculation commands and functions, see *Technical Reference for Oracle Analytics Cloud - Essbase*.

Aggregate storage member formulas cannot be created using Calculator language. Instead, create them using Multidimensional Expression Language (MDX). See Aggregate Storage and MDX Outline Formulas in *Technical Reference for Oracle Analytics Cloud - Essbase* and Developing Formulas on Aggregate Storage Outlines in *Designing and Maintaining Essbase Cubes*.

### Set Attribute Associations

When manually working with attributes, use the outline editor and the Attributes tab in the member inspector. First you associate attribute dimensions with base dimensions and then you associate attribute members with members of the base dimension.

Attributes are associated with Base dimensions; base dimensions are sparse standard dimensions containing members with which you would like to associate attributes.

#### Associate an Attribute Dimension with a Base Dimension

To associate an attribute dimension in `<yourapplication>` with a base dimension:

1. On the Applications page, expand `<yourapplication>`.
2. From the **Actions** menu to the right of the cube name, select **Outline**.
3. Select a base dimension to which you want to associate an attribute dimension. For this exercise, choose Market.
4. From the menu for that dimension name, select **Inspect**.
5. Click **Attributes**.
6. Select an attribute dimension, Intro Date from the **Attribute Name** column.
7. Click the right arrow next to **Associated Attributes** to associate the selected attribute to the regular dimension you selected in step 4.
8. Click **Apply**.
9. Click **Close**.
10. Click **Save** to save the outline.
After you associate an attribute dimension with a base dimension, you must associate members of the attribute dimension with members of the base dimension; these members must all be from the same level in the base dimension.

Associate an Attribute Member with a Member of the Base Dimension

To associate an attribute member in `<yourapplication>` with a member of a base dimension:

1. With the `<yourapplication>` outline still open, click Edit.
2. Expand Market, then East and select New York. New York is the base member to which we'll associate an attribute.
3. Click menu ⌘ and select Inspect.
4. Select Attributes.
5. From the member tree, expand Intro Date and select the attribute member you want to associate to New York.
6. Click menu ⌘ and select Assign.
7. Click Apply and Close.
8. Click Save to save the outline.

See See Working with Attributes.

Create User-Defined Attributes

On the User-defined Attributes tab, you can create, assign, and unassign user-defined attributes (UDAs). A UDA is a word or phrase that describes the member. For example, you might create a UDA called Major Market and assign it to all members in the outline that are part of a major market, as defined by your organization.

Like attributes, UDAs are used to filter data retrievals. Unlike attributes, UDAs have no built-in calculation functionality. However, UDAs can be assigned to dense and sparse dimensions, whereas attributes can be assigned to only sparse dimensions. Also, a UDA can be assigned to any level or generation in a dimension.

1. On the applications page, expand `<yourapplication>`.
2. Click the Actions menu to the right of the cube name and select Outline.
3. Click Edit.
4. Highlight a member to which you would like to assign a UDA.
5. Click menu ⌘ and click Inspect.
6. Click the User-defined Attributes tab.
7. In the User-defined Attributes field, enter a UDA name and press the Enter key.
8. Click Apply and Close to create the UDA for the dimension and assign the new UDA to the member.
9. Click Save to save the outline.
Name Generations and Levels

You can create your own names for generations and levels in an outline, using a word or phrase that describes the generation or level. For example, you might create a generation name called Cities for all cities in the outline. You can define only one name for each generation or level.

Use generation and level names in calculation scripts wherever you need to specify either a list of member names or a list of generation or level numbers. For example, you can limit a calculation in a calculation script to the members of a specific generation.

Data Visualization displays generation names, while in Smart View, you use dimension names for browsing.

1. On the Applications page, expand <yourapplication>.
2. From the Actions menu, to the right of the cube name, click Inspect.
3. In the inspector, select the Dimensions tab.
4. On the Dimensions tab, select the dimension in which you want to name generations or levels.
5. Click a generation or level name to enable editing of that field.
6. Enter a generation or level name.
   <yourapplication> already has generation and level names, but you can change them if you want to.
7. Click Save.

Set Advanced Cube Properties

If the current cube is a block storage cube, then you can select whether to enable the following options:

- **Aggregate missing values**: If you never load data at parent levels, selecting this option may improve calculation performance. If this option is selected and you load data at the parent level, then the parent-level values are replaced by the results of the cube consolidation, even if the results are #MISSING values.

- **Create blocks on equations**: If this option is selected, then when you assign a non-constant value to a member combination for which no data block exists, a data block is created. Selecting this option can produce a very large cube.

- **Two-Pass calculation**: If this option is selected, then after a default calculation, members that are tagged as two-pass are recalculated.

1. On the Applications page, expand the application.
2. From the Actions menu, to the right of the cube name, click Inspect.
3. Select the Settings tab.
4. Select Calculation.
5. Select the options that you want.
6. Click Save.

Unlock Objects

Essbase uses a checkout facility for cube objects (such as calculation scripts and rules files). Objects are locked automatically when they are in use and the locks are deleted when they are no longer in use.

You can view and unlock objects, according to your security role. Users with the Service Admin role can unlock any object. Users without the Service Admin role can unlock only those objects that they locked.

1. On the Applications page, expand the application.
2. From the Actions menu, to the right of the cube name, click Inspect.
4. From the Display menu, select Objects.
5. Select the object you want to unlock and click Unlock.

Remove Data Locks

Data locks apply to block storage cubes only.

Occasionally, you may need to release a lock that you created in the cube, generally from a Smart View Submit Data action. For example, if you’re calculating a cube that has active locks on data, and the calculation encounters a lock, then the calculation must wait. If you release the lock, the calculation can resume.

You can always unlock data that you locked. To remove another user’s data locks, you must have the Application Manager or Database Manager role.

1. On the Applications home page, expand the application.
2. From the Actions menu, to the right of the cube name, click Inspect.
3. Select the Locks tab.
4. From the Display menu, select Blocks.
5. Select the lock and click Unlock.
Use Connections and Datasources

Using saved connections and Datasources, you can set up cubes to interact easily with a variety of source data.

For example, you can set up a partition between a cube and RDBMS tables, share data between a cube and Business Intelligence (BI), develop security filters using variables to fetch members or user names from outside source data, and load data from REST API endpoints.

Many cube operations require connection information, such as login details, to access remote source data or hosts. You can define these as connections and Datasources once, and reuse them in various operations, so that you do not have to specify the details each time you perform a task.

You can implement saved connections and Datasources to facilitate the following operations:

• Loading dimensions and data
• Importing cubes
• Defining variable security filters
• Connecting cubes using partitions, and accessing real-time data
• Drilling through to remote sources of data

Topics in this chapter:

• About Connections and Datasources
• Create Connections and Datasources

About Connections and Datasources

Many operations call for connecting to source data external to the cube. Connections and Datasources, which you create and save as reusable objects in Oracle Analytics Cloud - Essbase, provide a way to do this efficiently.

A **connection** stores information about an external server and the login credentials that are required to access it. By defining one connection that can be used by multiple processes and artifacts, you can simplify many aspects of your analytics. For example, when it’s time to change a system password, you only need to update one connection.

A **Datasource** is another object that you can define once and reuse, to help you manage data flow into and out of your cubes. You can define a Datasource to represent any external source of information, whether that source is a relational system, a table, a file, Oracle BI, or another cube.

You can define one connection and use it to access multiple Datasources. For example, consider an external Oracle Database server that has separate tables for products, resellers, and sales territories. You need only one connection to access
Oracle Database, but you might want to create unique Datasources to access each of the tables.

One use case in which you might define multiple Datasources per connection is as follows: if you use separate load rules to build each dimension in a cube, each rules file can be set up to access the relevant table in Oracle Database. For example, assume your cube has a Market dimension, and you regularly build dimensions using a Dim_Market load rule to populate the Market dimension from a SALES_TERRITORIES table. Likewise, you use a Dim_Product load rule to populate the Product dimension from a PRODUCT table. Both load rules can use the same connection, but because they draw from separate tables, you defined two different Datasources.

Historically, you needed to hard code connection and source data details into Essbase artifacts such as rule files, location aliases, and partitions. While hard coded information is still supported in these artifacts, you can work more efficiently if you define connections and Datasources globally (or, at the application level).

Create Connections and Datasources

Before you can create connections to external source data from Oracle Analytics Cloud – Essbase, you must get the connection details such as host names, user names, passwords, and any other service credentials from your system administrator.

Topics in this section:

• Create a Connection and Datasource to Access Oracle BI
• Create a Connection and Datasource to Access Oracle Database
• Create a Connection and Datasource to Access Another Cube
• Create a Connection and Datasource to Access a Data File

You can also create connections and Datasources for Spark, DB2, SQL Server, and MySQL.

Create a Connection and Datasource to Access Oracle BI

Define a connection and Datasource between Essbase and Oracle BI.

1. In Oracle Analytics Cloud – Essbase, on the Sources page, click Connections.

   To define the connection and Datasource at application level, instead of globally, start on the Applications page instead of the Sources page. From the Actions menu to the right of an application name, launch the inspector and click Sources.

2. Click Create Connection and select Oracle BI.

3. Enter a connection name, host, port number, user name, password, and optional description.
4. Click **Test** to validate the connection, and if successful, click **Create**.

5. Verify that the connection was created successfully and appears in the list of connections.

   Next, you will create a Datasource for the Oracle BI connection.

6. Click **Datasources**, and click **Create Datasource**.

7. From the **Connection** drop-down box, select the name of the connection you just created; for example, OracleBI_Conn.

8. Provide a name for the Datasource; for example, OracleBI_DS.

9. Optionally enter a description of the Datasource; for example, **Datasource on top of Oracle BI**.

10. In the Query field, enter a logical SQL statement used by an Oracle BI analysis. A BI analysis is a query against an organization's data.

11. Click **Next**. If the SQL statement was correct to query an Oracle BI area, you should see the queried columns populated.

12. Change any numeric columns to Double, and click **Next**.

13. Change any additional source-specific parameters, if applicable, and click **Next**.

14. Review the preview panel. You should see the results of the SQL query fetching columns of data from Oracle BI Server.

15. If the preview looks correct, click **Create** to finish creating the Datasource.

---

Create a Connection and Datasource to Access Oracle Database

Define a connection and Datasource between Essbase and Oracle Database.

1. In Oracle Analytics Cloud – Essbase, on the Sources page, click **Connections**.
To define the connection and Datasource at application level, instead of globally, start on the Applications page instead of the Sources page. From the Actions menu to the right of an application name, launch the inspector and click Sources.

2. Click Create Connection and select Oracle Database.

3. Enter a connection name, host, port number, user name, and password. Select SID (server ID) or Service, and enter server details.

4. Click Test to validate the connection, and if successful, click Create.

5. Verify that the connection was created successfully and appears in the list of connections.

   Next, you will create a Datasource for the Oracle Database connection.

6. Click Datasources, and click Create Datasource.

7. From the Connection drop-down box, select the name of the connection you just created; for example, custDBaaS. For application-level Datasources, select the application-level connection name, in the format appName.connectionName.

8. Provide a name for the Datasource; for example, OracleDB_DS.

9. Optionally enter a description of the Datasource; for example,Datasource on top of Oracle DB.

10. In the Query field, provide the appropriate SQL query that selects the Oracle Database data you want to make available in this Datasource.
11. Click Next. If the SQL statement was correct to query an Oracle Database area, you should see the queried columns populated.

12. Change any numeric columns to Double, and click Next.

13. Change any additional source-specific parameters, if applicable, and click Next.

14. Review the preview panel. You should see the results of the SQL query fetching columns of data from Oracle Database.

15. If the preview looks correct, click Create to finish creating the Datasource.

Create a Connection and Datasource for Oracle Autonomous Data Warehouse

Define a connection and Datasource between Essbase and Autonomous Data Warehouse

To do this from Global Sources, you need to have the service administrator role. To do it from application level sources, you need to have the user role, plus application manager permission on the application.

1. In Oracle Analytics Cloud – Essbase, on the Sources page, click Connections.

To define the connection and Datasource at application level, instead of globally, start on the Applications page instead of the Sources page. From the Actions menu to the right of an application name, launch the inspector and click Sources.

2. Click Create Connection and select Oracle Database.

3. Select Autonomous using the toggle switch.
4. Enter a connection name and a service name.
5. Drag and drop a wallet file, or click to upload.
   Obtain a wallet file by selecting **Download Client Credentials (Wallet)** from your Autonomous Data Warehouse Administration page in Oracle Cloud Infrastructure.
6. Enter your Autonomous Data Warehouse username, password, and optionally, a description.
7. Click **Test** to validate the connection, and if successful, click **Create**.
8. Verify that the connection was created successfully and appears in the list of connections. Next, you will create a Datasource for the Autonomous Data Warehouse connection.
9. Click **Datasources**, and click **Create Datasource**.
10. From the Connection drop-down box, select the name of the connection you just created; for example, EssbaseADW. For application-level Datasources, select the application-level connection name, in the format `appName.connectionName`.
11. Provide a name for the Datasource; for example, ADW_DS.
12. Optionally enter a description of the Datasource; for example, Autonomous Data Warehouse Datasource.
13. In the **Query** field, provide the appropriate SQL query that selects the Autonomous Data Warehouse data you want to make available in this Datasource.
14. Click **Next**. If the SQL statement was correct to query an Autonomous Data Warehouse area, you should see the queried columns populated.
15. Change any additional source-specific parameters, if applicable, and click **Next**.
16. Review the preview panel. You should see the results of the SQL query fetching columns of data from Autonomous Data Warehouse.

17. If the preview looks correct, click Create to finish creating the Datasource.

Create a Connection and Datasource to Access Another Cube

Define a connection and Datasource between two Oracle Analytics Cloud – Essbase cubes.

1. In Oracle Analytics Cloud – Essbase, on the Sources page, click Connections.

To define the connection and Datasource at application level, instead of globally, start on the Applications page instead of the Sources page. From the Actions menu to the right of an application name, launch the inspector and click Sources.

2. Click Create Connection and select Essbase.

3. Enter a connection name; for example, Essbase_FinanceCube_Conn.

4. Check the box to Use URL, and enter the connection details to an Essbase instance. Connection information is provided by your Service Administrator.

![Create Connection](image)

**Create Connection**

- **Name**: Essbase_FinanceCube_Conn
- **URL**: https://myEssbase2.oraclecloud.com/es
- **Host**: 
- **Port**: 0
- **User**: admin
- **Password**: ********
- **Description**: Connection to Finance cube
Use the discovery URL. A discovery URL is the URL provided by your Service Administrator, with /agent appended to the end. For example:

https://myEssbase2.oraclecloud.com/essbase/agent

5. Click **Test** to validate the connection, and if successful, click **Create**.
6. Verify that the connection was created successfully and appears in the list of connections.
   
   Next, you will create a Datasource for the Essbase connection.
7. Click **Datasources**, and click **Create Datasource**.
8. From the **Connection** drop-down box, select the name of the connection you just created.
9. Enter a name for the Datasource, and an optional description.
10. Select the application and database that will be used for this Datasource.
11. Provide a valid MDX query that selects the cube data you want to make available in this Datasource.

![Create Datasource](image)

12. Click **Next**. If the MDX syntax was correct to query the cube, you should see the queried columns populated.
13. Change any numeric columns to Double, and click **Next**.
14. Change any additional source-specific parameters, if applicable, and click **Next**.
15. Review the preview panel. You should see the results of the MDX query fetching columns of data from the other cube.

16. If the preview looks correct, click Create to finish creating the Datasource.

Create a Connection and Datasource to Access a Data File

Define a connection and Datasource between Essbase and a source data file.

1. Upload the source data file to the file catalog on Oracle Analytics Cloud – Essbase.

   If you need a sample source data file for this task flow, you can copy and paste UserDetails.csv from the gallery section of the file catalog to your application's file catalog. It represents a data repository of 22 users, with their associated countries, cost centers, currency, managers, company, business units, and offices.

2. In Oracle Analytics Cloud – Essbase, on the Sources page, click Connections.

   To define the connection and Datasource at application level, instead of globally, start on the Applications page instead of the Sources page. From the Actions menu to the right of an application name, launch the inspector and click Sources.

3. Click Create Connection and select File.

4. Enter a name for the connection; for example, UserDetails_Conn.

5. Provide the catalog path to the source data file.

6. Enter an optional description; for example, Connection to user repository for filters.

7. Click Test to validate the connection, and if successful, click Create.

8. Verify that the connection was created successfully and appears in the list of connections.

   Next, you will create a Datasource for the file connection.

9. Click Datasources, and click Create Datasource.

10. From the Connection drop-down box, select the name of the connection you just created; for example, UserDetails_Conn.

11. Enter a name for the Datasource, and an optional description.
12. Essbase detects and enters details about the source data; for example, whether it has a header row, and is comma-delimited. Click Next.

13. You should see the columns populated from the file source. Change any numeric columns to Double, and click Next.

14. If the preview looks correct, click Create to finish creating the Datasource.

If you update the source file metadata (for example, to add columns), you must recreate the Datasource.
Build Dimensions and Load Data

Building dimensions is the process of converting source data containing information about dimensions and members into a database outline, including hierarchies, using an Essbase data source and rule file. Loading data is the process of adding data values to a cube from any number of data sources.

A data source can contain data values, information about members (such as member names, member aliases, and formulas), generation and level names, data storage properties, attributes, and user-defined attributes (UDAs). Since data sources seldom are configured solely to support dimension build and data load processes, a rule file is generally used to create Essbase-compatible directives to be applied to the data source.

- Typical Workflow for Building Dimensions and Loading Data
- About Dimension Builds
- About Data Loads
- Work with Rules
- Build Dimensions and Load Data Using a Rules File
- Upload Files to a Cube
- Build Dimensions and Load Data by Streaming from a Remote Database
- Build Dimensions and Load Data Using SQL
- Build Dimensions and Load data Using Data Sync

Typical Workflow for Dimension Builds and Data Loads

The workflow for building dimensions and loading data into a cube includes the steps described here. The use of rules are necessary if the dimensions and data are not in Essbase-ready format.

1. For data sources other than flat files, set up a connection to the data source, and then select the application-specific data source.
2. Build dimensions using a rule, and then run the build dimension job in the Essbase web interface.
3. Load data using a rule, and then run the load data job in the Essbase web interface.

About Dimensions Builds

Dimensions, and their associated hierarchies, can be built from various types of data sources, using a rule file.
Building dimensions is the process of adding dimensions and members to an Essbase database outline by using a data source and a rule file. You can also use Outline Editor to build dimensions and members manually.

For more information on dimensions and members, see Add Dimensions and Members to Outlines.

You can build dimensions using one of the following methods:

- Building a flat file of dimensions using a rule file. See Build Dimensions Using a Rule File.
- Using SQL. See Build Dimensions using SQL.
- Using Data Sync. See Build Dimensions Using Data Sync.
- Using the CLI tool and the streaming option. Build Dimensions and Load Data by Streaming from a Remote Database.
- Adding dimensions manually in the Outline Editor. See Add Dimensions and Members to Outlines.

About Data Loads

Loading data is the process of adding data values to a cube from any number of data sources, such as a Microsoft Excel spreadsheet or SQL database. Since data sources seldom are configured solely to support Essbase dimension build and data load processes, a rule file is generally used to create Essbase-compatible directives to be applied to the data source.

You must have the Database Update role to load data into a cube, and Database Manager role to create the necessary artifacts.

For all files that you upload and import to Essbase cloud, using Essbase or command line interfaces, their file name lengths are limited to 30 characters, including file extension characters. You must shorten file names accordingly before performing these operations. In addition, when you are building or changing cubes using application workbooks, the name of the workbooks must be no more than 30 characters.

You can load data to a cube using one of the following methods:

- Using a flat data file or database table, using a rules file. See Load Data Using a Rules File.
- Using SQL. See Load Data Using SQL.
- Streaming from a remote database. See Build Dimensions and Load Data by Streaming from a Remote Database.
- Using Data Sync. See Load Data from Data Sync to Essbase.
- Loading data values from an application workbook that you are using to build a cube. See Create a Cube from an Application Workbook.
- Submitting data values in Smart View. See About the Submit Data Options in the Oracle Smart View for Office User’s Guide.
Work with Rules

Using rules, you can define operations that Essbase performs on data values and dimensions and members, loaded from a data source. You also use rules, if necessary, to map data values to an Essbase cube, or dimensions and members to an Essbase outline.

Rules are stored in rule files. A rule file loads the rule that defines which build method to use, whether data values or members are sorted or in random order, and how to transform data values or members before loading them. You can create a separate rule for each dimension.

Essbase reads the data values or dimensions in the data source, loads them based on the rules. Essbase doesn't change the data source. You can reuse a rule with any data source that requires the same set of rules.

If you build a cube from an application workbook, Essbase creates the rules for you.

If a load data rule already exists, you must edit it when you add a new dimension, change a data source for your analysis, or change mappings or properties.

You can also use rules, while building dimensions and loading data, to do the following:

- Define operations that Essbase performs on data values or on dimensions and members when it processes a data source.
- Map data values to an Essbase database.
- Map dimensions and members to an Essbase outline.

You must use a rule in the following instances.

- You need a rule if you're loading data, and you need to define the mapping of the data source fields to database fields.
- If loading data from a SQL data source or a database, you need a rule to map the relational table information of the database columns to dimensions.
- When building dimensions, if you're adding or changing dimensions and members in the database, you need a rule.
- If you change fields in any way, including the mapping of data, and order of fields, you need to use a rule when loading the data.
- You need to prepare a separate rule file for each unique non-Essbase source, whether the source requires a dimension build or load data rule.
- If you're using native format data files, you need to use a rule file for mapping data.

Global and Field Options

Various options can be specified at the global and field level in the Rules editor, when creating and editing a rule.

The sequence of steps to open the Rules editor are as follows: On the home page, expand an application to see its cube, open the row’s Actions menu, select Inspect, Scripts, and then Rules, and then create or edit a rule.
The options that are available, in the Global and Field option toolbars on the Rules editor, are described here.

**Global Options**

The Global toolbar, on the upper right of the Rules editor page, allows you to edit the data source, general file options, and properties. In most cases, the default options do not need to be modified.

**Table 8-1  Global Options in Rules Editor**

<table>
<thead>
<tr>
<th>Global Options Toolbar Tabs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (main tab)</td>
<td>(For dimension builds only.) This main tab allows you to enter a new dimension, select from existing ones, and edit their global options.</td>
</tr>
<tr>
<td>Dimensions, General</td>
<td>(For dimension builds only.)</td>
</tr>
<tr>
<td>• Member Name: This can be left empty. It is the same value as the dimension name.</td>
<td></td>
</tr>
<tr>
<td>• Type, Storage, Config, Unique, and Hierarchy: These options have the default value of “Existing”, when the dimension already exists, or you can select values from the menu.</td>
<td></td>
</tr>
<tr>
<td>• Allow xxxx Changes: Allows you to make changes to mapped associations, properties, formula, and user-defined attributes.</td>
<td></td>
</tr>
<tr>
<td>Dimensions, Advanced</td>
<td>(For dimensions builds only.)</td>
</tr>
<tr>
<td>• Update Option: Enables you to use Merge to do incremental updates, or Remove Unspecified to delete existing members and replace file contents.</td>
<td></td>
</tr>
<tr>
<td>• Create Attributes: Allows you to add and associate attributes.</td>
<td></td>
</tr>
<tr>
<td>• Moves: Allows you to move members between hierarchies. Generation-2 option allows only generation-2 members to be moved.</td>
<td></td>
</tr>
<tr>
<td>Dimensions, Measure Properties</td>
<td>(For dimension builds only.) Applies to dimensions of type measures.</td>
</tr>
</tbody>
</table>

For information on member property codes, see Using the Data Source to Work with Member Properties in *Designing and Maintaining Essbase Cubes*. 
Table 8-1  (Cont.) Global Options in Rules Editor

<table>
<thead>
<tr>
<th>Global Options Toolbar Tabs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions, Attribute Properties (For dimension builds only.) Applies to attribute dimensions.</td>
<td></td>
</tr>
<tr>
<td>Source, General</td>
<td>Enables you to define data source options, specify header (for repeating header values), and specify token ignore or token join options.</td>
</tr>
<tr>
<td>Source, File Properties</td>
<td>Enables you to change file property options, including: set header, file type, and delimiter.</td>
</tr>
<tr>
<td>Source, SQL/Datasource Properties</td>
<td>Enables you to set properties and queries for SQL (such as Oracle SQL server) or datasource properties.</td>
</tr>
<tr>
<td>Properties</td>
<td>Includes load and sign flip options for data loads, and smart list options for dimension build text measures. Also enables you to clear multiple combinations of members by entering them in rows.</td>
</tr>
<tr>
<td>Verify</td>
<td>Enables you to verify the syntax of the rule. Errors are displayed.</td>
</tr>
</tbody>
</table>

Field Options

The Field Options toolbar, on the left of the Rules editor page, allows you to set field–level properties and options.

Table 8-2  Field Options in Rules Editor

<table>
<thead>
<tr>
<th>Field Options Toolbar Tabs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create, Regular</td>
<td>Allows you to add a field (column).</td>
</tr>
<tr>
<td>Create, With Static Value</td>
<td>Allows you to add a field with a specified static value.</td>
</tr>
<tr>
<td>Create, With Join (Not available for dimension build indexed based rules). Allows you to create a field using a join. First, you select multiple field columns, and then enter a value in the Join Position dialog box, for the field position (column) in which to place the joined fields.</td>
<td></td>
</tr>
<tr>
<td>Create, With Expression (For dimension build index based rules only.) Allows you to create an expression within a rule.</td>
<td></td>
</tr>
<tr>
<td>Properties, General</td>
<td>Allows you to change a field name, handle a smart list (text measures), handle upper and lower case letters, set date format (for a Date dimension), and trim spaces (remove leading or trailing spaces).</td>
</tr>
<tr>
<td>Properties, Filters</td>
<td>Allows you to set filters including to select (include), reject (exclude), and replace (find and replace tool to fix mistakes in the data).</td>
</tr>
<tr>
<td>Expression (For dimension build index based rules only.) Allows you to create or edit an expression within a rule.</td>
<td></td>
</tr>
<tr>
<td>Delete</td>
<td>Allows you to delete a field from the rule after highlighting the field column. You can't delete a field after performing a field operation on it, such as join or split.</td>
</tr>
</tbody>
</table>
### Table 8-2 (Cont.) Field Options in Rules Editor

<table>
<thead>
<tr>
<th>Field Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbar Tabs</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>Toggle option that allows you to exclude a field from processing (the field display is grayed out) by highlighting a field column. Any fields that are not mapped can be set to Ignore.</td>
</tr>
<tr>
<td></td>
<td>Join</td>
</tr>
<tr>
<td></td>
<td>(Not available for dimension build index based rules.) Allows you to join (merge) two fields by highlighting the two fields' columns, and joining them into the first field's position, in <strong>Join Position</strong>.</td>
</tr>
<tr>
<td></td>
<td>Split</td>
</tr>
<tr>
<td></td>
<td>(Not available for dimension build index based rules.) Allows you to split a field's data into two fields. Highlight the two fields' columns, and then enter the <strong>Split Position</strong> (from where you want to split the field). For example, if the field's value is &quot;NewYork&quot; and the Split Position value is &quot;3&quot;, then the new (split) fields are &quot;New&quot; and &quot;York&quot;.</td>
</tr>
<tr>
<td></td>
<td>Move</td>
</tr>
<tr>
<td></td>
<td>(Not available for dimension build index based rules.) Allows you to move a field by highlighting a field column, and then moving the data to another field's column (with the target field number specified in the <strong>Move field to</strong> value).</td>
</tr>
</tbody>
</table>

---

## Build Dimensions and Load Data Using a Rule File

Using a rule, you can build a dimension and load data from a text or other flat file.

Before you begin, you will need the following resources.

- Access to an Essbase cloud service instance.
- If you're not using a flat file as the data source, you will need a connection to an Essbase data source and setup of the data source as part of the application.
- Dimension metadata file (sample exercise file: `dim-market.txt`) downloaded to your computer.
- Data file (sample exercise file: `data-basic.txt`) downloaded to your computer.

Using the listed resources, you can now perform the tasks of building dimensions and loading data using a rule.

## Build Dimensions Using a Rule File

You can edit and map dimensions to an Essbase outline using a rule, rather than manually building empty dimensions in the Essbase Outline editor. In this section, we address and illustrate building dimensions from a flat file, using a rule.

When you build using a rule, you define the hierarchical structure of dimensions and member metadata. You can create one or more dimensions using a single rule file, or use one rule file per dimension.

You can build a dimension to add or modify dimensions, but you can't use it to delete an existing dimension.

Here, we illustrate an example of building dimensions, from a flat file, using rules. The process of loading data using SQL, Data Sync, and streaming is described in other topics.
1. Open the downloaded dimension metadata file, `dim-market.txt`, in a formatted text editor. Notice that the file doesn't have a header row and that the file delimiter is a comma.

2. Sign into Oracle Analytics Cloud – Essbase.

3. On the home page, expand the Sample application, and select the Basic cube.

4. Now you create the rule file.
   a. From the **Actions** menu to the right of the cube, launch the inspector.
   b. Click **Scripts**, and then **Rules**. The Rules editor is displayed, showing the currently defined rules.
   c. Click **Create**, and select **Dimension Build (Indexed Based)** to define the build dimension rule. An index-based build dimension rule removes dependency of fields to each other and allows the fields to appear in any order.
   d. In the New Rule dialog box, enter `Dim_market1` as the name of the rule file.
   e. Under Preview Data, select **File** for the flat file input option.
   f. Click the browse icon and locate the file `dim-market.txt` that you downloaded, and click **Open** to select it.
   g. As you saw earlier, the first row of the flat file doesn't contain header values. Deselect the **Header Row** check box if it is selected.
   h. Specify the **Delimiter** value as Comma, based on the file format.
   i. Click **Proceed**.

   The top-right toolbar in the Rules editor shows the Global options for a rule. You can change the properties or data source here and view the results. The left toolbar of the Rules editor shows the Field options for the rule.

5. On the Rules editor page, you can now set up and edit the rule.
   a. On the Preview page for the new rule, in the first field (column), click **Dimension**, and select **Market** as the dimension name. The Market dimension is now assigned to all fields.
   b. Under Market, in the first field, it, click **Type**, and select the dimension type, **Parent**.

   The source file for this rule is in parent-child format. If you had a generation-based source file, you could set the first field to Generation. In that case, the Generation Number is set to 2, as by default, the Generation 1 is the dimension itself.
   c. Set up the other fields:
      Set Field 2 Type to **Child**.
      Set Field 3 Type to **Property**, and third row Parent/Child box to **Child**.
      For Field 4 and 5, set Type to **UDA**, and third row Parent/Child boxes to **Child**.
      For Field 6-9, set Type to **Alias**, third row Alias boxes to **ChineseNames**, **JapaneseNames**, **RussianNames**, and **GermanNames** respectively; and fourth row boxes to **Child**.
Set Field 10 Type to **Attribute Member**, third row box to **Population**, and fourth row box to **Child**.

The Dimension field is most often set to Generation, Parent or Child. If the Dimension name you want isn’t in the menu, click **Dimensions** (on the Global toolbar), add the dimension name, and click **Add** and **OK**.

d. Now check the field properties for a field. Select the last field column, **Population**. On the Field options toolbar, open the **Properties** tab and verify that the Case option is set to **No Operation**. This means that uppercase and lowercase text aren’t handled differently here than they were in the source text file.

e. In the Global toolbar, click the **Source** tab, if you want to change the data source file. On the File Properties tab, verify that the Delimiter is set to **Comma**.

f. When you have finished defining the rule, click **Verify** in the Global toolbar, to validate the rule syntax.

g. Click **Save and Close**.

h. Click **Refresh**. See that your created rule is now listed in the Rules pane of the Scripts tab. You can edit your rule by clicking on the rule name and then clicking **Proceed**.

   From the **Actions** menu for a listed rule, you can optionally copy, rename, copy or export the build (into a json file to be used for troubleshooting purposes. Click **Close** to return to the home page.

6. Next, you create and run a job to build the dimension using the rule.

   a. On the home page, select, **Jobs**, and then **New Job**.

   b. Select **Build Dimension**.

   c. In the Build Dimension dialog box, from the **Application** list, select the **Sample** application.

   d. In the **Database** list, select the **Basic** cube. It might take a few moments to load.

   e. In the **Script** list, select the build dimension rule that you created, **Dim_market1.rul**.

   f. For **Load Type**, select **File**.

   g. In the **Data File** list, select the **Dim_Market** as the data dimension data file. This file is located in the Sample, Basic folder.

   h. From the **Restructure Options** list, select the **Preserve Input Data** option for the data you want to preserve.

      To disconnect other users who are connected to the Sample, Basic cube, so that you can immediately build the dimension, you could select **Force to Build Dimension**.

      For leaf level data, only level-0 values are preserved. Use this option if all data required for the calculation resides in level-0 members. For input data, only blocks that contain data being loaded are preserved. Neither option applies to aggregate storage databases.

   i. Click **OK**. The build dimension job is executed.

   j. On the Jobs page, click **Refresh** to monitor the job status.
When the job completes, click the **Actions** menu for the executed job, and select **Job Details** to verify the status of your build job.

