

# HP Universal CMDB

For the Windows and Red Hat Enterprise Linux operating systems

Software Version: 10.00

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## Data Flow Management Guide

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# Introduction

# Chapter 1

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## Introduction to Data Flow Management

This chapter includes:

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**Note:** (for HP Universal CMDB Configuration Manager users) The Data Flow Management modules are available only when you are logged in to UCMDB in **Actual** state.

## Data Flow Management Overview

This section gives an overview about the Discovery Control Panel and the Integration Studio.

This section includes:

- "Integrations " below
- "Discovery " on next page
- "Data Flow Management Modules" on next page
- "Reconciliation" on page 16

## Integrations

You use the Integration Studio to set up integrations with external data repositories.

You can set up the following types of integrations:

- **Population.** Integration that populates the CMDB with CI and relationship information.
- **Federation.** Integration that retrieves CIs and relationships from an external repository whenever the data is requested in an ad-hoc fashion.
- **Data Push.** Integration that pushes CIs and relationships from the CMDB to an external data repository.

Each integration adapter supports certain types of integrations. For example, an integration adapter that supports both population and federation types can retrieve data periodically for storage within the CMDB or upon query time; both of these configurations can co-exist within a single integration.

To learn more, see "Integration Studio" on page 129.

## Discovery

The Discovery process is the mechanism that enables you to collect information about your IT infrastructure resources and their interdependencies. Discovery automatically discovers and maps logical application assets in Layers 2 through 7 of the Open System Interconnection (OSI) Model.

Discovery discovers resources such as installed and running applications, network devices, servers, and so on. Each discovered IT resource is delivered to, and stored in, the configuration management database (CMDB) where the resource is represented as a managed CI.

Discovery is an ongoing, automatic process that continuously detects changes that occur in the IT infrastructure and updates the CMDB accordingly. You can discover nodes using agent-based or agentless discovery.

After configuration, Universal Discovery automatically discovers the network on which the Data Flow Probe is located, the Node on which the Probe resides, and the Node's IP address. A CI is created for each of these objects. These discovered CIs populate the CMDB. They act as triggers that activate discovery jobs. Every time a job is activated, the job discovers more CIs, which in turn are used as triggers for other jobs. This process continues until the entire IT infrastructure is discovered and mapped.

For details on out-of-the-box discovery packages and supported integrations, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## Data Flow Management Modules

**Note:** The Data Flow Management modules are only available when you are logged into UCMDB in **Actual** state.

Data Flow Management (DFM) includes the following application modules:

### Integration Studio

The Integration Studio enables you to set up UCMDB integrations to define and control data flows from external data repositories to the CMDB, or from the CMDB to external data repositories.

For more information, see "[Integration Studio](#)" on page 129.

### Discovery Control Panel

The Discovery Control Panel enables you to manage the Discovery process to discover the CIs and relationships of your IT infrastructure. You control the process by activating discovery jobs.

You can manage discovery by partitioning your enterprise into zones and activating discovery activities (groups of discovery jobs) to discover infrastructure (IPs, nodes), basic software (shallow running software including application servers, databases, and web servers), deep database configuration, and inventory (for example, CPUs, installed software, logical volumes), among other data.

You could also control the process by manually activating discovery jobs. You can choose to activate all or some of the jobs in a module. You can also edit discovery jobs, and schedule a job to run at a certain time.

For more information, see ["Universal Discovery" on page 184](#).

## Data Flow Probe Setup

The Data Flow Probe Setup module enables you to add Data Flow Probes to the system and to manage existing Data Flow Probes. You define the network range that each Data Flow Probe covers.

You also manage communication credentials from the Data Flow Probe Setup module. These credentials are used for both Discovery and Integrations purposes.

Universal Discovery integrates with HP Real Time Monitor (RUM) to provide passive, real-time discovery and monitoring of traffic in a given environment. This is known as the Just-In-Time discovery mechanism. You can manage IP ranges and port ranges for passive discovery probes from the Data Flow Probe Setup module.

For more information, see ["Data Flow Probe Setup" on page 23](#).

## Reconciliation Priority

The Reconciliation Priority module enables you to specify the reconciliation priority for a particular integration point, CIT, or attribute.

For more information, see ["Reconciliation Priority" on page 268](#).

## Adapter Management

The Adapter Management module enables you to edit adapters, scripts, configuration files (including discovery rules), and scanner configurations. You can also replace or remove external resources needed for Discovery or Integration from this module.

For more information, see ["Adapter Configuration" on page 78](#).

## Universal Discovery Community

The Universal Discovery Community Web site provides you with a convenient way to obtain the latest Discovery and Integration Content Pack. The Content Pack provides all of the out-of-the-box discovery packages and integration adapter required for performing discovery and integrating with external sources.

For more information, see ["Universal Discovery Community" on page 21](#).

## Data Flow Probe Status

The Data Flow Probe Status module enables you to view the current status of a particular Data Flow Probe: which discovery or integration job the Probe is currently running, execution statistics, and so on.

**Note:** Data Flow Probes installed on *Windows* platforms only are displayed in this module.

For details, see ["Data Flow Probe Status" on page 71](#).

# Reconciliation

The Reconciliation process consists of two important steps:



- **Identification.** The process by which CIs and relationships within the CMDB are identified against existing CIs within the CMDB, other CIs within the same bulk, or CIs coming from various federated data sources.
- **Reconciliation Priority.** The process by which the CMDB reconciliation engine decides how to deal with conflicting data. When conflicting values are given for the same CI attribute by different integrations, the CMDB reconciliation engine resolves the conflict by looking at the reconciliation priority assigned to each integration.

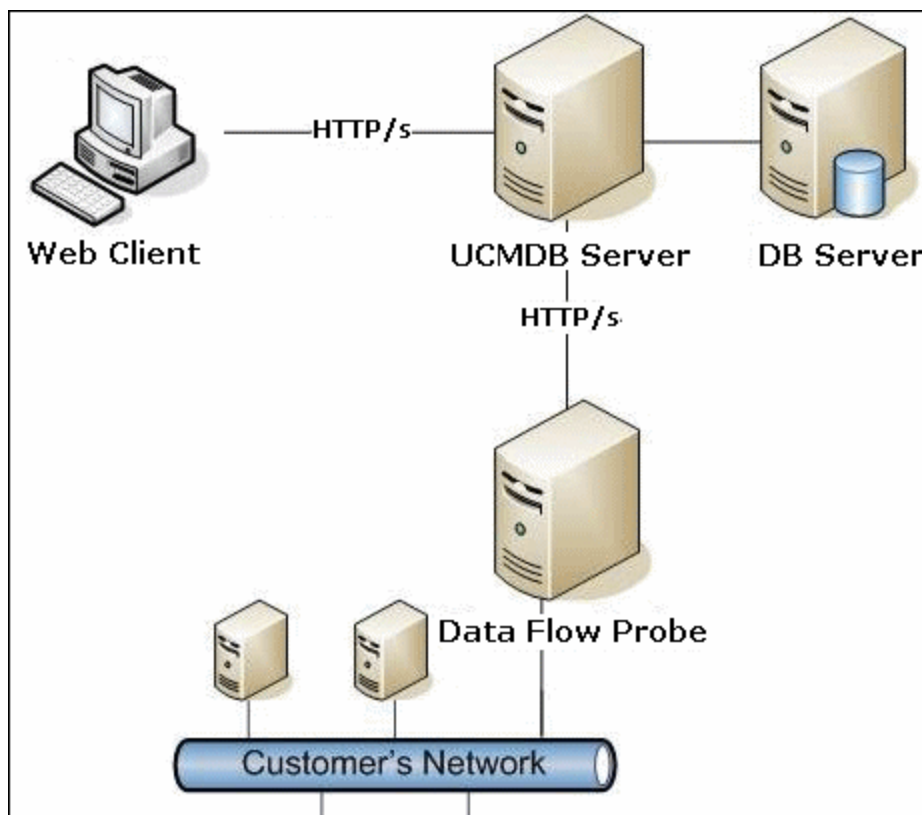
By default, unless you customize the reconciliation priorities within the Reconciliation Priority Manager, the CMDB reconciliation engine uses the last reported value as the most accurate, that is, all integrations have exactly the same priority.

For more information about reconciliation, see ["Entity Reconciliation"](#) on page 250.

For details about the Reconciliation Priority Manager, see ["Reconciliation Priority Window"](#) on page 274.

## Data Flow Management Architecture

Data Flow Management architecture is deployed as follows:



- The Data Flow Probe is responsible for integration of data to and from external data repositories and for performing discovery.

- The Data Flow Probe initiates communication with the UCMDB Server using http or https traffic, enabling the product to bypass possible firewalls.

## Universal Discovery Concepts

This section describes the main topics of Universal Discovery:

### Data Flow Probe

The Data Flow Probe is the main component responsible for requesting tasks from the server, scheduling discovery and integration tasks, executing them, and sending the results back to the UCMDB Server. You define a range of network addresses for a specific, installed Data Flow Probe. Each Data Flow Probe is identified by its name, chosen during the Data Flow Probe installation process.

