APM Connect

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Contents

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Chapter 1

Overview

Topics:

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About APM Connect

The APM Connect system provides the means to load data from the Industrial Internet of Things (IIOT) into APM.

The system uses data loaders and adapters to establish a data flow between APM and EAM systems, Field Service Management systems, and other assets. The APM Connect context file defines the communication path between the IIOT and APM.

Note: For information about the APM Connect versions corresponding to APM versions, refer to the APM Connect Version Compatibility Table on page 134.

APM Connect Next Generation ETL is the new integration tool in replacement to the existing technology stack. The new model provides for common workflow development, deployment, execution, and monitoring with remote management option.

You can ingest data to APM using one of the following methods:

- Using Data Loaders Manually
- Using Automatic Data Loaders
- Using EAM Adapters

Access the APM Connect Page

Procedure

In the **Applications** menu, navigate to **ADMIN** > **Operations Manager** > **Connections**., and then select **APM Connect**.

The **APM Connect** workspace appears.

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Chapter 2

About NextGen ETL

Topics:

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About NextGen ETL Integration Platform

This is implemented using the Boomi Integration Platform. Using the Boomi Platform Integration service, you have access to an intuitive interface, data mapping tools, process building recipes, and a library of connectors to accelerate your process using low/no code capabilities.

In Integration, a process represents a business process or transaction-level interface between two or more systems. There are three major parts to an integration process as follows:

Build	Build workflows to integrate source of data, transform the data based upon the destination requirements, and send the data to the destination system.
Deploy	Deploy your built workflows to your runtime environment to be able to execute the integration between your source and destination systems.
Manage	Manage the lifecycle of your built workflows including manual and scheduled execution, scheduling changes, and viewing workflow execution logs.

Terminology

Term	**Definition**
Process	A workflow that integrates data between a source and destination.
Execution	A workflow execution in the runtime environment.
JVM	An instance of a Java Virtual Machine
Atom	An Atom is a minimalistic runtime environment that is remotely managed from the Boomi Integration Platform. Within the context of APM Connect, a Boomi Atom is deployed on-premise and a Cloud Atom deployment is not available. As part of an Atom deployment, integration processes are made available to your Atom. An Integration process contains all the components required to run your processes from end to end, including connectors, transformation rules, decision handling, and processing logic.
Computer	A physical or Virtual Machine instance on which an Atom can be deployed.
CPU	Central Processing Unit
Memory or RAM	Random Access Memory
Hard Disk or Storage	A storage device used by the computer for persistent data retention.

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Term	Definition
Integration Packs	Integration Packs Integration packs are content developed by GE for integrating your APM solution with specific source systems. This content contains the workflows necessary to extract data from the source system and deliver it to APM for use in your asset management work processes. APM Connect Release Integration pack and process folders will contain the below workflows and their dependencies: • [Main]Extraction_Wrapper: For Running SAP interface • [Main]Maximo_Extraction_Wrapper • [Main]IR_Create_Intermediate_Repository • [Main]IR_Add_Source_System • [Main]IR_Add_Postgres_Functions
Extensions	Extensions are variables that are defined for each environment and integration pack deployment. These variables are used by the integration pack for a specific environment to dynamically allow an end user to configure parameters in the workflow that will be unique to their individual environment. The use of extensions in integration packs allows for standard workflow content without the need to rebuild and deploy a workflow that is unique for each environment and customer. In the APM Connect Integration packs, parameters of multiple extensions are defined and utilized. Details regarding the extensions are available in the environment connection setting steps in the installation portion of the document.
Environment	Environments give you greater control over change management and support different connection configurations using extensions. An environment is a workspace that users create and use for testing or production purposes. When you add an environment, you must select a classification: the choices are Production or Test.

Architecture

The following image shows the architecture for on-premises environment.

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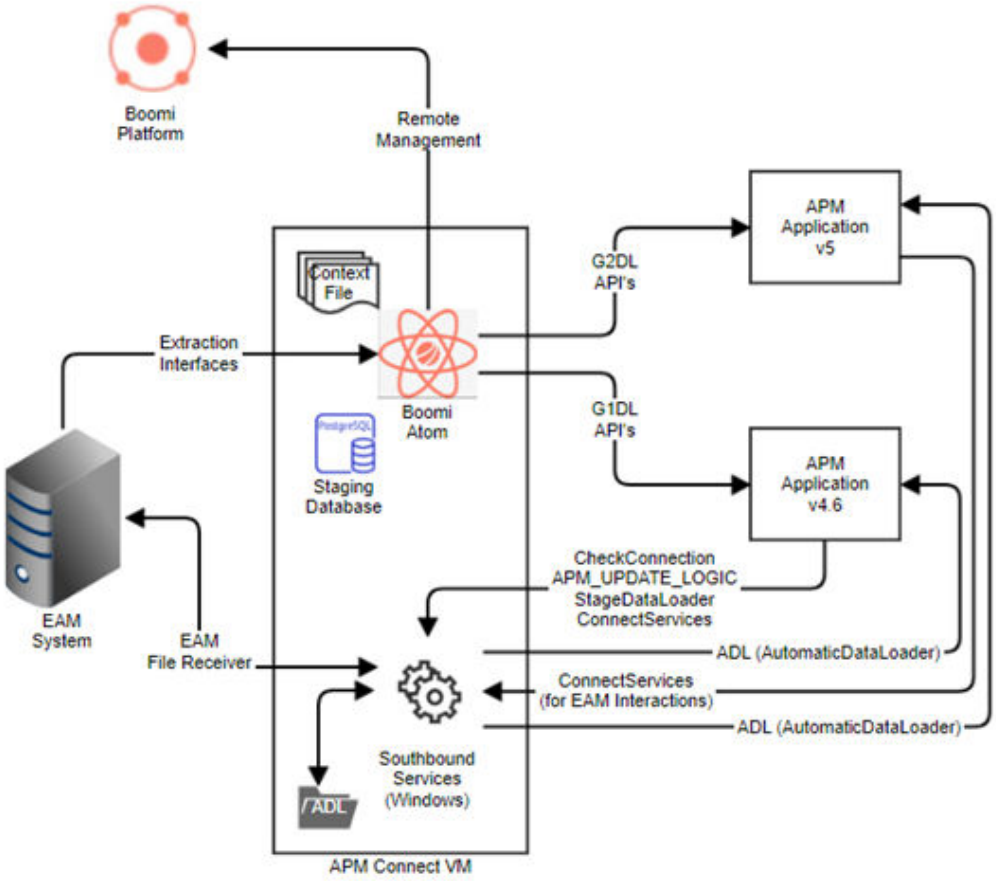

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Chapter 3

NextGen ETL Installation

Topics:

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Installation Steps

EAM Integration

About This Task

Complete the following steps:

Step	Required
Validate that the server meets the listed System Requirements	Yes
Local Atom Configuration and Setup (Integration Job Deployment)	Yes
Southbound Service Installation and Configuration	Yes - If writing back to EAM or using Automated Dataloaders
Northbound and Southbound Data Extraction SAP Mapping Configuration	Optional
Postgres Configuration	Yes

Automated Data Loader Integration

About This Task

Complete the following steps:

Steps	Required
Validate that the server meets the following System Requirements	Yes
Local Atom Configuration and Setup (Integration Job Deployment)	No
Southbound Service Installation & Configuration	Yes
Northbound and Southbound Data Extraction SAP Mapping Configuration	No
Postgres Configuration	Yes

System Requirements

System Requirements

An Atom must be installed within your network to connect to source systems and process the data into APM applications hosted on On-premise APM . The Atom will process and transmit data within your network boundary.

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Supported Operating Systems

Operating system	Version
Windows 64-bit	APM Connect supports Windows Server 2016, 2019, or 2022

Hardware Requirements

The requirements for a single Atom that must process high volumes of data are:

Processor	Dual 64-bit processors or higher (with 8 or 16 Cores) More processors allow for increased, simultaneous process runs
Memory	32 GB of RAM (minimum 8 GB dedicated to the Atom) More RAM allows for increased, simultaneous process runs
Hard disk	100–200 GB of hard disk space

Java Runtime

Java (for Windows and Linux)	Java 8 or 11 (Preferred)

Java runtime (for Windows and Linux)	Support for the following Java Runtime Variants:
	• Java 8
	  ◦ Oracle Java
	  ◦ Amazon Corretto OpenJDK
	• Java 11
	  ◦ Amazon Corretto OpenJDK
	Note: It is recommended to use the Java distribution from the remote management platform so that Java updates can be managed remotely (including automation).

Java Information Panel	Boomi provides a view to Java in use by the Atom in the management view. • Details are available with the Atom online or offline • Manual Java updates can be executed • The option to opt the Atom into automatic Java updates can be turned on or off

Software Requirements

- Postgres (included as part of the installer for southbound services)
- SAP Integration
  - Install sapnwrfc (an open-source library) for .Net Core framework to connect to SAP. (https://github.com/huysentruitw/SapNwRfc)
  - The above open-source library requires the SAP NetWeaver RFC Library 7.50 SDK C++ binaries be installed locally. (SAP LaunchPad Download Link: the SAP NetWeaver RFC Library 7.50 SDK C++)

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    - In addition to the installation, the .dlls and .lib files (icudt50.dll, icuin50.dll, icuuc50.dll, libsapucum.dll, libsapucum.lib, sapnwrfc.dll, sapnwrfc.lib) need to be copied to the southbound service installation folders
- ◦ *sapjco3.jar and sapjco.dll specific to the customer sap version are available in the below directories:
    - C:\windows\system32
    - {atom_name}/userlib directory
- Install the 64-bit version of the Visual C++ 2013 Redistributable package (Microsoft Download Link)
- Add Postgres 42.5.4 jar (Postgres JDBC Download Link) to {atom_name}/userlib directory

Note: The Atom directory will be created as part of the Atom installation. The userlib folder will need to be manually created if it does not exist.

Required Service Ports

To provide communication between APM Connect server and other systems, make sure the listed ports are open.

Port Numbers	Description
5013/8040 (Ingress for the Service)	The service can listen on any port as per its configuration. It is recommended to use a unique port that would not interfere with other standard applications running on the server where it is hosted.
80, 9080, 8879, 9043, 9044, 9060, 9061, 9430, 9443, 139, 50000, 50005, 3300	Used for SAP and Maximo Interfaces.
443, 8080, 8005, 7000, 7001, 7777, 7555,1099, 8040, 8101, 9001, 44444, 5432, 443, 61616, 5013	Used for APM Interfaces.

Other Considerations

Here are other requirements and information about installing Atoms:

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- Multiple runtime environments can be installed on the same operating system
- A reliable high speed internet connection is required
- Network connectivity must be enabled between the source and destination systems
- The Atom installation path cannot contain unicode characters
- Installation should be executed running the installer as an administrator
- Ensure the OS hosting the Atom and any attached storage devices have synchronized system clocks

Local Atom Configuration and Setup (Integration Job Deployment)

Pre-deployment Checklist

About This Task

Review the following steps in the checklist as you prepare for the deployment:

Step	Task
1	Sign in to the Boomi Platform Account provisioned by GE Vernova.
2	Ensure that the system is available for installing Atom with necessary configuration. See documentation sections outlined in the following sections.
3	Ensure that source and destination system access and other permissions are validated: • Boomi platform connectivity check • PLSAP folder • User permission
4	Postgres database is installed, and necessary configuration change is made on `pg_hba.conf` (see Postgres Configuration

Deployment Steps

Step 1 - Setup Environment

Procedure

1. Sign in to the platform account and then select **Manage** → **Atom Management**.

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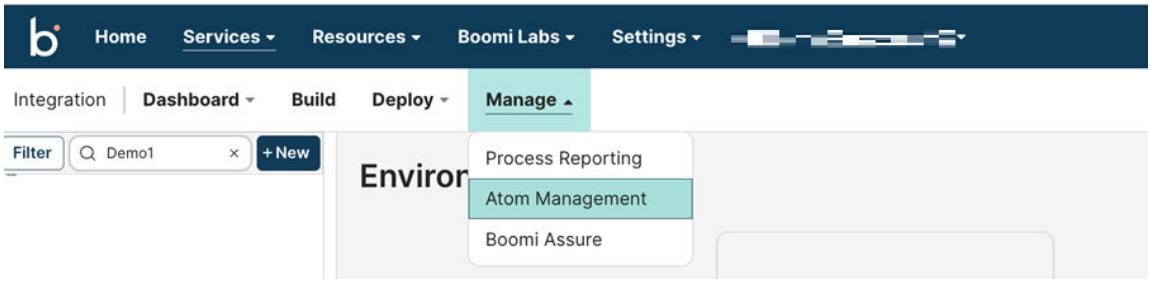
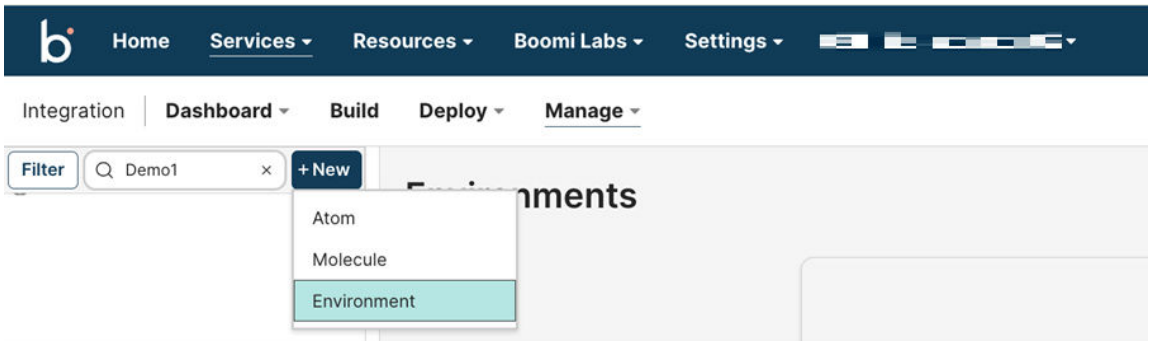
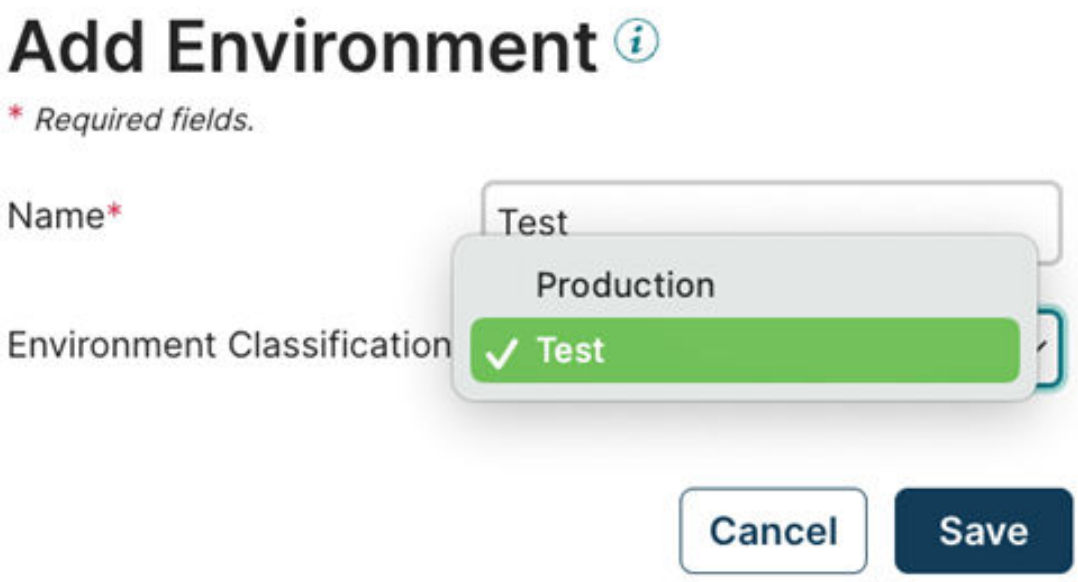


2. On the left navigation panel, select **New** and then select **Environment**.



3. In the **Add environment** window that appears, in **Name** field, enter the name and, in **Environment Classification**, select **Test.**



4. Repeat Steps 2 and 3 and, in **Environment Classification** list, select **Production**.

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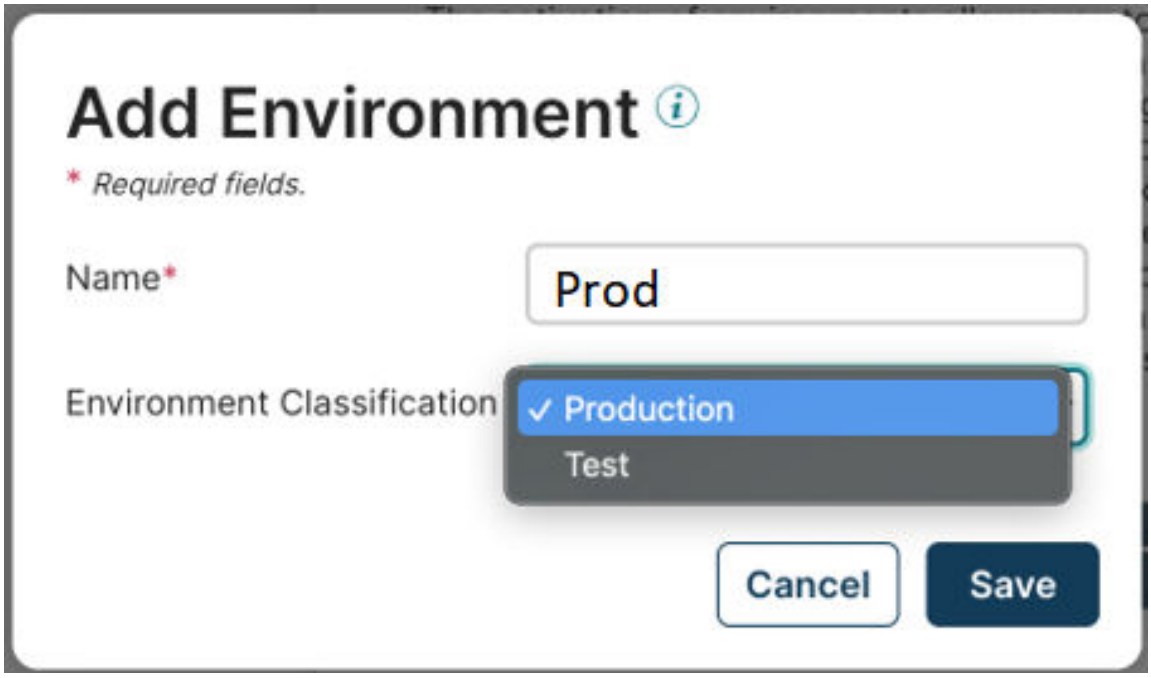

Two new environments are created in the left navigation panel with the name you provided.

Step 2 - Setup Atom

Procedure

1. Sign in to the platform account from the machine and select **Manage** → **Atom Management.**
2. On the left navigation panel, select **New** and then select **Atom**.
   The Atom Setup window appears.
3. In **Setup Preference**, select **Local** as the **atom preferences** and in **Operating System**, select the appropriate operating system.

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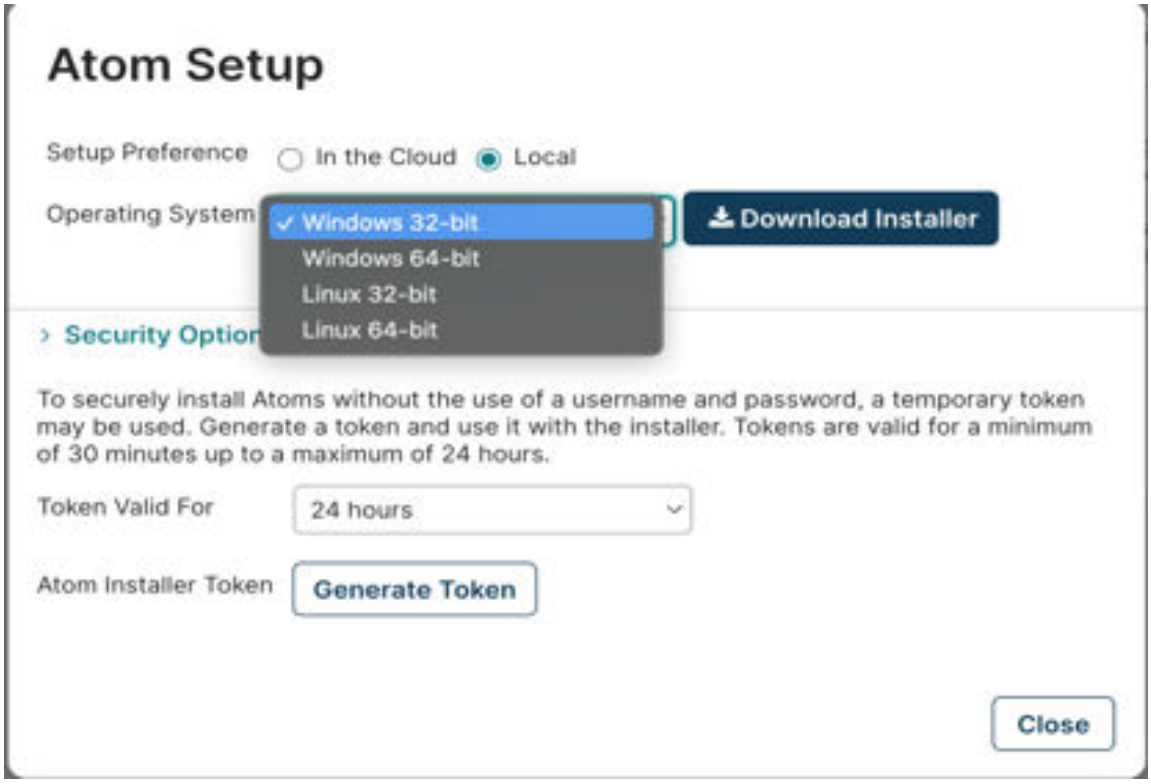

Tip: Expand **Security Options** to generate one or more enrollment tokens for enrolling the installed Atom in the remote management platform.

4. Then, select **Download Installer** and a .exe file will get downloaded.
5. Run the downloaded .exe file as Administrator/System user.
6. In the **Setup - Atom** Window that opens, select **Next**.

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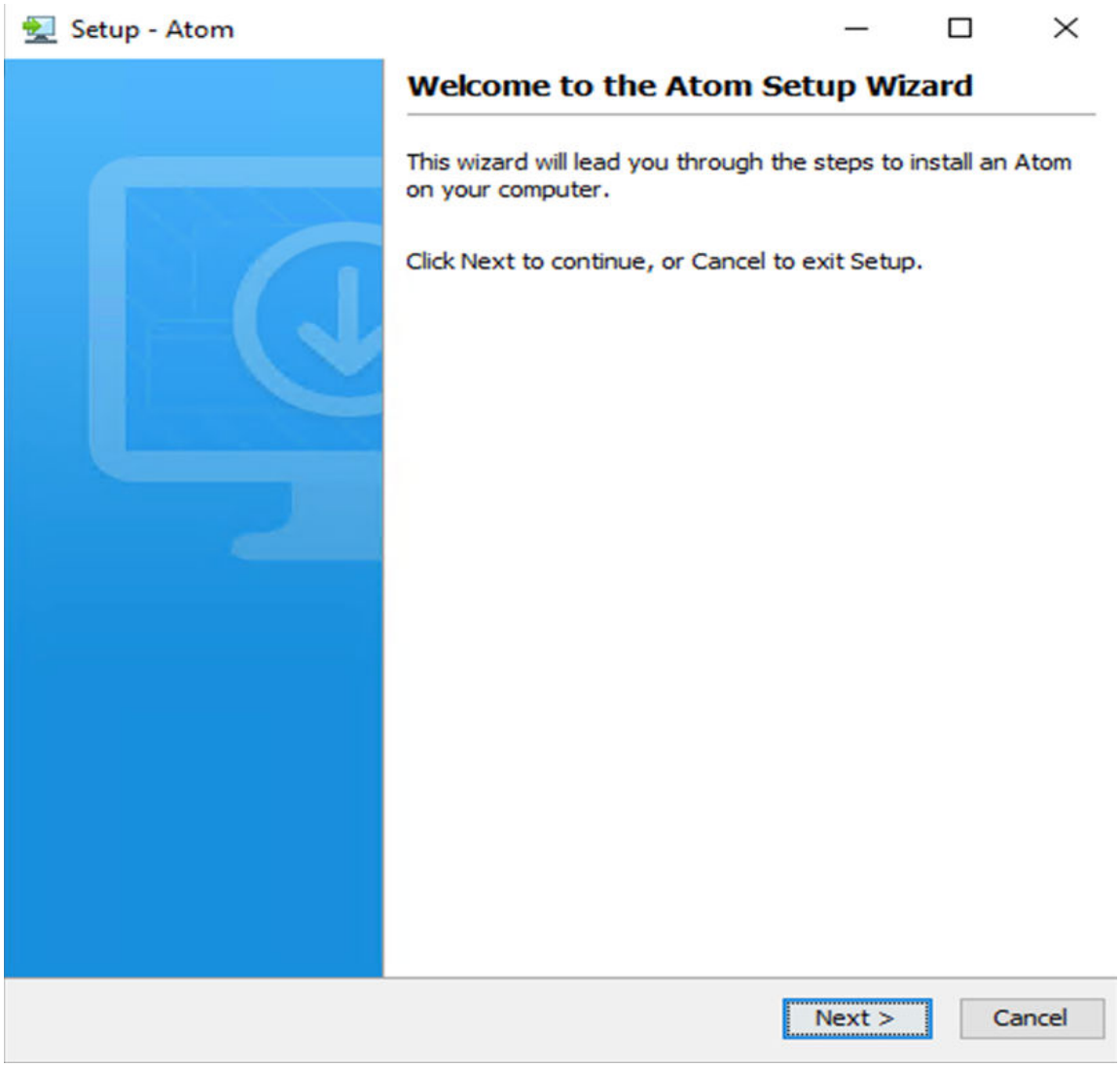

7. Then, select **User Name and Password** to enter your account username and password, or select **Token** to enter the token generated in Step 3 in **Security Options** of the **Atom Setup** window.

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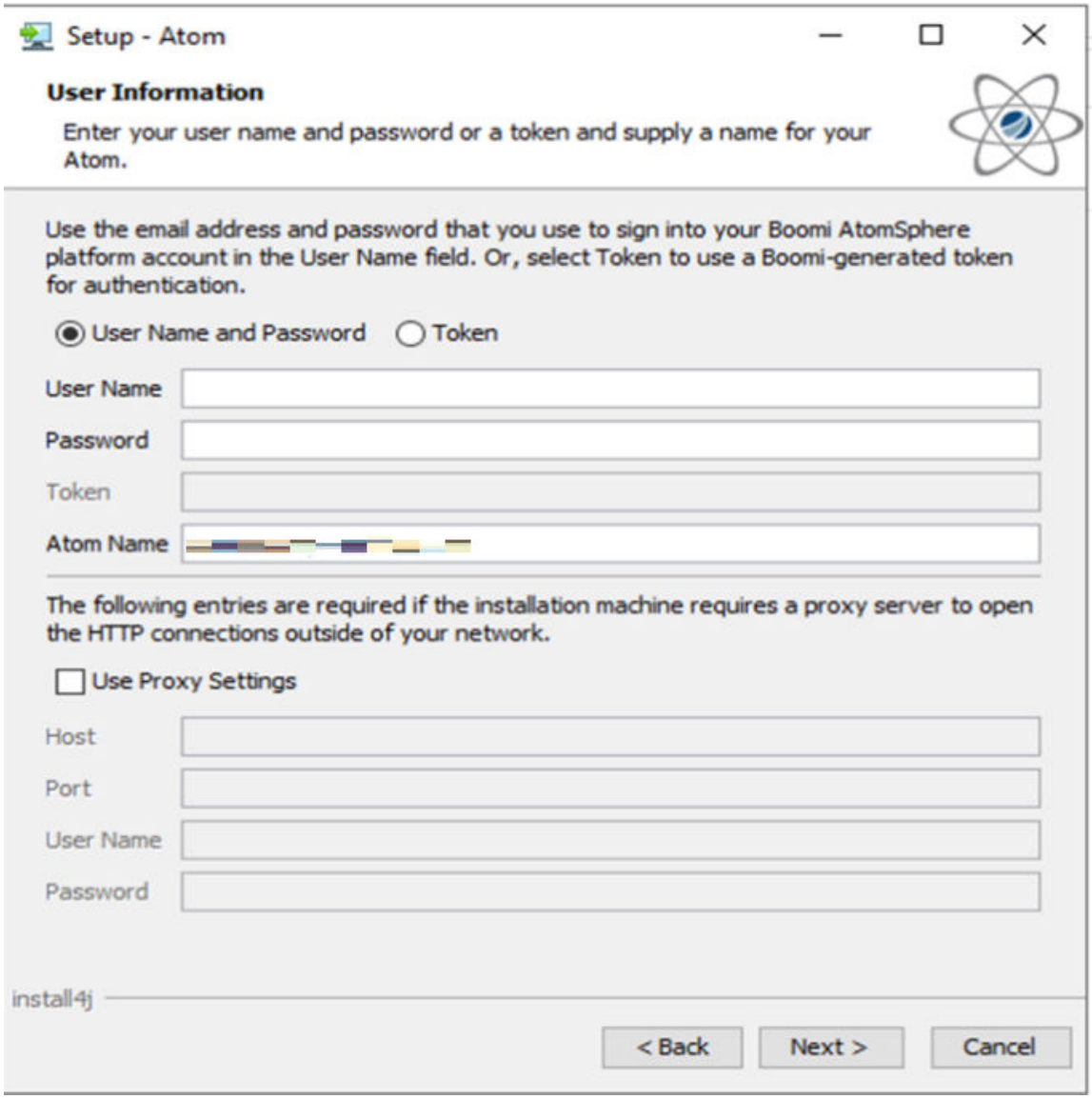

Note: If you have proxy, then configure the proxy to connect Atom to the Internet. Your proxy information should be provided by your network team.