On the Applications home page, to the right of the Basic cube in the Sample application, open **Actions**, and then **Outline** to verify the dimension hierarchy. In **Actions, Database, Inspect**, you can also view the created generation names under the dimension tab. When done, exit the view.

You have now completed building a dimension using a rule.

### Load Data Using a Rule File

You can use rules to extract, transform and load data values to an Essbase cube. The data source values can contain the following:

- Data values
- Member names, aliases and formulas
- Generation and level names
- Data storage properties
- Attributes and user—defined attributes

When you build an Essbase cube, data files and load data rule files are created in the cloud service. You can also use data and rules from a supported on-premises version of Oracle Analytics Cloud – Essbase.

Both pivot data and row set flat file data format are supported.

Here, we illustrate an example of loading data from a flat file, using rules. The process of loading data using SQL, Data Sync, and streaming is described in other topics.

1. Open the downloaded data file, `data-basic.txt`, in a formatted text editor. Notice that there’s no header row and that the file delimiter is a comma.
2. Sign into Oracle Analytics Cloud – Essbase.
3. On the home page, expand the Sample application, and select the Basic cube.
4. Now create the rule.
   a. From the **Actions** menu to the right of the Basic cube, launch the inspector.
   b. Select **Scripts** tab, and then **Rules**. The Rules editor is displayed, showing currently defined rules.
   c. Click **Create**, and select **Data Load** to define the load data rule.
   d. In the New Rule dialog box, enter **Data_basic1** as the name of the rule.
   e. Enter **Measures** as the data dimension.
   f. Under Preview Data, select **File** for flat file input.
   g. Click the browse icon to locate the file `data-basic.txt` that you downloaded, and click **Open** to select it.
   h. As you saw earlier, the first row of the flat file doesn’t contain header values. Deselect the **Header Row** check box if it is selected. When the header row is present, the columns are mapped automatically.
   i. Select **Comma** as the **Delimiter** value, based on the file format.
   j. Click **Proceed**.
You can now see the preview of the data in the Rules editor, based on the input flat file.

The Global options toolbar, on the top right of the Rules editor allows you to modify file properties or the data source and to see the results in the Rules editor. The Field options toolbar on the left side of the Rules editor allows you map fields in the rule.

Because there were no headers in the input file, you need to map each column to the appropriate dimensions and members.

5. In the Rules editor, you can now set up the rule fields.
   a. Click Create drop-down menu, and start setting the field names.
      Set Field (column) 1 to Product.
      Set Field 2 to Market.
      Set Field 3 to Year.
      Set Field 4 to Scenario.
      Set Field 5 to Sales.
      Set Field 6 to COGS.
      Set Field 7 to Marketing.
      Set Field 8 to Payroll.
      Set Field 9 to Misc.
      Set Field 10 to Opening Inventory.
      Set Field 11 to Additions.
      All dimensions must be represented in the load data rule before any data can be loaded.
   b. When you are finished defining the rule, with global and field options, click Verify on the Global toolbar to validate the syntax and click Close.
   c. After syntax is validated, click Save and Close.
   d. Click Refresh. See that your created rule is now listed in the Rules pane of the Scripts tab. You can edit your rule by clicking the rule name and then clicking Proceed.
   e. Click Close to return to the Applications home page.

Next, create a job to load the data using the rule.

6. On the home page, select Jobs, and then New Job.
   a. Select Load Data.
   b. In the Load Data dialog box, from the Application menu, select the Sample application.
   c. In the Database list, select the Basic cube.
   d. In the Script list, select the load data rule that you created, Data_market1.rul.
   e. For Load Type, select File.
   f. Select the file Data_Basic1 from the Data File list. This file is located in the Sample > Basic folder.
g. Optional: select the **Abort on error** check box if you want the load to stop if an error occurs.

h. Click **OK**. The load data job is executed.

i. On the Jobs page, click **Refresh** to monitor the job status.

7. After the job is completed, verify that the input records were processed and loaded.
   a. On the Applications home page, click **Actions** to the right of the Basic cube in the Sample application.
   b. Select **Job Details** to check the load data job details.
   c. Click **Close** when done.
   d. On the Applications home page again, open the **Actions** inspector for the Sample cube.
   e. Select **Statistics** to view the resulting statistics for the Basic cube.

You have now completed loading data using a rule.

**Upload Files to a Cube**

To perform some tasks, you may need to upload required files to a cube. For example, for data loads and dimension builds, you may need to upload text files and rules files.

1. In Oracle Analytics Cloud – Essbase, click **Files**.
2. On the Files page, navigate into **Applications**, then navigate into the appropriate application and cube directory.
3. Click **Upload**, then drag or select files from your local directory.
   - calculation script (**.csc**)
   - text (**.txt**)
   - rules (**.rul**)
   - Excel (**.xls, .xlsm, .xlsx**)
   - XML (**.xml**)
   - linked reporting object (**.lro**)
   - report (**.rep**)
   - ZIP (**.zip**)
   - tabular plain text file (**.csv**)
   - outline (**.otl**)
   - JSON (**.json**)
   - output (**.out**)
   - error (**.err**)
4. Click **Close** to upload the file.
Build Dimensions and Load Data by Streaming from a Remote Database

If the data or dimensions you want to load to a cube are in a remote database, you can use the stream option in the Oracle Command Line Interface (CLI) utility, to push the data or members to your cube, using a rules file.

When you use the stream option for the CLI Dataload: Load Data to a Cube or Dimbuild: Load Dimensions to a Cube command, you must also reference a saved JDBC connection that reflects your driver and connection strings.

Before you Begin

1. The rules file must exist in the Files section for the relevant database.
2. The database query used to load data or build dimensions must have the same dimensionality as the columns in the rules file. (For example, see Build Dimensions Using SQL, where the order of dimensions in the rules file must match the order of dimensions in the SQL query).

Limits

• Substitution variables are not supported in SQL statements used in load rules.
• Only use SQL functions that are supported by JDBC. ODBC scalar functions are not supported in CLI.

Workflow for Streaming Dimension Builds and Data

1. Create a saved JDBC connection string that reflects your data source's driver and connection strings, using the CLI Createlocalconnection: Save a JDBC Connection command.
2. (Not required for Oracle database) Set an environment variable EXTERNAL_CLASSPATH to point to the .jar file for your database driver. See the Examples of EXTERNAL_CLASSPATH Environmental Variables section in this topic.
3. Run the CLI Dataload: Load Data to a Cube or Dimbuild: Load Dimensions to a Cube command with the streaming option, providing the saved connection name.
   You can optionally specify the database query in the dataload or dimbuild command. Otherwise, you can specify it in the load rules, in the Select section of the Data Source tab. For examples, see Build Dimensions Using SQL and Load Data Using SQL.

Examples of EXTERNAL_CLASSPATH Environmental Variables

You must set the EXTERNAL classpath environment variable before you can stream from any data source other than the Oracle database. Set the variable to point to the location of relevant database driver .jar file.

DB2

Set the external classpath variable to point to the location of the DB2 driver jar file.
C Shell Example

setenv EXTERNAL_CLASSPATH /scratch/db/jars/db2jcc.jar

Korn or Bash Shell Example

export EXTERNAL_CLASSPATH=/scratch/db/jars/db2jcc.jar

MySQL
Set the external classpath variable to point to the location of the MySQL driver jar file.

C Shell Example

setenv EXTERNAL_CLASSPATH /scratch/db/jars/mysql-connector-java-5.1.43-bin.jar

Korn or Bash Shell Example

export EXTERNAL_CLASSPATH=/scratch/db/jars/mysql-connector-java-5.1.43-bin.jar

Microsoft SQL Server
Set the external classpath variable to point to the location of the SQL Server driver jar file.

C Shell Example

setenv EXTERNAL_CLASSPATH /scratch/db/jars/sqljdbc4-3.0.jar

Korn or Bash Shell Example

export EXTERNAL_CLASSPATH=/scratch/db/jars/sqljdbc4-3.0.jar

Teradata
Set the external classpath variable to point to the location of both Teradata driver jar files.

C Shell Example

setenv EXTERNAL_CLASSPATH /scratch/db/jars/tdgssconfig.jar:/scratch/db/jars/terajdbc4.jar

Korn or Bash Shell Example

export EXTERNAL_CLASSPATH=/scratch/db/jars/tdgssconfig.jar:/scratch/db/jars/terajdbc4.jar
Build Dimensions and Load Data Using SQL

Using SQL, you can import a table to an RDBMS server, create dimension build and data load rules, connect to the RDBMS, and load dimensions and data to a cube.

Before you begin, you will need the following resources.

- Access to an Essbase cloud service instance
- Access to an RDBMS server
- Oracle SQL Developer, or another SQL integrated development environment
- A tabular data file. For example, in this exercise, consider a sample_basic_table.csv file that contains columns of data, as in the following abbreviated representation (many rows are omitted):

![Figure 8-1 Tabular Data File to Import to Relational Database](image)

- A valid OCI or DSN-less connection string, as listed below. For both connections, you do not have to edit odbc.ini. Essbase makes the connection using the ODBC driver.

Connection Strings

The available OCI and DSN-less connection string types are listed, with syntax and examples.

**Oracle Call Interface (OCI)**

Syntax: $Keyword$DatabaseServerName:PortNumber/SID

Example: $OCI$mydsn01:1521/ORCL

**Oracle Database (DSN-less)**

Syntax (SID): oracle://HostName:PortNumber/SID

Example (SID): oracle://somedb99:1234/ORCL
Syntax (ServiceName): ORACLESERVICE:oracle://HostName:PortNumber/
Servicename

Example (ServiceName): ORACLESERVICE:oracle://somedb99:1234/
esecs.host1.oraclecloud.com

Microsoft SQL Server (DSN-less)
Syntax: sqlserver://HostName:1433:DBName
Example: sqlserver://myMSSQLHost:1433:myDbName

DB2 (DSN-less)
Syntax: db2://HostName:PortNumber:DBName
Example: db2://myDB2Host:1234:myDbName

MySQL (DSN-less)
Syntax: mysql://HostName:3306:DBName
Example: mysql://someHostName:3306:myDbName

Once you have all the prerequisite information listed in this topic, you can perform the
tasks of building dimensions and loading data using SQL.

- Build Dimensions Using SQL
- Load Data Using SQL

No members from a CellProperties dimension should be included in tabular data or in
the headers of the SQL-based load rules files.

Build Dimensions Using SQL

This task flow demonstrates how to import a table to a RDBMS server, create
dimension build rules, connect to the RDBMS, and build dimensions using SQL.

Before you begin, complete the prerequisites and obtain a valid OCI connection string.
See Build Dimensions and Load Data Using SQL

1. In Oracle SQL Developer (or your choice of SQL tool), import a table from a flat file
   (for example, sample_basic_table.csv), to your SQL database server connection.
   An example of the imported table, SAMPLE_BASIC_TABLE, is shown here.
Next, you will delete some members from Sample Basic, and then create a load rule to rebuild the Market dimension from the SQL table.

2. In Oracle Analytics Cloud – Essbase, on the Applications page, expand the Sample application, and select the cube, Basic.

3. From the Actions menu to the right of Basic, select Outline.

4. Click the Market dimension, and then click member East.

5. Click Edit to lock the outline for editing.

6. Delete some of the states from the East market. For example, delete Connecticut, New Hampshire, and Massachusetts.

7. Click Save, and then verify that East now contains only the states Florida and New York.

Next, you will create dimension build rules and repopulate the Market dimension, from the SQL table, with the states you have removed.

8. Close the Outline browser tab.

9. On the Applications page, from the Actions menu to the right of Basic, launch the inspector, click Scripts, then choose the Rules tab.

10. Click Create > Dimension Build (Regular) to begin defining new dimension build rules.

11. In the Name field, enter the name of the rules file as MarketSQLDimbuild. Leave the other options as-is, and click Proceed.

12. Click the Dimensions button.

13. Click the field containing the text Select existing dimension, select Market, and click Add, then OK.

15. Click the **Type** drop-down field and select **Generation**. Increment the generation number to 2.

16. Click the **Generation Name** field and type **REGION**.

   The Market dimension is generation 1, and you added a child named Region.

17. Click **Create > Regular** to create a second dimension build rule field.

18. Name the field **STATE** and associate it with dimension Market, at generation 3.

19. Click the **Source** button to begin associating a data source with the dimension build rules.

20. In the **General** tab, enter the valid connection string.

   a. For OCI connections: In the **Name** field of the **General** group, enter the valid OCI connection string.
b. For DSN-less connections, such as Oracle DB, Microsoft SQL Server, and DB2: You must leave the Name field of the General group empty. Instead, enter the connection string in the Server field of the SQL/Datasource Properties group. The format is oracle://host:port/sid for and Oracle database.

21. In Oracle SQL Developer (or your alternate SQL tool of choice), write and test a SELECT statement selecting some columns from the table SAMPLE_BASIC_TABLE:
```
SELECT distinct market, statename from SAMPLE_BASIC_TABLE
```

22. If the SQL query is valid, it should return the requested table columns, Market and Statename, from the database to which your SQL tool is connected:

![MARKET STATENAME](image)

1 Central Wisconsin
2 South Louisiana
3 East Massachusetts
4 East Connecticut
5 Central Colorado
6 East Florida
7 South Oklahoma
8 West Oregon
9 West Washington
10 West Nevada

23. Copy the SELECT statement to your clipboard. The results of this query are the dimensions you will load into the Sample Basic cube.

24. Back in the Edit Source dialog for your dimension build rule, paste the SQL statement into the Query field of the SQL/Datasource Properties group.
25. Click OK, then Verify, Save and Close. to save and close the MarketSQLDimbuild rule.

26. Refresh the list of rules in the Scripts list to ensure that MarketSQLDimbuild has been added to the list of rules files for the cube Sample Basic.

27. Click Close.

Next, you will use this rules file to load the members back into the Market dimension.

28. Click Jobs, and click New Job > Build Dimension.

29. Enter Sample as the application name, and Basic as the database name.

30. For the script name, select the name of the dimension build rules file you created, MarketSQLDimbuild.

31. Select SQL as the load type.

32. Leave Connection blank, unless you already have a saved SQL connection you wish to use.

33. Enter the user name and password of one of your SQL database schema users.

34. Leave Data File blank.

35. From the Restructure Options drop-down list, select Preserve All Data.

36. Click OK to begin the job.

The dimension build begins. Click the Refresh symbol to watch the status, and when it completes, click Job Details from the Actions menu.

37. Inspect the outline to verify that your dimensions were built (verify that Connecticut, New Hampshire, and Massachusetts exist as children under East).

Load Data Using SQL

This task flow demonstrates how to clear data from a cube, create data load rules, load data (using SQL) from an RDBMS server, and verify in Smart View that the data was loaded.

Before beginning this task flow, complete prerequisites and obtain a valid OCI connection string. See Build Dimensions and Load Data Using SQL for details.

1. After building the dimensions, you will clear data from the cube, and then load the data again from a table. In Oracle Analytics Cloud – Essbase, click Jobs, and click New Job.

2. Select Clear Data as the job type. Select application Sample and database Basic, and click OK.

3. Click OK to confirm that you want to clear data. The job begins. Click the Refresh symbol to watch the status, and when it completes, click Job Details from the Actions menu.

4. Connect to the Sample Basic cube from Smart View, and do an ad hoc analysis.

5. Notice that data was cleared. For example:
Keep the worksheet open. Next, you will create load rules that use SQL to repopulate the Sales data from the table.

6. On the Applications page, expand the Sample application, and select the cube, Basic.

7. From the Actions menu to the right of Basic, launch the inspector, click Scripts, then choose the Rules tab.

8. Click Create > Data Load to begin defining new load rules.

9. In the Name field, enter the name of the rules file as SalesSQLDataload.

10. In the Data Dimension drop-down box, select the Measures dimension.

11. Leave the other options as-is, and click Proceed.

12. In Oracle SQL Developer (or your alternate SQL tool of choice), write and test a SELECT statement selecting some columns from the table SAMPLE_BASIC_TABLE:

   ```sql
   SELECT Product, Year, Scenario, Statename, Sales
   FROM SAMPLE_BASIC_TABLE
   ```

13. Ensure that the SQL query is valid and returns a result in your SQL tool. If the SQL query is valid, it should return the requested table columns, PRODUCT, YEAR, SCENARIO, STATENAME, and SALES, from the database to which your SQL tool is connected:

```
<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>YEAR</th>
<th>SCENARIO</th>
<th>STATENAME</th>
<th>SALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-10</td>
<td>Sep</td>
<td>Actual</td>
<td>Ohio</td>
<td>107</td>
</tr>
<tr>
<td>200-10</td>
<td>Sep</td>
<td>Budget</td>
<td>Ohio</td>
<td>110</td>
</tr>
<tr>
<td>300-10</td>
<td>Oct</td>
<td>Actual</td>
<td>Ohio</td>
<td>107</td>
</tr>
<tr>
<td>400-10</td>
<td>Oct</td>
<td>Budget</td>
<td>Ohio</td>
<td>100</td>
</tr>
<tr>
<td>500-10</td>
<td>Nov</td>
<td>Actual</td>
<td>Ohio</td>
<td>114</td>
</tr>
<tr>
<td>600-10</td>
<td>Nov</td>
<td>Budget</td>
<td>Ohio</td>
<td>110</td>
</tr>
<tr>
<td>700-10</td>
<td>Dec</td>
<td>Actual</td>
<td>Ohio</td>
<td>101</td>
</tr>
<tr>
<td>800-10</td>
<td>Dec</td>
<td>Budget</td>
<td>Ohio</td>
<td>90</td>
</tr>
<tr>
<td>900-10</td>
<td>Jan</td>
<td>Actual</td>
<td>Wisconsin</td>
<td>150</td>
</tr>
<tr>
<td>1000-10</td>
<td>Jan</td>
<td>Budget</td>
<td>Wisconsin</td>
<td>180</td>
</tr>
</tbody>
</table>
```

14. Copy the SQL query to a text file or your clipboard. You will need to use this in an upcoming step. The results of this query are the data you will load into the Sample Basic cube.

15. Note the order of dimensions in your SQL query. The dimensions of the load rule fields must appear in the same order. This means that when you add fields, you should first add the last dimension listed in the SQL query (Sales). Each time you add a new field, it appears in front of the previous one, so when you are finished adding all fields, the dimensional order will match that of the SQL query.
16. In Oracle Analytics Cloud – Essbase, in the New Rule browser tab for your SalesSQLDataload rule, select Sales from the Select drop-down box.

17. Click Create > Regular to create a second load rule field. From the Select drop-down box, select Market (which maps to Statename in your SQL query).

18. Click Create > Regular to continue adding fields, in this order: Scenario, Year, and Product.

Your load rule fields should now be arranged like this:

19. Click the Source button to begin associating a data source with the load rules.

20. In the General tab, enter the valid connection string.

   a. For OCI connections: In the Name field of the General group, enter the valid OCI connection string.

   b. For DSN-less connections, such as Oracle Database, Microsoft SQL Server, and DB2: You must leave the Name field of the General group empty. Instead, enter the connection string in the Server field of the SQL/Datasource Properties group.

21. Click OK.

22. Verify, save, and close the SalesSQLDataload rule.

23. Refresh the list of rules in the Scripts list to ensure that SalesSQLDataload has been added to the list of rules files for the cube Sample Basic, and then close the database inspector.

Next, you will load the data from Jobs.
24. Click **Jobs**, and click **New Job > Load Data**.

25. Enter Sample as the application name, and Basic as the database name.

26. For the script name, select the name of the dimension build rules file you created, SalesSQLDataload.

27. Select **SQL** as the load type.

28. Leave **Connection** blank, unless you already have a saved SQL connection you wish to use.

29. Enter the user name and password of one of your SQL database schema users.

30. Leave **Data File** blank.

31. Click OK to begin the job.

   The data load begins. Click the Refresh symbol to watch the status, and when it completes, click **Job Details** from the Actions menu.

32. Go back to the worksheet in Smart View, and refresh it to verify that the data was loaded from the table.

---

**Build Dimensions and Load Data Using Data Sync**

Data Sync is a data replication tool that you can use to load data into an Essbase cube for analysis in Oracle Analytics Cloud. The following workflows apply when you need to load dimensions and data from Data Sync to Essbase.

**Workflow in Essbase**

Complete following steps in Essbase:

1. Create the Essbase application and cube.

2. Set up dimension load rules files for each dimension, to dictate how the dimensions should be loaded to the Essbase cube. See **Build Dimensions Using Data Sync**.

3. Set up a data load rules file to define how the measures data should be loaded to the Essbase cube. See **Load Data Using Data Sync**.

If you already have appropriate dimension and data load rules you can use, skip the rules file creation steps. Be sure you have uploaded the rules files to Oracle Analytics Cloud – Essbase.

**Workflow in Data Sync**

Complete following steps in Data Sync:
Prepare the dimensions and data as described in Typical Workflow for Loading Data to Oracle Essbase in Preparing Data in Oracle Analytics Cloud. The following is a summary of the workflow:

1. Using manual entry, select Essbase as a target.
2. Write a SQL query in which the columns match the order of the columns defined in the Essbase load rule.

For example, for the Product dimension, if the Essbase rules file lists the order of fields as PRODUCT_NUMBER, PRODUCT_NAME, PRODUCT_TYPE, then the order of selection of columns from your SQL query should be the same:

   select PRODUCT_NUMBER, PRODUCT_NAME, PRODUCT_TYPE from PRODUCTS

3. Define incremental load strategy options.
4. Define more information about the Essbase target. Provide Essbase specific properties in the Target Tables tab under Pluggable Attributes. Give the application and cube name that you are loading to in Essbase. Provide the Load Type (Dimension Build or Data Load), the object name, and the rules file name that you created in Essbase.

5. Summarize the load objects into groups, in the Project Summary tab. In Data Sync, you define a single group for loading data into one Essbase cube, and within that group, you define a sequence of load steps. For example, if you have five dimensions to load, your group will have a defined sequence of five steps.

   Create one group per cube loaded. Ensure that the Dimension Build type data flows happen first, followed by the Data Load type. In addition, all the data flows must be run serially; for example, no two data flows within a group should be run in parallel.

6. Run the job. If the job hangs or an error occurs, restart the Essbase application and run the job again.

Build Dimensions from Data Sync to Essbase

This topic tells you how to create a rules file to build dimensions from Data Sync to Essbase. Create one rules file for each dimension you will load to Essbase.

1. In Essbase, on the Applications home page, expand the application, and select the cube.
2. From the Actions menu in the cube row, launch the inspector, click Scripts, then choose the Rules tab.
3. Click Create > Dimension Build (Regular) to begin defining new load rules (unless you are editing an existing load rule).
4. In the Name field, give a name to the load rule.
5. Add fields to the load rule. For the fields, ensure that you list the columns in same order as you define the columns in the SQL query you write from Data Sync.
6. Do not define any sources. You provide all your connection details from Data Sync.
7. Save and close the load rule. Now you are ready to load a dimension from Data Sync to Essbase.
Load Data Using Data Sync

This topic tells you how to load data from using Data Sync.

1. In Essbase, on the Applications home page, expand the application, and select the cube.
2. Click Scripts, and then choose the Rules Editor tab.
3. Click Create to begin defining new load rules.
4. On the drop-down menu next to Verify, select Data Load.
5. In the Name field of the Properties tab, give a name to the load rule.
6. On the Dimension tab, add a dimension name corresponding to the measures dimension that contains the data you will load into Essbase.
7. On the Fields tab, click Create (do not click the arrow next to Create).
8. For the fields, add the column names. List the columns in the same order as they are presented in the SQL query you write from Data Sync.
9. Skip the Data Source tab. You provide all your connection details from Data Sync.
10. Save and close the load rule. Now you are ready to load data from Data Sync to Essbase.
Calculate Cubes

A cube contains two types of values: values that you enter, called input data, and values that are calculated from input data. A cube can be calculated using one of two methods. Outline calculation, which is the simplest calculation method, bases the calculation of a cube on the relationships between members in the cube outline and on any formulas that are associated with members in the outline. Calculation script calculation lets you procedurally calculate a cube; for example, you can calculate one part of a cube before another, or copy data values between members.

- **Access to Calculations**
- **Create Calculation Scripts**
- **Execute Calculations**
- **Use Substitution Variables**
- **Set Two-Pass Calculation Properties**
- **Tracing Calculations**

### Access to Calculations

If you have the Database Update user role, you have access to run the default calculation on the cube (from Smart View), and to run specific calculation scripts provisioned to you. If you have the Application Manager or Database Manager role, you have Calc privileges and rights to execute all calculations, and to provision access to execute specific calculation scripts.

When creating or editing a calculation script in the Oracle Analytics Cloud – Essbase web interface, you can use the Permissions page within the script editor to provision users to execute the script.

### Create Calculation Scripts

Calculation scripts specify how block storage cubes are calculated and, therefore, override outline-defined cube calculations. For example, you can calculate cube subsets or copy data values between members.

You create calculation scripts using a script editor in the Oracle Analytics Cloud – Essbase web interface.

Calculation scripts do not apply to aggregate storage applications.

1. On the Application page, expand the application.
2. From the Actions menu, to the right of the cube name, launch the inspector.
3. Select the **Scripts** tab, and then select the **Calculation Scripts** tab.
4. Click Add + to create a new calculation script.
5. If member names are required in your calculation script, drill into the **Member Tree** to find the members you want to add.

   Right-click dimension or member names to insert them into the script.

6. If function names are required in your calculation script, use the **Function Name** menu to find calculation functions and add them to the script.

   See the **Function description** under the menu to read descriptions of each function.

7. Click **Validate** before saving your script.

   Validating a script verifies the script syntax. For example, incorrectly spelled function names and omitted end-of-line semicolons are identified. Validation also verifies dimension names and member names.

8. Correct any validation errors.

   Calculation scripts can contain runtime substitution variables designed to derive the calculation scope from the point of view (POV) in a Smart View grid. These types of calculation scripts will not pass validation on the server, because the point of view can only be known from a Smart View grid.

9. Click **Save**.

   To learn about calculation script logic, see Developing Calculation Scripts for Block Storage Databases.

   To learn about calculation functions and commands, see Calculation Functions and Calculation Commands.

---

**Execute Calculations**

After creating and saving calculation scripts, you use the Jobs page to execute them and perform the calculations on data loaded in your cube.

1. Create your calculation script, or upload an existing calculation script.

2. In Oracle Analytics Cloud – Essbase, click **Jobs**.

3. On the **Jobs** page, click **New Job** and select **Run Calculation**.

4. On the **Run Calculation** dialog box, select the application and cube you want to calculate.

5. Select the script you want to use.

6. Click **OK** to start the calculation.

7. Click **Refresh** to see the status of your calculation.

   Calculation scripts can contain runtime substitution variables designed to derive the calculation scope from the point of view (POV) in a Smart View grid. These types of calculation scripts will not execute from the server, because the point of view can only be known from a Smart View grid.

   You can also execute calculation scripts from Smart View (whether or not they contain point-of-view based substitution variables).

**Assign access to execute specific calculation scripts:**

1. Log into the Essbase web interface as a service administrator or power user.

2. On the Applications page, expand an application, and select a cube.
3. From the **Actions** menu, to the right of the cube name, launch the inspector.

4. Select the **Scripts** tab, and then select the **Calculation Scripts** tab.

5. Select a script and select the **Permissions** tab.

6. Add the users or groups to assign them access and save your changes. The users or groups are given permission to execute the specific calculation script.

See also: Create Calculation Scripts.

See also: Upload Files to a Cube.

### Use Substitution Variables

Use **substitution variables** in calculation scripts to store values that might change. Use **runtime substitution variables** when you need different users to specify different values for the same script.

For example, if a variety of your calculation scripts, formulas, filters, report scripts, and MDX scripts all need to refer to the current month, you would not want to search and replace the month approximately every 30 days throughout your library of cube artifacts. Instead, you can define a substitution variable named `CurrMonth`, and change its assigned value each month to the appropriate month. All of the cube artifacts that reference the variable will then reference the appropriate month.

Here is an example of a simple substitution variable to represent the current month:

Variable name: `CurrMonth`  
Value: Jan

Substitution variable values apply to all users who run a calculation script containing the variable. For example, if `CurrMonth` has the value `Jan`, then all scripts containing `&CurrMonth` will execute for `Jan`. The scope of a substitution variable can be:

- global (for all applications and cubes on the server)
- application (for all cubes in the application)
- cube (for a single cube)

To define a substitution variable for a specific cube,

1. In the Oracle Analytics Cloud – Essbase web interface, on the Applications page, expand the application to show the cube you want to modify.
2. From the **Actions** menu to the right of the cube, launch the inspector.
3. Select the **Variables** tab, and click Add ➕.
4. Enter the variable name and value, click **Save**, and click **Close**.

To define a substitution variable for a specific application,

1. On the Applications page, from the Actions menu to the right of the application, launch the inspector.
2. Select the **Variables** tab, and click Add ➕.
3. Enter the variable name and value, click **Save**, and click **Close**.

To define a substitution variable globally,
1. In Oracle Analytics Cloud – Essbase, click **Console**.
2. Click the **Variables** tab, and click **Add**.
3. Enter the variable name and value, and click **Save**.

Once your substitution variable is defined, you can use it in calculation scripts, formulas, filters, MDX scripts, load rules, and reports. To reference the variable, prefix it with the `&` symbol.

Here is an example of a calculation script that references a substitution variable:

```
FIX(&CurrMonth)
   CALC DIM (Measures, Product);
ENDFIX
```

Here is an example of a formula that references a substitution variable:

```
@ISMBR(&CurrMonth)
```

**Runtime substitution variables** enable you to declare variables and their values in the context of a runtime action, such as a calculation script, MaxL script, or MDX query. Runtime substitution variables can be assigned to have numeric values or refer to member names. A default value can be assigned in case a user does not change an input value. Also, for calculation scripts, the variable value can be populated at runtime from the members of a dimension presented on a Smart View grid. For calculation scripts with variable values that populate at runtime, you must launch the calculation script from Smart View, as the variable has no definition outside the context of the grid.

Runtime substitution variables may be defined in the calculation script using key-value pairs:

```
SET RUNTIMESUBVARS
{
   myMarket = "New York";
   salesNum = 100;
   pointD = "Actual"->"Final";
}
```

Or, to define runtime substitution variables with values that change dynamically depending on the POV, assign the definition to POV, and use XML syntax to enable Smart View contextual prompts.

For more information, see
- Using Substitution Variables in *Designing and Maintaining Essbase Cubes*
- Using Runtime Substitution Variables in Calculation Scripts Run in Essbase and Using Runtime Substitution Variables in Calculation Scripts Run in Smart View in *Designing and Maintaining Essbase Cubes*
- The SET RUNTIMESUBVARS calculation command, in *Technical Reference for Oracle Analytics Cloud - Essbase*
- The gallery template Sample_Basic_RTSV, which you can find in Files > Gallery > Technical > Calc.
Set Two-Pass Calculation Properties

The Two-Pass Calculation property indicates which members need to be calculated twice to produce the desired value. To obtain the correct values for two-pass members, the outline is calculated, and then members that are dependent on the calculated values of other members are recalculated.

Even though two-pass calculation is a property that you can give to any non-attribute dimension member, it works only on members of the Accounts dimension and Dynamic Calc members. If two-pass calculation is assigned to any other member, it is ignored.

Two-pass calculations are supported only on block storage cubes. Hybrid mode and aggregate storage cubes use member solve order, instead of two-pass calculation, to control when members are calculated.

1. On the Applications page, expand the application.
2. From the Actions menu, to the right of the cube name, select Outline.
3. Click Edit.
4. In the outline editor, find and select the member you want to modify.
5. In the Properties pane, expand the Two-pass Calculation menu, and select True.

See Setting Two-Pass Calculations.

Trace Calculations

You can use calculation tracing to analyze member formula processing, and refine your calculation scripts.

Calculation tracing enables you to access logged information about a calculation, after the calculation script successfully executes against a cube.

Tracing a calculation does not change anything about calculation behavior. If a calculation is launched in Smart View, and the connected server has calculation tracing enabled by an administrator, Smart View displays a pop-up dialog box containing details, after the calculation runs. The calculation tracing information can be pasted from the pop-up dialog into a text editor. Or, you can find the same information in calc_trace.txt, located in the database files directory on the cloud service.

The calculation tracing information can help you debug calculation script execution, in case the results of the calculation are not what you expected.

Calculation tracing is not supported on applications with scenario management enabled.

To enable calculation tracing, the administrator must first turn on the CALCTRACE application configuration parameter. After calculation tracing is enabled for your application, there are two ways to take advantage of it:

• In Smart View, you can use context-sensitive tracing for a single cell value.
  1. In Smart View, connect a query sheet to the application for which you enabled calculation tracing.
2. Highlight a data cell whose calculated value you would like to trace.

3. In the Data panel of the Essbase tab, click the **Calculate** button and select a calculation script to execute. You will see the point-of-view from your highlighted data cell in the trace member runtime prompts.

4. Click **Launch** to execute the calculation script. The full scope of the calculation as contained in the script will be calculated, but only the highlighted data cell context will be traced during the calculation.

5. At the end of the calculation script, examine the **Calculation Result** dialog box, which shows the pre- and post-calculation results for your highlighted data cell.
   If the highlighted data cell was not modified during the calculation, you will see a message indicating that the cell was not modified.