### Passive Discovery Probe

A passive discovery probe is an HP Real Time Monitor (RUM) probe that is configured to integrate with a Data Flow Probe to provide passive, real-time discovery and monitoring of traffic in a given environment. This is known as Just-in-Time discovery.

### Communication Protocols

Discovery of the IT infrastructure components uses protocols such as SNMP, WMI, JMX, Telnet, and so on for communication. For details about each protocol, see the HP Universal CMDB Discovery and Integration Content Guide.

### Discovery and Integration Adapters

An adapter can be of one of the following types:

- **Jython Adapter.** An adapter based on a set of Jython scripts that are executed sequentially. For details, see [Create Jython Code](#) in the *HP Universal CMDB Developer Reference Guide*.
- **Java Adapter.** An adapter based on Java code that implements the various DFM interfaces and is wrapped in a JAR file. For details, see [Developing Java Adapters](#) in the *HP Universal CMDB Developer Reference Guide*.
- **Generic DB Adapter.** An adapter that uses SQL queries and maps database tables to CIs and relationships by using an ORM file. For details, see [Developing Generic Database Adapters](#) in the *HP Universal CMDB Developer Reference Guide*.
- **Generic Push Adapter.** An adapter that uses a mapping file and Jython scripts to push data to an external data repository. For details, see [Developing Push Adapters](#) in the *HP Universal CMDB Developer Reference Guide*.

The adapters themselves do not contain information about the target to which they are to connect and from which they are to retrieve information. For data flow to be configured correctly, adapters require further context information, which can include an IP address, port information, credentials, and so on.

For discovery adapters (adapters used for performing discovery), the additional information is brought from the Trigger CIs associated with the discovery jobs; for integration adapters, the information is manually fed when creating the integration or taken from the selected Trigger CI.

For details on making adapter changes, see ["Adapter Management Window" on page 101](#). For details on creating adapters, see [Adapter Development and Writing in the HP Universal CMDB Developer Reference Guide](#)

#### Input Queries

**Note:** Input queries refer only to discovery-based integrations.

Each discovery-based integration adapter is assigned an input query that is used as follows:

- **The input query defines a minimal set of requirements** for every Trigger CI included in a job or integration that triggers this adapter. (This is true even when no trigger query is associated with the job.)

For example, an input query can query for IPs related to nodes with an SNMP agent installed and discovered on them, that is, only IPs with installed SNMP agents can trigger this adapter. This prevents the case where a user could manually create a Trigger CI that adds all IPs as triggers to an adapter.

- **An input query defines how to retrieve data information from the CMDB.** Destination data information, even if it is not included in a Trigger CI, can be retrieved by the input query. The input query defines **how** to retrieve the information.

For example, you can define a relationship between a Trigger CI (a node with the node name of **SOURCE**) and the target CI and then can refer to the target CI according to this node name.

For details on using input queries when writing adapters, see [Step 1: Create an Adapter](#) in the *HP Universal CMDB Developer Reference Guide*.

#### Discovery Modules

The module is a grouping of discovery jobs that logically belong together, can be operated and managed together, and so on. This helps to reduce clutter in the main view when many jobs need to be written, and can also offer better manageability.

When creating a job, you should add it to a module or create a new module. If you are creating several jobs, the best practice is to split them into logical groups and assign them to modules accordingly.

Discovery Modules support a hierarchy of folders, to facilitate easy finding of the relevant discovery capability.

#### Discovery and Integration Content Packs

The latest Discovery and Integration content for UCMDB is delivered as a Content Pack available for download via the HP Live Network. For details on downloading and installing Content Packs, see the ["Universal Discovery Community" on page 21](#).

By downloading the latest Content Pack, you ensure that your system is up to date with the latest content functionality. Content Packs are released in a separate release train and are installed on top of the current UCMDB platform.

#### Integration Points

Integration points are entities used to set up UCMDB integrations. Each integration point is created with a selected integration adapter and the additional configuration information required to set up the

integration. For details on creating integration points, see ["Integration Studio" on page 129](#).

## Discovery Jobs

A job enables reuse of a discovery adapter for multiple discovery process flows. Jobs enable scheduling the same adapter differently over different sets of triggered CIs and also supplying different parameters to each set. You can launch a discovery by activating the relevant set of discovery jobs that must be run. Relevant trigger CIs are automatically added to the activated discovery jobs based on their trigger queries.

## Discovery Activities

You use one of the discovery activities to discover infrastructure (IPs, nodes), basic software (shallow running software including application servers, databases, and web servers), deep database configuration, and inventory (for example, CPUs, installed software, logical volumes), among other information within Management Zone.

### Management Zones

A Management Zone is a region in the network defined by a collection of IP ranges. A region of an organization's infrastructure should be defined as a Management-Zone when you want to discover all the managed objects of the region using the same scheduling policy and parameters.

You can set up multiple Management Zones to run different instances of a Discovery activity in different Data Centers in your enterprise.

For information, see ["Universal Discovery Overview" on page 184](#).

## Agent-Based Discovery

To collect inventory information, you can deploy Universal Discovery agents on client or server machines. The UD agent provides a secured communication channel between the Data Flow Probe and the Nodes being discovered. After setting up the secure communication channel, Universal Discovery deploys and activates scanners onto the Nodes being discovered. The Scanners scan the Nodes for inventory information and store the scanned results in scan files which are downloaded to the Data Flow Probe through the secured communication channel established with the UD agent.

When the UD agent is installed, collection of software utilization information is enabled. The UD Agent also enables you to benefit from the Call Home feature. Call Home is useful in the case where a Node was unavailable for scanning for a long period. It enables the UD agent to notify the Data Flow Probe that the Node is currently available for scanning.

## Agentless Discovery

Although agentless discovery does not require the installation of dedicated agents on the servers that are to be discovered, it does depend on native OS or standard agents that are already installed such as SNMP, WMI, TELNET, SSH, NETBIOS, and others. Other discovery capabilities are based on application-specific protocols such as SQL, JMX, SAP, Siebel, and so on. For details on supported protocols, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## Trigger CIs and Trigger Queries

A Trigger CI is a CI in the CMDB that activates a discovery job. Every time a job is activated, the job may discover additional CIs, which in turn are used as triggers for other jobs. This process continues until the entire IT infrastructure is discovered and mapped.

A Trigger query associated with a job is a subset of the Input query, and defines which specific CIs should automatically trigger a job. That is, if an Input query queries for IPs running SNMP, a Trigger query queries for IPs running SNMP in the range 195.0.0.0-195.0.0.10.

**Note:** A Trigger query must refer to the same objects as the Input query. For example, if an Input query of an adapter queries for IPs running SNMP, you cannot define a Trigger query for an associated job to query for IPs connected to a node. This is because some of the IPs may not be connected to an SNMP object, as required by the Input query.

## Universal Discovery Community

The [Universal Discovery Community](https://hpln.hp.com//group/universal-discovery/) (<https://hpln.hp.com//group/universal-discovery/>) on the HP Live Network provides customers with a convenient way to obtain the latest HP UCMDB Discovery and Integration Content Packs and related documentation.

**Note:** You need an HP Passport user name and password to log in to this site.

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# Data Flow Management Setup

# Chapter 2

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## Data Flow Probe Setup

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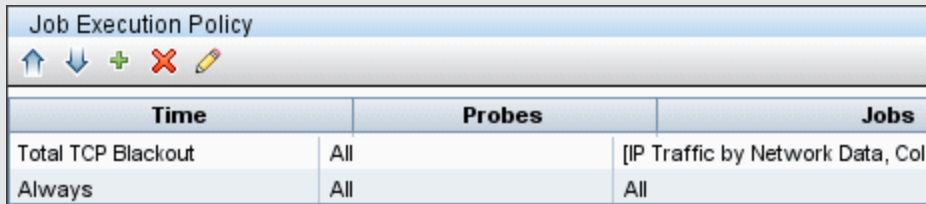
## Job Execution Policies

You can define periods of time when a Probe must not run. You can choose to disable specific jobs running on any Probe or all jobs running on a specific Probe. You can also exclude jobs from a job execution policy so that they continue running as usual.

For details on defining a job execution policy, see "New/Edit Policy Dialog Box" on page 37.