8. If the user (or token) is valid, the option to select your account appears. Select your account and select **Next**.

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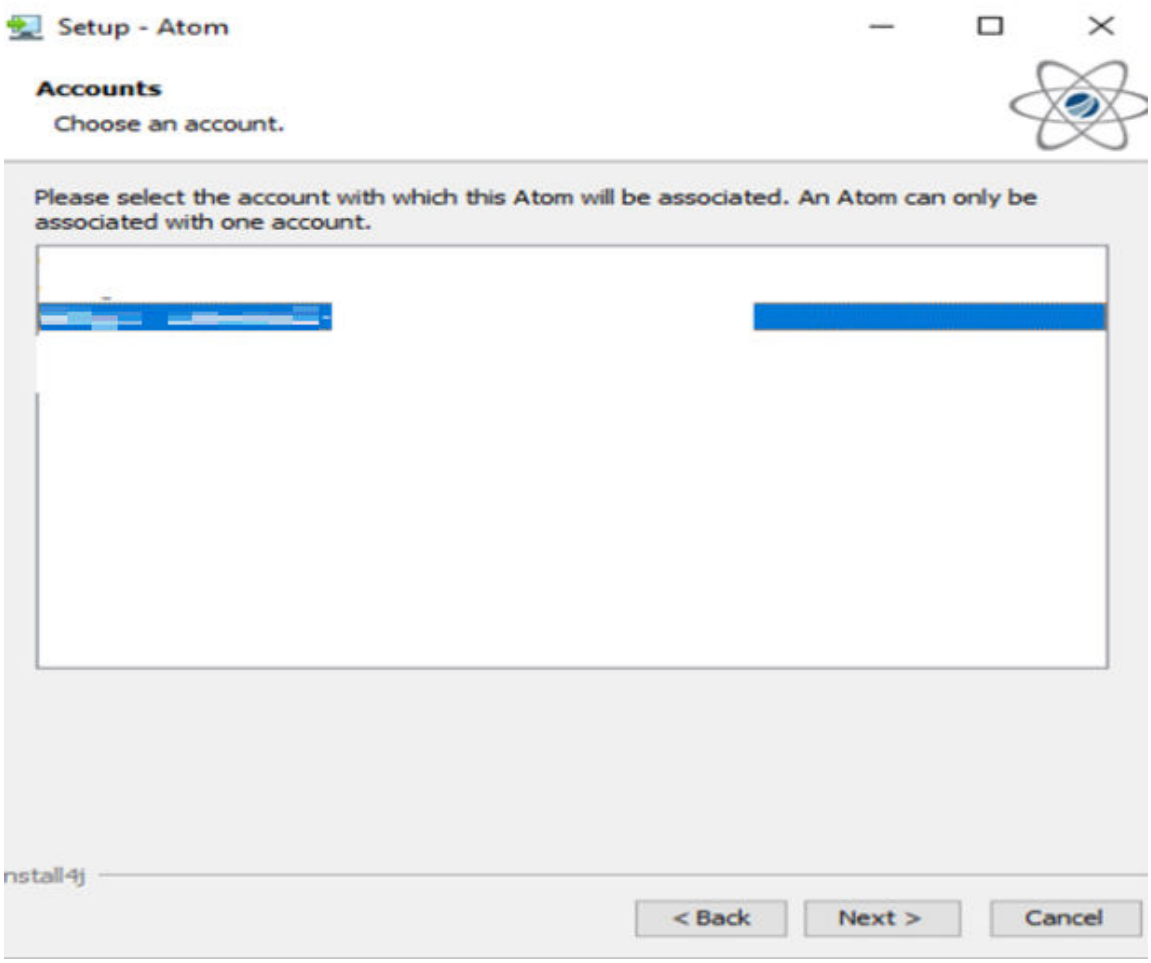

9. Then, select the Environment that you created in the Step 1 - Setup environment and select **Next**.

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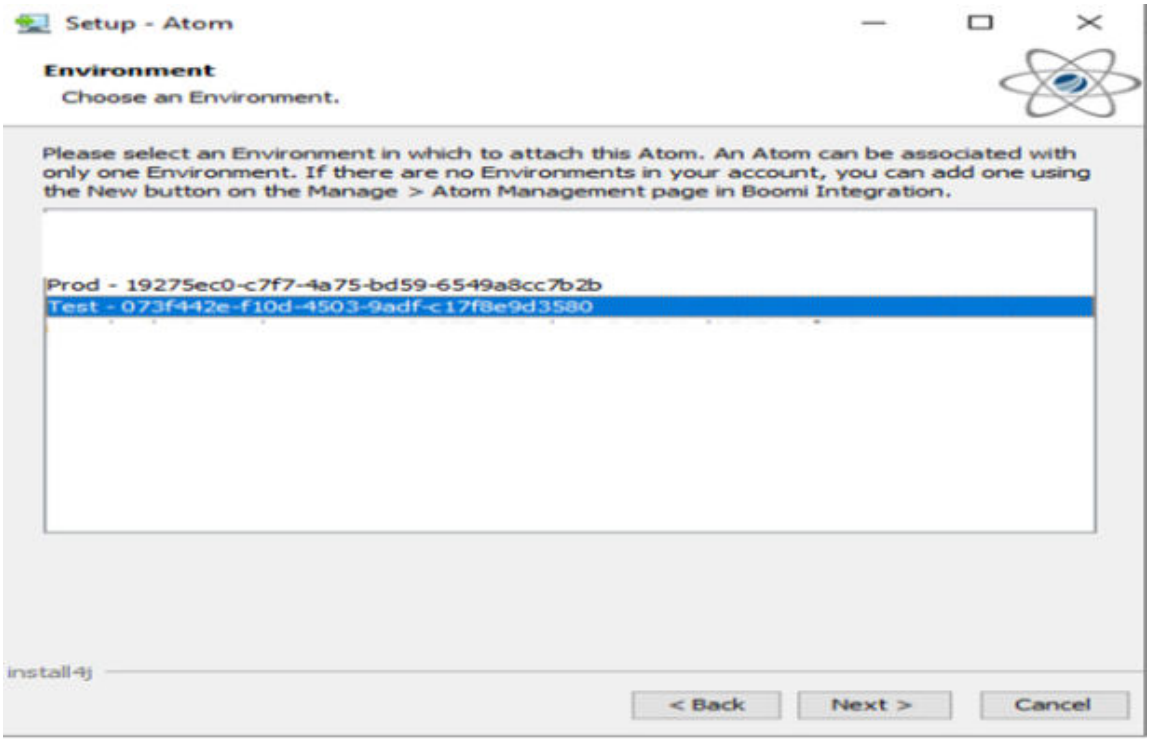
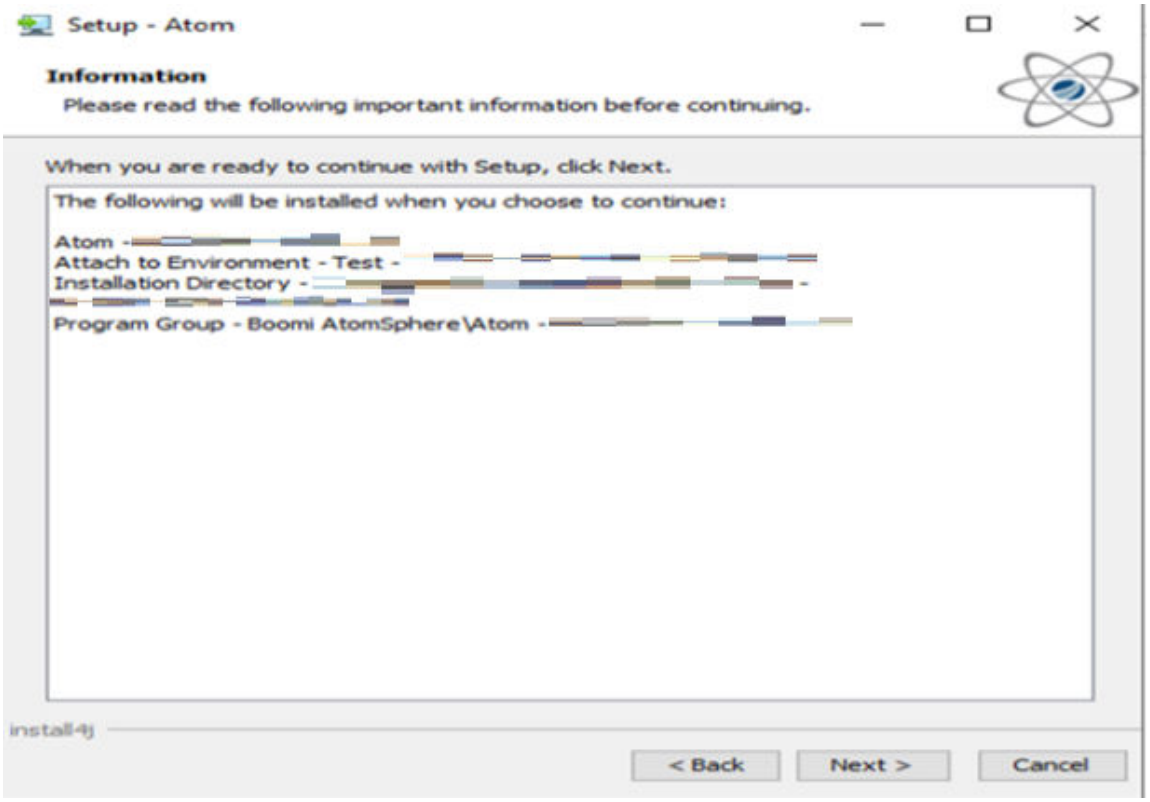


10. Validate the information and select **Next**.



11. Then, select **Browse** and select the required installation directory and select **Next**.

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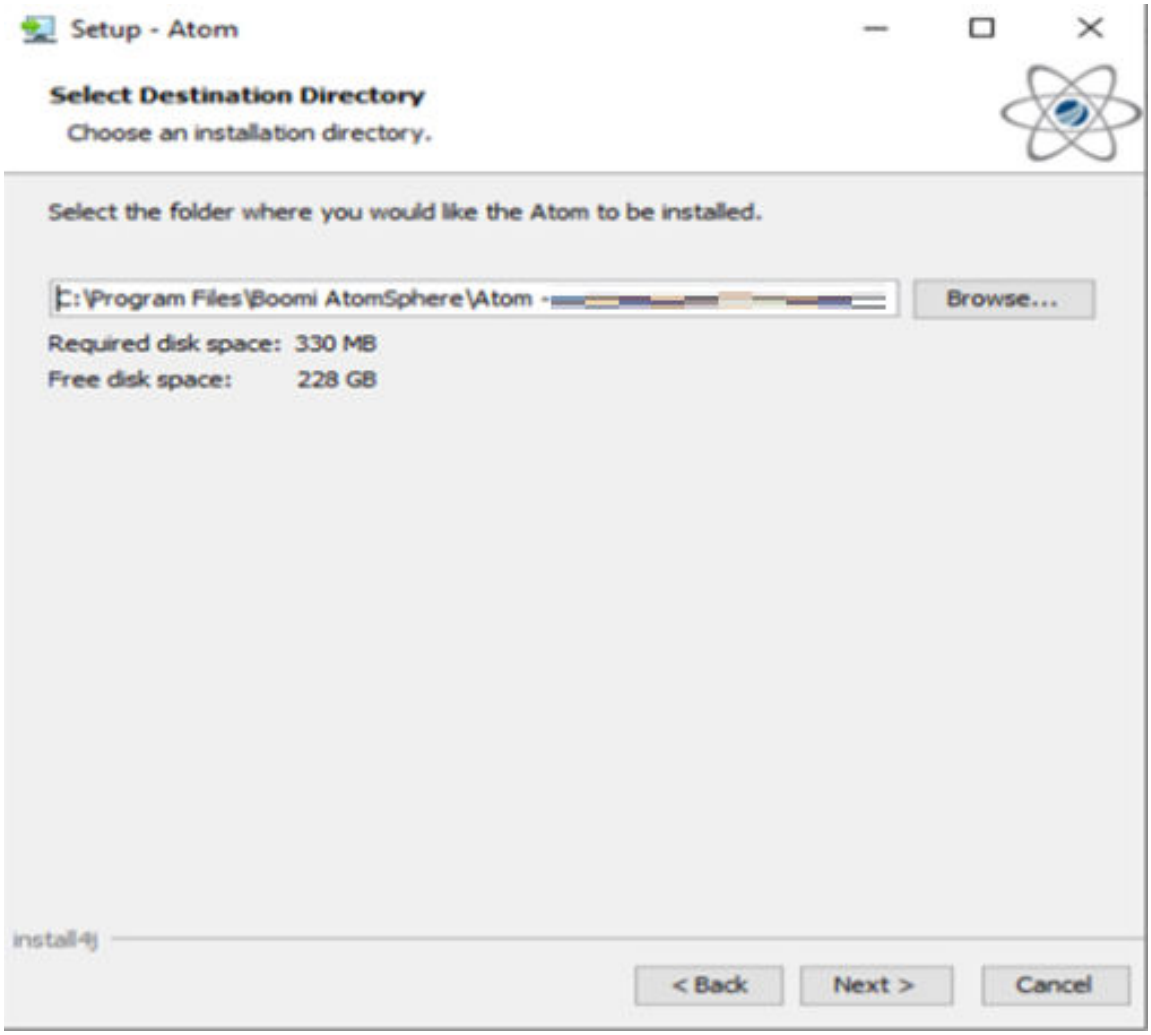

12. For shortcuts, select the **Create a Start Menu folder** checkbox and select **Next**.

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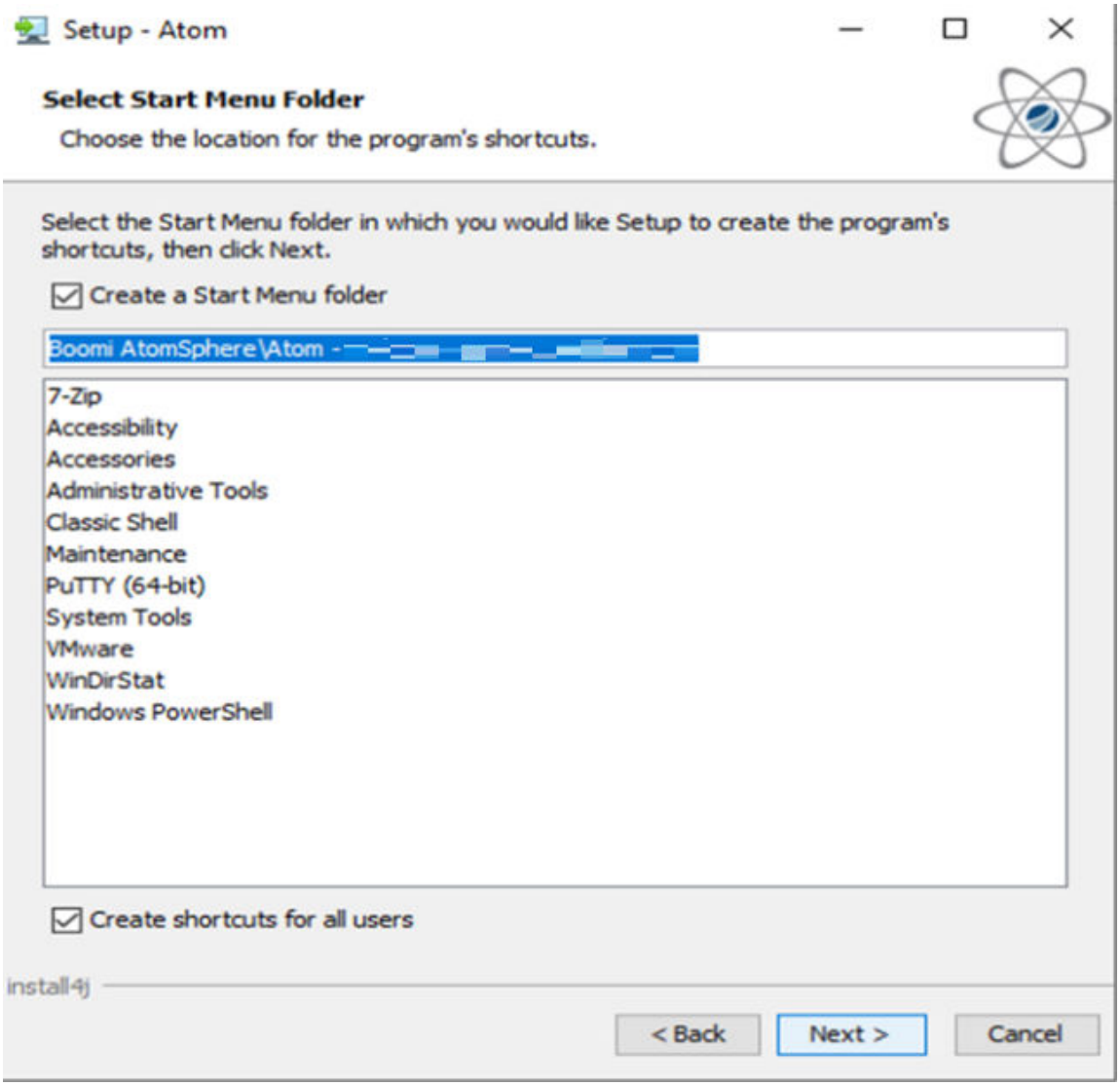

13. Atom will get installed as shown in the screenshot below.

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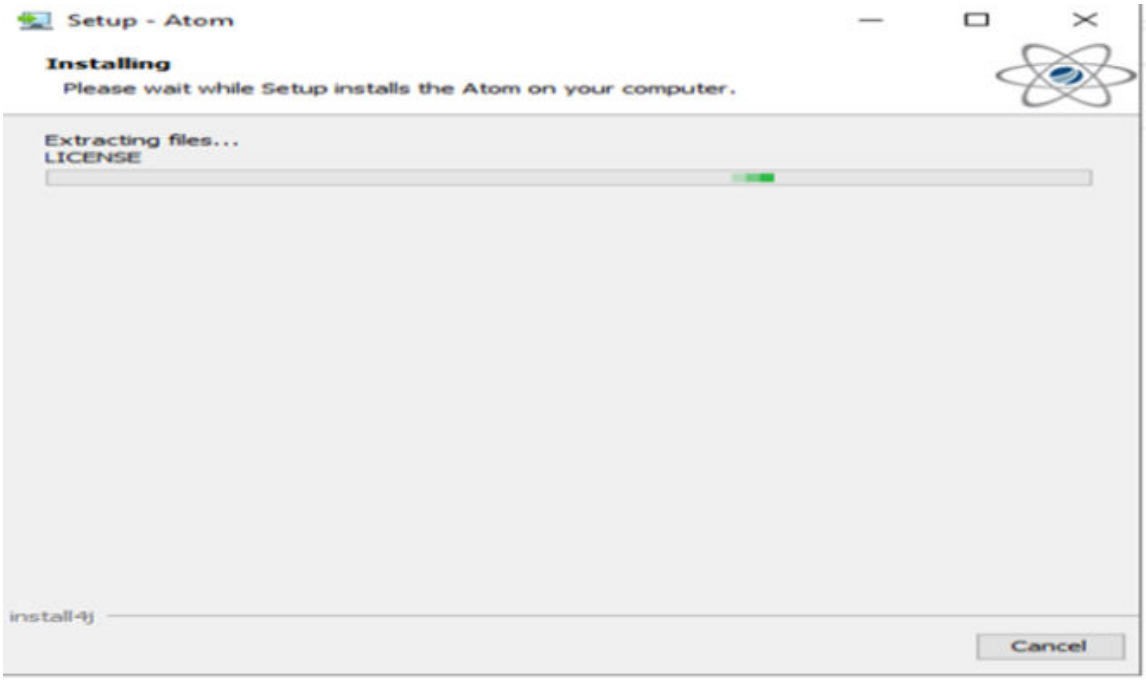

If you get an error as shown in the screenshot below, select **Ignore**.

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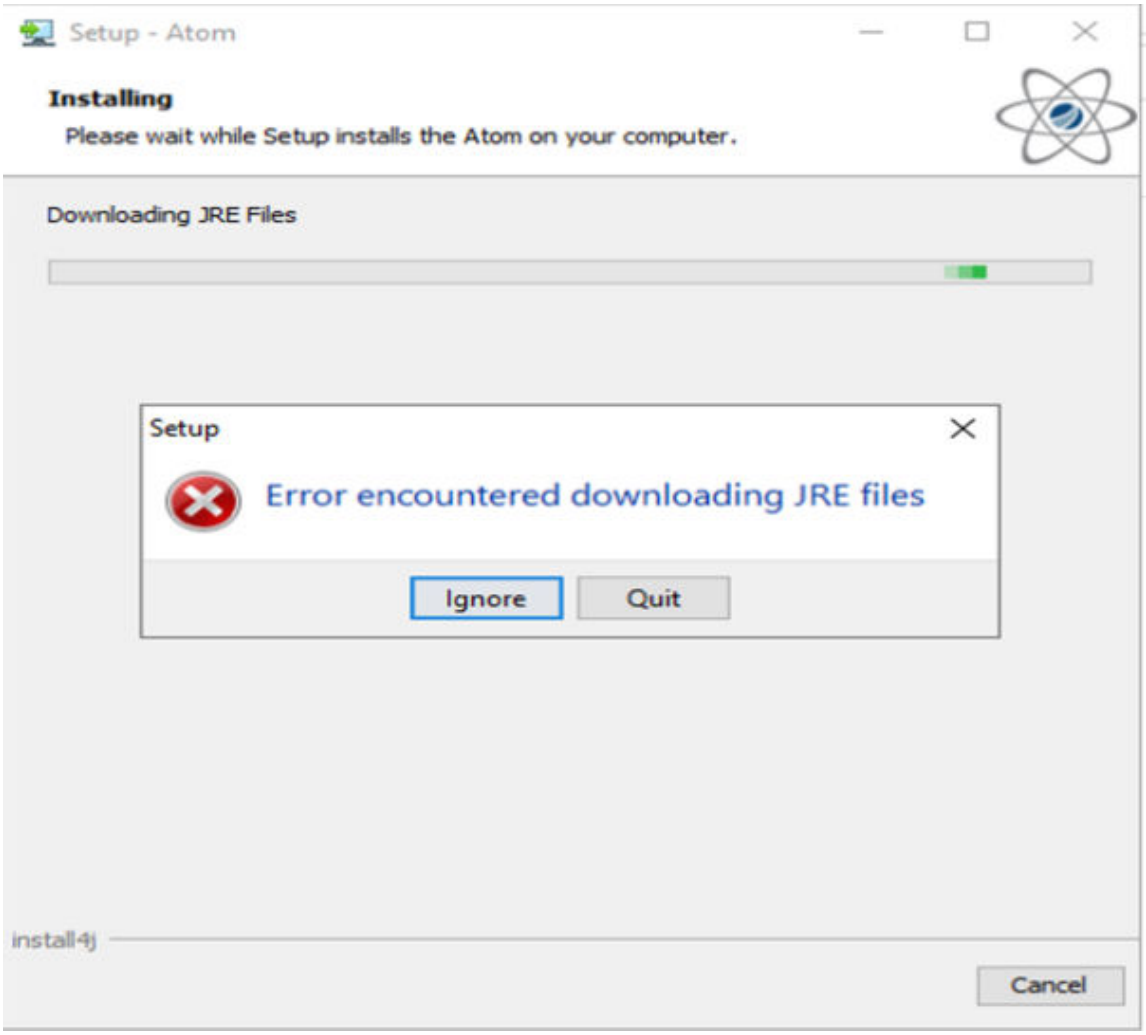

14. Select **Finish** to complete the setup.

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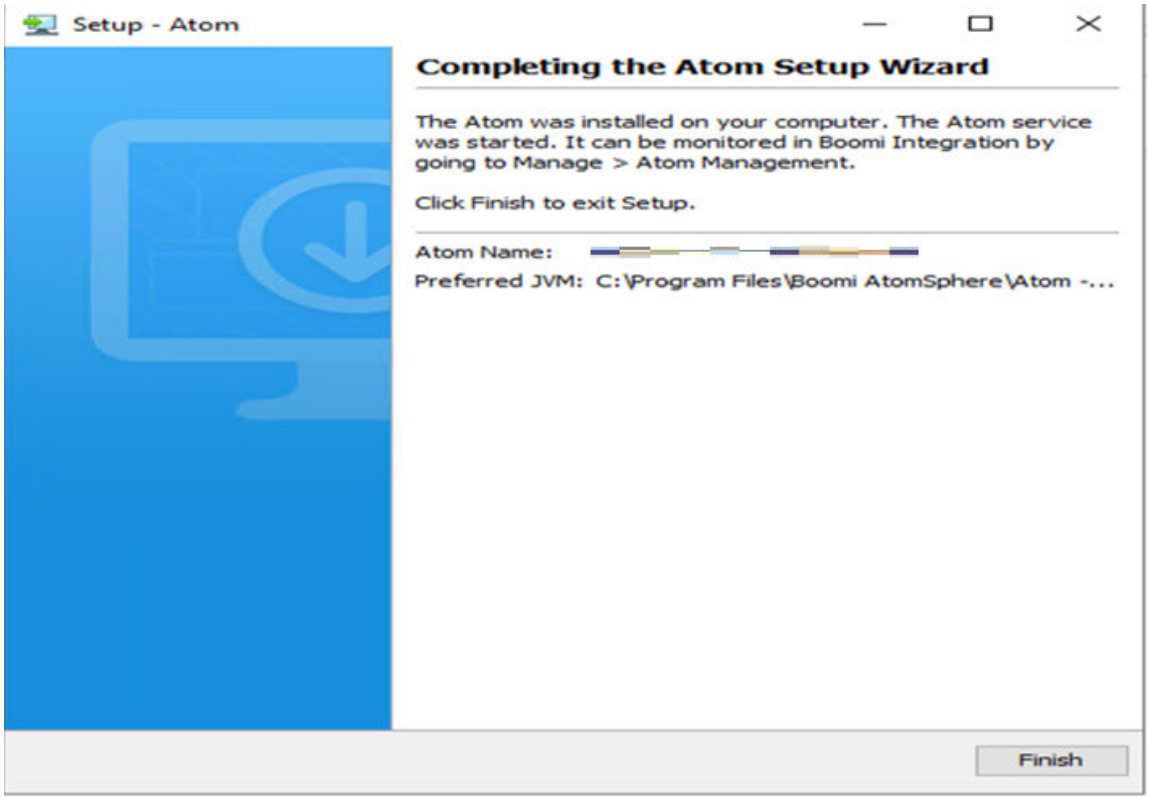


Results

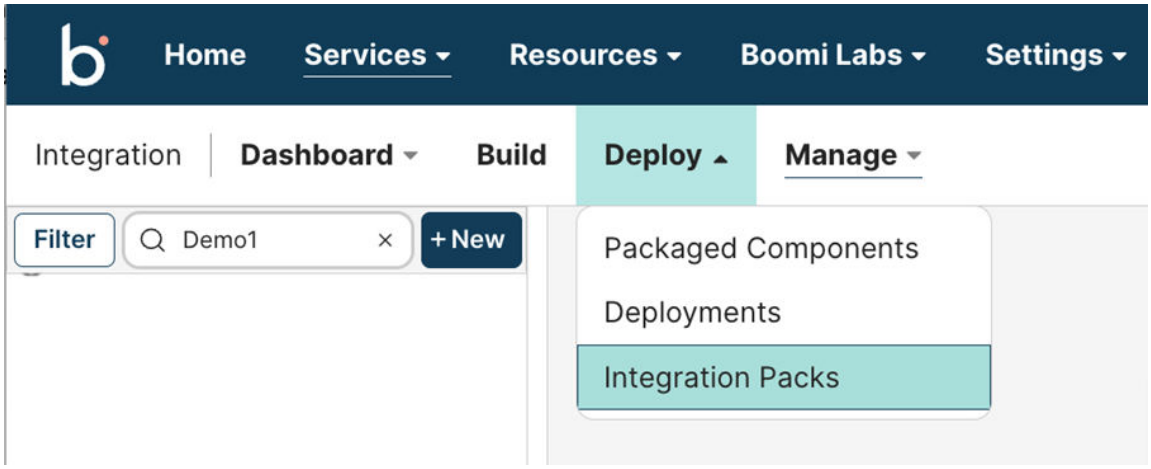
- A new service `Atom` is available under `Services.msc`.
- In platform, Atom with status **Online** will be attached to your selected environment.

  Note: For more details on the Atom configuration options, refer to the Boomi Documentation available in the Remote Management platform.

Step 3 - Install Integration Pack

Procedure

1. In the platform, select **Deploy** and select **Integration Packs**.



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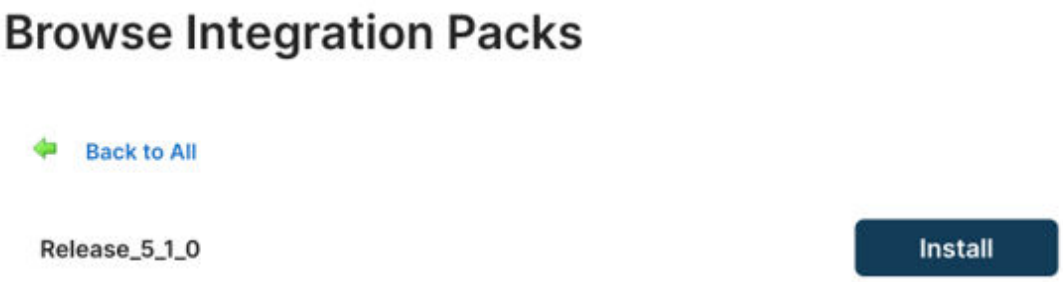
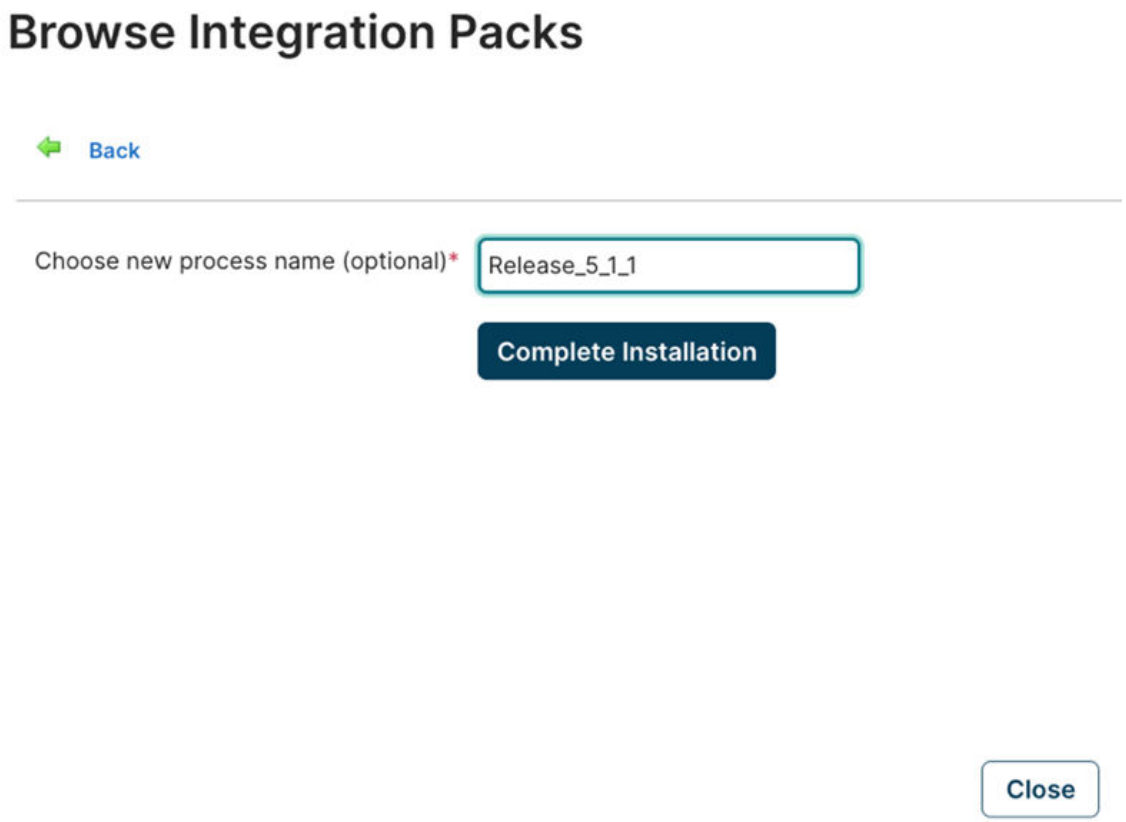
2. On the right side of the window, select the **Browse Integration Packs** button.
3. A list of the Releases assigned to your account will be displayed. Select the latest release number.
4. Then, select the **View button** and then select **Install.**



5. In the **Choose New Process Name (optional)** field, provide the baseline release number (by default) or the custom name for your custom projects. Then, select **Complete Installation.**



6. When the Integration Pack is installed, select **Close.**
7. The installed Integration will be listed in the leftmost panel as shown in the screenshot below.
8. Select the previously installed Integration pack from the leftmost panel.
9. In the **Attached Environments** and **Unattached Environments** fields, select the test environment from the Unattached Environment list (which you have created in Step 1 – Setup Environment)
10. Then, select **<<Attach Selected** button to move the selected Integration pack from left **Unattached Environment** list to **Attached Environment** list. The Integration pack will now be attached to your selected Environment.
11. The selected Environment will now appear on the **Attached Environment** list for the Integration pack.

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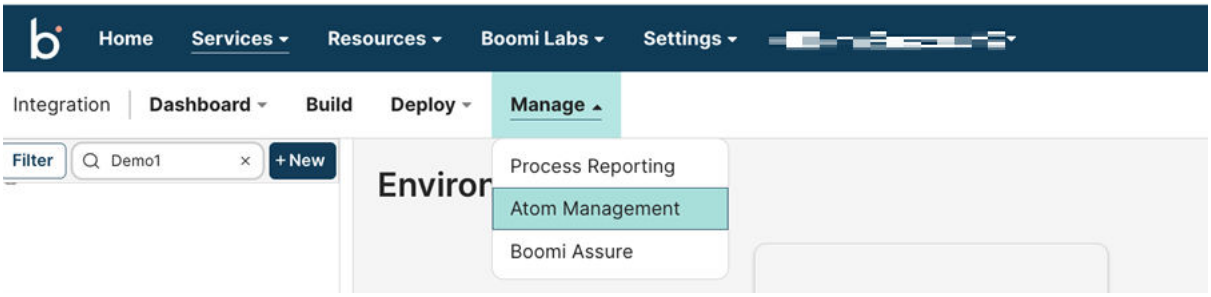
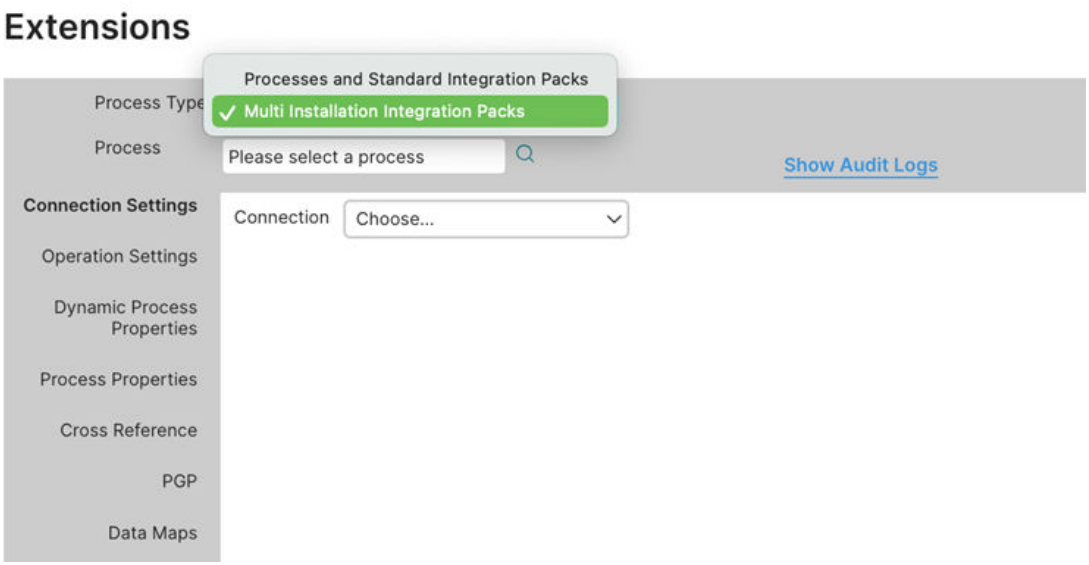
Step 4 – Setup/Configure Connection Settings

Procedure

1. In the platform, click **Manage** and select **Atom Management**.



   On the leftmost panel, your environment (Test) with your atom attached will be displayed.
2. Select your environment, i.e., **Test,** and click **Environment Extension.** The **Extensions** window will now appear.
   a. In the **Process Type** dropdown list, select **Multi Installation Integration pack.**



   b. In the **Process** search field, search and find the Integration pack artifact in the tree browser (Integration pack → Release_*→ [Main] Extraction Wrapper).

