Oracle

Construction Intelligence Cloud Administration Guide

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Contents

Getting Started

This chapter provides:

- an overview of the CIC Administration application
- a overview of the applications that need to be configured to display data from your source application in CIC.

In This Section

CIC Administration Application Overview

CIC is managed using the CIC Administration application. This administration application allows you to configure and manage CIC data sources of your organization. CIC currently supports P6 EPPM and Oracle Aconex as a data source.

The administration application is packaged and delivered with a set of predefined problems that represent common and significant challenges widespread across the industry. Each problem is also delivered with a seed model which uses a sample data set.

As CIC administrators, you can:

- configure CIC to evaluate your P6 and Aconex data for a select set of problems
- create one or more custom models for each problem and train it to predict future events related to enterprise projects
- enable a specific combination of features or characteristics in each model
- setup benchmarking groups to compare with your project data
- setup customized values for threshold settings which display in the **Filter** pane of CIC. Users can then use these threshold settings to filter their current view of ongoing projects

This guide describes how to set up CIC for your organization and configure your source applications such as P6 EPPM and Aconex to ensure the right set of projects and users access CIC.

Audience

This guide is intended to be used by administrators who have access to CIC.

CIC Application Setup Roadmap

Construction Intelligence Cloud can be configured to display predictive insights for projects managed and tracked in the following applications:

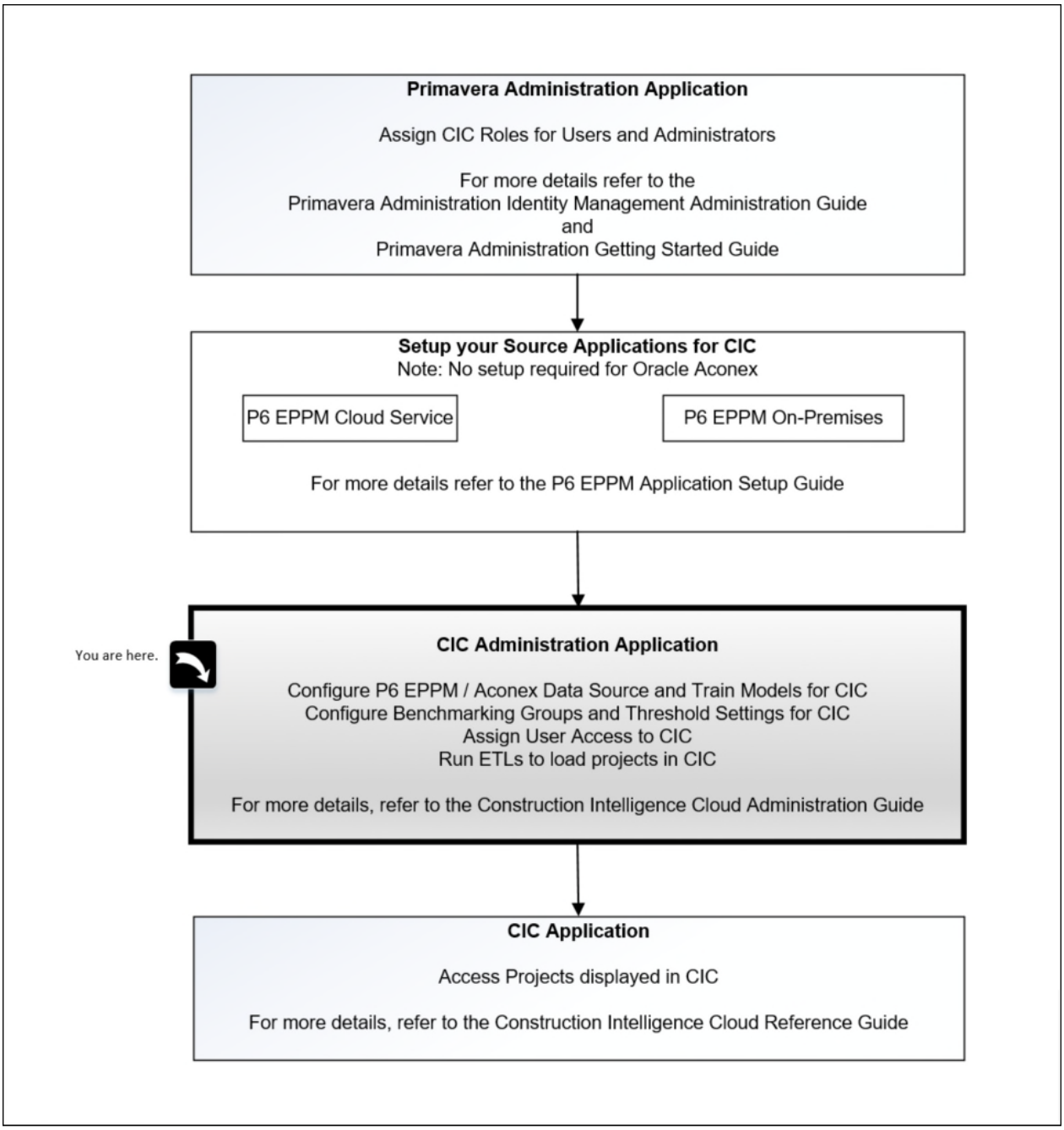
- P6 EPPM cloud
- Oracle Aconex

To connect CIC with your applicationP6 EPPM, (cloud or on-premises), you have to setup the following applications as listed in the order listed below:

1) Primavera Administration Application
2) The applications you wish to connect with CIC from those listed above.
3) CIC Administration application

The application setup roadmap illustrates the applications you need to setup to display P6 EPPM projects in CIC.

Note: At this point in the setup sequence, ensure you have completed the required setup in the Primavera Administration Application and configured your source application. For more details, see Before you Begin.



Before you Begin

This administration guide is meant for CIC administrators who manage the data displayed in CIC from any of the following applications:

- P6 EPPM
- Aconex

Depending on your source application (P6 EPPM or Aconex), you will initially assign specific roles for CIC users in the Primavera Administration Application.

To add additional administrators (optional) and users to CIC in the Primavera Administration Application:

1) Sign in to the Primavera Administration Application with your credentials.
2) To give your users access to the CIC or the CIC administration application, see:
   - ***Assigning CIC Roles in Primavera Administration Application*** (on page 14) for P6 users
   - ***Assigning CIC Roles in Primavera Administration Application*** (on page 27) for Aconex users

   For more details on using the Primavera Administration Application, you can also refer to:
   - the topic, *Preparing to Administer your Applications,* in the *Primavera Administration Getting Started Guide* *https://docs.oracle.com/cd/F25602_01/English/getting_started/index.htm.*
   - *Primavera Administration Identity Management Administration Guide* *https://docs.oracle.com/cd/F25602_01/English/id_mgmt/index.htm* on how to add administrators.
3) If you plan to use CIC for P6 projects, then publish P6 projects and bring the data over to CIC.

   For more details, see the P6 EPPM *Application Setup Guide* .

In This Section

How to Use this Guide

Construction Intelligence Cloud provides predictive insights by connecting to different CEGBU applications(data sources). Depending on the data source you associate with CIC, specific aspects may vary such as:

- configuration properties of a data source
- benchmark groups to compare the performance of your project data

The following sections serve as a guideline for configuring and managing CIC associated with your organization's product.

Customers of CIC and P6 EPPM

If your organization plans to use CIC insights for P6 EPPM only, review the following chapters in this guide to configure a P6 EPPM data source and train models in CIC:

- ***Getting Started*** (on page 5)
- ***CIC for P6 EPPM*** (on page 11)
- ***Standard Administration Tasks*** (on page 35)
- ***Working with the Machine Learning Workbench*** (on page 39)

Customers of CIC and Aconex

If your organization plans to use CIC insights for Aconex only, review the following chapters to configure Aconex data sources and train models in CIC:

- ***Getting Started*** (on page 5)
- ***CIC for Aconex*** (on page 25)
- ***Standard Administration Tasks*** (on page 35)
- ***Working with the Machine Learning Workbench*** (on page 39)

Customers of CIC, P6 EPPM, and Aconex

Since your organization will be using CIC insights for P6 EPPM as well as Aconex, review the chapters listed above in each section.

CIC for P6 EPPM

To bring data from a source application such as P6 EPPM into CIC, you need to setup and configure a P6 data source in the CIC administration application.

This includes:

