Cisco Process Orchestrator 3.4 Installation Guide

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Planning for the Installation

Before installing Cisco Process Orchestrator, you should verify that your system meets the minimum hardware and software requirements. For the requirements necessary to operate Cisco Process Orchestrator, see the *Cisco Process Orchestrator Compatibility Matrix.*

Cisco Process Orchestrator Performance Best Practice Guidelines

Cisco Process Orchestrator's multi-threaded architecture allows it to fully utilize all processors on the Cisco Process Orchestrator server system. Cisco Process Orchestrator generally scales linearly with the number of processor cores and the clock speed at which processors execute. Adding more CPU cores is the single most effective factor in increasing Cisco Process Orchestrator performance. To maximize performance capacity, include the maximum number of processor cores available in the hardware supporting the Cisco Process Orchestrator server.

The Cisco Process Orchestrator server intelligently caches data such as actively running processes to optimize performance. Sufficient memory is required to minimize paging. Allow memory to handle burst situations, but plan the number of processor cores in the system to be sufficient for steady state (average) load.

Database optimization is very important. While Cisco Process Orchestrator ships with a schema, which is performance optimized, including the relevant indices, customers need to install and operate this database. Customers should refer to documentation associated with their chosen database platform for best practice.

In high performance scenarios, the following best practices can dramatically affect performance:

- A separate host server for the database versus other Cisco Process Orchestrator architectural elements

- A separate high speed disk for the database, operating system and program files, and swap files

- Sufficient memory to avoid paging

A high speed network connection typically means the database is "close by" the Cisco Process Orchestrator server, or possibly in the same data center.

Proper database server hardware and routine database maintenance can have substantial effects on performance. Planning for high availability can have impacts on system design, requirements, environments, and installation topologies.

Cisco Process Orchestrator Ports and Services

This section provides the active ports and services used by Cisco Process Orchestrator as well as the recommended Exchange ports for use when executing targets.

Default Cisco Process Orchestrator Ports

The following table provides the list of all active TCP/IP ports used or consumed by Cisco Process Orchestrator. In addition, to make sure that your Active Directory environment is configured properly with the correct ports, see the Microsoft site, *Active Directory and Active Directory Domain Services Port Requirements*.

Table 1   Cisco Process Orchestrator Ports

Protocol	Port	Description
HTTP	TCP:56803	Default port for Cisco Process Orchestrator Server to connect to AdapterHost processes
HTTP	TCP:56804	Default port for Java Adapter Host services processes to connect to AdapterHost process
HTTP	TCP:61525	Client communications port for Cisco Process Orchestrator. This is the port that the Cisco Process Orchestrator Server and the Cisco Process Orchestrator client communicate over.
HTTP	UDP:161	Default SNMP adapter port for Set/Get Request on remote SNMP server
HTTP	UDP:162	Default SNMP adapter port for Publish Trap on remote SNMP server
HTTP	TCP:1433	SQL Server
HTTP	TCP:2081	Default Web Console port. If the customer uses SSL with basic authentication, the user will have to bind a HTTPS protocol port to the Web Console site prior to implementing SSL.
HTTP	TCP:443	Web Console
HTTPS	TCP:61526	Northbound Webservice Default ports (disabled by default)
HTTP	TCP:61527	
HTTPS	TCP:51526	REST Webservice Default ports (disabled by default)
HTTP	TCP:51527	

Default Cisco Process Orchestrator Services

The Cisco Process Orchestrator service will not start if the *System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing* local security policy is enabled. For additional information on the policy, see the Microsoft site, http://support.microsoft.com/kb/811833.

To disable this option, choose **Start > Administration Tools > Local Security Policy**.

The following table provides the list of the current platform services that should be provided or enabled to use Cisco Process Orchestrator.

Table 2   Cisco Process Orchestrator Services

Executable Files	Service
svchost.exe -k iissvcs	World Wide Web Publishing Service
Java.exe	N/A (not a service)

Verifying that the Server Meets the Installation Prerequisites

Before You Begin

Verify that your machine meets the minimum requirements for installing Cisco Process Orchestrator by:

- Reviewing the Cisco Process Orchestrator 3.4 Compatibility Matrix.

- Manually checking your system setup or using the Prerequisite Checker on the Cisco Process Orchestrator Installation dialog box.

The prerequisite checker will perform the correct checks based on the platform it is running on. If the prerequisites checker runs on a 64-bit platform, it will detect the existence of the 64-bit prerequisite applications (such as 64-bit Remedy client). If the checker runs on a 32-bit platform, it will detect the 32-bit prerequisite applications.

1. Double-click the *Setup.exe* file.

2. On the Setup tab, click **Check Prerequisites**.

3. From the drop-down list, select one of the options to verify that the computer meets the requirements for the selected installation.

4. To view details about the displayed results, highlight the appropriate item in the Results pane.

5. After verifying the status of the system requirements, click **Close**.

Note: For additional information about installing Cisco Process Orchestrator, see Installing Cisco Process Orchestrator, page 7.

Configuring Access Requirements

Prior to installing Cisco Process Orchestrator, the following user access and configuration requirements must be met:

- Verifying User Rights, page 3

- Microsoft SQL Server Database Access Rights, page 3

- Oracle Database Access Rights, page 5

- Disabling Windows User Access Control, page 5

- Reporting Database Authentication, page 5

Verifying User Rights

Cisco Process Orchestrator Server

To install the product, the user must be a member of the *Local Administrators* group on the computer where Cisco Process Orchestrator is to be installed.

Microsoft® SQL Server Account

The reporting database user account is used by the SQL Server Reporting Services server to connect to the Cisco Process OrchestratorReporting database. The account needs at least the *Owner* permission on the Cisco Process OrchestratorReporting database. The Reporting DB user needs db_datareader, db_datawriter, and execute permissions using the dbo default schema.

Microsoft SQL Server Database Access Rights

Admin rights to the database will grant everything needed. For POCs, lab environments, development environments, etc., most users just grant admin rights for the login account to the database. For production environments, DBAS may require more fine-grained privileges.

Microsoft Windows Server

For the Reporting Services server that runs on Windows Server, users who import reports should be a direct member of the *Local Administrators* group on the Reporting Services server machine.

The import report process will not work if a user is a member of a global group and the global group is a member of the *Local Administrators* group.

Microsoft SQL Server Windows Authentication

If SQL Server Windows authentication is being used, the following access rights must be set on the machine where Cisco Process Orchestrator is installed. To change the connection settings through the database user configuration utility on Cisco Process Orchestrator server, the logged in user needs to have db_owner, db_datareader, db_datawriter, db_ddladmin (roles with dbo default schema) permission to the Cisco Process Orchestrator installation folder.

■ Windows Server 2012—The user account that connects to the database must be assigned *Logon as Service* rights.

Microsoft SQL Server SQL Authentication

If the company requires a higher level of security restrictions than allowing the standard access, then use the following scripts to create the logon script for access.

Process Database Logon Script

Use the following logon SQL script to create the necessary credentials for accessing the Cisco Process Orchestrator processes database.

```
IF  EXISTS (SELECT * FROM sys.server_principals WHERE name = N'orchestratorprocess')
DROP LOGIN [orchestratorprocess]
GO
CREATE LOGIN [orchestratorprocess] WITH PASSWORD=N'cpo', DEFAULT_DATABASE=[OrchestratorProcess],
CHECK_EXPIRATION=OFF, CHECK_POLICY=OFF
--For Windows authentication
--CREATE LOGIN [domain\userID] FROM WINDOWS WITH DEFAULT_DATABASE=[OrchestratorProcess]
GO
USE [OrchestratorProcess]
GO
IF  EXISTS (SELECT * FROM sys.database_principals WHERE name = N' orchestratorprocess ')
DROP USER [orchestratorprocess]
GO
CREATE USER [orchestratorprocess] FOR LOGIN [orchestratorprocess] WITH DEFAULT_SCHEMA=[dbo]
GO
EXEC sp_addrolemember N'db_datareader', N' orchestratorprocess '
GO
EXEC sp_addrolemember N'db_datawriter', N' orchestratorprocess '
GO
```

Reporting Database Authentication Script

Use the following logon script to create a SQL user account for the OrchestratorReporting reporting database. The assumption is that the OrchestratorReporting database will be created by a sysadmin account first, after which the script can be used to create a OrchestratorReporting database account with limited permission, and change reporting database to use the OrchestratorReporting user account.

```
IF EXISTS (SELECT * FROM sys.server_principals WHERE name = N'OrchestratorReporting')
DROP LOGIN [OrchestratorReporting]
GO

CREATE LOGIN [OrchestratorReporting] WITH PASSWORD=N'cpo', DEFAULT_DATABASE=[OrchestratorReporting],
CHECK_EXPIRATION=OFF, CHECK_POLICY=OFF
--For Windows authentication
--CREATE LOGIN [domain\userID] FROM WINDOWS WITH DEFAULT_DATABASE=[OrchestratorReporting]
GO

USE [OrchestratorReporting]
GO

IF EXISTS (SELECT * FROM sys.database_principals WHERE name = N'OrchestratorReporting')
DROP USER [OrchestratorReporting]
GO

CREATE USER [OrchestratorReporting] FOR LOGIN [OrchestratorReporting] WITH DEFAULT_SCHEMA=[dbo]
```

```
GO

EXEC sp_addrolemember N'db_datareader', N'OrchestratorReporting'
GO

EXEC sp_addrolemember N'db_datawriter', N'OrchestratorReporting'
GO

GRANT EXECUTE TO OrchestratorReporting
GO
```

Oracle Database Access Rights

Following is a list of privileges for the Process DB user on Oracle:

- ALTER TABLESPACE

- CREATE SEQUENCE

- CREATE TABLE

- CREATE VIEW

- CREATE PROCEDURE

- CREATE SESSION

- CREATE TRIGGER

- UNLIMITED TABLESPACE

Reporting Database Authentication

The following is a list of privileges required by the Cisco Process OrchestratorReport user account. To create the Cisco Process OrchestratorReporting database manually, use the *Cisco Process OrchestratorReportingCreateUser.sql* script.

- CREATE SEQUENCE

- CREATE SYNONYM

- CREATE TABLE

- CREATE VIEW

- CREATE MATERIALIZED VIEW

- CREATE PROCEDURE

- CREATE CLUSTER

- CREATE JOB

- CREATE TRIGGER

- CREATE ROLE

- QUERY REWRITE

- CREATE SESSION

- MANAGE SCHEDULER

- CREATE EVALUATION CONTEXT

- CREATE RULE

- CREATE RULE SET

Installing Cisco Process Orchestrator

You can install three different components of Cisco Process Orchestrator:

- Client—Installs only the components necessary to launch the Cisco Process Orchestrator Console and use it to connect to an automation server located on another computer.