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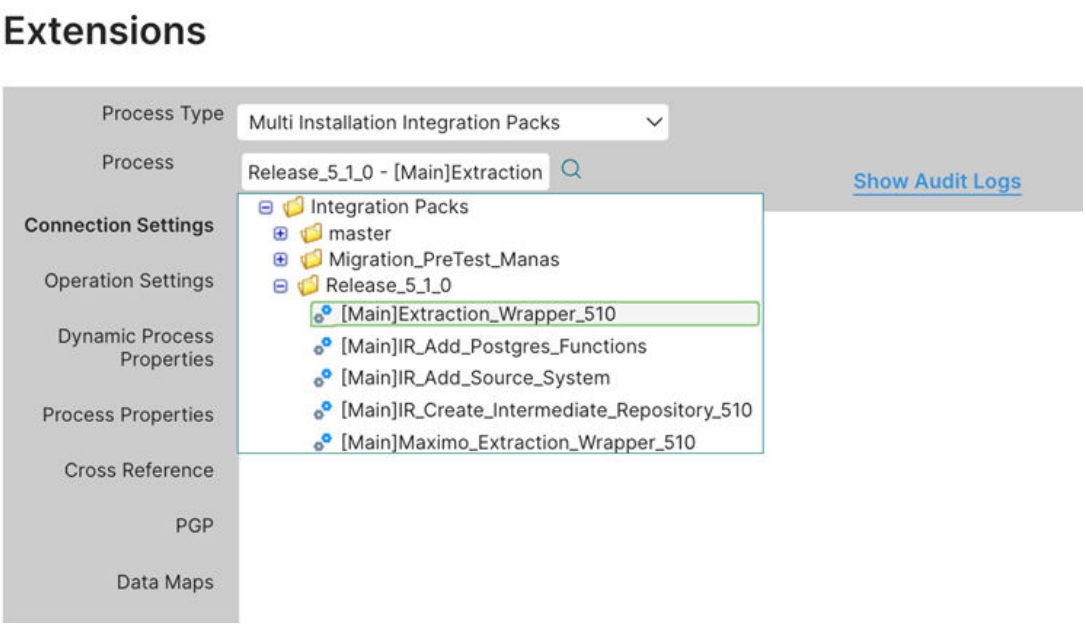
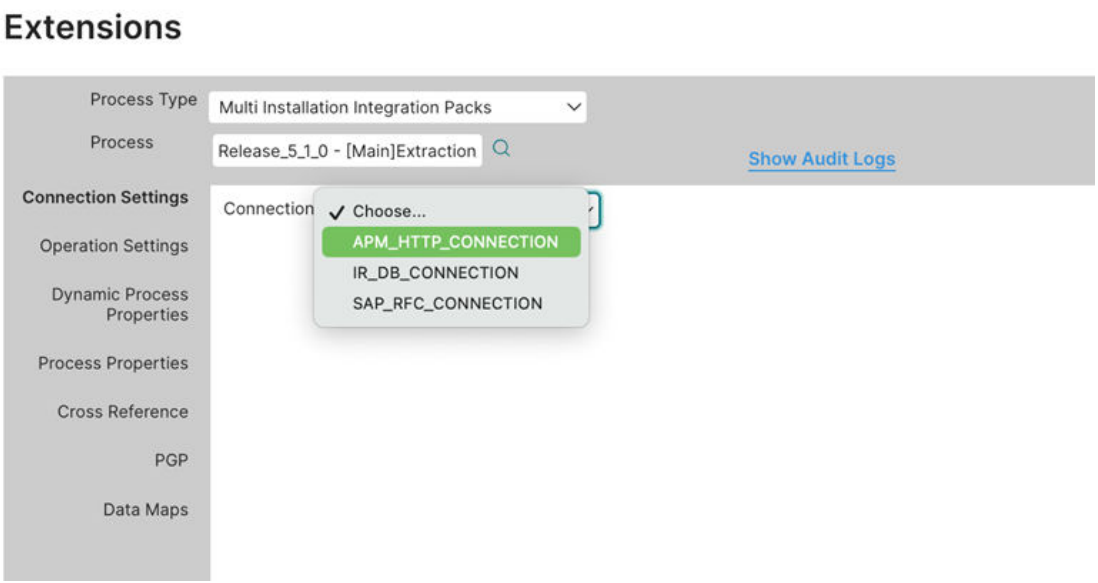


c. Then, in **Connection Setting tab**, in Connection dropdown list, select the connection appropriate for all connections as shown in the screenshot below.



Note: To provide tenant-specific connection values in the input box, clear the **Use Connection Component Value** checkbox.

- **APM_CLOUD_OAUTH_HTTP**: (contains the details for Cloud APM)
  - URL : Enter http://{Token Request URL}
  - Connect Timeout
  - Read Timeout
  - Use Basic Authentication
  - User
  - Password
  - Use Client Authorization

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- Client SSL certificate
- Use Trusted SSL certificate
- Trust SSL Server certificate

- **APM_HTTP_CONNECTION**
  - URL : Enter http://{APM_API_APP_SERVER}
  - Connect Timeout
  - Read Timeout
  - Use Basic Authentication
  - User: APM_USERID
  - Password: APM_PASSWORD
  - Use Client Authorization
  - Client SSL Certificate
  - Use Trusted SSL Certificate
  - Trust SSL Server Certificate
- **IR_DB_CONNECTION**
  - User : IR_USERID
  - Password :IR_PASSWORD
  - Connection URL : the URL will be: jdbc:postgresql://{IR_HOST}:{IR_PORT}/{IR_DATABASE}
  - Enable Pooling
  - Maximum Connections
  - Maximum Idle Time (sec)
- **SAP_RFC_CONNECTIONS**
  - Connection Type : select APPLICATION SEVER HOST
  - User Name : SAP_USERID
  - Password :SAP_PASSWORD
  - Server : SAP_HOST
  - Client : Enter SAP_CLIENT
  - System Number : SAP_SYSTEM_NUMBER
  - Group Name
  - Maximum Idle Connections
  - Maximum Active Connections
  - Idle Time
  - Gateway Host
  - Gateway Service
  - Enable Low Latency Logging
  - Additional Connection Settings
    SAP-PI has the below additional extension parameters:
    - URL
    - Connect Timeout
    - Read Timeout
    - Use Basic Authentication
    - User
    - Password

d. Then, in **Process Properties** tab, configure the following parameters:

   i. SYSTEM_TO_RUN : Context file folder name (typically CMMS_ID)
   ii. CONFIG_FILE_DIR : Enter the directory path to the folder where the context file resides

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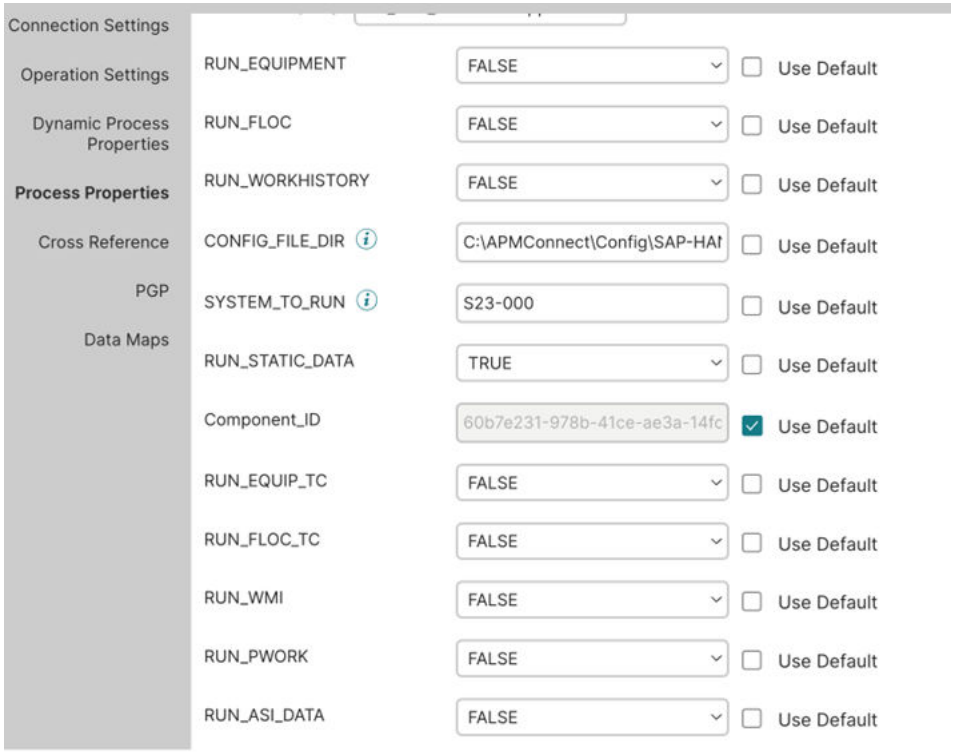
iii. RUN_EQUIPMENT : It can be TRUE/FALSE
iv. RUN_FLOC : It can be TRUE/FALSE
v. RUN_WORKHISTORY : It can be TRUE/FALSE
vi. RUN_STATIC_DATA :It can be TRUE/FALSE
vii. RUN_EQUIPMENT_TC : It can be TRUE/FALSE
viii. RUN_FLOC_TC : It can be TRUE/FALSE
ix. RUN_WMI : It can be TRUE/FALSE
x. RUN_PWORK : It can be TRUE/FALSE
xi. RUN_ASI_DATA : It can be TRUE/FALSE



Note: Make sure you have only one file under one cmms_id folder and all the above details match with your APM Connect context files.

3. Click **OK**. You will receive a notification on the lower left corner of your screen that **Extension is saved**.
4. Miscellaneous Configuration:

   a. For V5 tenant context file, enable <ENABLE_G2DL_INGESTION>true</ENABLE_G2DL_INGESTION>
   b. Change MAX_FILE_WAIT_SEC to 10 seconds <MAX_FILE_WAIT_SEC>10</MAX_FILE_WAIT_SEC>
   c. On Atom installation directory,

      i. Open file {atom Installation dir }\bin\atom.vmoptions in text editor:

         A. change - Xmx512m to -Xmx16G
         B. add - Dfile.encoding=utf-8

   Note: Every time when consuming a new Integration pack, set up extension property against it.

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Step 5a - Execute a Process Manually

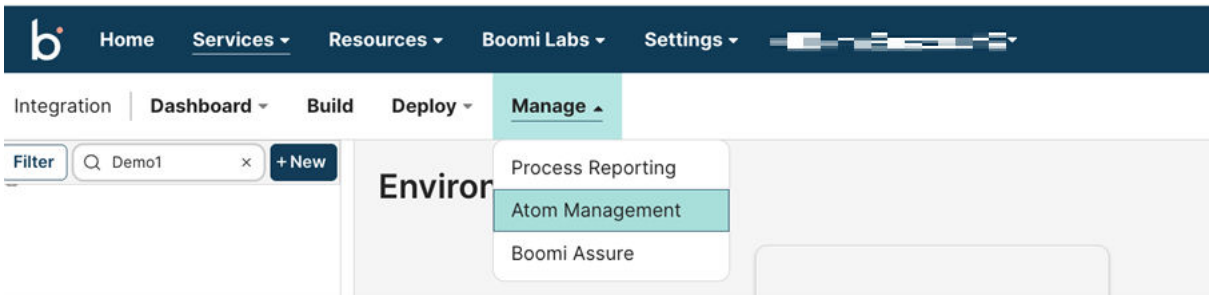
Procedure

1. In the platform, select **Manage** and then select **Process Reporting**.
2. Click **Execute Process** and, in **Select an Atom** field, select your Atom under the appropriate environment.
3. Then in the **Process** field, select the process under your installed Integration Packs, which you want to execute, and select the **Execute** button.
4. A record against your execution will be displayed.
5. View or save the logs by selecting the File icon.

Step 5b - Schedule a Process

Procedure

1. In the platform, select **Manage** and then select **Atom Management**.



2. Select the Atom under your Environment and select **Deployed Processes**.
3. Open the dropdown list of any deployed process and select **Edit Schedules**.
4. In the **Scheduling** window that appears, select the **Add** button.

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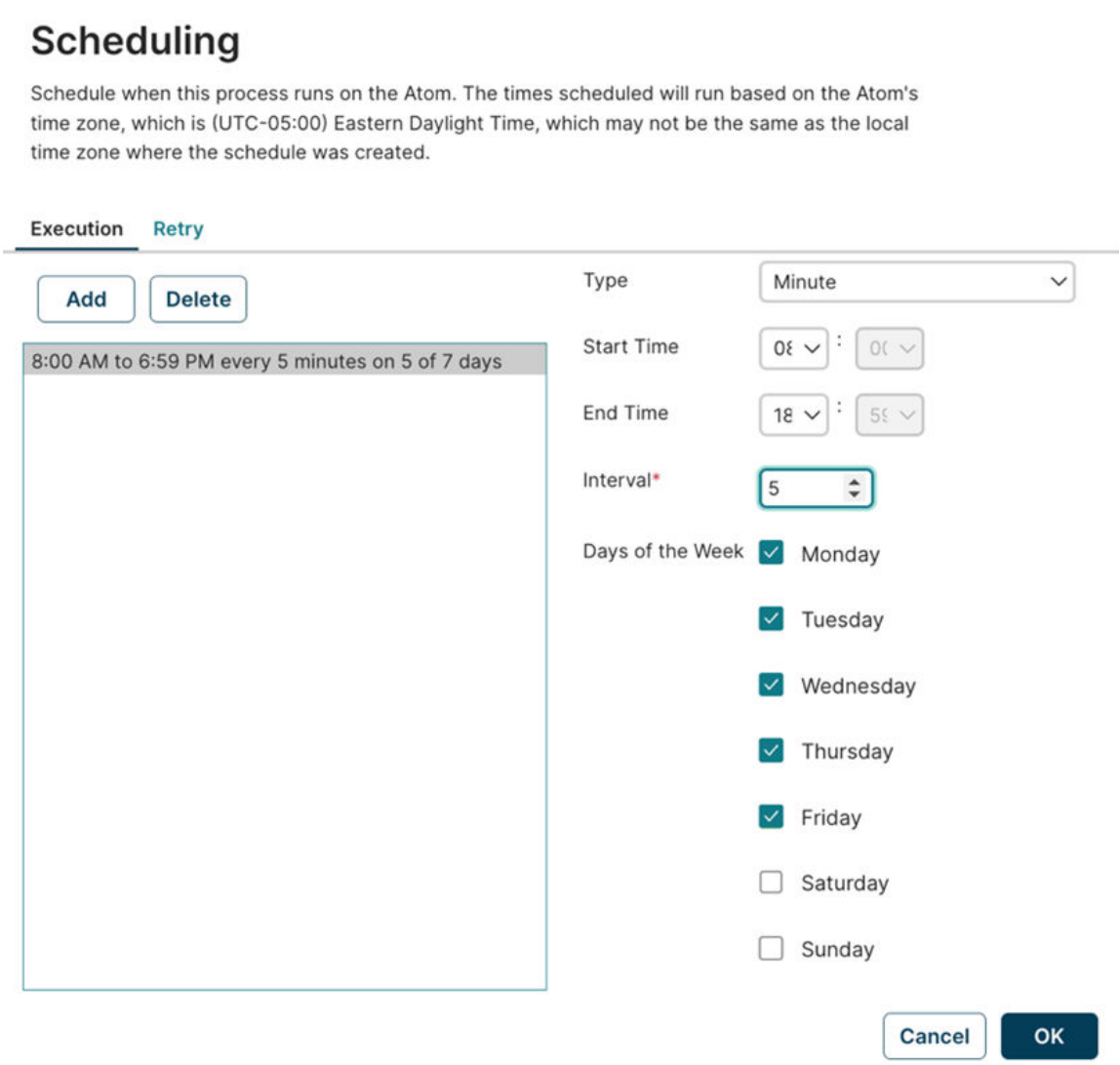

5. Then, edit the schedule as needed (check **Advance**option too) and select **OK**. You will receive a **Scheduled Saved** notification.
6. In the Process reporting page, an entry for your schedule run will appear, as shown in the screenshot below. You can view or save the logs.
7. To stop a schedule, select **Manage** and select **Atom management.** Then, select your Atom and select **Deployed Processes**. Open the dropdown arrow of the intended process and select **Stop Schedules**.

   Note: The scheduled and manual executions can be identified by the calendar or human icon beside the **Time** column in the process reporting page.

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Process Customizations from Process Libraries

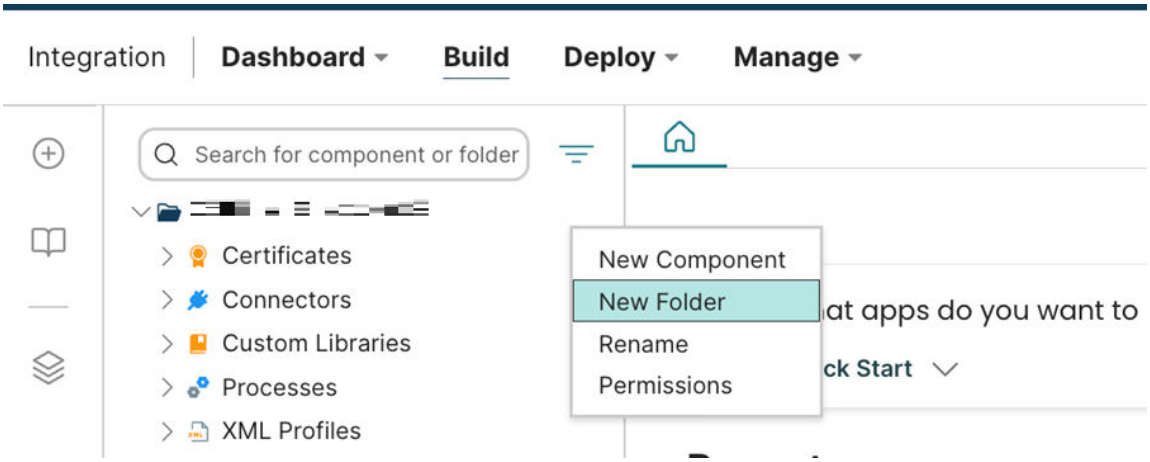
Process Customizations from Process Libraries

About This Task

To customize an ETL job by extending GE Vernova baseline integration flows, create a folder and install the process libraries shared by GE Vernova to your account.

Procedure

1. On the build page, select the three vertical dots (on the root node of the folder hierarchy on the leftmost pane of the UI) and select **New Folder**. In the **New Folder** dialog box, enter the folder name and select **Save**. A New Folder will be created. The folder name should start with custom_ and should have a suffix with the release number of the Process Library package being downloaded.



2. On the build page, in the lower left corner, select **Browse Process Library**. A window with all the process libraries that has been shared to your account appears.
3. On the upper right corner of the window, under **Filter by Publisher**, select **GE Vernova**.
4. In the search result, the list of process libraries shared with your account is displayed. Each process library will have a suffix with the release version.
5. To install a particular process library for customization, select the **Install** button to the right of the process library name.

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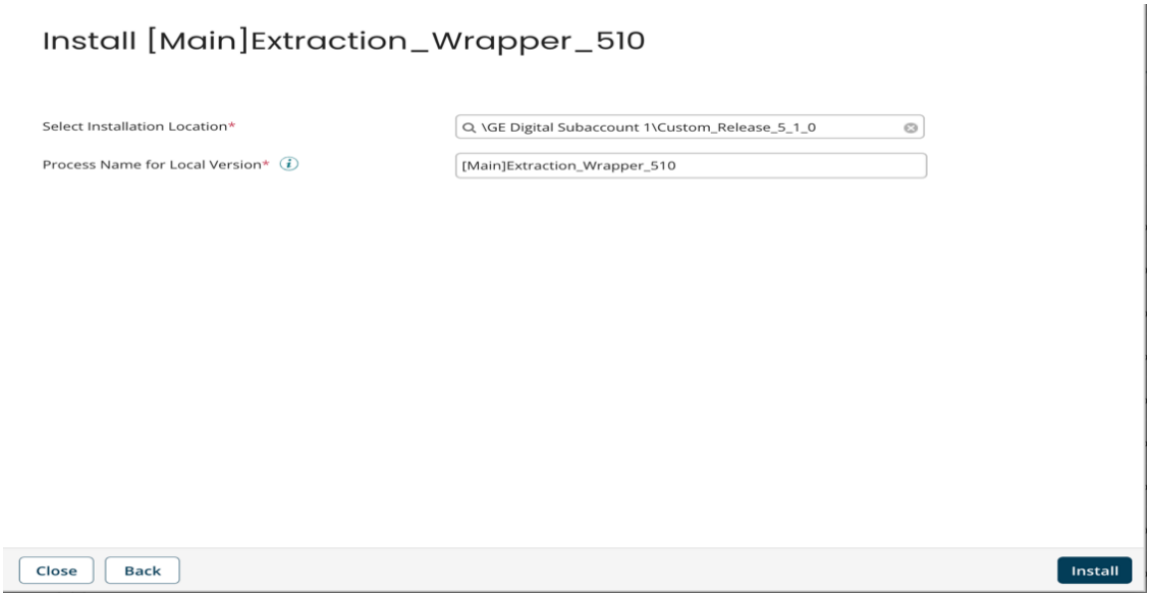
6. Then, in **Select Installation Location** field, select the folder that you have created in Step 1 above and select **Install**.



7. After the process library is installed, select the component you would like to extend to start editing the process.
8. After editing is completed, the process can be deployed to an Atom.

Southbound Service Installation and Configuration

Overview

APM as part of the Install Package also delivers an installation package setup of the Southbound Service from the APM to the EAM system. The topics outline the steps that you must complete to deploy and configure this module for the first time. These instructions assume that you have completed the steps for deploying the basic APM system architecture.

Note: This service can be deployed on the APM Connect Server, APM server, or a dedicated server. The service should have access to the APM Connect Postgres Staging Database.

Installation Procedure

Before You Begin

Before you run the Southbound Services installer, you must:

1. Ensure that your system meets the System Requirements.
2. Ensure that you have access to the Southbound Services installation package.
3. Ensure that you can access the APM Server host URL and the ActiveMQ from the server where you plan to install the Service.
4. Ensure that you have access to the Postgres IR database of the APM Connect server.

Procedure

1. Sign in as a user with administrative privileges to the server where you plan to install the application.

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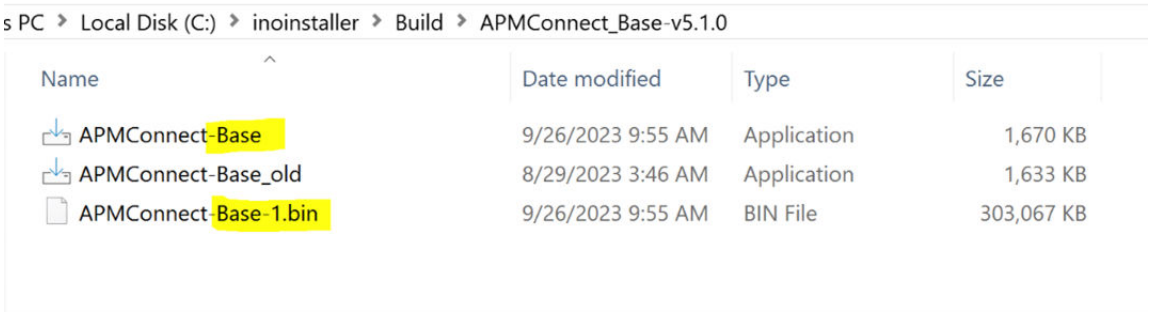
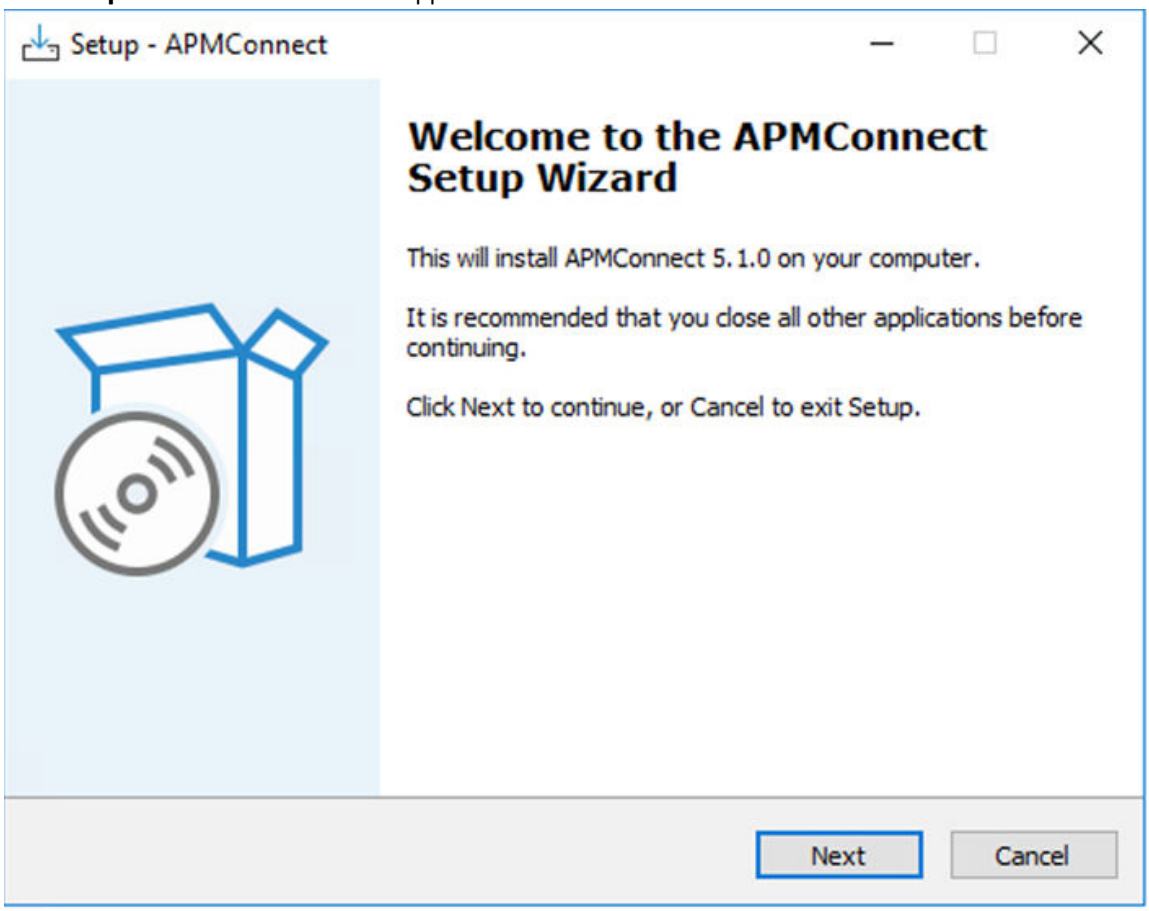
2. Access the APM distribution package and then navigate to the folder.
3. Run the file installer APMConnect-Base.exe with administrative privileges.



4. The **Setup - APMConnect** window appears. Select **Next**.



5. Select **Browse** and select the destination folder where the services need to be installed.

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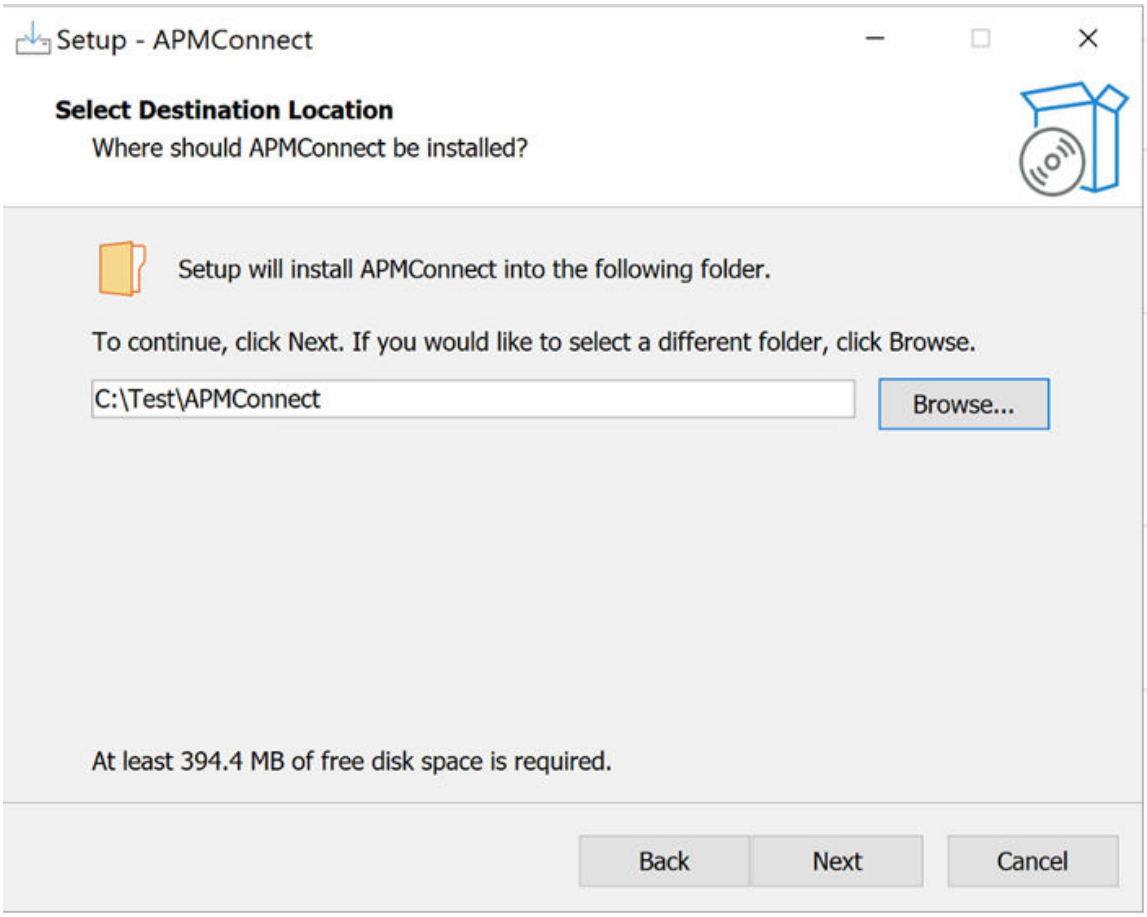

6. Then, select the components that need to be installed and select **Next**, as shown in the screenshot below:

   a. PostgreSQL is used for the Intermediate Repository. If you already have one, then clear the checkbox.
   b. APM Connect Southbound Service is used for the Southbound Interfaces.
   c. Boomi is used in an air-gapped situation (with no internet connectivity).