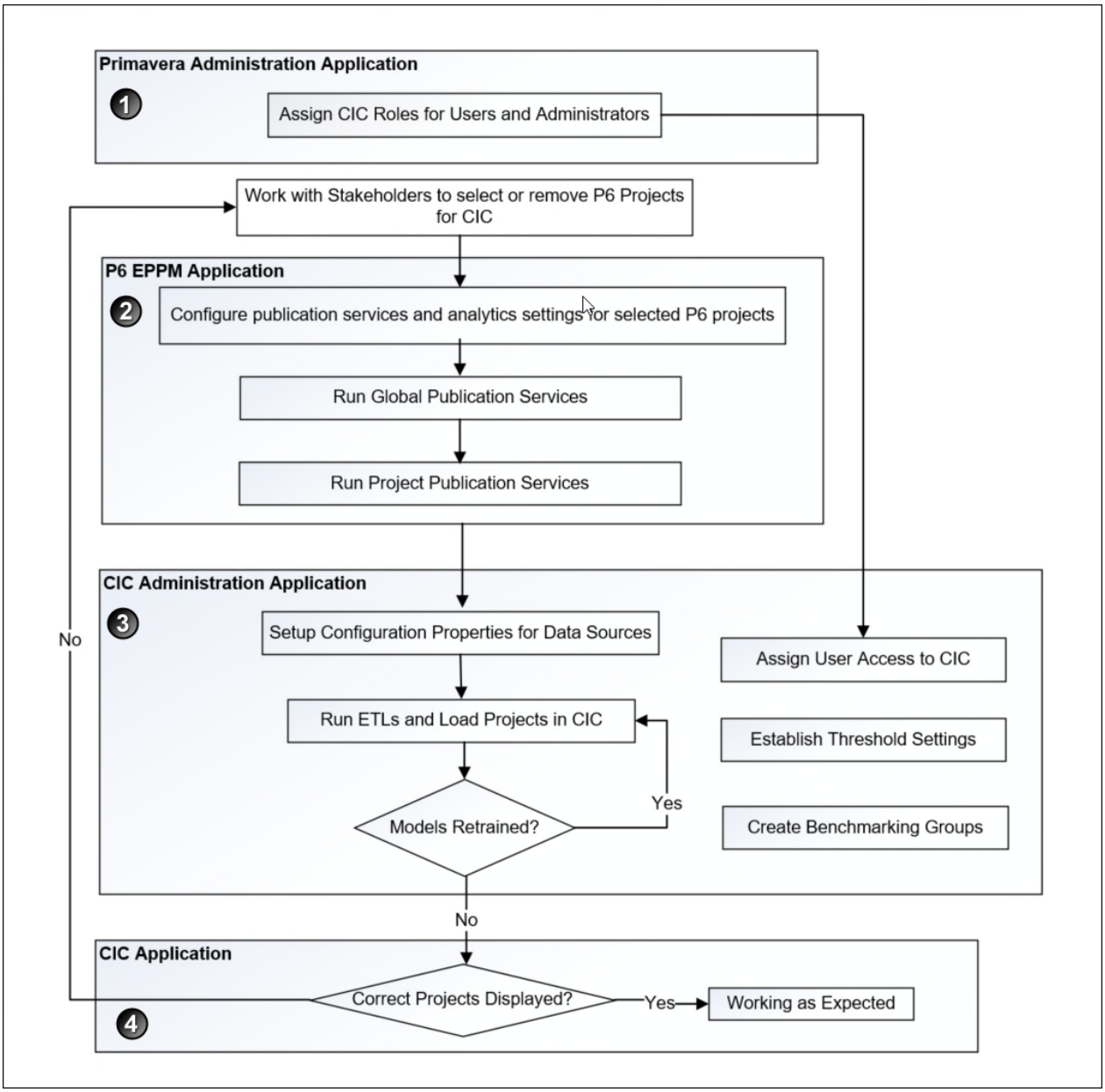
- a roadmap that outlines a setup task sequence for <0P_ProdName_P6_Short>
- tasks for setting up Aconex users with access to CIC
- information on how to configure one or more <0P_ProdName_P6_Short> data source for CIC
- configure threshold benchmarking groups to compare your <0P_ProdName_P6_Short> project

This chapter describes the above procedures to set up CIC with data from P6 EPPM.

In This Section

Roadmap for Configuring CIC for P6

As a CIC administrator, use the following roadmap to setup users, add additional administrators, P6 projects, and configure P6 data sources for CIC.



To configure CIC for P6:

1) Assign CIC roles to add additional administrators (optional) and users to CIC. For more details, see ***Before you Begin*** (on page 9).
2) Setup P6 EPPM application to bring P6 projects over to CIC. For more details, see the *P6 EPPM Application Setup Guide*.
3) In the CIC Administration application complete the following tasks.

a. Assign CIC access to P6 users from the **User Management** page.

   For more details, see ***Assigning Construction Intelligence Cloud Access for P6 Users*** (on page 15).

b. Configure P6 data sources to bring projects into CIC.

   For more details, see ***Configuring P6 EPPM Data Sources*** (on page 16).

c. Manage and load projects into CIC. These include:

   - Start or stop STARETL processes
   - Schedule STARETL runs
   - Reviewing the global status of STARETL runs and status of publication services
   - Access log files and Access STARETL
   - Run reports for STARETL processes

   For more details on each task, see ***Standard Administration Tasks*** (on page 35).

d. Based on the content displayed in Construction Intelligence Cloud, configure and retrain machine learning (ML) models as necessary to obtain the desired level of accuracy for predicting outcomes in Construction Intelligence Cloud.

   For more details, see ***Working with the Machine Learning Workbench*** (on page 39)

> **Note**: When you deselect P6 projects or change the model used for predictions, you will need to rerun publication services and the ETL to ensure CIC reflects the current changes.

4) Use CIC to to review the information displayed. Identify any threshold settings or project benchmarking groups that may need to be modified.

   For more details on how to setup benchmarking groups, see ***Configuring Benchmarking Groups for P6 Projects*** (on page 23).

   For more details on how to modify threshold settings, see ***Configuring Threshold Settings for P6 Data*** (on page 23).

Managing P6 Users for CIC

To add a user or administrator for CIC, complete the following procedures sequentially:

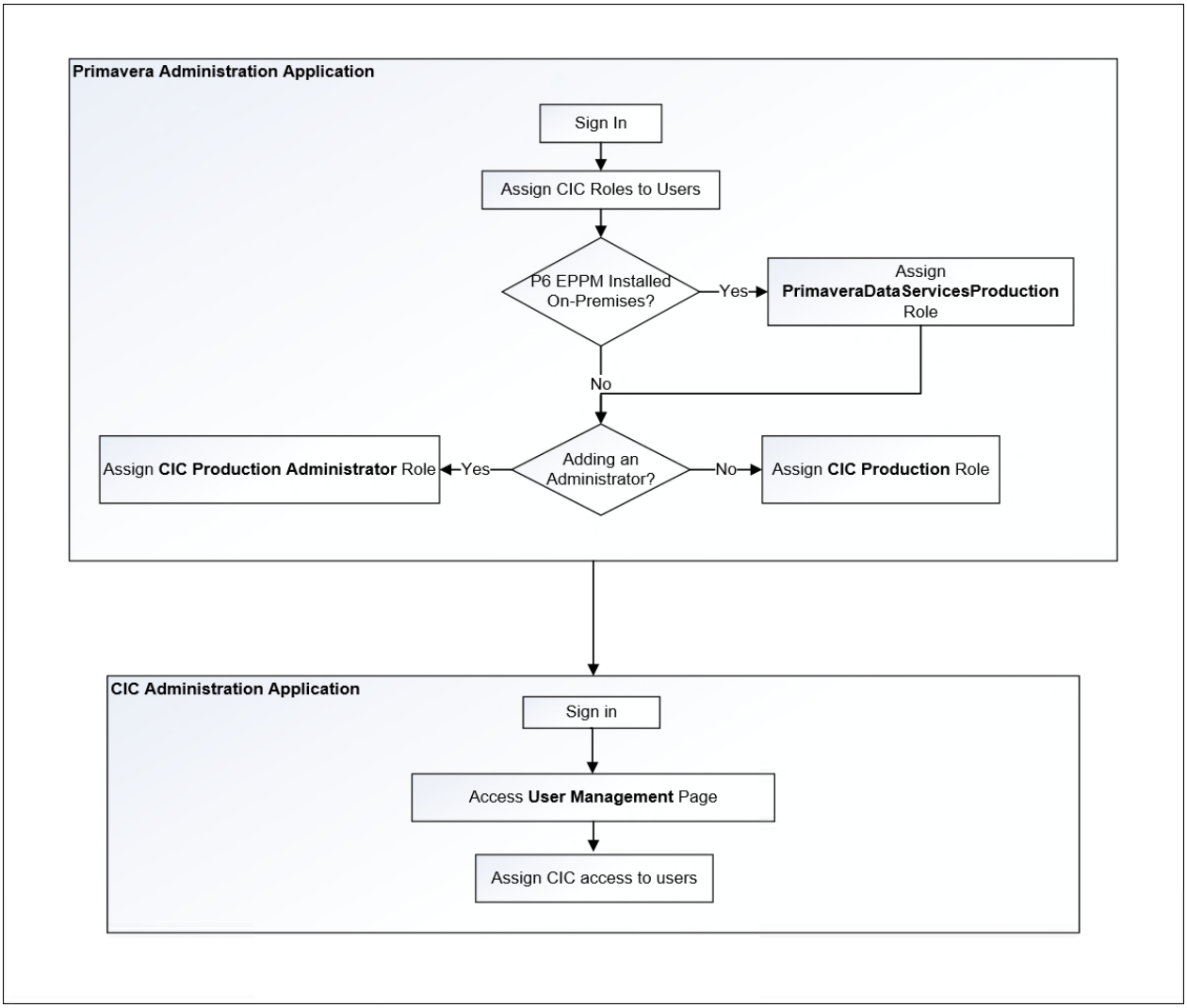
1) ***Assigning CIC Roles in Primavera Administration Application*** (on page 14)
2) ***Assigning Construction Intelligence Cloud Access for P6 Users*** (on page 15)

To remove a user or administrator, revoke the corresponding roles in both applications.

This section also provides a flow chart to manage users, and detailed instructions for accomplishing each task listed above.

Adding CIC Users

To assign users to CIC, you must first assign CIC roles in Primavera Administration Application. Use the following flowchart and the procedures outlined in this chapter to add users to CIC.



Assigning CIC Roles in Primavera Administration Application

To add additional CIC administrators you will need to use the Primavera Administration Application. Until you add additional administrators, you are the sole administrator able to add accounts, grant roles, and reset passwords. You will also be the primary contact for receiving Oracle notifications about upgrades, monthly updates, planned downtime, and maintenance periods.

To add CIC administrators or users:

1) Sign in to Primavera Administration Application.
2) Assign users with the following roles as needed:

- **PrimaveraDataServicesProduction**: This role is applicable only if your organization chooses to display P6 EPPM on-premises projects in CIC. Assign this role to users who are responsible for synchronizing data between P6 EPPM on-premises and P6 EPPM cloud.
- **CIC Production Administrator**: Assign this role to designate a user as a CIC administrator. This roles gives your user access to the CIC administration application.
- **CIC Production**: Assign this role to give a user access to insights in the Construction Intelligence Cloud application.

> **Note**: To give a CIC administrator access to insights in Construction Intelligence Cloud, you will need to assign the user with **CIC Production Administrator** role and **CIC Production** role.

For detailed instructions also refer to:

- The topic, *Preparing to Administer your Applications,* in the *Primavera Administration Getting Started Guide https://docs.oracle.com/cd/F25602_01/English/getting_started/index.htm.*
- *Primavera Administration Identity Management Administration Guide https://docs.oracle.com/cd/F25602_01/English/id_mgmt/index.htm* to add administrators.