   - In calculation scripts, you can use the **SET TRACE** calculation command to select data intersections to trace. **SET TRACE** enables you to trace multiple data cells. Additionally, you can trace sections of calculation scripts by using a combination of **SET TRACE mbrList** (to turn calculation tracing on over a member list) and **SET TRACE OFF** (to disable calculation tracing until a new **SET TRACE** is encountered in the script. To use **SET TRACE** command, you must execute the calculation script outside of Smart View, using Cube Designer or the Jobs page of the cloud service.

```plaintext
SET TRACE ("100-10", "California", "Jan", "Sales", "Budget");
FIX("California", "Budget")
  "Sales" (   
    "100-10" = @MEMBER(@CONCATENATE(@NAME(@PARENT("Product")), 
      "-20")) / 10;
  );
ENDFIX;
```

Sample Basic has two sparse dimensions: Product and Market. The member formula is on Sales, a member of Measures, which is a dense dimension. The FIX statement's member list only contains one sparse member, California, which belongs to the Market dimension.

The number of existing blocks in the FIX statement determines the number of times the traced cell is calculated. In this example, the calculation cycles through all existing sparse member combinations of California. Each of these combinations represents a block.

After the calculation completes, the following tracing information is logged and displayed:

```
Tracing cell: [100-10][California][Jan][Sales][Budget]  (Cell update count: 1)
Previous value: 840.00
Dependent values:
  [100-20][California][Jan][Sales][Budget] = 140.00
New value: [100-10][California][Jan][Sales][Budget] = 14.00

Computed in lines: [91 - 93] using:
"Sales{"  
  "100-10"=@MEMBER(@CONCATENATE(@NAME(@PARENT("Product")),"-20"))/10;
}
```
The calculation tracing log provides the following insights about how the calculation worked, on the cell that was traced:

- The traced cell was calculated several times, and the cell value was overwritten each time with the new value (the reported cell update count stops at 8).
- The value of the cell, before calculation, was 840.00.
- For each calculation occurrence, dependent values and new values are shown. Dependent values come from the member formula in the FIX statement.
- The final value of the traced cell, after all calculation completes, is 9, but it represents the value of product "400-20"->California divided by 10.
• Lines 91-93 of the calculation script, containing a member formula on Sales, are responsible for the updated values.

For each of the blocks cycled through, Sales is calculated using the formula:

"100-10"=\@MEMBER(\@CONCATENATE(\@NAME(\@PARENT("Product")),"-20"))/10

The formula contains a sparse member on the left hand side, which could cause the actual calculation block to be different than the initial FIX block. For example, when the calculation cycles through "California"->"100-20", the calculations are actually done in "California"->"100-10".

The trace log entries entitled Block from FIX scope and Actual block used in calculation are only printed if there is a discrepancy between the blocks in the FIX statement and the block that is represented in the member formula. These log entries can provide indications as to why there are duplicate calculations, helping you to debug your calculation scripts.

Calculate Selected Tuples

By selecting tuples, you can focus your calculations in the active Smart View grid, limiting their scope to specific slices of data in your cube. Tuple selection helps you optimize asymmetric grid calculations across dimensions, avoiding over-calculation.

Essbase calculation tuples differ from tuples used in MDX queries. Calculation performance and cube size are mainly driven by the number of blocks in the database (given a specific block size). For this reason, calculation tuples are specified only for sparse member combinations. In addition, for ease of calculation scripting, multiple members from a single sparse dimension can be included in a calculation tuple specification. For example, if you specify ("New York", "California", "Actual", "Cola") as a calculation tuple, then you calculate the following cell intersections:

"New York"->"Actual"->"Cola"
"California"->"Actual"->"Cola"

Consider the following symmetric grid. It is symmetrical because each product has the same markets and scenario (Actual) represented in the grid.
The following grid is asymmetric, because the Diet Cola product has fewer markets in the grid than the Cola product has.

<table>
<thead>
<tr>
<th></th>
<th>Profit</th>
<th>Inventory</th>
<th>Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Actual</td>
<td>Actual</td>
</tr>
<tr>
<td></td>
<td>Jan</td>
<td>Jan</td>
<td>Jan</td>
</tr>
<tr>
<td>Cola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet Cola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The default calculation scope, when more than one dimension is in a FIX statement or a Smart View grid point of view (POV), is to calculate the cross product (all possible combinations) of the members in the FIX or grid. In other words, a POV-driven calculation in which product and market combinations are taken from the grid calculates all of these row-member combinations:

Cola->"New York"
Cola->"Massachusetts"
Cola->"Florida"
Cola->"Connecticut"
Cola->"New Hampshire"
"Diet Cola"->"New York"
"Diet Cola"->"Massachusetts"
"Diet Cola"->"Florida"
"Diet Cola"->"Connecticut"
"Diet Cola"->"New Hampshire"

This may be more calculation activity than you need. If you want to calculate only the combinations shown on the grid, you can specify which tuples to calculate, and limit the calculation to a smaller slice. Calculating tuples can also lower calculation time and cube size.

Cola->"New York"
Cola->"Massachusetts"
Cola->"Florida"
Cola->"Connecticut"
Cola->"New Hampshire"
"Diet Cola"->"New York"
"Diet Cola"->"Florida"

**Tuple-Based Calculation**

A calculation **tuple** is a way to represent a data slice of members, from two or more sparse dimensions, to be used in a calculation.

Examples of valid calculation tuples:

- ("Diet Cola", "New York")
If you write MDX expressions, you might be aware of these tuple restrictions that apply to MDX:

- Only a single member from each dimension can be included in an MDX tuple
- All tuples in an MDX set must have the same dimensions represented, in the same order

However, when you select tuples in calculation scripts, these requirements are relaxed for convenience. You may freely write tuple expressions, and the tuples may describe member lists, as the following tuple does: (@Children(East), Cola).

Select Tuples for Point of View Calculation

An easy way to select tuples is to insert them explicitly into a calculation script, as a list inside the FIX statement.

Recall that the format of a FIX statement is as follows:

```plaintext
FIX (fixMbrs)
COMMANDS ;
ENDFIX
```

In the FIX statement below, two tuples are specified before the command block begins. The tuples are enclosed within the curly braces {} that delimit a set, which is a collection of tuples.

```plaintext
FIX({
    (@Children(East), Cola),
    ("New York", Florida, "Diet Cola")
})
Sales (Sales = Sales + 10;);
ENDFIX
```

Another way to select tuples is contextually, based on whichever members are present in a Smart View grid POV at calculation run time. You do this by providing the `@GRIDTUPLES` function as an argument to FIX, in your calculation script.

```plaintext
FIX({@GRIDTUPLES(Product, Market)})
Sales (Sales = Sales + 10;);
ENDFIX
```

If you execute this calculation script from Smart View against the grid below, then only the displayed combinations of products and markets are calculated. For example, "Diet Cola"->Massachusetts is not calculated, as it is not shown explicitly on the grid. Note that all scenarios (the third sparse dimension in this sample cube) are calculated, even though only Actual is shown on the grid. This is because the Scenario dimension is not part of the GRIDTUPLES statement in the calculation script.
Tuple selection, whether done using explicit lists of tuples or by using the @GRIDTUPLES function, is applicable only in the context of the FIX...ENDFIX calculation command. The syntax of the FIX statement is expanded to enable tuple selection:

```
FIX ({{ tupleList | @GRIDTUPLES(dimensionList) }},] fixMbrs)
COMMANDS ;
ENDFIX
```

- `tupleList` - comma-separated set of tuples.
- `dimensionList` - at least two sparse dimensions whose members from the active Smart View grid are used to define the calculation regions. (In calculation scripts, you can use only sparse dimensions to define tuples.)
- `fixMbrs` - a member or list of members.

Examples of Tuple Selection to Reduce Calculation Scope

Using a Smart View grid and a calculation script FIX statement, you can calculate selected member tuples based on the grid point of view (POV). Alternatively, you can explicitly type the tuple combinations in your FIX statement, removing the dependency on a particular Smart View grid to define the calculation scope.

Calculating selected tuples helps you efficiently work with asymmetric regions in both calculation scripts and Smart View grids.

Consider the following examples:

- **No Tuple Selection** - Calculates in the default manner, based on current Smart View grid point-of-view (POV). The calculation is not limited to any specific tuples.
- **Selection of Named Sparse Dimensions** - Calculates tuples from two or more sparse dimensions named in a calculation script. The calculation is limited to members from the tuple dimensions that are present in the Smart View grid.
- **Selection of Contextual Sparse Dimensions** - Calculates tuples from sparse dimensions selected at run-time. The calculation is limited to members from the tuple dimensions present in the Smart View grid.

To try the examples, download the CalcTuple_Tuple.xlsx workbook template from the Technical > Calc section of the gallery folder in the Files area of the Oracle Analytics Cloud – Essbase web interface. Refer to the README worksheet in the workbook for instructions.
No Tuple Selection

Demonstrating the default calculation behavior that occurs when you do not select tuples, the following calculation script calculates the entire cross-product of Product and Market dimension members from a Smart View grid.

With the help of two runtime substitution variables (RTSV) defined in the SET RUNTIMESUBVARS block, calculation is limited to whichever Product and Market points of view are present in the grid when the calculation is run from Smart View.

```
SET RUNTIMESUBVARS
{
  ProductGridMembers = POV
  <RTSV_HINT><svLaunch>
  <description>All Product's members on the grid</description>
  <type>member</type>
  <dimension>Product</dimension><choice>multiple</choice>
  </svLaunch></RTSV_HINT>;
  MarketGridMembers = POV
  <RTSV_HINT><svLaunch>
  <description>All Market's members on the grid</description>
  <type>member</type> <dimension>Market</dimension><choice>multiple</choice>
  </svLaunch></RTSV_HINT>;
};
FIX {
  &ProductGridMembers, &MarketGridMembers
}
Marketing{
  Marketing = Marketing + 1;
}
ENDFIX
```

Selection of Named Sparse Dimensions

Using the @GRIDTUPLES function to select the tuple of Product and Market dimensions, this calculation script calculates tuples for only those two dimensions, limiting its scope to those members present in a Smart View grid at the time the calculation is executed from Smart View.

```
FIX {
  @GRIDTUPLES(Product, Market)}
Marketing{
  Marketing = Marketing + 1;
}
ENDFIX
```

By fixing on only the sparse dimensions named in the tuple, the calculation encompasses a much smaller number of blocks than a default calculation would. However, all members from dimensions not mentioned in the fix (Year, Scenario) are calculated by this calculation script.
Selection of Contextual Sparse Dimensions

Using the @GRIDTUPLES function and a runtime substitution variable, this calculation script calculates only selected tuples from the grid, based on the sparse dimension selections in the RTSV prompt.

The runtime substitution variable &DimSelections, which is defined in the SET RUNTIMESUBVARS block, limits the calculation scope to only the sparse dimensions of the cube, excluding Scenario. The @GRIDTUPLES function used in the FIX statement calls this variable, limiting how many intersections are calculated.

```plaintext
SET RUNTIMESUBVARS
{
}

FIX {
    @GRIDTUPLES(&DimSelections)
}
Marketing(
    Marketing = Marketing + 1;
);
ENDFIX
```

The calculation encompasses an even smaller number of blocks than the previous example, because in this case, the tuple definition extends to more sparse dimensions beyond Product->Market.

To try the examples, download the CalcTuple_Tuple.xlsx workbook template from the Technical > Calc section of the gallery folder in the Files area of the Oracle Analytics Cloud – Essbase web interface. Refer to the README worksheet in the workbook for instructions.
10

Model Data in Private Scenarios

Using scenario management, scenario participants can perform what-if analysis to model data in their own private work areas. These scenarios can optionally be subject to an approval workflow which includes a scenario owner and one or more approvers. In the workflow, scenario owners merge scenario data with the final cube data only after it is approved.

- Understand Scenarios
- Scenario Workflow
- Enable Scenario Modeling
- Work with Scenarios

Understand Scenarios

Scenarios are private work areas in which users can model different assumptions within the data and see the effect on aggregated results, without affecting the existing data. Each scenario is a virtual slice of a cube in which one or more users can model data and then commit or discard the changes.

Scenario-enabled cubes have a special dimension called Sandbox. The sandbox dimension is flat, with one member called Base and up to 1000 other members, commonly referred to as sandbox members. All members in the sandbox dimension are level-0. Sandbox members are named sb0, sb1, and so on. Each sandbox is a separate work area, whereas the Base holds the data currently contained in the cube.

<table>
<thead>
<tr>
<th>Sandbox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
</tr>
<tr>
<td>sb0</td>
</tr>
<tr>
<td>sb1</td>
</tr>
<tr>
<td>sb2</td>
</tr>
</tbody>
</table>

Base data is the starting point before you use the sandbox to model possible changes. Sandbox data (also known as scenario data) is not committed unless the scenario owner applies it, at which point it overwrites the Base data.

When first created, sandbox member intersections are all virtual and have no physical storage. The physical data from the cube is stored in the Base member slice. Querying any of the other sandbox members dynamically reflects the values stored in the Base.

Only after you update any of the values in a sandbox are your changes stored physically in the sandbox. After you update some values in a sandbox member, queries against the sandbox reflect a mixture of stored sandbox values and values inherited dynamically from the Base.

Changes made in a sandbox are not committed to the Base until you do so explicitly, generally after an approval workflow. See Understand Scenario User Roles and Workflow.
After you’re finished with the sandbox, you can put the sandbox through the approval workflow, or you can skip the workflow and commit the updated values to the Base, or reject and discard the sandbox changes.

You must enable hybrid aggregation for scenario management to work. For queries, it is enabled by default. Do not disable it. For calculations, you need to enable the HYBRIDBSOINCALCSCRIPT application configuration. See HYBRIDBSOINCALCSCRIPT in Technical Reference for Oracle Analytics Cloud - Essbase.

Security and filters apply to the Sandbox dimension.

Scenario enabled cubes have a CellProperties dimension that you should ignore, as it is for internal processes. You do not need to modify it nor account for it in calculations, queries, or load rules, and it shouldn’t be included in any calculations or other operations.

View and Work With Scenario Data

There are two entry points for viewing and working with scenario data in Smart View.

You can launch a scenario in Smart View from the Essbase web interface, or you can use a Smart View private connection and work with the scenario data that way.

View and Work With Scenario Data From the Essbase Web Interface

You can launch Smart View from a scenario in the web interface. When you do this, because you enter from the scenario, you can only work in Smart View in the sandbox member associated with the scenario from which you entered. The sandbox member is implicit. You do not see it in the Smart View grid.

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. Click the Excel icon next to the scenario you want to view.
3. Select to open the file.
4. This launches Excel with a Smart View connection to the scenario.

When you do this, the slice of data for that specific scenario is in the worksheet. You can submit data only to that scenario (When you submit data to a scenario, you are submitting data to one sandbox member).

You can launch a scenario in Smart View from the web interface only on Windows using Firefox, Internet Explorer, or Chrome browsers.

View and Work With Scenario Data From a Smart View Private Connection

You can open Excel and make a private connection to your cube, without starting from the web interface.

When you do this, the sandbox dimension will be in the worksheet, so you can submit data to any sandbox member to which you have access. This is helpful when you are a participant in more than one scenario, but you must explicitly know which sandbox you want to work in.

To see which sandbox member is associated with a scenario, click on the scenario name, and view the General Information tab.
1. Open Excel.
2. Make a private connection to your scenario-enabled cube. See Access the Cloud Service from Smart View.
3. Do an ad hoc analysis.
4. Drill into the Sandbox dimension to view the sandbox members.

Examples

This is a Smart View grid including the Base member and a sandbox member. Sandbox values have not been updated, so they reflect the Base values. Those values are stored only in the Base, not in the sandbox members:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Base</th>
<th>sb10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cola</td>
<td>New York</td>
<td>Actual</td>
<td>Jan</td>
<td>Sales</td>
</tr>
<tr>
<td>Cola</td>
<td>New York</td>
<td>Actual</td>
<td>Jan</td>
<td>COGS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>678</td>
<td>678</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>271</td>
<td>271</td>
</tr>
</tbody>
</table>

The changed sandbox value, 500, is stored in a sandbox member. The remaining sandbox value, 271 that was not updated is stored only in the Base:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Base</th>
<th>sb10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cola</td>
<td>New York</td>
<td>Actual</td>
<td>Jan</td>
<td>Sales</td>
</tr>
<tr>
<td>Cola</td>
<td>New York</td>
<td>Actual</td>
<td>Jan</td>
<td>COGS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>678</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>271</td>
<td>271</td>
</tr>
</tbody>
</table>

This is a grid with multiple sandbox members. If you have the Database Update user role, you can create or work within multiple scenarios simultaneously:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>New York</td>
<td>Cola</td>
<td>678</td>
</tr>
<tr>
<td>Actual</td>
<td>Jan</td>
<td>COGS</td>
<td>New York</td>
<td>Cola</td>
<td>271</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>600</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>271</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>271</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>271</td>
</tr>
</tbody>
</table>

Understand Scenario Calculations

By default, Oracle Analytics Cloud – Essbase calculates all members from a dimension unless a fix statement is used to limit the scope of the calculation to a specific member or group of members from the dimension.

The sandbox dimension is an exception to this behavior; if members from the sandbox dimension are not included in the fix for a calculation, only the base member from the sandbox dimension is calculated by default. To calculate non-base members from the sandbox dimension, include them in the fix statement, optionally along with the base member.

When specifying non-base sandbox members in a fix statement, base is excluded unless explicitly included in the fix.

This behavior is different from calculations on non-sandbox dimensions excluded from the fix, which include all dimension members in their scope. Sandbox dimensions are
calculated differently, as the intent is usually to calculate either Base or specific sandboxes at a given time. Essbase calculates the Base member values, rather than the working sandbox values, except:

- When the calculation fixes on particular sandbox members.
- When the calculation is executed from a sheet launched from a scenario in the web interface. See View and Work With Scenario Data From the Essbase Web Interface.

If you execute a calculation script from a scenario-launched sheet, the calculation runs in the sandbox associated with the scenario as long as no sandbox is explicitly mentioned in the script. If you intend to calculate in your scenario's sandbox, you should not fix on a sandbox in your script.

**Understand Scenario Limitations**

These limitations apply to scenarios and sandbox dimensions.

- Scenarios are not supported on aggregate storage cubes.
- The DATAEXPORT calculation command isn't supported on sandbox members. It is only supported on the Base member.
- When you connect to a scenario from a scenario-launched sheet, MDX queries, MDX inserts, and MDX exports will work with the base instead of working with the sandbox for that scenario.
- Runtime substitution variables with the svLaunch parameter are not supported when you launch the scenario in Smart View from the web interface. See View and Work With Scenario Data From the Essbase Web Interface.

Runtime substitution variables with the svLaunch parameter work correctly when you connect to the scenario directly from a private connection. This is because the sandbox member is included in the sheet.

There are functions that are not supported in hybrid aggregation mode, which is used with scenario-enabled cubes. See Functions Supported in Hybrid Aggregation Mode in Technical Reference for Oracle Analytics Cloud - Essbase.

**Scenario Workflow**

You can review a scenario using an optional approval workflow. Alternatively, when working with a scenario, you can change data values in the scenario and commit data changes to the cube (or reject them), without going through an approval process.

You must have at least one approver to enable the scenario workflow. Without an approver, participants do not have the option to submit the scenario for approval, for example, and there is no option to approve or reject the scenario. The only action for scenarios without at least one approver is Apply.

- Enable Email Notifications for Scenario Status Changes
- Create a Scenario
- Model Data
- Submit a Scenario for Approval
- Approve or Reject Scenario Changes
Enable Email Notifications for Scenario Status Changes

If the system administrator has enabled outgoing emails from Oracle Analytics Cloud – Essbase, then the appropriate scenario participants receive email notifications for scenario changes.

To set up SMTP email notifications:

1. Log in to Oracle Analytics Cloud – Essbase as a system administrator.
2. Click Console.
3. Select Email Configuration.
4. Select the SMTP Configuration tab. SMTP controls outgoing email.
5. Enter your company’s SMTP host and port.
6. Enter your company email address and password.
7. Click Save.

When SMTP mail is set up, scenario participants begin receiving emails when their scenarios change status, ownership, priority, or due date.

When users are added to the system, email is an optional field. If it has not been filled out, then that user cannot receive emails even if they participate in scenarios.

<table>
<thead>
<tr>
<th>Scenario State</th>
<th>Email to</th>
<th>Email Cc</th>
<th>Email Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create scenario</td>
<td>Participant, approver</td>
<td>Owner</td>
<td>You are invited to participate in scenario &lt;scenario name&gt;</td>
</tr>
<tr>
<td>Submit</td>
<td>Approver</td>
<td>Owner, participant</td>
<td>Scenario &lt;scenario name&gt; is submitted for approval</td>
</tr>
<tr>
<td>Approve</td>
<td>Owner</td>
<td>Participant, approver</td>
<td>Scenario &lt;scenario name&gt; is approved</td>
</tr>
<tr>
<td>Reject</td>
<td>Owner</td>
<td>Participant, approver</td>
<td>Scenario &lt;scenario name&gt; is rejected by &lt;user&gt;</td>
</tr>
<tr>
<td>Apply</td>
<td>Participant</td>
<td>Owner, approver</td>
<td>Scenario &lt;scenario name&gt; is updated</td>
</tr>
<tr>
<td>Delete</td>
<td>Participant, approver, owner</td>
<td>Deleting user</td>
<td>Scenario &lt;scenario name&gt; is deleted</td>
</tr>
<tr>
<td>Update action</td>
<td>Participant, approver</td>
<td>Owner</td>
<td>Scenario &lt;scenario name&gt; is updated</td>
</tr>
</tbody>
</table>

An existing scenario can be updated (see Update action in the table) to change the owner, the priority, or the due date. If, for example, the scenario’s due date is changed, then the participants will receive an email indicating the new due date.
old due date will appear in strike through text, so that it is clear what information about the scenario was updated.

Create a Scenario

To create a scenario, you specify general information about your scenario, including creating a scenario name, selecting a due date, selecting an application and cube, and choosing whether to use calculated values. Then you add users and define whether each user is a participant or an approver.

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. Click Create Scenario.
3. On the General Information tab, enter a scenario name and select a Priority (optional), Due Date, Application, and Database (cube).
4. Turn on Use Calculated Values if you want to merge calculated values to base values when running calculation scripts on scenarios.
5. (Optional) Enter a description.
6. On the Users tab, click Add for a list of users.
7. Add the users that you want.
8. Close the Add Users dialog box.
9. For each user, keep the default (Participant), or select Approver.
   Scenario user roles determine the workflow for the scenario.
10. Save your changes.

See also: Understand Scenario User Roles and Workflow.

Model Data

As a scenario user, you can model data slices in your own scenario.

1. In Oracle Analytics Cloud – Essbase, click Scenario.
2. On the Scenarios page, locate the scenario in which you want to model data.
   • You can search for the scenario by name in the Search field.
   • You can select your application from the All Applications drop-down list and search within that application.
   • After selecting the application, you can further narrow your search by selecting the database (cube) from the All Databases drop-down list and searching within that specific cube.
3. Start Smart View by clicking the Excel icon before the scenario name.
4. Make data changes and perform your what-if analysis in Smart View.
   If you change and submit values and decide you want to go back to the base values, you can revert to the base by typing #Revert in the changed cells and choosing Submit Data on the Smart View Essbase ribbon.
   If a cell in the base has a value, and you want the corresponding cell in the scenario to be #Missing, you can send #Missing to the scenario or you can delete
the value in Smart View and select **Submit Data** on the Smart View Essbase ribbon.

5. Continue this process until you’re ready to submit data for approval.

If a calculation has been run on a sandbox and the changes are not acceptable, request from your application designer a calc script to revert the changes, or request a new sandbox.

### Submit a Scenario for Approval

After you submit a scenario for approval, no one will be able to write to that scenario.

1. In Oracle Analytics Cloud – Essbase, click **Scenarios**.
2. Click the **Submit** ➔ arrow under **Actions**.
3. (Optional) Enter a comment.
4. Click **OK**.

After a scenario is submitted for approval, the scenario approver can approve or reject the data changes.

### Approve or Reject Scenario Changes

After the owner of the scenario submits for approval, the approver has the option to approve or reject scenario changes, and the scenario owner is notified of the action. You must be logged in as an approver to have the options to approve or reject a scenario.

1. In Oracle Analytics Cloud – Essbase, click **Scenarios**.
2. Next to the submitted scenario, under **Actions**, click **Approve** or **Reject**.
3. Enter a comment on the Approve or Reject dialog box.

After a scenario is approved, the scenario owner can apply the changes to the cube.

### Apply or Discard Data Changes

When you apply data changes, the changes stored within the scenario overwrite the base data.

You can apply or discard changes from the Scenario page.

1. In Oracle Analytics Cloud – Essbase, click **Scenarios**.
2. Next to the approved scenario, under **Actions**, click **Apply** or **Discard**.
3. When prompted, confirm your selection.

- You can also apply data changes using the DATAMERGE calculation command. See *Technical Reference for Oracle Analytics Cloud - Essbase*
- After a scenario is applied or discarded, you can delete the scenario to reuse the sandbox for that scenario.
- Database managers and higher can execute a calculation script to perform a DATAMERGE. They do not need to be designated as scenario approvers in order to do so.
• After a scenario is applied, it can be re-applied, but it cannot be changed.

Delete the Scenario

Since there are a fixed number of available sandboxes in a cube, you may need to free up sandboxes from inactive scenarios. After the associated scenario is deleted, the sandbox is empty and is automatically returned to the pool of available sandboxes.

To reuse a sandbox associated with a scenario, you need to delete the scenario.

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. Click the Actions menu for the scenario you want to delete, and click Delete.

Understand Scenario User Roles and Workflow

You can review a scenario using an optional approval workflow.

Scenario user role assignments determine the workflow for scenarios. You must have at least one approver to enable the scenario workflow. Without an approver, participants do not have the option to submit the scenario for approval, for example, and there is no option to approve or reject the scenario.

The only action for scenarios without at least one approver is Apply. Without an approver, the scenario owner can still change data values in the scenario and apply data changes to the cube (or reject them), without going through an approval process.

Participants can participate in a what-if analysis. They must have Database Update or Database Access user role. Adding participants is not mandatory.

Approvers monitor the process, and approve or reject scenarios. They must have Database Access or higher role. Scenarios can have multiple approvers, in which case each one must approve the scenario before it can be submitted.

Participants and approvers with the Database Access user role cannot write to a scenario until they are granted write access through a filter.

Participants and approvers are not mandatory. The scenario owner can change data values in the scenario and commit data changes to the cube (or reject them) without designating participants or approvers.
Enable Scenario Modeling

Enabling scenario modeling as part of the cube creation process is as easy as selecting a check box in the user interface or populating the right fields in an application workbook.

You can create or enable a cube for scenario modeling using one of the following methods:

- Create a Scenario-Enabled Cube
- Create a Scenario-Enabled Sample Cube
- Enable an Existing Cube for Scenario Management

Data Audit Trail is not supported on scenario-enabled cubes.
Create a Scenario-Enabled Cube

Scenario-enabled cubes have specialized dimensions required to use scenario management. These include the Sandbox dimension and the CellProperties dimension. CellProperties is considered a hidden dimension in that you do not need to interact with it in any way when performing Essbase tasks such as building cubes, loading data, or calculating cubes.

1. On the Applications home page, click Create Application.
2. On the Create Application dialog box, enter an Application Name and a Database Name (cube name) and expand Advanced Options.
3. Ensure that in Database Type, Block Storage (BSO) is selected.
4. Select Enable Scenarios.
5. Click OK.

Create a Scenario-Enabled Sample Cube

You can create a scenario-enabled cube by importing the scenario-enabled sample application workbook.

1. In Oracle Analytics Cloud – Essbase, click Files.
2. Drill down into the Gallery, Cubes, and General folders.
3. Select Sample_Basic_Scenario.xlsx.
4. From the Actions menu, select Download and save the file to a local drive.
5. Return to the applications home page and select Import.
6. Browse to the Sample_Basic_Scenario.xlsx file and select Open.
7. In the Import dialog box select the options that you want.
   You can select View Dimensions to see the dimensions that will be created.

Enable an Existing Cube for Scenario Management

If you have the application manager role, you can enable an existing cube to use scenario modeling. It is best to do so on a copy of the original cube. Existing scripts, rules, and queries will work as before, on the base member. If you need to run them on a sandbox member, you can run them from a scenario-launched sheet.

A scenario launched sheet is an Excel sheet launched from a scenario in the web interface. See View and Work With Scenario Data From the Essbase Web Interface.

1. On the Applications page, expand the application.
2. Click the Actions menu to the right of the cube name and select Inspect.
3. On the General tab, for Scenarios, click Not Enabled.
4. Adjust the number of scenarios members (non-base sandbox members) you want to create and click Ok.
Create Additional Sandbox Members

By default, a new scenario has 100 sandbox members. You can create additional sandbox members (up to 1000).

1. On the Applications page, expand the application.
2. Click the Actions menu to the right of the cube name, and select Inspect.
3. On the General tab, click the plus sign next to Scenarios.
4. Enter the number of sandbox members you want to create.
5. Click OK.

Work with Scenarios

After you create a scenario-enabled cube, you can create scenarios and follow a workflow that includes modeling data, approving or rejecting changes, applying or discarding changes, and submitting the scenario for approval.

- View Base Member Data
- Compare Scenario Values to Base Values
- Revert Scenario Values Back to Base Values
- Set Scenario Cells to #Missing

View Base Member Data

From the web user interface, you can launch an Excel sheet showing base data for a scenario.

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. Click the Actions menu for the scenario you want to view, and click Show Base Data.
3. Click OK to launch Smart View.

The Excel sheet that is launched shows base data for the cube. It does not show sandbox data.
Compare Scenario Values to Base Values

If you are the owner, approver or participant for a given scenario, you can view scenario and base values in a spreadsheet or in the web user interface to compare models.

Compare Values in Excel

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. From the Actions menu, select Show Changes in Excel.
3. Click OK to open the Smart View link.
4. You can view values for both the scenario and base members in the spreadsheet.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Base</td>
<td>sb10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cola</td>
<td>New Yo Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>678</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cola</td>
<td>Massac Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>494</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cola</td>
<td>Florida Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>210</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cola</td>
<td>Connec Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>310</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Cola</td>
<td>New Hi Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>120</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cola</td>
<td>East</td>
<td>Actual</td>
<td>Jan</td>
<td>Sales</td>
<td>1812</td>
<td>1950</td>
</tr>
</tbody>
</table>

- On row 1, sb10 is the scenario (or sandbox) member.
- Also on row 1, Base shows the base values.
- In the scenario, values for sb10 on rows 2 through 6 have been changed, and you can see the aggregated result in row 7.

Compare Values in the Web User Interface

1. In Oracle Analytics Cloud – Essbase, click Scenarios.
2. From the Actions menu, select Show Changes.

The Data Changes dialog box is empty if no data changes have been made.

Compare the scenario to the base in order to determine your next steps. For example, you might choose to change the status of the scenario to approved based on this information.

Revert Scenario Values Back to Base Values

Initially, scenario values are not stored and they are an exact mirror of the base values. After you change the scenario values in Excel and submit the changes to the cube, the scenario values are stored, and they are different from the base. You can revert the scenario values back to the base by typing #Revert in the changed cells and clicking Submit Data on the Smart View ribbon.

To revert scenario values back to the base:

1. In Excel, type #Revert in the scenario cells you want to revert to the base.
2. Click Submit Data on the Smart View ribbon.

The selected scenario values are updated to the base values.
Example

1. Initially, the value in sb1 is an exact mirror of the value in base.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>678</td>
</tr>
<tr>
<td>Jan</td>
<td>678</td>
<td>100</td>
</tr>
</tbody>
</table>

2. Submit a new value, 100, to sb1.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>100</td>
</tr>
</tbody>
</table>

3. Submit #Revert to sb1.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>#Revert</td>
</tr>
</tbody>
</table>

4. Refresh the sheet. See that sb1 again reflects the base value of 678.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>678</td>
</tr>
</tbody>
</table>

Set Scenario Cells to #Missing

You can set scenario cells to #Missing even if the corresponding base cells have values.

To set a scenario cell to #Missing:

1. Type #Missing in the cell or delete the cell contents.
2. Select Submit Data on the Smart View ribbon.

Example

1. Initially, the value in sb1 is an exact mirror of the value in the base.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>678</td>
</tr>
</tbody>
</table>

2. Enter #Missing in sb1 (or delete the cell contents) and submit data.

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>678</td>
<td>#Missing</td>
</tr>
</tbody>
</table>
3. Refresh the sheet. See that sb1 is #Missing.

<table>
<thead>
<tr>
<th>Base</th>
<th>sb1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>Jan</td>
</tr>
<tr>
<td>100-10</td>
<td>New York Sales</td>
</tr>
</tbody>
</table>
Work with Cubes in Cube Designer

You can create or modify application workbooks and then deploy cubes to Oracle Analytics Cloud - Essbase using Cube Designer, a Smart View extension.