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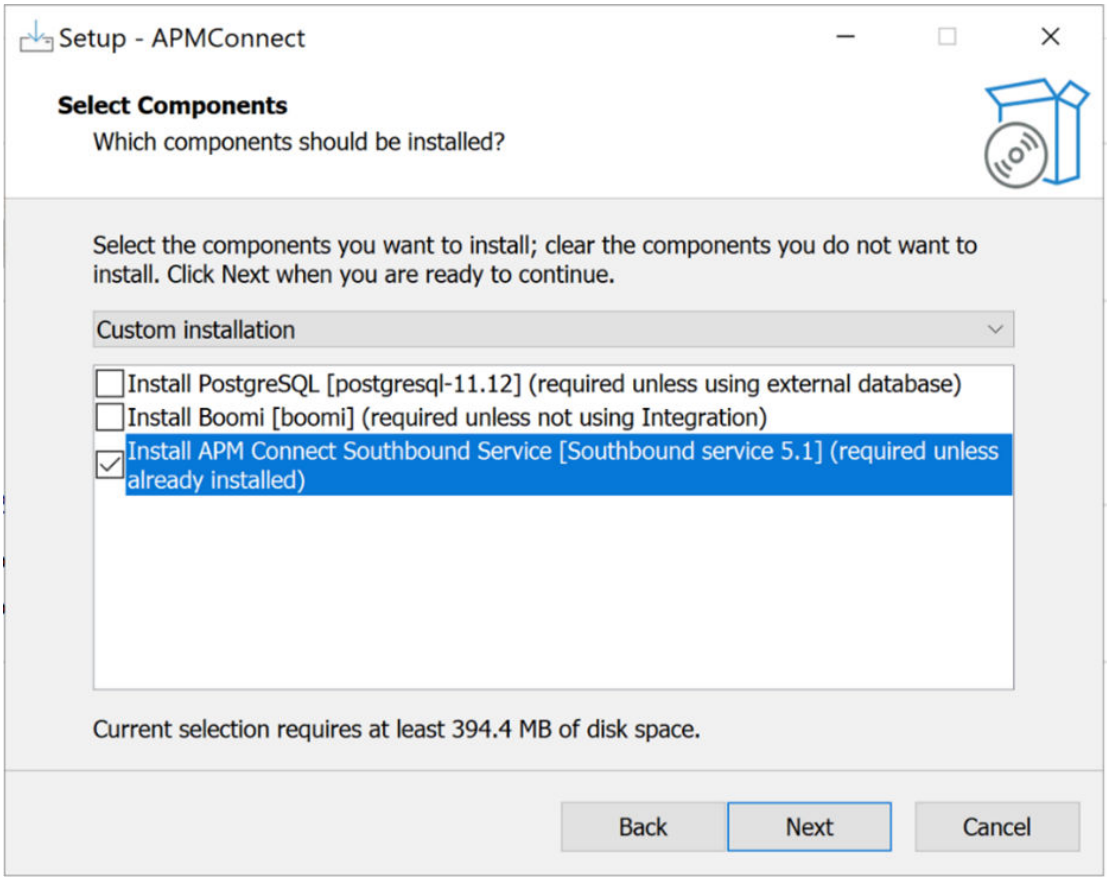

7. Select the Start Menu Folder for the Program Shortcuts and then select **Next**.

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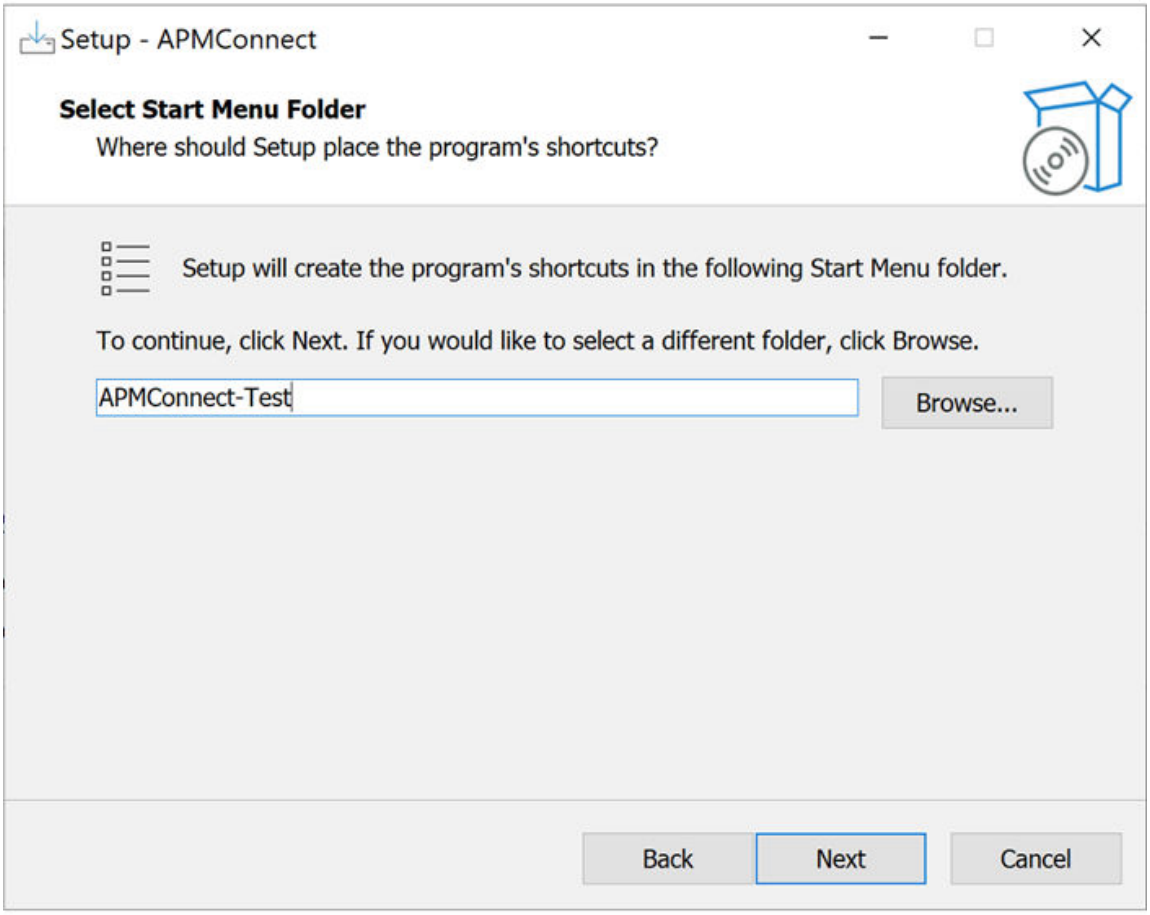

8. Then, verify the components that are ready for installation.

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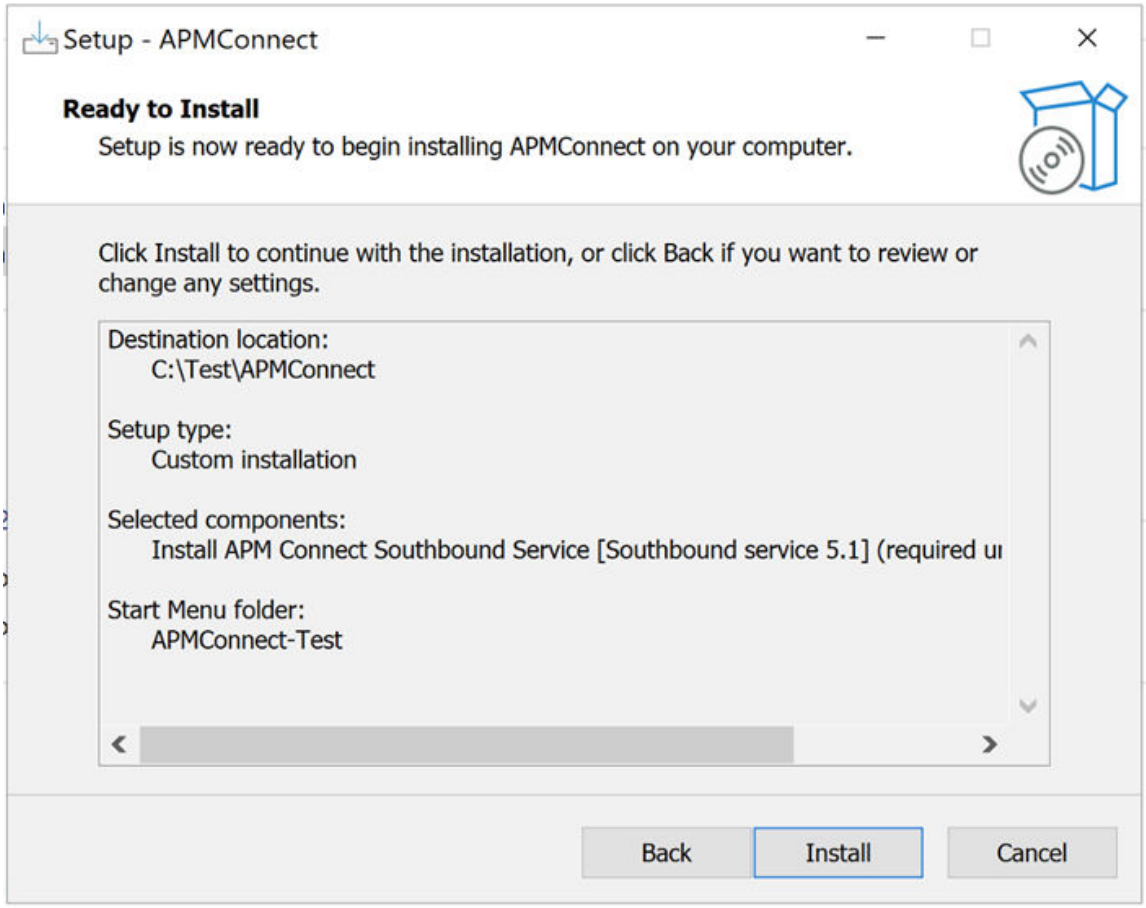

9. Select **Install** and the progress of the installation will be displayed.

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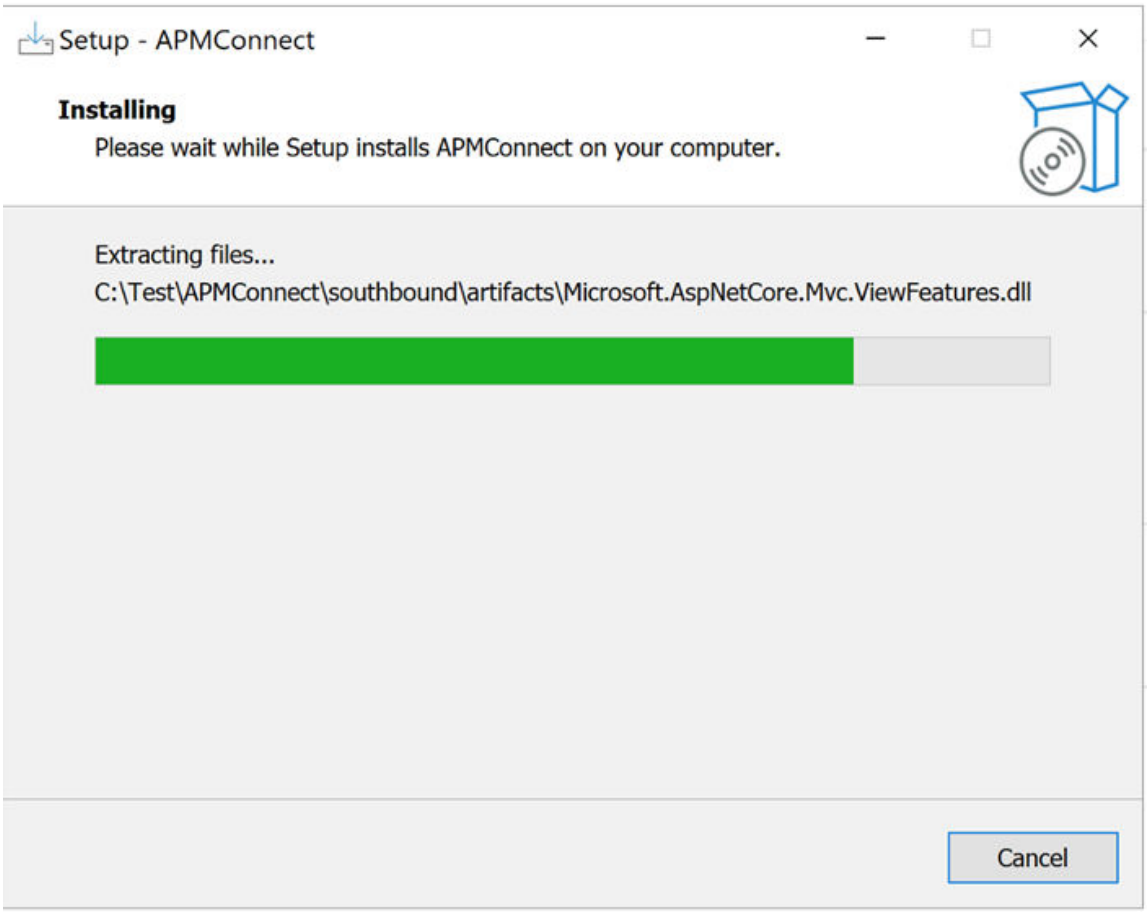

10. After the Installation is complete, select **Yes, restart the computer now** and select **Finish** to restart the server.

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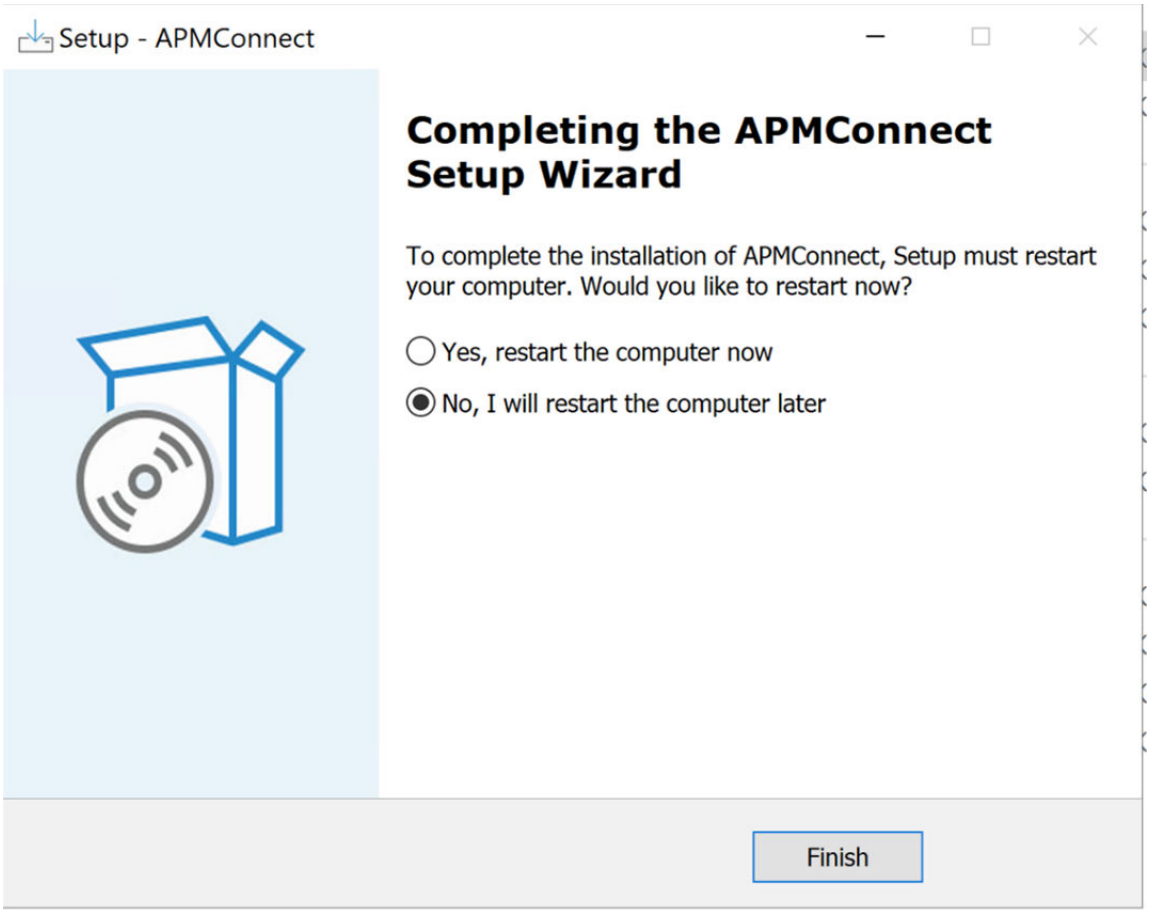

11. After the restart, validate if the service **APM Connect Southbound Service** is running in the Service Panel and binaries in the installation folder.
12. After the installer is installed, the southbound service will not be in the start state. User needs to configure appsettings.json and then start the service manually.

Uninstall Boomi or Postgres Application

Procedure

1. Open the **APMConnect - Uninstaller** application. Select the required checkbox and select **Uninstall**.

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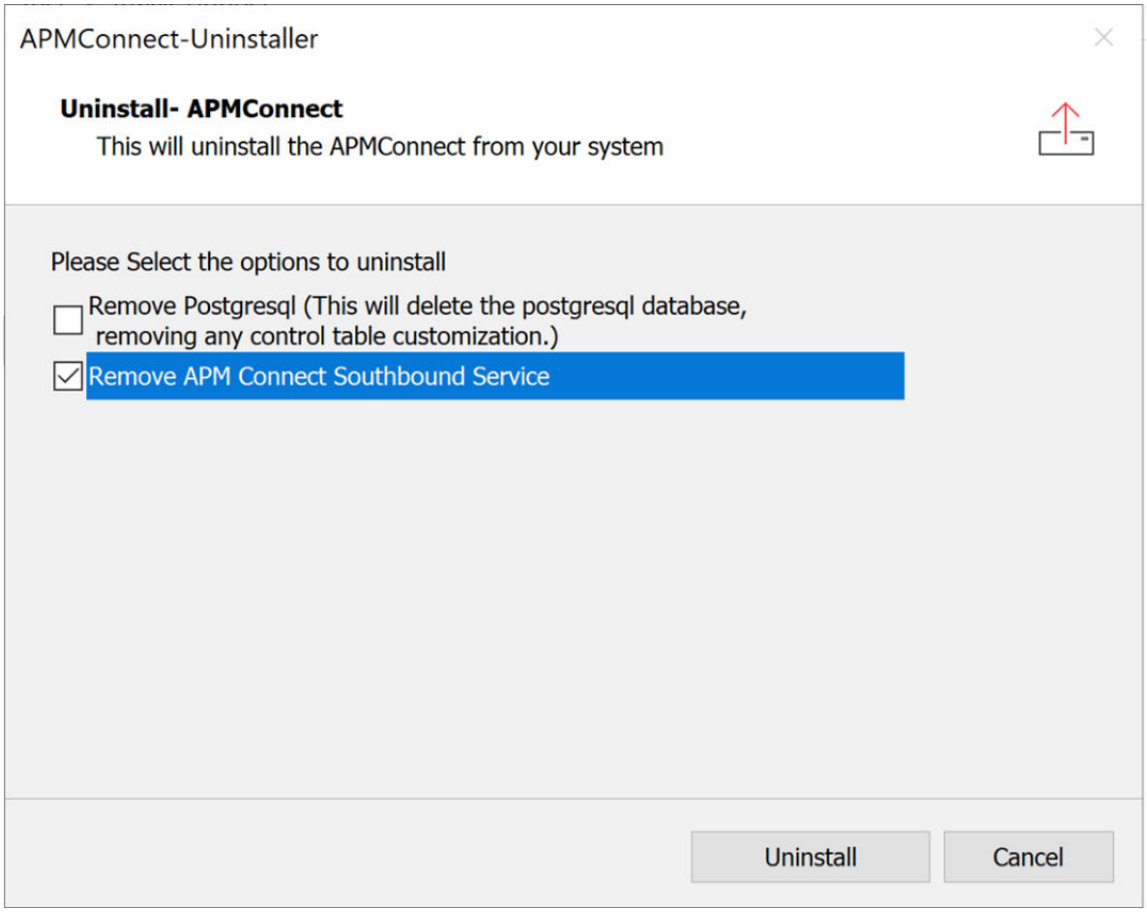
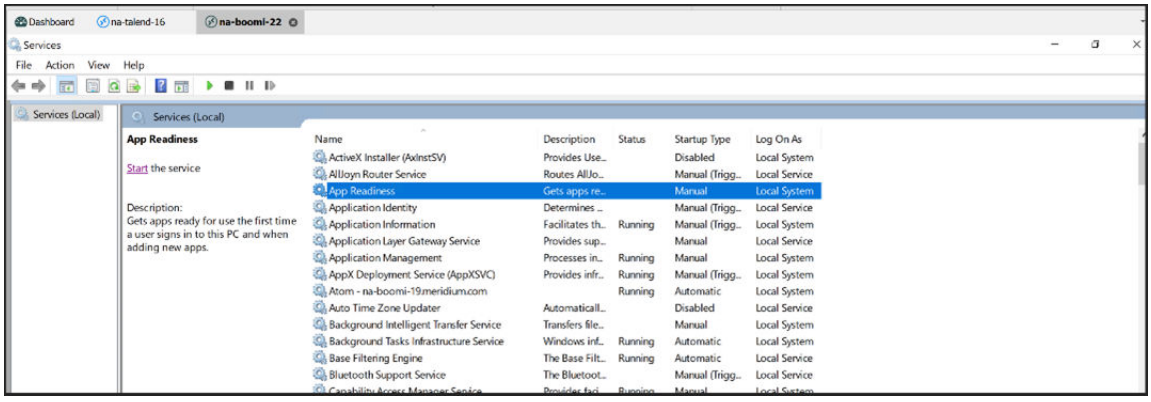


2. Then, check if the service is removed from the Windows Service Panel.



APMC Southbound Service Configuration

Before starting the Southbound Service, the required configuration needs to be set up.

Southbound Service Configuration

The APM Connect Southbound Service configuration needs to be provided in the appsettings.json file in `C:\\Program Files\APM.Connect.Southbound`.

It consists of following sections:

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- Logging - Logging Level
- FileWSDL - Contains the configuration for the EAM file receiver.
- AppConfiguration contains the following:
  - IR staging Database information
    - IR_Host
    - IR_Port
    - IR_Database
    - IR_Schema
    - IR_UserId
    - IR_Password
  - ADL configuration
    - Default_Base_Directory - This is for the CSV file shared for the DL between APM and the APMC Southbound Service.
    - Directory_Path – This is for the ADL root folder of the Scan and Archive.
    - Polling_Frequency_In_MilliSeconds
    - Max_File_Size_In_Bytes
    - Max_Filename_Length
    - Valid_Extensions
    - Valid_Zip_Extensions
  - APM (Application Server) configuration
    - Apm_Api_Test_Path
    - Web_Api_Path
    - DatasourceId
    - Id. (user-id)
    - Password
  - EAM Server Connection Type Configuration
    - Sap_Connection_Type (Application/Message)
    - Use_API_Key (True/false)
    - API_Key
  - APM Application ActiveMQ Credentials - For the v5 Audit Job:
    - ActivemqName (Queue name where the Asset Ingestion Completion Messages are posted by the Ingestor)
    - ActivemqUri
    - ActivemqUsername
    - ActivemqPassword

Southbound Service Configuration Example File

```
{
  "Urls": "http://0.0.0.0:8040",
  "Logging": {
    "LogLevel": {
      "Default": "Trace",
      "Microsoft.AspNetCore": "Trace"
    }
  },
  "Microsoft.AspNetCore.HttpLogging.HttpLoggingMiddleware":
"Information",
  "FileWSDL": {
```

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```
    "UrlOverride": "",
    "VirtualPath": "",
    "WebServiceWSDLMapping": {
      "EamFileReceiver": {
        "UrlOverride": "EamFileReceiver",
        "WsdlFile": "EamFileReceiver.wsdl",
        "SchemaFolder": "Schemas",
        "WsdlFolder": "Schemas"
      }
    }
  },
  "AllowedHosts": "*",
  "AppConfiguration": {
    "IR_Host": "",
    "IR_Port": "5432",
    "IR_Database": "",
    "IR_Schema": "public",
    "IR_UserId": "",
    "IR_Password": "",
    "Is_Linux": false,
    "Linux_Base_Path": "",
    "Default_Base_Directory": "C:\\APMConnect\\ ADL",
    "Apm_Api_Test_Path": "/meridium/api/internal/connect/
connectionstatus/ApmcToApm",
    "Use_SSL": false,
    "CmmsId": "",
    "Integration_Api_Key": "",
    "Integration_Use_Api": true,
    "Sap_Connection_Type": "Application",
    "Use_API_Key": false,
    "API_Key": "",
    "DownStream_Request_Timeout_In_Minutes": 2,
    "Directory_Path": "\\\\{APM_CONNECT_HOST}\\APMConnect\\ ADL",
    "Web_Api_Path": "http://{APM_HOSTNAME}/meridium/api/v1",
    "Ingestor_Api_Path": "http://{Ingestor_HOSTNAME}/meridium/
connect/api/v1",
    "DatasourceId": "",
    "Id": "",
    "Password": "",
    "Polling_Frequency_In_MilliSeconds": 0,
    "Max_File_Size_In_Bytes": 100000000,
    "Max_Filename_Length": 100,
    "Valid_Extensions": "zip,xlsx",
    "Valid_Zip_Extensions": "csv",
    "Sap_Cloud_Enabled": false,
    "Asset_Ingestion_Enabled": false,
    "Enable_G2DL_Ingestion": true,
    "ActivemqName": "ApmConnectIngestionCompleted",
    "ActivemqUri": "activemq://{APM_ACTIVE_MQ_HOST}:61616",
    "ActivemqUsername": "",
    "ActivemqPassword": ""
  },
  "ASPNETCORE_URLS": "http://+:8040",
  "DOTNET_PRINT_TELEMETRY_MESSAGE": false,
  "ASPNETCORE_ENVIRONMENT": "Production"
}
```


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Optional Intermediate Repository (IR) Database (DB) Configuration

Optional Intermediate Repository (IR) Database (DB) Configuration

APM Connect allows dynamic configuration for both data extraction from your EAM system and the configuration of APM data pushed back into your EAM system from APM. This configuration is achieved by manipulating table entries in the Intermediate Repository Database (IRDB).

Caution: As you will be editing the IRDB table entries, it is recommended to take a backup of the existing database so that it can be restored in the event the changes you make do not have the desired effect. The backup can be of the entire database that you are modifying.

Database Backup Steps

Procedure

1. From an elevated command line, execute the following command, replacing postgres with a username with full access to the database labeled database_name:

   ```
   pg_dump -U postgres -Fc database_name > database.dump
   ```

   Additionally, database.dump can be renamed to any name with a .dump extension.
2. In the event you get a **“pg_dump” is not recognized as an internal or external command** error, execute using the full path of the postgres installation. An example of full path execution is as follows:

   ```
   C:\Program Files\PostgreSQL\11\bin\pg_dump” U postgres -Fc database_
   name > database.dump
   ```

Database Restoration Steps

Procedure

1. From an elevated command line, execute the following command, replacing postgres with a username with full access to the database labeled database_name.

   ```
   pg_restore -U postgres -d database_name database.dump
   ```

   Additionally, database.sql can be renamed to any name with a .sql extension.
2. In the event you get a **“pg_dump” is not recognized as an internal or external command** error, execute using the full path of the postgres installation. An example of full path execution is as follows:

   ```
   C:\Program Files\PostgreSQL\11\bin\ pg_restore” -U postgres -d
   database_name database.dump
   ```

Northbound & Southbound Data Extraction SAP Mapping Configuration

To facilitate a dynamic mapping capability for data extracted from SAP and pushed into APM, the below IRDB tables can be configured. The structure of the tables and fields that are modified during configuration is outlined in subsequent sections of the documentation.

- autoextractor_control

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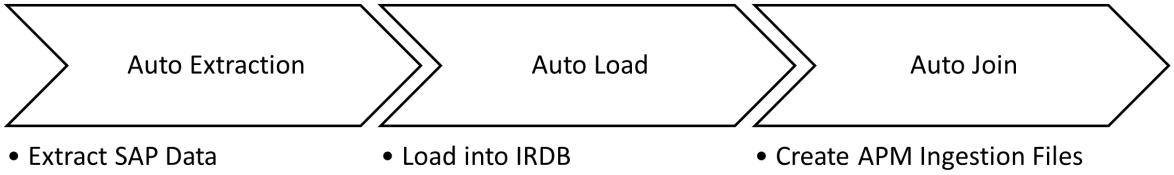
- autoloader_control
- autojoin_control
- southbound_mapping_control

Within each table are rows that correspond with steps for data extraction to support the following data types:

- Asset Strategy Integration
- Equipment
- Equipment Technical Characteristics
- Functional Location
- Functional Location Technical Characteristics
- Planned Work Interface
- Static Data
- Work Management Interface
- Work History

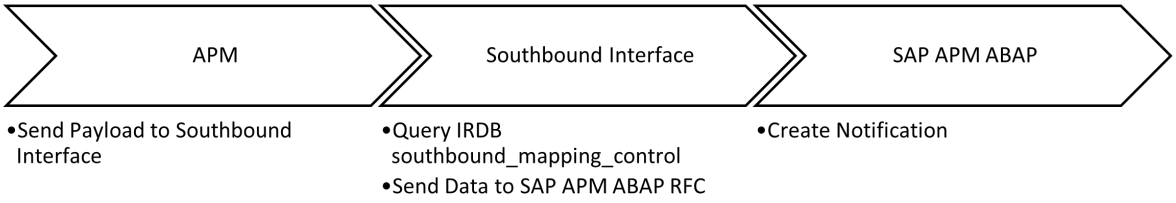
Northbound Data Integration Data Flows

During the northbound data integration, each interface follows the following logic:



Southbound Data Integration Data Flows

During the southbound data integration, each interface follows the following logic:



IRDB Table Architecture

autoextractor_control Table

The purpose of the auto extractor control table is to specify the conditions and data extracted by the APM Connect interfaces. The structure of the table is outlined below, indicating the fields that should be updated during customization.

Field Name	Description
autoextract_id	Auto-generated index
batch_name	Interface Batch Name
active	• Inactive and will not run • Active and will run

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Field Name	Description
job_name	APM Connect sub-process name
filename	Filename returned by SAP
run_in_background	True - Run in SAP background False - Run in foreground
default_date_value	Date used when SAP returns a null date
field_separator	Indicates file delimiter in file returned by SAP
abap_cursor_fetch_size	Invokes SAP to read large data sets as a batch of the size indicated
extract_schema_definition	An array utilized in SAP select statements when retrieving data. Structure: “SAP Table Name | SAP Field Name” Delimiter: “;”
join_condition	Join condition used when querying the data in SAP
where_condition	Where condition used when querying the data in SAP
for_all_entries_field_name	Field name used in SAP where a “For All Entries” statement is in use in the SAP Query
for_all_entries_field_type	SAP Field data type used in SAP where a “For All Entries” statement is in use in the SAP
for_all_entries_condition	Condition used in SAP where a “For All Entries” statement is in use in the SAP Query
object_list_type	Object to create a list of objects when utilizing the object_list_control table
object_type	Refers to SAP object, interface name, SAP Table name when utilizing the object_list_con table
sap_background_job_name	When running in SAP background, this is the job name passed to SAP.
step_seq	Not in use
cmms_id	SAP System ID

autoloader_control Table

The purpose of the auto loader control table is to specify the condition under which the data extracted in active entries in the autoextractor_control is staged in temporary tables in the IRDB. The structure of the table is outlined below, indicating the fields that should be updated during customization.

Field Name	Description
autoloader_id	Auto-generated index
batch_name	Interface Batch Name
active	1. Inactive and will not run 2. Active and will run Note: Must match active status for same batch_name in autoextracor_control table
job_name	APM Connect sub-process name
filename	Filename returned by SAP that will load into IRDB temporary table.
table_name	IRDB temporary Table Name
null_string	Default Date String
field_separator	Indicates file delimiter in file returned by SAP
row_separator	Indicates new line indicator in file returned by SAP

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Field Name	Description
delete_where_clause	Utilized in multiple EAM system configurations to clear entries in temporary table for the EAM syster being updated.
object_type	Refers to SAP object, interface name, SAP Table name when utilizing the object_list_control table
transform_job_name	APM Connect transformation sub-process name
cmms_id	SAP System ID

autojoin_control Table

The purpose of the auto join control table is to fetch the data loaded into the IRDB temporary tables and create the data payloads to be loaded into APM. The structure of the table is outlined below indicating the fields that should be updated during customization.

Field Name	Description
autojoin_id	Auto-generated index
batch_name	Interface Name
table_name	The data table name to identify the data sheet when loading into APM.
sql_execution_order	Specifies the order of the data load for each batch_name
sql	The query to extract data from the temporary table in the IRDB.
site_reference	Site reference in APM can be an APM Family Field or a constant
apm_site_reference_column	Field name for Site Reference in APM
apm_site_reference_family	APM Family to fetch the site reference in which site_reference field resides.
use_relationship_lookup	Null – ignored 1. Do not use relationships 2. Use relationships
default_site_reference	Default Site is no site is configured
primary_family_id	APM Family ID
cmms_id	SAP System ID

southbound_mapping_control Table

The purpose of this table is to provide a dynamic mapping capability from APM fields (including custom fields) in the Recommendation to SAP fields supported by the baseline interface for notification creation. The request from APM has the following details:

- Entity (EQ/FL) on which the request is being generated
- Connection information of the EAM system
- APM Family Fields (including custom fields) from the Recommendation

The structure of the table is outlined below, indicating the fields that should be updated during customization.

Field Name	Description
southbound_mapping_control_id	Auto-generated index
apm_field_name	APM Field Name

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Field Name	Description
target_field_name	SAP Field Name
target_field_map_name	SAP RFC Parameter Name
mapping_enabled	True – Will be pushed to SAP False – Will not be pushed to SAP
target_default_value	Default value in case data is not provided in the payload
cmms_id	SAP System ID

IRDB Configuration Examples

Functional Location

About This Task

An end user is recommended to have a custom field in SAP to be extracted and added to a custom field in APM. Details on SAP and APM Families are as follows:

- SAP Table Name: IFLOT
- SAP Field Name: ERNAM
- APM Family Name: MI_FLOC00
- APM Field Name: CC_CREATED_BY

To update the interface, the following steps need to be followed:

Procedure

1. Updates to autoextractor_control table
    a. Schema definition needs to be added to the extract_schema_definition field for batch name “Functional_Location_Step_1”. This can be done by appending “IFLOT|ERNAM” to the end of the extract_schema_definition.
2. Updates to autoloader_control table
    a. Duplicate the row for batch_name=”Functional_Location_Step_1”
    b. In the new row, update
        i. table_name to a unique value (CUSTOM_FLOC)
        ii. jobname to IR_Custom_Loader
3. Update to autojoin_control table
    a. Update the sql field in the row where batch_name=”Functional_Location” and table_name=”MI_FNLOC00”
        i. Select the new field (IFLOT|ERNAM as CC_CREATED_BY)
        ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_FLOC" on “IFLOT|TPLNR.” =” MI_FNCLOC00_FNC_LOC_C”

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Equipment

About This Task

An end user is recommended to have a custom field in SAP to be extracted and added to a custom field in APM. Details on SAP and APM Families are as follows:

- SAP Table Name: EQUI
- SAP Field Name: ERNAM
- APM Family Name: MI_EQUIP000
- APM Field Name: CC_CREATED_BY

To update the interface, the following steps need to be followed:

Procedure

1. Updates to autoextractor_control table
    a. a. Schema definition needs to be added to the extract_schema_definition field for batch name “Equipment_Step_1”. This can be done by appending “EQUI|ERNAM” to the end of the extract_schema_definition.
2. Updates to autoloader_control table
    a. Duplicate the row for batch_name=”Equipment_Step_1”
    b. b. In the new row, update
        i. i. table_name to a unique value (CUSTOM_EQUI)
        ii. jobname to IR_Custom_Loader
3. Update to autojoin_control table
    a. a. Update the sql field in the row where batch_name=”Equipment” and table_name=” MI_EQUIP000”
        i. Select the new field (EQUI|ERNAM as CC_CREATED_BY)
        ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_EQUI" on “EQUI|EQUNR.” =” MI_EQUIP000_EQUIP_ID_C”

Work History

About This Task

An end user is recommended to have a custom field in SAP to be extracted and added to a custom field in APM. Details on SAP and APM Families are as follows:

- SAP Table Name: VIQMEL
- SAP Field Name: ERNAM
- APM Family Name: MI_EVWKHIST
- APM Field Name: CC_CREATED_BY

To update the interface, the following steps need to be followed:

Procedure

1. Updates to autoextractor_control table

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a. Schema definition needs to be added to the extract_schema_definition field for batch name “WORKHISTORY_STEP_1”. This can be done by appending “VIQMEL|ERNAM” to the end of the extract_schema_definition.

2. Updates to autoloader_control table
   a. Duplicate the row for batch_name=” WORKHISTORY_STEP_1”
   b. In the new row, update
      i. table_name to a unique value (CUSTOM_WH)
      ii. jobname to IR_Custom_Loader
3. Update to autojoin_control table
   a. Update the sql field in the row where batch_name=” WORKHISTORY” and table_name=”WorkHistory”
      i. Select the new field (VIQMEL|ERNAM as CC_CREATED_BY)
      ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_WH" on “VIQMEL|QMNAM.” =” MI_EVWKHIST_RQST_ID_C”

Work Management Interface

An end is recommended to have a custom field in SAP to be extracted and added to a custom field in APM. Details on SAP and APM Families are as follows:

- SAP Table Name: VIMPLA
- SAP Field Name: ERNAM
- APM Family Name: MI_TASKINSP
- APM Field Name: CC_CREATED_BY

Inspection Task

About This Task

To update the interface, the following steps need to be followed for inspection tasks:

Procedure

1. Updates to autoextractor_control table
   a. a. Schema definition needs to be added to the extract_schema_definition field for batch name “WMI_STEP_2”. This can be done by appending “VIMPLA L|ERNAM” to the end of the extract_schema_definition.
2. Updates to autoloader_control table
   a. a. Duplicate the row for batch_name=” WMI_STEP_2”
   b. In the new row, update
      i. table_name to a unique value (CUSTOM_WMI_INSP)
      ii. jobname to IR_Custom_Loader
3. Update to autojoin_control table
   a. Update the sql field in the row where batch_name=”WMI” and table_name=” EQUIP_INSPECTION_TASK”
      i. Select the new field (VIMPLA |ERNAM as CC_CREATED_BY)
      ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_WMI_INSP" on “VIMPLA|WARPL.” =” MI_TASK_MAINT_PLAN_NBR_C”

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b. Update the sql field in the row where batch_name=”WMI” and table_name=” FLOC_INSPECTION_TASK”

i. Select the new field (VIMPLA |ERNAM as CC_CREATED_BY)

ii. ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_WMI_INSP" on “VIMPLA|WARPL.” =” MI_TASK_MAINT_PLAN_NBR_C”

Calibration Task

About This Task

To update the interface the following steps need to be followed for Calibration tasks:

Procedure

1. Updates to autoextractor_control table
   a. a. Schema definition needs to be added to the extract_schema_definition field for batch name “WMI_STEP_3”. This can be done by appending “VIMPLA L|ERNAM” to the end of the extract_schema_definition.
2. Updates to autoloader_control table
   a. Duplicate the row for batch_name=” WMI_STEP_3”
   b. In the new row, update
      i. table_name to a unique value (CUSTOM_WMI_CAL)
      ii. jobname to IR_Custom_Loader
3. Update to autojoin_control table
   a. Update the sql field in the row where batch_name=”WMI” and table_name=” EQUIP_CALIBRATION_TASK”
      i. Select the new field (VIMPLA |ERNAM as CC_CREATED_BY)
      ii. ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_WMI_CAL" on “VIMPLA|WARPL.” =” MI_TASK_MAINT_PLAN_NBR_C”
   b. Update the sql field in the row where batch_name=”WMI” and table_name=” FLOC_CALIBRATION_TASK”
      i. Select the new field (VIMPLA |ERNAM as CC_CREATED_BY)
      ii. ii. Add a left autojoin to include the custom table included in step 2 left outer join "CUSTOM_WMI_CAL" on “VIMPLA|WARPL.” =” MI_TASK_MAINT_PLAN_NBR_C”

Notifications

About This Task

An end user is recommended to have a custom field in APM to be extracted and sent back to SAP into the SAP Coding Code. Details on SAP and APM Families are as follows:

- APM Field Name: MI_REC_CODING
- SAP Target Field Name: CODING

To update,

Procedure

1. Open the table southbound_mapping_control table.

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2. Update the field apm_family_name to “MI_REC_CODING” where target_field_name=”CODING”.
3. Additionally, change the mapping_enabled Boolean to True.

PostgreSQL Configuration

Postgres Configuration

To allow connections from the APM Server to APM Connect, you must update the PostgreSQL networking configuration. This topic describes how to perform the configuration update.

Procedure

Procedure

1. On the machine in which you installed APM Connect, navigate to your PostgreSQL installation files. The default location is
   `<root:>\Program Files\PostgreSQL\11\data.`
2. Locate the configuration file pg_hba.conf, and then right-click the file and open it in a text editor.
3. Move through to the end of the document and locate the following line of text:

```
host all all 127.0.0.1/32 md5
```

```
76
77  # TYPE  DATABASE        USER            ADDRESS                 METHOD
78
79  # IPv4 local connections:
80  host    all             all             127.0.0.1/32            md5
81  host    all             all             <APM IP address>/32     md5
82  # IPv6 local connections:
83  host    all             all             ::1/128                 md5
84  # Allow replication connections from localhost, by a user with the
85  # replication privilege.
86  #host    replication     postgres        127.0.0.1/32            md5
87  #host    replication     postgres        ::1/128                 md5
88
```

4. Add a “host all all IP address of the APM Server md5” statement to the file.
5. Save the file and then close the text editor.

   Note: For better security posture, it is recommended to restrict the PostgreSQL access to the APM Server only.

Results

PostgreSQL is now configured to open the connection from the APM Server.

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Automated Data Loader Service Installation

Automated Data Loader Service Installation

The service for integrating to APM via Automated Data Loader (ADL) is configured as part of the southbound service installation. To utilize only the ADL, execute the southbound services and postgres installation only. No remotely managed runtime environment is required for ADL to function.

Automated Data Loader Directory Creation

The following table lists the directories that need to be created when using the Automated Data Loader capability. The folders should be created in the directory specified in the southbound configuration file (see ADL configuration). Directories need to be created only for the Data Loader types that are in use.

Data Loader Name	Folder Name
Family Data Loader	FamilyDataLoader
Equipment and Functional Location Loader	EquipmentFunctionalLocationLoader
Taxonomy Data Loader	TaxonomyLoader
Work History Loader	WorkHistoryLoader
Production Loss Analysis (PLA) 1 - Admin	PLAAdminBatchDataLoader
Production Loss Analysis (PLA) 2 - Event	PLAEventBatchDataLoader
Production Loss Analysis (PLA) 3 - Plan	PLAPlanBatchDataLoader
Root Cause Analysis (RCA)	RCABatchDataLoader
System Reliability Data Loader	SystemReliabilityBatchDataLoader
Asset Criticality Analysis (ACA Checklist)	ACACheckListDataLoader
Asset Criticality Analysis (ACA)	ACAMatrixDataLoader
GIS Data Loader	GISDATALOADER
Policy Instance Data Loader	PolicyInstanceBatchDataLoader
Role Data Loader	RolesDataLoader
Rounds Allowable Values	AllowableValuesBatchDataLoader
Rounds Readings	ReadingsBatchDataLoader
Rounds Routes	RouteBatchDataLoader
Rounds Templates and Template Groups	TemplateBatchDataLoader
Inspection Management (IM) Assets	IMBatchAssetDataLoader
Inspection Management (IM) Functional Location	IMBatchFLDataLoader
RBI Components To TML Groups Relationship	RBITMBatchDataLoader
Risk Based Inspection (RBI) 580	RBI580BatchDataLoader
Risk Based Inspection (RBI) 581	RBI581BatchDataLoader
Risk Based Inspection (RBI) Corrosion Loop	RBICorrosionLoopBatchDataLoader

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Data Loader Name	Folder Name
Thickness Monitoring (TM) Equipment	TMBatchAssetDataLoader
Thickness Monitoring (TM) Functional Location	TMBatchFLDataLoader
Thickness Monitoring (TM) Piping Equipment	TMBatchPipingAssetDataLoader
Thickness Monitoring (TM) Piping Functional Location	TMBatchPipingFLDataLoader
Generation Availability Analysis (GAA) GADS Amplification Codes	GAAAmplificationCodeDataLoader
Generation Availability Analysis (GAA) GADS Cause Code	GAACauseCodeDataLoader
Generation Availability Analysis (GAA) Events	GAAEventsDataLoader
Calibration Management	CalibrationBatchDataLoader
Hazard Analysis	HazardAnalysisBatchDataLoader
Asset Strategy Management (ASM)	AsmDataLoader
Asset Strategy Management (ASM) Template	AsmTemplateDataLoader
Failure Modes and Effects Analysis (FMEA)	FMEAAnalysisDataLoader
Failure Modes and Effects Analysis (FMEA) Analysis Templates	FMEAAnalysisTemplateDataLoader
Failure Modes and Effects Analysis (FMEA) Asset Templates	FMEAAssetTemplateDataLoader
Reliability Centered Maintenance (RCM)	RCMAnalysisDataLoader
Reliability Centered Maintenance (RCM) Analysis Template	RCMAnalysisTemplateDataLoader
Risk Matrix	RiskMatrixDataLoader
GAA Wind Asset Hierarchy	GAAWindAssetHierarchyDataLoader
GAA Wind Events	GAAWindEventDataloader
GAA Wind Sub Group Capacity	GAAWindSubgroupCapacityDataLoader
Rounds Pro - Picklist Dataloader	PicklistDataloader
Rounds Pro - Route Master Dataloader	RouteMasterDataloader
Rounds Pro - Step Dataloader	StepDataloader
Rounds Pro - Step Conditions	StepConditionDataloader
Rounds Pro - Step Template	StepTemplateDataloader

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Chapter 4

NextGen ETL Account Management

Topics:

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Account Management

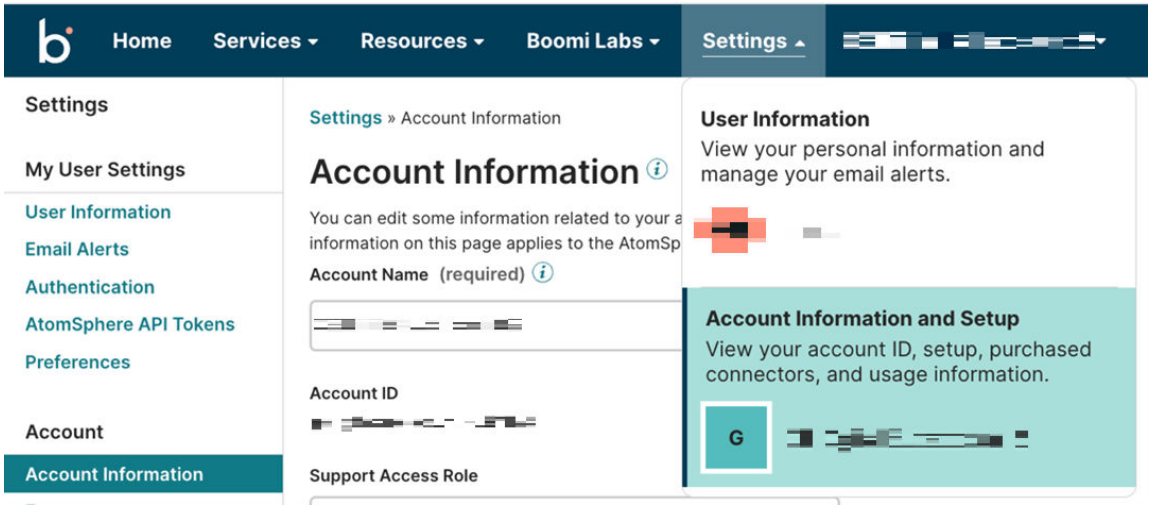
APM Connect Administrators will be provisioned an account within their Boomi tenant and provided administrator access. An administrator can add additional users, create custom roles, assign default or custom roles to users, change security options for the account, among other administrative options.

Access the Account Settings Page

Procedure

1. Sign in to the Boomi Platform.
2. In the top banner, select **Settings**.

3. In the dropdown list, select **Account Information and Setup**.



User Management

Procedure

1. Go to the Account Settings page.
2. In the left pane, under **Account Access**, select **User Management**.

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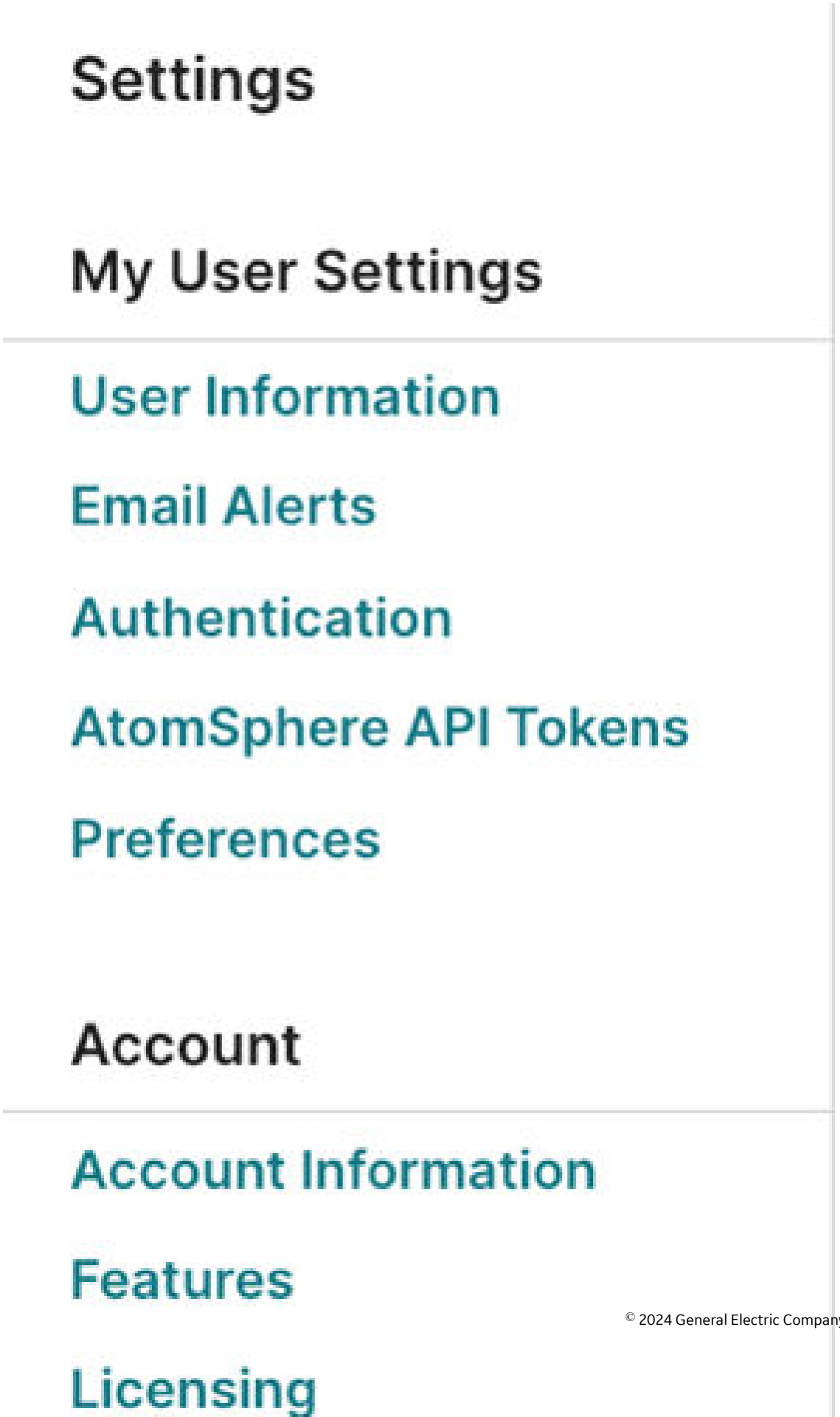

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Account Roles

Boomi has predefined roles that can be assigned to a user. As an account administrator, you can create custom roles for your users. Refer the Boomi documentation if you are interested in configuring your own custom roles.

In addition to the predefined roles from Boomi and any custom roles created by your account administrators, GE has made roles that have permissions designed for the APM Connect implementation and usage of Boomi. The roles added by GE will have the permissions detailed below.

- GE Vernova Services Integration Engineering -- This role should be used for services engineering extending or developing custom integrations.
    - Atom Management -- Atom configuration and administration.
    - Atom Management Read Access -- Read access to Atom configuration and administration.
    - Build Read and Write Access -- Build, write, and modify processes and components.
    - Dashboard -- Access to the Dashboard.
    - Environment Management -- Management of all environments and associated access.
    - Execute -- Execute or retry available processes.
    - Integration Pack -- Manage Integration Packs
    - Packaged Component Management -- Create and manage packaged components.
    - Packaged Component Deployment -- Deploy packaged components to environments.
    - Process Library -- Manage Process Library.
    - Scheduling -- Manage configured process schedules.
    - View Audit Logs -- View and download audit logs.
    - View Data -- View data in process reporting.
    - View Results -- View and monitor process execution activity and logs.
- GE Vernova Services Integration Implementor -- This role should be used for services engineering deploying prepackaged integrations.
    - Atom Management -- Atom configuration and administration.
    - Atom Management Read Access -- Read access to Atom configuration and administration.
    - Dashboard -- Access to the Dashboard.
    - Environment Management -- Management of all environments and associated access.
    - Execute -- Execute or retry available processes.
    - Packaged Component Deployment -- Deploy packaged components to environments.
    - Scheduling -- Manage configured process schedules.
    - View Audit Logs -- View and download audit logs.
    - View Data -- View data in process reporting.
    - View Results -- View and monitor process execution activity and logs.
- GE Vernova Support Engineer -- This role should be used for frontline support staff who need the ability to troubleshoot as built integrations.
    - Atom Management Read Access -- Read access to Atom configuration and administration.
    - Dashboard -- Access to the Dashboard.
    - Execute -- Execute or retry available processes.
    - Scheduling -- Manage configured process schedules.
    - View Audit Logs -- View and download audit logs.
    - View Data -- View data in process reporting.
    - View Results -- View and monitor process execution activity and logs.

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User Addition, Editing, Removal

For the latest steps on adding, editing, or removing a user, refer the Boomi documentation.

Account Advanced Security Settings

Boomi offers additional account settings that are not enabled by default and are optional. Refer Boomi documentation below for the advanced security options like SSO enablement, Multi-Factor Authentication, and advanced session controls.

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Chapter 5

Admin

Topics:

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Access the APM Connect Administration Center

Using the APM Connect Administration Center, you can run extraction and load jobs. Before you can begin running jobs, you must set up the APM Connect Administration Center. This topic explains how to access and deploy the APM Connect Administration Center for the first time.

Procedure

1. Open a web browser, and then enter the following URL into your web browser: http://localhost or hostname provided:8080/apmconnect/.
2. In the **Data Parameters** window (if it appears, refer to the Step 3), in the **Password** box, enter `postgres`, and then select **OK**.
3. If the TAC license file was not provided during the install step you will get the **Database Parameters** window to setup the license. If already provided you will get the APM Connect **Login** Page (Check step 5).
4. Select .

   The **Database parameters** window appears, and a check is performed by the APM Connect Administration Center.
5. If your license validates, in the **Database parameters** window, select **Go to login page**.

   The **Login** page appears.
6. In the **Login** window, enter the required information and then select **Login**.
   - In the **Login** box, enter the default username: `admin@company.com`.
   - In the **Password** box, enter the default password: admin.

   The APM Connect Administration Center is successfully deployed, and the APM Connect Administration Center **Welcome** page appears.
7. Add an APM Connect Service User using the following steps:
   a) Select **Users** in the **Menu** Pane, and then select Add.
   b) Add the following information:
      - Login ID – preferably an e-mail id. For example, apmc@company.com
      - First Name and Last Name – Add an identifier name
      - Password – Preferably admin or user defined
      - Type – Data Integration/ESB
      - For the Role select all the roles except **Auditor**

   c) Select **Save**.
8. Logout of the APM Connect Administration Center and then log back in as the Service user that you setup in Step 7 (For example, apmc@company.com/admin).
9. Select a Project on the **Welcome** page.

   Note: If no project is displayed you can add a new project titled **APMCONNECT_UNIFIED_PLATFORM** with **Project Type** value set as `Data Integration/ESB` and **Storage** value set as `None`.
10. In the **Menu** pane select **Project Authorizations**

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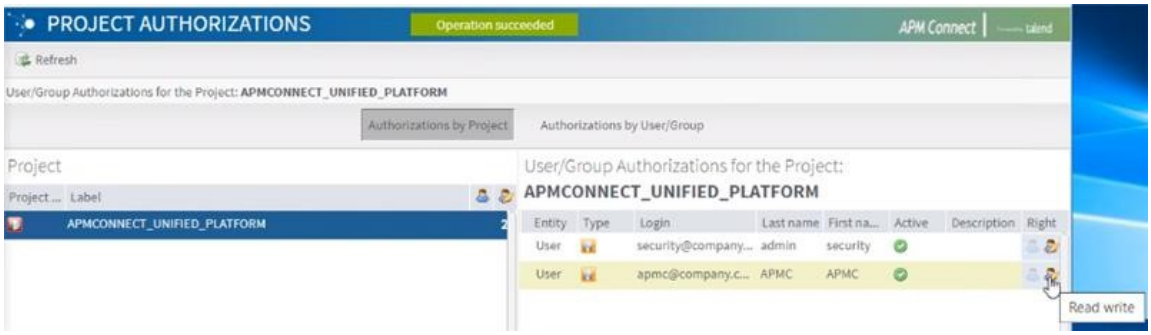
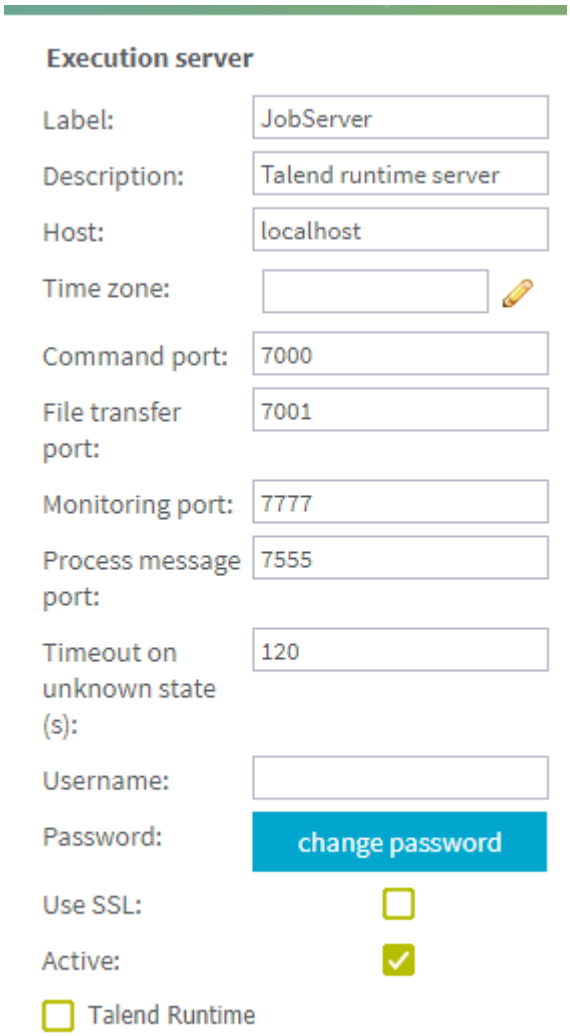


11. In the **Project** section select the project **APMCONNECT_UNIFIED_PLATFORM**, and provide the Read and Write access to the newly created service user.
12. In the **Menu** pane select **Servers** to check the execution server details.
13. If no Server is displayed, then add a server with **Label** value set as `JobServer` and other values configured as shown below:



14. Select **Save**.
15. In the **Menu** pane select **Job Conductors** to check if any jobs are deployed.

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Note: If jobs are not deployed then the APM Connect jobs provided need to be deployed manually.

Configure the APM Connect Administration Center

This topic describes how to configure the APM Connect Administration Center.

About This Task

Depending on whether you are using the EAM Adapters or the Data Loaders, configuring the APM Connect Administration Center requires defining parameters for some or all of the following components: Commandline, Job conductor, Monitoring, and Log4j.

Procedure

1. If you are not already in the APM Connect Administration Center, access it via http://localhost:8080/apmconnect/.
2. If prompted, log in to the APM Connect Administration Center.
3. In the **Menu** pane, in the **Settings** section, select the **Configuration** tab.

   The **Configuration** pane appears.
4. Select the **Job conductor (7 Parameters)** group to expand the workspace.
5. Using the following table as a guide, enter the recommended parameters.

   Note: You can accept the default values of parameters not listed in the table. Make sure that the folders already exist.

Parameter	Description	Recommended or Default Value
Generated jobs folder	The path to the folder with the Job execution archives.	C:\APMConnect\Logs\generated_jobs
Tasks logs folder	The path to the folder with the Job execution logs.	C:\APMConnect\Logs\execution_logs

6. Select the **Servers** group to expand the workspace.
7. In the workspace, select **Add**, and then select **Add Server**.
8. In the **Execution server** section, configure the server.
   a) Enter the name of the administrator host in the **Label:**, **Description:**, and **Host:** boxes.
   b) Select the **Meridium Runtime** check box.
   c) Select **Save**.
      The server configuration is saved.
   d) Select the server you just added to verify the configuration.
      All of the server indicators should be green.
9. Select the **Monitoring (2 Parameters)** group to expand the workspace.

   Note: Configuring this parameter is optional.
10. Select the **Log4j (4 Parameters)** group to expand the workspace.
11. Using the following table as a guide, enter the necessary parameters.

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Parameter	Description	Recommended or Default Value
Technical file appender	The path to the technical log file of the APM Connect Administration Center.	C:/APMConnect/Utilities/Tomcat/logs/technical.log
Technical log threshold	The level of logs you want to append.	WARN
Business log file path	The path to the business log file of the APM Connect Administration Center.	C:/APMConnect/Utilities/Tomcat/logs/business.log
Technical logstash appender	The host and port corresponding to the Logstash instance.	localhost:8050

Results

The APM Connect Administration Center parameters are configured.

Authorize Users for Projects

Before a user can begin work on a specific project, that user must be authorized to work on that project. Each project can have multiple users with differing roles. Users can also be authorized for multiple projects. This topic explains how to authorize a user for a project.

Procedure

1. In the **Menu** pane, in the **Settings** section, select **Project authorizations**.

   The **Project Authorizations** workspace appears displaying the **Project** section which lists all the projects to which you can add users and the **User Authorizations for the Project: <name>** section which lists all users that can be added to the project.

2. From the **Project** list, select the project to which you want to add a user.

3. To give a user read permissions only, in the **Right** column in the row for that user, select the button.

4. To give a user read and write permissions, in the **Right** column in the row for that user, select the  button.

   Tip: The icons in the **Right** column will be appear in a lighter color if the user is not authorized for a specific action, and be colored if the user has the required permissions.

   The user is now authorized for the project.

Set User Permissions

To begin using the APM Connect Administration Center to run data extractions, or Jobs, you must first give the admin user all the user roles.

Before You Begin

A user must be authorized for a project before they can view or change sections associated with a project.

Procedure

1. In the **Menu** pane, in the **Settings** section, select the **Users** tab.

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2. Select the user that you want to be the administrator.

   The **Data** section is activated.
3. In the **Data** section, next to the **Role:** box, select  .
4. In the **Role Selection** window, select each check box to assign the user all roles, or select the box of the role(s) you want to assign the user, based on the following table:

   Important: To access the Job Conductor, you must designate at least one user the role of Operation Manager.

Role	Read Permissions by Module	Write Permissions by Module
Administrator	None.	License, Configuration, Users, Projects, Rights Management, Backup, Notifications, Software Updates
Operations Manager	Projects, EBS Publisher, Service Activity Monitoring, Authorization, Service Registry, Studio, Repository Browser	Configuration, Lock, Notifications, Servers, Job Conductor, ESB Conductor, Execution Plan, Monitoring Audit BRMS (Drools), Service Locator
Designer	Configuration, Projects, Servers, Job Conductor, EBS Conductor, EBS Conductor, EBS Publisher, Execution Plan, Monitoring	Execution Plan, Audit, BRMS (Drools), Service Locator
Viewer	Servers, Job Conductor, Execution Plan, Audit, Studio, Repository	None.

5. Select **Validate**, and then select **Save**.

Results

The user permissions are set.

Configure Logging

APM Connect uses Apache log4j version 2 to log events. It includes a default xml configuration for logging events. You can personalize logging by using an xml-based custom configuration file, which can be passed through the JVM argument parameter in the Job Conductor task, `Dlog4j.configurationFile={path to custom xml file}`. For more details, refer to the apache logging framework.

Deploy Audit Job for Adapters

The Audit job helps to get audit data, including Date Control and Success/Failure records from APM. An Audit job can be scheduled to run for specified minutes or hours, or on a daily basis in the APM Connect Administration Center.

Set Up the Audit Job

Before You Begin

- APM Connect must be installed.
- Context file must be set up and have details of IR, APM, and ActiveMQ.

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Procedure

1. Access the APM Connect Administration Center.
2. In the **Menu** pane, in the **Conductor** section, select the **Job Conductor** tab.
3. In the **Job Conductor** menu, select **Add**.

   The **Execution task** pane is enabled.
4. In the **Execution task** pane, in the **Label** box, enter a label for the job.
5. In the **Description** box, enter a description for the Job.
6. Select the **Active** check box.
7. In the **Job** section, select  .
   The **Import generated code** window appears.
8. Select **Browse...** and then navigate to the folder containing the updated jobs package.
9. Select **AuditJob.zip**, and then select **Launch upload**.
   The job is imported into the **Job Conductor**.
10. Configure the context file to identify the details of the IR, APM, and APM ActiveMQ.
11. Modify the `<Context_File_PATH>` value in the **Job Conductor** context parameters to point to the context file for the job.
12. Schedule a trigger or run the job.

Results

The Job Conductor indicates that the job ran successfully or the trigger is active.

Configure the Context File

Before You Begin

You should have imported the audit job.

About This Task

The context file provides the audit job with the information it needs to connect to ActiveMQ, IR, and APM.

Procedure

1. Navigate to the following folder: `C:\APMConnect\Config\<system>`.
2. Modify `ContextFile.xml` to indicate the values for your system.

Results

Parameter	Description	Default or Recommended Value
CONFIG_FILE_PATH	The path to the context file used for extraction.	Enter your unique value (for example, `C:\APMConnect\Config\ContextFile.xml`).
IR_HOST	Intermediary Repository host name.	Enter your unique value.
IR_DATABASE	Database for the dinoloader job.	Enter your unique value.
IR_USERID	Intermediary Repository username.	Enter your unique value.

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Parameter	Description	Default or Recommended Value
IR_PASSWORD	Intermediary Repository password.	Enter your unique value.
IR_SCHEMA	The schema in which the IR database will be created.	The default value is public.
IR_PORT	Intermediate Repository port.	Default value is 5432.
APM_USERID	The APM user ID.	Enter your unique value.
APM_PASSWORD	The APM password.	Enter your unique value.
APM_DATASOURCE	The name of the APM data source to which the data will be exported.	This is a required parameter. Enter your unique value.
APM_API_APP_SERVER	The name of the APM API server.	This is a required parameter. Enter your unique value.
APM_APP_SERVER	The name of the APM server.	This is a required parameter. Enter your unique value.
TRUSTSTORE_FILE	The directory path to the dinoloader SSL configuration file.	Enter your unique value.
TRUSTSTORE_PASSWORD	The password for the keystore files.	Enter your unique value.
USE_SSL	Determines if SSL is used.	True: will use SSL. False: will not use SSL.
QUEUE_HOST	The host name of the APM ActiveMQ.	Enter your unique value.
QUEUE_PORT	APM ActiveMQ port.	Default port is 61616.
QUEUE_USER	APM ActiveMQ user.	Enter your unique value.
QUEUE_PASSWORD	APM ActiveMQ password.	Enter your unique value.
CMMS_ID	Enter your EAM system ID	Enter your unique value.

Create the Intermediate Repository Database

This topic describes how to set up a repository in preparation to run your first job.

Before You Begin

Important: If you are using both the Data Loaders and an EAM Adapter, you need only one Intermediate Repository Database.

- Before you can prepare and deploy the repository, you must import the CreateIntermediateRepository job.
- If you are using the Data Loaders and the EAM Adapters, you must deploy and run the CreateIntermediateRepository job for each set of adapters.
- For SAP adapters, you must first run the Static Data job.
- For multiple EAM systems, the context file parameter values for a specific type of system must be identical except for the value of CMMS_ID.

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- For multiple EAM systems, the Intermediate Repository Connection parameters have the same values for all adapters connected to this APM system.

Important: Each time you run the CreateIntermediateRepository you recreate the APM database to the baseline settings, removing any previous configuration. When you run the addSourceSystem job, the job will add new source systems based on the CMMS_ID and the SOURCE_SYSTEM_TYPE. If the job is run an additional time with the same configuration, it will reset the control values of an existing source system.

Procedure

1. Log in to the APM Connect Administration Center web application.

   Note: The user logging in must have access to the Job Conductor by being designated the Operations Manager role. By default, users designated as administrators do not have Job Conductor permissions.
2. In the **Job Conductor** workspace, in the appropriate project, select the CreateIntermediateRepository job.

   Note: For ServiceMax, this job is called CreateIntermediateRepository_ServiceMax.
3. Select **Context parameters**.

   The **Context parameters** section appears.
4. Configure the following parameter.

Context Parameter	Description
CONFIG_FILE_PATH	The file path to context files for the jobs. **Important:** • You must change the default value to reflect the actual path to your configuration file. • CMMS_ID and SOURCE_SYSTEM_TYPE must be set in the context file.

5. Select **Run**.

   If you are configuring a single system, you have completed your configuration.

   The intermediate repository database is created for the project.

If you are configuring multiple EAM systems, perform the remaining steps in this topic.

6. In the **Job Conductor** workspace, in the appropriate project, select the addSourceSystem job.
7. Configure the following parameter.

Context Parameter	Description
CONFIG_FILE_PATH	The file path to context files for the jobs. **Important:** • You must change the default value to reflect the actual path to your configuration file. • CMMS_ID and SOURCE_SYSTEM_TYPE must be set in the context file.

8. Select **Run**.
9. Repeat steps 6 on page 67 through 8 on page 67 for all adapters.

Configure Source System Custom Field Mappings or Default Values

APM Connect documents a baseline set of fields that are considered standard in the APM to SAP Notification Creation integration with SAP. Additionally, there is capability to configure these and other fields to be included in the Notification Creation process. For information on the available fields to add to

mapping, refer to the List of attributes that can be added to Notification Creation from APM to SAP topic. This topic describes how to configure additional baseline fields or make changes to default values.

Before You Begin

To successfully perform this task, you must have the following:

- Administrative rights to the APM Connect database from which you are retrieving the field values or setting the default values.
- A database tool, such as DBeaver or DBVisualizer.

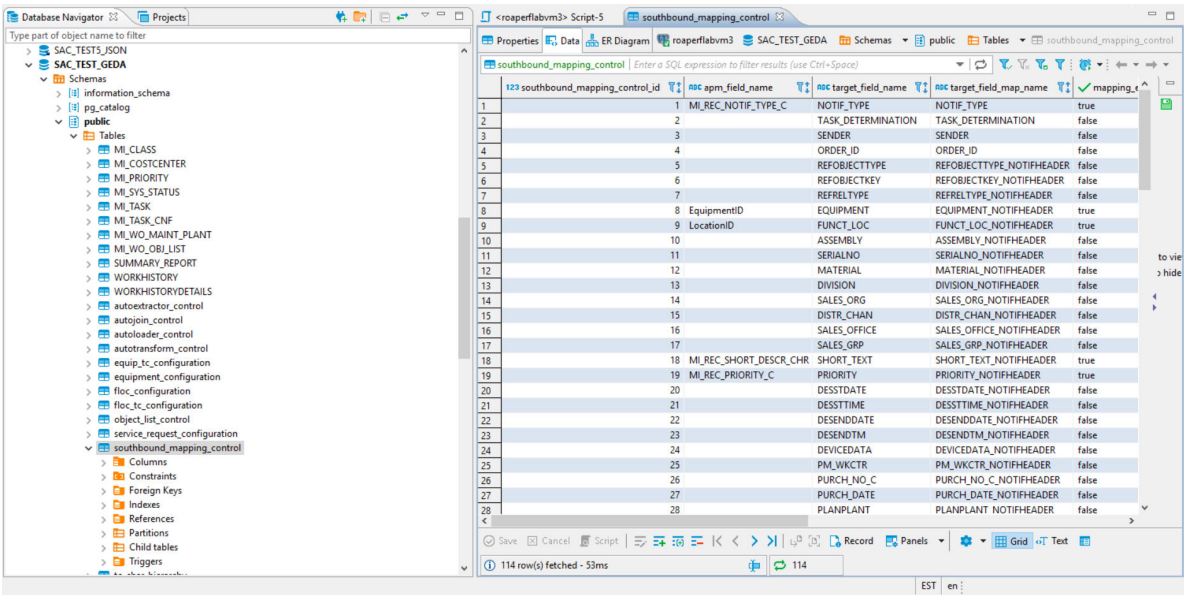
About This Task

There are times when you need to have information that is stored in APM displayed in your source system database. To achieve this goal, you need to modify tables used by APM to send data to your source system.

Note: If Custom field mappings are needed, or fields that are not in this list, customization options exist with our Integration Center of Excellence engagement process.

The following procedure describes how to either configure a mapping between APM and your source system or to set a default in your source system from APM.

The following image is an example of the southbound_mapping_control table as displayed by a database tool.



Note: This feature is not available for creating work orders.

Procedure

1. Using a database tool, navigate to the APM database you want to configure.
2. In the database navigation, in the `Tables` folder, select **southbound_mapping_control**.
3. Navigate to the **target_field_name** and **target_field_map_name** column you want to configure.
4. Configure the field mapping or default value for your source system.

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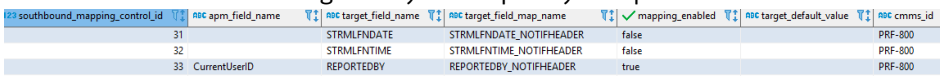
Item to configure	How to configure
Field mapping	In the **apm_field_name** column, enter the name of the APM field that contains the value to apply in the source system, and then set the value in the **mapping_enabled** column to `true` For example, if you want to set the source system value of REPORTEDBY in map table REPORTEDBY_NOTIFHEADER from the APM field CurrentUserID, the table would resemble the following when you complete your update.  **Important:** If, after configuring the mapping, you see a blank value for the field, make sure the value you entered in the **apm_field_name** column is correct.
Default value	In the **target_field_default** column, enter the value you want to be the default in your source system and set the value in the **mapping_enabled** column to `false`.

southbound_mapping_control_id	apm_field_name	target_field_name	target_field_map_name	mapping_enabled	target_default_value	cmms_id
31		STRMLFNDATE	STRMLFNDATE_NOTIFHEADER	false		PRF-800
32		STRMLFNTIME	STRMLFNTIME_NOTIFHEADER	false		PRF-800
33	CurrentUserID	REPORTEDBY	REPORTEDBY_NOTIFHEADER	true		PRF-800

Results

Your source system mappings or default values are configured.

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Chapter 6

Studio

Topics:

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Configure the APM Connect Administration Center for the Studio

About This Task

Important: This step is required only if you have the APM Connect Studio license. If you are deploying APM Connect Base with a Basic or Plus License, skip this procedure.

Procedure

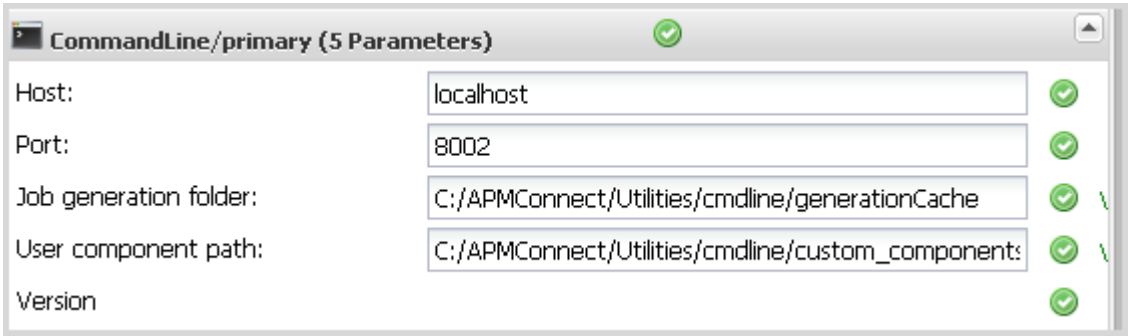
1. Open a web browser.

   Tip: APM Connect is most compatible with Google Chrome or Mozilla Firefox web browsers. It is not recommend using Internet Explorer to access the APM Connect Administration Center.
2. Enter the following URL into your web browser: http://localhost:8080/apmconnect/.
3. If prompted, log in to the APM Connect Administration Center.
4. In the **Menu** pane, in the **Settings** section, select the **Configuration** tab.

   The **Configuration** pane appears.
5. Select the **CommandLine/primary (5 Parameters)** group to expand the workspace.
6. According to recommendations in the information in the following table, enter the necessary parameters.

Parameter	Description	Recommend or Default Value
Host	The IP address of the CommandLine.	localhost
Port	The port number on which the CommandLine is queried.	8002
Job generation folder	The path to the folder where Jobs are generated.	<root:>\APMConnect\Utilities\cmdline\generationCache
User component path	The path to the folder where user components are stored.	<root:>\APMConnect\Utilities\cmdline\custom_components

The default parameters are configured as shown in the following image.



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Install the Studio

About This Task

Important: This step is required only if you have the APM Connect Studio license. If you are deploying APM Connect Base with a Basic or Plus License, skip this procedure and proceed to the next step in the APM Connect Base deployment workflow.

Procedure

1. On the machine on which you installed APM Connect, access the Talend Studio installation package.
2. Open the file `TalendStudioInstall.exe`.
3. In the **Setup-Talend Studio** window, select **Next**.