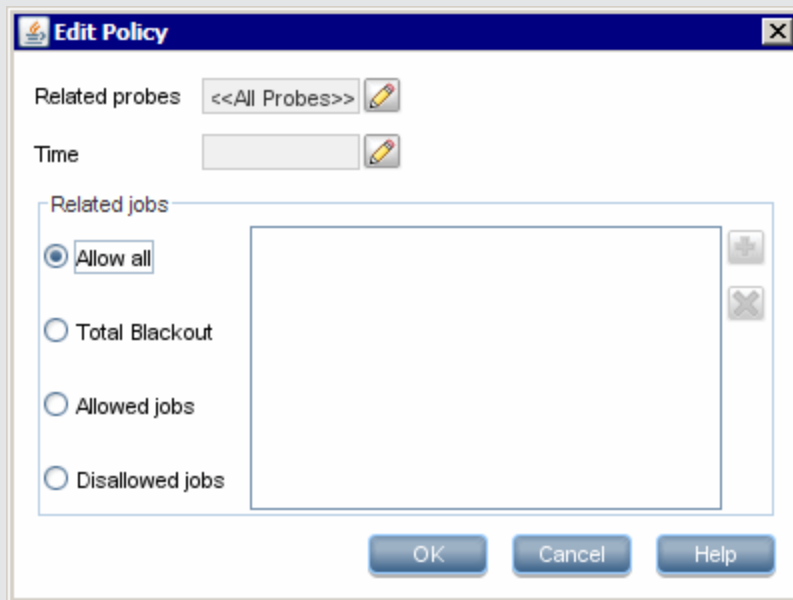
### Example of Policy Ordering

Say there are two policies, **Total TCP Blackout** and **Always** (the out-of-the-box policy). **Total TCP Blackout** does not allow any TCP discovery jobs to run. The policies appear in the list as follows:



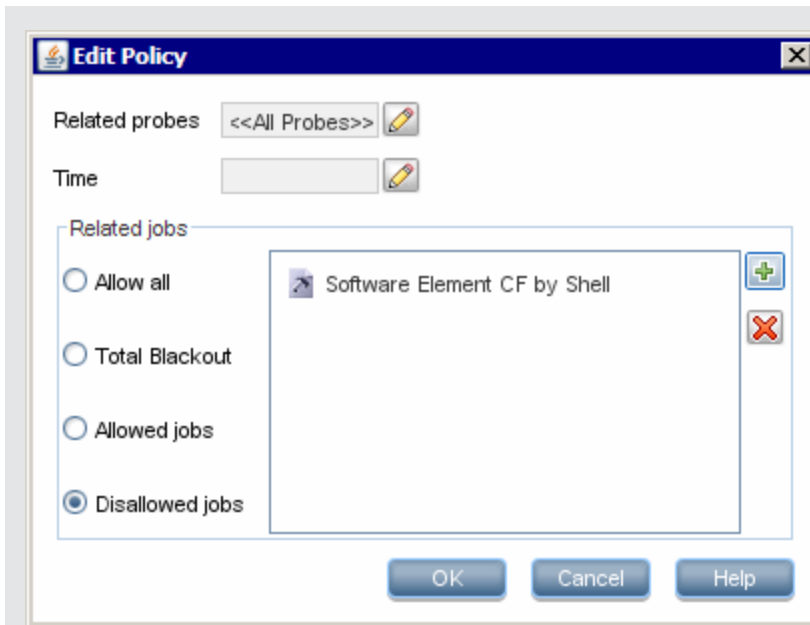
Time	Probes	Jobs
Total TCP Blackout	All	[IP Traffic by Network Data, Col
Always	All	All

A job (**Class C IPs by ICMP**) starts running. It checks the policies in the policy list from top to bottom. It starts by checking **Total TCP Blackout**. The job does not appear in this policy, so it continues down the list and checks **Always**. The job does appear here (**Allow All** is selected in the Edit Policy dialog box) so the job runs:



The next job (**Software Element CF by Shell**) starts running. It checks the policies in the policy list from top to bottom. It starts by checking **Total TCP Blackout**. The job appears in this policy (**Disallowed Jobs** is selected in the Edit Policy dialog box), so the job does not run:





**Caution:** If a job is not connected to any policy, it does not run. To run these jobs, set the last policy in the list to **Allow All**.

## Running Jobs When a Job Execution Policy Is Running

If a policy begins to operate while a Probe is executing a job, the job pauses. When the policy finishes, the job continues to run from where it ceased. For example, say a job contains 10,000 Trigger CIs. The job finishes working on 7,000 of them and then the policy starts to operate. When the job continues (after the policy finishes), it works on the remaining 3,000 Trigger CIs—the job does not start running from the beginning.

## Data Validation on the Data Flow Probe

After discovery or integration, results are processed, each one verifying a different aspect of the outgoing discovery result - class model validation, redundant results validation, and so on. This is called the **result processing chain**.

This section includes:

- "Class Model Data Validation" below
- "Content Data Validation" on next page

### Class Model Data Validation

The CIT model resides on the Data Flow Probe (as well as in the CMDB). This enables data validation to take place on the Probe when receiving data from services. Problems are generated for a specific Trigger CI and displayed to the user.

The following validation takes place on the Probe:

- The CIT of the CI is compared to that in the CIT model.
- The CI is checked to verify that all key attributes are present (on condition that the `CmdbObjectId` attribute is not defined).
- The CI's attributes are checked to verify that they are all defined in the CIT.
- The CI's attributes of type STRING are checked to verify that they do not exceed the size limit. If an attribute is longer than the limit, DFM checks whether an **AUTO\_TRUNCATE** qualifier is defined for the attribute. If there is a qualifier, the value is truncated and a warning message is written to the Probe `error.log` file.
- The CI attributes are checked for case inconsistencies. If there are inconsistencies, DFM checks if a case-relevant qualifier (**LOWERCASE** or **UPPERCASE**) is defined, and if so, it applies the relevant case to all of the attributes.
- The CI attributes are checked for white spaces. If there are white spaces, DFM checks whether the **DDM\_AUTOTRIM** qualifier value for the attribute. If it is set to **true**, the results are trimmed— that is, leading and trailing spaces and tabs are trimmed, so that there are no white spaces at the beginning or at the end of the result.

All invalid attributes raise an error, which reports on a specific CI. When the Probe finds invalid data that is related to the CITs, all data that the Probe has collected on that CI is dropped by the Probe and is not sent to the server.

For details on attributes, see "[CI Type Attributes](#)" in the *HP Universal CMDB Modeling Guide*.

## Content Data Validation

Content that comes out-of-the-box with the Discovery and Integration Content Pack uses standard libraries. However, user-defined packages might not be compatible with the standard APIs and can send invalid data to the UCMDB server.

To provide strong validation for data reported to the UCMDB server, UCMDB allows for additional content data validation before the data is sent to the UCMDB server, and indication of any invalid data. To perform content data validation, you can create validation jython scripts and specify them in the dedicated configuration file, **dataValidationlibs.xml**.

The Content Data Validation module loads and executes sets of jython scripts defined in the **dataValidationlibs.xml** file. The content data validation jython scripts should contain the **ValidateData** function, which is the entry point for data validation execution.

For details about how to configure the content data validation jython scripts, and for some examples, see "[Content Data Validation Jython Scripts](#)" on page 65.

To enable or disable Content data validation in UCDMB, see "[How to Enable Content Data Validation](#)" on page 34.

## Filtering Results

You can filter results sent by the Probe to the HP Universal CMDB server. You would probably need to filter irrelevant data regularly during production runs and specifically when you are testing a limited environment.

There are two levels of filtering: adapter filtering and global filtering:

- **Adapter filtering.** The Data Flow Probe filters the results for a specific adapter and sends to the CMDB only those filtered CIs. You define an adapter filter in the Results Management pane in the **Adapter Configuration** tab. For details, see "[Adapter Configuration Tab](#)" on page 96.
- **Global filtering.** DFM filters the results of all jobs running on a Probe. You define global filters in the `globalFiltering.xml` file. For details, see "[Configure a Filter](#)" on page 87.

The order of filtering is as follows: during a run, the Data Flow Probe first searches for an adapter filter and applies the filter to the results of the run. If there are no adapter filters, DFM searches for a global filter and applies that filter to the results. If DFM finds no filters, all results are sent to the server.

## How to Start the Data Flow Probe

This section explains how to start the Data Flow Probe running on a Windows platform.

### Note:

- The Data Flow Probe that runs on a Linux platform is intended only for integrations, and not for discovery.
- The managed environment is defined by the IP ranges of the domains. However, with some discovery adapters it is possible to override this behavior and discover CIs that are out of a Probe's range.

This task includes the following steps:

- "[Prerequisite](#)" below
- "[Start the Probe](#)" below

### Prerequisite

- Ensure that the Data Flow Probe is installed on a Windows machine. For details, see the interactive *HP Universal CMDB Deployment Guide*.
- Ensure that UCMDB is installed and running.

### Start the Probe

- **From the Start Menu**

On the machine on which the Probe is installed, select **Start > Programs > HP UCMDB > Start Data Flow Probe**. The Probe is started as a service.

To verify that the Probe has been launched successfully, in HP Universal CMDB select **Data Flow Management > Data Flow Probe Setup**. Select the Probe and, in the Details pane, verify that the status is **connected**.

- **In a Console**

You can configure the Probe so that it opens in a console. In this case, the command prompt window is displayed. Execute the following script:

**C:\hp\UCMDB\DataFlowProbe\bin\gateway.bat console.**

**Note:** The user running the Probe service must be a member of the Administrators group.

## How to Stop the Data Flow Probe

- To stop the Probe when it is running as a service, select **Start > Programs > HP UCMDB > Stop Data Flow Probe**.
- To stop the Probe when it is running in a command prompt window (the console), press CTRL+C, then **y**.

## How to Add a Data Flow Probe

This task describes how to add a Probe to UCMDB.