- Server—Installs the automation server and all client components

- Web Console—Installs only the components necessary to provide access to the product's Web Console

Note: Review the system requirements and prerequisites before beginning the installation process (see Planning for the Installation, page 1).

Installing Using Silent Install

You can automate the installation of Cisco Process Orchestrator by running the server batch file after you enter the required details in the server response file (Cisco Process Orchestrator silent install configuration file).

Use the following steps to verify or enter the appropriate details in the server response file.

Note: Don't modify the values to the left of the equal sign.

1. In the **Destination Folder** section, verify the default file path or enter the appropriate file path for the install directory. For example:

```
INSTALLDIR=C:\Program Files\Cisco\Process Orchestrator\
```

Note: Don't enter quotes for long file path names.

2. In the **Setup Type** section, verify or enter the application to be installed, separated by commas. To install:

   a. Client enter **ConsoleFeature**

   b. Server enter **ServerFeature**

   c. Web Console enter **WebConsoleFeature**

For example:

```
ADDLOCAL=ConsoleFeature,ServerFeature,WebConsoleFeature
```

Note: The values to be entered are case sensitive and you must install Client along with the Server.

3. In the **Server Install Options** section:

   a. Under **Server Number**, specify the **Server Install Option**:

   — For new installation, enter: 1

   — To add server to HA environment, enter: 2

For example:

```
SERVER_NUMBER=1
```

Note: You must use this section when ServerFeature is installed.

b. If this is a new installation, enter a unique name for the Cisco Process Orchestrator server environment or the default name is **Production**. For example:

```
HA_ENVIRONMENT_NAME=PRODUCTION
```

4. In the **Database Information** section:

a. Choose the **Database Type**:

— For Microsoft SQL Server, enter: 1

— For Oracle Database Server, enter: 2

— For MariaDB Server, enter: 3

For example:

```
DATABASETYPE=1
```

b. If this is an **Oracle RAC Install**, enter: 1, otherwise leave blank.

For example:

```
RAC_CHECKBOX=
```

Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

Updating MSSQL Details

Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

Note: You must use this section when Database Type is Microsoft SQL Server (DATABASETYPE is set to 1).

1. Under the **Processes Database** section:

a. Enter the **Server Name**. For example:

```
IS_SQLSERVER_SERVER=<server>
```

b. In the **Processes Database Name Field**, enter a unique name or the default name is **OrchestratorProcess**. For example:

```
IS_SQLSERVER_DATABASE=OrchestratorProcess
```

c. If the above database is an existing database, enter: 1, otherwise leave blank. For example:

```
TDBEXIST=1
```

d. In the **Database** creation credentials:

— For Windows Authentication of the current user, enter: 0

— For Server Authentication using specific credentials, enter: 1

For example:

```
IS_SQLSERVER_AUTHENTICATION2=0
```

e. If using Server Authentication using specific credentials, enter **Username** and **Password**, otherwise leave blank. For example:

```
IS_SQLSERVER_USERNAME=<username>
IS_SQLSERVER_PASSWORD=<password>
```

2. Under the **Processes Database Storage** section:

   Note: You must use this section when Processes Database is new (TDBEXIST is blank).

   a. Verify the default data path (**.mdf**) and File Size (in **MB**) (Minimum and Default value is **13**) or enter the alternate information in the appropriate fields.

For example:

```
ADMDATAPATH=C:\Program Files\Microsoft SQL
Server\MSSQL11.MSSQLSERVER\MSSQL\DATA\OrchestratorProcess.mdf

ADMDATASIZE=13
```

   b. Under **Transaction Log**, verify the default log path (**.ldf**) and file size (in **MB**) (Minimum and default value is **7**) or enter the alternate information in the appropriate fields.

For example:

```
ADMLOGPATH=C:\Program Files\Microsoft SQL
Server\MSSQL11.MSSQLSERVER\MSSQL\DATA\OrchestratorProcess_log.ldf

ADMLOGSIZE=7
```

   c. Under Recovery Model, enter the **Recovery Model Type**:

   — To set to Full, enter: FULL

   — To set to Simple, enter: SIMPLE

For example:

```
RECOVERY_MODEL=FULL
```

   Note: The value is Case Sensitive (Default is FULL).

3. Under the **Processes Database Access Account** section:

   Note: You must use this section when Processes Database is new or existing (TDBEXIST is set to 1 or is blank).

   a. Specify the credentials for the server to access the database.

   — For Windows Authentication, enter: 0

   — For SQL Authentication (Mixed mode), enter: 1

For example:

```
IS_SQLSERVER_AUTHENTICATION5=0
```

   b. Enter the **Username** and **Password**. For example:

```
TIAACCESSACCOUNTNAME=<username>
TIAACCESSACCOUNTPASSWORD=<password>
```

   c. If using Windows Authentication, enter the **Domain Name**, otherwise leave blank. For example:

```
TIADOMAINNAME=<domain>
```

4. Under the **Reporting Database** section:

a. Enter the **Server Name**. For example:

```
IS_SQLSERVER_SERVER1=<server>
```

b. In the **Reporting Database Name Field**, enter a unique name or the default name is **OrchestratorReporting**. For example:

```
IS_SQLSERVER_DATABASE1=OrchestratorReporting
```

c. If the above database is an existing database, enter: 1, otherwise leave blank. For example:

```
TDBEXIST1=1
```

d. In the **Database** creation credentials:

— For Windows Authentication of the current user, enter: 0

— For Server Authentication using specific credentials, enter: 1

For example:

```
IS_SQLSERVER_AUTHENTICATION3=0
```

e. If using Server Authentication using specific credentials, enter **Username** and **Password**, otherwise leave blank. For example:

```
IS_SQLSERVER_USERNAME1=<username>
IS_SQLSERVER_PASSWORD1=<password>
```

5. Under the **Reporting Database Storage** section:

Note: You must use this section when Reporting Database is new (TDBEXIST1 is blank).

a. Verify the default data path (**.mdf**) and file size (in **MB**) (Minimum and Default value is **100**) or enter the alternate information in the appropriate fields. For example:

```
ADMDATAPATH1=C:\Program Files\Microsoft SQL
Server\MSSQL11.MSSQLSERVER\MSSQL\DATA\OrchestratorReporting.mdf
```

```
ADMDATASIZE1=100
```

b. Under **Transaction Log**, verify the default log path (**.ldf**) and file size (in **MB**) (Minimum and default value is **20**) or enter the alternate information in the appropriate fields. For example:

```
ADMLOGPATH1=C:\Program Files\Microsoft SQL
Server\MSSQL11.MSSQLSERVER\MSSQL\DATA\OrchestratorReporting_log.ldf
```

```
ADMLOGSIZE1=20
```

c. Under Recovery Model, enter the **Recovery Model type**:

— To set to Full, enter: FULL

— To set to Simple, enter: SIMPLE

For example:

```
RECOVERY_MODEL1=FULL
```

Note: The value is Case Sensitive (Default is FULL).

6. Under the **Reporting Database Access Account** section:

Note: You must use this section when Reporting Database is new or existing (TDBEXIST1 is set to 1 or is blank).

a. Specify the credentials for the server to access the database:

— For Windows Authentication, enter: 0

— For SQL Authentication (Mixed mode), enter: 1

For example:

```
IS_SQLSERVER_AUTHENTICATION6=0
```

b. Enter the **Username** and **Password**. For example:

```
TIAACCESSACCOUNTNAME1=<username>
TIAACCESSACCOUNTPASSWORD1=<password>
```

c. For Windows Authentication, enter the **Domain Name**, otherwise leave blank. For example:

```
TIADOMAINNAME1=<domain>
```

Updating Oracle NON-RAC Mode Details

This section provides Oracle NON–RAC mode details to be entered in the Cisco Process Orchestrator silent install configuration file.

Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

Note: You must use this section only when Database Type is Oracle Server (DATABASETYPE is set to 2).

1. Under the **Processes Database** section:

   Note: You must use this section only if this is NOT an Oracle RAC install (RAC_CHECKBOX is blank).

   a. Enter the **Database Server**. For example:

```
IS_SQLSERVER_SERVER_ORA=<server>:<port number>/<global database name>
```

   b. Enter the **Oracle Service Identifier** (SID). For example:

```
ORACLE_SID=<orcl>
```

   c. Enter the **Account Name** and **Password** to create database. For example:

```
IS_SQLSERVER_USERNAME_ORA=<username>
IS_SQLSERVER_PASSWORD_ORA=<password>
```

   Note: If the database is preexisting, provide the db schema and password else provide a system account or account with dba privileges to create a new database.

2. Under the **Processes Database Access Account** section:

   a. Specify the **User/Schema** and **Password** for the server to access the database. (Default is **OrchestratorProcess**). For example:

```
TIAACCESSACCOUNTNAME_ORA=OrchestratorProcess
TIAACCESSACCOUNTPASSWORD_ORA=<password>
```

   b. If the above user/schema already exists, enter: TRUE, otherwise leave blank. For example:

```
TDBEXIST_ORA=<TRUE>
```

   Note: The value is Case Sensitive.

3. Under the **Oracle Processes Tablespace Datafiles** section:

   Note: You must use this section only when Processes Database is new (TDBEXIST_ORA is blank).

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     a. Enter the **Database Tablespace** file full path (**.dbf**).

     — If Oracle is local to your machine, this should be the location of your **oradata\orcl** folder. For example:

```
c:\app\(user)\oradata\orcl\OrchestratorProcessData.dbf
```

     — If your Oracle Server is remote, enter the **Name** of the file. For example:

```
OrchestratorProcessData.dbf
```

For example:

```
ADMDATAPATH_ORA=<OrchestratorProcessData.dbf>
```

     b. Enter the **Database Tablespace Size** (in **MB**). (Minimum value is **20** and Default is **500**). For example:

```
ADMDATASIZE_ORA=500
```

     c. Enter the **Temporary Tablespace** file full path (**.dbf**).