Assigning Construction Intelligence Cloud Access for P6 Users

To add users to access insights in Construction Intelligence Cloud, complete the following procedures:

Prerequisite

Assigning CIC Roles in Primavera Administration Application (on page 14).

Procedure

To assign access or remove access for a P6 user to Construction Intelligence Cloud:

1) Sign in to the CIC Administration application.
2) In the sidebar, select **User Management**.
3) Select any of the following actions:
   - To assign access to Construction Intelligence Cloud, select the check box for a **P6 User ID**.

     > **Note**: If the user being added already has access to CIC insights for Aconex, then confirm the user's email ID identified by the system to grant them access to P6 data.

   - To remove access to Construction Intelligence Cloud, deselect the check box for a **P6 User ID**.
4) Select the **Save Access** button to confirm the changes.

Configuring P6 EPPM Data Sources

CIC can be configured to display projects from P6 EPPM data sources.

To configure the properties for any P6 data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** , select a **staretl<id>** or a **<Custom Name for DataSource>**.

> **Note:** <id> is the identifier of the data source.

3) Select **Config** in the sidebar for a selected P6 data source. .
4) Set the following properties, and then select **Save**:

Configuration Property	Description
In the **Configurable Properties** section, set up the following properties as required:	
Custom Name for Datasource	Enter a name for the data source for identification purposes. For example, *P6 EPPM Staging Data*.
Enable Activity Period Actuals	Controls the display of past period actuals for activities. Select any of the following values: ▸ *True* (default)*:* Enables pay period actuals for activities. ▸ *False:* Disables pay period actuals for activities. **Note**: Primavera Data Warehouse can use two additional financial periods. To add additional financial periods, submit a service request to Oracle Support.
ODI LoadPlan Auto Restart	Controls restart of all real-time ODI Load plans. Select any of the following values: ▸ *True* (default)*:* Auto restarts ODI load plans for a maximum count of 3 if an initial run fails. ▸ *False:* Manually restart is required for all real-time ODI load plans.

Configuration Property	Description
Enable Resource Assignment Period Actuals	Controls the display of past period actuals for resources. Select any of the following values: ▸ *True* (default)*:* Enables pay period actuals for resources. ▸ *False:* Disables pay period actuals for resources. **Note**: The Primavera Data Warehouse can use two additional financial periods. To add additional financial periods, submit a service request to Oracle Support.
Enable Relationship load	Controls the ETL from processing activity relationships. Select any of the following values: ▸ *True* (default)*:* ETL runs will not process relationship loads. ▸ *False:* ETL runs will process relationship loads.
Turn off all History, keep Slowly Changing Dimensions	Controls history tables. Select any of the following values: ▸ *True:* Turns off history tables. **Note**: Slowly changing dimensions (SCDs) will continue to be captured at the project level without the history tables. ▸ *False* (default): Keeps history tables with SCDs. **Note**: To delete SCD data for an effective date or a specific date range, contact Oracle Support with a service request.
Disable Rebuild Index	Controls rebuilding of indexes in the cloud database. Select any of the following values: ▸ *True* (default)*:* Does not rebuild indexes. Results in improved performance. ▸ *False:* Rebuilds indexes
Turn off Resource and Role Limits	Controls resource and role utilization scripts. Select any of the following values: ▸ *True:* Turn the scripts *off*. ▸ *False* (default): Keeps the scripts running.

Configuration Property	Description
Enabled Spread Snapshot History	Controls the use of spread snapshot history in the advanced analytics dashboard. Select any of the following values: ▸ *True:* Enables spread snapshot history. ▸ *False* (default): Disables spread snapshot history
Use project filter in data source 1	Selects filtered projects only. Select any of the following values: ▸ *True:* Ensures the next ETL run includes only projects filtered with the `ETLFILTER code = ''Y'`. ▸ *False* (default): Does not user project filters
Include Inactive Resources	Controls resource filtration. Select any of the following values: ▸ *True*: Ensures Primavera Data Warehouse tables will not filter out inactive resources. ▸ **Note**: If inactive resources are included, then spread data and other dimension tables will also be included. You may not need to process this extra resource assignment information. ▸ *False* (default): Filters out inactive resources.
Enable Slowly Changing Dimensions and Spread History	Controls the creation of slowly changing dimensions (SCDs) and spread history. Select any of the following values: ▸ *True (default) :* Capture SCDs and spread history. ▸ *False:* Turn off (SCDs) and spread history.
Load all Hierarchy Codes	Builds code hierarchies. Select any of the following values: ▸ *True:* Runs **codes_hier.sql** script and build code hierarchies with all codes that come from the source. ▸ *False* (default): Runs **codes_hier_all.sql** script and build hierarchies with codes from **configStar**.

Configuration Property	Description
ODI Log Level	Controls the level of detail included in the ODI log files. Select any of the following values: ▸ *Summary*: Displays a summarized content in the log file. ▸ *Detail* (default)*:* Displays detailed information in the log file..
Degree of Parallelism for Rebuild Index	Select the number of threads running in parallel for the rebuilding index process.
If you plan to use ODI for projects in real-time, set the following properties to poll for changes in project data in P6 EPPM. The minimum poll interval is 5 minutes, and the maximum is 1440 minutes for all poll interval settings listed below:	
ODI Realtime Global Loadplan Poll Interval (in minutes)	Enter the frequency at which changes to global data is to be checked in P6 EPPM and captured in the data warehouse. By default the poll interval for ODI Realtime Global load plan is set to *10* minutes.
ODI Realtime On Demand Loadplan Poll Interval (in minutes)	The ODI Realtime On Demand Loadplan Poll Interval checks for changes to projects whose **Enable Publication** flag is selected in P6 EPPM. This process runs when new projects are added and published to the data warehouse by triggering the ODI On Demand load plan to run for the selected projects and include it in the data warehouse. Enter the frequency in minutes to check for changes to the **Enable Publication** flag for projects in P6 EPPM and send it to the data warehouse. By default the poll interval for running the On Demand ODI load plan is set to *60* minutes. At each check, new projects with **Enable Publication** flag will be added to the data warehouse, and projects whose **Enable Publication** flag is disabled will be deleted in the data warehouse.

Configuration Property	Description
ODI Realtime Project Loadplan Poll Interval (in minutes)	The ODI Realtime Project Loadplan Poll Interval setting checks for changes in current projects in P6 EPPM. This configuration property checks those projects whose **Data Warehouse Update Frequency (ODI Only)** field is set as *Immediate* in the **Project Preferences** dialog box in P6 EPPM. Enter the frequency in minutes to send changes directly to the data warehouse. By default the poll interval value is set to *1440 minutes* (24 hours).
In the **OBIEE Settings** section set up the following properties:	
P6 Base URL	Enter the URL in the following format: http://<host>:<port>/p6
OBIEE Cache Purge	Controls the clearance of OBIEE cache entries. Select any of the following values: ▸ True: Clears the OBIEE cache ▸ False: Retains the cache entries.
Send Email Notification	Enter the e-mail IDs of personnel who are to be notified about STARETL run status or issues. Also select the events for which you wish to be notified: ▸ **Failure:** Email notifications sent only for failed ETL runs. ▸ **Success**: Email notifications sent only for successful ETL runs. ▸ **Both**: Email notifications sent for successful and failed ETL runs.

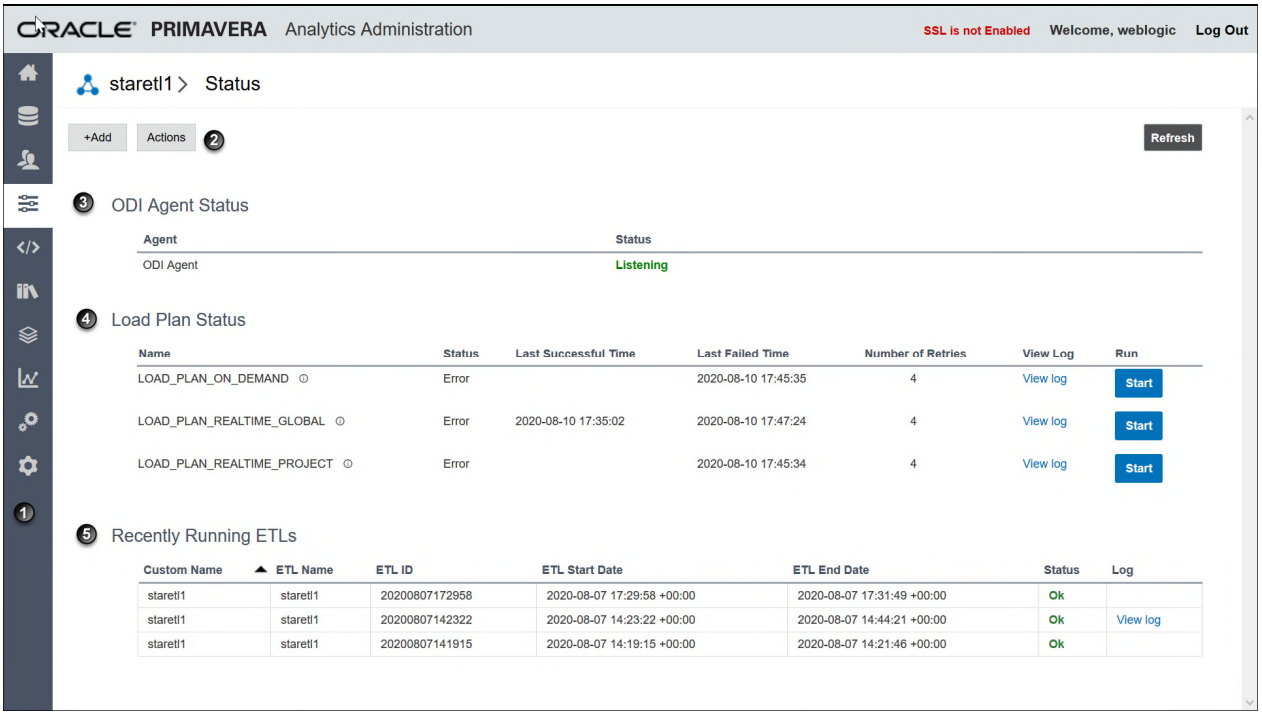
Running ETLs and ODI Loads for P6 EPPM Data Sources

To bring data over from P6 EPPM to CIC, you must run ETLs or ODI load plans from the **Status** page of the CIC Administration application.