This task includes the following steps:

- ["Prerequisites" below](#)
- ["Add a domain to UCMDB" below](#)
- ["Add a Data Flow Probe to the new domain" below](#)
- ["Add more Probes to the domain – optional" on next page](#)
- ["Define credentials" on next page](#)

### 1. Prerequisites

Verify that the Probe is installed and make a note of its IP address.

### 2. Add a domain to UCMDB

In this step, you create the domain for the new Probe. When you start the Probe, it connects to UCMDB automatically. To verify, select **Data Flow Management > Data Flow Probe Setup**. Select the Probe and, in the Details pane, verify that the status is **connected**.

To define Probe ranges before the Probe has connected for the first time, you must define them manually. For details, see ["New/Edit IP Range Dialog Box" on page 35](#).

- a. Access the Probe configuration window: **Data Flow Management > Data Flow Probe Setup**.
- b. Select **Domains and Probes** and click the **Add Domain or Probe** button to open the **Add New Domain** dialog box. For details, see ["Add New Domain Dialog Box" on page 38](#).

### 3. Add a Data Flow Probe to the new domain

In this step, you define the Probe and its range.

- a. Double-click the new domain and select the **Probes** folder.
- b. Click the **Add Domain or Probe** button to open the Add New Probe dialog box. For details, see ["Add New Probe Dialog Box" on page 39](#).

- c. Select the new Probe and define its IP range. For details, see ["New/Edit IP Range Dialog Box"](#) on page 35.

#### 4. **Add more Probes to the domain – optional**

To add more Probes to this domain, repeat step ["How to Add a Data Flow Probe"](#) on previous page.

#### 5. **Define credentials**

You configure credentials depending on what must be discovered and which protocols are supported on your site's network.

For details, see ["Data Flow Probe Setup Window - Details Pane"](#) on page 40. For a list of protocols, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## How to Configure Periodic Data Flow Task Updates

When a data flow job is activated, the input TQL of the adapter is calculated once and is sent to the Data Flow Probe. If trigger CI data changes (for example: a laptop acquires a different IP address) the Data Flow Probe needs to be updated with the modified trigger CI data. As long as the Data Flow Probe is not updated with any changes, the query continues to run with out-of-date information.

To ensure that the Data Flow Probe is always kept up-to-date with possible changes in trigger CI data, you can configure UCMDB to recalculate trigger CI data and send any changes to the Data Flow Probe.

This section includes:

- ["Global Configuration"](#) below
- ["Adapter Configuration"](#) on next page
- ["Ad Hoc Updates"](#) on next page

### Global Configuration

Data flow tasks for all adapters are updated per the global setting configured in the Infrastructure Settings.

**Note:** Where necessary, you can configure updates for a particular adapter to behave differently. For details, see ["Adapter Configuration"](#) below.

#### To configure global data flow task updates:

1. Select **Administration > Infrastructure Settings Manager**.
2. Select the **General Settings** category.
  - a. Locate **Enable periodic update of data flow tasks** parameter and set the value to **true**.
  - b. Locate **Periodic data flow task update interval** and **Periodic data flow task update**

**start time** and specify how often (in hours) to update the data flow tasks, and the time (01-24) at which to start the update.

By default, this option is enabled, and the data flow tasks are updated once a day, at midnight.

## Adapter Configuration

This task describes how to configure a particular adapter so that updates to its data flow tasks are periodically sent to the Data Flow Probe.

### Note:

- The setting in the adapter file overrides the global setting (**Enable periodic update of data flow tasks**) described above.

For example, if the setting in the adapter file is set to **true**, but the global setting is set to **false**, the adapter's tasks are still updated on the Data Flow Probe (and vice versa).

- This setting should be configured for an adapter only in the case where updates for the adapter should behave differently to configuration in the global settings.

### To configure data flow task updates for a particular adapter:

1. Open the adapter's xml file in an editor.
2. Locate the **<dispatchMechanism>** tag. If it does not exist, create it.
3. Add the following parameter:

```
<dispatchOnChanges isEnabled = "<true or false>" />
```

### Example:

```
<pattern>
..
    <dispatchMechanism type = "IpAddress">
        <dispatchOnChanges isEnabled = "true" />
    </dispatchMechanism>
..
</pattern>
```

## Ad Hoc Updates

### To run ad hoc updates of data flow tasks:

1. Log in to the JMX console.
2. Run the relevant JMX method:

JMX Method	Description
<b>recalculateAndUpdateDFMTasks</b>	Updates data flow tasks for all the adapters for which data flow task update is enabled.  <b>Note:</b> Data flow task updates are enabled in the adapter's configuration file. For details, see " <a href="#">Adapter Configuration</a> " above.
<b>recalculateAndUpdateDFMTasksForAdapter</b>	Updates data flow tasks for selected adapters without checking the adapter configurations. That is, even if the data flow task update is not enabled for a selected adapter, the updates are run.

## How to Update the Data Flow Probe's IP Address

This task describes how to configure a Data Flow Probe if its IP address has changed.

**Note:** If the IP address of a Data Flow Probe has changed, it is advisable to re-install the Probe. For information about installing the Data Flow Probe, see the interactive *HP Universal CMDB Deployment Guide*. If it is not possible to reinstall the Probe, perform the procedure below.

**To change the IP address of a Data Flow Probe:**

### 1. Update the Probe properties

In **C:\hp\UCMDB\Data Flow Probe\conf** folder:

- Open the **DataFlowProbe.properties** file and update the following properties:
  - **appilog.collectors.local.ip**
  - **appilog.collectors.probe.ip**

For more details about these properties, see "[DataFlowProbe.properties Parameters](#)" on [page 55](#).

- Open the **probeMgrList.xml**, locate the line that starts with `<probeMgr ip=` and update the Probe Manager machine name or IP address, for example:

```
<probeMgr ip="OLYMPICS08">
```

### 2. Stop the Probe

- To stop the Probe when it is running as a service, select **Start > Programs > HP UCMDB > Stop Data Flow Probe**.
- To stop the Probe when it is running in a command prompt window (the console), press CTRL+C, then **y**.

### 3. Run the clearProbeData script

In `C:\hp\UCMDB\DataFlowProbe\tools` run `clearProbeData.bat`.

#### 4. Restart the Probe

- To restart the Probe from the Start window, see "Start the Probe" on page 27.
- To restart the Probe in a console, see "In a Console" on page 27.

## How to Update the Data Flow Probe Memory Size

The Data Flow Probe Memory Size is defined during installation.

This task describes how to change the maximum heap size..

1. Open the `WrapperEnv.conf` located in `C:\hp\UCMDB\DataFlowProbe\bin\`
2. Update the following parameters:
  - `set.GATEWAY_MAX_MEM`
  - `set.MANAGER_MAX_MEM`

**Note:** For Probes on Linux machine, update only `set.GATEWAY_MAX_MEM`

3. Restart the Data Flow Probe process.

## How to Configure the Data Flow Probe to Automatically Delete CIs

This task explains how to configure a job so that CI instances of specific CITs are automatically deleted. For details on how the Data Flow Probe deletes CIs, see "Automatically Deleted CIs and Relationships and Candidates for Deletion CIs" on page 80.

1. **Select the CIs to be Deleted**
  - a. Access the **Results Management** pane in the **Adapter Configuration** tab.
  - b. Select the **Enable Automatic Deletion** check box.
  - c. Click the **Add** button to open the Choose Discovered Class dialog box. For details, see "Choose Discovered Class Dialog Box" on page 104.
  - d. Select the deletion method for the CIT: **Auto Delete** or **Candidate for Deletion**.
  - e. Click the **Save** button at the bottom of the page.

#### 2. Results

To view the deleted CIs, access the Deleted column in the Statistics Results pane. For details, see "Statistics Results Pane" on page 220.



## How to Configure Number of Connections to Other Machines

This task describes how to configure the number of connections per second that a Data Flow Probe is allowed to create to other machines. You configure these settings in the `globalsettings.xml` file which is located in the Adapter Management module under **Resources pane > Packages > AutoDiscoveryContent > Configuration Files**.

**To configure the number of connections per second created by the Probe to other machines:**

1. In the `globalsettings.xml` file, configure the properties listed below as follows:

Property	Description
<b>maximumConnectionsPerSecond</b>	<p>Enables limiting the number of new connections per second created by the Probe to other machines.</p> <ul style="list-style-type: none"><li>■ <b>0.</b> Unlimited number of connections allowed.</li><li>■ <b>&gt; 0.</b> The maximum number of connections. If this limit is reached, any job trying to create a new connection will wait for a period of time that is determined in the <b>timeToSleepWhenMaximumConnectionsLimitReached</b> property (see below)</li></ul> <p><b>Default:</b> 0 (unlimited)</p>
<b>timeToSleepWhenMaximumConnectionsLimitReached</b>	<p>Determines how long (in milliseconds) a job needs to wait until a new connection can be created, assuming the "<code>maximumConnectionsPerSecond</code>" limit has been reached.</p> <p><b>Default:</b> 1000 milliseconds (1 second)</p> <p><b>Note:</b> If <code>maximumConnectionsPerSecond = 0</code> this property is ignored.</p>

2. Save your changes.

## How to Delete Unsent Probe Results

This task describes how to empty the Probe queue that contains results that have not yet been transmitted to the UCMDB Server.