     — If Oracle is local to your machine, this should be the location of your **oradata\orcl** folder. For example:

```
c:\app\(user)\oradata\orcl\OrchestratorProcessTemp.dbf
```

     — If your Oracle Server is remote, enter the **Name** of the file. For example:

```
OrchestratorProcessTemp.dbf
```

For example:

```
ADMLOGPATH_ORA=<OrchestratorProcessTemp.dbf>
```

     d. Enter the **Temporary Tablespace Size** (in **MB**). (Minimum value is **10** and Default is **250**). For example:

```
ADMLOGSIZE_ORA=250
```

  4. Under the **Reporting Database** section:

     Note: You must use this section only if this is NOT an Oracle RAC install (RAC_CHECKBOX is blank).

     a. Enter the **Database Server**. For example:

```
IS_SQLSERVER_SERVER1_ORA=<server>:<port number>/<global database name>
```

     b. Enter the **Oracle Service Identifier** (SID). For example:

```
ORACLE_SID1=<orcl>
```

     c. Enter the **Account Name** and **Password** to create database. For example:

```
IS_SQLSERVER_USERNAME10=<username>
IS_SQLSERVER_PASSWORD10=<password>
```

     Note: If the database is preexisting, provide the db schema and password else provide a system account or account with dba privileges to create a new database

  5. Under the **Reporting Database Access Account** section:

     a. Specify the **User/Schema** and **Password** for the server to access the database. (Default is **OrchestratorReporting**). For example:

```
TIAACCESSACCOUNTNAME1_ORA=OrchestratorReporting
TIAACCESSACCOUNTPASSWORD1_ORA=<password>
```

     b. If the above user/schema already exists, enter: TRUE, otherwise leave blank. For example:

```
TDBEXIST1_ORA=<TRUE>
```

   Note: The value is Case Sensitive.

   6. Under the **Oracle Reporting Tablespace Datafiles** section:

   Note: You must use this section only when Reporting Database is new (TDBEXIST1_ORA is blank).

   a. Enter the **Database Tablespace** file full path (**.dbf**).

   — If Oracle is local to your machine, this should be the location of your **oradata\orcl** folder. For example:

```
c:\app\(user)\oradata\orcl\OrchestratorReportingData.dbf
```

   — If your Oracle Server is remote, enter the name of the file. For example:

```
OrchestratorReportingData.dbf
```

For example:

```
ADMDATAPATH1_ORA=<OrchestratorReportingData.dbf>
```

   b. Enter the **Database Tablespace Size** (in **MB**). (Minimum value is **100** and Default is **500**). For example:

```
ADMDATASIZE1_ORA=500
```

   c. Enter the **Temporary Tablespace** file full path (**.dbf**).

   — If Oracle is local to your machine, this should be the location of your **oradata\orcl** folder. For example:

```
c:\app\(user)\oradata\orcl\OrchestratorReportingTemp.dbf
```

   — If your Oracle Server is remote, enter the **Name** of the file. For example:

```
OrchestratorReportingTemp.dbf
```

For example:

```
ADMLOGPATH1_ORA=<OrchestratorReportingTemp.dbf>
```

   d. Enter the **Temporary Tablespace Size** (in **MB**). (Minimum value is **20** and Default is **250**). For example:

```
ADMLOGSIZE1_ORA=250
```

Updating Oracle RAC Details

This section provides Oracle RAC details to be entered in the Cisco Process Orchestrator silent install configuration file.

Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

Note: You must use this section only when Database Type is Oracle Server (DATABASETYPE is set to 2).

Note: You must use this section only if this is an Oracle RAC install (RAC_CHECKBOX is set to 1).

1. Under the **Processes Database** section, specify the **Oracle RAC Server** that host the Processes Database.

   a. Enter the connection type you want to use:

   — For TNS (Requires Oracle Client 11g R2 64-bit), enter: 1

   — For Single Client Access Name (SCAN), enter: 2

For example:

```
RAC_CONN_TYPE=1
```

   b. Enter the **TNS Alias** if RAC_CONN_TYPE is set to 1. For example:

```
RAC_TNS_ALIAS=1
```

   c. Enter the **SCAN Host Name**, **Port** (Default is 1521) and **Service Name** if RAC_CONN_TYPE is set to 2. For example:

```
RAC_SCAN_HOST=<hostname>
RAC_SCAN_PORT=1521
RAC_SCAN_SERVICENAME=<servicename>
```

   d. Enter the System Account **User/Schema Name** and **Password**. For example:

```
RAC_USER_SCHEMA=<username>
RAC_PASSWORD=<password>
```

2. Under the **Processes Database Access Account** section:

   a. Specify the **User/Schema** and **Password** for the server to access the database. (Default is **OrchestratorProcess**). For example:

```
TIAACCESSACCOUNTNAME_ORA_RAC=OrchestratorProcess
TIAACCESSACCOUNTPASSWORD_ORA_RAC=<password>
```

   b. If the above User/Schema already exists, enter: TRUE, otherwise leave blank. For example:

```
TDBEXIST_ORA_RAC=<TRUE>
```

   Note: The value is Case Sensitive.

3. Under the **Oracle Processes Tablespace Datafiles** section:

   Note: You must use this section only when Processes Database is new (TDBEXIST_ORA_RAC is blank).

   a. Enter the **Disk Group** information for data file. For example:

```
DISK_GROUP_DATA=DATA
```

   Note: Do not enter plus sign before the value.

   b. Enter the **Database Tablespace Size** (in **MB**). (Minimum value is **20** and Default is **500**). For example:

```
ADMDATASIZE_ORA_RAC=500
```

    c. Enter the **Disk Group** information for temp file. For example:

```
DISK_GROUP_TEMP=DATA
```

    Note: Do not enter plus sign before the value.

    d. Enter the **Temporary Tablespace Size** (in **MB**). (Minimum value is **10** and Default is **250**). For example:

```
ADMLOGSIZE_ORA_RAC=250
```

  4. Under the **Reporting Database** section, specify the **Oracle RAC Server** that host the Reporting Database.

    a. Enter the **Connection Type** you want to use:

    —   For TNS (Requires Oracle Client 11g R2 64-bit), enter: 1

    —   For Single Client Access Name (SCAN), enter: 2

For example:

```
RAC_CONN_TYPE1=1
```

    b. Enter the **TNS Alias** if RAC_CONN_TYPE1 is set to 1. For example:

```
RAC_TNS_ALIAS1=1
```

    c. Enter the **SCAN Host Name**, **Port** (Default is 1521) and **Service Name** if RAC_CONN_TYPE1 is set to 2. For example:

```
RAC_SCAN_HOST1=<hostname>
RAC_SCAN_PORT1=1521
RAC_SCAN_SERVICENAME1=<servicename>
```

    d. Enter the System Account **User/Schema Name** and **Password**. For example:

```
RAC_USER_SCHEMA1=<username>
RAC_PASSWORD1=<password>
```

  5. Under the **Reporting Database Access Account** section:

    a. Specify the **User/Schema** and **Password** for the server to access the database. (Default is **OrchestratorReporting**). For example:

```
TIAACCESSACCOUNTNAME1_ORA_RAC=OrchestratorReporting
TIAACCESSACCOUNTPASSWORD1_ORA_RAC=<password>
```

    b. If the above user/schema already exists, enter: TRUE, otherwise leave blank. For example:

```
TDBEXIST1_ORA_RAC=<TRUE>
```

    Note: The value is Case Sensitive.

  6. Under the **Oracle Reporting Tablespace Datafiles** section:

    Note: You must use this section only when Reporting Database is new (TDBEXIST1_ORA_RAC is blank).

    a. Enter the **Disk Group** information for data file. For example:

```
DISK_GROUP_DATA1=DATA
```

    Note: Do not enter plus sign before the value.

    b. Enter the **Database Tablespace Size** (in **MB**). (Minimum value is **100** and Default is **500**). For example:

```
ADMDATASIZE1_ORA_RAC=500
```

    c. Enter the **Disk Group** information for temp file. For example:

```
DISK_GROUP_TEMP1=DATA
```

    Note: Do not enter plus sign before the value.

    d. Enter the **Temporary Tablespace Size** (in **MB**). (Minimum value is **20** and Default is **250**). For example:

```
ADMLOGSIZE1_ORA_RAC=250
```

Updating MariaDB Details

Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

Note: You must use this section when Database Type is MariaDB Server (DATABASETYPE is set to 3).

  1. Under the **Processes Database** section:

    a. Enter the **Server Name**.

For example:

```
MARIADB_IS_SQLSERVER_SERVER=<server>
```

    b. In the **Processes Database Name Field**, enter a unique name or the default name is **OrchestratorProcess**. For example:

```
MARIADB_IS_SQLSERVER_DATABASE=OrchestratorProcess
```

    c. If the above database is an existing database, enter: 1, otherwise leave blank. For example:

```
MARIADB_TDBEXIST=1
```

    d. Enter the **Database** creation credentials:

For example:

```
MARIADB_IS_SQLSERVER_USERNAME=<username>
MARIADB_IS_SQLSERVER_PASSWORD=<password>
```

  2. Under the **Processes Database Access Account** section:

    Note: You must use this section when Processes Database is new or existing (TDBEXIST is set to 1 or is blank).

    a. Specify the credentials for the server to access the database, Enter the **Username** and **Password**.

For example:

```
MARIADB_TIAACCESSACCOUNTNAME=<username>
MARIADB_TIAACCESSACCOUNTPASSWORD=<password>
```

    b. If the above database is new (TDBEXIST is blank), enter: 1.

For example:

```
TIAACCESSACCOUNTUSER_CANCREATE=1
```

    c. Enter the password used in *MARIADB_TIAACCESSACCOUNTPASSWORD*.

For example:

```
TIAACCESSACCOUNTPASSWORD_CONFIRM=<password>
```

Updating High Availability Details

This section provides HA (High Availability) details to be entered in the Cisco Process Orchestrator silent install configuration file.

Note: You must use this section when ServerFeature is installed and only if choosing to add server to HA environment (SERVER_NUMBER is set to 2).

1. Under the **Server Connection Information** section:

   a. Provide the connection details. **Server Name** or **IP Address** and **Port Number** (Default Port is **61525**). For example:

```
HA_EXISTING_SERVER=<server>
HA_EXISTING_SERVER_PORT=61525
```

   b. Enter the **Credentials**:

   — For current user, enter: 1

   — For other user, enter: 2

For example:

```
HA_EXISTING_SERVER_CREDS=1
```

   c. If other user, enter the **Username** and **Password**. For example:

```
HA_EXISTING_SERVER_USERNAME=<username>
HA_EXISTING_SERVER_PASSWORD=<password>
```

2. Under the **Database Connection Information** section. If you are adding this server to an **SQL Server HA environment**, provide the connection details.