To access the **Status** page for any data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb

2) From the **Home** menu, select a data source.



Item	Description
1	Navigation menu: Select the following icons in the sidebar to use the interface: **Home**: Shows currently running STARETL processes for all data sources and enables you to stop a currently running STARETL process. **ML Workbench**: Monitor and manage models for a P6 or Aconex data source. **User Management**: Setup and manage P6 and Aconex accessing CIC. **Status**: Manage and schedule ETL runs and ODI load plans, view ETL logs and status reports for a selected P6 or Aconex data source. **Publication Status**: View the status of recent publication runs for a selected P6 data source. **Benchmark**: Setup and manage the benchmark groups to compare P6 projects in CIC. **Threshold Settings**: Set up the acceptable range for project metrics displayed in CIC. **Config**: Configure the properties of the STARETL process for each P6 data source.

Item	Description
2	**Add** menu: Select this menu to select codes from an available list. **Actions** menu: Select this menu to schedule or run ETLs for the selected data source. **Refresh**: Select this button to renew the current view of the page.
3	**ODI Agent Status**: Displays the current status or mode of the ODI agent.
4	**Load Plan Status**: Displays the recent runs of ODI load plans that were run for this data source. Use this section to **Start** or **Restart** ODI load runs.
5	**Recently Running ETLs**: Displays the recent ETL runs for this data source. Select **View log** to review the log file for each ETL run.

Reviewing the Status of P6 Publication Services

Publication services are responsible for ensuring that the data is up-to-date prior to running the STARETL process. Publication services are available for P6

To view the status of recent publication runs:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

   Note: <id> is the identifier of the data source.

3) In the sidebar, select **Status**.
4) On the **Status** page, select **Publication Status** in the sidebar.
5) On the **Publication Status** page, the following information for each publication service run:
   For P6 Publication Services:
   - **Job ID**: A unique identifier for the publication service.
   - **Job Type**: The category of the publication service to which it belongs.
   - **Job Name**: The name of the publication service.
   - **Recur Type**: The recurrence of the publication service. The following values may display:
     - *RT_WebEnabled*: Indicates that the job is a recurring job and is scheduled
     - *RT_RecurDisabled*: Indicates that the job is a scheduled recurring job, but is currently disabled
     - *RT_WebASAP*: Indicates that the job is a one-time job, and must be run at the earliest
   - **Status Code**: The status of the publication service. The following values may display:

- *Cancelled,*: The publication service has been canceled.
- *CompError,:* The publication service has been completed with errors.
- *Completed*: The publication service has been completed.
- *Delegated*: The publication service is waiting to complete child jobs.
- *Failed*: The publication service has failed to complete.
- *Pending*: The publication service is in the queue waiting to be run.
- *Running*: The publication service is currently in process.

- **Last Run Date**: The most recent date on which the publication service was run.

6) Select **Refresh** to update the publication services run list as needed.

Configuring Benchmarking Groups for P6 Projects

In CIC, projects can be compared and contrasted with two benchmark groups on the **Benchmark Detail** page.

To set up benchmarking groups in CIC to compare your P6 project with:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

> **Note:** <id> is the identifier of the data source.

3) In the sidebar, select **Benchmark**.
4) Select **Edit** and enter a name for each baseline group being created.

> **Note**: You can set up only two benchmark groups with a maximum of 7 projects in each group that are either complete, or 85 - 90% complete.

5) Populate each group with projects as follows:
   - To add a project to a baseline group, select a project from the list of available projects brought over by the ETL, and drag and drop it into a baseline group.
   - To remove a project from a baseline group, select a project in a baseline group and delete it from the baseline group.
6) Select the **Save** button to create baseline groups for benchmarking.

Configuring Threshold Settings for P6 Data

In CIC, projects are analyzed to identify metrics responsible for a potential delay in a project schedule. These metrics are identified based on an acceptable range of values established for each metric in the **Threshold Settings** page of the CIC Administration application.

To establish an acceptable range for each metric in **Threshold Settings** page:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

Note: <id> is the identifier of the data source.

3) In the sidebar, select **Threshold Settings**.
   Each setting is set up with a default value initially.
4) To customize threshold values for each setting choose any of the following actions:
   - For each **Setting Name**, enter a value in the **Custom Value** field.
   - To revert to its default value, select **Default Value**.
   - To revert all threshold settings to their default values, select **Set All Default**.

CIC for Aconex

This chapter describes how to set up CIC with data from Oracle Aconex.

It includes:

- a roadmap that outlines a task sequence to setup CIC with data from Oracle Aconex
- tasks for setting up Aconex users with access to CIC
- information on how to configure Aconex data sources for CIC

In This Section

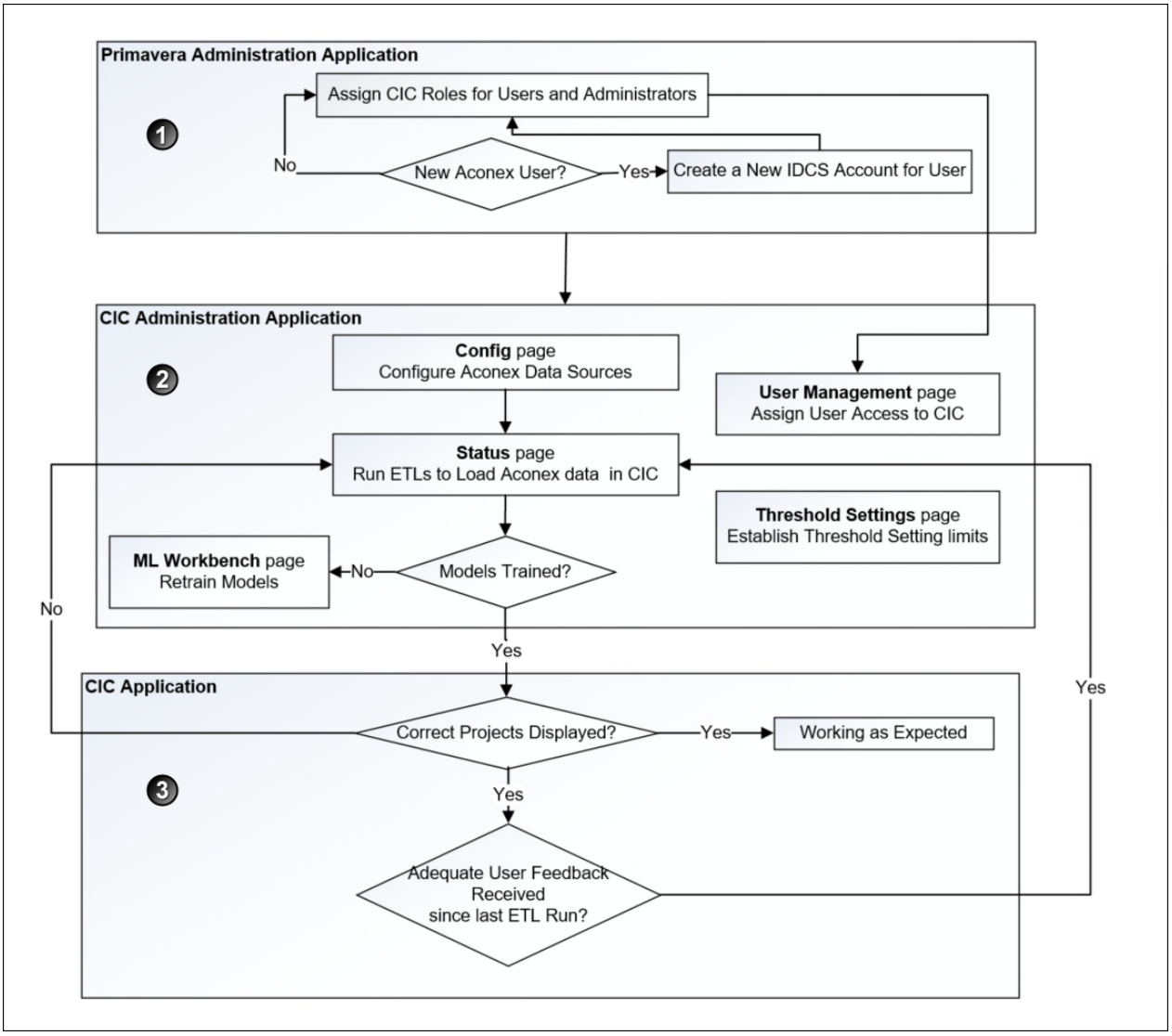
Roadmap for Configuring CIC for Aconex

As a CIC administrator, use the following roadmap to setup users, add additional administrators, and configure Aconex data sources for CIC.

The following applications will need to be setup for CIC to support users, administrators, and data sources from Oracle Aconex:

- Primavera Administration Application

- CIC Administration



To configure CIC for Aconex:

1) Assign CIC roles to add Aconex users to CIC.
   For more details, see ***Assigning CIC Roles in Primavera Administration Application*** (on page 27).
2) In the CIC Administration application complete the following tasks.
   a. Assign CIC access to Aconex users from the **User Management** page.
      For more details, see ***Assigning CIC Access to Aconex Users*** (on page 28).
   b. Configure Aconex data sources to bring Aconex data into CIC.
      For more details, see ***Configuring Aconex Data Sources*** (on page 28).
   c. Manage and load projects into CIC. These include:
      - Start or stop STARETL processes

- Schedule STARETL runs
- Reviewing the global status of STARETL runs and status of publication services
- Access log files and Access STARETL
- Run reports for STARETL processes

For more details on each task, see ***Standard Administration Tasks*** (on page 35).

d. Based on the content displayed in Construction Intelligence Cloud, configure and retrain machine learning (ML) models as necessary to obtain the desired level of accuracy for predicting outcomes in Construction Intelligence Cloud.

For more details, see ***Working with the Machine Learning Workbench*** (on page 39).

3) Use CIC to review the information displayed. Identify any threshold settings that may need to be modified.

For more details on how to modify threshold settings in the administration application, see ***Configuring Threshold Settings for Aconex Data*** (on page 31).