1. Access the Data Flow Probe JMX console: Launch a Web browser and enter the following address: **`http://<Probe Gateway machine name or IP address>:1977`**. If you are running the Data Flow Probe locally, enter **`http://localhost:1977`**.

You might have to log in with a user name and password.

**Note:** If you have not created a user, use the default user name **sysadmin** and the

password **sysadmin** to log in.

2. Locate the **Probe\_<Probe Name> > type=MainProbe** service and click the link to open the JMX MBEAN View page.
3. Invoke the operation by clicking the **dropUnsentResults** button.

## How to Enable Content Data Validation

This task describes how to enable or disable the execution of content data validation.

1. In the **DataFlowProbe.properties** file (located in **c:\hp\UCMDB\DataFlowProbe\conf**), set the **appilog.agent.local.process.result.dataValidation.content** parameter as follows:
  - **true**. Enables content data validation (default)
  - **false**. Disables content data validation
2. Restart the Probe to update the changes.
3. If you are enabling validation, ensure that your content data validation configuration file, **dataValidationlibs.xml**, is defined with the necessary Jython and library scripts. For details, see ["Content Data Validation Jython Scripts" on page 65](#).

For more information about Content Data Validation, see ["Content Data Validation" on page 26](#).

**Note:** The value given to the **appilog.agent.local.process.result.dataValidation.content** parameter in the **DataFlowProbe.properties** file can be overridden on an adapter level by adding the **"enableContentDataValidation"** parameter to the adapter parameters. If this parameter is absent among the adapter parameters (by default), the value defined in the **DataFlowProbe.properties** file is used.

## Data Flow Probe Setup User Interface





This section includes:

- ["New/Edit IP Range Dialog Box" on next page](#)
- ["New/Edit Policy Dialog Box" on page 37](#)
- ["Add New Domain Dialog Box" on page 38](#)
- ["Add New Probe Dialog Box" on page 39](#)
- ["Choose Discovery Jobs Dialog Box" on page 39](#)
- ["Data Flow Probe Setup Window" on page 39](#)
- ["Data Flow Probe Setup Window - Details Pane" on page 40](#)
- ["Domains and Probes Pane" on page 47](#)
- ["Edit Related Probes Dialog Box" on page 48](#)
- ["Edit Timetable Dialog Box" on page 48](#)

- "Protocol Parameter Dialog Box" on page 54
- "Scope Definition Dialog Box" on page 54
- "Selecting Probes" on page 54




## New/Edit IP Range Dialog Box


Enables you to set the network range for a Data Flow probe or for a passive discovery probe. The results are retrieved from the addresses in the range you define. You can also define IP addresses that must be excluded from a range.

<b>To access</b>	<ol style="list-style-type: none"> <li>1. Select <b>Data Flow Management &gt; Data Flow Probe Setup &gt; Domains and Probes &gt; Domain:</b></li> <li>2. <b>For a Data Flow Probe:</b> Under Data Flow Probes, select a probe, and in the Ranges pane click the <b>New IP range</b>  or <b>Edit IP range</b>  button.  <b>For a passive discovery probe:</b> Under Passive Discovery Probes, select a passive probe, and in the Passive Discovery Integrated Ranges pane click the <b>New IP range</b>  or <b>Edit IP range</b>  button.</li> </ol>
<b>Important information</b>	<p>If you define a range that is out of the scope of the network on which the Probe is installed, a warning message informs you that the Probe is not included in the range.</p> <ul style="list-style-type: none"> <li>• Answer <b>Yes</b> to save the current range without including the Probe in the range.</li> <li>• Answer <b>No</b> to continue editing without saving the current range.</li> </ul>
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• <a href="#">"How to Add a Data Flow Probe" on page 28</a></li> <li>• <a href="#">"Module/Job-Based Discovery Workflow" on page 190</a></li> <li>• <a href="#">"How to Configure Just-In-Time Discovery" on page 193</a></li> </ul>

User interface elements are described below:



<b>UI Element</b>	<b>Description</b>
<b>IP Range</b>	<p>Enables you to define a range of IP addresses over which the Probe should perform discovery.</p> <ul style="list-style-type: none"> <li>• <b>Range.</b> The IP address range. The rules for defining an IP address range are as follows:           <ul style="list-style-type: none"> <li>▪ The IP address range must have the following format:  <code>start_ip_address - end_ip_address</code>                For example: 10.0.64.0 - 10.0.64.57</li> </ul> </li> </ul>

UI Element	Description
	<ul style="list-style-type: none"> <li>■ The first decimal value (octet) of the start IP and end IP must be identical. For example, 10.1.2.3 – 10.2.3.4.</li> <li>■ The range can include an asterisk (*), representing any number in the range of 0-255.</li> <li>■ If you use an asterisk, you do not need to enter a second IP address. For example, you can enter the range pattern 10.0.48.* to cover the range from 10.0.48.0 to 10.0.48.255.</li> <li>■ Use an asterisk in the lower bound IP address of the IP range pattern only. (If you use an asterisk in the lower bound IP address and also enter an upper bound IP address, the upper bound IP address is ignored.)</li> <li>■ You can use more than one asterisk (*) in an IP address as long as they are used consecutively. The asterisks cannot be situated between two numbers in the IP address, nor can they be substituted for the first digit in the number. For example, you can enter 10.0.*.* but not 10.*.64.*.</li> <li>■ Two Probes in the same domain cannot have the same IP address in their range.</li> <li>■ For a passive discovery probe, this range must fall within the range of the Data Flow Probe it is reporting to.</li> </ul> <ul style="list-style-type: none"> <li>● <b>Type.</b> (Data Flow Probe only) Defines the IP address lease time setting for the range.           <ul style="list-style-type: none"> <li>■ <b>Data Center:</b> For permanent or long IP address lease times.</li> <li>■ <b>Client:</b> For short IP address lease times.</li> </ul> <p><b>Note:</b> Mac addresses are not captured during a ping sweep discovery job when the setting is Data Center.</p> </li> <li>● <b>Description.</b> (Optional) A description about the selected range.           <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>■ Maximum number of characters allowed: 150</li> <li>■ No new lines or tabs may be inserted</li> </ul> </li> </ul>
<p><b>Excluded IP Ranges</b></p>	<p>Enables you to define a range of IP addresses to exclude from the IP range specified above.</p> <ul style="list-style-type: none"> <li> <b>New Excluded IP Range.</b> Enables you to define a range of IP addresses to exclude, and enter a description about the excluded range if desired.</li> <li> <b>Delete Excluded IP Range.</b> Deletes an excluded IP range.</li> <li> <b>Edit Excluded IP Range.</b> Enables you to edit a defined excluded IP range.</li> </ul> <p><b>Note:</b></p>



UI Element	Description
	<ul style="list-style-type: none"> <li>The rules for entering an excluded range are the same as for entering a range. For details, see <a href="#">IP Range</a> above.</li> <li>Use this feature to divide a network range into several sub-ranges.</li> </ul> <p>For example, if the range is 10.0.64.0 – 10.0.64.255</p> <p>and you define three excluded ranges: 10.0.64.45 – 10.0.64.50 10.0.64.65 – 10.0.64.70 10.0.64.89 – 10.0.64.95</p> <p>the ranges to be discovered are: 10.0.64.0 – 10.0.64.44 10.0.64.51 – 10.0.64.64 10.0.64.71 – 10.0.64.88 10.0.64.96 – 10.0.64.255</p>
<b>Ports</b>	<p>Enables you to define ports over which passive discovery should be performed within the defined IP address range:</p> <ul style="list-style-type: none"> <li><b>All available ports.</b> Enables passive discovery over all available ports.</li> <li><b>Selected ports</b> Enables passive discovery over ports that you select from the Global Ports List. Click  to select ports to monitor.</li> </ul> <p><b>Available:</b> When defining an IP address range for a passive discovery probe only.</p>

## New/Edit Policy Dialog Box

Enables you to create a job execution policy, to disable jobs from running at specific times.


<b>To access</b>	<p><b>Data Flow Management &gt; Data Flow Probe Setup &gt; Domains and Probes &gt; Details pane &gt; Job Execution Policy</b> section. Select an existing policy and click the <b>Edit Policy</b>  button , or click the <b>New Policy</b>  button.</p>
<b>See also</b>	<ul style="list-style-type: none"> <li>"Job Execution Policies" on page 23</li> <li>"Data Flow Probe Setup Window - Details Pane" on page 40</li> </ul>

User interface elements are described below:

UI Element (A–Z)	Description
<b>Related jobs</b>	<ul style="list-style-type: none"> <li>• <b>Allow all.</b> Run the job execution policy on all jobs.</li> <li>• <b>Total blackout.</b> The policy does not run on any jobs.</li> <li>• <b>Allowed jobs.</b> Choose jobs to run even during the configured blackout time.</li> <li>• <b>Disallowed jobs.</b> Choose jobs that do not run during the configured blackout time.</li> </ul> <p>For allowed and disallowed jobs, click the <b>Add job</b> or <b>Remove job</b> button to choose specific jobs to be included in, or excluded from, the policy. If you click the <b>Add job</b> button, the Choose Discovery Jobs dialog box opens.</p>
<b>Related Probes</b> 	The Probes on which to run the policy. Click the button to open the Edit Related Probes dialog box to define which Probes are included in the policy.
<b>Time</b> 	The date and time during which the policy is active. Click the button to open the Edit Timetable dialog box.