- About Cube Designer
- About the Cube Designer Ribbon
- About the Designer Panel
- Manage Files in Cube Designer
- Download Sample Application Workbooks from the Cloud
- Build a Private Inventory of Application Workbooks
- Work with Application Workbooks in Cube Designer
- Create a Cube from Tabular Data in Cube Designer
- Update Cubes Incrementally in Cube Designer
- Create and Validate Member Formulas in Cube Designer
- Load Data in Cube Designer
- Calculate Data in Cube Designer
- Work with Jobs in Cube Designer
- View Dimension Hierarchies in Cube Designer
- Export Cubes to Application Workbooks in Cube Designer
- Delete Applications and Cubes in Cube Designer
- View Logs in Cube Designer

About Cube Designer

The basic components of Cube Designer are the Cube Designer ribbon and the Designer Panel. See About the Cube Designer Ribbon and About the Designer Panel.

About the Cube Designer Ribbon

Cube Designer helps you to design, create and modify application workbooks to meet their strict layout and syntax requirements. You can also use options on the Cube Designer ribbon to perform a number of cube management tasks, such as loading data, editing formulas and viewing jobs.
Cube Designer Ribbon Options

- **Connections**: Opens the Connections dialog box, in which you choose the cloud service URL.
- **Cloud**: Opens the Cloud Files dialog box, which contains a selection of prebuilt application workbooks, from which you can build sample applications and cubes. Also, a catalog toolbar is available in this dialog box from which that you can perform many file operations within the catalog, such as upload, download, cut, copy, paste, delete, rename, and create a new folder.
- **Local**: Provides a drop-down menu with options to open or save an application workbook locally, or to export a cube to an application workbook.
- **Designer Panel**: Opens the Designer Panel, a series of panels in which you can design and edit application workbooks.
- **Formula Editor**: Opens the Formula Editor, which provides an interface in which to develop member formulas, with assistance for developing correct syntax.
- **Hierarchy Viewer**: Opens the Dimension Hierarchy dialog box, in which you can view the hierarchy for the selected dimension worksheet in an application workbook, and perform tasks, such as renaming members and changing storage settings. See Work with Dimension Worksheets in Cube Designer.
- **Build Cube**: Opens the Build Cube dialog box, where you can build a cube from the active application workbook. In this dialog box, cube designer automatically detects existing data and calculation worksheets, and then pre-selects options to load the data and run the worksheets.
- **Load Data**: Opens the Load Data dialog box, which contains options to clear all data and to load data.
- **Calculate**: Opens the Calculate Data dialog box, in which you can select an application, a cube, and a calculation script to execute.
- **Analyze**: Provides a drop-down menu with options to create a Smart View ad hoc grid, or connect application workbook query worksheets (Query.query_name worksheets) to Smart View.
- **View Jobs**: Opens the Job Viewer dialog box, in which you can monitor the status of jobs, such as data loads, calculations, imports, and exports.
- **Transform Data**: Opens the Transform Data dialog box, which lets you build a cube from tabular data.
- **Options**: Provides options to specify the default working folder and to activate the cube designer log.
- **Admin Tasks**: Opens a menu from which you can delete an application, delete a cube, or view logs. Selecting one of these options opens the Delete Application or Delete Cube dialog box, or allows you to view server or application logs.
- **Server name**: Shows the currently defined connection location. When you click **Server name** and log in (if prompted to do so), the server name and the client and server versions are displayed.

### About the Designer Panel

The Designer Panel uses a manual system of reading and writing to the worksheets in an application workbook. The From Sheet button at the bottom of the Designer Panel
reads the entire application workbook’s data and populates the panel with the data. The **To Sheet** button updates the entire application workbook with the data from the Designer Panel. The **Reset** button clears the data from the Designer Panel.

One common use of panel is to populate it with information from one application workbook using **From Sheet**, open a new blank workbook, and then use **To Sheet** to make a clone of the first application workbook.

You can design and edit application workbooks in the Designer Panel. Each of its five tabs correspond to one of the five types of worksheets in an application workbook. See [Design and Create Cubes Using Application Workbooks](#).

To open the panel, click **Designer Panel** on the Cube Designer ribbon.

If the Smart View panel displays when you click **Cube Designer**, then click **Switch To** and select **Cube Designer** from the drop down menu.

The Designer Panel contains the following tabs:

- **Cube**: You can design and modify the Essbase.Cube worksheet in an application workbook. See [Work with the Essbase.Cube Worksheet in Cube Designer](#).

- **Settings**: You can design and modify the Cube.Settings worksheet in an application workbook. See:
  - [Work with the Cube.Settings Worksheet: Alias Tables in Cube Designer](#).
  - [Work with the Cube.Settings Worksheet: Properties in Cube Designer](#).
  - [Work with the Cube.Settings Worksheet: Dynamic Time Series in Cube Designer](#).
  - [Work with the Cube.Settings Worksheet: Attribute Settings in Cube Designer](#).
  - [Work with Text Lists Worksheets in Cube Designer](#).

- **Dimensions**: You can design and modify the Dim.\*dimname* worksheets in an application workbook. See [Work with Dimension Worksheets in Cube Designer](#).

- **Data**: You can design and modify the Data.\*filename* worksheet in an application workbook. See [Work with Data Worksheets in Cube Designer](#).

- **Calc**: You can design and modify the Calc.\*scriptname* worksheet in an application workbook. See [Work with Calculation Worksheets in Cube Designer](#).

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**Manage Files in Cube Designer**

Your access to view and work with Cube Designer files depends on your permissions.

In Cube Designer, you access the file folders in the Catalog using the **Cloud** option in the Cube Designer ribbon.
The **Applications** folder requires Database Administrator role access to view cubes for which you have permission.

The **Gallery** folder is read-only access for all users.

The **Shared** folder is read-write access for all users.

The **Users** folder is read-write access for the logged in user.

According to your permissions, you can create, move, rename and delete custom folders. Similarly, users with access can import, export, copy, move, rename and delete files.

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**Download Sample Application Workbooks from the Cloud**

Using the sample application workbooks provided in the Cloud Files dialog box, you can quickly create sample applications and cubes. The cubes are highly portable, because they are quickly and easily imported and exported.

1. On the Cube Designer ribbon, click **Cloud**.
2. If prompted to connect, enter your user name and password.
3. On the Cloud Files dialog box, choose the sample application workbook you want to open.

You can then edit the application workbook to fit your requirements in the Designer Panel. See **Work with Application Workbooks in Cube Designer**.

You can save this modified application workbook to your private inventory. See **Build a Private Inventory of Application Workbooks**.

You can upload this modified application workbook to either the user or shared catalog locations. If uploaded to the shared catalog location, the application workbook will be available to all users.

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**Build a Private Inventory of Application Workbooks**

Cube Designer allows you to create and store application workbooks on the client computer. This lets you keep a private inventory of completed and in-progress application workbooks.

Using the Local icon menu items on the Cube Designer ribbon, you can manage your private application workbook inventory:

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**Open an Application Workbook**

Open an existing application workbook from your inventory.

1. On the Cube Designer ribbon, click **Local**.
2. Select **Open Application Workbook**.
3. Browse to the application workbook and click **Open**.
Save an Application Workbook

Save a new or updated application workbook to your inventory.

1. Open the application workbook.

2. On the Cube Designer ribbon, click Local.

3. Select Save Application Workbook.

4. Browse to your inventory location and click Save.

Export to an Application Workbook

Export a cube to an application workbook and add it to your inventory.

1. On the Cube Designer ribbon, click Local.

2. Select Export Cube to Application Workbook.

3. If prompted to log in to the cloud service, enter your user name and password.

4. In the Export Cube dialog box, select the application and cube you want to export, and from the Export Build Method menu, select either the Parent-Child or Generation build method; indicate if you want to export input level data and calculation scripts, and click Run.

5. To add the application workbook to your private inventory, click Save Application Workbook.

Work with Application Workbooks in Cube Designer

Using Designer Panel, you can modify an application workbook, and then you can use the modified workbook to create an updated cube, reflecting your changes.

• Limitations of Application Workbooks
• Work with the Essbase.Cube Worksheet in Cube Designer
• Work with the Cube.Settings Worksheet: Alias Tables in Cube Designer
• Work with the Cube.Settings Worksheet: Properties in Cube Designer
• Work with the Cube.Settings Worksheet: Dynamic Time Series in Cube Designer
• Work with the Cube.Settings Worksheet: Attribute Settings in Cube Designer
• Work with the Cube.Settings Worksheet: Substitution Variables in Cube Designer
• Work with Dimension Worksheets in Cube Designer
• Work with Data Worksheets in Cube Designer
• Work with Calculation Worksheets in Cube Designer
• Create a Cube from a Local Application Workbook in Cube Designer
• Work with Text Lists Worksheets in Cube Designer
Limitations of Application Workbooks

Current limitations for using application workbooks, are listed here.

The following limitations currently exist when working on application workbooks in Excel using the designer panel.

• You cannot set up a dimension worksheet using the generation format. Instead, you must import using the parent-child build method.
• Multiple dimension sheets for the same dimension are not supported. You are limited to one worksheet per dimension.
• Application workbooks do not support aggregate storage cubes.
• Changes to the Cube.Settings worksheet cannot be applied incrementally. Instead, you must rebuild the cube to apply those changes.

Work with the Essbase.Cube Worksheet in Cube Designer

Using the Cube tab in the Designer Panel, you can modify the following fields on the Essbase.Cube worksheet:

• Application Name
• Cube Name
• Dimension Definitions

You can change the application name and cube name, and delete one or more dimensions.

1. On the Cube Designer ribbon, select Designer Panel.
2. In the Designer Panel, select the Cube tab.
3. Select **From Sheet** to populate the Designer Panel with the contents of the application workbook.

4. Change the application name or the cube name, if you want to.

5. Add one or more dimensions by typing the name in the text box and pressing the enter key after each one.

6. In the Dimensions list
   - If you want to delete a dimension, right click the dimension name and select **Delete Dimension**. Alternatively, you can select a dimension name and press the delete key.
   - If you want to rename a dimension, right click the dimension name and select **Rename Dimension**.

7. Select **To Sheet** to propagate the changes to the application workbook.

8. Examine the updated application workbook to see your changes.

See also: Understand the Essbase.Cube Worksheet.

### Work with the Cube.Settings Worksheet: Alias Tables in Cube Designer

You can add new alias tables in the Cube.Settings worksheet.

1. In the Designer Panel, select the **Settings** tab.
2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. In the Alias Tables field, enter a name for the new alias table.

4. Press Enter.

5. Select To Sheet.

A new alias table name is added on the Cube.Settings worksheet in the application workbook. To add the alias table to a dimension worksheet, open the Dimensions tab in the Designer Panel, and add the alias table to the selected dimension worksheet. See Work with Dimension Worksheets in Cube Designer. After you add the alias table to the dimension worksheet, you must populate the aliases manually, or by copying from a source.

Work with the Cube.Settings Worksheet: Properties in Cube Designer

You can add new properties in the Cube.Settings worksheet.

1. In the Designer Panel, select the Settings tab.

2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. Expand the Properties section.

![Properties section](image)

4. Make your selections.

5. Select To Sheet to propagate the changes to the application workbook.

See also: Understand the Cube.Settings Worksheet: Properties.

Work with the Cube.Settings Worksheet: Dynamic Time Series in Cube Designer

You can add dynamic time series members in the Cube.Settings worksheet.

1. In the Designer Panel, select the Settings tab.

2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. Expand the Dynamic Time Series section.
4. Make the changes that you want.

5. Select **To Sheet** to propagate the changes to the application workbook.

There are reserved generations names used by dynamic time series. For example, using the generation name of “Year” activates dynamic time series for “Y-T-D.”

See also: **Understand Dimension Worksheets**.

### Work with the Cube.Settings Worksheet: Attribute Settings in Cube Designer

You change attribute settings on the Cube.Settings worksheet.

1. In the Designer Panel, select the **Settings** tab.

2. Select **From Sheet** to populate the Designer Panel with the contents of the application workbook.

3. Expand the **Attribute Settings** section.

4. Make the changes that you want.

5. Select **To Sheet** to propagate the changes to the application workbook.

See also: **Understand the Cube.Settings Worksheet: Attribute Settings**.
Work with the Cube.Settings Worksheet: Substitution Variables in Cube Designer

You can add cube-level substitution variables on the Cube.Settings worksheet.

Enter the name of the substitution variable in column A. Enter the corresponding value of the substitution variable in column B.

You must enclose member names in double quotes.

<table>
<thead>
<tr>
<th>Substitution Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>CurMonth</td>
</tr>
<tr>
<td>&quot;Jan&quot;</td>
</tr>
</tbody>
</table>

Work with Dimension Worksheets in Cube Designer

1. In the Designer Panel, select the Dimensions tab.

2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. Make the changes that you want.
For descriptions of the options and valid values, see Understand Dimension Worksheets.

4. (Optional) If you want to update the Cube.Generations worksheet in the application workbook for this dimension, click the Update Generation Worksheet button.

The Update Generation Worksheet button creates a section in the Cube.Generations worksheet for the dimension selected in the Dimension drop down list on the Dimensions tab of the Designer Panel.

The Dimension section of the Cube.Generations worksheet changes if you add or delete members on the dimension worksheet (Dim.dimname), causing the number of generations in the dimension to change. If you make changes to the dimension worksheet by adding or deleting members, you should always press the Update Generation Worksheet button as part of the editing process.

5. Select To Sheet to propagate the changes to the application workbook.

- After adding alias tables using Designer Panel, populate the alias table column with alias names manually, or by copying them from a source.
- Use no more than 1024 characters when naming dimensions, members, or aliases.
- The length limit for the dimension worksheet is 30 characters, including 3 characters for the “Dim.” at the beginning of the sheet name. So, the name following “Dim.” can contain up to 27 characters.

See Understand the Cube.Generations Worksheet.

Work with Data Worksheets in Cube Designer

You can create new data worksheets in the Designer Panel.

1. In the Designer Panel, select the Data tab.

2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. Enter a name for the new data worksheet in the Data Sheets field.

4. Press Enter.

5. Select To Sheet to propagate the changes to the application workbook.

A new data worksheet is created in the application workbook.

Work with Calculation Worksheets in Cube Designer

You can create new calculation worksheets in the Designer Panel.

1. In the Designer Panel, select the Calc tab.

2. Select From Sheet to populate the Designer Panel with the contents of the application workbook.

3. In the Calculation Sheets field, enter a name for the new calculation worksheet.

4. Press Enter.
5. Select **To Sheet**.

A new calculation worksheet is created in the application workbook.

Cube Designer calculation worksheets apply only to block storage cubes.

## Create a Cube from a Local Application Workbook in Cube Designer

Using a sample local application workbook, you can create a cube from Cube Designer.

1. In Excel, on the Cube Designer ribbon, select **Local** and then select **Open Application Workbook**.
2. Select an application workbook, then select **Open**.
3. On the Cube Designer ribbon, select **Build Cube**.
4. On the Build Cube dialog box, verify that you want to use the selected options. Cube Designer detects data worksheets and calculation worksheets in the application workbook, and pre-selects those options for you, however you can deselect those options if you want to:
   - **Load Data Sheets Contained within Workbook** is pre-selected if data worksheets exist in the workbook. You can de-select this option if you do not want to load data.
   - **Run Calculation Sheets Contained within Workbook** is pre-selected if calculation worksheets exist in the workbook. You can de-select this option if you do not want to run the calculations.
5. Click **Run**.
6. After the asynchronous job completes a dialog box is displayed. Click **Yes** to launch Job Viewer and view the status of the Excel import, or click **No** if you don’t want to launch Job Viewer.

See [Work with Jobs in Cube Designer](#).

## Work with Text Lists Worksheets in Cube Designer

You can add text list definitions to application workbooks to work with text measures.

1. Open an application workbook.
2. On the Cube Designer ribbon, click **Cube Designer** to open the Designer Panel.
3. Click the **Settings** tab.
4. Click **From Sheet** to populate the Designer Panel with the contents of the application workbook.
5. In the **Text Lists** field, type the name for the new text list.
6. Press Enter.
   - The text list name is moved to the text box below the **Text Lists** field.
7. Click **To Sheet**.
A new text list definition section is added on the Cube.Textlists worksheet in the application workbook. If no Cube.Textlists sheet exists, one is created and the text list definition is added. Multiple text list definitions are supported, and will be added to the same worksheet.

After you add the text list, you must enter the text list information manually. This includes the associated members for the text list, the valid text items in the list and their related numeric values.

- Understand the Cube.Textlists Worksheet
- Working with Typed Measures
- Performing Database Operations on Text and Date Measures

Create a Cube from Tabular Data in Cube Designer

This workflow uses two sample tabular data Excel files to demonstrate the concepts of intrinsic and forced-designation headers. See Transform Tabular Data to Cubes.

1. In Excel, on the Cube Designer ribbon, click Cloud.
2. On the Cloud Files dialog box, under Catalog, select Gallery, then select a sample tabular data file:
   - Technical/Table Format/Sample_Table.xlsx: Intrinsic headers
   - Technical/Table Format/Unstr_Hints.xlsx: Forced-designation headers
3. Click Open.
4. On the Cube Designer ribbon, select Transform Data.
5. On the Transform Data dialog box, enter an application and cube name, if you want to change the default names that are prepopulated.
   - Sample_Table.xlsx: Application name is Sample_Table and the cube name is Sales.
   - Unstr_Hints.xlsx: Application name is Unstr_Hints and the cube name is SpendHistory.
6. If you selected Sample_Table.xlsx, do not select Preview Data. Skip to step 8 to create the cube.
7. If you selected Unstr_Hints.xlsx, press Preview Data. The workbook is sent to Oracle Analytics Cloud – Essbase for analysis and the relationships are returned for viewing.
   - Using the Tree View, you can drag and drop columns to create dimension hierarchies, measure hierarchies, and skipped columns. You can also right click on a column name and designate the property of the column: Generation, Attribute, Alias or UDA. You can also select measures, and hierarchical or flat dimensions, in the Options menu, to set those options for the headers. If you select hierarchical, you get a hierarchy with the dimensions receiving the Excel header names. If you select the flat option, you get a flat display of
generations that receive the Excel header names. This setting applies to the entire outline.

b. To save changes to the Excel file, click **To Sheet**.

c. You can also make changes directly in the open Excel file and have those changes reflected in the grid view by clicking **From Sheet**.

d. If you do not want to save your changes, select **Options** and then select **Reset to Original Header**.

e. If you want to change the cube type and the type of dimensions to be created, before deploying, select **Options**, and then select **Cube Type**. Select **Hybrid BSO** (block storage option) or **ASO** (aggregate storage option).

8. When you are ready to create the cube, click **Run**.

9. When prompted, save the application workbook to your private inventory directory.

10. When asked if you want to create the cube, click **Yes**.

11. (Optional) When asked if you want to see the cube job status, click **Yes**.
The newly created application and cube are listed on the Applications home page in the cloud service and are available in Cube Designer. Now that the cube has been created from the tabular data, you can export the cube to an application workbook.

12. On the Cube Designer ribbon, select Local, then select Export Cube to Application Workbook.

13. On the Export Cube to Application Workbook dialog box, select the application and cube, and then select Run

To create a cube in the cloud service, see Create and Update a Cube from Tabular Data.

Update Cubes Incrementally in Cube Designer

Updating a cube is how you load dimensions and members to a cube outline using a data source and a rules file.

You can also use the cloud service to add dimensions and members manually (see Creating and Updating Cubes from Tabular Data).

In an existing cube, you can incrementally update a dimension, or add a new one.

You cannot use Cube Designer to delete a dimension in an existing cube.

1. In Excel, on the Cube Designer ribbon, select Build Cube.

2. Choose an Update Cube option from the Build Option menu.

When an outline was changed by a dimension build, the database may be restructured. Each of these options specifies how data values are handled during restructures:

a. Update Cube - Retain All Data

   All data values are preserved.
b. **Update Cube - Retain Input Data**
   All blocks (both upper-and lower-level) that contain loaded data are preserved.
   This option applies only to block storage cubes.

c. **Update Cube - Retain Leaf Data**
   Only leaf (level 0) values are preserved. If all data required for calculation resides in leaf members, then you should select this option. If selected, then all upper-level blocks are deleted before the cube is restructured. Therefore, the disk space required for restructuring is reduced, and calculation time is improved. When the cube is recalculated, the upper-level blocks are re-created.

d. **Update Cube - Remove All Data**
   All data values are cleared.
   This option applies only to block storage cubes.

- Dimension build definitions are contained within the application workbook and automatically generate the necessary rules files. You do not select a rules file when building dimensions in Cube Designer.
- When making changes to user-defined attributes (UDAs) while updating a cube incrementally using Cube Designer and an application workbook, you must specify all the UDAs in the dimension sheet, both new ones you are adding and existing UDAs in the outline. If you specify some UDAs (such as those you are adding), but not all of them, those that are not specified are deleted.

## Create and Validate Member Formulas in Cube Designer

In the Cube Designer Formula Editor, you can write formulas for specific outline members in block storage cubes. You can construct member formulas from operators, functions, dimension names, member names, substitution variables, and numeric constants, and you can validate them to check for correct syntax.

- The Cube Designer Formula Editor applies only to block storage cubes.
- Validation works against existing cubes in the cloud service. It does not detect application workbook changes that have not been applied to the cube.
- Member selection works with existing cubes only.

Formula Editor provides a formula editing pane in which you can enter a formula. You can use the Tab and arrow keys to move focus within Formula Editor. You can also use a point-and-click approach to select and insert formula components into the formula editing pane. A member selection tree helps you place the correct member names into the formula.

1. Open the application workbook for the cube that you want to modify.
2. If a dimension worksheet has been defined with the Formula property, select the cell in the Formula column for the member you wish to create a formula.

3. On the Cube Designer ribbon, click **Formula Editor**.
4. Enter your login credentials for the service, if prompted to do so.
5. In the Formula Editor, create the formula.
• Use the keyboard to enter formula text. Enclose in quotation marks any member names containing blanks or special characters.

• Select a cell containing a member name or alias from any dimension worksheet. Place the cursor in the appropriate location of the editor and right-click to paste that name surrounded by quotes into the editor.

• Double-click on a member in the member selection tree to have that member pasted into the editor.

• Double-click on a function to have that function syntax pasted into the editor.

6. Click **Validate** to check formula syntax.

   If the validation fails, edit the formula and try again. Be sure to check the error message for guidance.

See these topics in *Designing and Maintaining Essbase Cubes*:

• Developing Formulas for Block Storage Databases

• Understanding Formula Syntax

• Reviewing Examples of Formulas

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**Load Data in Cube Designer**

At times, you may need to clear and reload data during cube development. The data and rules files used in the data load process must be stored in the cloud service. If a data worksheet is included in the application workbook, then the data files and rules files get automatically generated during the cube build process. Individual files can also be uploaded. See **Upload Files to a Cube**.

1. In Excel, on the Cube Designer ribbon, select **Load Data**.

2. On the Load Data dialog box, select the application and cube in which you want to load data.

3. Under **Select a Job Type**, select an option:
   
   • **Load Data**: to load data to the cube.
   
   • **Clear all Data**: to clear all data from the cube.

4. Select the data file and load rule file that you want to use.

5. Select whether to **Abort on Error**.

   If you select **Abort on Error**, the data load is stopped when an error is encountered.

6. Click **Run** to start the data load.

7. When the asynchronous job completes a dialog is displayed. Click **Yes** to launch Job Viewer and view the status of the data load, or click **No** if you do not want to start Job Viewer.

8. (Optional) View the status in Job Viewer.

See Understanding Data Loading and Dimension Building in *Designing and Maintaining Essbase Cubes*.
Calculate Data in Cube Designer

Calculation scripts specify how cubes are calculated and, therefore, override outline-defined cube consolidations. For example, you can calculate cube subsets or copy data values between members. See Developing Calculation Scripts for Block Storage Databases in *Designing and Maintaining Essbase Cubes*.

During cube development, it is common to recalculate a cube many times when validating the data and formulas. The calculation script files used in the calculation process must be stored in the cloud service. If a Calc worksheet is included in the application workbook, then the calculation script files are automatically generated during the cube build process. Individual calculation script files can also be uploaded in the cloud service. See *Upload Files to a Cube*.

1. In Excel, on the Cube Designer ribbon, select **Calculate**.
2. On the Calculate Data dialog box, select an application and a cube, and select the calculation script you want to use.
3. Click **Run** to start the calculation.
4. When the asynchronous job completes a dialog box is displayed. Click **Yes** to start Job Viewer and view the status of the calculation, or click **No** if you do not want to start Job Viewer.
5. (Optional) View the status in Job Viewer.

*See Work with Jobs in Cube Designer.*

Work with Jobs in Cube Designer

Use the Cube Designer Job Viewer to view, monitor and troubleshoot jobs that you run from your particular client. Jobs are operations such as data loads, dimension builds, and calculations.

A record of all Oracle Analytics Cloud – Essbase jobs is maintained on the cloud service instance. Each job has a unique ID number.

The jobs listed in the Job Viewer are for one specific user. If a different user logs into the client, then only jobs for that user are displayed.

View Jobs in the Cube Designer Job Viewer

You can view jobs for the specific user that is logged into the client in the Cube Designer Job Viewer.

In Excel, on the Cube Designer ribbon, click **View Jobs**.

The Job Viewer dialog box opens, showing a list of jobs that have been run from that particular client.
Monitor Cube Designer Jobs

The Cube Designer ribbon shows when a job is in progress. After the job finishes, you can view the status of the job in the Cube Designer Job Viewer.

- While a job is running, the **Job Viewer** icon on the Cube Designer ribbon displays an hourglass.
- When the job finishes running a Job Viewer status dialog box displays, indicating the status of the job.

If you close Excel while the job is running, the job continues to run, but you will not see a status dialog when it finishes. The job is a server process, so it runs regardless of whether Excel is open or not.

Troubleshoot Jobs in the Cube Designer Job Viewer

If a job fails, you can view and troubleshoot errors.

1. In Job Viewer dialog box, select a job and click **Details** to see the job details.
2. In the Job Details dialog box, select a file from the **Server Error Files** drop-down menu and click **Open** to view and troubleshoot errors.

Clear and Archive Cube Designer Jobs

Clear the Job Viewer or archive job viewer logs periodically to improve performance.

- Press **Clear All** to remove all jobs from the Job Viewer dialog box.
- To selectively remove individual jobs, select one or more jobs and press the Delete key.
  - Use the Shift key to select multiple contiguous jobs.
  - Use the Ctrl key to select multiple non-contiguous jobs.
- To archive the job viewer logs, copy and rename the log file and then delete the original.
  **Job viewer logs are located** in C:\Users\username\AppData\Roaming\Oracle\SmartView\DBX\Jobs.
  
  There is a separate log for each user on the client machine.

Removing jobs from the Job Viewer dialog box or archiving job viewer logs only affects the client. You can still view all jobs in the web interface.

View Dimension Hierarchies in Cube Designer

You can view dimension hierarchies in the Cube Designer Dimension Hierarchy viewer. To learn more about hierarchies, see Outline Hierarchies in *Designing and Maintaining Essbase Cubes*.

1. Open the application workbook containing the hierarchy that you want to view.
2. Select the dimension worksheet for the hierarchy that you want to view.
3. On the Cube Designer ribbon, select **Hierarchy Viewer**.

When you view a hierarchy in Cube Designer, you can perform some actions on the hierarchy. These include:

- To search for a member in the hierarchy, enter a member name in the **Find Next** text box, and click **Find Next**.
- To find a member of the dimension in the application workbook dimension worksheet, either double-click a member in the hierarchy or right-click on a member in the hierarchy and select **Go To**.

The corresponding member in the application workbook is highlighted.

- To rename a member:
  1. Right-click a member in the hierarchy and select **Rename**.
  2. Enter the new member name.
  3. Press **Enter**.

The corresponding member is renamed wherever found within the Parent and Child columns of the dimension worksheet.

- To set storage for all parents (except members containing formulas or defined as label only) to dynamic calc or to stored:
  1. Select the member in the hierarchy and click **Edit parents**.
  2. On the drop-down menu, select **Set storage to dynamic calc** or **Set storage to stored**.

- To expand or collapse a hierarchy:
  1. Right-click a member in the hierarchy.
  2. Select **Expand All** or **Collapse All**.

- To show or hide aliases, storage, or operators:
  1. Click **Show**.
  2. Click **Alias, Storage, or Operator**, to show or hide those items.

---

**Export Cubes to Application Workbooks in Cube Designer**

In Cube Designer, you can export any cube that exists in the cloud service.

1. Select the build method, either parent-child or generation format.

2. In Excel, on the Cube Designer ribbon, select **Local**, then select **Export cube to application workbook**.

3. On the Export Cube dialog box, select the application and cube that you want to export.
   - Select **Include Data** if you want input level data included in the application workbook.
– In block storage cubes, if the size of the data is 400 MB or less, data is exported to the application workbook, on the Data worksheet. If the data size exceeds 400 MB, data is exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip. The .zip file is created in the specified export directory if the export process is successful.

– In aggregate storage cubes, regardless of the size of the data, it is always exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip. The .zip file is created in the specified export directory if the export process is successful.

- Select Include Calculation Scripts if you want calculation scripts in your block storage cube included in the application workbook.

Aggregate storage cubes do not have calculation scripts.

4. Click Run.

5. When the export is completed, click OK.

The application workbook is saved to the local folder location: C:\Users\username \AppData\Roaming\Oracle\smartview\DBX. Because it is saved to the local folder location, you can open it using the Local icon on the Cube Designer ribbon.

The exported application workbook can be imported to the cloud service. See these topics:

- Create a Cube from an Application Workbook
- Create a Cube from a Local Application Workbook in Cube Designer

Delete Applications and Cubes in Cube Designer

In Cube Designer, you can delete any application or cube that exists in the cloud service. Deleting an application or cube cannot be undone.

1. In Excel, on the Cube Designer ribbon, select Admin tasks.

2. From the menu, select Delete Application or Delete Cube.
3. From the Delete Application or Delete Cube dialog box, select the application or cube you want to delete.

**View Logs in Cube Designer**

In cube designer, you can view the platform log or an application log.

1. In Excel, on the cube designer ribbon, select **Admin tasks**.
2. From the menu, select **View Logs**.
3. Select a log to view:
   - Select **View Platform Log** to view the log for the platform service.
   - Select **View Application Log** to view the log for an individual application.
Export Cubes to Application Workbooks

After you create a cube and make modifications to the cube outline, such as adding dimensions and members, and setting dimension and member properties, you can export the cube to an application workbook that reflects the current state of the cube.

- Export a Cube to an Application Workbook
- Export On-Premises Cubes to Import to the Cloud

Export a Cube to an Application Workbook

1. In Oracle Analytics Cloud – Essbase, expand the application that contains the cube that you want to export.
2. From the Actions menu, to the right of the cube name, select Export to Excel.
3. On the Export to Excel dialog box:
   - Select Export Data if you want to export the data from the cube. How the data is exported depends on whether the cube is block storage or aggregate storage.
     - In block storage cubes, if the size of the data is 400 MB or less, it is exported to the application workbook, on the Data worksheet. If the data size exceeds 400 MB, data is exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip on the Files page.
     - In aggregate storage cubes, regardless of the size, data is always exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip on the Files page.
   - Select a build method, Generation or Parent-Child.
   - Select Export Calculation Script if you want to export each of the calculation scripts as a separate worksheet within the application workbook.
4. When prompted, save the exported application workbook to your local or network drive or download the exported application workbook and data .zip files from the Files page.

File names do not include spaces because files that are imported to the cloud service cannot contain spaces in the file name.

The exported application workbook can be imported to the cloud service. See:

- Create a Cube from an Application Workbook
- Create a Cube from a Local Application Workbook in Cube Designer

Export On-Premises Cubes to Import to the Cloud

If you have applications and cubes that were created in a supported on-premises instance of Essbase, then you can use the cube export utility, which is a command-line
tool, to export the metadata and data of a cube into an application workbook. Then you can import the application workbook to create a cube in the cloud service.

You can export applications and cubes created in an on-premises instance of Essbase 11.1.2.3.0nn, 11.1.2.4.0nn, 11.1.2.4.5.nn, 12.2.1 and later.

See:

- Download the Cube Export Utility
- Export On-Premises Cubes to Application Workbooks
- Review Member Names Before you Import an Application Workbook Created by the Cube Export Utility

Download the Cube Export Utility

The cube export utility is supported on Windows and UNIX/Linux.

To download the cube export utility from the cloud service:

1. On the Applications page, click Console.
2. On the Console page, click Download next to Export Utility.
3. Save the cube export utility, which is named dbxtool.zip, to a local drive.

Export On-Premises Cubes to Application Workbooks

1. On your local drive, uncompress the export utility file (dbxtool.zip) that you previously downloaded.

   See Download the Cube Export Utility.

2. Ensure that Java Runtime Environment (JRE) 1.7.nn or later is installed, and test that it works by entering java -version at a command prompt.

3. In a command prompt, change directories to the dbxtool/bin directory.

4. Run the cube export utility by entering the export command with the options that you want. Options are describes in the following table.

   - Windows: export.bat
   - UNIX/Linux: export.sh

   You must set export.sh to have execute permission. For example, chmod 744 export.sh.