Managing Aconex Users for CIC

To add Aconex users to CIC, complete the following procedures sequentially:

1) ***Assigning CIC Roles in Primavera Administration Application*** (on page 27)
2) ***Assigning CIC Access to Aconex Users*** (on page 28)

To remove a user, revoke the corresponding role in the relevant applications.

Assigning CIC Roles in Primavera Administration Application

To add additional CIC administrators you will need to use the Primavera Administration Application. Until you add additional administrators, you are the sole administrator able to add accounts, grant roles, and reset passwords. You will also be the primary contact for receiving Oracle notifications about upgrades, monthly updates, planned downtime, and maintenance periods.

To add current or new Aconex users to CIC:

1) Sign in to Primavera Administration Application.
2) For *new* Aconex users, create an IDCS account by entering the following information in Primavera Administration Application:
   - **User Name**: The user name of the new user being added to Aconex.
   - **Email**: The email ID of the new user.

   For *current* Aconex users, skip this step and proceed to the next step.
3) Assign users with any of the following roles as needed:
   - **CIC Production Administrator**: Assign this role to designate a user as a CIC administrator. This roles gives your user access to the CIC administration application.
   - **CIC Production**: Assign this role to give a user access to insights in the Construction Intelligence Cloud application.

Notes: To give a CIC *administrators* access to insights in CIC

application itself, you will need to also assign them the **CIC Production** role.

For detailed instructions also refer to:

- The topic, *Preparing to Administer your Applications,* in the *Primavera Administration Getting Started Guide https://docs.oracle.com/cd/F25602_01/English/getting_started/index.htm.*
- *Primavera Administration Identity Management Administration Guide https://docs.oracle.com/cd/F25602_01/English/id_mgmt/index.htm* to add administrators.

Assigning CIC Access to Aconex Users

To give Aconex users access to Construction Intelligence Cloud insights, complete the following procedures:

Prerequisite

Assigning CIC Roles in Primavera Administration Application (on page 27)

Procedure

To assign or remove CIC access for an Aconex user:

1) Sign in to the CIC Administration application.
2) In the sidebar, select **User Management**.
3) On the User Management page, select any of the following actions:
   - To assign user access to CIC, select the check box associated with the user's **Aconex User ID**.
   - To remove access to Construction Intelligence Cloud, deselect the check box for an **Aconex User ID**.
4) Select the **Save Access** button to send a notification to the user.

Configuring Aconex Data Sources

To configure the properties for any P6 data source:

1) Select **Config** in the sidebar for a selected Aconex data source.
2) Set the following properties, and then select **Save**:

Configuration Property	Description
In the **Configurable Properties** section, set up the following properties as required:	
Custom Name for Datasource	Enter a name for the data source for identification purposes. For example, *Aconex Staging Data*.
Aconex URL	This URL is preset for your organization and is used for detailed analysis.

Configuration Property	Description
Degree of Parallelism for Rebuild Index	This property is preset for your organization. Displays the number of threads running in parallel for the rebuilding index process.
In the **OBIEE Settings** section set up the following properties:	
Mail Prefix	Enter the subject line text that will be displayed when recipients are notified about STARETL runs by email. For example, STAR ETL email notifications for Aconex can be prefixed as CIC for Aconex ETL.
Aconex CIC Host URL	This Aconex URL is preset for your organization and is used for analysis.
OBIEE Cache Purge	Controls the clearance of OBIEE cache entries. Select any of the following values: ▸ *True*: Clears the OBIEE cache ▸ *False*: Retains the cache entries.
Send Email Notification	Enter the e-mail IDs of personnel who are to be notified about STARETL run status or issues. Also select the events for which you wish to be notified: ▸ **Failure:** Email notifications sent only for failed ETL runs. ▸ **Success**: Email notifications sent only for successful ETL runs. ▸ **Both**: Email notifications sent for successful and failed ETL runs.

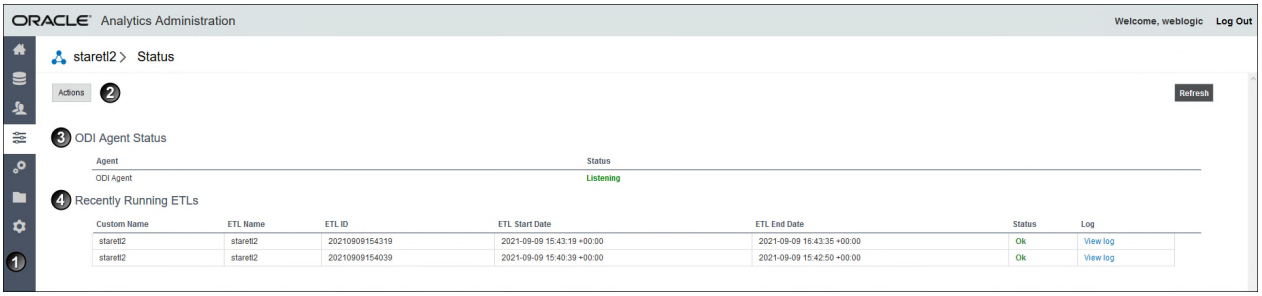
Running ETLs for Aconex Data Sources

To bring data over from Aconex into CIC, you must run ETLs from the **Status** page of the CIC Administration application.

To access the **Status** page for an Aconex data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb

2) From the **Home** , select a data source.



Item	Description
1	Navigation menu: Select the following icons in the sidebar to use the interface: **Home** : Shows currently running STARETL processes for all data sources and enables you to stop a currently running STARETL process. **ML Workbench**: Monitor and manage models for an Aconex data source. **User Management**: Setup and manage Aconex users accessing CIC. **Status**: Manage and schedule ETL runs and ODI load plans, view ETL logs and status reports for a selected Aconex data source. **Threshold Settings**: Set up the acceptable range for project metrics displayed in CIC. **Config**: Configure the properties of the STARETL process for each Aconex data source.
2	**Actions** menu: Select this menu to schedule or run ETLs for the selected data source. **Refresh**: Select this button to renew the current view of the page.
3	**ODI Agent Status**: Displays the current status or mode of the ODI agent.
4	**Recently Running ETLs**: Displays the recent ETL runs for this data source. Select **View log** to review the log file for each ETL run.

Configuring Threshold Settings for Aconex Data

In CIC, projects are analyzed to identify metrics responsible for potential risks. These metrics are identified based on an acceptable range of values established for each metric in the **Threshold Settings** page of the CIC Administration application.

To establish an acceptable range for each metric in **Threshold Settings** page:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** , select a **staretl<id>** or a **<Custom Name for DataSource>**.

   Note: <id> is the identifier of the data source.

3) In the sidebar, select **Threshold Settings**.
   Each setting is set up with a default value initially.
4) To customize threshold values for each setting choose any of the following actions:
   - For each **Setting Name**, enter a value in the **Custom Value** field.
   - To revert to its default value, select **Set Default**.
   - To revert all threshold settings to their default values, select **Set All Default**.

CIC for Aconex and P6 EPPM

If your organization plans to use CIC with insights from P6 as well as Aconex, then complete the task sequence outlined in the following topics:

- ***Roadmap for Configuring CIC for P6*** (on page 12)
- ***Roadmap for Configuring CIC for Aconex*** (on page 25)
- ***Assigning CIC Roles in Primavera Administration Application*** (on page 27)
- ***Managing P6 and Aconex Users for CIC*** (on page 33)

In This Section

Managing P6 and Aconex Users for CIC

To add users to access insights in Construction Intelligence Cloud, complete the following procedures:

Prerequisite

Assigning CIC Roles in Primavera Administration Application (on page 27)

Procedure

To assign or remove CIC access for an Aconex or P6 user:

1) Sign in to the CIC Administration application.
2) In the sidebar, select **User Management**.
3) On the **User Management** page, select any of the following actions:
   - To assign access to CIC, select the check box for an **Aconex User ID** / **P6 User ID**.

     Note: CIC does not make decisions for you. If the user already has access to CIC insights for P6 or Aconex, the system will try to match and identify the user's email ID and display it in the relevant **Email** column.

   - To remove access to CIC, deselect the check box for an **Aconex User ID** / **P6 User ID**.
4) Select the **Save Access** button to send a notification to the user.

Standard Administration Tasks

To bring new data over from a source application into CIC, you need to run or schedule ETLs and ODI load plans (if applicable to your data source) from the **Status** page of the CIC Administration application.

The following source applications are currently supported:

- P6 EPPM
- Aconex

This chapter describes the standard administration tasks that you will perform to manage the source data displayed in CIC.

In This Section

Running the STARETL Process

The CIC Administration application contains a **staretl** section for each data source.

To run the STARETL process for a data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) In the sidebar, select **Status**.
3) From the **Home** menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

   Note: <id> is the identifier of the data source.

4) From the **Actions** menu, select the **Run ETL** button to run a STARETL process immediately.

Stopping the STARETL Process

To stop the STARETL process run for a data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) In the sidebar, select **Status.**

3) Select **Stop** for a currently running STARETL process.
4) View the log file, *YYYYMMDDProcessID_failed.log* created in the **<PDW Install Folder>\star\etl_homes\STARETL<id>\log** folder.

Scheduling STARETL Runs

To schedule a STARETL process run for a data source:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) In the sidebar, select **Status**.
3) From the **Home** menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

> **Note:** <id> is the identifier of the data source.

4) From the **Actions** menu, select **Schedule Etl**.
5) In the **Schedule Frequency** field, select the frequency for the STARETL process run.
   If you select *None*, no STARETL process run will be scheduled for a data source.
   If you select *Daily:*
   a. In the **Run ETL at** field, enter the time for the daily process run, and then select **Save**.
      To schedule multiple ETL runs daily, select **Add** and enter date and time for each ETL run.

> **Note**: Schedule multiple ETLs daily at least 2 hours apart.

   If you select *Weekly*:
   b. In the **Run ETL at** field, enter the time for the process run.
   c. Select the days for the STARETL process run, and select **Save**.