   Note: You must use this section when ServerFeature is installed and only if choosing to add server to SQL Server HA environment (SERVER_NUMBER is set to 2).

   a. Enter the **SQL Server Connection Server Name** or **IP Address**. For example:

```
HA_DB_SERVER_EDIT=<server>
```

   b. Enter the **SQL Server Name**. For example:

```
HA_DB_NAME_EDIT=<server>
```

   c. For the Windows Authentication (Domain\Username), enter: 1

   d. For the SQL Authentication (Mixed mode), enter: 2

For example:

```
HA_DB_CONN_INFO_RADIO=1
```

   e. If using Windows Authentication, enter **Domain\Username**. For example:

```
HA_DB_USER_EDIT=<domain\username>
```

   f. Enter the authentication **Password**. For example:

```
HA_DB_PASSWORD_EDIT=<password>
```

3. Under the **Database Connection Information** section. If you are adding this server to an **Oracle HA environment**, provide the connection details.

Note: You must use this section only when Database Type is Oracle Server (DATABASETYPE is set to 2).

Note: You must use this section when ServerFeature is installed and only if choosing to add server to Oracle HA environment (SERVER_NUMBER is set to 2).

a. Enter the **Oracle Server Connection Server Name** or **IP Address**. For example:

```
HA_DB_SERVER_EDIT_ORA=<server>
```

b. Enter the **Oracle Server Port**. For example:

```
HA_DB_PORT_EDIT_ORA=<port>
```

c. Enter the **Oracle Service Identifier** (SID). For example:

```
HA_DB_SID_EDIT_ORA=<orcl>
```

d. Enter the **Oracle DB User/Schema**. For example:

```
HA_DB_USER_EDIT_ORA=<username>
```

e. Enter the **Oracle DB Password**. For example:

```
HA_DB_PASSWORD_EDIT_ORA=<password>
```

4. Under the **Database Connection Information** section. If you are adding this server to an **Oracle RAC HA environment**, provide the connection details.

Note: You must use this section when ServerFeature is installed and only if choosing to add server to Oracle RAC HA environment (SERVER_NUMBER is set to 2).

a. If using TNS Alias, enter the **Name**. For example:

```
HA_RAC_TNS_ALIAS_EDIT=<aliasname>
```

b. If using SCAN, enter **Host Name**, **Port**, and **Service Name**. For example:

```
HA_RAC_SCAN_HOST_EDIT=<hostname>
HA_RAC_SCAN_PORT_EDIT=<port>
HA_RAC_SCAN_SERVICENAME_EDIT=<servicename>
```

c. Enter the **Oracle RAC DB User/Schema**. For example:

```
HA_RAC_USER_SCHEMA_EDIT=<username>
```

d. Enter the **Oracle RAC DB Password**. For example:

```
HA_RAC_USER_PASSWORD_EDIT=<password>
```

5. Under the **Database Connection Information** section, If you are adding this server to an **MariaDB**, provide the connection details.

Note: You must use this section when ServerFeature is installed and only if choosing to add server to MariaDB HA environment (SERVER_NUMBER is set to 2).

a. Enter the **MariaDB Server Connection Server Name** or **IP Address**.

For example:

```
HA_DB_SERVER_EDIT=<server>
```

b. Enter the **Database name**. For example:

```
HA_DB_NAME_EDIT=<databasename>
```

      c. Enter the **Username**. For example:

```
HA_DB_USER_EDIT=<username>
```

      d. Enter the **Authentication Password**. For example:

```
HA_DB_PASSWORD_EDIT=<password>
```

Updating Additional Configuration Details

This section provides additional configuration details to be entered in the Cisco Process Orchestrator silent install configuration file.

1. Under the **Default Role User Assignments** section, choose user or group to assign to security roles.

    Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

    a. If you don't want to configure **Active Directory Groups**, enter: 1, otherwise leave blank. For example:

```
SKIP_GROUP_CREATION=1
```

    b. If you wish to assign users or groups, enter the name beside each role (**Administrators, Auditors, Definition, Operators**), otherwise leave blank. For example:

```
For users, use format: DOMAIN\USERNAME
For local groups, use format: BUILTIN\GROUPNAME
For non-local groups, use format: DOMAIN\GROUPNAME

AD_ADMIN_GROUP_EDIT=

AD_AUDITORS_GROUP_EDIT=

AD_DEF_AUTHORS_GROUP_EDIT=

AD_OPERATORS_GROUP_EDIT=
```

    Note: To assign the Administrators Role you must have Administrator rights.

2. Under the **Server Name** and **Port Number** section:

    a. Specify the default **Server name** or **IP Address** to which the console connects. For example:

```
DEFAULTSERVERNAME=<server>
```

    b. Specify the default **Port Number** for the server name (Default is **61525**). For example:

```
DEFAULTPORTNUMBER=61525
```

    Note: You must use this section when ConsoleFeature and/or WebConsoleFeature is installed and only if this is a new installation.

    Note: You must not use this section if ServerFeature is installed.

3. Under the **Windows Runtime User** section, enter the default Windows credentials (**Username**, **Password**, and **Domain**) to create a **CPO Windows Runtime User**. For example:

```
WINDOWS_USER_USER=<username>
WINDOWS_USER_PWD=<password>
WINDOWS_USER_DOMAIN=<domain>
```

    Note: You must use this section when ServerFeature is installed and only if this is a new installation (SERVER_NUMBER is set to 1).

    Note: You must not use this section if TDBEXIST or TDBEXIST_ORA is set to 1.

4. Under the **Web Console** section:

    a. Enter the **Web Console Site Name** (Default is **OrchestratorWebConsole**). For example:

```
WEBCONSOLESITE=OrchestratorWebConsole
```

    b. Enter the **Web Console Port Number** (Default is **443**). For example:

```
TCPPORTNUMBER=443
```

    Note: You must use this section when WebConsoleFeature is installed.

Installing Cisco Process Orchestrator Manually

This section provides information to install Cisco Process Orchestrator manually.

Installing Using MSSQL

The Server option installs all database server and client components available in Cisco Process Orchestrator. The user will be required to configure the Processes and Reporting database (optional) features during the installation process.

With the Client option, you can open multiple instances of the Console on the same client computer. The individual Console instances can be connected to the same or different server of any version of the product.

Use the following steps to install the entire Cisco Process Orchestrator product. This installation includes the client, automation server, and web console.

1. Run *Setup.exe* to start the Cisco Process Orchestrator Autorun Utility.

2. On the Setup tab, click **Install Cisco Process Orchestrator** to display the Welcome to the Cisco Process Orchestrator Setup Wizard panel, and then click **Next**.

3. Review the default installation folder path for Cisco Process Orchestrator, and then click **Next**.

To change the file path for the installation folder, click **Change**. This action launches the Change Current Destination Folder panel and allows the user to navigate to the appropriate file location.

4. In the Setup Type panel:

    a. Select the application options to be installed, and then click **Next**.

    b. Optionally, you can add the Console and Webconsole shortcuts to the Desktop and/or pin them to the taskbar.

5. In the Cisco Process Orchestrator Server Install Options panel:

    a. Under Server Install Options, specify the server install option.

Field	Description
This is a new installation of Cisco Process Orchestrator server	Select this option if this is a new installation and you do not wish to add a server to an existing High Availability configuration.
Add Cisco Process Orchestrator server to an existing High Availability configuration	Select this option to add a server to an existing environment.

    b. In the Environment name field, enter a unique name for the Cisco Process Orchestrator environment, and then click **Next**.

6. In the Database Information panel:

a. Under Database Server, select **Microsoft SQL Server Database** as the database platform to be created for both the Cisco Process Orchestrator Process and Reporting database.

b. Under Additional Install Options, check the appropriate configuration check boxes, and then click **Next**.

Options	Description
Restart WMI service during installation	Check this check box to restart the Windows Management Instrumentation during the installation and ensure that certain Cisco Process Orchestrator processes can run after the installation. If the check box remains unchecked, then the Cisco Process Orchestrator processes will not be able to run until after the WMI service has been restarted.
Create reporting database during installation	Check this check box to create reporting database while installing Cisco Process Orchestrator.

7. In the Create Processes Database panel:

a. In the Database server field, enter the appropriate database server path that will be used to store processes and other Cisco Process Orchestrator created objects.

b. In the Processes Database name field, enter the name of the database that will be used to store processes (default: OrchestratorProcess).

c. Choose **Create database using**, select the appropriate credentials to be used for creating the database, and then click **Next**.

Field	Description
Windows authentication credentials of current user	Select this radio button to use the Windows credentials for creating the database.
Server authentication using the credentials below	Select this radio button and then enter the SQL server credentials to use for creating the database.

8. In the Processes Database Storage panel:

a. Under Database, verify the default data path and file size or enter the alternate information in the appropriate fields:

Field	Description
Data path	File path to the database data file
Size (MB)	Maximum file size for the data file. The database size should not be smaller than the model database in the SQL server.

b. Under Transaction Log, verify the default log path and file size or enter the alternate information in the appropriate fields:

Field	Description
Log path	File path to the database transaction log file
Size (MB)	Maximum file size for the transaction log file.

Note: To avoid having huge database log files, run daily backups of the Cisco Process Orchestrator database or change the recovery model.

c. Under Recovery Model, select the Recovery Model type from the list, and then click **Next**.

The default of *Full* is appropriate for a production level deployment which has routine backups. The note is about this mode. For POCs or environments where users will not take daily backups, it is important to set the SQL Server recovery mode to *Simple*. This can dramatically increase Cisco Process Orchestrator database performance and reduce disk usage.

9. In the Processes Database Access Account panel, specify the credentials the server will use to create the database, and then click **Next**.

Field	Description
Windows authentication	Select this radio button and then enter the credentials to use for creating a database. ■ User—User name for the default Windows user ■ Password—Password credentials for the user name ■ Domain—Verify the default Windows domain for the current logged in user or enter the new Windows domain.
SQL Server authentication	Select this radio and then enter the SQL server credentials to use for creating the database. ■ User—User name for the SQL Server database ■ Password—Password credentials for the user name

10. In the Create Reporting Database panel, specify the credentials the server will use to create the database, and then click **Next.**

Field	Description
Database Server	The SQL Server that will host the Reporting database
Reporting Database name	The name of the Reporting database (default: OrchestratorReporting)
Create database using	■ Windows authentication credentials of the current user ■ Server authentication using the credentials below. — User—User name for the SQL Server database — Password—Password credentials for the user name

11. In the Reporting Database Storage panel:

   a. Under Database, verify the data path and file size:

Field	Description
Data path	File path to the database data file
Size (MB)	Maximum file size for the data file. The database size should not be smaller than the model database in the SQL server.

   b. Under Transaction Log, verify the log path and file size:

Field	Description
Log path	File path to the database transaction log file
Size (MB)	Maximum file size for the transaction log file.