   The **License Agreement** window appears.
4. Read the entire license agreement, and then select one of the following options:
   - **I accept the agreement**: If you agree to the terms of the license agreement and want to continue. These instructions assume that you want to continue.
   - **I do not accept the agreement**: This option is selected by default. If you do not agree to the terms of the license agreement and do not want to continue, select **Cancel** to exit the installer.

   Next is enabled.
5. Select **Next**.

   The **Select Destination Location** screen appears.
6. Select **Next**.

   The **Select Components** screen appears.
7. Select the **Add Start Menu Entry** box, then select the **Add Desktop Icon** box, and then select **Next**.
8. Select **Next**.
9. In the **Select Start Menu Folder** window, select **Next**.
10. In the **Ready to Install** window, select **Install**.

    The **Installing** screen appears, displaying an installation progress bar.
11. When the installation completes, in the **Completing the Talend Studio Setup Wizard** window, select **Finish**.

Results

The installation is complete, and Talend Studio desktop icon is available.

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Chapter 7

Data Loaders

Topics:

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General Information

Requirements for APM Connect Data Loaders

All APM Connect Data Loaders have the same mapping and security settings requirements.

Important: To achieve best performance in the ingestion process, APM Connect recommends ingestion of maximum file size to be 10 MB. However, there are circumstances that may require larger files for ingestion. For such use cases, APM Connect allows file sizes up to 30 MB. If the file size exceeds 30 MB, an error message appears indicating that maximum file size has reached and the file is not processed. Additionally, there will be a check for file sizes in uncompressed state to ensure that file size does not to exceed 100 MB.

Note: File size, and data model complexity are two variables of data ingestion performance. Ingesting smaller files and lower complexity data models will assist in improving the performance.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

Mapping

The Data Loaders map the datasheet columns in the Excel workbook to fields in APM families by field ID. The captions may be changed as needed, but do not change the field IDs.

Exclude Fields with Large Data

About This Task

This topic describes how to reduce the size of the GEDA archive file by excluding fields with large amount of data while loading Equipment and Functional Location records because if the size exceeds 10,000 KB, an error occurs.

Procedure

1. Access the `INGESTION_CONFIGURATION.mipref` file, located in the `ExcludeGedaFieldsSystemPrefFiles` folder.
2. In the `GedaFieldsToExclude` section, remove the fields with large amount of data.

   Tip: For a sample `INGESTION_CONFIGURATION.mipref` file, refer to KBA 000069790.
3. Import data from the `INGESTION_CONFIGURATION.mipref` file. For instructions, refer to .

About Populating Site Reference Data

The APM Family Data Loader can be used to populate the Site Reference on Equipment and Functional Location records in APM.

About This Task

The APM Family Data Loader populates the **ENTY_KEY** system field and the **MI_SITE_KEY** system field associated with the Site Reference value to be populated. On asset records, the Site Reference is stored in the **MI_SITE_KEY** field, a system field in APM. The APM Data Loader uses the Site Name (**MI_SITE_NAME**) to translate the value to the corresponding Site Key and populate the **MI_SITE_KEY** field; therefore, you

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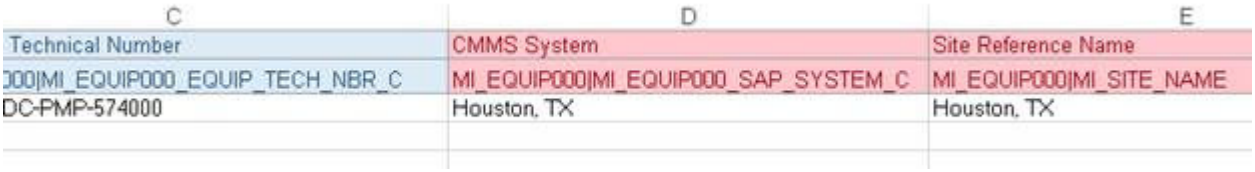
do not need to know the key to be able to populate the site reference. This functionality is important because this value can change from one database to another.

Procedure

1. On the data worksheet, add a column that contains **MI_SITE_NAME** in the column name.
   For example if you are working with a relationship, where a distinction needs to be made regarding which family is associated with each column, then the column name will be prefaced with the Family ID. As shown in the following image, the column name might take the form `MI_EQUIP000|MI_SITE_NAME`, where MI_EQUIP000 is the Family ID.



C	D	E
Technical Number	CMMS System	Site Reference Name
000|MI_EQUIP000_EQUIP_TECH_NBR_C	MI_EQUIP000|MI_EQUIP000_SAP_SYSTEM_C	MI_EQUIP000|MI_SITE_NAME
DC-PMP-574000	Houston, TX	Houston, TX

2. Enter the site name to designate the site by which the asset record, once loaded into APM, will be filtered.
3. Continue populating the source workbook, and then run the data loader.

APM Family Data Loader

The APM Family Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Before You Begin

1. Determine Load Type: Single Family or Two Related Families.
   The APM Family Data Loader supports loading records into a single family, or you can load records into one family and records into another family and link the two records together. The type of data that you want to load will determine the sample template with which you will start.
2. Determine What Families and Relationships to Populate.
   You can determine which families are available and how families are related in Family Management. To access Family Management:

Procedure

1. Determine if you want to load data into a single family or into two families that are related to each other.
2. Access a sample APM Family Data Loader source file based on the type of load determined in step 1 on page 75.
3. Determine what families and or relationships you want to populate using the APM Family Data Loader.
4. Export the metadata that reflects the metadata definition for the family or families into which you want to load data.
5. Populate the **Configuration** worksheet.
6. Populate the column headers of the **<Data>** worksheet using the exported metadata.
7. As needed, modify the worksheets to populate unit of measure to apply the correct unit of measure to any of the numeric fields.
8. As needed, modify the worksheets to populate time zones to convert any date or time fields to the correct time zone.

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About the APM Family Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the APM Family Data Loader, APM provides an Excel workbook that must be used to perform the data load.

The following table lists the worksheets that are included in the `APM Family.xlsx` workbook.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
<data>	Where you specify the actual data to be loaded.

Each worksheet in the APM Data Loader workbook contains field values that can be mapped to the appropriate APM Family Data Loader family/field.

Configuration Worksheet

The Configuration worksheet tells the APM Family Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the Configuration worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Number of Rows to Chunk	OPTION_NUMBER_ROWS_TO_CHUNK	Character	Option to break-up or chunk data.
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will not be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.

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Field Caption	Field ID	Data Type (Length)	Comments
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

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Field Caption	Field ID	Data Type (Length)	Comments
Family Type	FAMILY_TYPE	Character	The value is this column should be Entity or Relationship depending on the type of data that is being loaded.
Predecessor Family ID	PRED_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

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Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is Entity, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is Relationship, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE

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Field Caption	Field ID	Data Type (Length)	Comments
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE
Insert with Null Values?	OPTION_INSERT_ON_NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_UPDATE_ON_NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.

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Field Caption	Field ID	Data Type (Length)	Comments
Replace an Existing Link?	OPTION_REPLACE_EXISTING_LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship Location Contains Asset that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.
Allow Change of Family?	OPTION_ALLOW_CHANGE_OF_FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

Family Data Loader Option to Break-up or Chunk Data

When loading data using the Family Data Loader, the data is broken-up into batches, based on the Batch Size specified on the Configuration sheet. The batches of the rows of data are then loaded in parallel into APM. When loading rows of data in parallel, it is possible that multiple rows of data in the same sheet represent the same record, which will cause the same record to be loaded in different batches. This results in creation of duplicate records, if the record in question did not exist in APM at the time that the data load was initiated. So, if the Primary, Predecessor or Successor Action is Insert/Update this scenario could play out. To avoid duplicate records from being created, the Data Loader Framework groups together similar rows of data into the same batch. When working with records the number of rows is relatively small, but when considering links, the number of rows can grow considerably.

When this occurs, it is possible that the number of records in a given batch may exceed the maximum batch size. As a means to avoid the above scenario where the maximum batch size is exceeded or if the number of records in a given batch result in timeout issues, the user may create multiple data loader

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templates with fewer rows per sheet, or they may restructure the data being loaded so that all of the predecessor and successor records are first loaded so that when linking records the predecessor and successor records just need to be located when creating the link between those two records. There is also another option available on the Configuration sheet of the Family Data Loader to break-up or chunk the data in corresponding sheet. Instead of creating multiple data loader templates, the Data Loader Framework will break-up or chunk the rows of data in the corresponding sheet so that the rows in the first chunk are processed and then the rows in the second chunk and so on. In the Data Loader Framework, to chunk the data in the given sheet, you can add a column with following Caption and Name in the Configuration sheet:

- Caption: Number of rows to be chunked together
- Name: OPTION_NUMBER_ROWS_TO_CHUNK

In the corresponding row for that column, specify the number of rows to be chunked together. Specifying a positive integer value >= 1000 will cause the Data Loader Framework to chunk the rows of data into the number of rows specified, if the value is <= 0 this indicates that data chunking is not to occur when loading data for that sheet. Once that chunk of data has been loaded, the next chunk of data will be loaded, and so forth until all the rows of data for that sheet have been loaded. Then processing will continue with the rows of data in the next sheet.

<Data> Worksheet

There is no preexisting format that must be adhered to on the **<data>** worksheet, because the Data Loader operates on a flexible framework. Field captions and ID are determined based on the data that you want to load.

Use the metadata exported from APM to construct the **<data>** worksheet, to populate the rows with the actual data that will be loaded.

Important: If a field is calculated in APM, it cannot be populated through the data loader. If you attempt to load these fields, a warning will appear in the log.

Steps: Export Metadata

Get a copy of the metadata definitions for the family or families that you will be working with to load data.

1. Login to APM.
2. In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Export**.
3. At the top of the page, in the **File Name** box, enter a file name and in the **File Type** box, select **Excel (.xlsx)**.
4. In the **Select metadata type** box, select **Families, Fields and Field Behaviors**.
5. Select the family or families that you want to export and move them to the **Selected Items** list.

   Tip: Be sure to order the families in the order in which you want the fields to appear in the export.
6. Select **Start Export**.

   The metadata is exported, and can be used to populate the **<data>** worksheet.
7. Save the metadata.

> **Export Metadata to Load Thickness Measurements**
>
> If you want to load Thickness Measurements into APM, because Thickness Measurements needs to be related to a Thickness Measurement Location, you must also export that family along with the Has Measurements relationship family.
>
> 1. Log in to APM.
> 2. In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Export**.

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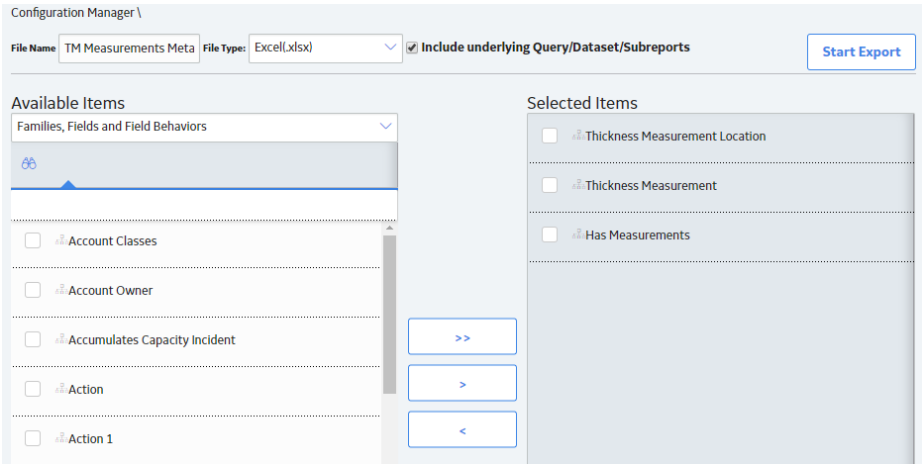
3. At the top of the page, in the **File Name** box, enter a file name (for example, `TM Measurements Metadata`).
4. In the **File Type** box, select **Excel (.xlsx)**.
5. In the **Select metadata type** box, select **Families, Fields, Fields Behaviors**, and then select the following families:
   - **Thickness Measurement Location**
   - **Thickness Measurement**
   - **Has Measurements.**

   Tip: Export the families in this order. This is how the fields appear in the export file.



6. Select **Start Export**.

   The metadata is exported, and can be used to populate the **<data>** worksheet.
7. Save the metadata.

   This exported metadata, is used to build source file template.

Configure the Data Loader Source File to Use Units of Measure

Sometimes the data that is being loaded, is in a different unit of measure than the one associated with the corresponding field in APM. When this is the case, the APM Family Data Loader allows for you to specify the unit of measure that is tied to a specific row and column. This is done by copying the column to which the unit of measure is tied, and then adding the suffix |UOM to the end of the Column ID. Then, in the data, specify the unit of measure ID for the data being loaded. This unit of measure ID needs to be a valid unit of measure as defined in APM, and a valid conversion needs to be specified for the unit of measure specified and the field's unit of measure. Please note that if a unit of measure is not specified, then it will use the field's unit of measure, as defined in APM.

Configure the Data Loader Source File to use Time Zones

Sometimes date and time data that is being loaded was collected in a different time zone than the time zone associated with the current user. When this is the case, the APM Family Data Loader allows you to specify the time zone that is tied to a specific row and column. This is done by copying the column to which the time zone is tied, and then adding the suffix |TZ to the end of the Column ID. Then, in the data, specify the time zone for the data being loaded. A valid list of time zones can be found in the Microsoft .NET documentation. Please note that if a time zone is not specified, then it will use the time zone defined for the current user.

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Example APM Family Workbooks

In addition to the APM Family Data Loader workbook, you can access an example workbook Foundation_APM_Data_Loader-Health Indicators and Readings example.xlsx. This example workbook illustrates how you can use the APM Family Data Loader to load records into a defined APM family and link records in one family to another. You can use the information in this example as a model to configure or define templates for loading data into any baseline or custom family.

The data loader in this example creates Health Indicator records in APM, links the Health Indicator records to Equipment records, and then links the Health Indicator records to Health Indicator Mapping records. Finally, the data loader loads Readings for one of the Health Indicators. In addition, the example spreadsheet includes how you can use a reference worksheet to store list values and other reference information that users can use when populating the data loader template with data.

Populate the Configuration Worksheet

The Configuration Worksheet tells the APM Family Data Loader what types of data are being loaded and how the data is to be loaded.

Populate the HealthIndicators Worksheet

The HealthIndicators worksheet is populated with the actual Health Indicator records you want to load into APM.

Populate the HealthIndicatorsEquipment Worksheet

The HealthIndicatorsEquipment worksheet is populated with the key field values for the Equipment records to which the Health Indicators on the HealthIndicators worksheet will be linked once loaded into APM.

Populate the HealthIndicatorMappings Worksheet

The HealthIndicatorMappings worksheet is populated with the Health Indicator Mappings to load into APM.

Populate the HealthIndicatorReadings Worksheet

The HealthIndicatorReadings worksheet is populated with the actual Health Indicators data you want to load into APM.

On this worksheet, Column C illustrates a feature of the APM Family Data Loader where the unit of measure for a given field can be indicated, so that it can be converted to the baseline unit of measure if needed. Assume, for example, that the MI_TSVALUE_VALUE_N field was defined in APM as being stored in PSIG, but the data in the spreadsheet was represented by BAR(G). As shown in the following image, you can add the UOM column to indicate to that the unit of measure for the source data is BAR(G). When this column is added, the APM Family Data Loader will convert the data from BAR(G) to PSIG (assuming that there is a unit of measure conversion defined for this in APM).

Tip: For more information, refer to the units of measure documentation.

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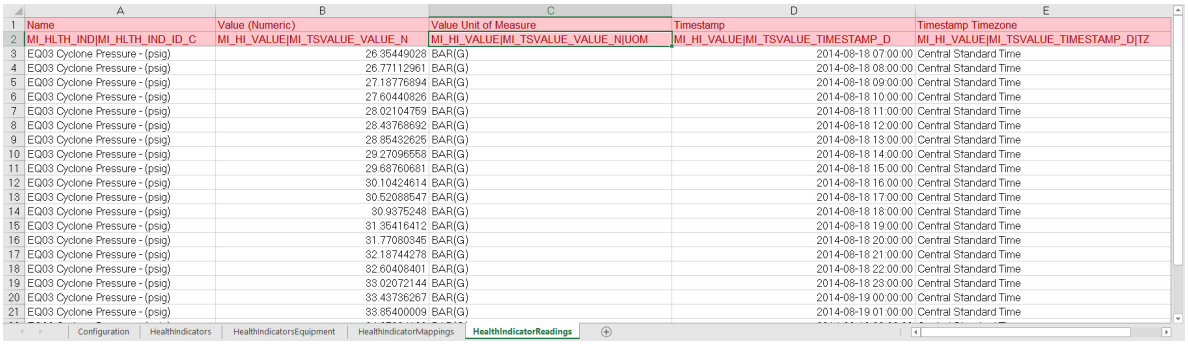
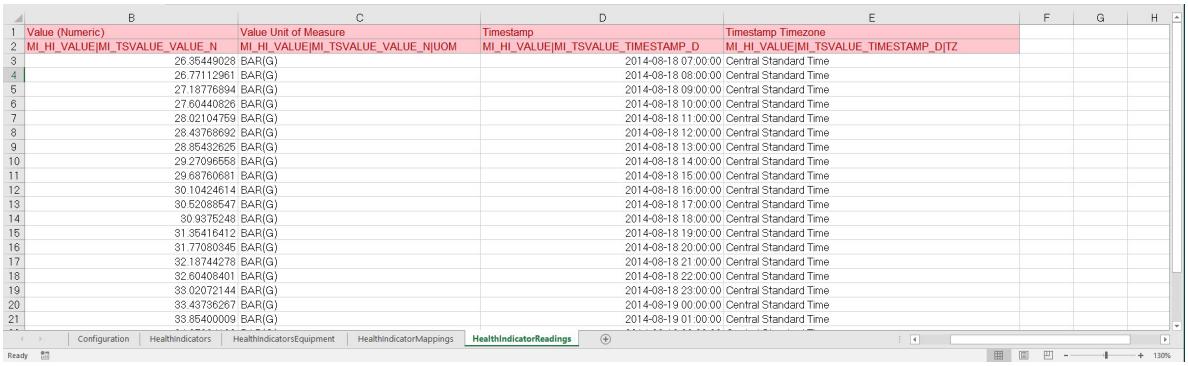


	A	B	C	D	E
1	Name	Value (Numeric)	Value Unit of Measure	Timestamp	Timestamp Timezone
2	MI_HLTH_IND|MI_HLTH_IND_ID_C	MI_HI_VALUE|MI_TSVALUE_VALUE_N	MI_HI_VALUE|MI_TSVALUE_VALUE_N|UOM	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D|TZ
3	EQ03 Cyclone Pressure - (psig)	26.35449028	BAR(G)	2014-08-18 07:00:00	Central Standard Time
4	EQ03 Cyclone Pressure - (psig)	26.77112961	BAR(G)	2014-08-18 08:00:00	Central Standard Time
5	EQ03 Cyclone Pressure - (psig)	27.18776894	BAR(G)	2014-08-18 09:00:00	Central Standard Time
6	EQ03 Cyclone Pressure - (psig)	27.60440826	BAR(G)	2014-08-18 10:00:00	Central Standard Time
7	EQ03 Cyclone Pressure - (psig)	28.02104759	BAR(G)	2014-08-18 11:00:00	Central Standard Time
8	EQ03 Cyclone Pressure - (psig)	28.43768692	BAR(G)	2014-08-18 12:00:00	Central Standard Time
9	EQ03 Cyclone Pressure - (psig)	28.85432625	BAR(G)	2014-08-18 13:00:00	Central Standard Time
10	EQ03 Cyclone Pressure - (psig)	29.27096558	BAR(G)	2014-08-18 14:00:00	Central Standard Time
11	EQ03 Cyclone Pressure - (psig)	29.68760681	BAR(G)	2014-08-18 15:00:00	Central Standard Time
12	EQ03 Cyclone Pressure - (psig)	30.10424614	BAR(G)	2014-08-18 16:00:00	Central Standard Time
13	EQ03 Cyclone Pressure - (psig)	30.52088547	BAR(G)	2014-08-18 17:00:00	Central Standard Time
14	EQ03 Cyclone Pressure - (psig)	30.9375248	BAR(G)	2014-08-18 18:00:00	Central Standard Time
15	EQ03 Cyclone Pressure - (psig)	31.35416412	BAR(G)	2014-08-18 19:00:00	Central Standard Time
16	EQ03 Cyclone Pressure - (psig)	31.77080345	BAR(G)	2014-08-18 20:00:00	Central Standard Time
17	EQ03 Cyclone Pressure - (psig)	32.18744278	BAR(G)	2014-08-18 21:00:00	Central Standard Time
18	EQ03 Cyclone Pressure - (psig)	32.60408401	BAR(G)	2014-08-18 22:00:00	Central Standard Time
19	EQ03 Cyclone Pressure - (psig)	33.02072144	BAR(G)	2014-08-18 23:00:00	Central Standard Time
20	EQ03 Cyclone Pressure - (psig)	33.43736267	BAR(G)	2014-08-19 00:00:00	Central Standard Time
21	EQ03 Cyclone Pressure - (psig)	33.85400009	BAR(G)	2014-08-19 01:00:00	Central Standard Time

Configuration | HealthIndicators | HealthIndicatorsEquipment | HealthIndicatorMappings | HealthIndicatorReadings

Additionally, column E of the HealthIndicatorReadings worksheet illustrates how time zones can be configured. Notice the appendage to the field name as shown in the following image. Adding a column where the Field ID is appended with a |TZ indicates the timezone of the source column data.

Note: If a timezone is not specified, any Date and Time field values are assumed to be in the same timezone as the user who is loading the data.



	B	C	D	E	F	G	H
1	Value (Numeric)	Value Unit of Measure	Timestamp	Timestamp Timezone			
2	MI_HI_VALUE|MI_TSVALUE_VALUE_N	MI_HI_VALUE|MI_TSVALUE_VALUE_N|UOM	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D|TZ			
3	26.35449028	BAR(G)	2014-08-18 07:00:00	Central Standard Time			
4	26.77112961	BAR(G)	2014-08-18 08:00:00	Central Standard Time			
5	27.18776894	BAR(G)	2014-08-18 09:00:00	Central Standard Time			
6	27.60440826	BAR(G)	2014-08-18 10:00:00	Central Standard Time			
7	28.02104759	BAR(G)	2014-08-18 11:00:00	Central Standard Time			
8	28.43768692	BAR(G)	2014-08-18 12:00:00	Central Standard Time			
9	28.85432625	BAR(G)	2014-08-18 13:00:00	Central Standard Time			
10	29.27096558	BAR(G)	2014-08-18 14:00:00	Central Standard Time			
11	29.68760681	BAR(G)	2014-08-18 15:00:00	Central Standard Time			
12	30.10424614	BAR(G)	2014-08-18 16:00:00	Central Standard Time			
13	30.52088547	BAR(G)	2014-08-18 17:00:00	Central Standard Time			
14	30.9375248	BAR(G)	2014-08-18 18:00:00	Central Standard Time			
15	31.35416412	BAR(G)	2014-08-18 19:00:00	Central Standard Time			
16	31.77080345	BAR(G)	2014-08-18 20:00:00	Central Standard Time			
17	32.18744278	BAR(G)	2014-08-18 21:00:00	Central Standard Time			
18	32.60408401	BAR(G)	2014-08-18 22:00:00	Central Standard Time			
19	33.02072144	BAR(G)	2014-08-18 23:00:00	Central Standard Time			
20	33.43736267	BAR(G)	2014-08-19 00:00:00	Central Standard Time			
21	33.85400009	BAR(G)	2014-08-19 01:00:00	Central Standard Time			

Configuration | HealthIndicators | HealthIndicatorsEquipment | HealthIndicatorMappings | HealthIndicatorReadings

Ready

Taxonomy Data Loader

About the Taxonomy Data Loader

The Taxonomy Data Loader loads data from a standard Excel workbook into the Taxonomy data model. The data loader will create or update Taxonomy Categories, Classes, and Types based on the data in the Excel workbook.

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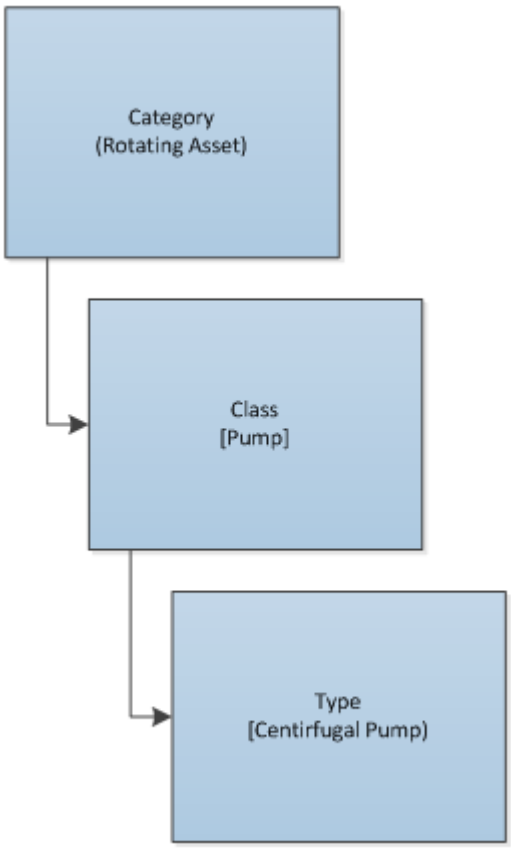
About the Taxonomy Data Loader Data Model

The data for a Taxonomy location is loaded from a single Excel workbook containing a single worksheet.



The Taxonomy Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Before You Begin

As the taxonomy structure is a foundation for analysis and reporting, users should clearly understand the usage and data model for Taxonomy related records prior to implementing the Taxonomy structure.

About This Task

Note: Before reading this section, refer to the Data Model section.

The Taxonomy data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records.

Procedure

1. Load Taxonomy Category.
2. Load Taxonomy Class.
3. Load Taxonomy Type.

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4. Load Taxonomy Mapping Values.

About the Taxonomy Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Taxonomy Data Loader, we provide an Excel workbook, `Taxonomy.xlsx`, which supports baseline data loading of Taxonomy in APM. This workbook must be used to perform the data load. On the Taxonomy worksheets, you will enter the information to load a taxonomy structure that will be assigned to assets within APM.

The baseline file is organized such that each row is capable of creating one node in the data model when all columns contain the appropriate values.

The following table lists the worksheets that are included in the Taxonomy Data Loader workbook.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

Worksheet	Description
Configuration	The **Configuration** worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
TaxonomyCategory	This worksheet is used to link Taxonomy Category data and Taxonomy Class data.
TaxonomyClass	This worksheet is used to link Taxonomy Class data and Taxonomy Type data.
TaxonomyMapping	This worksheet is used to link Taxonomy Type data and Taxonomy Mapping data.

Configuration Worksheet

The **Configuration** worksheet tells the data loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the **Configuration** worksheet.

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Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will not be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>**worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of `<PRIMARY_FAMILY_ID>`. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.

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Field Caption	Field ID	Data Type (Length)	Comments
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		The value is this column should be `Entity` or `Relationship` depending on the type of data that is being loaded.
Predecessor Family ID	PRED_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

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Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Primary Action	PRIMARY_ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is Entity, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the value needs to be ACTION_NONE .

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Field Caption	Field ID	Data Type (Length)	Comments
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity*then the value needs to be ACTION_NONE.
Insert with Null Values?	OPTION_INSERT_ON_NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_UPDATE_ON_NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.

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Field Caption	Field ID	Data Type (Length)	Comments
Replace an Existing Link?	OPTION_REPLACE_EXISTING_LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship Location Contains Asset that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.
Allow Change of Family?	OPTION_ALLOW_CHANGE_OF_FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

TaxonomyCategory

Note: Each row in this worksheet represents a single asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Category Description	SC_TAXOCATG_TAX_CATEG_DESC_C	Character (255)	None

TaxonomyClass

Note: Each row in this worksheet represents a single asset. You should not include the same asset more than once.

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Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Class	SC_TAXOCLAS_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Class Description	'SC_TAXOCLAS_TAX_CLASS_DESC_C	Character (255)	None

TaxonomyType

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Class	SC_TAXOCLAS_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Type	SC_TAXOTYPE_TAX_TYPE_C	Character (50)	This is a key field.
Taxonomy Type Description	SC_TAXOTYPE_TAX_TYPE_DESC_C	Character (255)	None

TaxonomyMapping Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Mapping Category	SC_TAXOMAPP_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Mapping Class	SC_TAXOMAPP_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Mapping Type	SC_TAXOMAPP_TAX_TYPE_C	Character (50)	This is a key field.
Taxonomy Mapping Value	SC_TAXOMAPP_TAX_MAPPI_VALUE_C	Character (255)	This is a key field.

Note: In the baseline logic of APM, the value in the SC_TAXOMAPP_TAX_MAPPI_VALUE_C field on the Taxonomy Mapping family is mapped to the MI_EQUIP000_OBJ_TYP_C field on the Equipment family, and to the MI_FNCLOC00_OBJ_TYP_C field on the Functional Location family. When you change an existing Taxonomy Mapping Value on the Taxonomy Mapping family, the Object Type values on the Equipment and Functional Location records must be synchronized. This is done by executing the Asset Taxonomy Mapping Update policy. This policy can be executed manually; however, it is recommended that you define an execution schedule for this policy, so that this synchronization occurs automatically.

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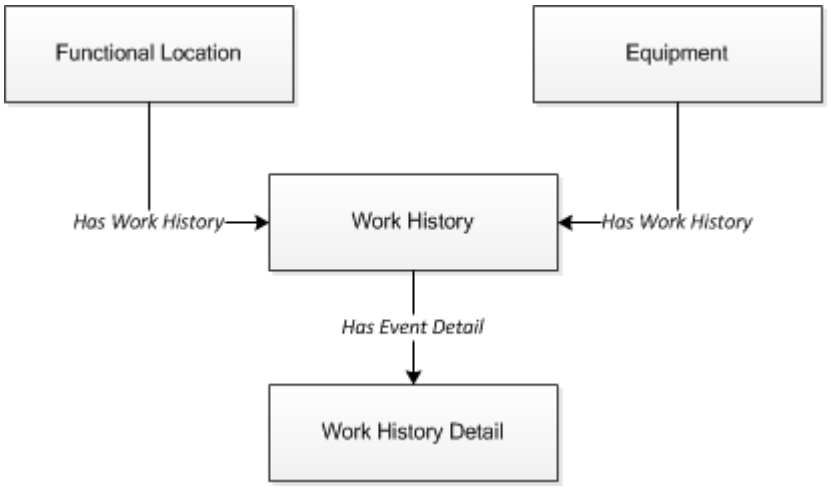
Work History Data Loader

About the Work History Data Loader

The Work History Data Loader allows a user to load historical work order data from an Excel workbook. The loader will create the necessary work history and work history detail records and link them to the corresponding equipment or functional location records as defined in the Excel workbook.

About the Work History Data Loader Data Model

The data for Work History and Work History detail families is loaded from a single Excel workbook containing a single worksheet. This includes Work History and Work History Detail.



Relationships:

- The Work History records are linked to Equipment and/or Functional Location records via the relationship Has Work History [MIR_HSWKHST].
- The Work History Detail records will be related to the appropriate Work History records via the relationship family Has Event Detail [MIR_EVNTDET].

The Work History Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

About This Task

Note: Before reading this section, refer to the Data Model section.

The Work History and Work History Detail data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records.

Procedure

1. Create or Update the Work History record.
2. Link the Work History record to the Asset ID (Equipment or Functional Location).
3. Create or Update the Work History Detail record.
4. Link the Work History Detail record to the associated Work History record.

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Note: There can be multiple Work History Detail records for each Work History record.

Work History Data Loader Load Verification

Use this query in any APM database to populate an Excel format with the required data fields.

Work History Data Query