Starting and Restarting ODI Load Plans

If applicable to your data source, to manage and run ODI load plans:

1) Sign in to the CIC Administration application.
   http://<host>:<port>/p6rdb
2) From the **Home** menu, select a **staretl<id>** or a <**Custom Name of a data source**>.
3) In the sidebar, select **Status**.
4) In the **Load Plan Status** section, select any of the following buttons:
   - Select the **Start** button to run a specific ODI load plan
   - Select the **Restart** button to stop and begin a currently ongoing run

Reviewing the Global Status of STARETL Runs

To view details on recently run STARETL processes for all data sources:

1) Sign in to CIC Administration application.

http://<host>:<port>/p6rdb

2) In the sidebar, select **Status**.
3) The following information is provided for each STARETL process:
   - **Custom Name**: The custom name given to a data source.
   - **ETL Name**: The identifier for the data source for the STARETL process.
   - **ETL ID**: The unique identifier for the STARETL process run.
   - **ETL Start Date**: The start date and time for the STARETL process run based on the server time.
   - **ETL End Date**: The end date and time for the STARETL process run based on the server time.
   - **Status**: The status of the STARETL process run. These include:
     - **OK:** The STARETL process completed successfully.
     - **Running:** The STARETL process is currently running.
     - **Failed:** The STARETL process has failed. View the report and log for more information about the failure.
   - **Report**: The link to the status report of this STARETL process run.
   - **Log**: The link to the ETL log of this STARETL process run.

Accessing Log Files of STARETL Runs

Every time you run the STARETL process, Primavera Data Warehouse creates extensive log files that provide information about the installation and daily operations details of each step of the process. Inspect the log files after each run of the STARETL process to determine if any issues exist.

To access the log files:

1) Sign in to the CIC Administration Application:
   http://<host>:<port>/p6rdb
2) In the sidebar, select **Status**.
3) Select the **View Log** link.
   The following log files are created after each STARETL run:
   - **<yyyymmdd>ProcessId.log**: Contains the details of the SQL commands run to perform the database refresh updates.
   - **<yyyymmdd>ProcessId.html**: Contains results of the processes run to create the users, tables, and transfer of data. Provides the time it took for each step to run. This log is derived from the `ETL_PROCESSMASTER`, `ETL_PROCESSINFO`, and `ETL_PROCESSEXCEPTION` tables.
   - **<yyyymmdd>**: The date of the STARETL process run.

Accessing Recent STARETL Run Reports and Logs

To access a log of a StarETL run for a data source:

1) Sign in to CIC Administration application.

http://<host>:<port>/p6rdb

2) In the sidebar, select **Status**.
3) From the **Global Status** menu select **staretl<id>** or <**Custom Name for data source>**.
4) In the **Recently Running ETLs** section, review the following information for recent StarETL runs:
   - **ETL Name**: Identifier for the data source associated with the StarETL run.
   - **ETL ID**: Unique identifier for the StarETL run.
   - **ETL Start Date**: Start date and time for the StarETL run based on the server time.
   - **ETL End Date**: End date and time for the StarETL run based on the server time.
   - **Status**: Status of the StarETL run. These include:
     - **OK:** The StarETL run completed successfully.
     - **Running:** The StarETL runis currently running.
     - **Failed:** The StarETL run failed. View the log for more information about the failure.
   - **Log**: Links to the log file of the StarETL run.

Working with the Machine Learning Workbench

The ML workbench allows you to monitor, train, and retrain the models driving predictions in CIC.

For each problem that you want to investigate, you can:

- create machine learning (ML) models without having to learn complex technology and being a data scientist
- train multiple models simultaneously, each with a different combination of features enabled if available
- enable prediction of future outcomes within each model

The following topics describe how to set up and use the administration application to train models for Construction Intelligence Cloud application for the following products:

- P6 EPPM
- Aconex.

In This Section

Selection Criteria for Training ML Models

As a rule of thumb, the criteria for training machine learning models as well as selecting models to train must be determined in consultation with project stakeholders in your organization.

> **Note**: Oracle recommends that you initially train the seed models and check the results if these provide appropriate guidance. Otherwise, retrain and select custom models to retrain.

Assessing the performance of a machine learning model is an essential step in a predictive modeling pipeline. Once a model is ready, it has to be evaluated to establish its correctness. There are some widely used validation metrics that are used to assess a prediction model and we have used some of them:

- **Accuracy**: It is the ratio of correct predictions to the total number of predictions.

  For example, consider a prediction model predicting an activity is going to be delayed or not with an accuracy of 0.75. If the model predicts 100 times in total, then 75 times the model will predict it correctly.
- **Recall**: It answers how well the model can find all the positive results actually in the data. Of all the activities that are actually delayed, how many the model correctly identified.

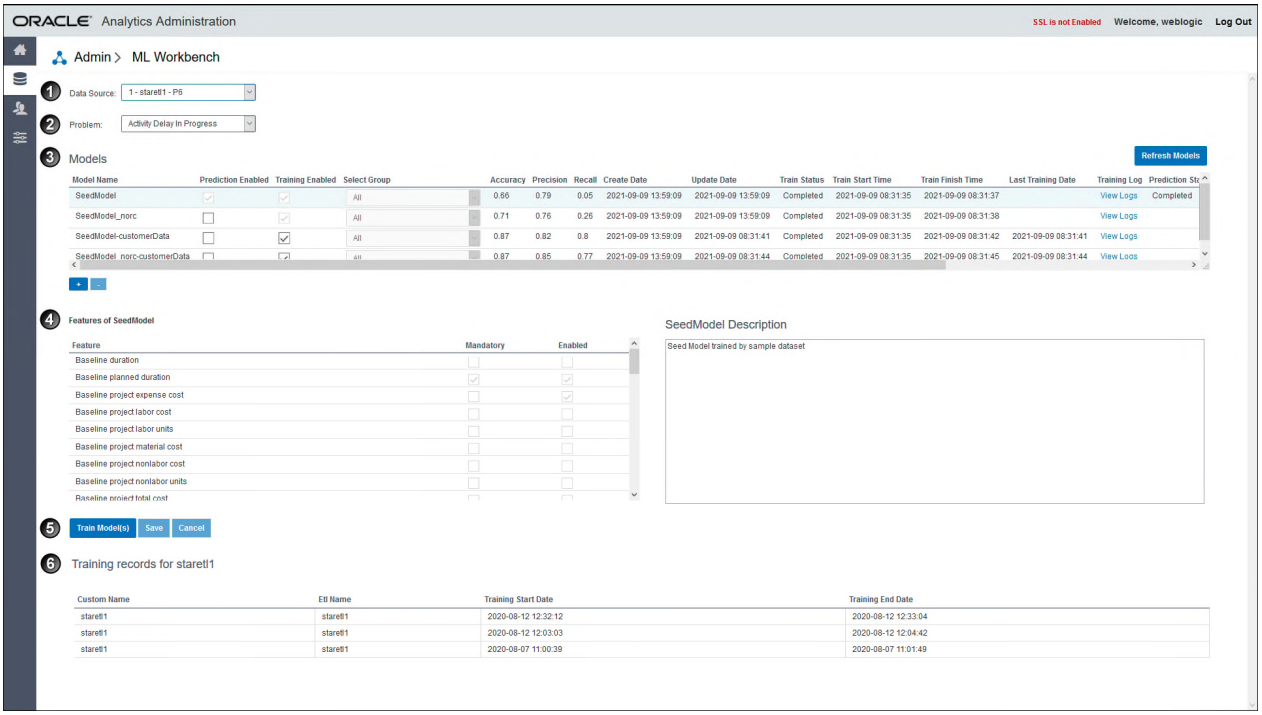
For example, consider a prediction model predicting an activity is going to be delayed or not. If the recall is 0.57, then it implies that for every 100 activities that are actually delayed, approximately 57 activities are correctly predicted to be delayed.

- **Precision**: It tells us, how often are we correct when we have a positive prediction, and how many are actually delayed out of all the activities that are predicted to be delayed.

  For example, consider a prediction model predicting an activity is going to be delayed or not. If the precision is 0.6, then for every 100 activities that are predicted to be delayed, 60 activities are actually delayed.

Using ML Workbench for P6 EPPM

To enable CIC to make recommendations, predict outcomes, or raise warnings for large scale enterprise projects, you need to establish settings in the **ML Workbench** page of the CIC Administration application. The settings on this page control the data eventually displayed in CIC.



Item	Description
1	**Data Source**: The data from a source application that is being analyzed to predict future outcomes, success rate, risks, anomalies, etc.
2	**Problem**: The administration application delivers a set of predefined problems or scenarios for a product-specific data set. These problems represent recurrent issues and significant challenges that are widespread across the construction industry.

Item	Description
3	**Models Table**: Machine learning is a technique of data analysis that uses algorithms to analyze large sets of data to identify patterns in data. Models are machine-learning algorithms that generate predictions by finding patterns in data. You train a model to learn from a data set. A model can be generated to analyze each real-life problem in a data set. The inference from this analysis is built into a model. Additionally, multiple models can be generated to analyze a specific objective for a problem. ▸ **SeedModel**: Each problem is delivered with a seed model that is generated from analyzing a sample data set. ▸ **CustomModel**: A custom model is generated once the seed model is retrained using a customer-specific data set. These custom models may be retrained as often as needed to ensure more accurate predictions. A custom model refers to a model that is generated from analyzing data from a customer-specific construction and engineering product data set. For example, customer feed back provided during project progress and current project progress to date in addition to customer specific P6 EPPM data set. **Note**: Oracle recommends you retrain the model for each problem before using it for predictions. For each problem you can train multiple models simultaneously with a different combination of features selected in each model. However, you can only select one model for prediction for each problem.
4	**Features of a Model**: A feature is a characteristic or an attribute of the data set. Feature lists can vary for each problem identified in a data set. To analyze problems, specific combination of features can be enabled or disabled in a model. Therefore, you may create multiple models each associated and enabled with a different combination of features to analyze a problem.
5	**Train Models**: Train models with data and feature sets using seed models or existing custom models with new customer-specific training data set to learn from and provide better predictions. As the model learns, its accuracy also increases over time. Models are built using trends identified in the data from past projects. These models then serve as the engine that drives predictions. These models can be retrained through user feedback to identify patterns and trends specific to the way the organization chooses to run its projects thereby enhancing the accuracy of the predictions. Initially, you will need to make decisions for a data set when the application recognizes patterns in the data set. The application begins to learn from past decisions to predict outcomes. A vast data pool provides greater exposure to train a model.