## Add New Domain Dialog Box

Enables you to add a domain.

<b>To access</b>	Click the <b>Add Domain or Probe</b>  button in the Domains and Probes pane.
<b>Important information</b>	In a version 8.01 or later environment that has been upgraded from version 6.x, to enable data to be modeled similarly as in the previous version, you must define the Probes as belonging to the <b>External</b> domain and not to the <b>Customer</b> domain.

User interface elements are described below:

UI Element (A–Z)	Description
<b>Description</b>	Enter a description to appear in the Details pane of the Data Flow Probe Setup window.
<b>Domain Type</b>	<ul style="list-style-type: none"> <li>• <b>Customer.</b> A private domain used for your site. You can define several domains and each domain can include multiple Probes. Each Probe can include IP ranges but the customer domain itself has no range definition.</li> <li>• <b>External.</b> Internet/public domain. A domain that is defined with a range. The external domain can contain only one Probe whose name equals the domain name. However, you can define several external domains in your system.</li> </ul>
<b>Name</b>	Enter a unique name for the domain.

## Add New Probe Dialog Box

Enables you to add a Probe.

<b>To access</b>	Click the <b>Add Domain or Probe</b> button in the Domains and Probes pane.
<b>Important information</b>	<ul style="list-style-type: none"> <li>To add a Probe to an existing domain, select <b>Probes</b> in the Domains and Probes pane and click the <b>Add Domain or Probe</b> button.</li> <li>To add a Probe to a new domain, create a domain, then add the Probe to the domain.</li> <li>Two Probes in the same domain cannot have the same IP address in their range.</li> <li>When a Probe is activated, it is added automatically and its status changes to <b>connected</b>. For details, see "Start the Probe " on page 27 or "In a Console" on page 27.</li> </ul>

## Choose Discovery Jobs Dialog Box

Enables you to choose the jobs that are to be added to, or excluded from, the job execution policy.

<b>To access</b>	Select <b>Allowed Jobs</b> or <b>Disallowed jobs</b> in the Edit Policy dialog box and click the  button.
------------------	--

User interface elements are described below:

UI Element (A–Z)	Description
<Installed packages>	Locate the job to be included in, or excluded from, the policy. (Use the SHIFT or CTRL key to select several packages.)

## Data Flow Probe Setup Window

Enables you to define a new domain or to define a new Probe for an existing domain. Also enables you to define the connection data for each protocol.

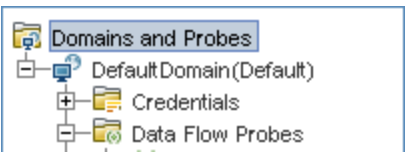
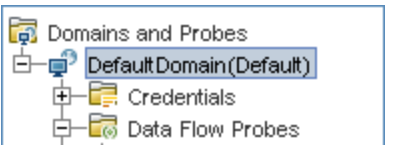
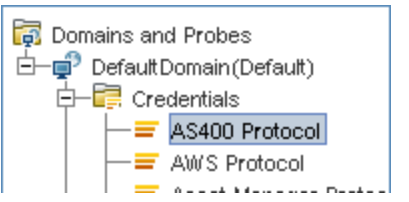
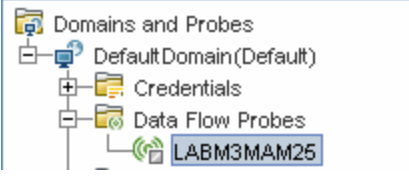
<b>To access</b>	<b>Data Flow Management &gt; Data Flow Probe Setup</b>
<b>Important information</b>	<ul style="list-style-type: none"> <li>For details on the Domains and Probes pane, see "Domains and Probes Pane" on page 47.</li> <li>For details on the Details pane, see "Data Flow Probe Setup Window - Details Pane" on next page.</li> </ul>
<b>See also</b>	Supported Protocols and Supported Agents in the <i>HP Universal CMDB Discovery and Integration Content Guide</i> .

## Data Flow Probe Setup Window - Details Pane

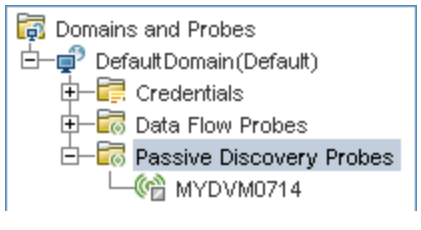
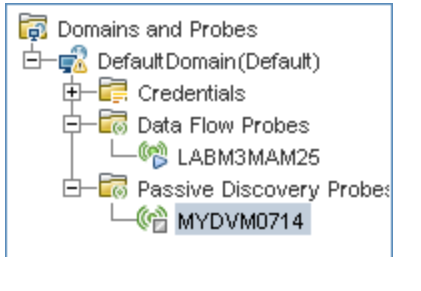
Enables you to view the Probes running under all domains and to add an execution policy to jobs.

<b>To access</b>	In the Data Flow Probe Setup window, click an object in the Domains and Probes pane.
------------------	--

Depending on what you select in the Domains and Probes pane, different information is displayed in the Details pane.

If you select...	The information displayed is...
	<p><b>Domains and Probes.</b> You can view details of all Probes and you can define and edit job execution policies.</p> <p>For details, see:</p> <ul style="list-style-type: none"> <li>• "Data Flow Probes Pane" on next page</li> <li>• "Job Execution Policy Pane" on page 43</li> </ul>
	<p><b>A specific domain.</b> You can add a description and view a list of Data Flow Probes and passive discovery probes defined and running in that domain.</p> <p>For details, see:</p> <ul style="list-style-type: none"> <li>• "Details Pane (Domain)" on page 42</li> <li>• "Data Flow Probes Pane" on next page</li> <li>• "Passive Discovery Probes Pane" on page 52</li> </ul>
	<p><b>A specific protocol.</b> You can add protocol parameters and you can view details on the protocol, including user credentials.</p> <p>For details, see "[Protocol] Pane" on page 44</p> <p>For a list of supported protocols, see the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</p>
	<p><b>A specific Data Flow Probe.</b> You can view details of the Data Flow Probe, including range information. You can also add ranges to, or exclude ranges from, the Data Flow Probe, and you can remove a Data Flow Probe from UCMDB.</p> <p>For details, see:</p> <ul style="list-style-type: none"> <li>• "Details Pane (Probe)" on page 42</li> <li>• "Ranges Pane" on page 46</li> </ul>



If you select...	The information displayed is...
	<p><b>Passive Discovery Probes.</b> You can view and globally configure notification types and verification policies for all passive discovery probes that integrate with the Data Flow Probes of the same domain.</p> <p>For details, see <a href="#">"Passive Discovery Probes Pane"</a> on page 52.</p>
	<p><b>A specific passive discovery probe.</b> Displays the details of a passive discovery probe, including the Data Flow Probe to which it connects, and its IP range information. You can also configure the IP ranges to be monitored by the passive probe, and you can remove a passive probe from the domain.</p> <p>For details, see <a href="#">"Passive Discovery Probe Details Pane"</a> on page 49.</p>

### Data Flow Probes Pane

Enables you to view a list of all Probes connected to the server.

<b>To access</b>	In the Domains and Probes pane, do one of the following: <ul style="list-style-type: none"> <li>• Select <b>Domains and Probes</b></li> <li>• Select <b>Domains and Probes &gt; &lt;a domain&gt;</b></li> </ul>
------------------	---

User interface elements are described below:

UI Element (A–Z)	Description
<b>IP</b>	The main IP address with which the Probe communicates with the UCMDB server.
<b>Last Access Time</b>	The last time that the Probe requested tasks from the server.
<b>Name</b>	The name given the Probe when it was added to UCMDB.
<b>Probe Version</b>	The version of the Probe.  If the version of the Probe is not compatible with the version of the UCMDB server, this is indicated. Moreover, if the incompatible Probe tries to connect to the UCMDB server, the server sends a shutdown instruction to the Probe. To ensure compatibility, you must upgrade the Probe manually. For details, see the section about manually upgrading the Probe in the <i>HP Universal CMDB Deployment Guide</i> .

UI Element (A–Z)	Description
<b>Status</b>	<ul style="list-style-type: none"> <li>• <b>Connected.</b> The Probe is connected to the server (the Probe connects every few seconds).</li> <li>• <b>Connected (suspended).</b> The Probe is connected, but it is suspended such that no jobs can run on the Probe.</li> <li>• <b>Disconnected.</b> The Probe is not connected to the server.</li> </ul>

### Details Pane (Domain)

This pane displays the details of the selected domain.