Note: To avoid having huge database log files, run daily backups of the Cisco Process Orchestrator database or change the recovery model.

    c. Under Recovery Model, select the Recovery Model type from the list, and then click **Next**.

    — Choose *Full* for a production level deployment that has routine backups.

    — For POCs or environments that do not take daily backups, set the SQL Server recovery mode to *Simple*. This can dramatically increase Cisco Process Orchestrator database performance and reduce disk usage.

12. In the Reporting Database Access Account panel, specify the credentials the server will use to create the database, and then click **Next**.

Field	Description
Windows authentication	Select this radio button and then enter the credentials to use for creating a database. ■ User—User name for the default Windows user ■ Password—Password credentials for the user name ■ Domain—Verify the default Windows domain for the current logged in user or enter the new Windows domain.
SQL Server authentication	Select this radio and then enter the SQL server credentials to use for creating the database. ■ User—User name for the SQL Server database ■ Password—Password credentials for the user name

13. In the Default Role User Assignments panel, choose a user or group to assign to the default security roles, and then click **Next**.

    Note: Click **Skip** to defer assigning user assignments to the Cisco Process Orchestrator default roles until after the installation.

    a. To assign the same user or user group to all default Cisco Process Orchestrator roles, check the **Use the same assignment for all roles** check box. Click **Browse** to launch the Select User or Group dialog box to query the user or user group.

    b. To assign a user or group to a default Cisco Process Orchestrator role, click **Browse** to the right of the appropriate role to launch the Select User or Group dialog box to query the appropriate user or user group

Table 1   Cisco Process Orchestrator Roles

User Group	Description
Administrators Role	Full rights to every view on the Console and the ability to create and update all process definitions. **Note:** Local administrators of the machine where Cisco Process Orchestrator is installed will automatically have Cisco Process Orchestrator administrator rights, even if they do not have specifically granted Cisco Process Orchestrator administrator rights.
Auditors Role	View all Operations information (Activity Views, Process Views and Auditing) ■ Cannot start processes in an adhoc manner ■ Permission to view all Operation and audit logs ■ View, but cannot modify or create product objects such as process definitions, target definition or administration information.
Definition Role	View all Operations information (Activity Views, Process Views and Auditing) ■ Start processes in adhoc manner ■ Cancel running processes ■ Permission to view, create, edit, or control product definitions such as process definitions and target definitions. ■ Permission to view but not update administration information.
Operators Role	View all Operations information (Activity Views, Process Views and Auditing) ■ Start processes in adhoc manner ■ Cancel running processes ■ Cannot view or update definition and administration information

14. In the Windows Runtime User panel, enter the default Windows user credentials to create a Cisco Process Orchestrator Windows Runtime user, and then click **Next**.

15. In the Cisco Process Orchestrator Web Console panel, specify the website name and port information to be used for the Web Console, and then click **Next**.

Field	Description
Web site name	Enter the product Web Console name. The default is *OrchestratorWebConsole*.
Port	Verify the port for the Web Console (Default: *443*)

16. Click **Install** to install the selected application components.

17. When the Setup Completed panel displays, choose one of the following options:

    a. Click **Finish** to launch the Automation Pack Import Wizard immediately after the install is finished.

    b. To prevent the Automation Pack Import Wizard from launching automatically, uncheck the **Launch Import Automation Pack Wizard now** check box, and then click **Finish**.

Installing Using Oracle

Use the following steps to provide the Oracle Database credentials to create a process and reporting database for Cisco Process Orchestrator.

Note: The database settings should be case-insensitive.

1. Run *Setup.exe* to start the Cisco Process Orchestrator Autorun Utility.

2. On the Setup tab, click **Install Cisco Process Orchestrator** to display the Welcome to the Cisco Process Orchestrator Setup Wizard panel, and then click **Next**.

3. Review the default installation folder path for Cisco Process Orchestrator, and then click **Next**.

To change the file path for the installation folder, click **Change**. This action launches the Change Current Destination Folder panel and allows the user to navigate to the appropriate file location.

4. In the Setup Type panel:

    a. Select the application options to be installed, and then click **Next**.

    b. Optionally, you can add the Console and Webconsole shortcuts to the Desktop and/or pin them to the taskbar.

5. In the Cisco Process Orchestrator Server Install Options panel:

    a. Under Server Install Options, specify the server install option.

Field	Description
This is a new installation of Cisco Process Orchestrator server	Select this option if this is a new installation and you do not wish to add a server to an existing High Availability configuration.
Add Cisco Process Orchestrator server to an existing High Availability configuration	Select this option to add a server to an existing environment.

    b. In the Environment name field, enter a unique name for the Cisco Process Orchestrator server environment, and then click **Next**.

6. In the Database Information panel:

    a. Under Database Server, select **Oracle Database** as the database platform to be created for both the Cisco Process Orchestrator Process and Reporting database.

Note: (Optional) Check the Oracle Real Application Clusters (RAC) install check box to indicate the Oracle RAC should be installed when the Oracle database is installed, then skip to .

    b. Under Additional Install Options, check the appropriate configuration check boxes, and then click **Next**.

Options	Description
Restart WMI service during installation	Check this check box to restart the Windows Management Instrumentation during the installation and ensure that certain Cisco Process Orchestrator processes can run after the installation. If the check box remains unchecked, then the Cisco Process Orchestrator processes will not be able to run until after the WMI service has been restarted.
Create reporting database during installation	Check this check box to create reporting database while installing Cisco Process Orchestrator.

  7. In the Create Processes Database panel:

    a. In the Database server field, enter the appropriate database server path that will be used to store processes and other Cisco Process Orchestrator created objects. For example, `<server>:<port>/<global database name>`.

    b. In the Oracle Service Identifier (SID) field, enter the Oracle system ID for the selected database.

    c. Choose **Create database using**, enter the system login ID for the Oracle database server and the password credentials for the login ID, and then click **Next**.

  8. In the Processes Database Access Account panel, enter the credentials the server will use to access the database, and then click **Next**.

  9. In the Oracle Tablespace datafiles panel, enter the following information, and then click **Next**.

    a. Under the Processes Database Tablespace:

Options	Description
Disk Group	Enter the ASM disk group.
Size	Enter the maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

  10. Under the Temporary Tablespace:**.**

Options	Description
Disk Group	Enter the ASM disk group.
Size	Enter the maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

  11. In the Create Reporting Database panel, enter the following information, and then click **Next**.

Options	Description
Database Server	Enter the appropriate database server path that will be used to store processes and other Cisco Process Orchestrator created objects. For example, `<server>:<port>/<global database name>`.
Oracle Service Identifier (SID)	Enter the Oracle system ID for the selected database.
Create database using	Login ID—Enter the system login ID for the Oracle database server. Password—Enter the password credentials for the login ID.

12. In the Reporting Database Access account panel, enter the credentials the server will use to access the database, and then click **Next**.

Options	Description
User/Schema	Enter the name for the user or schema.
Password	Enter the password credentials for the user or schema.

13. In the Oracle Tablespace datafiles panel, enter the following information, and then click **Next.**

    a. Under Reporting Database Tablespace:

Options	Description
Data File	Enter the name of the file for the Reporting tablespace.
Size (MB)	Maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

    b. Under Temporary Tablespace:

Options	Description
Data File	Enter the name of the file for the temporary tablespace.
Size (MB)	Maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

14. In the Default Role User Assignments panel, choose a user or group to assign to the default security roles, and then click **Next**.

    Note: Click **Skip** to defer assigning user assignments to the Cisco Process Orchestrator default roles until after the installation.

    a. To assign the same user or user group to all default Cisco Process Orchestrator roles, check the **Use the same assignment for all roles** check box. Click **Browse** to launch the Select User or Group dialog box to query the user or user group.

    b. To assign a user or group to a default Cisco Process Orchestrator role, click **Browse** to the right of the appropriate role to launch the Select User or Group dialog box to query the appropriate user or user group. For more information, *see* Table 1Cisco Process Orchestrator Roles.

15. In the Windows Runtime User panel, enter the default Windows user credentials to create a Cisco Process Orchestrator Windows Runtime user, and then click **Next**.

16. In the Cisco Process Orchestrator Web Console panel, specify the website name and port information to be used for the Web Console, and then click **Next.**

Field	Description
Web site name	Enter the product Web Console name. The default is *OrchestratorWebConsole*.
Port	Verify the port for the Web Console (Default: *443*)

17. Click **Install** to install the selected application components.

18. When the Setup Completed panel displays, choose one of the following options:

    a. Click **Finish** to launch the Automation Pack Import Wizard immediately after the install is finished.

    b. To prevent the Automation Pack Import Wizard from launching automatically, uncheck the **Launch Import Automation Pack Wizard now** check box, and then click **Finish**.

Using Oracle RAC Mode

Oracle Real Application Clusters (RAC) provides software for clustering and high availability in Oracle database environments. Oracle RAC allows multiple computers to run Oracle RDBMS software simultaneously while accessing a single database, thus providing clustering. In an Oracle RAC environment, two or more computers (each with an Oracle RDBMS instance) concurrently access a single database. This allows an application or user to connect to either computer and have access to a single coordinated set of data.

1. Run *Setup.exe* to start the Cisco Process Orchestrator Autorun Utility.

2. On the Setup tab, click **Install Cisco Process Orchestrator** to display the Welcome to the Cisco Process Orchestrator Setup Wizard panel, and then click **Next**.

3. Review the default installation folder path for Cisco Process Orchestrator, and then click **Next**.

To change the file path for the installation folder, click **Change**. This action launches the Change Current Destination Folder panel and allows the user to navigate to the appropriate file location.

4. In the Setup Type panel:

    a. Select the application options to be installed, and then click **Next**.

    b. Optionally, you can add the Console and Webconsole shortcuts to the Desktop and/or pin them to the taskbar.