Item	Description
6	**Training records for staretl<n>**: View the model training history executed for a selected data source.

Configuring and Training CIC Models with P6 Data

To manage information displayed in Construction Intelligence Cloud, as administrators you have to select models that need to be trained for predicting outcomes.

> **Note**: A seed model or initial model is also delivered for each problem. Oracle recommends that you train the seed model before using it for predictions.

To set up and train models with specific features enabled:

1) Sign in to the administration application of CIC.
   http://<host>:<port>/p6rdb
2) In the sidebar, select **ML Workbench**.
3) From the **Data Source** list, select a P6 data source.
4) From the **Problem** list, select a predefined area of improvement that you want to focus in CIC for the selected P6 data source.
5) In the **Model** section, add a model for the selected problem as follows:
   a. Select **Add Model**, and then select **OK** to confirm your selection.
      By default, the model is named as *CustomModel1*.
      The following information is displayed for each model:
      - **Model Name:** A user-friendly name to identify a model.
      - **Prediction Enabled**: Indicates that a model is used for predictions. For each problem, only one model which has been trained can be used for predictions.
      - **Training Enabled**: Indicates that a model is being trained. Multiple models can be trained for a problem.
      - **Create Date**: The date on which the model was added.
      - **Update Date**: The date on which the model was previously updated.
      - **Train Status**: The current status of the model being trained. Choices include: *Failed, Completed*.
      - **Train Start Time**: Time when the training process for the model was initiated.
      - **Train Finish Time**: Time when the training process for the model was completed.
      - **Last Training Date**: The date on which the model previously trained.

> **Note**: Prediction can be enabled for a model only if a model has a **Last Training Date**.

- **Training Log**: Click the **View Logs** link to view the log file containing details corresponding to each model that has been trained.
- **Prediction Status**: The current status of the model enabled for prediction. Choices include: *Failed, Completed*.
- **Prediction Start Time**: Time when the prediction process for the model was initiated.
- **Prediction Finish Time**: Time when the prediction process for the model was completed.
- **Prediction Log**: Click the **View Logs** link to view details of the prediction process run for the model that has been enabled for prediction. / **Accuracy**: It is the ratio of correct predictions to the total number of predictions.

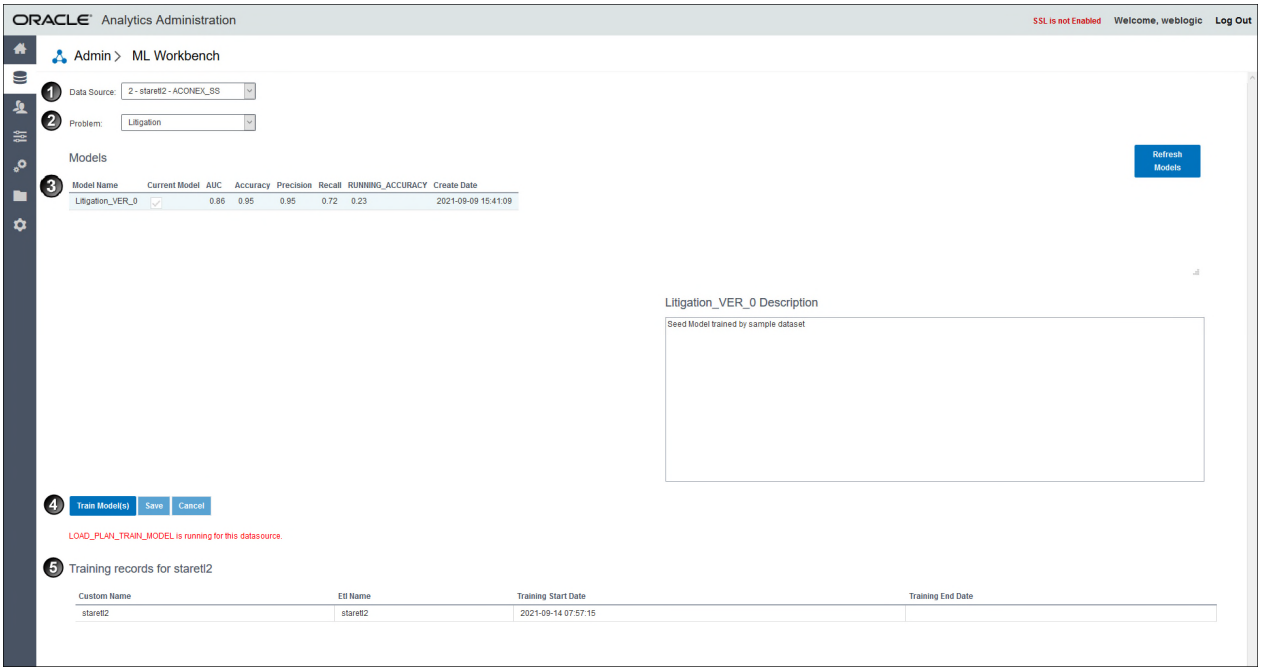
b. In the **Model Name** field, select **Edit**, and rename the model.

c. In the **Description** section, enter information that describes the purpose of the model.

6) Enable features for a model:
   1. In the **Model** section, select a row to select the model whose feature you want to enable.
   2. In the **Features** section, select the **Enabled** check box to activate each feature for the selected model.
   3. Select **Save**.
7) To add multiple models for each problem, repeat steps 5 and 6 for each problem.
8) To train the models:
   a. In the **Model** section, select the **Training Enabled** check box for one or more models across all problems.
   b. Select the **Train Model(s)** button.

Using ML Workbench for Aconex

To enable CIC to make recommendations and predict potential risks based on **User Feedback** for your projects in Aconex, you need to train models in the **ML Workbench** page of the CIC Administration application. The model trained on this page controls the data eventually displayed in CIC.



Item	Description
1	**Data Source**: The data from a source application that is being analyzed to predict future outcomes, success rate, risks, anomalies, etc.
2	**Problem**: The administration application delivers a set of predefined problems or scenarios for a product-specific data set. These problems represent recurrent issues and significant challenges that are widespread across the construction industry.

Item	Description
3	**Models Table**: Machine learning is a technique of data analysis that uses algorithms to analyze large sets of data to identify patterns in data. Models are machine-learning algorithms that generate predictions by finding patterns in data. You train a model to learn from a data set. A model can be generated to analyze each real-life problem in a data set. The inference from this analysis is built into a model. Additionally, multiple models can be generated to analyze a specific objective for a problem. **Note**: Oracle recommends you retrain the model for each problem before using it for predictions. For each problem you can train multiple models simultaneously. However, you can only select one model for prediction for each problem.
4	**Train Models**: Train models with data using seed models with new customer-specific training data set to learn from and provide better predictions. As the model learns, its accuracy also increases over time. Models are built using trends identified in the data from past projects. These models then serve as the engine that drives predictions. These models can be retrained through user feedback to identify patterns and trends specific to the way the organization chooses to run its projects thereby enhancing the accuracy of the predictions. Initially, you will need to make decisions for a data set when the application recognizes patterns in the data set. The application begins to learn from past decisions to predict outcomes. A vast data pool provides greater exposure to train a model.
5	**Training records for staretl<n>**: View the model training history executed for a selected data source.

Configuring and Training CIC Models with Aconex Data

A model can be selected, trained or retrained for each predefined problem identified as an area of improvement in Aconex.

> **Note**: In the CIC application, for an Aconex project, users can indicate if a risk has been identified by indicating *Yes* or *No* in the **User Feedback** field. You can choose to retrain the model based on the **Create Date**
> To retrain a model,

To train a model with Aconex data:

1) Sign in to the administration application of CIC.
   http://<host>:<port>/p6rdb
2) In the sidebar, select **ML Workbench**.
3) From the **Data Source** list, select an Aconex data source.

4) From the **Problem** list, select any of the following predefined areas that you want to focus in CIC:
   - *Health and Safety*
   - *Litigation*
5) In the **Model** section, select the **Current Model** check box to indicate the current model to be used for training purposes and then select the **Save** button.

   The following information additionally displays for each model:
   - **Model Name:** A user-friendly name for a CIC model.
   - **Accuracy**: The ratio of correct predictions to the total number of predictions.
   - **Precision**: The frequency of being correct with a positive prediction, and how many are actually delayed out of all the risks that are predicted to be delayed.
   - **Recall**: The ability of a model to find all the positive results actually in the data. It Of all the activities that are actually delayed, how many the model correctly identified.
   - **Create Date**: The date on which the model was added.
6) To train a model:
   a. Select the **Train Model(s)** button.
   b. In the confirmation dialog box, select **OK**.

      In the **Training Records** section, a new row displays the following information when a model is retrained:
      - **Custom Name**: The name of the Aconex data source
      - **Etl Name**: The name of the ETL process.
      - **Training Start Date**: The start date and time when the model was trained or retrained.
      - **Training End Date**: The end date and time when the training completed.

      In the **Model** section, a new row is displays when the model completes training or retraining.

Managing Personal Information

This chapter describes how to manage personal information (PI) in Construction Intelligence Cloud.

In This Section

About Consent Notices

Consent notices inform users how personal information (PI) is collected, processed, stored, and transmitted, along with details related to applicable regulations and policies. Consent notices also alert users that the action they are taking may risk exposing PI. Oracle Construction and Engineering products help you to ensure that you have requested the appropriate consent to collect, process, store, and transmit the PI your organization holds as part of any source application (P6 EPPM) that can be configured with Construction Intelligence Cloud.

About Personal Information

Personal information (PI) is any piece of data which can be used on its own or with other information to identify, contact or locate an individual or identify an individual in context. This information is not limited to a person's name, address, and contact details. For example, a person's IP address, phone IMEI number, gender, and location at a particular time could all be personal information. Depending on local data protection laws , organizations may be responsible for ensuring the privacy of PI wherever it is stored, including in back-ups, locally stored downloads, and data stored in development environments.