<b>To access</b>	In the Domains and Probes pane, select <b>Domains and Probes &gt; &lt;a domain&gt;</b>
------------------	--

User interface elements are described below:

UI Element (A–Z)	Description
<b>Description</b>	The description that was given to the domain when it was defined in UCMDB.
<b>Domain Type</b>	<ul style="list-style-type: none"> <li>• <b>Customer.</b> A private domain used for your site. You can define several domains and each domain can include multiple Probes. Each Probe can include IP ranges but the customer domain itself has no range definition.</li> <li>• <b>External.</b> Internet/public domain. A domain that is defined with a range. The external domain can contain only one Probe whose name equals the domain name. However, you can define several external domains in your system.</li> </ul>

### Details Pane (Probe)

This pane displays the details of the selected Data Flow Probe.

<b>To access</b>	In the Domains and Probes pane, select <b>Domains and Probes &gt; &lt;a domain&gt; &gt; Probes &gt; &lt;a Data Flow Probe&gt;</b>
------------------	---

User interface elements are described below:

UI Element (A–Z)	Description
<b>Last time probe accessed UCMDB</b>	The last time that the Probe was accessed on the server machine.
<b>Probe Description</b>	The description given to the Probe when it was added to UCMDB.




UI Element (A–Z)	Description
<b>Probe IPs</b>	The IPs of the Probe machine.  <b>Note:</b> If the Probe machine has more than one network card, all the IP addresses are displayed.
<b>Status</b>	<ul style="list-style-type: none"> <li>• <b>Connected.</b> The Probe is connected to the server (the Probe connects every few seconds).</li> <li>• <b>Connected (suspended).</b> The Probe is connected, but it is suspended such that no jobs can run on the Probe.</li> <li>• <b>Disconnected.</b> The Probe is not connected to the server.</li> </ul>
<b>Version</b>	The version of the Probe.  <b>Note:</b> If the version of the Probe is not compatible with the version of the UCMDB server, this is indicated. Moreover, if the incompatible Probe tries to connect to the UCMDB server, the server sends a shutdown instruction to the Probe. To ensure compatibility, you must upgrade the Probe manually. For details, see the section about manually upgrading the Probe in the <i>HP Universal CMDB Deployment Guide</i> .


## Job Execution Policy Pane

Enables you to configure the periods of time when jobs should or should not run on selected Probes.

<b>To access</b>	In the Domains and Probes pane, select <b>Domains and Probes</b> .
<b>Important information</b>	<ul style="list-style-type: none"> <li>• The default job execution policy is <b>Always</b>. This policy allows all jobs to run on any Probe at any time.</li> <li>• Jobs that have a listening functionality—that is, they do not perform discovery, for example, they listen to SNMP traps—are not included in a policy.</li> </ul>
<b>See also</b>	<a href="#">"Job Execution Policies" on page 23</a>







User interface elements are described below:

UI Element (A–Z)	Description
	<b>Move priority up/down.</b> Move the priority for the policy up or down. DFM executes all the policies in the list with the first policy taking priority. If a job is included in two policies, DFM executes the first policy only for that job.
	<b>New Policy.</b> Opens the New Policy dialog box, enabling you to add a job execution policy.
	<b>Remove Policy.</b> Removes the selected job execution policy.

UI Element (A–Z)	Description
	<b>Note:</b> If a job affected by the policy is active when the Remove command is executed, UCMDB removes the policy but any of the job's triggers that are currently running remain unaffected.
	<b>Edit Policy.</b> Opens the Edit Policy dialog box, enabling you to edit the selected job execution policy.
<b>Jobs</b>	The jobs that are affected by the policy.
<b>Probes</b>	The Probes that are affected by the policy.
<b>Time</b>	The schedule of the policy.

### [Protocol] Pane

Enables you to manage protocol connection credentials.

UI Element (A–Z)	Description
	<b>Create New Connection Details.</b> Opens the Protocol Parameters dialog box, enabling you to define a connection credential for the selected protocol type. For details, see "Protocol Parameter Dialog Box" on page 54.
	<b>Remove Connection Details.</b> Removes the selected connection credential.
	<b>Edit Connection Details.</b> Opens the Protocol Parameters dialog box, enabling you to edit the selected connection. For details, see "Protocol Parameter Dialog Box" on page 54.
	<b>Copy/Move selected credential to another domain.</b> Enables you to copy/move the selected protocol credential to another domain in the Domains and Probes tree.
	<b>Export Certificate for Manual Agent Deployment.</b> Enables you to export the Universal Discovery Agent certificate when installing the Universal Discovery Agent manually. For details, see the section about manual Universal Discovery Agent deployment in the <i>HP Universal CMDB Discovery and Integration Content Guide</i> .  <b>Available for:</b> Universal Discovery Protocol only.
	<b>Move entry up/Move entry down.</b> Enables you to move credential connections up or down to set the order in which credential sets are attempted. UCMDB tries to connect using all the credential sets in the list with the first set taking priority.
<b>&lt;Protocol connection details&gt;</b>	Displays the defined connection credentials for the protocol type selected in the Domains and Probes pane. The details displayed in this section vary from protocol type to protocol type. For details, see the relevant protocol information as

UI Element (A–Z)	Description
	<p>described in the Supported Protocols section in the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</p> <p>All protocol credentials include the following parameters:</p> <ul style="list-style-type: none"> <li>• <b>Index.</b> Indicates the order in which credential instances are selected to make a connection attempt. The lower the index, the higher the priority.  <b>Default:</b> Credentials are added with an auto-increasing index value. To update the index, use the arrows buttons.</li> <li>• <b>Scope.</b> To change the range that a protocol must discover or to select a Probe, click <b>Edit</b>. For details, see "<a href="#">Scope Definition Dialog Box</a>" on page 54.  <b>Default: ALL.</b></li> <li>• <b>User Label.</b> Enter a label to help you identify a specific protocol credential, when you use it later. Enter a maximum of 50 characters.</li> </ul>
<right-click menu>	<p>Choose from the following options:</p> <ul style="list-style-type: none"> <li>• <b>Edit.</b> Enables you to enter protocol parameters, such as user name and password, that enable connection to an application on a remote machine.</li> <li>• <b>Edit using previous interface.</b> Choose this option if:           <ul style="list-style-type: none"> <li>■ In a previous version of UCMDDB, you added parameters to this protocol that do not exist in this version.</li> <li>■ Values in this version cannot be deleted. For example, in this version you cannot configure SQL Protocol credentials with an empty port number. Select this option to open the previous Edit Protocol Parameter dialog box and delete the port number.</li> </ul> </li> <li>• <b>Copy/Move to another domain.</b> Enables you to copy/move the selected protocol credential to another domain in the Domains and Probes tree..</li> <li>• <b>Check credentials.</b> In the box that opens, enter the IP address of the remote machine on which the protocol must run. The Probe attempts to connect to this IP and returns an answer as to whether the connection succeeded or not.</li> <li>• <b>Export public certificates.</b> Opens the Export dialog box, enabling you to export the UD Agent certificate when deploying the UD Agent manually. For details, see the section about manual agent deployment in the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</li> </ul>
<right-click a column name>	<p>Choose from the following options:</p> <ul style="list-style-type: none"> <li>• <b>Hide Column.</b> Displayed when a column is shown.</li> <li>• <b>Show All Columns.</b> Displayed when a column is hidden.</li> </ul>







UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Select Columns.</b> Select to choose which columns to display or to change the display order of the columns.</li> <li>• <b>Auto-resize Column.</b> Select to change the column width to fit the contents.</li> </ul>





## Ranges Pane

Enables you to define network IP addresses on which a Probe must discover CIs.

<b>To access</b>	In the Domains and Probes pane, select <b>Domains and Probes &gt; &lt;a domain&gt; &gt; Probes &gt; &lt;a Data Flow Probe&gt;</b>
<b>Important Information</b>	For details on searching for a specific range, see the <b>Find Probe Range by IP</b> button in "Domains and Probes Pane" on next page.

User interface elements are described below:

UI Element (A–Z)	Description
	<b>New IP Range.</b> Opens the <b>New IP Range</b> dialog box, enabling you to define a new IP range for the selected Probe. For details, see "New/Edit IP Range Dialog Box" on page 35.
	<b>Delete IP Range.</b> Select an IP range and click the button to delete a range from the list.  <b>Note:</b> You can also delete an excluded IP range.
	<b>Edit IP Range.</b> Opens the <b>Edit IP Range</b> dialog box, enabling you to edit the selected IP range for the selected Probe. For details, see "New/Edit IP Range Dialog Box" on page 35.  <b>Note:</b> You can also edit an excluded IP range.
	<b>Export Data To File.</b> Enables you to export the defined IP ranges in Excel, PDF, RTF, CSV, or XML format. For details, see "CI Selector" in the <i>HP Universal CMDB Modeling Guide</i> .
	<b>Import Ranges from CSV File.</b> Opens the Import Ranges from File dialog box, enabling you to select a CSV file from which to import a set of IP ranges.  <b>Note:</b> Before using this feature, verify that: <ul style="list-style-type: none"> <li>• the imported file is a valid CSV file</li> <li>• the ranges in the CSV file do not conflict with existing ranges, that is, there are no duplicate or overriding ranges.</li> </ul>
	<b>Expand All.</b> Expands the entire hierarchical tree structure to display all of the defined IP ranges, including the excluded IP ranges.