5. In the Cisco Process Orchestrator Server Install Options panel, select **This is a new installation of Cisco Process Orchestrator server** and enter a unique environment name, and then click **Next**.

6. In the Database Information panel, select the **Oracle Real Applications Clusters (RAC)** install option.

7. In the Processes Database - Oracle RAC panel under Database Information, select the existing Processes database server information, and then click **Next**.

Options	Description
TNS (Requires Oracle Client 11g R2 64-bit)	Enter the following: ■ TNS Alias—Enter the TNS alias name for detecting an RAC only connection. ■ Login ID—Enter the system login ID for the Oracle database server. ■ Password—Enter the password credentials for the login ID.
Single Client Access Name (SCAN)	Enter the following: ■ Host—Enter the Oracle DB SCAN host name. ■ Port—Enter the port number for the host. ■ Service Name—Enter the Oracle service name. ■ System Account—Enter the system login ID for the Oracle database server. ■ Password—Enter the password credentials for the login ID.

8. In the Processes Database Access Account panel under Database credentials, enter the credentials the server will use to access the database, and then click **Next**.

Options	Description
User/Schema	Enter the name for the user or schema.
Password	Enter the password credentials for the user or schema.
Confirm Password	Reenter the password credentials for the user or schema.

9. In the Oracle Tablespace datafiles panel, enter the following information, and then click **Next.**

    a. Under Processes Database Tablespace:

Options	Description
Disk Group	Enter the ASM disk group.
Size (MB)	Enter the maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

A prompt displays requesting you verify there is enough free disk space to support the database files on the remote Oracle Server.

    b. Under Temporary Tablespace:

Options	Description
Disk Group	Enter the ASM disk group.
Size (MB)	Enter the maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

10. In the Reporting Database - Oracle RAC panel under Database Information, select the existing Reporting database server information, and then click **Next**.

Options	Description
TNS (Requires Oracle Client 11g R2 64-bit)	Enter the following: ■ TNS Alias—Enter the TNS alias name for detecting an RAC only connection ■ Login ID—Enter the system login ID for the Oracle reporting database server. ■ Password—Enter the password credentials for the login ID.
Single Client Access Name (SCAN)	Enter the following: ■ Host—Enter the Oracle DB SCAN host name. ■ Port—Enter the port number for the host. ■ Service Name—Enter the Oracle service name ■ System Account—Enter the system login ID for the Oracle database server. ■ Password—Enter the password credentials for the login ID.

11. In the Reporting Database Access account Panel under Database credentials, enter the credentials the server will use to access the reporting database, and then click **Next**.

Options	Description
User/Schema	Enter the name for the user or schema.
Password	Enter the password credentials for the user or schema.
Confirm Password	Reenter the password credentials for the user or schema.

12. In the Oracle Tablespace datafiles panel:

    a. Under Reporting Database Tablespace:

Options	Description
Disk Group	Enter the ASM disk group.
Size (MB)	Maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

    b. Under Temporary Tablespace:

Options	Description
Disk Group	Enter the ASM disk group.
Size (MB)	Maximum file size for the disk group. The database size should not be smaller than the model database in the Oracle server.

A prompt displays requesting you verify there is enough free disk space to support the database files on the remote Oracle Server.

13. In the Default Role User Assignments panel, choose a user or group to create default roles in Cisco Process Orchestrator based on users and groups in Active Directory, and then click **Next**.

    Note: Click **Skip** to defer assigning user assignments to the Cisco Process Orchestrator default roles until after the installation.

    a. To assign the same user or user group to all default Cisco Process Orchestrator roles, check the **Use the same assignment for all roles** check box. Click **Browse** to launch the Select User or Group dialog box to query the user or user group.

    b. To assign a user or group to a default Cisco Process Orchestrator role, click **Browse** to the right of the appropriate role to launch the Select User or Group dialog box to query the appropriate user or user group.

Field	Description
Administrators Role	When assigned to this group, you have access to everything in the product. Users can view or modify any definition, process, or setting.
Auditors Role	When assigned to this group, the user can view any definition, such as running processes.
Definition Role	When assigned to this group, the user can view or modify any definition or workflow.
Operators Role	When assigned to this group, users have full access to all processes. All processes can be viewed, started, and canceled, but cannot be modified.

14. In the Windows Runtime User panel, enter the default Windows user credentials to create a Cisco Process Orchestrator Windows Runtime user, and then click **Next**.

Note: Optionally, you can click **Skip** to skip choosing the AD or user for each roles. Only the Administrators Role will be assigned to the current installing user.

15. In the Cisco Process Orchestrator Web Console panel, specify the website name and port information to be used for the Web Console, and then click **Next.**

Field	Description
Web site name	Enter the product Web Console name. The default is *OrchestratorWebConsole*.
Port	Verify the port for the Web Console (Default: *443*)

16. Click **Install** to install the selected application components.

17. When the Setup Completed panel displays, choose one of the following options:

   a. Click **Finish** to launch the Automation Pack Import Wizard immediately after the install is finished.

   b. To prevent the Automation Pack Import Wizard from launching automatically, uncheck the **Launch Import Automation Pack Wizard now** check box, and then click **Finish**.

Manual Installation

You can configure information for Cisco Process Orchestrator using Oracle database 11gR2 running in real application clustering. Most of the configuration is applied post-installation. Before the Cisco Process Orchestrator Process database can be configured in RAC mode, the Oracle Call Interface (OCI) client must exist on the computer where the Cisco Process Orchestrator server is installed.

Use the following steps to configure the Cisco Process Orchestrator process database server in RAC mode.

1. Install `oracle win64_11gR2_client`.

2. Create an entry for the Cisco Process Orchestrator oracle service than is running in the tnsnames.ora file as mentioned below.

```
Default location of tnsnames.ora: C:\app\Administrator\product\11.2.0\client_1\network\admin

ORCL =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = 172.18.173.24)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = orcl.GIATAC.local)
    )
  )
```

3. Make sure you are able to successfully do a tnsping to the Oracle SID. For example:

```
C:\Users\Administrator>tnsping orcl
TNS Ping Utility for 64-bit Windows: Version 11.2.0.1.0 - Production on 05-DEC-2
013 10:51:36
Copyright (c) 1997, 2010, Oracle.  All rights reserved.
Used parameter files:
C:\app\Administrator\product\11.2.0\client_1\network\admin\sqlnet.ora
Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)
(HOST = 172.18.173.24)(PORT = 1521))) (CONNECT_DATA = (SID = ORCL)))
OK (0 msec)
```

4. Before you run the Cisco Process Orchestrator installer, identify your global database by executing the SQL mentioned below.

5. Login as 'system' or sys and execute the following:

```
SELECT * FROM global_name;
```

For example:

```
ORCL.GIATAC.LOCAL is the global database
```

6. Click **Next**. You will be prompted to create OrchestratorProcess and OrchestratorReporting tablespaces (The password character length is greater than 8 chars).

7. Follow this guide for the next steps.

8. Click **Install**.

Installing Using MariaDB

Use the following steps to provide the MariaDB credentials to create a process and reporting database for Cisco Process Orchestrator.

Note: The database settings must be case-insensitive.

1. Run *Setup.exe* to start the Cisco Process Orchestrator Autorun Utility.

2. On the **Setup** tab, click **Install Cisco Process Orchestrator** to display the Welcome to the **Cisco Process Orchestrator** Setup Wizard panel, and then click **Next**.

3. Review the default installation folder path for Cisco Process Orchestrator, and then click **Next**.

To change the file path for the installation folder, click **Change**. This action launches the Change Current Destination Folder panel and allows you to navigate to the appropriate file location.

4. In the **Setup Type** panel:

   a. Select the application options to be installed, and then click **Next**.

   b. Optionally, you can add the Console and Webconsole shortcuts to the Desktop and/or pin them to the taskbar.

5. In the Cisco Process Orchestrator **Server Install Options** panel, do the following:

   a. Under Server Install Options, select the **server install** option.

   b. In the **Environment name field**, enter a unique name for the Cisco Process Orchestrator server environment, and then click **Next**.

6. In the Database Information panel:

   a. Under Database Server, select **MariaDB** as the database platform to be created for both the Cisco Process Orchestrator Process.

   b. Under Additional Install Options, check Restart WMI service during installation check box, and then click **Next.**

   — Check this check box to restart the Windows Management Instrumentation during installation and ensure that certain Cisco Process Orchestrator processes can run after the installation.

   Note: If the check box remains unchecked, then the Cisco Process Orchestrator processes will not be able to run until after the WMI service has been restarted.

7. In the **Use Existing or Create Processes Database** panel:

    a. In the **Database server field**, enter the appropriate database server path used to store processes and other Cisco Process Orchestrator created objects.

    b. In the **Processes Database Name field**, enter the name of the database used to store processes (default: OrchestratorProcess).

    c. Enter the system login ID for the MariaDB database server and the password credentials for the login ID, and then click **Next**.

8. In the **Processes Database Access Account** panel, enter the credentials the server will use to access the database, and then click **Next**.

    Note: If the check box is checked, then the Cisco Process Orchestrator creates a new user if the user doesn't exist already.

9. In the **Default Role User Assignments** panel, choose a user or group to assign to the default security roles, and then click **Next**.

    Note: Click **Skip** to defer assigning user assignments to the Cisco Process Orchestrator default roles until after the installation.

    a. To assign the same user or user group to all default Cisco Process Orchestrator roles, check the **Use the same assignment for all roles** check box. Click **Browse** to launch the Select **User or Group** dialog box to query the user or user group.

    b. To assign a user or group to a default Cisco Process Orchestrator role, click **Browse** to the right of the appropriate role to launch the Select User or Group dialog box to query the appropriate user or user group. For more information, *see* Table 1Cisco Process Orchestrator Roles.

10. In the **Windows Runtime User** panel, enter the default Windows user credentials to create a Cisco Process Orchestrator Windows Runtime user, and then click **Next**.

11. In the Cisco Process Orchestrator Web Console panel, specify the website name and port information to be used for the Web Console, and then click **Next.**

Field	Description
Web site name	Enter the product Web Console name. The default is *OrchestratorWebConsole*.
Port	Verify the port for the Web Console (Default: *443*)

12. Click **Install** to install the selected application components.

13. When the **Setup Completed** panel displays, choose one of the following options:

    a. Click **Finish** to launch the **Automation Pack Import Wizard** immediately after the install is finished.

    b. To prevent the **Automation Pack Import Wizard** from launching automatically, uncheck the **Launch Import Automation Pack Wizard now** check box, and then click **Finish**.