As part of your Primavera Analytics Cloud Service, you may be using Oracle Identity Cloud Service (“Oracle IDCS”) to manage your user access and entitlements across a number of cloud and on-premises applications and services. If you are using or accessing Oracle IDCS, you are responsible for deleting your details and data from the Oracle IDCS environment. You are responsible for retrieving your content in Oracle IDCS during your applicable services period.

Configuring Consent Notices for Construction Intelligence Cloud

Construction Intelligence Cloud consumes data from source applications and makes it available to Construction Intelligence Cloud users. End-users must give their consent in the *source* application to read and agree to the consent message to ensure they:

- have access to the data in Construction Intelligence Cloud

- understand the responsibilities with regard to data protection and security

P6 EPPMsource applications can be configured with Construction Intelligence Cloud. For detailed instructions on how to configure consent notices in P6 EPPM, refer to *P6 EPPM Application Administration Guide.*

Your Responsibilities

Information security and privacy laws can carry heavy penalties and fines for organizations which do not adequately protect PI they gather and store. Data visible to an Construction Intelligence Cloud user depends on the consent notices configured and accepted by users in the source applications which can be configured with Analytics.

If these laws apply to your organization, it is your responsibility to ensure consent notices are configured in the source applications before they are required.

Ensuring Privacy of Data Collection

Personal information (PI) in Construction Intelligence Cloud depends on the changes made in source applications such as P6 EPPM. When PI data is modified or deleted in the source applications, run the ETL process to ensure it is automatically reflected in Construction Intelligence Cloud. If a user is deleted in a source application, they can no longer access Construction Intelligence Cloud.

Ensure the user is also deleted from the historical data of Data Warehouse. Use the **data_cleanup_package** to handle the history cleanup and resource data based on the demand.

Limiting Granular Access to Data

Products provide granular access controls, by record, data element, type of data, or logs. Ensure Primavera Data Warehouse adheres to the same user privileges and access rights as P6 EPPM.

Ensuring Data Masking is Supported

Data masking is the ability to display only a portion of a data field or prevent viewing data. Oracle database security policies can hide access to certain columns. Ensure you review this feature for Construction Intelligence Cloud.

Ensuring IP White-Listing

An IP white list is a list of trusted IP addresses from which your users can access domains. Construction Intelligence Cloud uses OBIEE for displaying analyses and dashboards. For more details on IP white-listing, refer to OBIEE documentation.

Controlling Access to Special Categories of Data

Construction Intelligence Cloud has control over some sensitive fields. Control can be regulated to only users that are allowed to login. Data access is generally project level and either cost or no cost, and granularity is provided for those differences. Global data is also visible but honors same security as source applications.

Security Considerations

In This Section

Introduction

For any company that deals with sensitive data, keeping it secure is crucial to success. While hosting Construction Intelligence Cloud data on Oracle Cloud provides security measures, it can't do everything. For example, it can't prevent phishing attempts or other attacks that exploit gaps in its users' security awareness. That's why it's important for everyone who works with Construction Intelligence Cloud to understand what they can do to keep data secure.

Security is everyone's business. This information is for anyone who uses, manages, or is just interested in Construction Intelligence Cloud. If you're a security expert or administrator, this is a good place to start. It should help you see the big security picture and understand the most important guidelines related to security in Construction Intelligence Cloud.

Authentication: How Users Sign On

If your Construction Intelligence Cloud Cloud environment is provisioned in Oracle Cloud Infrastructure (OCI), it comes with IDCS. See Oracle Identity Cloud Service https://docs.oracle.com/en/cloud/paas/identity-cloud/index.html in the Oracle Help center for more information.

Authentication refers to the way users sign on. If Construction Intelligence Cloud is configured to use Oracle Identity Cloud Service (IDCS), administrators can—and should—implement Single Sign-on (SSO). SSO reduces the number of passwords users have to remember. It also enables multi-factor login, which is when users are asked to provide some verification in addition to their passwords, like a code that they receive via text or email.

Authorization: What Users can Access

Authorization refers to what users can access. There are several ways to manage this in Construction Intelligence Cloud.

Permission Sets: In Construction Intelligence Cloud, permission sets help administrators view and set permissions for many users by listing permissions in multi-dimensional tables.

Groups: Security groups make it easier for administrators to assign permission sets to multiple users at the same time. Construction Intelligence Cloud users need to be assigned access to P6 EPPM, and in IDCS CIC users should be assigned the roles of **CIC Production Administrator** and **CIC Production.** For more details, see *Manage Application Access* topic in the *Primavera Administration Identity Management Administration Guide*

Machine Learning Security Considerations

It is important to understand the following security considerations when you give application access to administrators and users:

- The CIC administrator role is very powerful and therefore must be granted judiciously.

  The CIC administrator role grants access to the **CIC Administration** application. This administration application gives CIC administrators access to the **ML Workbench** page. On the **ML Workbench** page, administrators can explore and see the models to be trained or retrained and feature selections that can be made. When a model is retrained, if new data has been added into the training set, it could cause the current predictions to train. Therefore, granting access to administration application and **ML Workbench** page should be limited and restricted.

  > **Note**: CIC users however, have no access to the ML models, the model code, or the data used for training or testing. They also cannot change the actual models.

- Administrators should be cautious of input poisoning.

  Data used in training shapes future predictions. Malicious or bad data can lead to bad future predictions. CIC administrators should be aware of the projects opted into the system and also aware of which projects are used for training the models that leads to prediction accuracy. Oracle recommends you to use Separation of Duty controls to ensure that those choosing the projects for CIC, which will also be used for training, opt in their target data appropriately. Similar to other Primavera applications, bad or misleading source data can affect outputs. CIC is delivered with multiple out-of-the-box (OOTB) *Seed Models*, which are trained with sample data. These are not the ideal models to use but they give your organization a good starting point for enabling the system, and to see a first round of predictions while you understand how to train with your data.

- Irrelevant features can precipitate confounding and spurious correlations.

  It is important to understand how certain features affect your predictions or how your data is reflected in the feature set. For example, if you are an organization without costs, you may want to make sure no cost features are selected. To get a basic implementation with the models you can choose *SeedModel customerData*. This model will use the Seed Model features with your data. Therefore select only the relevant features applicable for your data.

  > **Note**: No PII is used in training data.

- Data used in training is not visible if the user does not have access to that data.

If you have bad predictions made, however, then it may be discerned that the training data is skewed in a negative fashion. For example, all projects are predicted to be delayed significantly indicates a skewed prediction. The models are continuously learning and adapting based on the data being pumped into the system. Therefore, it is recommended to keep access to the CIC Administrator role restricted and selective to ensure that non-admin CIC users cannot see the projects being used for training. CIC users can only see the prediction and the data they have access to.

> **Note**: CIC users cannot see data they do not have access to in the source systems. They also do not see or can **not** access any of the training data in CIC.

- Model robustness attack

  A malicious user may be able to precipitate bad prediction by modifying the associated input data imperceptibly, and with plausible deniability. If the source application data is manipulated in a way that gives a skewed direction for the predictions then that can be reflected in CIC predictions as well. For example, if you select projects for CIC to include only those projects that are far behind and excessively over budget, then it is likely that the predictions will skew in the similar direction as well. Therefore, it is recommended to keep the access to the CIC Administrator role restricted and selective.

  > **Note**: At no point in time, are the models exposed through any user interface to any organization that enables them to change, access, or inject any malicious adjustments to the model.

Endpoint Security

From laptops to cellphones, organizations have to keep track of data on more devices than ever, and more devices means more risk. That's why it’s important to implement Enterprise Mobility Management (EMM) tools and policies.

Inherent Risks and Practical Policies

No automated security system or protocol can make a system fully secure if those with legitimate access exploit it for illegitimate purposes or if a device falls into the wrong hands. Here are some general "common sense" guidelines you should follow when it comes to endpoint security:

Use good mobile device management (MDM) software. MDM systems can help your organization secure the devices where its sensitive data might end up.

Grant security permission conservatively. Don't give everyone permission to everything just to avoid perceived complexity. Remember, one breach can be many times more costly and time consuming than setting and following standard security protocols.

Organize permission sets and credentials so they can be edited quickly. Keep user groups and their permissions organized and easy to manage. Use descriptive names for permission sets, and organize them logically to make it easier for you or anyone else to manage them quickly and confidently.

Keep up with organizational changes. If a user no longer needs access to a part of the app, for whatever reason, update that user's permissions accordingly.

Privacy and Personal Information

Closely related to security are matters of privacy and personal information.

View the section *Managing Personal Information* in Construction Intelligence Cloud in the *Construction Intelligence Cloud Administration Guide* to learn about what information is collected and what you can do to monitor personal information in Construction Intelligence Cloud.

Some Security Basics

We'll use the term **administrator** to refer to anyone who's responsible for managing a company's data and who can access that data. For our purposes, administrators includes a wide variety of IT professionals, from those who define roles in the Construction Intelligence Cloud application to those who manage company servers.

An **end user** is anyone who uses Construction Intelligence Cloud to do their job. This includes project managers, executives, and everyone else who logs into Construction Intelligence Cloud from an office or jobsite to get their work done.

Administrators should...

- **Set up Single Sign-On (SSO) and enable multi-factor authentication** to minimize the number of passwords that users have to remember and to consolidate risk.
- **Kindly educate users** on how they can avoid unwittingly helping hackers. One of the best ways application administrators and security advocates can help users is by helping them to prevent security breaches.
- **Use a VPN** to encrypt data being sent over the internet.
- **Stay up-to-date** about security trends and best practices.

End users should...

- **Follow security guidelines** created by their companies and the administrators of any network applications they use.
- **Use strong passwords**. The more random-looking the better, and avoid reusing passwords.
- **Learn to recognize phishing**. Phishing is when someone disguises an email or some other transmission as a legitimate message in an attempt to get a user to reveal sensitive information. For example, a hacker may send you an email disguised to look like an email from your employer requesting login information. These attacks are becoming more sophisticated, but you can still protect yourself by making sure any emails you receive or websites you visit are legitimate before using them to share sensitive information.

What's Next?

Congratulations!! You have now successfully completed setting up CIC Administration application to brings projects into CIC application.

Sign in to the CIC application and also refer to the CIC *Reference Guide t*o review the insights delivered for your projects.

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