```
            SELECT 'Customer Event Id' "Customer Event Id",
[MI_EVWKHIST].[MI_EVENT_ID]
            "Event ID", [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C]
"Equipment ID",
            [MI_EQUIP000].[MI_EQUIP000_EQUIP_TECH_NBR_C] "Equipment
Technical Number",
            [MI_FNCLOC00].[MI_FNCLOC00_FNC_LOC_C] "Functional
Location",
            [MI_EVWKHIST].[MI_EVWKHIST_SAP_SYSTEM_C] "CMMS System",
            [MI_EVWKHIST].[MI_EVWKHIST_ACTIV_CAUSE_C] "Activity
Cause",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_PM_ACT_DESC_C] "Activity
Type Description",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_PM_ACT_C] "Activity Type",
            [MI_EVWKHIST].[MI_EVWKHIST_BRKDN_IND_F] "Breakdown
Indicator",
            [MI_EVWKHIST].[MI_EVWKHIST_DETCT_MTHD_CD_C] "Detection
Method Code",
            [MI_EVWKHIST].[MI_EVWKHIST_DETCT_MTHD_DESC_C] "Detection
Method Description",
            [MI_EVWKHIST].[MI_EVWKHIST_EFFCT_CD_C] "Effect Code",
            [MI_EVWKHIST].[MI_EVWKHIST_EFFCT_DESC_C] "Effect
Description",
            [MI_EVWKHIST].[MI_EVWKHIST_EVENT_DATE_DESC_C] "Event Date
Description",
            [MI_EVWKHIST].[MI_EVENT_LNG_DSC_TX] "Event Long
Description",
            [MI_EVWKHIST].[MI_EVENT_SHRT_DSC_CHR] "Event Short
Description",
            [MI_EVWKHIST].[MI_EVENT_STRT_DT] "Event Start Date",
            [MI_EVWKHIST].[MI_EVWKHIST_STATUS_C] "Event Status",
            [MI_EVWKHIST].[MI_EVENT_TYP_CHR] "Event Type",
            [MI_EVWKHIST].[MI_EVWKHIST_FAILR_MODE_CD_C] "Failure Mode
Code",
            [MI_EVWKHIST].[MI_EVWKHIST_FAILR_MODE_DESC_C] "Failure
Mode Description",
            [MI_EVWKHIST].[MI_EVWKHIST_FAILURE_REM_T] "Failure
Remarks",
            [MI_EVWKHIST].[MI_EVWKHIST_FNCTNL_LOSS_CD_C] "Functional
Loss Code",
            [MI_EVWKHIST].[MI_EVWKHIST_FNCTNL_LOSS_DESC_C] "Functional
Loss Description",
            [MI_EVWKHIST].[MI_EVWKHIST_MAINT_COMPL_D] "Maintenance
Completion Date",
            [MI_EVWKHIST].[MI_EVWKHIST_MAINT_CST_UOM_C] "Maintenance
Cost UOM",
            [MI_EVWKHIST].[MI_EVWKHIST_MAINT_CST_N] "Maintenance
Cost",
            [MI_EVWKHIST].[MI_EVWKHIST_MAINT_START_D] "Maintenance
Start Date",
            [MI_EVWKHIST].[MI_EVWKHIST_MECH_DWN_TIME_N] "Mechanical
```

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```
Down Time",
            [MI_EVWKHIST].[MI_EVWKHIST_MECH_AVAIL_D] "Mechanically
Available Date",
            [MI_EVWKHIST].[MI_EVWKHIST_MECH_UNAVL_D] "Mechanically
Unavailable Da",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_CRT_DT_D] "Order Creation
Date",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_DESC_C] "Order
Description",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_ID_C] "Order ID",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_MAINT_PLAN_C] "Order
Maintenance Plan",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_PRTY_DESC_C] "Order
Priority Description",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_PRTY_C] "Order Priority",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_REF_DT_D] "Order Reference
Date",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_CND_DES_C] "Order
System Condition Desc",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_COND_C] "Order System
Condition",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_STAT_C] "Order System
Status",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_TYP_CD_C] "Order Type
Code",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_TYP_DESC_C] "Order Type
Description",
            [MI_EVWKHIST].[MI_EVWKHIST_ORDR_USER_STAT_C] "Order User
Status",
            [MI_EVWKHIST].[MI_EVWKHIST_PM_NBR_C] "PM Number",
            [MI_EVWKHIST].[MI_EVWKHIST_PRDN_CST_N] "Production Cost",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_ID_C] "Request ID",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_CRT_DT_D] "Request
Creation Date",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_DESC_C] "Request
Description",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_PRTY_DESC_C] "Request
Priority Descriptio",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_PRTY_C] "Request
Priority",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_SYS_STAT_C] "Request
System Status",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_TYP_CD_C] "Request Type
Code",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_TYP_DESC_C] "Request Type
Description",
            [MI_EVWKHIST].[MI_EVWKHIST_RQST_USER_STAT_C] "Request User
Status",
            [MI_EVWKHIST].[MI_EVWKHIST_SCHED_COMPL_D] "Scheduled
Completion Date",
            [MI_EVWKHIST].[MI_EVWKHIST_SCHED_START_D] "Scheduled Start
Date",
            [MI_EVWKHIST].[MI_EVWKHIST_TARGET_COMPL_D] "Target
Completion Date",
            [MI_EVWKHIST].[MI_EVWKHIST_TARGET_START_D] "Target Start
Date",
            [MI_EVWKHIST].[MI_EVWKHIST_TIME_TO_REPR_N] "Time To Repair
(TTR)",
            [MI_EVWKHIST].[MI_EVWKHIST_TOTL_CST_N] "Total Cost",
            [MI_EVWKHIST].[MI_EVWKHIST_WORK_HIST_TYPE_C] "Work History
Type",
```