Installing Cisco Process Orchestrator for a High Availability Environment

1. Run *Setup.exe* to start the Cisco Process Orchestrator Autorun Utility.

2. On the Setup tab, click **Install Cisco Process Orchestrator** to display the Welcome to the Cisco Process Orchestrator Setup Wizard panel, and then click **Next**.

3. Review the default installation folder path for Cisco Process Orchestrator, and then click **Next**.

    Note: To change the file path for the installation folder, click **Change**. This action launches the Change Current Destination Folder panel and allows the user to navigate to the appropriate file location.

4. Select the application options to be installed, and then click **Next**.

5. Under Server Install Options, select **Add a Cisco Process Orchestrator to an existing High Availability configuration**, and then click **Next**.-

6. In the Server Connection Information panel, provide the following connection details to an existing server in the Cisco Process Orchestrator HA environment, and then click **Next.**

Field	Description
Server Name or IP Address	Enter the product HA server name.
Port	Verify the port for the HA server (Default: 61525)
User Name	User name for the default user for the HA environment. ■ SQL Authorization—select to use your SQL Service credentials upon connection to the database. ■ AD Authorization—select to use your Active Directory credentials upon connection to the database.
Password	Password credentials for the user name

Note: By default, if the existing server is using SQL Server, the SQL server connection dialog will be shown. If the existing server is using Oracle, the Oracle connection dialog will be shown or if the existing server is using MariaDB, the MariaDB connection dialog will be shown. The dialog by default will be populated with the information that was used to validate the connection to the database, so you will need to modify this information with the correct information in order to continue. All fields are required in order to continue and when the user clicks Next, the installer validates the connection to the database and proceed if successful or show detailed error if it fails.

7. In the Database Connection Information panel, enter the following information, and then click **Next**.

Field	Description

Database Server	Enter the appropriate database server path used to store processes and other Cisco Process Orchestrator created objects.
	
	For example,
	
	`For Oracle: <server>:<port>\<global database name>.`
	`For SQL and MariaDB: <server>.`

Database Name	The name for the database used to store processes and other Cisco Process Orchestrator created objects. **Note:** The database name is filled in automatically and is not changeable.
Connection Information	■ Windows Authentication—Select to use your Windows credentials upon connection to the database SQL Server. ■ SQL Server Authentication—Select to use your SQL Service credentials upon connection to the database. ■ Custom Authentication—For Oracle and MariaDB.
Database Port	■ For Oracle and MariaDB, enter the database listening port number.
Database SID	■ For Oracle, enter the Oracle system ID for the selected database.

8. In the Cisco Process Orchestrator Web Console panel, specify the website name and port information to be used for the Web Console, and then click **Next.**

Field	Description
Web site name	Enter the product Web Console name. The default is *OrchestratorWebConsole*.
Port	Verify the port for the Web Console (Default: 443)

9. Click **Install** to install the selected application components.

10. On the Setup Completed panel, click **Finish**.

Importing Automation Packs

1. On the Setup Completed panel, click **Launch Automation Pack Import Wizard now** (this is checked by default.)

2. On the Select Automation Packs dialog box, click the automation packs to be imported and click **OK**.

   Note: The Core automation pack check box is checked by default and is always imported first.

   The Welcome to the Automation Pack Import Wizard panel displays

3. Review the display-only information about the automation pack, and then click **Next**.

   Note: The settings in this panel can be manually changed when configuring a specific email activity that requires a different SMTP server or sender email address. This can also be skipped by unchecking the box next to Enable SMTP server for outgoing emails.

4. On the Email Configuration panel, specify the default SMTP server and sender's email address to be used for email activities, and then click **Next**.

Field	Description
Default SMTP server	Name of the SMTP server that is used as the default server for sending email messages.
Default SMTP port	Port number for the SMTP server. This field is automatically populated with port number 25.
Default sender	Email address of the sender that is designated as the default sender for email activities.
Credentials Required	Specify the credentials if they will be required upon sending.

5. On the Automation Summary Configuration panel, specify where the automation summary reports that are generated by activities are to be saved and how long the reports are to be retained. The file paths specified indicate the path that will be used when viewing the automation summary reports..

Field	Description
Automation summary file share	Verify the default file path that the Cisco Process Orchestrator server will use when creating automation summary reports. Click **Browse** to determine the file share location on the network where all the automation summary reports are stored or click the **Create a share on the current Orchestrator Server** link.

6. Verify or enter the appropriate default file path for the automation summary directory. Enter the appropriate directory to map the automation summary to a shared directory or IIS Virtual Directory to allow end-users easier access to automation summaries using email or the Cisco Process Orchestrator Web Console.

Option	Description
Automation summary file share	

Option	Description
Share path	Enter the UNC path to a share directory. This path will be used when viewing the automation summary reports. For example: `(\\servername\sharename\path\filename)` ■ **Create a share on the current Orchestrator Server**—Click this button to create the directory on the Cisco Process Orchestrator server where the automation summary reports should be created. **Note:** Verify that the UNC share file path is on a network where the Cisco Process Orchestrator service account has write permissions.
Credentials	There is a set of credentials used to write to the share. The account specified needs to have a "Batch" logon type in local security policy. It is located in Control Panel\All Control Panel Items\Administrative Tools. ■ Local Security Policy ■ Local Policies ■ User Rights Assignment ■ Log on as batch job
Virtual directory mapping	Select the **Enable virtual directory mapping** check box to map the automation summary share to an IIS virtual directory. In the Virtual directory path field, enter the http://host:(port)/sharefolder that corresponds to a virtual directory in IIS. If necessary, go to IIS Manager to create your Web Sites and your Virtual Directory for the share folder. Use the default settings, change the setting if necessary.

7. Under Specify the destination for the extracted data, verify the default location where the Cisco Process Orchestrator-provided data files should be copied.

8. Under Select data to extract, check the appropriate check boxes, and then click **Next.**

Option	Description
Business Objects Reports	Check this check box to indicate that BIAR report files should be copied. The files are available for importing later into Business Objects.
Microsoft SCOM Management Packs	Cisco Process Orchestrator provides management packs for integration with the Microsoft System Center Operations Manager 2007 framework. Check this check box to indicate that the SCOM management pack files should be copied.
SQL Server Reporting Services Reports	Check this check box to indicate that the report files should be copied. The files are available for importing later into SQL Server Reporting Services. **Note:** Reports should be imported after the Automation Pack Import Wizard is completed.

The Review Prerequisites panel displays the following information:

Column	Description
Name	Name of the prerequisite
Status	Status shows whether the prerequisite was located on the computer ■ Passed—The green check mark verifies that the prerequisite was located on the computer. ■ Failed—The red X determines that the prerequisite is not available on the computer. When this occurs, the import progress is stopped and cannot continue until all prerequisites have been met.
Complete	Percentage of computer checked when verifying prerequisite
Description	Displays description of the prerequisite information or instructions to further requirements for the prerequisites to be installed.

9. During the import process:

   a. If you click **Cancel** during the import, the wizard will close and the automation pack will not be imported.

   b. If all prerequisites are passed, the wizard automatically continues to the next panel, which displays the status of the automation pack objects being imported.

   c. If objects are being removed as a result of the updated automation pack, click **OK** to confirm the removal of the objects from the automation pack and Cisco Process Orchestrator.

After the objects have been imported, the importing of the Core automation pack is complete. If other automation packs were selected to be imported, the wizard will relaunch for the next automation pack.

Repairing Cisco Process Orchestrator Installation

In cases where the Cisco Process Orchestrator installation has become corrupted due to lost DLL files or bad files, uninstall and then reinstall Cisco Process Orchestrator on the designated computer.

Uninstalling Cisco Process Orchestrator

This section provides the steps used to uninstall Cisco Process Orchestrator from your machine using the Windows Add or Remove Programs application. If a language pack is installed, then it will be uninstalled along with Cisco Process Orchestrator.

1. Choose **Start > Control Panel > Add or Remove Programs**.

2. Select **Cisco Process Orchestrator** and click **Remove**.

3. Click **Yes** on the confirmation dialog box.

Configuring Cisco Process Orchestrator

Configuring the Core Functions Adapter

The Core Functions Adapter provides the basic functionality in Process Orchestrator. Use the Core Functions Adapter Properties dialog box to configure default task settings, automation summary report

Configuring Return on Investment Settings

When you create a process, you have the option to enter the equivalent time it would take to run the process manually. This value is calculated against the hourly rate specified on this page to determine the return on investment for the process.

1. Choose **Administration > Adapters**, right-click **Core Functions Adapter** and choose **Properties**.

2. On the Core Functions Adapter Properties dialog box, click the **ROI** tab and specify the hourly rate (in dollars) that it would cost to execute a process manually, then click **OK**.

Configuring Task Expiration Settings

Use the Task Properties page to specify the default number of days used for the task expiration date. If a task is opened on its expiration date, an internal event is raised that can be used to trigger a process. Users will be able to modify the date manually on the appropriate task property page.

1. Choose **Administration > Adapters**, right-click **Core Functions Adapter** and choose **Properties**.

2. On the Core Functions Adapter Properties dialog box, click the **Task Properties** tab.

3. Under Task expiration days, modify the default task expiration date, then click **OK**.

Enabling Data Execution Prevention (DEP)

To secure your underlying hardware and operating system in Microsoft Windows 2008 and Windows 2012, use the following Data Execution Prevention (DEP) features:

- Hardware-enforced DEP detects code that is running from these locations and raises an exception when execution occurs.

- Software-enforced DEP can help prevent malicious code from taking advantage of exception-handling mechanisms in Windows.

To enable DEP in Windows 2008 and Windows 2012:

1. Choose **Start > All Programs > Control Panel > System**, then click **Advanced system settings**.

2. Choose **Performance > Settings**.

3. Click the **Data Execution Prevention** tab, then check **Turn on DEP for all programs and services except those I select**.

4. Choose the programs and services on which you do *not* want to run DEP, then click **OK**.

Hardening the Cisco Process Orchestrator Configuration

Hardening the Microsoft Windows Server operating system reduces the attack surface by disabling functionality that is not required while maintaining the minimum functionality that is required. For information about how to harden your Windows operating system and to make additional changes to Cisco Process Orchestrator to harden its configuration, see the *Cisco Process Orchestrator Hardening Guide*.