   **Table 12-1** Cube Export Utility Syntax Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-server</td>
<td>Cloud service instance URL.</td>
</tr>
<tr>
<td>-application</td>
<td>Application name (case-sensitive).</td>
</tr>
<tr>
<td>-cube</td>
<td>Cube name (case-sensitive).</td>
</tr>
<tr>
<td>-user</td>
<td>User name.</td>
</tr>
</tbody>
</table>

Chapter 12
Export On-Premises Cubes to Import to the Cloud
12-2
Table 12-1 (Cont.) Cube Export Utility Syntax Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-password</td>
<td>Password. If not specified, then you are prompted to enter the password.</td>
</tr>
<tr>
<td>-path</td>
<td>Full path to the export directory. If the file already exists on the specified path, then you are prompted whether to overwrite the file. If you enter yes, then the export proceeds.</td>
</tr>
<tr>
<td>-build</td>
<td>(Optional) Build method to use. Options: PARENT-CHILD, GENERATION</td>
</tr>
<tr>
<td>-data</td>
<td>(Optional) Export input data. Only input data can be exported using the cube export utility. Input data means only those blocks of data where the block contains at least one data value that was loaded (imported), rather than created as the result of a calculation. How the data is exported depends on whether the cube is block storage or aggregate storage. In block storage cubes, if the size of the data is 400 MB or less, it is exported to the application workbook, on the Data worksheet. If the data size exceeds 400 MB, data is exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip. The .zip file is created in the specified export directory if the export process is successful. In aggregate storage cubes, regardless of the size of the data, it is always exported to a flat file named Cubename.txt, which is included in a file named Cubename.zip. The .zip file is created in the specified export directory if the export process is successful. If the -data option is omitted or the export process is not successful, then data is not exported and the Cubename.txt and Cubename.zip files are not created.</td>
</tr>
<tr>
<td>-calc</td>
<td>(Optional) Export calculation scripts. Separate worksheets are created for each calculation script in the cube.</td>
</tr>
</tbody>
</table>

Windows example:

export.bat -server server99.us.example.com:1423 -application Sample -cube Basic -user esscs_user -password password -path C:\export_dir -build PARENT-CHILD -calc -data

During the export process, a structured file representing metadata, named Appname_Cubename.xml, is created in the specified export directory. This .xml file is then used to create an application workbook, named Appname_Cubename_timestamp.xlsx. If the export process is successful, then only the application workbook file remains in the specified export directory; the .xml file is removed.

The application workbook can be used to redploy the same cube to the cloud service. See Create a Cube from an Application Workbook and Create a Cube from a Local Application Workbook in Cube Designer.

When importing an application workbook that was created using the cube export utility, you should carefully review member names in the application workbook, because
some member records might be rejected when you import the application workbook. See Review Member Names Before you Import an Application Workbook Created by the Cube Export Utility.

The application workbook that is created does not have a space in the file name. Files that are imported to the cloud service cannot contain spaces in the file name.

Limitations of Cube Export

• For setting named generations to dimensions, you must use the GENERATION build method. The PARENT-CHILD build method is not supported.
• Named levels are not supported.
• Formulas cannot exceed 32767 characters.

Review Member Names Before you Import an Application Workbook Created by the Cube Export Utility

When importing an application workbook that was created using the cube export utility, you should carefully review member names in the application workbook. Member names are exported to the application workbook as is. If a member name ends with a backslash (for example, mbrname\ or mbr\name\), then the member name is exported to the application workbook as is (mbrname\ or mbr\name\). During the import process, however, the trailing backslash is interpreted as an escape character and the member is rejected (not added to the cube outline).

When the import process is completed, a dialog box provides status details, such as whether a dimension build was successful or if errors were encountered.

For each dimension in which one or more member names are rejected, an error file is created. The error file is named err_DimName.txt or err_Dim_DimName.txt. For example, if the Year dimension has any rejected member names, the error file name is err_Year.txt or err_Dim_Year.txt.

In the dimension error file, each rejected member name is listed, as shown:

```
\\Record #98 - Error in association transaction [RB6300] to [Curr_EUR] (3362)
"OTHER","RB6300","N","","","Ballsport L","","","Curr_EUR"
```

The rejected member record text files are available on the Files page. Review the text files and correct the issues in the application workbook.
13

Track Changes to Data

Use an audit trail to track changes to cube data, including changes to Linked Reporting Objects (LROs), adding notes, attaching files, and referencing URLs. Export your log to an Excel spreadsheet, and perform ad hoc queries.

To view data audit trail records, you must be a Service Administrator or Power User who has one of these roles on the Application: Application Manager, Database manager, or Database Update role. You can only view those records where your user name matches the user name registered in the audit records. To delete data audit trail records, you must be a Power User who has Application Manager role on the application.

• Turn on Data Audit Trail and View the Data Audit Trail
• Link a Report Object to a Cell
• Export Logs to a Sheet
• Refresh the Audit Log

Limitations of Audit Trail

• Supported only on block storage cubes
• Not supported on scenario-enabled cubes
• Not supported with text measures
• Not supported in ad hoc analysis

Turn on Data Audit Trail and View the Data Audit Trail

You turn on data audit trail by adding AUDITTRAIL DATA as an application level configuration setting.

See Set Application-Level Configuration Properties.

1. To turn on Data Audit Trail, add the following to the application configuration parameters: AUDITTRAIL DATA.

2. Perform ad hoc analysis through Smart View, make data changes through Smart View and click on Submit - this results in an audit record being stored.

When doing ad hoc analysis, there are many ways of getting a particular Point of View (POV) on to the grid. One of them is by using the POV toolbar. It's got great flexibility for zeroing in on certain members in one or more dimensions. See these topics in Oracle Smart View for Office User's Guide

• Selecting Members from the POV Toolbar
• Displaying the POV Toolbar
• Selecting Members Using the Cell-Based POV

3. With Data Audit Trail enabled, you can view the audit trail in the connection Panel in Smart View. Under the connection information, click on the menu of operations
under **More** and you will see a menu option titled **Audit Trail**. Click on **Audit Trail** to view the data audit trail records for a cube.

<table>
<thead>
<tr>
<th>Audit Trail</th>
</tr>
</thead>
<tbody>
<tr>
<td>DateTime</td>
</tr>
<tr>
<td>07/23/17 15:32:50</td>
</tr>
<tr>
<td>07/23/17 15:49:42</td>
</tr>
<tr>
<td>07/23/17 15:49:42</td>
</tr>
</tbody>
</table>

4. The audit trail record shows the date and time of the change in the first column, the new value or the linked reporting object in the second column and the POV in the third column. The time corresponds to your time zone. Click on an item in the audit trail and you will see a description of the change at the bottom of the pane.

5. You can display a sheet with the new POV and refreshed data value by clicking **Ad hoc** below the **Audit Trail** pane. When you click on subsequent audit records and click this icon, you see a different sheet with the POV for that audit record and refreshed data for that POV. This way, you can do further analysis on targeted data.

**Link a Report Object to a Cell**

You can link a reporting object to a cell. When you do, this change displays in the data audit trail. You can add a note to a cell, attach a file, or reference a URL. When you make these changes, the cells are highlighted in your cube. See these topics in the *Oracle Smart View for Office User’s Guide* on how to link reporting objects to cells:

- Linked Reporting Objects
- Attaching a Linked Reporting Object to a Data Cell
- Launching a Linked Reporting Object from a Data Cell

**Export Logs to a Sheet**

You can easily export your logs to a new Excel sheet just by clicking an icon.

Export your log onto a new sheet using **Export**. Click this icon to export the logs with all the details for each entry onto a new sheet that looks like this:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User</td>
<td>Date/Time</td>
<td>Cell Note</td>
<td>New Value</td>
<td>Old Value</td>
<td>Operation</td>
<td>POV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>weblogic</td>
<td>07/23/17 15:49:42</td>
<td></td>
<td>25</td>
<td>20</td>
<td>INPUT</td>
<td>Qtr3Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>3</td>
<td>weblogic</td>
<td>07/23/17 15:49:42</td>
<td></td>
<td>20</td>
<td>20</td>
<td>INPUT</td>
<td>Apr</td>
<td>Market</td>
<td>Product</td>
</tr>
<tr>
<td>4</td>
<td>weblogic</td>
<td>07/23/17 15:49:42</td>
<td></td>
<td>20</td>
<td>20</td>
<td>INPUT</td>
<td>Qtr2Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>5</td>
<td>weblogic</td>
<td>07/23/17 15:49:42</td>
<td></td>
<td>14</td>
<td>339580</td>
<td>INPUT</td>
<td>Year</td>
<td>Market</td>
<td>Product</td>
</tr>
</tbody>
</table>
Once exported, you can resort columns or remove them to show the information you want to analyze.

**Refresh the Audit Log**

You can refresh the audit log to see your latest changes at any time.

When you make more changes to your data, you can refresh the log view any time.

Click **Refresh**.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User</td>
<td>Date</td>
<td>Time</td>
<td>Time</td>
<td>Cell</td>
<td>New Value</td>
<td>Old Value</td>
<td>Operation</td>
<td>POI</td>
</tr>
<tr>
<td>2</td>
<td>weblogic</td>
<td>07/21/17 15:32:59</td>
<td>75</td>
<td>30580</td>
<td>INPUT</td>
<td>Qtr</td>
<td>Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>3</td>
<td>weblogic</td>
<td>07/21/17 15:40:42</td>
<td>30</td>
<td>9777.5</td>
<td>INPUT</td>
<td>Apr</td>
<td>Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>4</td>
<td>weblogic</td>
<td>07/21/17 15:40:42</td>
<td>20</td>
<td>29503.1</td>
<td>INPUT</td>
<td>Qtr</td>
<td>Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>5</td>
<td>weblogic</td>
<td>07/21/17 15:40:42</td>
<td>14</td>
<td>138880</td>
<td>INPUT</td>
<td>Year</td>
<td>Market</td>
<td>Product</td>
<td>Accounts</td>
</tr>
<tr>
<td>7</td>
<td>weblogic</td>
<td>07/23/17 16:20:13</td>
<td>55</td>
<td>271</td>
<td>INPUT</td>
<td>Sep</td>
<td>South</td>
<td>Visual</td>
<td>Accounts</td>
</tr>
<tr>
<td>8</td>
<td>weblogic</td>
<td>07/23/17 16:20:13</td>
<td>65</td>
<td>-1840</td>
<td>INPUT</td>
<td>Qtr</td>
<td>South</td>
<td>Visual</td>
<td>Accounts</td>
</tr>
</tbody>
</table>
Link Cubes Using Partitions and XREF/XWRITE

You can use either partitions or XREF/XWRITE to analyze data across cubes.

You may have more than one cube that you use for business analysis. To share data across multiple cubes, you can connect the cubes by implementing partitions, XREF/XWRITE, or both. Two cubes connected by a partition can be thought of as a source and target pair. When using XREF/XWRITE, it is easiest to think of the local cube and the remote cube.

When partitioning or using XREF/XWRITE functions between cubes on the same Essbase instance, no reference to the host instance or login credentials are required. However, if the cubes you wish to connect are on separate Essbase cloud instances, you will first need to create a reusable connection to link the two cloud instances.

To use partitions or XREF/XWRITE, users must be provisioned on the remote cube as well as the local cube.

• Define a Reusable Connection for Partitions or XREF/XWRITE
• Understand Transparent and Replicated Partitions
• Create a Transparent Partition
• Create a Replicated Partition
• Refresh a Replicated Partition
• Understand XREF/XWRITE
• Create a Location Alias Based on a Defined Connection

Define a Reusable Connection for Partitions or XREF/XWRITE

This topic shows you how to create a reusable connection between two Essbase cloud instances. Using the connection, you can then create partitions or use XREF/XWRITE functions.

Create connections globally for use with all applications on the system, or at the application level for use within the context of an application. Global connections require system administrator role, whereas application connections require, at minimum, Application Manager role.

1. In the Oracle Analytics Cloud – Essbase web interface, click Sources, and click Create Connection > Essbase to create a global Essbase connection. Alternatively, use the Actions menu on the target or local application and select Inspect, followed by Sources, Create Connection, and Essbase.

2. In the Name field, enter a name for the saved connection; for example myhost01_conn.
3. Select the **Use URL** checkbox, and enter the discovery URL of the remote Essbase instance. The discovery URL is available from your system administrator, and ends in /agent.

4. Enter a user name, password, and a description. The user defined in the connection must be provisioned for the source application you intend to access on the remote instance. If you have used a global connection, the user will need to be a system administrator or be provisioned for all applications you intend to access using the connection.

5. Click **Test** to verify that the connection is valid.

6. If it is valid, click **Create** to save the connection.

Now you have a remote Essbase connection defined in the service. You can use this connection to define partitions between the two instances, or combine it with a location alias to enable XREF/XWRITE functionality between the two instances.

See also: **Create a Connection and Datasource to Access Another Cube**

**Understand Transparent and Replicated Partitions**

A partition is a region of a cube that is shared with another cube. You can create a transparent or replicated partition between a target and a source cube, to share congruent cube regions between them. In the Oracle Analytics Cloud – Essbase web interface, you create partition definitions in the target cube.

A **transparent** partition target region is virtual; it pulls data on-demand from a source cube region containing stored data. The source cube can be in the same or another application, or on another cloud instance.

A **replicated** partition target region is a physical copy of stored data from the source cube region. Data stored in a replicated partition target must be synchronized when data changes in the source cube. Using the replicated partition, some users access the data in the target, while others access it in the source.

Changes made to the data in a replicated partition flow from the source to the target. If users are permitted to change the data in the target partition region, it is overwritten when the replicated partition is refreshed.

If all cubes involved in a transparent or replicated partition are hosted on the same instance of Oracle Analytics Cloud – Essbase, no login credentials are needed as part of the partition setup. However, the user creating the partition must be provisioned on the target application and also the source application. Business users querying the target cube must also be provisioned on both cubes, typically with Read access.

**Create a Transparent Partition**

This topic shows you how to create a transparent partition. Transparent partitions allow access to data from the data source as though it were stored in the data target. The data source can be in another cube, or on another Essbase cloud instance.

If your source cube is on a different Essbase cloud instance, you must first define an Essbase connection as described in **Define a Reusable Connection for Partitions or XREF/XWRITE**.

1. In the Oracle Analytics Cloud – Essbase web interface, on the **Applications** page, expand the target application. In the row for the target cube, click the **Actions** menu, and click **Inspect**.
2. Select the **Partitions** tab.

3. Click **Create > Transparent**.

4. On the **Connection** tab, in **Source Info**, if the source cube is on a different Essbase instance, select the name of the saved connection that you created. If the source cube is on the same Essbase cloud instance, leave the **Connection Name** field empty. If you have not created any connections, you will not see a **Connection Name** field.

5. Provide the source **Application** and **Database** name, and an optional **Description**.

6. If the source cube is on a different Essbase cloud instance, in the **Target Info**, type your **User name** and **password**.

7. You need to define at least one area. Go to the **Areas** tab.

8. Click **Add Area** and provide at least one source and target area definition. For example, add a source area of \@DESCENDANTS(valid upper-level member specification), and add the same matching target area. If the same member doesn't exist in both cubes, create an area mapping as described below.

9. Click **Cell Count** to see how many cells are in the defined partition area and to ensure that the counts are matching.

10. Optionally, you can map member names between the target and source cubes within a specific area, using the **Areas** tab, or for multiple areas, using the **Mappings** tab.

11. Click **Validate**.

12. If the validation succeeded, click **Save and Close**.

---

**Create a Replicated Partition**

This topic shows you how to create a replicated partition, which duplicates an area of a source cube into the target cube. The data source can be in another cube, or on another Essbase cloud instance.

If your source cube is on a different Essbase cloud instance, you must first define an Essbase connection as described in Define a Reusable Connection for Partitions or XREF/XWRITE.

1. In the Oracle Analytics Cloud – Essbase web interface, on the **Applications** page, expand the target application. In the row for the target cube, click the **Actions** menu, and click **Inspect**.

2. Select the **Partitions** tab.

3. Click **Create > Replicated**.

4. On the **Connection** tab, in **Source Info**, if the source cube is on a different Essbase cloud instance, select the name of the saved connection that you created. If the source cube is on the same Essbase instance, leave the **Connection Name** field empty. If you have not created any connections, you will not see a **Connection Name** field.

5. Provide the source **Application** and **Database** name, and an optional **Description**.

6. If the source cube is on a different Essbase cloud instance, in the **Target Info**, type a provisioned **User name** and **password**.
7. You need to define at least one area. Go to the **Areas** tab.

8. Click **Add Area** and provide at least one source and target area definition. For example, add a source area of `@DESCENDANTS(valid upper-level member specification)`, and add the same matching target area. If the same member doesn’t exist in both cubes, create an area mapping as described below.

9. Click **Cell count** to see how many cells are in the defined partition area and to ensure that the counts are matching.

10. Optionally, you can map member names between the target and source cubes within a specific area, using the **Areas** tab, or for multiple areas, using the **Mappings** tab.

11. Click **Validate**.

12. If the validation succeeded, click **Save and Close**.

---

### Refresh a Replicated Partition

If you have at least Database Manager permission on a replicated partition target application, you can replicate the data from the source.

1. In the Oracle Analytics Cloud – Essbase web interface, on the **Applications** page, expand the target application containing the replicated partition definition.

2. In the row for the target cube, click the **Actions** menu, and click **Inspect**.

3. Select the **Partitions** tab.

4. From the **Actions** menu on the replicated partition, select **Replicate Data from Source**.

5. Select **Update change cells only** to update the target only with source data that has been updated since the last update, or select **Update all cells** to update the target with all source data.

---

### Understand XREF/XWRITE

XREF is a calculation function you use to reference data in another cube, and XWRITE is a calculation function you use to write back data to another cube.

XREF and XWRITE are easiest to understand from the context of the cube containing the XREF or XWRITE formula, called the local cube. The second cube is the remote cube.

To implement XREF, you define a formula in the local cube that pulls values from a remote cube. The member containing the XREF formula can either be stored or dynamically calculated.

To implement XWRITE, you define a formula in the local cube that pushes (writes) values into a remote cube. The remote cube data intersection must be stored, since XWRITE writes values into the remote cube.

When the local and remote cube are on the same Essbase cloud instance, no connection information is needed to implement XREF or XWRITE. However, users of the local cube must also be provisioned on the remote cube. To implement XREF or
XWRITE for cubes on the same instance, the application and database name for the source cube are required in the function syntax:

```plaintext
@XREF(appName, dbName [, mbrList])
@XWRITE (expression, appName, dbName [, mbrList])
```

If the local and remote cubes are on different Essbase cloud instances, a location alias containing connection information must be defined:

```plaintext
@XREF (locationAlias [, mbrList])
@XWRITE (expression, locationAlias [, mbrList])
```

- @XREF
- @XWRITE
- Create a Location Alias Based on a Defined Connection

Create a Location Alias Based on a Defined Connection

This topic shows you how to create a location alias, which you can use when your XREF/XWRITE formulas need to reference data from a cube on a remote cloud instance. You do not provide a user name and password when you create a location alias. You use a saved connection.

This topic assumes you have created a connection as described in Define a Reusable Connection for Partitions or XREF/XWRITE.

1. In the Oracle Analytics Cloud – Essbase web interface, on the Applications page, expand the target application. In the row for the local cube, click the Actions menu, and click Inspect.
2. Click the Location Aliases tab.
3. Click +
4. In the Location alias name field, enter a name.
5. In the Essbase connection field, select a saved connection to the Essbase cloud instance hosting the remote cube.
6. Select the remote application and database and click Save.

Now you have created a location alias. To use it for read operations from a remote cube to the target, use the @XREF function in a member formula or calculation script on the local cube. To use it to write from the local to the remote cube, use @XWRITE on the local cube.

```plaintext
@XREF (locationAlias [, mbrList])
@XWRITE (expression, locationAlias [, mbrList])
```
Migrate Applications

If you have existing applications from a supported on-premises installation of Essbase, you can migrate them to Oracle Analytics Cloud – Essbase. You can also migrate applications that are in the cloud service from one cloud service instance to another.

- Migrate On-Premises Applications
- Migrate Cloud Service Applications

Migrate On-Premises Applications

You can migrate on-premises applications and cubes to Cloud services. Learn how to prepare for migration, and review some use cases for migrating.

Topics:
- Prepare to Migrate On-Premises Applications to the Cloud Service
- On-Premises Application Migration and Use Cases
- Migrated On-Premises Artifacts

Prepare to Migrate On-Premises Applications to the Cloud Service

If you have an existing Essbase on-premises application and cube to migrate to the cloud service, keep in mind the following design considerations and prerequisites.

- Lifecycle Management Utility
  With the Lifecycle Management (LCM) utility, you can create applications by exporting on-premises applications and cubes. You can then import them to the cloud service using the CLI utility.

  To use the LCM utility, you must have installed Java Development Kit 8 or higher, and have set the JAVA_HOME environment variable.

- Unicode Mode
  You must convert all applications and associated elements to Unicode mode (UTF-8 encoding) before you export and migrate them to the cloud service. Enable Unicode on the server and then for the Essbase application, or a copy, prior to running LCM export. There is an option within the LCM utility for auto-conversion.

- Hybrid Aggregation Mode
  The default calculation and query processor in the cloud service is hybrid mode. Hybrid mode enables block storage cubes to have dynamic, upper-level sparse members, and fully dynamic query and calculation. You can query data immediately after updating it, without running batch calculations. In hybrid mode, there is no impact to your cubes if you choose not to apply Dynamic Calc to upper level sparse members.

- Implied Sharing
  Implied sharing is not applicable in the cloud service. All stored intersections have data, regardless of their child count.
• **Configuration Settings**
Default configuration values are different in the cloud service.

  – **IGNORECONSTANTS** setting is now TRUE by default. Calculations in hybrid mode do not assign constants.

  – **INDEXCACHESIZE** and **DATACACHESIZE** settings now control cache sizes for all cubes on the cloud service (except aggregate storage cubes). Formerly, these settings only affected newly created or migrated cubes. You cannot change the cache sizes using MaxL. You can only change the cache sizes using these configuration settings.

  – **GRIDSUPPRESSINVALID** is now TRUE by default. Invalid intersections are not displayed in Smart View grids.

  – **QRYGOVEXECTIME** is now set by default to 300 seconds, meaning that queries time out if not completed in that timeframe.

In addition to the above noted configuration changes, you can modify the default values for the application-level configuration settings.

Oracle strongly recommends managing all configuration settings at the application level. Application-level configuration is preserved during the LCM utility export and import processes.

• **Application Files and Artifacts**
Convert all application-level files and artifacts to database-level files and artifacts before you export them from on-premises Essbase instance, and before you migrate to the cloud service. This includes calculation scripts, rule files, and text files. In the cloud service, artifacts are supported at the database level only.

You can import on-premises rules files to the cloud service and execute them in the cloud service.

If you encounter file upload size restrictions between external clients and the cloud service, then you may need to split large files into smaller files and then concatenate them together after uploading them to the cloud service, using an SSH connection to the server. This option is only available for Oracle Analytics Cloud – Essbase users in a customer-managed environment.

• **Outlines**
Outlines are encrypted on the cloud service deployment servers. If you need to export and import outlines between cloud service servers, then the LCM command-line utility and application workbooks are the supported methods.

• **Users and Groups**
If you want filters and calculation assignments of existing users to be migrated from on-premises to the cloud service, ensure that Oracle Analytics Cloud – Essbase has the same set of users and groups already available. Also assign appropriate roles to the users before initiating the import.

• **Unsupported Application and Database Setting**
The following application and database level settings are not applicable in Oracle Analytics Cloud – Essbase:

  – Enable/disable Commands (enabled by default)
  – Enable/disable Connects (enabled by default)
  – Enable/disable Updates (enabled by default)
Data and index cache size controls (defaults are fixed, but can be changed per application using INDEXCACHESIZE and DATACACHESIZE configuration settings)

Minimum permission levels (create security filters prior to LCM export instead)

Set lock timeout

Currency conversion

Disk volumes

**Partitions**

When you perform the LCM utility import operation, import the source applications before the target applications. If you don't import source applications prior to target applications, then the partition definition won't work, and you must re-create the partition definition after importing source applications.

**Size Requirements**

Ensure that pre-existing applications you plan to migrate to the cloud service will fit at the resource level you procure. Estimate sizing requirements, and procure the most relevant combination of CPU, memory, and storage.

**Application Creation Options Other than LCM**

In addition to using LCM to migrate exported applications, you can also create applications in the following ways:

- Use Excel application workbooks.
- In Smart View, use the Cube Designer extension.

---

**On-Premises Application Migration and Use Cases**

Oracle Analytics Cloud – Essbase provides a Lifecycle Management (LCM) command-line utility you can use to import Essbase on-premises applications, folders and elements using a .zip file that can be migrated to the cloud service.

The following releases have been tested for migration: 11.1.2.3.0nn, 11.1.2.4.0nn, 11.1.2.4.5nn, 12.2.1, and later. Older versions can be used - work with Oracle Support if you need any assistance. Not all application and database artifacts can be exported.

A .zip file is created containing all the artifacts of the exported application. Federated or linked partitions are not supported.

**Download LCM Utility and Migrate an Application**

Download the LCM utility for migration of On-premises applications.

1. In the Oracle Analytics Cloud – Essbase web interface, click **Console**, expand **Command Line Tools**, and download the Life Cycle Management utility (**EssbaseLCMUtility.zip**).

2. In the uncompressed downloaded file, run **EssbaseLCM.bat** (Windows) or **EssbaseLCM.sh** (Linux), based on the platform on which you want to run the utility. You can execute the file from any location against a remote cloud service instance.

3. Run the LCM export command to download the on-premises Essbase application and its elements to the specified .zip file.
At the LCM utility command prompt, enter the following command syntax to export the application to a .zip file:

```bash
export -server <hostname> <port> -user username -password password -application appname -zipFile zipfile [-nodata] [-isl]
```

4. To import the application into the cloud service, use the Oracle Analytics Cloud – Essbase CLI utility to upload the .zip file to a target cloud service application. When partitions exist in the source between a source application or database, and a target application or database, only partitions from the target are exported to the file system. When partitions exist between cubes being migrated, you must import the data source before the data target. Otherwise, partition definitions may not be restored.

5. Log in to the Oracle Analytics Cloud – Essbase web interface to see the application and cube on the Applications home page.

Migrate from 11.1.2.3.nn On Premises

You can use the LCM to migrate from 11.1.2.3 On Premises to the cloud service, as described here.

1. Download the Life Cycle Management utility from the Console page and execute it in the system running Essbase 11.1.2.3.nn. This use case is similarly relevant to Essbase 11.1.2.4.nn.

2. Export the required source application using the utility. This includes application-level elements. The default -isl argument exports server-level substitution variables.

3. In the exported .zip file, if a partition exists in the source application, then edit the partition XML to correct any partition settings.

4. Import the .zip file into the cloud service using the CLI utility (not the LCM utility, which can't be used for importing to the cloud service).

5. After importing using CLI, perform the following in the Oracle Analytics Cloud – Essbase web interface:
   a. Assign cloud-based user roles to users.
   b. Assign calculation scripts to relevant users

LCM Utility Export Options

You have the following options to use the LCM utility to export from on-premises to the cloud service.

- You can specify `-converttoutf8` option during export to convert the on-premises Essbase application to Unicode, before exporting it to a .zip file.
- You can specify the arguments (`-server`, `-user`, `-password`, `-application`, `-zipfile`) in any order.
- To prompt for a password, do not include the `-password password` option.
- To skip the export of cube data during export, specify `-nodata`, which is an optional argument). By default, all cube data is exported.
### Migrated On-Premises Artifacts

The following table describes which global, application-level, and cube-level Essbase artifacts you can migrate from on-premises to cloud service, using the Lifecycle Management (LCM) command-line tool.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Supported for On-Premises to Cloud migration</th>
<th>Exceptions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application and cube metadata</td>
<td>yes</td>
<td>Application metadata includes application type and settings. Cube metadata includes cube properties and settings.</td>
</tr>
<tr>
<td>Calculation scripts</td>
<td>yes</td>
<td>Application and cube level calculations are migrated. To see the calculation scripts, you must move application level scripts to the cube level using the catalog.</td>
</tr>
<tr>
<td>Data</td>
<td>yes</td>
<td>To be migrated, data must be in the cube directory on the cloud service.</td>
</tr>
<tr>
<td>Database transaction IDs</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Artifact</td>
<td>Supported for On-Premises to Cloud migration</td>
<td>Exceptions/Comments</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Disk volumes</td>
<td>no</td>
<td>Disk volume definitions are not applicable to Oracle Analytics Cloud – Essbase.</td>
</tr>
<tr>
<td>Drill through definitions</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Excel workbooks and files</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Filters</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Linked Reporting Objects (LROs)</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>Location aliases</td>
<td>yes</td>
<td>Location aliases are migrated with the cube.</td>
</tr>
<tr>
<td>Log files</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>Outlines and formulas</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Partitions</td>
<td>yes</td>
<td>Replicated and transparent partitions are migrated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only partition definitions from the target cube are exported to the file system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When migrating the partitioned cubes, you must import the source cube before the target cube; otherwise, partition definitions may not be restored.</td>
</tr>
<tr>
<td>Report scripts</td>
<td>yes</td>
<td>Report scripts are migrated at both application and cube level.</td>
</tr>
<tr>
<td>Rules files, text files, .csv files</td>
<td>yes</td>
<td>Application and cube level files are migrated.</td>
</tr>
<tr>
<td>Scenarios</td>
<td>no</td>
<td>Scenarios do not apply for on-premises applications. There are the same number of rows in both cases.</td>
</tr>
<tr>
<td>Shadow configuration for .jar files</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Substitution variables</td>
<td>yes</td>
<td>Application and cube-level substitution variables are migrated. If you have global (server) level substitution variables, you must convert them to application-level variables prior to migration, or recreate them in the Console post migration.</td>
</tr>
<tr>
<td>Users</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>User roles</td>
<td>no</td>
<td>User roles can be migrated only from one Oracle Analytics Cloud – Essbase instance to another.</td>
</tr>
</tbody>
</table>
Migrate Cloud Service Applications

You can migrate applications and cubes across cloud service instances. Learn how to prepare for migration, and review some use cases for migrating.

- Prepare to Migrate Cloud Service Applications
- Cloud Service Application Migration and Uses Cases
- Migrated Cloud Service Artifacts

Prepare to Migrate Cloud Service Applications

There are a few issues and requirements when migrating cloud service application. The following are some issues to consider:

- If you are migrating across Oracle Analytics Cloud – Essbase deployments and releases, from v17.3.3 (or earlier), use the scripts for migrating to Essbase, as described in the section, Scripts for Administration Tasks in the Administering Oracle Analytics Cloud - Classic document. This also applies to export and import of provisioning of application roles and scripts across these deployments.
- Restoring an application or database from a prior backup, after the application or database was re-created using LCM import, is not supported.

The required user roles are as follows:

- For exporting: Application manager for the application created. In addition, the following can use the LCM utility and CLI tool: Service administrator for all applications; Power user for all applications created by the Power user.
- For importing: Power user or Service administrator, for creating new applications during import.

Cloud Service Application Migration and Uses Cases

You can use the Command-Line Interface (CLI) tool to migrate your source application and elements across Oracle Analytics Cloud – Essbase deployments and releases.

The process flow involves exporting the application to a zip file and then importing the .zip file to the target deployment or release.

To export a Cloud service application from the source

- Run the CLI tool to export the cloud service application to a .zip file.
- Run the CLI tool to import the Essbase on-premises application from the .zip file to the target.

To import a Cloud service application to the target

When partitions exist in the source between a source application or database, and a target application or database, only partitions from the target are exported to the file system. When partitions exist between cubes being migrated, you must import the data source before the data target. Otherwise, partition definitions may not be restored.
To migrate applications and databases from the Financial Consolidation and Close Cloud Service, or from the Planning and Budgeting Cloud Service

1. Export from Planning and Budgeting Cloud Service (PBCS) or Financial Consolidation and Close Cloud Service (FCCS) using the PBCS interface, or the EPM Automate Utility command line tool using `exportsnapshot`. See EPM Automate Utility Commands in Working with EPM Automate for Oracle Enterprise Performance Management Cloud.

2. Run the CLI tool to import the Essbase application and cubes from the PBCS `.zip` file using CLI command `lcmimport`.

Migrated Cloud Service Artifacts

The following table describes which global, application-level, and cube-level Essbase artifacts you can migrate between cloud service instances, using the Lifecycle Management (LCM) command-line tool.