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```
            [MI_EVWKHIST].[MI_EVWKHIST_WO_PRIORTY_N] "Work Order
Priority",
            'WHD_Customer WHD ID' "WHD_Customer WHD ID", [MI_DTWKHIST].
[MI_DTWKHIST_EVNT_DTL_ID_C]
            "WHD_Work History Detail ID", [MI_DTWKHIST].
[MI_DTWKHIST_EVNT_DTL_DESC_C]
            "WHD_Work Hist Detail Desc", [MI_DTWKHIST].
[MI_DTWKHIST_ORDR_ID_C]
            "WHD_Order ID", [MI_DTWKHIST].[MI_DTWKHIST_RQST_ID_C]
"WHD_Request ID",
            [MI_DTWKHIST].[MI_DTWKHIST_CAUSE_CD_C] "WHD_Cause Code",
            [MI_DTWKHIST].[MI_DTWKHIST_CAUSE_DESC_C] "WHD_Cause
Description",
            [MI_DTWKHIST].[MI_DTWKHIST_CNDTN_CD_C] "WHD_Condition
Code",
            [MI_DTWKHIST].[MI_DTWKHIST_CNDTN_DESC_C] "WHD_Condition
Description",
            [MI_DTWKHIST].[MI_DTWKHIST_DTL_NARTV_T] "WHD_Detail
Narrative",
            [MI_DTWKHIST].[MI_DTWKHIST_MAINT_ITEM_CD_C]
"WHD_Maintainable Item Code",
            [MI_DTWKHIST].[MI_DTWKHIST_MAINT_ITEM_DESC_C]
"WHD_Maintainable Item Desc",
            [MI_DTWKHIST].[MI_DTWKHIST_MAINT_ACTN_CD_C]
"WHD_Maintenance Action Code",
            [MI_DTWKHIST].[MI_DTWKHIST_MAINT_ACTN_DESC_C]
"WHD_Maintenance Action Desc"
            FROM [MI_EVWKHIST] JOIN_PRED [MI_EQUIP000] JOIN_PRED
[MI_FNCLOC00]
            ON {MIR_FLHSEQ} ON {MIR_HSWKHST} JOIN_SUCC [MI_DTWKHIST]
ON {MIR_EVNTDET}
```

About the Work History Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

To import data using the Work History Data Loader, APM provides an Excel workbook, `Work History.xlsx`, which supports baseline data loading of work history and work history detail records in APM. This workbook must be used to perform the data load.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

The following table lists the worksheets that are included in the Foundation Work History Data Loader workbook.

Worksheet	Description
Configuration	The **Configuration** worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
WorkHistory	This worksheet is used to specify data for import to the Work History family.

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Worksheet	Description
WorkHistoryToWHDetails	This worksheet is used to specify data for import to the Work History Detail family.
WorkHistoryToEquipment	This worksheet is used to link Work History to Equipment records.
WorkHistoryToFLOCs	This worksheet is used to link Work History to Functional Location records.

Configuration Worksheet

The **Configuration** worksheet tells the Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the **Configuration** worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Number of Rows to Chunk	OPTION_NUMBER_ROWS_TO_CHUNK	Character	Option to break-up or chunk data.
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will not be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.

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Field Caption	Field ID	Data Type (Length)	Comments
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

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Field Caption	Field ID	Data Type (Length)	Comments
Family Type	FAMILY_TYPE	Character	The value is this column should be Entity or Relationship depending on the type of data that is being loaded.
Predecessor Family ID	PRED_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

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Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is Entity, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is Relationship, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE

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Field Caption	Field ID	Data Type (Length)	Comments
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE
Insert with Null Values?	OPTION_INSERT_ON_NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_UPDATE_ON_NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.

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Field Caption	Field ID	Data Type (Length)	Comments
Replace an Existing Link?	OPTION_REPLACE_EXISTING_LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship Location Contains Asset that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.
Allow Change of Family?	OPTION_ALLOW_CHANGE_OF_FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

WorkHistory

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVENT_ID	Character (255)	Generated by the system, and is not loaded.
CMMS System	MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Equipment ID	MI_EVENT_ASST_ID_CHR	Character (255)	Used as unique key to find equipment.
Asset Tech ID	MI_EVWKHIST_ASST_TECH_ID_C	Character (255)	None

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Field ID	Filed Caption	Data Type (Length)	Comments
Location ID	MI_EVENT_LOC_ID_CHR	Character (255)	Is a key field, and is used to find Functional Location.
Activity Cause	MI_EVWKHIST_ACTIV_CAUSE_C	Character (255)	None
Activity Cause Description	MI_EVWKHIST_ACTIV_CAUSE_DESC_C	Character (255)	None
Activity Type	MI_EVWKHIST_ORDR_PM_ACT_C	Character (50)	None
Activity Type Description	MI_EVWKHIST_ORDR_PM_ACT_DESC_C	Character (255)	None
Breakdown Indicator	MI_EVWKHIST_BRKDN_IND_F	Boolean	None
Detection Method Code	MI_EVWKHIST_DETCT_MTHD_CD_C	Character (50)	None
Detection Method Description	MI_EVWKHIST_DETCT_MTHD_DESC_C	Character (255)	None
Effect Code	MI_EVWKHIST_EFFCT_CD_C	Character (50)	None
Effect Description	MI_EVWKHIST_EFFCT_DESC_C	Character (50)	None
Event Date Description	MI_EVWKHIST_EVENT_DATE_DESC_C	Character (255)	None
Event Long Description	MI_EVENT_LNG_DSC_TX	Text	None
Event Short Description	MI_EVENT_SHRT_DSC_CHR	Character (255)	None
Event Start Date	MI_EVENT_STRT_DT	Date	None
Event Status	MI_EVWKHIST_STATUS_C	Character (50)	None
Event Type	MI_EVENT_TYP_CHR	Character (255)	None
Failure Mode Code	MI_EVWKHIST_FAILR_MODE_CD_C	Character (50)	None
Failure Mode Description	MI_EVWKHIST_FAILR_MODE_DESC_C	Character (255)	None
Failure Remarks	MI_EVWKHIST_FAILURE_REM_T	Text	None
Functional Loss Code	MI_EVWKHIST_FNCTNL_LOSS_CD_C	Character (50)	None
Functional Loss Description	MI_EVWKHIST_FNCTNL_LOSS_DESC_C	Character (50)	None
Maintenance Completion Date	MI_EVWKHIST_MAINT_COMPL_D	Date	None
Maintenance Cost UOM	MI_EVWKHIST_MAINT_CST_UOM_C	Character (10)	None
Maintenance Cost	MI_EVWKHIST_MAINT_CST_N	Numeric	None
Maintenance Start Date	MI_EVWKHIST_MAINT_START_D	Date	None
Mechanical Down Time	MI_EVWKHIST_MECH_DWN_TIME_N	Numeric	Calculated by system.
Mechanically Available Date	MI_EVWKHIST_MECH_AVAIL_D	Date	None

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Field ID	Filed Caption	Data Type (Length)	Comments
Mechanically Unavailable Date	MI_EVWKHIST_MECH_UNAVL_D	Date	None
Order Creation Date	MI_EVWKHIST_ORDR_CRT_DT_D	Date	None
Order Description	MI_EVWKHIST_ORDR_DESC_C	Character (255)	None
Order ID	MI_EVWKHIST_ORDR_ID_C	Character (50)	None
Order Maintenance Plan	MI_EVWKHIST_ORDR_MAINT_PLAN_C	Character (50)	None
Order Priority	MI_EVWKHIST_ORDR_PRTY_C	Character (50)	None
Order Priority Description	MI_EVWKHIST_ORDR_PRTY_DESC_C	Character (255)	None
Order Reference Date	MI_EVWKHIST_ORDR_REF_DT_D	Date	None
Order System Condition	MI_EVWKHIST_ORDR_SYS_COND_C	Character (50)	None
Order System Condition Description	MI_EVWKHIST_ORDR_SYS_CND_DES_C	Character (255)	None
Order System Status	MI_EVWKHIST_ORDR_SYS_STAT_C	Character (255)	None
Order Type Code	MI_EVWKHIST_ORDR_TYP_CD_C	Character (50)	None
Order Type Description	MI_EVWKHIST_ORDR_TYP_DESC_C	Character (50)	None
Order User Status	MI_EVWKHIST_ORDR_USER_STAT_C	Character (255)	None
PM Number	MI_EVWKHIST_PM_NBR_C	Character (255)	None
Production Cost	MI_EVWKHIST_PRDN_CST_N	Numeric	None
Request ID	MI_EVWKHIST_RQST_ID_C	Character (50)	None
Request Creation Date	MI_EVWKHIST_RQST_CRT_DT_D	Date	None
Request Description	MI_EVWKHIST_RQST_DESC_C	Character (255)	None
Request Priority	MI_EVWKHIST_RQST_PRTY_C	Character (50)	None
Request Priority Description	MI_EVWKHIST_RQST_PRTY_DESC_C	Character (255)	None
Request System Status	MI_EVWKHIST_RQST_SYS_STAT_C	Character (255)	None
Request Type Code	MI_EVWKHIST_RQST_TYP_CD_C	Character (50)	None
Request Type Description	MI_EVWKHIST_RQST_TYP_DESC_C	Character (255)	None
Request User Status	MI_EVWKHIST_RQST_USER_STAT_C	Character (255)	None
Scheduled Completion Date	MI_EVWKHIST_SCHED_COMPL_D	Date	None
Scheduled Start Date	MI_EVWKHIST_SCHED_START_D	Date	None
Target Completion Date	MI_EVWKHIST_TARGET_COMPL_D	Date	None
Target Start Date	MI_EVWKHIST_TARGET_START_D	Date	None

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Field ID	Filed Caption	Data Type (Length)	Comments
Work History Type	MI_EVWKHIST_WORK_HIST_TYPE_C	Character (50)	None
Work Order Priority	MI_EVWKHIST_WO_PRIORTY_N	Numeric	None
Site Reference Name	MI_SITE_NAME	Character (50)	None

WorkHistoryToWHDetails Worksheet

On the WorkHistoryToWHDetails worksheet, you will find work history and work history detail fields.

Note: Each row in this worksheet represents a unique record. You should not include the same asset more than once.

Field ID	Field Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	Generated by the system, and is not loaded.
CMMS System	MI_EVWKHIST|MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Work Detail History ID	MI_DTWKHIST|MI_DTWKHIST_EVNT_DTL_ID_C	Character (50)	None
CMMS System	'MI_DTWKHIST|MI_DTWKHIST_SAP_SYSTEM_C	Character (50)	None
Work History ID	MI_DTWKHIST|MI_DTWKHIST_WRK_HISTRY_ID_C	Character (50)	None
Work History Detail Description	MI_DTWKHIST|MI_DTWKHIST_EVNT_DTL_DESC_C	Character (255)	None
Order ID	MI_DTWKHIST|MI_DTWKHIST_ORDR_ID_C	Character (50)	None
Request ID	MI_DTWKHIST|MI_DTWKHIST_RQST_ID_C	Character (50)	Request ID from the associated order ID on the WH record, if not work order.
Cause Code	MI_DTWKHIST|MI_DTWKHIST_CAUSE_CD_C	Character (50)	None
Cause Description	'MI_DTWKHIST|MI_DTWKHIST_CAUSE_DESC_C	Character (255)	None
Condition Code	MI_DTWKHIST|MI_DTWKHIST_CNDTN_CD_C	Character (20)	None
Condition Description	MI_DTWKHIST|MI_DTWKHIST_CNDTN_DESC_C	Character (255)	None
Detail Narrative	MI_DTWKHIST|MI_DTWKHIST_DTL_NARTV_T	Text	None
Maintainable Item Code	MI_DTWKHIST|MI_DTWKHIST_MAINT_ITEM_CD_C	Character (50)	None

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Field ID	Field Caption	Data Type (Length)	Comments
Maintainable Item Description	MI_DTWKHIST|MI_DTWKHIST_MAINT_ITEM_DESC_C	Character (255)	None
Maintenance Action Code	MI_DTWKHIST|MI_DTWKHIST_MAINT_ACTN_CD_C	Character (50)	None
Maintenance Action Description	MI_DTWKHIST|MI_DTWKHIST_MAINT_ACTN_DESC_C	Character (255)	None
Equipment ID	MI_DTWKHIST|MI_DTWKHIST_ASST_ID_C	Character (50)	None
Functional Location ID	MI_DTWKHIST|MI_DTWKHIST_LOC_ID_C	Character (50)	None
Site Reference Name	MI_DTWKHIST|MI_SITE_NAME	Character (50)	None
Sub Object Number	MI_DTWKHIST|MI_DTWKHIST_SUB_OBJECT_NUM_C	Character (50)	None.

WorkHistoryToEquipment Worksheet

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	None
CMMS System	'MI_EVWKHIST|MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Equipment ID	'MI_EQUIP000|MI_EQUIP000_EQUIP_ID_C	Character (50)	None
CMMS System	'MI_EQUIP000|MI_EQUIP000_SAP_SYSTEM_C	Character (50)	None

WorkHistoryToFLOCs Worksheet

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	None
CMMS System	'MI_EVWKHIST|MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Functional Location Internal	'MI_FNCLOC00|MI_FNCLOC00_INTERNAL_ID_C	Character (50)	None
CMMS System	'MI_FNCLOC00|MI_FNCLOC00_SAP_SYSTEM_C	Character (50)	None

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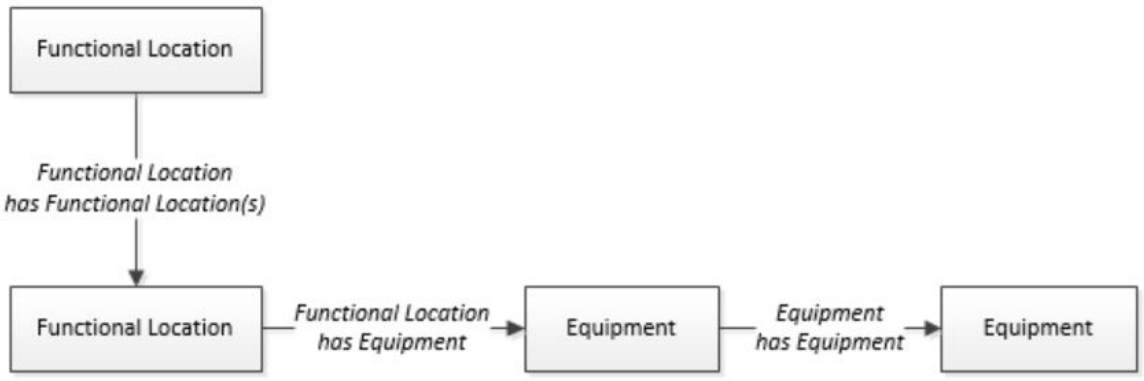
Equipment and Functional Location Data Loader

About the Equipment and Functional Location Data Loader

The Equipment and Functional Location Data Loader allows a user to import data from an Excel workbook. The user is able to build out the asset hierarchy based on structure defined in the Excel workbook.

About the Equipment and Functional Location Data Loaders Data Model

The data for Equipment and Functional Location is loaded from a single Excel workbook containing multiple worksheets. This includes Functional Locations and Equipment.



The Functional Location can be linked to a parent Functional Location using the relationship Functional Location Has Functional Location(s).

The Equipment and Functional Location Data Loader General Loading Strategy

This topic describes any prerequisites to loading the data and the order in which the data will be loaded for Equipment and Functional Location Data Loaders.

Before You Begin

Equipment Taxonomy data must be present prior to loading Equipment and Functional Location data.

About This Task

Note: Before reading this section, refer to the Data Model section.

The Equipment and Functional Location data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records.

Procedure

1. Create the Functional Location.
2. Create the Equipment.

   The Equipment and Functional Location Data Loaders have the listed limitations.

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- The Functional Location hierarchy can be constructed in the loader by assigning the parent Functional Location (superseding Functional Location) to the child record.
- CMMS-ID is a required field that is intended to identify the original source of the data and part of the key value.
- After loading Equipment records into APM with a specific site reference, you cannot update the Equipment records to have global site references by reimporting the workbook with the site reference column updated to global on the Equipment worksheet. To update Equipment records to have global site references, you must update the predecessor Functional Locations with the site reference value *Global* on the worksheet.

  In APM, records inherit their site references from their predecessor records. Additionally, when the Equipment and Functional Location Data Loader is run, it loads Equipment records first, and then loads Functional Location records. Therefore, to change the equipment record's site reference to global, you would need to re-import the workbook with the Functional Location record indicating a *Global* site reference.

About the Equipment and Functional Location Data Loaders Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Equipment and Functional Location Data Loaders, APM provides an Excel workbook, `Equipment and Functional Location.xlsx`, which supports baseline data loading of equipment and functional locations in APM. This workbook must be used to perform the data load.

The master Excel workbook contains one worksheet for each node that will be populated in the data model.

The following table lists the worksheets that are included in the Equipment and Functional Location Data Loaders workbook.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
Equipment	This worksheet is used to specify data for import to the Equipment family.
EquipmentToSuperiorEquipment	This worksheet is used to link Equipment to Superior Equipment records.
FunctionalLocations	This worksheet is used to specify data for import to the Functional Location family.
FuncLocsToEquipment	This worksheet is used to link existing Functional Location records to existing Equipment records.
FuncLocsToSuperiorFuncLocs	This worksheet is used to link existing Functional Locations to superior Functional Locations.

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Configuration Worksheet

The Configuration worksheet tells the Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the Configuration worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Number of Rows to Chunk	OPTION_NUMBER_ROWS_TO_CHUNK	Character	Option to break-up or chunk data.
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will not be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

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Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE	Character	The value is this column should be Entity or Relationship depending on the type of data that is being loaded.
Predecessor Family ID	PRED_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.

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Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family Key Fields	PRED_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

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Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is Entity, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is Relationship, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE

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Field Caption	Field ID	Data Type (Length)	Comments
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is Entity then the values needs to be • ACTION_NONE
Insert with Null Values?	OPTION_INSERT_ON_NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_UPDATE_ON_NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.

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Field Caption	Field ID	Data Type (Length)	Comments
Replace an Existing Link?	OPTION_REPLACE_EXISTING_LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship Location Contains Asset that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.
Allow Change of Family?	OPTION_ALLOW_CHANGE_OF_FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

Equipment Worksheet

On the Equipment worksheet, you will specify Equipment that you want to load into APM.

Note: Each row in this worksheet represents a unique asset. You should not include the same asset more than once.

Field Caption	Field Column Name	Data Type (Length)	Comment
Maintenance Plant	MI_EQUIP000_MAINT_PLANT_C	Character (50)	This field is required, and is used to group or batch the equipment records.
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (225)	This is a key field.

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Field Caption	Field Column Name	Data Type (Length)	Comment
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	None
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field.
Site Reference Name	MI_SITE_NAME	Character (255)	**Important:** Site Reference records must preexist in APM. The data loader does not create Site Reference records, but simply provides foreign key data in the asset records, as determined in the source workbook. If the site reference record does not preexist, then you will receive an error. 1. Enter the site name to designate which site the Equipment record, once loaded into APM, will be filtered by. -or- 1. Enter *Global* to indicate a that the site reference should be left global. Meaning that it will not be filtered by site in APM. **Note:** Only super users are permitted to update Site Reference records.
Equipment Short Description	MI_EQUIP000_EQUIP_SHRT_DESC_C	Character (255)	None
Equipment Long Description	MI_EQUIP000_EQUIP_LNG_DESC_T	Text	None
Object Type (Taxonomy Mapping Value)	MI_EQUIP000_OBJ_TYP_C	Character (50)	None
Equipment System Status	MI_EQUIP000_SYS_ST_C	Character (255)	None
Manufacturer	MI_EQUIP000_MFR_C	Character (255)	None
Model Number	MI_EQUIP000_MOD_NO_C	Character (255)	None
Equipment Serial Number	MI_EQUIP000_SN_C	Character (255)	None

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Field Caption	Field Column Name	Data Type (Length)	Comment
Active	'MI_EQUIP000_ACTIVE_F	Logical	None
Equipment uniquely identified by SAP System - Equipment ID	MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.

FunctionalLocations Worksheet

On the FunctionalLocations worksheet, you enter information for Functional Locations and the Functional Location hierarchy.

Note: Each row in this worksheet represents a unique asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.
Functional Location	MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field.

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Field Caption	Field ID	Data Type (Length)	Comments
Site Reference Name	MI_SITE_NAME	Character (255)	**Important:** Site Reference records must preexist in APM. The data loader does not create Site Reference records, but simply provides foreign key data in the asset records, as determined in the source workbook. If the site reference record does not preexist, then you will receive an error. 1. Enter the site name to designate the site by which the Functional Location record, once loaded into APM, will be filtered. -or- 1. Enter *Global* to indicate a that the site reference should be left global. Meaning that it will not be filtered by site in APM. **Note:** Only Super Users are permitted to update Site Reference records.
Functional Location Description	MI_FNCLOC00_FNC_LOC_DESC_C	Character (255)	None
Functional Location Long Description	MI_FNCLOC00_FNC_LOC_LNG_DESC_C	Text	None
Object Type (Taxonomy Mapping Value)	MI_FNCLOC00_OBJ_TYP_C	Character (50)	None
System Status	MI_FNCLOC00_SYS_STATUS_C	Character (255)	None

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Field Caption	Field ID	Data Type (Length)	Comments
Is a Process Unit?	SC_FNCLOC00_IS_A_PROCE_UNIT_L	Logical	None
Functional Location uniquely identified by SAP System - Functional Location Internal ID	MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.

FuncLocsToEquipment

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.
Functional Location	MI_FNCLOC00| MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field. Functional Location CMMS System.
Functional Location uniquely identified by System - Functional Location ID	MI_FNCLOC00| MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (225)	This is a key field.

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Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field. Equipment CMMS System.
Equipment uniquely identified by System - Equipment ID	MI_EQUIP000| MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Equipment ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.

FuncLocsToSuperiorFuncLocs

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	<PRED_FAMILY_ID>| MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	<PRED_FAMILY_ID>| MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.
Functional Location	<PRED_FAMILY_ID>| MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	<PRED_FAMILY_ID>| MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field. Functional Location CMMS System.
Functional Location uniquely identified by System - Functional Location ID	<PRED_FAMILY_ID>| MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.
Predecessor Family ID	PRED_FAMILY_ID	Character (255)	None
Functional Location Internal ID	<SUCC_FAMILY_ID>| MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.

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Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	<SUCC_FAMILY_ID>| MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field. Equipment CMMS System.
Functional Location uniquely identified by System - Functional Location ID	<SUCC_FAMILY_ID>| MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note:** You should not use this field if you have an on-premises implementation of APM.
Successor Family ID	SUCC_FAMILY_ID	Character (255)	This is a key field.

EquipmentToSuperiorEquipment Worksheet

On the EquipmentToSuperiorEquipment worksheet, you specify the hierarchy between an Equipment and its Superior Equipment. This generates the relationships between the entities in the database.

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	<PRED_FAMILY_ID>| MI_EQUIP000_MAINT_PLANT_C	Character (50)	This value identifies the plant responsible for maintenance. This field is not required to contain a value, but entering a value is recommended as it could be useful for searches or data analysis.
CMMS System	<PRED_FAMILY_ID>| MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This value identifies the parent family and EAM system as defined in APM.
Equipment ID	<PRED_FAMILY_ID>| MI_EQUIP000_EQUIP_ID_C	Character (255)	This value identifies the parent family and equipment ID as defined in APM.
Predecessor Equipment Unique ID	<PRED_FAMILY_ID>| MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Equipment ID>.
Predecessor Family ID	PRED_FAMILY_ID	Character (255)	This value identifies the parent family as defined in APM.

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Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	<SUCC_FAMILY_ID>|MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This value identifies the child family and EAM system as defined in APM.
Equipment ID	<SUCC_FAMILY_ID>|MI_EQUIP000_EQUIP_ID_C	Character (255)	This value identifies the child family and equipment ID as defined in APM.
Successor Equipment Unique ID	<SUCC_FAMILY_ID>|MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Equipment ID>.
Successor Family ID	SUCC_FAMILY_ID	Character (255)	This value identifies the child family as defined in APM. This is a key field.

The value of this field has the format YYYY-MO-DDTHH:MN:SS.ttt+OOOO, where:

- YYYY is the 4-digit year.
- MO is the 2-digit month.
- DD is the 2-digit day.
- HH is the 2-digit hour in 24-hour time.
- MN is the 2-digit minute.
- SS is the 2-digit second.
- ttt is the 3 digit thousandths of a second.
- OOOO is the 4-digit offset from UTC.

The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.

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Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: the corresponding worksheet will be processed. • False: The corresponding worksheet will not be loaded into the Meridium database.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

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Chapter 8

Automatic Data Loader

Topics:

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About the Automatic Data Loader Job

The Automatic Data Loader can load `.xlsx` files created with Microsoft Excel version 2007 and above or `.zip` files into the system from an on-premises installation of APM Connect.

Note: To be able to load data successfully using Automatic Data Loader, make sure that:

- The file name length is not more than 100 characters.
- The file path of the scan directory is not more than 150 characters from root.
- The file name does not contain any special characters.
- Data loader templates are followed for loading the data in excel files.

APM provides a method to automatically load data into the system from correctly formatted `.xlsx` or a `.zip` file containing correctly formatted `.csv` files. You must place your data loader workbook in the correct directory for a successful data load.

The job monitors a configured load directory for the presence of a file in a subdirectory and stages the contents of the file into the system. Multiple files moved into the directory are processed in descending order according to the last modified time stamp on each file.

The system logs the staging progress and archives the files in an archive directory. If data fails to stage or upload, a message is written to the log indicating the reason for failure, and the source files are moved to the FAILED FILES directory.

A service then retrieves the staged workbooks, and, using an administrative account, the service invokes the appropriate data loader to load the data contained in the workbooks.

Set up the Automatic Data Loader Job

Before You Begin

APM Connect must be installed.

Procedure

1. Access the APM Connect Administration Center.
2. In the **Menu** pane, in the **Conductor** section, select **Job Conductor**.
3. In the **Job Conductor** toolbar, select **Add**.

   The **Execution task** pane is enabled.
4. In the **Execution task** pane, in the **Label** box, enter a label for the job.
5. In the **Description** box, enter a description for the job.
6. Select the **Active** check box.
7. In the **Job** section, select  .

   The **Import generated code** window appears.
8. Select **Browse...**, and then navigate to the folder containing the updated jobs package.
9. Select the job **dinokeeper.zip**, and then select **Launch upload**.

   The job is imported into the **Job Conductor**.
10. Configure the context file to identify the location of the load directory, the archive directory, and the log file.

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11. Modify the <Context_File_PATH> value in the job conductor context parameters to point to the context file for the job.
12. Run the job.

Results

The job conductor indicates that the job ran successfully, and the automatic data loader directories will be created if they do not already exist.

You can now place workbooks in the appropriate data loader directory.

Configure the Context File

Before You Begin

The context file provides the automatic data loader job with the information it needs to locate the directories and log the file it requires.

You should have imported the automatic data loader job.

Procedure

1. Navigate to the following folder: **C:\APMConnect\Config\<system>**
2. Modify the file **ContextFile.xml** to indicate the values for your system.

Parameter	Description	Default or recommended value
CONFIG_FILE_PATH	The path to the context file used for extraction.	Enter your unique value (for example, C:\APMConnect\Config \ContextFile.xml).
SCAN_DIR	The directory that contains the directories from which the job retrieves workbooks to load data.	Enter your unique value (for example, C:\APMConnect \Dinokeeper). **Important:** Because this job runs with administrative authority, you must control user access to this directory.
ARCHIVE_DIR	The directory that the facility uses to archive workbooks.	Enter your unique value (for example, C:\APMConnect \Archives).
SAP_CLOUD_ENABLED or MAXIMO_CLOUD_ENABLED	Determines whether the Adapter will be used in a cloud environment.	This is a required parameter. You must enter one of the following values: • true: Adapters will be run in the cloud. • false: Adapters will be run on premises.
APM_USERID	The APM user ID.	Enter your unique value.
APM_PASSWORD	The APM password.	Enter your unique value.
APM_DATASOURCE	The name of the APM data source to which the data will be exported.	This is a required parameter only for the on-premises implementation. Enter your unique value.

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Parameter	Description	Default or recommended value
APM_API_APP_SERVER	The name of the APM server	This is a required parameter only for the on-premises implementation. Enter your unique value.
APM_APP_SERVER	The name of the APM server	This is a required parameter only for the on-premises implementation. Enter your unique value.

Use the Automatic Data Loader

Use the Automatic Data Loader job to manually or programmatically load asset data to APM.

About This Task

By default, the Automatic Data Loader job processes the files in the directories based on the alphanumeric directory name and then the time stamp of the files from oldest to most recent.

Procedure

1. Identify the directory that corresponds to the data loader you are using.
2. Move the data loader files (either a correctly formatted `.xlsx` or a `.zip` file that contains correctly formatted `.csv` files) into the identified directory.

The Automatic Data Loader Directories

The automatic data loader job uses directories within the directory identified in the SCAN_DIR parameter to identify the data loader to use for a particular workbook.

Data Loaders and Directories

The following table lists the directories that are created when the job starts that correspond to the various data loaders.

Note: For a Custom Data Loader, you now have the option of creating a directory with the same name as the new Loader ID and process the files within.

Data Loader Name	Folder Name
Family Data Loader	FamilyDataLoader
Equipment and Functional Location Loader	EquipmentFunctionalLocationLoader
Taxonomy Data Loader	TaxonomyLoader
Work History Loader	WorkHistoryLoader
Production Loss Analysis (PLA) 1 - Admin	PLAAdminBatchDataLoader
Production Loss Analysis (PLA) 2 - Event	PLAEventBatchDataLoader
Production Loss Analysis (PLA) 3 - Plan	PLAPlanBatchDataLoader
Root Cause Analysis (RCA)	RCABatchDataLoader

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Data Loader Name	Folder Name
System Reliability Data Loader	SystemReliabilityBatchDataLoader
Asset Criticality Analysis (ACA Checklist)	ACACheckListDataLoader
Asset Criticality Analysis (ACA)	ACAMatrixDataLoader
GIS Data Loader	GISDATALOADER
Policy Instance Data Loader	PolicyInstanceBatchDataLoader
Role Data Loader	RolesDataLoader
Rounds Allowable Values	AllowableValuesBatchDataLoader
Rounds Readings	ReadingsBatchDataLoader
Rounds Routes	RouteBatchDataLoader
Rounds Templates and Template Groups	TemplateBatchDataLoader
Inspection Management (IM) Assets	IMBatchAssetDataLoader
Inspection Management (IM) Functional Location	IMBatchFLDataLoader
RBI Components To TML Groups Relationship	RBITMBatchDataLoader
Risk Based Inspection (RBI) 580	RBI580BatchDataLoader
Risk Based Inspection (RBI) 581	RBI581BatchDataLoader
Risk Based Inspection (RBI) Corrosion Loop	RBICorrosionLoopBatchDataLoader
Thickness Monitoring (TM) Equipment	TMBatchAssetDataLoader
Thickness Monitoring (TM) Functional Location	TMBatchFLDataLoader
Thickness Monitoring (TM) Piping Equipment	TMBatchPipingAssetDataLoader
Thickness Monitoring (TM) Piping Functional Location	TMBatchPipingFLDataLoader
Generation Availability Analysis (GAA) GADS Amplification Codes	GAAAmplificationCodeDataLoader
Generation Availability Analysis (GAA) GADS Cause Code	GAACauseCodeDataLoader
Generation Availability Analysis (GAA) Events	GAAEventsDataLoader
Calibration Management	CalibrationBatchDataLoader
Hazard Analysis	HazardAnalysisBatchDataLoader
Asset Strategy Management (ASM)	AsmDataLoader
Asset Strategy Management (ASM) Template	AsmTemplateDataLoader
Failure Modes and Effects Analysis (FMEA)	FMEAAnalysisDataLoader
Failure Modes and Effects Analysis (FMEA) Analysis Templates	FMEAAnalysisTemplateDataLoader
Failure Modes and Effects Analysis (FMEA) Asset Templates	FMEAAssetTemplateDataLoader
Reliability Centered Maintenance (RCM)	RCMAnalysisDataLoader
Reliability Centered Maintenance (RCM) Analysis Template	RCMAnalysisTemplateDataLoader

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Data Loader Name	Folder Name
Risk Matrix	RiskMatrixDataLoader
GAA Wind Asset Hierarchy	GAAWindAssetHierarchyDataLoader
GAA Wind Events	GAAWindEventDataloader
GAA Wind Sub Group Capacity	GAAWindSubgroupCapacityDataLoader
Rounds Pro - Picklist Dataloader	PicklistDataloader
Rounds Pro - Route Master Dataloader	RouteMasterDataloader
Rounds Pro - Step Dataloader	StepDataloader
Rounds Pro - Step Conditions	StepConditionDataloader
Rounds Pro - Step Template	StepTemplateDataloader

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Chapter 9

EAM Adapters

Topics:

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EAM Adapters

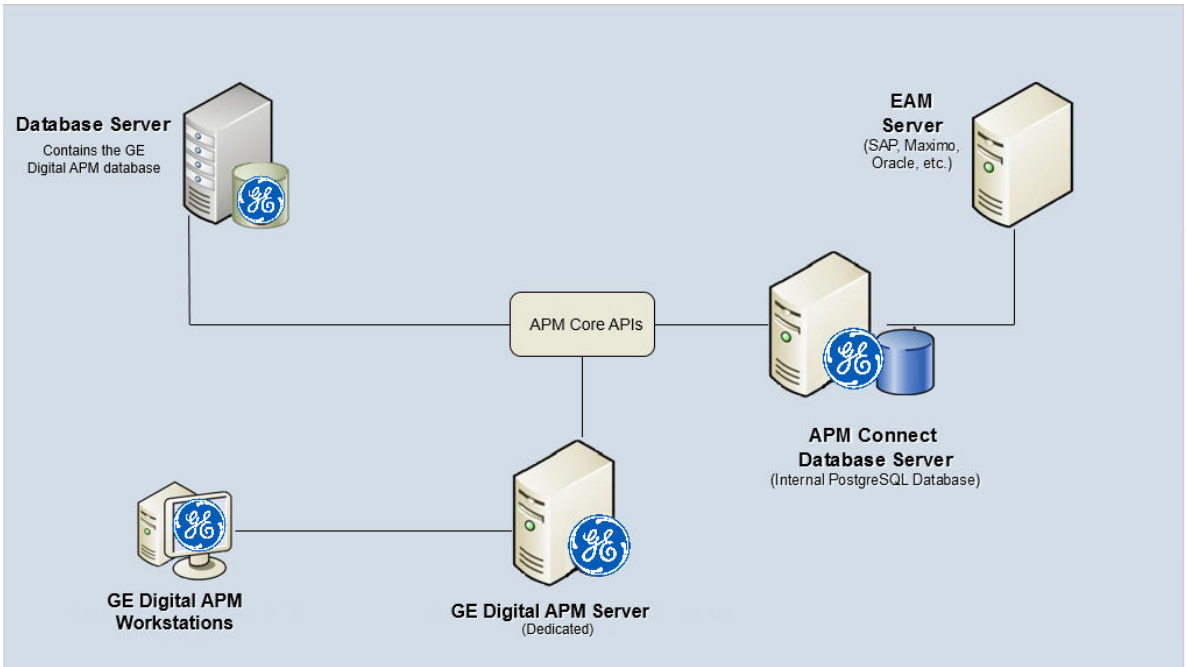
You can use EAM Adapters to ingest data into APM using one of the following EAM Adapters:

- Maximo Adapters
- SAP Adapters

System Architecture for EAM Adapter

Single Server Configuration (Recommended)

The single server configuration is the simplest way to configure APM Connect. However, it does include an embedded database. The following image depicts this configuration.



External Database Configuration

Many organizations choose to separate their databases. It is possible to install the intermediate repository database on an external server, and to keep the APM Connect Systems database on a different server. The following image depicts this configuration.

Note: The external configuration will affect performance. The single server configuration results in faster performance.

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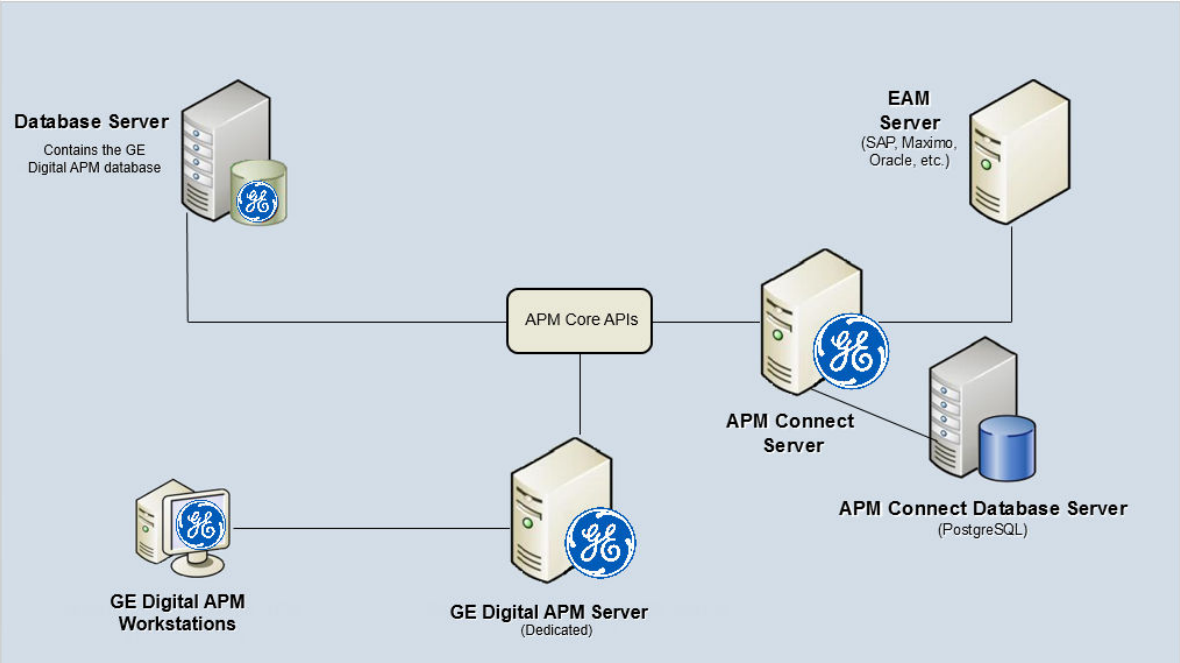

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Chapter 10

Reference

Topics:

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General Reference

APM Connect Version Compatibility Table

This topic provides the installation files that are required for an APM Connect installation, and the version structure for APM Connect.

Version Structure

Example:	EAM	SAP	V1	5	2
Description:	Area of APM Connect (that is, Data Loaders, EAM)	EAM System released against (that is, SAP, SAP PI, Maximo)	Architecture Release	Major Release	Maintenance or Patch Release

The following are examples of how to interpret the versions.

- EAM SAP V1.5.0 is the fifth major release on the APM Connect V1.x architecture; it can be applied to the EAM system SAP.
- EAM SAP V1.5.1 is a maintenance release that can be applied to EAM SAP V1.5.0.
- DL V1.4.0 is the fourth major release on the APM Connect V1.x architecture.
- Since V4.3.0.2, all the APM Connect Integration options are merged to a common framework, UDLP – Unified Data Loader Process for Dataloaders and EAMs.

APM Compatibility Table

This table includes only the APM versions for which a corresponding APM Connect version was released.

Note: GE Vernova will only support APM Connect Services Version 5.1, Integration Pack (IP) Version 5.1 from the current release. As per the new Technology Replacement notice, the below versions will cease operation upon the Talend license expiration.

- APM Connect Base version 3.X

APM Framework Version	APM Connect Base	Integrated Pack Version	SAP ABAP Version
V5.1.2.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V5.1.1.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V5.1.0.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V5.0.2.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V5.0.1.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V5.0.0.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X

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APM Framework Version	APM Connect Base	Integrated Pack Version	SAP ABAP Version
V4.6.6.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.5.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.4.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.3.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.2.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.1.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.6.0.0.0	APM Connect Services V5.1.2.0.0	Integration Pack (IP-Release_5_1_2)	V7.X
V4.5.0.0	APM Connect Base V2.0.0	UDLP Version: UDLP V2.9.0 or V2.8.0 or v2.9.0.1 (with ABAP V7.X)	V4.X

Table 1: SAP ABAP Package Certification Matrix

SAP Certificate Number	Certificate Issue Date	Certificate Expiration Date	SAP Version	ABAP Interface Version (as displayed on the certificate)	APM Versions
16649	June 26, 2020	June 25, 2023	S4/HANA 1909	V4.X	4.4.x, 4.5.x, 4.6.x, (UDLP 3.3.0)
13857	October 6, 2020	October 5, 2023	ERP (ECC) 6 EHP8	V7.X	4.6.x, 5.x
16864	January 21, 2021	January 20, 2024	S4/HANA Cloud Extended Edition 1909	V7.X	4.5.x*, 4.6.x, 5.x
17051	January 21, 2021	January 20, 2024	S4/HANA 1909	V7.X	4.5.x*, 4.6.x, 5.x
17336	January 21, 2021	January 20, 2024	S4/HANA Cloud Extended Edition 2020	V7.X	4.5.x*, 4.6.x, 5.x
17337	January 21, 2021	January 20, 2024	S4/HANA 2020	V7.X	4.5.x*, 4.6.x, 5.x
20873	October 12, 2022	October 11, 2025	S4/HANA Cloud Extended Edition 2021	V7.X	4.5.x*, 4.6.x, 5.x
20874	October 12, 2022	October 11, 2025	S4/HANA 2021	V7.X	4.5.x*, 4.6.x, 5.x
21395	July 20, 2023	July 20, 2026	S4/HANA 2022	V7.X	4.5.x*, 4.6.x, 5.x

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Note: *You must have UDLP 2.9.0.1 or later to use APM V4.5.0.0.0 with SAP ABAP packages of certificate numbers 16864, 17051, 17336, 17337, 20873, 20874, and 21395.

Attributes Available for Adding to Notification Creation from APM to SAP

label			
MI_GENRECOM_ALERT_GUID	MI_REC_DAYS_BEF_DUE_DT_NOT_NBR	MI_REC_ASSET_TYPE_CHR	MI_REC_ASSET_ID_CHR
MI_GENRECOM_ALERT_ID_C	MI_REC_STATU_CHANG_BY_CHR	MI_REC_LAST_CHANG_DATE_DT	MI_SM_STATE_OWNER_ID_C
MI_GENRECOM_CASE_GUID	MI_REC_STATU_CHG_BY_NM_CHR	MI_REC_CLOSE_COMME_TX	MI_SM_STATE_ENTERED_D
MI_GENRECOM_CASE_ID_C	MI_REC_WO_INTERFACE_FLAG_F	MI_REC_CLOSE_DATE_DT	MI_REC_ANALY_ID_CHR
MI_GENRECOM_EQUIP_KEY_N	MI_REC_MERIDIUM_TASK_ID_C	MI_REC_COMPL_DATE_DT	MI_REC_CREATE_SAP_NOTIF_FLG
MI_GENRECOM_FUNCT_LOCAT_KEY_N	MI_REC_TYPE_CHR	MI_REC_COMPL_FLG	MI_REC_WK_REQ_REF_CHR
MI_GENRECOM_SOURCE_KEY	MI_REC_WORK_ORDER_NUMB_CHR	MI_REC_CREAT_DATE_DT	MI_REC_WR_EQUIP_C
MI_REC_CAUSE_ID_NBR	MI_REC_LOC_ID_CHR	MI_REC_STATU_CHR	MI_REC_WR_LOC_C
MI_REC_ERP_01_CD_CHR	MI_REC_GENERATE_MERID_TASK_F	MI_REC_SHORT_DESCR_CHR	MI_REC_NOTIF_TYPE_C
MI_REC_ERP_02_CD_CHR	MI_REC_FINAL_STATE_LOCK_F	MI_REC_LONG_DESCR_TX	MI_REC_TECHNICAL_NUM_C
MI_REC_ERP_03_CD_CHR	MI_REC_FINAL_APPRO_ID_C	MI_REC_LAST_CHANG_BY_CHR	MI_REC_ASSET_DESCR_C
MI_REC_ERP_04_CD_CHR	MI_REC_FINAL_APPROVE_NAME_C	MI_REC_LAST_CHG_BY_NM_CHR	EVNT_START_DT
MI_REC_ERP_05_CD_CHR	MI_REC_REVIEWER_KEY_NBR	MI_REC_RECOR_NM_CHR	MI_OPR_REC_CRT_OF_MEAS_LOC_F
MI_REC_ERP_06_CD_CHR	MI_REC_ORIG_ENTY_KEY_N	MI_REC_PRIORITY_C	MI_OPR_REC_SOURCE_ML_DESC_C
MI_REC_ERP_07_CD_CHR	MI_REC_PUB_FLAG_F	MI_REC_FINAL_APPROVER_KEY_N	MI_OPR_REC_ASSET_KEY_N
MI_REC_ERP_08_CD_CHR	MI_REC_REVIE_NM_CHR	MI_REC_ASST_CL_CHR	MI_OPR_REC_SOURCE_ML_KEY_N
MI_REC_ERP_01_DESC_CHR	MI_REC_REVIE_CHR	MI_REC_ASST_CTGRY_CHR	MI_SM_STATE_KEY_N
MI_REC_ERP_02_DESC_CHR	MI_REC_REQUI_EQUIP_STATU_CHR	MI_REC_BASIS	MI_REC_SITE_C
MI_REC_ERP_03_DESC_CHR	MI_REC_REEVAL_EMAIL_TX	MI_REC_AUTHOR_LOCK_F	MI_REC_EAM_REF_CHANGE_DATE_C

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label			
MI_REC_ERP_04_DESC_CHR	MI_REC_ID	MI_REC_AUTH_KEY_NBR	MI_REC_EAM_REF_CREATE_DATE_C
MI_REC_ERP_05_DESC_CHR	MI_REC_EVNTREF_CHR	MI_REC_ASSIGNEE_KEY_NBR	
MI_REC_ERP_06_DESC_CHR	MI_REC_NOTIF_EMAIL_TEXT_CHR	MI_SM_STATE_ID_C	
MI_REC_ERP_07_DESC_CHR	MI_REC_NOTIFY_RP_FLG	MI_REC_ASSIG_NM_CHR	
MI_REC_ERP_08_DESC_CHR	MI_REC_REEVAL_DT	MI_REC_ASSIG_TO_CHR	
MI_REC_FINAL_ACTIO_TAKEN_TX	MI_REC_EAM_SERVICE_REQ_ID_C	MI_REC_ANALY_KEY_NBR	
MI_REC_STATU_CHANG_DATE_DT	MI_REC_IMPAC_CHR	MI_REC_AUTHO_CHR	
MI_REC_DATE_REVIE_DT	MI_REC_RECOR_CHR	MI_REC_AUTHO_NM_CHR	
MI_REC_REEVAL_FLG	MI_REC_NOTIF_AFTER_DD_CHR	MI_REC_TARGE_COMPL_DATE_DT	
MI_REC_REEVAL_NOTIF_LIST_CHR	MI_REC_LOC_SHRT_DESC_CHR	MI_REC_MANDA_DATE_DT	

About Time Zone Data

APM stores the dates and times of transactions in Universal Coordinated Time (UTC) format. This enables the data to flow through the system in a single time zone format. APM Connect supports the time zones defined in https://docs.microsoft.com/en-us/previous-versions/windows/embedded/gg154758(v=winembedded.80).

To provide information with the time stamp relevant to your operations, the system converts UTC to your time zone by using the time zone information configured in your user definition.

Important: If you change the time zone information configured in your user definition, all the records will reflect the new time zone.

The following sections contain the time zone considerations relevant to specific systems.

Maximo

APM stores the time stamp associated with the data extracted from Maximo in UTC and displays the time stamp based on your configured time zone.

SAP

SAP provides a set of baseline time zone codes, which contain most of the standard time zones across the world. SAP also provides the ability for administrators to define their own custom time zone, as needed. Before you use a customized time zone, you must configure the timezone_control table in APM Connect to include the customized time zone.

SAP defines two types of time zones:

- **System:** This time zone is based on SAP Application Server Operating System and is derived from the context file. You cannot modify this type of time zone.

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- **User:** This time zone is based on the user who created the SAP record. You can modify and store this type of time zone in the SAP user interface.

APM stores the time stamp associated with the data extracted from SAP in UTC and displays the time stamp based on the time zone configured for the user who created the SAP record.

Note: If the data extracted from SAP contains only the date, then APM will assign the time 00:00:00 and adjust the assigned time with the SAP system or user time zone. This may lead to a date mismatch when you choose to display the data in APM. To prevent this, APM stores the assigned reference time stamp as a string within the data, which is hidden by default. If you need this information, you can configure APM to display the data.

Support for Multiple Source Systems

Whether in a cloud environment or an on-premise installation, APM Connect enables you to connect multiple source systems to a single APM system.

There are occasions when you need to connect multiple source systems to a single APM system. For example, when your company acquires another company, rather than immediately attempting to merge two systems together, you need to keep the systems running separately but want to implement strategies centrally. The two systems might be the same type or of different types. You can configure APM Connect to handle either scenario.

The steps to configure these scenarios is similar to configuring a single system; you repeat the steps that define the EAM system records and, after creating the intermediate repository for the first system, run a job that adds the other systems to the intermediate repository with any required extraction filters.

Multiple Source Systems of the Same Type

This scenario is most useful when you all systems you need to support are the same type. The context file configuration for each source system will look the same for the target APM and APM Connect system for all the source systems. The unique parts of the context file are those that describe the particulars of the source system, for example, the system ID and filters used.

Multiple Source Systems of Different Types

Use this scenario if you need to support multiple disparate systems, for example, an SAP and a Maximo system. In this case, you will need to configure context files for each different type of source system, each pointing to the same target APM and APM Connect system. This does not preclude having multiple systems of a specific type (for example, one SAP, one ServiceMax, and two Maximo).

Considerations

There are some things to consider when connecting multiple source systems to a single APM with APM Connect:

- You must make sure that each source system has a unique system ID.
- The logs will contain the messages from all of the source systems. Each message will identify the source system using the system ID.
- Some source system types have unique requirements that must be performed for each source system. For example, you must run the Static Data job for all SAP systems.
- Each source system in a cloud environment will need an intermediate repository, even though they are communicating with a single tenant.
- Do not schedule running the same adapter job types (for example, functional location extractions) simultaneously from different source systems.

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Support for Multiple Culture Settings from a Single Source System

APM Connect enables you to send data to APM from a single source system that supports plants using different language or extraction requirements.

Important: This feature is not supported for Technical Characteristics, Work Management, Asset Criticality Analysis, Asset Strategy Management, or Asset Strategy Implementation.

Globalization has increased the need to improve management of assets in different culture settings. Your solution may involve including these new plants in a single source system that communicates with APM but requires the data to be presented to the user in their native language. You can accomplish this by configuring APM Connect so that the plants that require specific languages or extractions appear to be different source systems, one for each language or extraction requirement. This capability provides a better user experience for all users of APM regardless of their location.

A key advantage of this support is that you can combine your source systems and then configure APM Connect to extract the data correctly.

Considerations

- The user defined in the source system that communicates with APM must use the same decimal notation.
- You must have unique system IDs and the correct language parameter value or extraction requirements for each plant.
- You must configure filters to make sure that the data is routed correctly to the specific location.

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