Configuring a High Availability Environment

Because there are a variety of load balancers and you might have your own that you want to use, this section does not describe how to set up or configure load balancers. Instead, it explains how to load balance different Cisco Process Orchestrator client connections using the generic load balancer, Microsoft Network Load Balancing Manager, as an example.

Microsoft Network Load Balancing Manager is a virtual load balancer that is not as feature-rich as what most customers probably use in production environments, but does demonstrate how Process Orchestrator clients work with a generic load balancer.

Setting Up a Load Balancer

To set up Microsoft Network Load Balancing Manager for Process Orchestrator requires at least three to five machines and three static IP addresses:

- One machine acts as the cluster host (with a static IP).

- Two machines act as Process Orchestrator servers and Web Consoles. Alternatively, the Web Console could be installed on a separate highly-available IIS (with a static IP).

- One machine hosts a High Availability database for Process Orchestrator (for testing purposes this could be the same machine as the cluster host).

- One machine performs client testing (for testing purposes this could also be the same as the cluster host).

In the example in the following sections, the cluster/load-balancer is not monitoring specific Process Orchestrator ports to verify that the application is healthy, but instead is tested using the Load Balancing Manager software (by stopping incoming connections to a specific host) or by shutting down the server or disabling network access on one of the Process Orchestrator servers to ensure that load-balancing is occurring. In production, the load balancer should be configured to monitor the health of the Process Orchestrator server, northbound web service, or IIS ports to determine if the server, northbound web service, or web console are running or down. The default ports are as follows:

- IIS ports: HTTP 2081, HTTPS 443

- SNMP 1: 61

- Console: 61525

- NBWS: 61526 HTTPS, 61527 HTTP

- REST: 51526 HTTPS, 51526 for HTTP

Configuring the Console Connection

To configure the Cisco Process Orchestrator console to connect through the load balancer:

1. Choose **Start > Cisco Process Orchestrator Console**, then in the Select Server dialog, enter the host name of the load balancer cluster.

2. To verify that the connection is being made through the load balancer, check the Cisco Process Orchestrator Console; the load balancer URL should appear in the title bar.

3. To ensure that load balancing is running successfully, perform *one* of the following actions on the load balancer:

     a. Select a specific host and Stop or Drainstop connections to that host.

     b. Disable the network interface or bring down the server that the Process Orchestrator is running on.

In a production environment, you should be monitoring the server port, and can test just by bringing it down.

Configuring the NBWS and REST Connections

Before You Begin

Configure the Cisco Process Orchestrator console to connect through the load balancer (see Configuring the Console Connection, page 44).

1. Choose **File > Environment Properties > Web Service**.

2. Enable the Web Services. By default, the ports for SOAP HTTPS is 61526 and for HTTP is 61527. And Rest uses 51526 for HTTPS and 51527 for HTTP.

3. Set up SSL on your Process Orchestrator servers.

You should not need to do any additional certificate setup or configuration on the load balancer itself.

4. Configure any Northbound connections to connect through the load balancer. For example, to connect to the Target Northbound Web Service using the default SOAP HTTPS port, connect to:

```
https://<load-balancer-name>:61526/WS/Target?wsdl
```

5. To ensure that load balancing is running successfully, perform *one* of the following actions on the load balancer:

     a. Select a specific host and Stop or Drainstop connections to that host.

     b. Disable the network interface or bring down the server that the Process Orchestrator is running on.

In a production environment, you should be monitoring specific NBWS ports, and can test just by bringing them down.

Configuring the Web Console Connection

Before You Begin

Configure the Cisco Process Orchestrator console to connect through the load balancer (see Configuring the Console Connection, page 44).

1. Choose **File > Environment Properties.**

2. Click the **General** tab and enter the required information, then click **Save**.

     a. In the Web Console location field, enter *one* of the following:

     — The load balancer URL. This is what gets set as the task URL for tasks and can be sent in emails as a URL location to the Web Console. This is also what is used to open and complete the task using the Web Console.

     — The IP address of the cluster in the Web Console location.

3. Copy the Web Console URL, which is now using load balancer URL in the environment properties dialog, into your browser and confirm that the Web Console is displayed properly.

4. On each server, confirm that IIS authentication for the `orchestratorwebconsole` web site and `OrchestratorWebConsole` application under it is set to only use basic authentication and ASP.NET Impersonation.

5. Using an ASCII text editor, edit the file `C:\Program Files\Cisco\Cisco Process Orchestrator\WebConsole\Web.config`:

   a. In the <system.web> section, verify `<authentication mode="Windows" />` and `<identity impersonate="true" />`.

   b. In the <appsettings> section, set `<add key="WebServiceUris" value="the load balancer's URL" />`.

6. To ensure that load balancing is running successfully, perform *one* of the following actions on the load balancer:

   a. Select a specific host and Stop or Drainstop connections to that host.

   b. Disable the network interface or bring down the server that the Process Orchestrator is running on.

In a production environment, you should be monitoring the IIS port and can test just by bringing it down.

Upgrading Cisco Process Orchestrator

Upgrading from 3.3 to 3.4.

The 3.4 upgrade calls the needed SQL scripts to perform the upgrade operation based on the existing version found.

Important: Follow manual upgrade steps if the database schema has been modified for this setup.

Upgrading the Oracle Database

Before You Begin

■ Back up the database.

■ You must have the appropriate database rights to run the scripts.

1. Install the OCI client that is compatible with the Oracle database server, if it not already installed.

2. Choose **Start > Run**.

3. On the Run dialog box, in the Open field, type **cmd** and press **Enter**.

4. Run the following scripts in the order as they are listed.

   a. Log in as the user/schema that the process db is named (*OrchestratorProcess* is the default user/schema for previous versions of Cisco Process Orchestrator), then enter:

   Execute OrchestratorProcessUpgrade.sql

   Execute OrchestratorProcessViews.sql

   b. Log in as the user/schema that the report db is named (*OrchestratorReporting* is the default user/schema for previous versions of Cisco Process Orchestrator), then enter:

   — **Execute OrchestratorReportingUpgrade.sql**

5. Install Cisco Process Orchestrator 3.4. To upgrade the previous Cisco Process Orchestrator server, see Installing Using Oracle, page 25).

6. Verify that the system works.

Upgrading the MSSQL Database

Important: If the Process Orchestrator server is configured to use Windows authentication to access the process database, manually upgrade the Process database and Reporting database before upgrading to Cisco Process Orchestrator 3.4.

Note: If you are upgrading from Cisco Process Orchestrator 3.3 to 3.4 using SQL server, you must have *db_owner* role assigned for OrchestratorProcess and OrchestratorReporting to make db schema changes.

Note: If needed, you must rename the database names in the scripts to the current database names on your environment before running the scripts.

Upgrading from 3.3 to 3.4.

Before You Begin

■ Back up the database.

■ You must have the appropriate database rights to run the scripts.

1. Open Microsoft SQL Server Management Studio.

2. Run the following scripts:

    a. *\Release\DatabaseScripts\MSSQL\OrchestratorProcessUpgrade.SQL*

    b. *\Release\DatabaseScripts\MSSQL\OrchestratorReportingUpgrade.SQL*

3. Edit *\Release\DatabaseScripts\MSSQL\OrchestratorProcessViews.SQL*:

    a. Change the database name in the script if it is not the default name *OrchestratorProcess*.

    b. Run the script.

4. Install Cisco Process Orchestrator 3.4. To upgrade the previous Cisco Process Orchestrator server, see Installing Using MSSQL, page 20.

5. Verify that the system works.

Upgrading the MariaDB Database

Before You Begin

■ Back up process and reporting databases.

■ You must have the appropriate database rights to run the scripts.

1. Open HeidiSql.

2. Run the following scripts:

    \Release\DatabaseScripts\MYSQL\OrchestratorProcessUpgrade.SQL

3. Edit *\Release\DatabaseScripts\MYSQL\OrchestratorProcessViews.SQL*:

    — Change the database name in the script if it is not the default name *OrchestratorProcess*.

    — Run the script.

4. Run the following script manually on reporting database:

    — *OrchestratorReportingUpgrade.SQL*

    — Change the database name in the script if it is not the default name *OrchestratorReporting*.

    — Run the script.

    Note: MariaDB for reporting was not supported in 3.3. It could be either SQL Server Or Oracle. Use the appropriate connection to run the script.

5. Install Cisco Process Orchestrator 3.4. To upgrade the previous Cisco Process Orchestrator server, see Installing Using MariaDB, page 32.

6. Verify that the system works.

Creating the Databases Manually

This section provides information on creating the databases manually.

Creating the Oracle Database

1. Log in as System user.

2. Create process database user by executing **OrchestratorProcessCreateUser.sql**.

   Note: Modify the script as needed. For example, you may need to change the datafile, initial size and password.

3. Create reporting database user by executing **OrchestratorReportingCreateUser.sql**.

   Note: Modify the script as needed. For example, you may need to change the datafile, initial size and password.

4. Run the following scripts in the order as they are listed.

   a. Log in as process database user, then enter:

   ```
   Execute OrchestratorProcess.sql
   ```

   ```
   Execute OrchestratorProcessForEnterpriseEdition.sql
   ```

   Note: You must use OrchestratorProcessForEnterpriseEdition.sql only for enterprise edition.

   ```
   Execute OrchestratorProcessViews.sql
   ```

   b. Log in as reporting database user, then enter:

   ```
   Execute OrchestratorReporting.sql
   ```

Creating the MSSQL Database

1. Log in as System user.

2. Create Process database user, see Process Database Logon Script, page 4.

3. Create Report database user, see Reporting Database Authentication Script, page 4.

4. Run the following scripts in the order as they are listed.

   a. Log in as process database user, then enter:

   ```
   Execute OrchestratorProcess.sql
   ```

   ```
   Execute OrchestratorProcessForEnterpriseEdition.sql
   ```

   Note: You must use OrchestratorProcessForEnterpriseEdition.sql only for enterprise edition.

   ```
   Execute OrchestratorProcessViews.sql
   ```

   b. Log in as reporting database user, then enter:

```
Execute OrchestratorReporting.sql
```

Creating the MariaDB Database

1. Log in as Root user.

2. Create Process database user by executing **OrchestratorProcessCreateUser.sql**.

   Note: You can modify the script as needed.

3. Log in as process database user, then run the following scripts in the order as they are listed:

   ```
   Execute OrchestratorProcess.sql
   Execute OrchestratorProcessForEnterpriseEdition.sql
   Execute OrchestratorProcessViews.sql
   ```