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Supported For Cloud to Cloud migration</th>
<th>Exceptions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application and cube metadata</td>
<td>yes</td>
<td>Application metadata includes application type and settings. Cube metadata includes cube properties and settings.</td>
</tr>
<tr>
<td>Application-level configuration files</td>
<td>yes</td>
<td>If these files exist, they are migrated.</td>
</tr>
<tr>
<td>Calculation scripts</td>
<td>yes</td>
<td>Application- and cube-level calculations are migrated.</td>
</tr>
<tr>
<td>Catalog server</td>
<td>no</td>
<td>Files listed under Files in the web interface under Applications/&lt;appname&gt; are migrated. Other files or folders listed there are not migrated - you can manually download and restore them.</td>
</tr>
<tr>
<td>Connections and Datasources</td>
<td>yes</td>
<td>Application connections and Datasources are migrated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To migrate global connections and Datasources, include the following argument to LCM import or export operations: <code>-include-server-level</code> (or use abbreviation <code>-isl</code>)</td>
</tr>
<tr>
<td>Data</td>
<td>yes</td>
<td>To be migrated, data must be in the cube directory on the cloud service.</td>
</tr>
<tr>
<td>Disk volumes</td>
<td>no</td>
<td>Disk volume definitions are not applicable to Oracle Analytics Cloud – Essbase.</td>
</tr>
<tr>
<td>Drill through definitions</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Excel workbooks and files</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Filters</td>
<td>yes</td>
<td>Cube-level filters and user-created filters are migrated.</td>
</tr>
<tr>
<td>Artifact</td>
<td>Supported For Cloud to Cloud migration</td>
<td>Exceptions/Comments</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Layouts</td>
<td>yes</td>
<td>Cube-level layouts are migrated.</td>
</tr>
<tr>
<td>Linked Reporting Objects (LROs)</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>Location aliases</td>
<td>yes</td>
<td>Location aliases are migrated with the cube.</td>
</tr>
<tr>
<td>Log files</td>
<td>no</td>
<td>Log files are not migrated.</td>
</tr>
<tr>
<td>Named Queries</td>
<td>yes</td>
<td>Cube-level named queries are migrated.</td>
</tr>
<tr>
<td>Outlines and formulas</td>
<td>yes</td>
<td>Formulas containing @XREF cannot be migrated.</td>
</tr>
<tr>
<td>Partitions</td>
<td>yes</td>
<td>Replicated and transparent partitions are migrated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only partition definitions from the target cube are exported to the file system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When migrating the partitioned cubes, you must import the source cube before the target cube; otherwise, partition definitions may not be restored.</td>
</tr>
<tr>
<td>Report scripts</td>
<td>yes</td>
<td>Application- and cube-level report scripts are migrated.</td>
</tr>
<tr>
<td>Rules files, text files, .csv files</td>
<td>yes</td>
<td>Application-and cube-level files are migrated.</td>
</tr>
<tr>
<td>Scenarios</td>
<td>yes</td>
<td>If a cube is scenario-enabled and has a Sandbox dimension, the scenarios are migrated.</td>
</tr>
<tr>
<td>Substitution variables</td>
<td>yes</td>
<td>Application- and cube-level substitution variables are migrated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you have global (server) level substitution variables, you must convert them to application-level variables prior to migration, or recreate them in the Console post migration.</td>
</tr>
<tr>
<td>Users</td>
<td>no</td>
<td>-</td>
</tr>
<tr>
<td>User roles</td>
<td>yes</td>
<td>User roles can be migrated only from one Oracle Analytics Cloud – Essbase instance to another.</td>
</tr>
<tr>
<td>Wallet files</td>
<td></td>
<td>Wallet files for the specified application are migrated.</td>
</tr>
</tbody>
</table>
Configure Cloud Service Resource Limits and Application Configuration Properties

The cloud service is preconfigured with resource-limits that you may never need to modify. If necessary, you can modify resource limits for the cloud service instance and you can set configuration properties at the application level.

- Modify Cloud Service Resource Limits
- Set Application-Level Configuration Properties

Modify Cloud Service Resource Limits

This topic applies only to Oracle Cloud Infrastructure Classic.

If you have a Service Administrator role, you can customize your Oracle Analytics Cloud – Essbase instance by modifying the resource limits that were set when the size and shape of the cloud service compute node was selected during setup.

For information on compute shapes, see Before You Create a Service in Administering Oracle Analytics Cloud.

Before changing resource limits, you should know what the current resource limits are in the cloud service instance. The Service Administrator can access the cloud service virtual machine using a Secure Shell (SSH) client. Log in as user oracle and enter the `ulimit -a` command. Changing the cloud service resource limits could affect performance.

You can also view the system resources for available RAM and disk space, and the minimum required. If the available system resources are less than the minimum required, the system will stop responding.

1. On the Applications page, without selecting an application or cube, click **Console**.
2. On the Settings page, under Resources, is a list of the predefined settings and their descriptions, which are all set to the default value.
   
   See the tables that follow this task for the default values based on the shape of your cloud service compute node.

3. To change a resource limit, enter a value. If the value of a resource limit is not already set to unlimited, you can select **Unlimited**.
4. Click Save.

Default value of resource limits for the OC3, OC4, OC5, and OC6 compute shapes.

Default value of resource limits for the OC1M, OC2M, OC3M, OC4M, OC5M, and OC6M compute shapes.
Credentials for the Oracle Database that is used with your cloud service instance are used for administrative tasks related to managing services.

1. Under **Database**, enter the user name and password for the Oracle Database.
2. Click **Save**.

### Set Application-Level Configuration Properties

If you have the Service Administrator role, or the Power User role for applications that you created, you can customize applications using application-level configuration properties. Application-level configuration properties apply to all cubes in the application.

One way to specify configuration properties of an application is to do it prior to building the application and cube, using the application workbook. To see an example, go to Files in the Oracle Analytics Cloud – Essbase web interface, and download the application workbook `Sample_Basic.xlsx`. It is located in the gallery, in the Demo Samples section (under Block Storage). In this application workbook, go to the Cube.Settings worksheet. Under Application Configuration, you can see that the DATACACHESIZE property is set to 3M, and the INDEXCACHESIZE property is set to 1M.

The following steps tell you how to configure an application that is already deployed, by adding properties and their corresponding values in the Oracle Analytics Cloud – Essbase web interface.

1. On the Applications page, select the application you want to configure.
2. From the **Actions** menu to the right of the application, click **Inspect**, then click **Configuration**.
3. To add a property, click **+**. Select a property from the list. When done adding properties, close the list window.
4. To change a property’s value, double-click a property row and edit its value.
5. When you’re finished making changes, click **Apply**.

The configuration changes will take effect next time the application restarts.
For syntax and information about each of the application configuration properties you can use, see Config Settings List in the *Technical Reference for Oracle Analytics Cloud - Essbase*.

Do not attempt to modify `essbase.cfg` on the Oracle Analytics Cloud – Essbase file system. This configuration is automatically set.
Oracle Analytics Cloud – Essbase
Command-Line Interface (CLI)

The command-line interface is a nongraphical interface between you and the cloud service, in which you enter shell commands to perform administrative actions on Oracle Analytics Cloud – Essbase.

- Download and Use the Command-Line Interface
- CLI Command Reference

Download and Use the Command-Line Interface

1. If it is not already installed, download and install Java SE Development Kit 8 from Oracle Technology Network.
2. Set the JAVA_HOME environment variable on your system to point to the JDK installation folder. If the installation path has any spaces, enclose the path in quotation marks.

<table>
<thead>
<tr>
<th>Variable name:</th>
<th>JAVA_HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable value:</td>
<td>&quot;C:\Program Files\Java\jdk1.8.0_171&quot;</td>
</tr>
</tbody>
</table>

4. In the Console, go to Desktop Tools and expand Command Line Tools.
5. Click Download next to the utility labeled Command-line Tool.
6. Download cli.zip to a local drive. For best results, choose a path that has no spaces; for example, C:\Oracle.
7. Uncompress cli.zip, and see the extracted files under the cli folder.
8. To issue commands interactively, first start the shell:
   - Windows: Run esscs.bat.
   - UNIX: Run esscs.sh.

   If the CLI was installed correctly, a list of supported commands is displayed.
9. To run CLI scripts in the shell, start the shell in the command line, providing the script name as an argument to the shell. For example: .\esscs.sh scriptname
Oracle recommends beginning every CLI script with the following directive before the login statement:

```bash
export ESSCLI_ID=`whoami`_$PPID
```

This helps store session information and prevent execution errors when multiple scripts are run concurrently.

See also Set Up Your Client.

**CLI Command Reference**

The following commands are available in the command-line interface. Arguments to commands can be issued in any order.

- `calc`
- `clear`
- `createlocalconnection`
- `dataload`
- `deletefile`
- `deploy`
- `dimbuild`
- `download`
- `help`
- `lcmexport`
- `lcmimport`
- `listapp`
- `listdb`
- `listfiles`
- `listfilters`
- `listlocks`
- `listvariables`
- `login, logout`
- `setpassword`
- `start`
- `stop`
- `upload`
- `version`

To display help for all commands, enter `esscs -h`. To display help for a specific command, enter `esscs command -h`.

To turn on verbose output for any command, meaning that extended information (if available) is displayed, enter `esscs command -v command arguments`. 
Login/Logout: EssCS Connection

Before you can issue CLI commands to the cloud service, you must log in. If a secure connection is required, then the URL must begin with https.

Syntax (login)

```
login [-verbose] -essbaseurl https://cloud-instance-name.oraclecloud.com/essbase -user username [-password password]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-essbaseurl</td>
<td>-url</td>
<td>Address of an instance of Oracle Analytics Cloud – Essbase</td>
</tr>
<tr>
<td>-user</td>
<td>-u</td>
<td>User name</td>
</tr>
<tr>
<td>-password</td>
<td>-p</td>
<td>Optional. Password for user. Best practice is to set the password using setpassword.</td>
</tr>
</tbody>
</table>

Example (login)

```bash
esscs login -url https://myEssbase-test-myDomain.analytics.us2.oraclecloud.com/essbase -u smith
```

Syntax (logout)

```
logout
```

Example (logout)

```bash
esscs logout
```

Calc: Run a Calculation Script

Calculates a cube.

To run calculation scripts, you must first upload the scripts, as .csc files, to the cloud service. You can use the CLI to upload files. See Upload: Add Cube Files.

Syntax

```
calc [-verbose] -application appname -db cubename -script scriptfilename
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Database (cube) name</td>
</tr>
</tbody>
</table>
**Option** | **Abbreviation** | **Description**
---|---|---
-script | -s | Calculation script name. Must have `.csc` file extension. You do not need to give a full path. Files are assumed to be in the relevant application or database directory.

**Example**

```
esscs calc -v -a Sample -d Basic -s CALCALL.CSC
```

**Clear: Remove Data from a Cube**

Clears data from a cube.

**Syntax**

```
clear [-verbose] -application appname -db cubename [-option clearOption][-regionspec regionSpec]
```

**Option** | **Abbreviation** | **Description**
---|---|---
-verbose | -v | Optional. Show extended descriptions
-application | -a | Application name
-db | -d | Database (cube) name
-option | -O | Optional. Keyword specifying what to clear. The options are:

- `ALL_DATA`—All data, linked objects, and the outline are cleared
- `ALL_AGGREGATIONS`—All aggregated data is cleared
- `PARTIAL_DATA`—Only specified data region is cleared. Use with `-regionspec`

-regionspec | -rs | MDX expression specifying the region to clear

**Example**

```
esscs clear -a ASOSamp -d Basic -O PARTIAL_DATA -rs "{{Jan},{Sale},[Cash]})"
```

**Createlocalconnection: Save a JDBC Connection**

Creates a JDBC connection and stores it locally.

**Description**

You must use this command to create and save the local connection before you can use the CLI `dataload` or `dimbuild` commands with the streaming option. You must also set an environment variable `EXTERNAL_CLASSPATH` to point to the `.jar` file for your database driver. For examples of setting this variable, see Build Dimensions and Load Data by Streaming from a Remote Database.
Syntax

createLocalConnection [-verbose] -name streamConnection -connectionstring connectionString -user userName [-driver jdbcDriver]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-name</td>
<td>-N</td>
<td>Connection name</td>
</tr>
<tr>
<td>-connectionstring</td>
<td>-cs</td>
<td>JDBC connection string. Format can be with SID, as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>${jdbc:oracle:thin:@host:port:SID}</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or with service name, as follows</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>${jdbc:oracle:thin:@host:port/service_name}</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Examples.</td>
</tr>
<tr>
<td>-user</td>
<td>-u</td>
<td>User name</td>
</tr>
<tr>
<td>-driver</td>
<td>-D</td>
<td>JDBC driver. If not provided, Oracle Database is assumed the default, as</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>oracle.jdbc.driver.OracleDriver</code></td>
</tr>
</tbody>
</table>

Examples

The following examples reflect various data sources.

If the -driver option and `jdbcDriver` parameter are not provided, Oracle database is the assumed database by default.

**Oracle DB – Example with SID (Service ID)**

esscs createLocalConnection -N OracleDBConnection1 -cs jdbc:oracle:thin:@myhostname01:1521:ORCL -u OracleUser -D oracle.jdbc.driver.OracleDriver

**Oracle DB – Example with Service Name**

esscs createLocalConnection -N OracleDBConnection2 -cs jdbc:oracle:thin:@host1.example.com:1521/ORCL.esscs.host1.oraclecloud.com -u OracleUser

**DB2**

esscs createLocalConnection -N DB2conn -cs jdbc:db2:// myhostname02.example.com:50000/TBC -u myDB2User -D com.ibm.db2.jcc.DB2Driver
MySQL

```
```

Microsoft SQL Server

```
```

Teradata

```
esscs createLocalConnection -N TeraDconn -cs jdbc:teradata://myhostname05.example.com/DBS_PORT=1025 -u MSSQLUsr -D com.teradata.jdbc.TeraDriver
```

Dataload: Load Data to a Cube

Loads data to a cube.

This command requires one of the following sets of options:

- Data file and optional rules file
- Rules file with user name and password
- Stream option referencing a saved local connection. For additional information about the stream option, see Build Dimensions and Load Data by Streaming from a Remote Database.

To load data, you must first upload the data load and rules files to the cloud service. You can use the CLI to upload files. See Upload: Add Cube Files.

Syntax

```
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Database (cube) name</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Data load file name. You do not need to give a full path. Files are assumed to be in the relevant application or database directory.</td>
</tr>
<tr>
<td>-rule</td>
<td>-r</td>
<td>Optional. Rules file name. You do not need to give a full path. Files are assumed to be in the relevant application or database directory.</td>
</tr>
<tr>
<td>-user</td>
<td>-u</td>
<td>Optional. User name. Requires password if used.</td>
</tr>
<tr>
<td>-password</td>
<td>-p</td>
<td>Optional. Password for user. If omitted, user will be prompted for password.</td>
</tr>
<tr>
<td>Option</td>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-stream</td>
<td>-S</td>
<td>Optional. Use streaming data load. Requires -conn option if used.</td>
</tr>
<tr>
<td>-connection</td>
<td>-conn</td>
<td>Required if streaming option is used. Name of a saved connection that was created using the CLI command createlocalconnection.</td>
</tr>
<tr>
<td>-query</td>
<td>-q</td>
<td>Optional. Database query to submit along with the streaming data load.</td>
</tr>
<tr>
<td>-rows</td>
<td>-rows</td>
<td>Optional. Number of rows to stream simultaneously. Default is 100.</td>
</tr>
<tr>
<td>-abortOnError</td>
<td>-abort</td>
<td>Abort data load if error is encountered.</td>
</tr>
</tbody>
</table>

**Example**

esscs dataload -application Sample -db Basic -file Calcdat.txt -abortOnError true

esscs dataload -application Sample -db Basic -rule Basic.rul -stream -connection oraConn -query "Select * from Data" -rows 50

**Deletefile: Remove Cube Files**

Removes cube artifacts from the application, database, or user home directory.

**Syntax**

delelefile [-verbose] -file fileName [-application application [ -db database]]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Name of the file to delete.</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Optional. Application name. If not provided, files are assumed to be in the user home directory on the cloud service.</td>
</tr>
<tr>
<td>-database</td>
<td>-db</td>
<td>Optional. Database (cube) name</td>
</tr>
</tbody>
</table>

**Example**

esscs deletefile -a Sample -d Basic -f Act1.rul
Deploy: Create a Cube from a Workbook

Creates a cube from an Excel application workbook.

**Syntax**

```
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Name of the application workbook file</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Optional. Application name. If not provided, application name will be taken from the workbook.</td>
</tr>
<tr>
<td>-database</td>
<td>-db</td>
<td>Optional. Database (cube) name. If not provided, database name will be taken from the workbook.</td>
</tr>
<tr>
<td>-loaddata</td>
<td>-l</td>
<td>Optional. Load data, if the application workbook contains a data worksheet. Otherwise, only metadata is imported into the cube.</td>
</tr>
<tr>
<td>-recreateapplication</td>
<td>-ra</td>
<td>Optional. Re-create the application, if it already exists.</td>
</tr>
<tr>
<td>-createfiles</td>
<td>-cf</td>
<td>Optional. Create cube artifacts in the files directory on the cloud service instance.</td>
</tr>
<tr>
<td>-executescript</td>
<td>-e</td>
<td>Optional. Execute calculation scripts, if the application workbook contains a calculation worksheet.</td>
</tr>
</tbody>
</table>

**Example**

```
esscs deploy -a SampleD1 -d BasicD1 -f Sample_Basic.xlsx -l -ra -cf -e
```

Dimbuild: Load Dimensions to a Cube

Loads dimensions to a cube.

To load dimensions, you must first upload the dimension-build and rules files to the cloud service. You can use the CLI to upload files. See Upload: Add Cube Files.

**Syntax**

```
dimbuild [-verbose] -application appname -db cubename -file fileName -rule rulesFile [-user userName [-password password]] [-stream] [-connection connectionName] [-query queryString] [-rows n] [-restructureOption restructureOption] [-forcedimbuild]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>Option</td>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Database (cube) name</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Dimension build file name. You do not need to give a full path. Files are assumed to be in the relevant application or database directory</td>
</tr>
<tr>
<td>-rule</td>
<td>-r</td>
<td>Rules file name. You do not need to give a full path. Files are assumed to be in the relevant application or database directory</td>
</tr>
<tr>
<td>-user</td>
<td>-u</td>
<td>Optional. User name. Requires password if used</td>
</tr>
<tr>
<td>-password</td>
<td>-p</td>
<td>Optional. Password for user. If omitted, user will be prompted for password</td>
</tr>
<tr>
<td>-stream</td>
<td>-S</td>
<td>Optional. Use streaming dimension build. Requires -conn option if used.</td>
</tr>
<tr>
<td>-connection</td>
<td>-conn</td>
<td>Required if streaming option is used. Name of a saved connection that was created using the CLI command Createlocalconnection: Save a JDBC Connection.</td>
</tr>
<tr>
<td>-query</td>
<td>-q</td>
<td>Optional. Database query to submit along with the streaming dimension build.</td>
</tr>
<tr>
<td>-rows</td>
<td>-rows</td>
<td>Optional. Number of rows to stream simultaneously. Default is 100.</td>
</tr>
<tr>
<td>-restructureOption</td>
<td>-R</td>
<td>Controls your preservation choices for the outline restructure.</td>
</tr>
</tbody>
</table>

For block storage, possible options are:

- ALL_DATA: Preserve all data when loading dimensions.
- NO_DATA: Do not preserve data.
- LEAFLEVEL_DATA: Preserve only level 0 data values. If all data required for calculation resides in level-0 members, then you should select this option. All upper-level blocks are deleted before the cube is restructured. When the cube is recalculated, the upper-level blocks are re-created.
- INPUT_DATA: Preserve only input data.

For aggregate storage, possible options are:

- ALL_DATA: Preserve all data when loading dimensions.
- NO_DATA: Do not preserve data.

-forcedimbuild    | -F           | Continue the dimension build even if other user activities are in progress. This cancels active user sessions. |

Examples

escss dimbuild -a Sample -d Basic -r Basic.rul -u smith -p password -R NO_DATA -forceDimBuild


escss dimbuild -a Sample -d Basic -r Basic.rul -S -conn oraConn -q "Select * from Data" -rows 50 -R NO_DATA
Download: Get Cube Files

Downloads cube artifacts from an instance of Essbase to a local directory. You may need to download text files, rules files, or calculation script files from a cube, so you can upload them to another cube.

Syntax

download [-verbose] -file filename [-application appname [-db cubename]] [-localdirectory path] [-overwrite] [-nocompression]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Name of file to download</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Optional. Application name. If not provided, artifacts are downloaded from the user home directory on the cloud service.</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Optional. Database (cube) name</td>
</tr>
<tr>
<td>-localdirectory</td>
<td>-ld</td>
<td>Optional. A local directory path</td>
</tr>
<tr>
<td>-overwrite</td>
<td>-o</td>
<td>Optional. Overwrite existing file</td>
</tr>
<tr>
<td>-nocompression</td>
<td>-nc</td>
<td>Optional. Disable compression of data transfer</td>
</tr>
</tbody>
</table>

Example

esscs download -v -f Product003.rul -a Sample -d Basic -ld c:/temp -o

esscs download -file Acli.rul -ld c:/temp -o

Help: Display Command Syntax

Displays CLI command level help in the console or terminal.

Syntax

[command] -help | -h

Examples

esscs -help

esscs -h

esscs dataload -help
LcmExport: Back Up Cube Files

Backs up cube artifacts to a Lifecycle Management (LCM) .zip file.

Syntax


<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Name of application to back up</td>
</tr>
<tr>
<td>-zipfilename</td>
<td>-z</td>
<td>Optional. Name of compressed file to hold backup files</td>
</tr>
<tr>
<td>-localdirectory</td>
<td>-ld</td>
<td>Optional. A local directory path</td>
</tr>
<tr>
<td>-threads</td>
<td>-T</td>
<td>Optional. Number of threads to spawn if using parallel export</td>
</tr>
<tr>
<td>-skipdata</td>
<td>-skip</td>
<td>Optional. Do not include data in the backup</td>
</tr>
<tr>
<td>-overwrite</td>
<td>-o</td>
<td>Optional. Overwrite existing backup file</td>
</tr>
</tbody>
</table>

Notes

This command, like other CLI commands, can be used from outside the cloud service virtual machine, whereas the LCM utility must be run within the cloud service virtual machine.

Example

esscs lcmExport -v -a Sample -z Sample.zip -ld c:/temp -skip -o

LcmImport: Restore Cube Files

Restores cube artifacts from a Lifecycle Management (LCM) .zip file.

Syntax

lcmImport [-verbose] -zipfilename filename [-overwrite]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-zipfilename</td>
<td>-z</td>
<td>Name of compressed file containing backup files</td>
</tr>
<tr>
<td>-overwrite</td>
<td>-o</td>
<td>Optional. Recreate the target application.</td>
</tr>
</tbody>
</table>

Notes

- This command, like other CLI commands, can be used from outside the cloud service virtual machine, whereas the LCM utility must be run within the cloud service virtual machine.
When partitions exist between cubes being migrated, you must import the data source before the data target. Otherwise, partition definitions may not be restored.

**Example**

```bash
esscs lcmImport -z C:/Sample/Sample.zip -o
```

### Listapp: Display Applications

Lists applications that exist on an instance of Oracle Analytics Cloud – Essbase.

**Syntax**

```
listapp [-verbose] [details]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-details</td>
<td>-dtl</td>
<td>Optional. Display more details in the output.</td>
</tr>
</tbody>
</table>

**Example**

```bash
esscs listapp
```

### Listdb: Display Cubes

Lists databases that exist within an application on Oracle Analytics Cloud – Essbase.

**Syntax**

```
listdb [-verbose] [details]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-details</td>
<td>-dtl</td>
<td>Optional. Display more details in the output.</td>
</tr>
</tbody>
</table>

**Example**

```bash
esscs listdb
```

### Listfiles: Display Files

Lists cube artifacts that exist on an instance of Oracle Analytics Cloud – Essbase. Cube artifacts may include text files, rules files, calculation script files, or MaxL script files. Cube artifacts are any files that are needed to perform actions on applications and cubes.
Syntax

```
listfiles [-verbose] [-type filetype] [-application appname [-db cubename]]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
</tbody>
</table>
| -type       | -t           | Optional. File extension/type to display, not including the period. Supported file types are:
|             |              | • .csc (calculation scripts)                                 |
|             |              | • .rul (rules files)                                         |
|             |              | • .txt (text files)                                          |
|             |              | • .msh (MaxL scripts)                                        |
|             |              | • .xls, .xlsx (Excel workbooks)                               |
|             |              | • .xlsm (macro-enabled Excel workbooks)                       |
|             |              | • .xml (XML files)                                           |
|             |              | • .zip (compressed zip files)                                 |
|             |              | • .csv (comma-separated files)                               |
| -application | -a           | Optional. Application name. If not provided, files from the user home directory on the cloud service are displayed. |
| -db         | -d           | Optional. Database (cube) name                               |

Example

```
esscs listfiles -t rul -a Sample -d Basic
```

**Listfilters: View Security Filters**

View a list of Essbase security filters.

Syntax

```
listfilters [-verbose] -application appname -db cubename
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Database (cube) name</td>
</tr>
</tbody>
</table>

Example

```
esscs listfilters -v -a Sample -d Basic
```
Listlocks: View Locks

View any locked data blocks or cube-related objects.

Syntax

listlocks [-verbose] -application appname -db cubename [-object]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Database (cube) name</td>
</tr>
<tr>
<td>-object</td>
<td>-obj</td>
<td>Optional. Display locked files/artifacts.</td>
</tr>
</tbody>
</table>

Example

esscs listlocks -v -a Sample -d Basic -obj

Listvariables: Display Substitution Variables

Lists substitution variables defined at the application or cube scope.

Syntax

listvariables [-verbose] -application application [-db database]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Optional. Application name.</td>
</tr>
<tr>
<td>-database</td>
<td>-db</td>
<td>Optional. Database (cube) name</td>
</tr>
</tbody>
</table>

Example

esscs listvariables -a Sample -d Basic

Setpassword: Store CLI Credentials

Sets a password for a CLI user, and stores the user credentials so that the user can log in without entering a password.

Syntax

setpassword [-v] -url URL -u userName

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Show extended descriptions</td>
</tr>
</tbody>
</table>
### Option and Abbreviation Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-url</td>
<td>-url</td>
<td>Address of an instance of Oracle Analytics Cloud – Essbase</td>
</tr>
<tr>
<td>-user</td>
<td>-u</td>
<td>The user whose password to set</td>
</tr>
</tbody>
</table>

### Example

```bash
esscs setpassword -url https://myEssbase-test-myDomain.analytics.us2.oraclecloud.com/essbase -user smith
```

### Start: Start an Application or Cube

Start an Essbase application or cube, loading it into memory.

**Syntax**

```bash
start [-verbose] -application appname [-db cubename]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Optional. Database (cube) name</td>
</tr>
</tbody>
</table>

### Example

```bash
esscs start -v -a Sample -d Basic
```

### Stop: Stop an Application or Cube

Stop an Essbase application or cube.

**Syntax**

```bash
stop [-verbose] -application appname [-db cubename]
```

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Application name</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Optional. Database (cube) name</td>
</tr>
</tbody>
</table>

### Example

```bash
esscs stop -v -a Sample -d Basic
```
Upload: Add Cube Files

Uploads cube artifacts from a local directory to an instance of Oracle Analytics Cloud – Essbase. To perform tasks such as data loads, dimension builds, calculations, or running MaxL scripts, you may need to upload text files, rules files, calculation script files, or MaxL script files to a cube.

Syntax

upload [-verbose] -file filename [-application appname [-db cubename]] [-overwrite] [-nocompression][-compressionalgorithm]

<table>
<thead>
<tr>
<th>Option</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-verbose</td>
<td>-v</td>
<td>Optional. Show extended descriptions</td>
</tr>
<tr>
<td>-file</td>
<td>-f</td>
<td>Name of file to upload</td>
</tr>
<tr>
<td>-application</td>
<td>-a</td>
<td>Optional. Application name. If not provided, files are uploaded from the user home directory on the cloud service.</td>
</tr>
<tr>
<td>-db</td>
<td>-d</td>
<td>Optional. Database (cube) name</td>
</tr>
<tr>
<td>-overwrite</td>
<td>-o</td>
<td>Optional. Overwrite existing file</td>
</tr>
<tr>
<td>-nocompression</td>
<td>-nc</td>
<td>Optional. Disable compression of data transfer</td>
</tr>
<tr>
<td>-compressionalgorithm</td>
<td>-ca</td>
<td>Optional. Available if -nc is not used. Defines which compression algorithm to use for data transfer. Possible choices: gzip or lz4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• gzip—Default if compression is used. Provides smaller data transfer with slower calculation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• lz4—Provides faster calculation with a slower data transfer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Usage examples:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-ca gzip</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-ca lz4</td>
</tr>
</tbody>
</table>

Example

esscs upload -v -f c:/temp/Max101.msh -a Sample -d Basic -o -ca lz4

Version: Display API Version

Gets the version of the REST API that is behind this instance of Oracle Analytics Cloud – Essbase.

Syntax

version
Example

esscs version
Manage Essbase Using the MaxL Client

MaxL is a multi-dimensional database access language for Oracle Analytics Cloud – Essbase.

To run MaxL scripts or statements, you must use the MaxL Client to issue the statements over HTTP or HTTPS.

Prerequisites to Set Up the MaxL Client

Complete these tasks before you download and use the MaxL Client. To execute MaxL scripts or statements, you must be a power user or administrator.

To prepare for using the MaxL Client,
1. Get the URL, for the cloud service instance you are using, from your Service Administrator. Its basic format is:

   https://cloud-instance-name.oraclecloud.com/essbase

2. Using a web browser or cURL, test that you can reach the discovery URL from the client host. Here is a cURL example:

   curl https://myEssbase-myDomain.oraclecloud.com/essbase/agent --tlsv1.2

3. Set up the SSL certificate, if applicable to your organization.
   • If you’re using one of these deployment types, a Trusted CA Signed SSL Certificate is included:
     – Oracle Analytics Cloud
     – Oracle Analytics Cloud with Identity Cloud Service (IDCS) and Load Balancing
     – Cloud at Customer with Load Balancing
   • If you’re using Oracle Analytics Cloud or Cloud at Customer with LDAP (without Load Balancing), use a self-signed certificate.

4. To check if a certificate is trusted, paste the discovery URL into a web browser. If https is green or a label says “Secure,” it is trusted. If https is red or a label says “Not secure,” it is untrusted.

5. If the certificate is untrusted (self-signed), import it to the client trust store (cacert.pem).

6. The client verifies the server’s digital certificate using a provided ca-bundle certificate store. Provide the ca-bundle location by specifying the environment variable:

   API_CAINFO=CA certificate file path;
If the path is not provided, the Essbase Runtime Client will try to get ca-bundle from the default OpenSSL installation location (applicable for Linux and Macintosh).
Oracle Data Visualization clients and MaxL Client include a ca-bundle (cacert.pem).

If you need a ca-bundle (cacert.pem), you can also download it. One sample source is: https://curl.haxx.se/docs/caextract.html.

Download and Use the MaxL Client

The Essbase MaxL Client enables you to use MaxL over HTTP or HTTPS. MaxL is an administrative, language-based interface for managing cubes and artifacts. This alternative to the CLI can be useful if you already have a library of MaxL scripts. Be sure you are using the latest client version provided in the Console, as older, previously downloaded versions may not work correctly.

To run MaxL statements, you must be a power user or an administrator. Before you download the MaxL Client, see Prerequisites to Set Up the MaxL Client.

1. In the Oracle Analytics Cloud – Essbase web interface, click **Console**.
2. In the Console, go to **MaxL Clients**.
3. Click **Download**
   next to the MaxL Client that is appropriate for your platform.
4. Save the compressed **EssbaseMaxl** file to your local drive.
5. Extract the contents of the compressed file to a folder.
6. If you’re using a proxy, you must set or unset the correct proxy in the MaxL execution script, **startMAXL.bat** or **startMAXL.sh**. Here are examples using bash:

   ```bash
   export https_proxy=http://proxy.example.com
   export no_proxy=127.0.0.1,localhost,something.something.com
   ```

7. Run the **startMAXL** batch or shell script. A command prompt opens, the environment setup completes, and the MaxL Client starts up.
8. Log in by providing your service credentials and discovery URL in the MaxL **login** statement.
   For example:

   ```maxl
   login admin1 password1 on "https://myEssbase-
   myDomain.analytics.us2.oraclecloud.com/essbase/agent";
   ```

   For example:

   ```maxl
   display database all;
   ```

To learn more about MaxL, see MaxL Statement Reference in Technical Reference for Oracle Analytics Cloud - Essbase.
Analyze Data in the Web Interface

For convenience, you can perform analysis on cube data from the Essbase web interface.

To analyze data grids in the Essbase web interface,

1. Log in to Essbase with at least Database Access role for the application whose cube data you want to analyze.

2. On the Applications page, expand the application, and highlight the row containing the cube name.

3. From the Actions menu to the right of the cube name, click Analyze Data.

A grid is displayed in the Ad Hoc Analysis tab. In this tab, you can:

- Perform ad hoc analysis against the cube you selected when you opened the Analyze Data view.
- Save a grid layout that you can refresh when you use the Ad Hoc Analysis tab in the future.

On the Reports tab, you can use MDX to write sophisticated data queries to populate the grid and to save as named reports.

Perform Ad Hoc Analysis in the Web Interface

In the Ad Hoc Analysis tab of the Analyze Data view, a grid is displayed containing each of the base dimensions (non-attribute dimensions) from the cube.

You may or may not see data in the ad hoc grid, depending on your filter access and how data is stored in the cube. Data is not always stored at the topmost member for every dimension hierarchy.

Use the ad hoc navigation buttons at the top left of the Ad Hoc Analysis tab to navigate to data that you are allowed to see. If your filter grants you write permission on the cube, the Submit button enables you to update data for stored intersections within the scope of your filtered access.
Work with Layouts

If you create a grid that you would like to use again in the future, you can save it at any time as a Layout.

To create a layout,

1. In the Analyze Data view for your cube, on the Ad Hoc Analysis tab, create an ad hoc grid that you want to save.
2. Click **Save Layout**.
3. Enter a name for your layout, and optionally, a description.
4. If you want to see this grid each time you analyze data, instead of the database default ad hoc query, check the **default layout** box.
5. Click **Save**.

The last ad hoc grid that was rendered during your session will be displayed the next time you log in, unless a default is set.

To view a grid previously saved as a layout,

1. If layouts are not listed by name in the Ad Hoc Analysis tab, click the **Layouts Panel** button to display the list.
2. Click the name of a stored layout to render it in the grid.

To delete or edit layouts that you created, use the Actions menu next to the layout name. The Edit option allows you to select the layout as your default, update the description, or remove the default setting on a layout previously set as your default.

Access to Layouts

How you work with layouts depends on your cube access.

Clicking on a saved layout name causes it to render data in the Ad Hoc Analysis tab of the Analyze Data view.

Users with, at minimum, the application-level role of Database Manager can:

- See and render layouts created by others for this cube.
- Designate a layout to be the database default. This layout is shown to all cube users when they analyze data, unless they have previously created their own user default layouts.
- Delete layouts created by any user of this cube.
Layouts and reports are included when the cube is copied or moved using migration, export, and Lifecycle Management (LCM) tools.

**Analyze and Manage Data with MDX**

MDX (Multidimensional Expressions) is a powerful data manipulation and querying language.

With MDX, you can:

- Query and report against data and metadata in Essbase cubes
- Insert data into an Essbase cube
- Export data from an Essbase cube

An **MDX query** is a single MDX statement having exactly one result set that applies to a single cube.

An **MDX report** is an MDX query, saved in the cube context.

An **MDX script** is a file, with an .mdx extension, that you can run from Jobs or in Smart View.

Topics:

- Analyze Data with MDX Reports
- Insert and Export Data with MDX
- Run MDX Scripts

**Analyze Data with MDX Reports**

You can store and render queries in the Essbase web interface using MDX reports. The minimum permission required to create a report is Database Manager.

Defining Layouts using the Ad Hoc Analysis tab may not always be the most efficient way to create a sophisticated report. If you know exactly what you want to query, you can use MDX to create a query to populate the grid.

To create an MDX report:

1. Log in to the Essbase web interface as a Database Manager or higher role.
2. On the Applications page, expand an application and select a cube.
3. Click the Actions menu to the right of the cube name, and select Analyze Data.
4. In the Analyze view, select the Reports tab and click Create.
5. Enter a name for the report, and optionally, a description.
6. In the Query field, enter an MDX query relevant to the current cube. For example:

```mdx
SELECT
    {([West].children)}
on columns,
    {([Diet].children)}
on rows
```
The query must contain both row and column axes specifications. In other words, the query syntax must include specifications for both ON COLUMNS and ON ROWS, even if only an empty set {} is specified for one axis.

Because the context of Analyze Data is the active cube, we recommend that you omit the optional cube specification (the FROM clause) from MDX reports. Omitting the FROM clause allows for more flexibility—if the cube is copied or renamed, the report will work in the new cube.

Substitution variables are supported in MDX reports, but not runtime substitution variables. To use runtime substitution variables, save the MDX query as a script, and run it from Smart View using Calculate on the Essbase ribbon.

7. Click Validate to verify your MDX syntax, and then click Save.

8. From the Reports panel on the left, select the saved report to render a grid.

To learn more about MDX, see MDX in Technical Reference for Oracle Analytics Cloud - Essbase, and Writing MDX Queries in Designing and Maintaining Essbase Cubes.

Access to MDX Reports

How you work with reports depends on your cube access.

Users with, at minimum, the application-level role of Database Access can render saved MDX reports created by others. The data a user sees displayed in the report depends on that user's filter access.

In addition to rendering saved reports, Database Access users can export result sets in various formats: HTML, CSV, Excel, and JSON.

Database Access users can also view the MDX query that defines the report, by clicking the Actions menu next to the report name and selecting View.

If you have at least Database Manager role, you can use reports in the same ways that Database Access users can. Additionally, you can edit and delete reports using the Actions menu.

If you are a Service Administrator, you can additionally use the Execute As button to test the data access of other users. This can be useful for testing user filters assigned to various users.

Examples of MDX Reports

The MDX examples in this section demonstrate special types of analyses you can perform, using MDX reports, that are not easily accomplished in the Ad Hoc Analysis view.

The following examples are designed to work on the Sample Basic cube.

**Metadata Report**

The following example returns only metadata (member names, but no data):

```mdx
SELECT
  {[Product].Levels(1).Members}
ON ROWS,
```
{ }
ON COLUMNS

returning the grid:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
</tr>
<tr>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
</tr>
<tr>
<td>5</td>
<td>Diet</td>
</tr>
</tbody>
</table>

Attribute Report

The following example uses, on columns, members from an attribute dimension:

SELECT
  [Product].Children
ON ROWS,
  [Ounces].Children
ON COLUMNS
WHERE {Sales}

returning the grid:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ounces_32</td>
<td>Ounces_20</td>
<td>Ounces_16</td>
<td>Ounces_12</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>#Missing</td>
<td>#Missing</td>
<td>#Missing</td>
</tr>
<tr>
<td>3</td>
<td>200</td>
<td>#Missing</td>
<td>#Missing</td>
<td>49990.0</td>
</tr>
<tr>
<td>4</td>
<td>300</td>
<td>#Missing</td>
<td>64436.0</td>
<td>36969.0</td>
</tr>
<tr>
<td>5</td>
<td>400</td>
<td>84230.0</td>
<td>#Missing</td>
<td>#Missing</td>
</tr>
<tr>
<td>6</td>
<td>Diet</td>
<td>#Missing</td>
<td>#Missing</td>
<td>67438.0</td>
</tr>
</tbody>
</table>

Filtered Report

The following example uses a slicer (WHERE clause) to limit the query to Cola. Additionally, the Filter function limits the level 0 markets in the query to those that have a negative profit.

SELECT
  { Profit }
ON COLUMNS,
  Filter( [Market].levels(0).members, Profit < 0)
ON ROWS
WHERE (Cola)

returning the grid:
UDA Report

The following example shows Product data for Market dimension members that have a user defined attribute (UDA) of "Major Market." A slicer (WHERE clause) limits the query to include only Sales data.

```
SELECT
    [Product].Children
ON ROWS,
    {Intersect(UDA([Market], "Major Market"), [Market].Children)}
ON COLUMNS
WHERE {Sales}
```

returning the grid:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Profit</td>
</tr>
<tr>
<td>2</td>
<td>Oregon</td>
<td>-234.0</td>
</tr>
<tr>
<td>3</td>
<td>Utah</td>
<td>-31.0</td>
</tr>
<tr>
<td>4</td>
<td>Nevada</td>
<td>-210.0</td>
</tr>
<tr>
<td>5</td>
<td>Oklahoma</td>
<td>-102.0</td>
</tr>
<tr>
<td>6</td>
<td>Louisiana</td>
<td>-305.0</td>
</tr>
<tr>
<td>7</td>
<td>Ohio</td>
<td>-22.0</td>
</tr>
<tr>
<td>8</td>
<td>Wisconsin</td>
<td>-310.0</td>
</tr>
<tr>
<td>9</td>
<td>Missouri</td>
<td>-87.0</td>
</tr>
<tr>
<td>10</td>
<td>Iowa</td>
<td>-874.0</td>
</tr>
</tbody>
</table>

Insert and Export Data with MDX

In addition to being useful for grid-based analysis, MDX also enables you to copy and update subsets of multidimensional data.

The MDX Insert clause enables you to update the cube with data, either from another cube or from a calculated (non-physical) member that you define using MDX.

The MDX Export clause enables you to save and export query results as data subsets that you can view or import later.

Insert and Export MDX statements can be run as saved MDX scripts.

To learn more about MDX Insert and Export, see MDX Insert Specification and MDX Export Specification in *Technical Reference for Oracle Analytics Cloud - Essbase*.
Run MDX Scripts

Use MDX scripts when you need to execute data operations from a library of MDX scripts, run more than one MDX query in a batch, or use runtime substitution variables to select members in Smart View.

MDX scripts are also useful when you need to regularly execute MDX Insert or Export operations. For free-form data analysis, entering MDX queries in the Analyze view or in Smart View may be a better choice, so that you can see the results in a grid view. See Analyze Data with MDX Reports.

To use MDX scripts, select a workflow:

- Write, Upload, and Run an MDX Script
- Write an MDX Script in the Script Editor and Run It

Write, Upload, and Run an MDX Script

Use this workflow to write MDX scripts in a text editor and upload them to Oracle Analytics Cloud – Essbase.

1. Write the MDX script in a text editor, and save it with an .mdx extension.
2. Upload the MDX script to the application or cube directory under Files in the Essbase web interface.
3. Run the MDX script from Jobs. Alternatively, you can run MDX scripts from Smart View, using Calculate on the Essbase ribbon.

For MDX syntax help, see MDX in Technical Reference for Oracle Analytics Cloud - Essbase.

Write an MDX Script in the Script Editor and Run It

Use this workflow to write MDX scripts in a script editor on the cube, and run them from Jobs.

1. On the Applications page, expand an application and cube.
2. From the cube’s Actions menu, click Inspect.
3. Click Scripts, and then click MDX Scripts.
4. Click + to open a script editor.
5. Write the MDX script. A member tree and function list can help you.
6. Validate and save the script, then close the script editor.
7. Run the MDX script from Jobs, or if using Smart View, using Calculate on the Essbase ribbon.

Guidelines for MDX Scripts

Use the following guidelines when working with MDX scripts.

- MDX scripts can contain one or more MDX queries.
- Each MDX query in a script should be separated from the others by a semicolon.
• MDX scripts can optionally include runtime substitution variables.
  – To be usable within Smart View, MDX scripts with runtime substitution variables must use the XML syntax within the SET RUNTIMESUBVARS calculation command, including `<RTSV_HINT>`.
  – To set a runtime substitution variable so that it calculates only the visible slice of data in Smart View, set the value of the runtime substitution variable to `POV`, and set the data type to `member`.
  – When run from the Essbase web interface, your MDX scripts may use substitution variables, but not runtime substitution variables. To use runtime substitution variables in MDX scripts, you must run the scripts from Smart View, using `Calculate` on the Essbase ribbon.

Use Substitution Variables

Examples of MDX Scripts

The following are examples of MDX scripts you can run on the Sample Basic cube, either from Jobs or in Smart View.

**MDX Script With One Query**

You can save this `.mdx` script and run it from Jobs or from the Calculate dialog in Smart View.

```
SELECT
  {{([100-10],[East]), ([100-20],[East])}}
ON COLUMNS,
  {
    {{[Qtr1],[Profit]}, {[Qtr2],[Profit]},
     {[Qtr3],[Profit]}, {[Qtr4],[Profit]}
  }
ON ROWS
FROM [Sample].[Basic]
```

**MDX Export**

You can save this `.mdx` script and run it from Jobs or from the Calculate dialog in Smart View.

```
EXPORT INTO FILE "sample01" OVERWRITE
SELECT
  {{[Mar],[Apr]}}
ON COLUMNS,
  Crossjoin([New York]),
  Crossjoin([Actual],[Budget]),
    ([Opening Inventory],[Ending Inventory]))
ON ROWS
FROM [Sample].[Basic]
WHERE {{[100-10]}}
```
After you run the script, the following export file, `sample01.txt`, is saved in the cube directory of the file catalog:

```
Market, Scenario, Measures, Mar, Apr
New York, Actual, Opening Inventory, 2041, 2108
New York, Actual, Ending Inventory, 2108, 2250
New York, Budget, Opening Inventory, 1980, 2040
New York, Budget, Ending Inventory, 2040, 2170
```

**MDX Export Using Runtime Substitution Variable**

You can save this `.mdx` script and run it from the `Calculate` dialog in Smart View.

```
SET RUNTIMESUBVARS
{
  States = "Massachusetts"<RTSV_HINT><svLaunch>
    <description>US States</description>
    <type>member</type>
    <allowMissing>false</allowMissing>
    <dimension>Market</dimension>
    <choice>multiple</choice>
  </svLaunch></RTSV_HINT>;

EXPORT INTO FILE "sample002" OVERWRITE
SELECT
  ([Mar],[Apr])
ON COLUMNS,
  Crossjoin({States}, Crossjoin({Actual},{Budget}),
    {[Opening Inventory],[Ending Inventory]}))
ON ROWS
FROM [Sample].[Basic]
WHERE ((100-10))
```

After you run the script, the following export file, `sample002.txt`, is saved in the cube directory of the file catalog:

```
Market, Scenario, Measures, Mar, Apr
Massachusetts, Actual, Opening Inventory, -54, -348
Massachusetts, Actual, Ending Inventory, -348, -663
Massachusetts, Budget, Opening Inventory, -160, -520
Massachusetts, Budget, Ending Inventory, -520, -910
```
Work with Logs

You can download and view logs at the server level and at the applications level.

Download Server and Application Logs

Download Server Logs

As a Service Administrator, you can download all logs (server and application). You can download the latest log as well as rolled over logs. You can also view logs without downloading them.

1. In Oracle Analytics Cloud – Essbase, click Console.
2. On the Logs tab, choose the server log to download or view:
   - Managed Server: Warnings and error messages regarding Weblogic issues
   - Console Output: Managed server run-time exceptions and messages
   - Provider Services
   - Agent
   - Platform: User interface
3. Click the Actions menu to the right of the log you want to download.
4. Select whether to Download All, Download Latest, or View Logs.
5. If you are downloading, save the file locally.

Download Application Logs

As an Application Manager, you can download applications logs. You can download the latest log, as well as rolled over logs. You can also view logs without downloading them.

1. On the Applications page, select the application.
2. To the right of the application name, click the Actions menu and select Inspect.
3. On the Logs tab, click the Download icon under Latest, the View icon under Latest, or the Download icon under All.
4. If you are downloading, save the file locally.
Analyze Cube Data with Drill Through Reports

Sometimes you may require more information than what existed in the Essbase cube. You can access and analyze additional data using drill through reports.

Topics:

- About Drill Through Reports
- Create Drill Through Reports
- Execute Drill Through Reports

About Drill Through Reports

When you want more information than what you can see in the Essbase cube, you can use drill through reports to access external data sources.

Drill through refers to linking the Essbase cube to further data, for example, transactional-level data stored in a relational database.

You can drill through to data from any other Oracle application, an external database, or a file (delimited or Excel).

You can also select multiple cells or multiple ranges of cells, and see the merged results in drill through. Selections can be recursive, non-recursive, level 0, or non-contiguous.

Power users can create drill through reports in the Essbase interface or generate them using Smart View.

Typical Workflow for Drill Through Reports

The workflow for running a drill through report is based upon your defined connection and data source.

You can use an application workbook, an external data source file, and Cube Designer to set up an Essbase cube for drill through.

You can then use the report to analyze the cube that accesses the data source.

1. Create a connection to the data source type:
2. Define a data source and save it as part of the application:
   a. Create a connection.
   b. Define the data source.
   c. Select report columns and modify data types as necessary.
   d. Define aliases if relevant.
e. Define source-specific parameters if any.

f. Preview the data.

3. Create the drill through report:
   a. Select the data source.
   b. Choose data source columns to display.
   c. Define the drillable regions.

4. Execute the drill through report. Use the reports to analyze an Essbase cube that accesses the data source.

Use Cases and Column Mapping

For drill through reports, you must map a data source column to a dimension, generation of a dimension, or to a level 0.

The following are examples of mapping data source columns:

- Product column, which contains SKU data, can be mapped to Product SKU in the following hierarchy: Product dimension > Products > Category > Product SKU
- Year column, which contains Month data, can be mapped to Month, in the following hierarchy: Year dimension > Year > Quarter > Month
- Scenario column, which is defined as actual or budget, can be mapped directly to the Scenario dimension — this is a flat dimension without any generations

Essbase adds a filter condition is added to the drill through report query based upon the column mapping and the related intersection in Smart View.

For column mapping and use cases descriptions, see:

- Map Dimension to a Data Source Column
- Map Generation Name to a Data Source Column
- Map Level 0 to a Data Source Column
- Map Multiple Cells and Regions

Map Generation Name to a Data Source Column

This use case maps a generation name to a data source column. Drill through results contain members that match the mapped generation members.

The mapping is as follows:

Product – Product SKU, Region – Region, Year – Month
The selected columns in the column mapping are: Product, Region, Market, Year, and Sales. In this case, the datasource is the Excel file, Excel_DS.

The generated query is:

```
Select Product, Region, Market, "Year" from Excel_DS where Product = <SKU value> and Region = <Region value> and "Year" = <month value>
```

The report is executed on member Jan that is mapped to generation Month. The results are shown for month Jan.

**Recursive Drill Through in Generation Mapping**

This use case maps a generation name to a column name, where the report is executed on any top generation.

In this use case, execute the drill through report on Year member and map it to the Month generation. The generated query doesn't have a where condition for Month.

The result includes all data for Year column in the data source column (all Months).

When there is no mapping to a particular generation, find the generations under the selected generation. Verify if column mapping exists to any of these generations in the same dimension. If it exists, get the children from that generation and generate a query where all of these members are added in the Where condition.
The data source column is mapped to the Month generation in the Year dimension.

- Generations for Year dimension: History, Quarter, Month
- Column mapping for Year (dsColumn) == Month (gen)

"columnMapping" : {
  "Product" : "Product SKU",
  "Region" : "Region",
  ""Year"" : "Month",
  "Scenario" : "Scenario"
},

**Top Level**

When the report is executed with Year in the intersection, the actual generation name is History, which is not mapped. The next generation is Quarter, which is not mapped. The following generation is Month, which is mapped.

In the Year dimension, get all members from Month generation:

(Qtr1) Jan, Feb, Mar : (Qtr2) Apr, May, Jun : (Qtr3) Jul, Aug, Sep : (Qtr4) Oct, Nov, Dec

An example of the top-level query is as follows:

Select Product, Region, Market, "Year", Sales from "Excel_DS" where Product = '100-20' AND Region = 'East'

**Intermediate Level**

When the report is executed with Quarter in the intersection, the actual generation name is Quarter, which is not mapped. The next generation is Month, which is mapped.

In the Year dimension for Selected Quarter Qtr1, get all children from Month generation:

(Qtr1) Jan, Feb, Mar
An example of the intermediate level query is as follows:

\[
\text{Select Product, Region, Market, "Year" from Excel_DS where Product = '100-20' and Region = 'East' and "Year" IN (Jan, Feb, Mar)}
\]

**Mapped Level**

When the report is executed with Month in the intersection, the actual generation name is Month, which is mapped in the Year dimension for Selected Month Jan.

An example of a mapped-level query is as follows:

\[
\text{Select Product, Region, Market, "Year" from Excel_DS where Product = '100-20' and Region = 'East' and "Year" IN (Jan) OR Select Product, Region, Market, "Year" from Excel_DS where Product = '100-20' and Region = 'East' and "Year" = 'Jan'}
\]

**Map Dimension to a Data Source Column**

When you map a dimension to a data source column, the report result has the same member as where the drill through is executed. When you have a flat hierarchy, you also map the dimension name directly to a data source column.

When you do this mapping, the generated query has a condition such as:

\[
dsColName = \text{<actual value from Smart View intersection>}
\]

**Example**

You mapped the dimension Scenario in the Sample Basic file to the Scenario data source column. In Smart View, when you're not zoomed in on Scenario, the filter condition is Scenario = Scenario.

If you're zoomed in on Scenario, the filter condition is either Scenario = Actual or Scenario = Budget.

This can be useful when the data source column contains data from all of its generations. For example, Time data source column also contains values with Year and Month. You can map the Time dimension directly to it and, according to the intersection, the condition can be added.

**Map Level 0 to a Data Source Column**

When creating a drill through report, you can map a level 0, for a particular dimension, to a data source column.
So, whenever you execute a report from Smart View, on any intersection with the Product dimension member, we fetch all leaf level members for that particular member and add them to the drill through query.

In the use case of a recursive drill through, we get the members from the mapped generation, however, we always get all leaf level members in the hierarchy. If the report is executed on the root member, the dimension member itself, the query contains all leaf members from the dimension.

Map Multiple Cells and Regions

This use case describes the ability to use multi-cells and multi-regions in drill through reports.

**Prerequisites:** Latest versions of Smart View and Essbase.

You can select multiple cells or ranges of cells, and see the merged results in drill through. Selections can be recursive, non-recursive, level 0, contiguous, or non-contiguous.

If you have existing single-cell drill through reports, no changes in your reports are necessary. They continue to work with single as well as multi-cell and multi-range selections.

Your drill through depends on column mapping, which generates the filter conditions and “where” clause in the data source query.

If you use generation (recursive) mapping, it includes all descendants of the selected members, for example, Qtr1 includes Jan, Feb, and Mar cells.

If you use Level 0 (ragged hierarchies) mapping, all leaf-level members of the selected member hierarchy are included.

After you create the connection and data source, you specify the report columns to view drillable cells or regions in Smart View, and mapping of data source columns to cube entities.

When you use multi-cell drill through, you select contiguous cells in Excel, such as B3, B4 in column B in the following example.
When you use multi-region drill through, you select multiple non-contiguous areas of multiple cells. In the example below, you select: B3+B4+B5, B7+B8+B9, and B11+B12+B13.

Use **Ctrl + Select** to select multiple non-contiguous regions in Excel. The selection in the example gives you a detailed report for all of the months until September, excluding quarter totals.

You can select multi-ranges from any parent or hierarchy.

![Excel Table]

After you select multi-cells or multi-regions, and then select **Drill Through** in the Essbase ribbon in Smart View, a drop-down list of available and relevant drill through reports are displayed for your selection. These existing reports are based on the intersections for the selected cells.

If you want sorted data for multi-cell drill through, you can define the data source query itself with sorting, or use Excel sorting after the report runs.

Multi-region drill through data remains unsorted. You can sort the results in Excel.

**Create Drill Through Reports**

The steps for creating drill through reports are to create the connection and data source and then define drillable regions.

Before you set up the report, create or import the Essbase cube.
1. Create a Drill Through Connection and Data Source
2. Define Report Columns and Drillable Regions

Create a Drill Through Connection and Data Source

From the Cube Designer, you need to create a connection to the data source file.

1. On the Cube Designer ribbon, click **Connections**. Ensure that you're connected to the correct Essbase Cloud Service URL. Click **Save**.

Your connection is saved on the Server area of the ribbon.

2. If you need to build a cube, rather than use an existing one, do the following:
   a. On the Cube Designer ribbon, click **Build Cube**.
   b. After you log in to Essbase as a Power User, build the cube using the **Create Cube** option.
   c. Select the options to load data sheets, but not to run calculation sheets.
   d. Click **View Jobs** to view the status of your build.
   e. When your job completes, go to a web browser and log in as the same user. Navigate to Applications, and check that the application named DrillThrough was created with the relevant cube.
   f. If you're using a CSV data source file, copy any accessory data source files to the drill through application's file catalog. For example, click **Files** and navigate to the CSV file. Navigate to All Files > Applications > Drillthrough > Basic, and click **Paste**.

3. Now define the connection and a data source file. For full details, see Using Connections and Data Sources.
   a. On the Sources page, click **Connections**, then **Create connection**, and **File**.
   b. Enter a connection file name, and provide the path to the file you uploaded to the catalog.
   c. Click **Test** to validate the connection, and if successful, click **Create**.
   d. Now define the data source for the DrillThrough application. On the Sources page, click **Datasources**, and then **Create Datasource**.
   e. Select the saved connection that you created.
   f. Enter a name for the data source, optionally add a description, and click **Next**.
   g. On the Columns page, where relevant, change the column types, add aliases, set parameters, if any, and then click **Next**.
   h. Preview the tabular metrics, and when you're ready, click **Create** and then **Close**.

Define Report Columns and Drillable Regions

After defining the connection and datasource, the next step to provide the report columns and drillable regions for the report.

1. On the Applications page, select the cube under your drill through application, click the Actions icon to the right, and click **Inspect**.
2. Select the Scripts page.

3. Select Drill Through Reports.

4. Click Create and then Datasource to base this drill through report on the datasource, or URL.

5. Enter a name for the report and select the datasource you created. The columns of the data source are displayed on the Column Mapping view.

6. Select the report columns that you want in the report, map them to dimensions, and designate the appropriate generation or level, or leave as None.

7. If you select the option Use Temporary Table for a drill through report, all members in the IN statement will be added to a temporary table created in the source database. This can improve query execution performance. The source database must have permissions to create temporary tables for this option to be enabled.

8. Click Drillable Regions to define regions that should access (or drill through to) the external data source. Click + if you want to add a region.

For drillable region options, you can also use Essbase member-set calculation language for defining security filters. See Member Set Functions in the Essbase Technical Reference.

9. When done, click Save and Close.

The drill through report is created.

Execute Drill Through Reports

Now that you have set up an application and cube for drill through, and created a report, you are ready to execute the report and analyze data. But first, let's format the report.

• Format Drill Through Reports
• Run Drill Through Reports

Format Drill Through Reports

Let's set up Smart View to show drill through members and data cells in a different style.

1. In the workbook, on the Smart View ribbon, click Options.

2. Under Formatting, ensure that Use Cell Styles is selected.

3. Under Cell Styles:
   a. Expand Essbase, and then Member Cells. Select Member Drill-through, then right-click it and choose a style (for example, a blue background).
   b. Expand Data Cells, select Drill-through, then right-click it and choose the same style.

The report is now formatted and can be executed.

Run Drill Through Reports

After setting up the drill through report, you’re ready to run it.
1. On the Cube Designer ribbon, click Analyze and Connect Query Sheets. If prompted, select Reuse sheet contents and POV. This connects you to your drill through cube, moves the workbook focus to the first query sheet, and selects the Essbase ribbon.

   The drillable regions are displayed in the style you chose.

2. Drill through one of the cells to see the data source for the cell, for example, select a cell and click Drill Through.

   In the new sheet, examine the drill through report. You have drilled through to the external data source to see the next level data. Select an entire column in the new sheet. In the lower right of Excel, notice the sum. This number matches the value of the cell you drilled through from.

3. Optionally, click the Data ribbon to filter data in the drill through report
Oracle recommends that you download a sample application workbook and examine the worksheets to familiarize yourself on how to design your own application and cube.

• Understand the Essbase.Cube Worksheet
• Understand the Cube.Settings Worksheet
• Understand the Cube.Generations Worksheet
• Understand the Cube.Textlists Worksheet
• Understand Dimension Worksheets
• Understand Data Worksheets
• Understand Calculation Worksheets

Also see Download a Sample Application Workbook.

Understand the Essbase.Cube Worksheet

The Essbase.Cube worksheet defines the application and cube name and dimension information, such as dimension names, types, storage (dense or sparse) and outline order.

The following image shows the Essbase.Cube worksheet in a sample application workbook.

<table>
<thead>
<tr>
<th>Application Name</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Name</td>
<td>Basic</td>
</tr>
<tr>
<td>Version</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### Dimension Definitions

<table>
<thead>
<tr>
<th>Dimension Type</th>
<th>Storage Type</th>
<th>Outline Order</th>
<th>Base Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Time</td>
<td>Dense</td>
<td>1</td>
</tr>
<tr>
<td>Measures</td>
<td>Accounts</td>
<td>Dense</td>
<td>2</td>
</tr>
<tr>
<td>Product</td>
<td>Regular</td>
<td>Sparse</td>
<td>3</td>
</tr>
<tr>
<td>Market</td>
<td>Regular</td>
<td>Sparse</td>
<td>4</td>
</tr>
<tr>
<td>Scenario</td>
<td>Regular</td>
<td>Sparse</td>
<td>5</td>
</tr>
<tr>
<td>Caffeinated</td>
<td>Attribute-Boolean</td>
<td></td>
<td>6 Product</td>
</tr>
<tr>
<td>Ounces</td>
<td>Attribute-Numeric</td>
<td></td>
<td>7 Product</td>
</tr>
<tr>
<td>Pkg Type</td>
<td>Attribute-Text</td>
<td></td>
<td>8 Product</td>
</tr>
<tr>
<td>Population</td>
<td>Attribute-Numeric</td>
<td></td>
<td>9 Market</td>
</tr>
<tr>
<td>Intro Date</td>
<td>Attribute-Date</td>
<td></td>
<td>10 Product</td>
</tr>
</tbody>
</table>
### Table A-1  Essbase.Cube Worksheet Fields and Values

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Name</td>
<td>• The application name must not exceed 30 characters.</td>
<td>Enter the name of the application.</td>
</tr>
<tr>
<td></td>
<td>• Do not use spaces.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Application names are not case-sensitive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The following special characters are not allowed: % $ - { } ( ) ! ~ ` # &amp; @ ^</td>
<td></td>
</tr>
<tr>
<td>Database Name</td>
<td>• The cube name must not exceed 30 characters.</td>
<td>Enter the name of the cube.</td>
</tr>
<tr>
<td></td>
<td>• Do not use spaces.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cube names are not case-sensitive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The following special characters are not allowed: % $ - { } ( ) ! ~ ` # &amp; @ ^</td>
<td></td>
</tr>
<tr>
<td>Version</td>
<td>This must be a positive integer.</td>
<td>This is the application workbook version.</td>
</tr>
</tbody>
</table>
| Dimension Name        | Dimension names cannot be the same as the cube name.                        | Enter the name of each dimension. There must be at least two dimensions in a cube. For block storage, one dimension must be a dense dimension. Use no more than 1024 characters when naming dimensions, members, or aliases. The following special characters are not allowed: @, ,, !, {. [, ], /, *.
| Dimension Type        | • Time                                                                      | Describes the type of dimension. Regular is the Default. Per cube, you can only use one Time and one Accounts dimension type. |
|                       | • Accounts                                                                  |                                                  |
|                       | • Regular                                                                   |                                                  |
|                       | • Attribute-Boolean                                                        |                                                  |
|                       | • Attribute-Numeric                                                        |                                                  |
|                       | • Attribute-Text                                                            |                                                  |
|                       | • Attribute-Date                                                            |                                                  |
| Dimension Storage     | • Dense                                                                     | Sparse is the default. There must be at least one dense dimension. |
|                       | • Sparse                                                                    |                                                  |
| Outline Order         | This must be a positive integer.                                            | This is the order of the dimension in the outline. Attribute dimensions must be ordered after base dimensions.  |
Table A-1  (Cont.) Essbase.Cube Worksheet Fields and Values

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Dimension</td>
<td>This must be an existing dimension name.</td>
<td>This is the dimension pairing for the attribute dimension.</td>
</tr>
</tbody>
</table>

You can modify the Essbase.Cube worksheet in the Designer Panel. See Work with the Essbase.Cube Worksheet in Cube Designer.

Understand the Cube.Settings Worksheet

The Cube.Settings worksheet defines the application type (aggregate storage or block storage) and many cube and outline properties such as dynamic time series members and substitution variables.

Each of the five sections in the Cube.Settings worksheet has information about its fields and values, and how to modify those fields and values by using the Designer Panel.

- Understand the Cube.Settings Worksheet: Alias Tables
- Understand the Cube.Settings Worksheet: Properties
- Understand the Cube.Settings Worksheet: Dynamic Time Series
- Understand the Cube.Settings Worksheet: Attribute Settings
- Understand the Cube.Settings Worksheet: Substitution Variables

Understand the Cube.Settings Worksheet: Alias Tables

This section of the Cube Settings worksheet lists alias tables that need to be created for the cube.

It must contain at least the Default row.

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Default</td>
<td>Every cube has a table named Default. You can create additional alias tables in the rows following the Default row.</td>
</tr>
</tbody>
</table>

Rows following the default row. These new rows can be created manually, or using the Designer Panel.

Naming conventions for member names apply. See Naming Conventions for Dimensions, Members, and Aliases in Designing and Maintaining Essbase Cubes.

You can set multiple aliases for a member using multiple alias tables.

You define alias table names on the Cube.Settings worksheet. You define the contents of the alias tables on the dimension worksheets.

See Setting Aliases in Designing and Maintaining Essbase Cubes.
Understand the Cube.Settings Worksheet: Properties

The following table shows the fields, values and descriptions for the Properties section on the Cube.Settings worksheet:

Table A-2 Properties Section of the Cube.Settings Worksheet

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Type</td>
<td>• ASO</td>
<td>This is an application property. Defines whether the cubes in the application use aggregate storage (ASO) or block storage (BSO).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• BSO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outline Type</td>
<td>• Unique</td>
<td>This is a database property.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Duplicate</td>
<td>• Unique: member names in the outline must be unique.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Duplicate: Duplicate member names are permitted in the outline.</td>
<td></td>
</tr>
<tr>
<td>Aggregate missing values</td>
<td>• Yes</td>
<td>This is a database property. Defines whether missing (#MISSING) values are aggregated during a cube calculation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create blocks on equations</td>
<td>• Yes</td>
<td>This is a database property.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No</td>
<td></td>
<td>If you enter Yes, then when you assign a nonconstant value to a member combination for which no data block exists, a data block is created. Entering Yes can produce a very large cube. Sometimes, new blocks are not desired; for example, when they contain no other values. In large databases, creation and processing of unneeded blocks can increase processing time and storage requirements. For more specific control, you can use the SET CREATEBLOCKONEQ calculation command within a calculation script to control creation of blocks at the time the command is encountered in the script. See the SET CREATEBLOCKONEQ calculation command in Technical Reference for Oracle Analytics Cloud - Essbase.</td>
</tr>
</tbody>
</table>
### Table A-2  (Cont.) Properties Section of the Cube.Settings Worksheet

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
</table>
| Two-Pass calculation | • Yes  
• No | This is a database property. If you enter Yes, then after a default calculation, members that are tagged as two-pass are recalculated, overwriting the aggregation results from the first calculation pass. The two-pass tag is effective on members of the dimension tagged as Accounts and on Dynamic Calc and Dynamic Calc and Store members of any dimension. |
| Date Format | There are many valid date formats. These are some examples: 
• mm dd yyyy  
• dd mm yy  
• mm/dd/yy  
• mm-dd-yyyy | This is a database property. You can set the format of member names in date attribute dimensions. If you change the date format, then you must rebuild the date attribute dimensions and reassociate dimension members. |
| Scenario Sandboxes | • 0  
• A positive integer less than 1000. | This value defines whether the cube contains a sandbox dimension for creating scenarios of the data, and the number of sandbox members within the sandbox dimension. A value of 0 indicates no sandbox dimension. |

You can modify the Properties section on the Cube.Settings worksheet in the Designer Panel. See Work with the Cube.Settings Worksheet: Properties in Cube Designer.

### Understand the Cube.Settings Worksheet: Dynamic Time Series

#### Table A-3  Dynamic Time Series Section of the Cube.Settings Worksheet

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-T-D</td>
<td>Integer value representing the generation number</td>
<td>History to date</td>
</tr>
<tr>
<td>Y-T-D</td>
<td>Integer value representing the generation number</td>
<td>Year to date</td>
</tr>
<tr>
<td>S-T-D</td>
<td>Integer value representing the generation number</td>
<td>Season to date</td>
</tr>
<tr>
<td>P-T-D</td>
<td>Integer value representing the generation number</td>
<td>Period to date</td>
</tr>
<tr>
<td>Q-T-D</td>
<td>Integer value representing the generation number</td>
<td>Quarter to date</td>
</tr>
</tbody>
</table>
Table A-3  (Cont.) Dynamic Time Series Section of the Cube.Settings Worksheet

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-T-D</td>
<td>Integer value representing the generation number</td>
<td>Month to date</td>
</tr>
<tr>
<td>W-T-D</td>
<td>Integer value representing the generation number</td>
<td>Week to date</td>
</tr>
<tr>
<td>D-T-D</td>
<td>Integer value representing the generation number</td>
<td>Day to date</td>
</tr>
</tbody>
</table>


See Using Dynamic Time Series Members in Designing and Maintaining Essbase Cubes.

Understand the Cube.Settings Worksheet: Attribute Settings

The following table shows the fields, values and descriptions for the Attribute Settings section on the Cube.Setting worksheet:

Table A-4  Attribute Settings

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension Name</td>
<td>Default: Attributes Calculation</td>
<td>To avoid duplicating names in an outline, you can change the names of members of the attribute calculations dimension. Regardless of the name that you use for a member, the function of the member remains the same. For example, the Sum member always calculates a sum, no matter what you name it. See Changing the Member Names of the Attribute Calculations Dimension in Designing and Maintaining Essbase Cubes.</td>
</tr>
<tr>
<td>Sum Member</td>
<td>Default: Sum</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting sum data.</td>
</tr>
<tr>
<td>Count Member</td>
<td>Default: Count</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting count data.</td>
</tr>
</tbody>
</table>
### Table A-4  (Cont.) Attribute Settings

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Member</td>
<td>Default: Min</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting minimum data.</td>
</tr>
<tr>
<td>Maximum Member</td>
<td>Default: Max</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting maximum data.</td>
</tr>
<tr>
<td>Average Member</td>
<td>Default: Avg</td>
<td>This is a member of the attribute calculations dimension. The name to use when requesting average data.</td>
</tr>
<tr>
<td>False Member</td>
<td>Default: False</td>
<td>The initial Boolean member names in a cube are set as True and False. See Setting Boolean Attribute Member Names in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td>True Member</td>
<td>Default: True</td>
<td>The initial Boolean member names in a cube are set as True and False. See Setting Boolean Attribute Member Names in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td>Prefix/Suffix Value</td>
<td>• None</td>
<td>See Setting Prefix and Suffix Formats for Member Names of Attribute Dimensions in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>• Dimension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Parent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Grandparent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ancestors</td>
<td></td>
</tr>
<tr>
<td>Prefix/Suffix Format</td>
<td>• Prefix</td>
<td>You can define unique names by attaching a prefix or suffix to member names in Boolean, date, and numeric attribute dimensions in the outline. See Setting Prefix and Suffix Formats for Member Names of Attribute Dimensions in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>• Suffix</td>
<td></td>
</tr>
</tbody>
</table>
### Table A-4  (Cont.) Attribute Settings

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefix/Suffix Separator</td>
<td>_ Underscore</td>
<td>You can define unique names by attaching a prefix or suffix to member names in Boolean, date, and numeric attribute dimensions in the outline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Select a separator (to place between the prefix or suffix and the original name): underscore (_), pipe (</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute Numeric Ranges</td>
<td>Tops of ranges</td>
<td>See Setting Up Member Names Representing Ranges of Values in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>Bottoms of ranges</td>
<td></td>
</tr>
<tr>
<td>Date Member</td>
<td>Month First (mm-dd-yyyy)</td>
<td>You can change the format of members of date attribute dimensions. See Changing the Member Names in Date Attribute Dimensions in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>Day First (dd-mm-yyyy)</td>
<td></td>
</tr>
</tbody>
</table>

You can modify the Attribute Settings section on the Cube.Settings worksheet in the Designer Panel. See *Work with the Cube.Settings Worksheet: Attribute Settings in Cube Designer*.

### Understand the Cube.Settings Worksheet: Substitution Variables

Substitution variables act as global placeholders for information that changes regularly. You create the variable and a corresponding string value, and the value can then be changed at any time.

A substitution variable can be used in a query or calculation script to represent a member in the outline. By default, there are no substitution variables defined for a cube.

There is not an option to add substitution variables in the Designer Panel, however you can add them directly in the application workbook.

1. On the Cube.Settings worksheet, in the Substitution Variables section, create a new row.
2. Enter the variable name in column A and its value in column B, enclosing the value in quotation marks if it represents a member name.
   
   Example:

   ```
   CurrMonth "Jan"
   ```

   See Using Substitution Variables in *Designing and Maintaining Essbase Cubes*. 

---

**ORACLE**

A-8
Understand the Cube.Generations Worksheet

Cube.Generations Worksheets

The Cube.Generations worksheet is used for naming generations in an outline.

The term "generation" indicates the distance of a member from the root of the dimension. Using a generation number, you can determine the location of members within the database tree. All members in a database that are the same number of branches from their root have the same generation number. The dimension is generation 1, its children are generation 2, and so on.

You can create names for generations in an outline, such as a word or phrase that describes the generation. For example, you might create a generation name called Cities for all cities in the outline.

You can also use generation names in calculation scripts wherever you need to specify a list of generation numbers. For example, you could limit a calculation in a calculation script to all members in a specific generation.

You can specify only one name per generation. The specified name must be unique; that is, it cannot duplicate a generation, level, or member name or an alias or conventional alias.

If you build a cube using an application workbook that has names reserved for Dynamic Time Series on the Cube.Generations sheet for the time dimension, Essbase automatically creates and enables the corresponding Dynamic Time Series member.

Note:

The Dimension section of the Cube.Generations worksheet changes if you change the dimension worksheet (Dim.dimname) by adding or deleting members in such a way that the number of generations in the dimension is changed. If you make changes to the dimension worksheet by adding or deleting members, you should always press the Update Generation Worksheet button on the Dimensions tab of the Designer Panel as part of the editing process.

Cube.Generations Worksheet Format

The following image shows a Cube.Generations worksheet in a sample application workbook.
# Table A-5  Fields and Valid Values in Generation Worksheets

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension Name</td>
<td>For dimension naming restrictions, see Naming Conventions for Dimensions, Members, and Aliases for naming restrictions.</td>
<td>The dimension name.</td>
</tr>
<tr>
<td>Generation Number</td>
<td>A generation number, 1 or greater.</td>
<td>A root branch of the tree is generation 1. Generation numbers increase as you count from the root toward the leaf member.</td>
</tr>
<tr>
<td>Generation Name</td>
<td>You can define only one name for each generation. When you name generations, follow the same naming rules as for members. See Naming Conventions for Dimensions, Members, and Aliases.</td>
<td>The generation name. You can use this field to create or change generation names. Enter the generation name and then build or update the cube using the application workbook. See Update Cubes Incrementally in Cube Designer.</td>
</tr>
<tr>
<td>Unique</td>
<td>• Yes • No</td>
<td>For duplicate member name outlines, enter Yes to require unique member names within the associated generation.</td>
</tr>
</tbody>
</table>
Understand the Cube.Textlists Worksheet

In application workbooks, the Cube.Textlists worksheet defines text lists. Text lists are used to work with text measures, which extend the analytical capabilities of Essbase Cloud.

In addition to numeric values, measures can be associated with text-typed values. Storage and analysis of textual content can be useful when a cell needs to have one of a finite list of textual values; for example, a product may be sold in 5 different colors. The color is a text measure whose value must be one of the 5 colors. The colors are a set of text strings mapped to corresponding numeric IDs. These mappings are contained in tables in the Cube.Textlists worksheet.

You can add multiple text list tables to the same sheet and they can be associated with multiple measures.

The following image shows the Cube.Textlists worksheet in a sample application workbook.

<table>
<thead>
<tr>
<th>Text List Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>List Name</td>
</tr>
<tr>
<td>Associated Members</td>
</tr>
<tr>
<td>ID</td>
</tr>
<tr>
<td>#Missing</td>
</tr>
<tr>
<td>#OutOfRange</td>
</tr>
<tr>
<td>[replace with integer value]</td>
</tr>
<tr>
<td>[replace with string value]</td>
</tr>
<tr>
<td>[replace with integer value]</td>
</tr>
<tr>
<td>[replace with string value]</td>
</tr>
</tbody>
</table>

Table A-6  Cube.Textlists Worksheet Fields and Values

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>List Name</td>
<td>Must not exceed 80 characters.</td>
<td>A text list must start with a list name followed by its value in the adjacent cell.</td>
</tr>
<tr>
<td>Associated Members</td>
<td>Existing member names.</td>
<td>Member names added in adjacent cells. Multiple members can be added in adjacent cells to the right.</td>
</tr>
</tbody>
</table>
Table A-6  (Cont.) Cube.Textlists Worksheet Fields and Values

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>The first two values under ID are #Missing and #OutOfRange. These two values must exist in every text list table. The other IDs must be integers.</td>
<td>Each ID, including the #Missing, #OutOfRange and numeric values, must map to a text value. The first two IDs, #Missing and #OutOfRange, are for handling cases where the textual data is invalid or empty. For example, if you try to load an unmapped value such as &quot;Average&quot; to a text measure, the cell value would not be updated, and would display as #Missing in a subsequent query. If you load a numeric cell value that is unmapped, the subsequent query would return N/A.</td>
</tr>
<tr>
<td>Text</td>
<td>Up to 80 characters.</td>
<td>The text column contains the text values for each text measure. Each text value must map to an integer in the ID column. Any text value that does not map to an integer in the text list is considered by Essbase Cloud to be invalid.</td>
</tr>
</tbody>
</table>

In *Designing and Maintaining Essbase Cubes*, see:

- Working with Typed Measures
- Performing Database Operations on Text and Date Measures

**Understand Dimension Worksheets**

Application workbooks contain one dimension worksheet for each of the dimensions listed in the Essbase.Cube worksheet. The name of each dimension worksheet is Dim.dimname; for example, the Year dimension worksheet is called Dim.Year. Dimension names can contain up to 1024 characters, but long dimension names (longer than 31 characters, including "Dim.") are truncated in the dimension sheet name.

Dimension worksheets use load rules syntax. For example, an X in the Storage column means that the data value is not stored.

The following image shows a dimension worksheet in a sample application workbook.
<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimension Name</strong></td>
<td>The name of the dimension. Do not change the dimension name in this field.</td>
<td>Any dimension or attribute dimension in the outline. Defined on the Essbase.Cube worksheet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use no more than 1024 characters when naming dimensions, members, or aliases.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The following special characters are not allowed: @, ., , {, }, [,.], {,}.</td>
</tr>
<tr>
<td><strong>File Name</strong></td>
<td>A valid string. The file name cannot be longer than thirty characters.</td>
<td>The build process creates a data file with a .txt extension in the cloud service for every data worksheet in the application workbook. You can give them meaningful names so that they are easily recognizable if they need to be used again.</td>
</tr>
<tr>
<td><strong>Rule Name</strong></td>
<td>A valid string. See Name and Related Artifact Limits in Designing and Maintaining Essbase Cubes. The rule name cannot be longer than thirty characters.</td>
<td>The build process creates a rule file with a .rul extension in the cloud service for every dimension worksheet in the workbook. You can give them meaningful names so that they are easily recognizable if they need to be used again.</td>
</tr>
<tr>
<td>Property or Field</td>
<td>Valid Values</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Build Method</td>
<td>• PARENT-CHILD</td>
<td>In Designer Panel, you can build a cube with either build method, but you cannot edit a cube built using the Generation build method using the panel, and you cannot view hierarchies using Cube Designer Dimension Hierarchy viewer.</td>
</tr>
<tr>
<td></td>
<td>• GENERATION</td>
<td></td>
</tr>
<tr>
<td>Incremental Mode</td>
<td>• Remove Unspecified</td>
<td>Incremental dimension builds enable you to update existing dimensions with new members.</td>
</tr>
<tr>
<td></td>
<td>• Merge</td>
<td>Merge is the default. This option adds the new members to the dimension while retaining the existing members.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove Unspecified removes members that are not specified in the source file.</td>
</tr>
<tr>
<td>Delimiter</td>
<td>The values can be a tab, a</td>
<td>This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td></td>
<td>space, or any single character except “.”</td>
<td></td>
</tr>
<tr>
<td>Header Rows to Skip</td>
<td>A positive number or zero.</td>
<td>The number of header rows to skip when performing a data load or dimension build.</td>
</tr>
<tr>
<td></td>
<td>Zero is the default.</td>
<td>This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Allow Moves</td>
<td>• Yes</td>
<td>Within a dimension, moves members and their children to new parents; recognizes primary members and matches them with the data source; not available for duplicate member outlines.</td>
</tr>
<tr>
<td></td>
<td>• No</td>
<td>This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Data Source</td>
<td>A valid Data Source name.</td>
<td>This value is used to retrieve data from the source defined in the data source definition. This value must be updated directly in the application workbook. It can't be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Property or Field</td>
<td>Valid Values</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Member ID</td>
<td>Any unique key</td>
<td>Used to uniquely identify a member in an outline. Required for duplicate outlines.</td>
</tr>
<tr>
<td>Storage Type</td>
<td>• N</td>
<td>Never allow data sharing. Uses load rules member property codes. See Using the Data Source to Work with Member Properties in Designing and Maintaining Essbase Cubes.</td>
</tr>
<tr>
<td></td>
<td>• O</td>
<td>Tag as label only (store no data).</td>
</tr>
<tr>
<td></td>
<td>• S</td>
<td>Set member as stored (non dynamic calc and not label only).</td>
</tr>
<tr>
<td></td>
<td>• X</td>
<td>Create as dynamic calc.</td>
</tr>
<tr>
<td>Consolidation Operator</td>
<td>• +</td>
<td>+ (add)</td>
</tr>
<tr>
<td></td>
<td>• -</td>
<td>- (subtract)</td>
</tr>
<tr>
<td></td>
<td>• *</td>
<td>* (multiply)</td>
</tr>
<tr>
<td></td>
<td>• /</td>
<td>/ (divide)</td>
</tr>
<tr>
<td></td>
<td>• %</td>
<td>% (percent)</td>
</tr>
<tr>
<td></td>
<td>• ~</td>
<td>~ (no operation)</td>
</tr>
<tr>
<td></td>
<td>• ^</td>
<td>^ (never consolidate)</td>
</tr>
<tr>
<td>IGNORE</td>
<td>Ignore</td>
<td>Data in a column with the heading, IGNORE is ignored during data loads and dimension builds. This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Two-Pass Calculation</td>
<td>• Yes</td>
<td>If you enter Yes, after a default calculation, then members that are tagged as two-pass are recalculated. The two-pass tag is effective on members of the dimension tagged as Accounts and on Dynamic Calc and Dynamic Calc and Store members of any dimension. Two-pass calculation applies only to block storage outlines.</td>
</tr>
<tr>
<td></td>
<td>• No</td>
<td></td>
</tr>
<tr>
<td>Property or Field</td>
<td>Valid Values</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Solve Order</td>
<td>Any number, 0 to 127</td>
<td>Assign a calculation priority (0-127). The formula on the dimension or member that is assigned the highest solve order is calculated first. Values less than 0 or greater than 127 are reset to 0 and 127 respectively. The default value is 0. Members that are not assigned a solve order are assigned the solve order of their dimension.</td>
</tr>
<tr>
<td>Time Balance</td>
<td>• A</td>
<td>Treat as an average time balance item (Applies to accounts dimensions only). Uses load rules member property codes. See Using the Data Source to Work with Member Properties in <em>Designing and Maintaining Essbase Cubes</em>. Time balance properties provide instructions about how to calculate data in the Accounts dimension. See Setting Time Balance Properties in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>• F</td>
<td>Treat as the first time balance item (Applies to accounts dimensions only).</td>
</tr>
<tr>
<td></td>
<td>• L</td>
<td>Treat as the last time balance item (Applies to accounts dimensions only).</td>
</tr>
<tr>
<td>Skip Value</td>
<td>• B</td>
<td>Exclude data values of zero or #MISSING in the time balance (applies to accounts dimensions only). Uses load rules member property codes. See Using the Data Source to Work with Member Properties in <em>Designing and Maintaining Essbase Cubes</em>. If you set the time balance as first, last, or average, then set the Skip property to indicate what to do when missing values or values of 0 are encountered. See Setting Skip Properties in <em>Designing and Maintaining Essbase Cubes</em>.</td>
</tr>
<tr>
<td></td>
<td>• M</td>
<td>Exclude data values of #MISSING from the time balance (applies to accounts dimensions only).</td>
</tr>
<tr>
<td></td>
<td>• Z</td>
<td>Exclude data values of zero from the time balance (applies to accounts dimensions only).</td>
</tr>
<tr>
<td>Expense Reporting</td>
<td>E</td>
<td>Treat as an expense item (applies to accounts dimensions only)</td>
</tr>
<tr>
<td>Comment</td>
<td>Any string</td>
<td>Enter a comment.</td>
</tr>
<tr>
<td>Formula</td>
<td>Valid calculation syntax</td>
<td>Enter a member formula.</td>
</tr>
</tbody>
</table>
Table A-7  (Cont.) Fields and Valid Values in Dimension Worksheets

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Defined Attribute</td>
<td>Attribute names, such as specific colors or sizes</td>
<td>Defined attribute names used to aid in the analysis of the data. When making changes to user-defined attributes (UDAs) while updating a cube incrementally using Cube Designer and an application workbook, you must specify all the UDAs in the dimension sheet, both new ones you are adding and existing UDAs in the outline. If you specify some UDAs (such as those you are adding), but not all of them, those that are not specified are deleted.</td>
</tr>
<tr>
<td>Number of UDAs</td>
<td>A numeral</td>
<td>The number of UDAs for this member.</td>
</tr>
<tr>
<td>Available Alias Tables</td>
<td>Naming conventions for member names apply. See Naming Conventions for Dimensions, Members, and Aliases in Designing and Maintaining Essbase Cubes.</td>
<td>ALIAS.table_name After the column heading with ALIAS.table_name, the column is populated with the aliases for the cube.</td>
</tr>
</tbody>
</table>

You can modify dimension worksheets in the Designer Panel. See Work with Dimension Worksheets in Cube Designer.

See Working with Rules Files in Designing and Maintaining Essbase Cubes.

Understand Data Worksheets

Data Worksheets

You can include one or more data worksheets in an application workbook. The name of each data worksheet is Data.name. For example, for values for the eastern region, the data worksheet might be called Data.East. The name can be anything you choose. You can choose meaningful names so that you can recognize them if you need to use them again.

Note:

Multiple data worksheets are allowed in an application workbook, but they must share the exact same column layout.
Data Worksheet Format

When loading data, a member from every dimension must be defined before a data value. Therefore, the data worksheet places all but one dimension under the column headings titled Dimension.\textit{dimension\_name}. One dimension is selected as the Measures dimension and members from that dimension must be added manually under the remaining column headings titled Measure.\textit{member\_name}. Only place members that will contain data in the columns titled Measure.\textit{member\_name}.

When scenarios are enabled, cubes have a hidden dimension called sandbox. The sandbox dimension, named Dimension.\textit{sandbox}, is the first column in the data worksheet. It contains a member called base that you must define when loading data.

The following image shows a data worksheet in a sample application workbook.

<table>
<thead>
<tr>
<th>Definitions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>File Name</td>
<td>CubeBasic</td>
</tr>
<tr>
<td>Rule Name</td>
<td>Basic</td>
</tr>
<tr>
<td>Data Load Option</td>
<td>Replace</td>
</tr>
<tr>
<td>Dimension</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Columns</td>
<td>Dimension.Product</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
<tr>
<td>100-10</td>
<td>NewYork</td>
</tr>
</tbody>
</table>

The following table describes the settings on the data.name worksheets in application workbooks.

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Name</td>
<td>A valid string. See Name and Related Artifact Limits in \textit{Designing and Maintaining Essbase Cubes.}</td>
<td>The build process creates a data file with .txt extension in the cloud service for every data worksheet in the application workbook. You can give them meaningful names so that they are easily recognizable if they need to be used again.</td>
</tr>
<tr>
<td>Rule Name</td>
<td>A valid string. See Name and Related Artifact Limits in \textit{Designing and Maintaining Essbase Cubes.}</td>
<td>The build process creates a rule file with .rul extension in the cloud service for every dimension worksheet in the workbook. You can give them meaningful names so that they are easily recognizable if they need to be used again.</td>
</tr>
<tr>
<td>Property or Field</td>
<td>Valid Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Data Load Option</td>
<td>• Add</td>
<td>If you enter Replace, then the existing values of the database are overwritten with the values of the data source. You can also use incoming data values to add to or subtract from existing database values. For example, if you load weekly values, then you can add them to create monthly values in the database.</td>
</tr>
<tr>
<td></td>
<td>• Subtract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Replace</td>
<td></td>
</tr>
<tr>
<td>Delimiter</td>
<td>The values can be a tab, a space, or any single character except &quot;.&quot; • Tab • Space • Any single character except &quot;</td>
<td>This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Header Rows to Skip</td>
<td>A positive number or zero.</td>
<td>The number of header rows to skip when performing a data load or dimension build. This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Sign Flip Dimension</td>
<td>Dimension name</td>
<td>Reverses the values of data fields by flipping their signs. Enter the name of the dimension in the Sign Flip Dimension field, and enter the selected UDA within the specified dimension in the Sign Flip UDA field. This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Sign Flip UDA</td>
<td>• Flip</td>
<td>Reverses the values of data fields by flipping their signs. Enter the name of the dimension in the Sign Flip Dimension field, and enter the selected UDA within the specified dimension in the Sign Flip UDA field. This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td></td>
<td>• Blank</td>
<td></td>
</tr>
<tr>
<td>Property or Field</td>
<td>Valid Values</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ignore column header</td>
<td>Ignore</td>
<td>Data in a column with the heading, IGNORE is ignored during data loads and dimension builds. This value must be updated directly in the Excel sheet. It cannot be updated using the Cube Designer interface.</td>
</tr>
<tr>
<td>Data Source</td>
<td>A valid Data Source name</td>
<td>This value is used to retrieve data from the source defined in the Data Source definition. This value must be updated directly in the application workbook. It can't be updated using the Cube Designer interface.</td>
</tr>
</tbody>
</table>

### Data Operations

When you load data, values can replace, add to, or subtract from existing data values in the cube. You indicate which of these options to use in the Data Load Option field on the data worksheet.

- **Replace**: Overwrites cube values with the data source values. Replace is the default.
- **Add**: Adds data source values to the cube values. For example, if you load weekly data values, you can add them to create cumulative data values in the cube.
- **Subtract**: Subtracts data source values from the database values. For example, to track available budget by week, you can subtract weekly data expenditures from the previous week's budget values.

### Rules Files

When you build a cube, data files and data load rules files are created in the cloud service. Those files can then be used later if you want to load data to a cube. Data files are named with the file name specified in the definitions area of the data sheet and a .txt extension. For example, cube_basic.txt. Rules files are named with the file name specified in the definitions area of the data sheet and a .rul extension. For example, cube_basic.rul. You can also use data files and data load rules files from a supported on-premises release of Essbase.

You can modify data worksheets in the Designer Panel. See Work with Data Worksheets in Cube Designer.

See Data Sources in Designing and Maintaining Essbase Cubes.

### Understand Calculation Worksheets

You can have one or more calculation worksheets in an application workbook.

The following image shows a calculation worksheet in a sample application workbook.
Within the calculation worksheet, the calculation script begins in cell C6.

The name of each calculation worksheet is Calc.scriptname, for example, for the sample CalcAll calculation script, the calculation worksheet is called Calc.calcall.

The contents of the calculation worksheet are used to create a calculation script in the cloud service. The calculation script uses the file name specified in the definitions area of the calculation sheet and a has a .csc extension. For example, filename.csc.

You can execute the calculation script when you build the cube in Cube Designer, if you select Run Calculation Sheets Contained within Workbook in the Build Cube dialog box. If you do not want to execute the calculation, do not select this option.

The calculation scripts are executed in the order they appear in the application workbook.

<table>
<thead>
<tr>
<th>Property or Field</th>
<th>Valid Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Name</td>
<td>See Naming Conventions in Calculation Scripts, Report Scripts, Formulas, Filters, and Substitution and Environment Variable Values In Designing and Maintaining Essbase Cubes</td>
<td>The File Name defines the calculation script name. The calculation script created on the cloud service when the cube is created is the File Name with a .csc extension.</td>
</tr>
<tr>
<td>Execute Calc</td>
<td>• Yes</td>
<td>If you enter Yes, then the calculation is executed at the time you build the cube. If you enter No, then the calculation is not executed right away. In either case, each calculation worksheet creates a calculation script on the cloud service, using the specified file name with a .csc extension. That way, any of the calculations can be executed at a later time.</td>
</tr>
</tbody>
</table>

You can modify calculation worksheets in the Designer Panel. See Work with Calculation Worksheets in Cube Designer.
Set up Cube Designer

You might find it easier to work with application workbooks in Excel using the Cube Designer extension for Smart View.

- Workflow to Set up Cube Designer
- Download and Run the Smart View Installer
- Create Data Source Connections to the Cloud Service
- Install the Smart View Cube Designer Extension
- Update the Smart View Cube Designer Extension
- Delete Smart View Connection URLs

Workflow to Set up Cube Designer

This is the workflow for setting the Smart View Cube Designer extension:

1. Install Smart View.
2. Set up a data source connection to the cloud service.
3. Install Cube Designer Smart View extension.
4. Update Cube Designer Smart View extension.

Download and Run the Smart View Installer

Smart View Prerequisites

- The latest release of Smart View

  On the Oracle Technology Network Downloads tab, the latest release for Smart View is always certified.

- Microsoft Office 2010, 2013 or 2016
- .NET Framework 4.0

Note:

You must use .NET Framework 4.5 if you are installing Smart View from the cloud service without saving the installer locally.

Installing Smart View

1. Log into Oracle Analytics Cloud – Essbase.
2. Click Console.
3. On the **Desktop Tools** tab, click the Browse icon to the right of **Smart View for Essbase**.

4. On the Smart View download page on Oracle Technology Network, click **Accept License Agreement**, and then click **Download Now**.
   
   If the Oracle sign-in page is displayed, then sign in with your Oracle user name (usually your email address) and password.

5. Follow the steps for your browser to download the .zip file, and save it to a folder on your computer.

6. Go to the folder that you used in Step 5, and then double click **smartview.exe** to start the installation wizard.

7. Select a destination folder for Smart View, and then click **OK**. For new installations, **Smart View is installed by default in**: `C:\Oracle\smartview`

   If you are upgrading an installation of Smart View, then the installer defaults to the folder where you previously installed Smart View.

8. When the installation is complete, click **OK**.

Continue the setup process with **Create Data Source Connections to the Cloud Service**.

### Create Data Source Connections to the Cloud Service

After you install Smart View, you can create connections to Oracle Analytics Cloud – Essbase.

Connections require information about the server and port. Your cloud service administrator should provide you with the information you need to create the connection.

For the private connection to the cloud service, use the quick connection method.

1. In Excel, select the Smart View ribbon, and then click **Panel**.

2. On the **Smart View Panel**, click the arrow next to **Switch to**, and then select **Private Connections** from the list.

3. Still in the **Smart View Panel**, in the text box, enter the URL for the data source to which you want to connect.
   
   **URL syntax**: `https://server/essbase/smartview`

4. Click **Go** or press **Enter**.

5. On the login window, enter your login credentials, and then select a data source from the drop-down menu.

Continue the setup process with **Install the Smart View Cube Designer Extension**.

### Install the Smart View Cube Designer Extension

Before you perform this procedure, you must complete the steps in **Create Data Source Connections to the Cloud Service**.
Installing Cube Designer from Smart View

1. On the Smart View ribbon, select **Options**, and then **Extensions**.
2. Click the **Check for updates** link.
   Smart View checks for all extensions that your administrator has made available to you.
3. Locate the extension named **Oracle Cube Designer** and click **Install**
   to start the installer.
4. Follow the prompts to install the extension.

Installing Cube Designer from the Service

1. In Oracle Analytics Cloud – Essbase, click **Console**.
2. On the Desktop Tools tab, to the right of **Cube Designer Extension**, click **Download**
3. In the **Opening CubeDesignerInstaller.svext** dialog box, select **Save File** and click **OK**.
   Save the file to a local directory.
4. Close all Microsoft Office applications and make sure Microsoft Office applications are not running in the background.
5. Double click the CubeDesignerInstaller.svext file.
6. Restart Microsoft Office applications.

Update the Smart View Cube Designer Extension

If an extension is available for you to update, you can update it from Smart View Excel, on the **Extensions** tab of the Options dialog box.

To check for Cube Designer Smart View extension updates and install them:

1. From the Smart View ribbon, select **Options** and then **Extensions**.
2. Click the **Check for Updates, New Installs, and Uninstalls** link to check for updates.
   You are prompted to log in.
   If an update is available, the **Update Available** icon is displayed in the **Cube Designer** row.
Note:

This process uses a server locations list, which was created by previous Smart View connections. If there are connection definitions that are no longer valid, you receive errors when the process tries to connect to those servers. See Delete Smart View Connection URLs.

3. Click **Remove** to uninstall the extension.
5. Restart Excel.
6. From the Smart View ribbon, select **Options** and then **Extensions**.
7. Click **Check for Updates, New Installs, and Uninstalls**.
   You are prompted to log in.
8. In the Cube Designer row, click **Install**.
10. Open Excel.
11. Ensure that the Cube Designer ribbon is displayed in Excel.

Delete Smart View Connection URLs

When you connect to the cloud service from Cube Designer, the list of server locations that are used to connecting is created by previous Smart View connections. If there are connection definitions that are no longer valid, you receive errors.

You can reset the list of connection definitions to remove those that you are unwanted, or are invalid.

To reset the list of server locations:

1. Click the down arrow next to the **Private Connection** drop down list and select **Delete Connection URLs**.
2. In the Delete Connection URLs dialog box, select **Extension Update URLs** from the drop down menu.

3. Select all of the URLs except the one you want to use, and click **Delete**.
The default calculation and query processor lets you perform real-time analytics using procedural calculations and read and write modeling capabilities.

If you have worked with on-premises Essbase, then you likely remember one or more of these cube design variants, tailored for specific purposes:

- Block storage, with large, sparse dimensions, stored and pre-aggregated to achieve good query performance, and a rich set of calculation functions for analysis.
- Aggregate storage, for cubes having a large number of dimensions, and many upper-level aggregations.
- Hybrid aggregation mode, which is block storage enhanced with the benefits of aggregate storage.

The default calculation and query processor is the hybrid aggregation mode. The ASODYNAMICAGGINBSO configuration setting controls whether block storage databases use hybrid aggregation mode.

Hybrid aggregation mode is enabled by the ASODYNAMICAGGINBSO FULL default configuration setting.

Most calculation functions are supported in hybrid aggregation mode. To see a list and syntax for all supported calculation functions, as well as the few exceptions, see the Technical Reference for Oracle Analytics Cloud - Essbase.

See Using Hybrid Aggregation in Designing and Maintaining Essbase Cubes for a more in-depth description of Hybrid aggregation mode.

See ASODYNAMICAGGINBSO in Technical Reference for Oracle Analytics Cloud - Essbase for the syntax to configure Hybrid aggregation mode beyond the default settings.