UI Element (A–Z)	Description
	<b>Collapse All.</b> Collapses the hierarchical tree structure, leaving the top-level IP ranges showing, but hiding excluded IP ranges.
	<b>Show/Hide Legend.</b> Shows/Hides the legend for the Ranges pane. <ul style="list-style-type: none"> <li>. Denotes the range of IP addresses included for the selected Probe.</li> <li>. Denotes a range of IP addresses to exclude from the defined IP range.</li> </ul>
<b>Range; Description</b>	The network IP addresses that the Probe uses to discover CIs. For details, see "New/Edit IP Range Dialog Box" on page 35.





## Domains and Probes Pane






Enables you to view, define or edit a domain, connection credentials, Data Flow Probes, and passive discovery probes.

Also enables you to automatically upgrade all the Data Flow Probes with the latest cumulative patch (CUP).

<b>To access</b>	<b>Data Flow Management &gt; Data Flow Probe Setup</b>
<b>See also</b>	<ul style="list-style-type: none"> <li>"Job Execution Policies" on page 23</li> <li>"Data Flow Probe Setup Window - Details Pane" on page 40</li> <li>"Passive Discovery Probes Pane" on page 52</li> </ul>


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Domain or Probe.</b> Adds a domain or a Data Flow Probe, depending on what is selected. For details, see "Add New Domain Dialog Box" on page 38 or "Add New Probe Dialog Box" on page 39.
	<b>Remove Domain or Probe.</b> Deletes a domain, Data Flow Probe, or passive discovery probe, depending on what is selected.
	<b>Find Probe Range by IP.</b> If a Probe has many defined ranges, you can locate a specific range: select the Probe and click <b>Find Probe Range by IP</b> . In the Find Probe Range dialog box, enter the IP address and click the <b>Find</b> button. DFM highlights the range in the Ranges pane.
	<b>Reload Domain Information from Server.</b> Updates all domain, Data Flow Probe, and passive discovery probe information from the server.

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Suspend Probe.</b> Suspends the selected Probe (Data Flow Probe or passive discovery probe) from the UCMDB Server such that no jobs can run.</li> <li>• <b>Resume Probe.</b> Resumes the Probe's ability to run discovery and integration jobs.</li> </ul> <p><b>Note:</b> When a Probe is suspended, only the ability to run jobs is suspended. All other processes continues to run as usual.</p>
	<p><b>Deploy Probe Upgrade.</b> Opens the Deploy Probe Upgrade dialog box, enabling you to automatically upgrade the version of all the Data Flow Probes connecting to the UCMDB Server with the latest cumulative patch (CUP).</p> <p>In the Deploy Probe Upgrade dialog box, navigate to the Probe CUP .zip file.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• During the upgrade process, all compatible Data Flow Probes are automatically restarted. If an integration is running on a Data Flow Probe while it is restarting, the integration stops running, and starts over when the Data Flow Probe restarts. If an integration is almost finished running, or a significant part has already run, to avoid starting the integration over, we recommend letting it complete its run, and, thereafter, upgrading the CUP.</li> <li>• Data Flow Probes that are not compatible with the UCMDB Server are not updated using this feature and must be updated manually. For details, see the <i>HP Universal CMDB Deployment Guide</i>.</li> </ul>
<Data Flow Probe status icons>	<ul style="list-style-type: none"> <li>• . Indicates that a Probe is connected.</li> <li>• . Indicates that a Probe is suspended.</li> <li>• . Indicates that a Probe is disconnected.</li> </ul>


## Edit Related Probes Dialog Box

Enables you to select specific Probes.

<b>To access</b>	Click the <b>Related Probes</b> button  in the Edit Policy dialog box.
<b>See also</b>	"Job Execution Policies" on page 23


## Edit Timetable Dialog Box

Enables you to set the times when a Probe must run a job execution policy.

<b>To access</b>	Click the <b>Edit</b>  button in the Edit Policy dialog box.
<b>See also</b>	"New/Edit Policy Dialog Box" on page 37



User interface elements are described below:

UI Element (A–Z)	Description
<b>Description</b>	<p>Add a description of the specific policy. This field is mandatory.</p> <p><b>Tip:</b> The text you enter here appears in the Time box in the Job Execution Policy pane, so it is recommended that the description be informative:</p> 
<b>Time Definition</b>	<p>Click a cell for a day and time to be included in the policy. To add more than one time unit, drag the pointer over the cells.</p> <p><b>Note:</b> To clear a time unit, click the cell a second time.</p>

## Passive Discovery Probe Details Pane

This pane enables you to configure the passive discovery probes (HP RUM Engines) to monitor the IP address ranges and ports that you specify.

<b>To access</b>	<p>Select <b>Data Flow Management &gt; Data Flow Probe Setup</b>.</p> <p>In the Domains and Probes pane, select a domain, and select a passive probe under <b>Passive Discovery Probes</b></p>
<b>Important information</b>	<p>The passive discovery probes can be configured to monitor the IP address ranges in the domain of the Data Flow Probe only .</p>
<b>Relevant task</b>	<p><a href="#">"How to Configure Just-In-Time Discovery" on page 193</a></p>
<b>See also</b>	<ul style="list-style-type: none"> <li>• <a href="#">"Just-In-Time Discovery" on page 187</a></li> <li>• <a href="#">"Passive Discovery Probes Pane" on page 52</a></li> </ul>

## Passive Discovery Probe Details Pane

User interface elements are described below :

UI Element	Description
<b>Name</b>	The name given to the passive discovery probe (RUM Engine) when it was defined in HP RUM.
<b>Data Flow Probe</b>	The name of the Data Flow Probe to which the passive discovery probe reports.
<b>IP</b>	The IP address of the passive discovery probe (RUM Engine) machine.

UI Element	Description
<b>Version</b>	The HP RUM version.
<b>Status</b>	Indicates the status of the passive discovery probe: <ul style="list-style-type: none"> <li>• <b>Connected.</b> The passive discovery probe is connected and available to report information to the Data Flow Probe.</li> <li>• <b>Suspended.</b> The passive discovery probe is connected but unavailable to report information to the Data Flow Probe.</li> <li>• <b>Disconnected.</b> The passive discovery probe is not connected.</li> </ul>
<b>Last access time</b>	The date and time the passive discovery probe was last accessed.

### Passive Discovery Ranges Pane


This pane lists the RUM Probes that report to the RUM Engine. This information is obtained from the RUM Server.

User interface elements are described below :

UI Element	Description
<b>Passive Discovery Agent Name</b>	The name of the RUM Probe.
<b>Range</b>	The IP address range defined for the RUM Probe. Information from within this range is reported to the RUM Engine (passive discovery probe).
<b>Ports</b>	The ports defined for the RUM Probe over which information is reported.

### Passive Discovery Integrated Ranges Pane












User interface elements are described below :

UI Element	Description
<b>Use All Ranges Of Data Flow Probe &lt;Data Flow Probe name&gt;</b>	Enables passive discovery over all IP address ranges of the connected Data Flow Probe, over selected ports: <ul style="list-style-type: none"> <li>• <b>All available ports.</b> Enables passive discovery over all available ports.</li> <li>• <b>Selected ports</b> Enables passive discovery over ports that you select from the Global Ports List. Click  to select ports to monitor.</li> </ul>
<b>Use Selected Ranges Of Data Flow Probe &lt;Data Flow Probe name&gt;</b>	Enables the IP Ranges Definition area where you can select existing Data Flow Probe IP ranges of over which to perform passive discovery. See below.

UI Element	Description
	<b>Note:</b> IP ranges must be a subset of the connected Data Flow Probe's IP ranges.

### IP Ranges Definition Area

User interface elements are described below :

UI Element (A–Z)	Description
	<p><b>New IP Range.</b> Enables you to define a new IP address range for the passive discovery probe to monitor.</p> <p><b>Note:</b> This IP range must be a subset of one of the Data Flow Probe's IP address ranges.</p> <p>For details about defining an IP address range, see <a href="#">"New/Edit IP Range Dialog Box" on page 35</a></p>
	<p><b>Delete IP Range.</b> Enables you to remove an IP address range defined for passive discovery.</p>
	<p><b>Select IP Range</b> Enables you to select defined IP ranges for the passive discovery probe to monitor from the ranges defined for the connected Data Flow Probe.</p>
	<p><b>Edit IP Range.</b> Enables you to modify a selected IP range.</p> <p>For example, you can select one of the Data Flow Probes ranges, and then exclude some IP address from that range for passive discovery.</p>
	<p><b>Export Data To File.</b></p> <p><b>Note:</b> Not enabled for passive discovery probes.</p>
	<p><b>Import Ranges from CSV File.</b></p> <p><b>Note:</b> Not enabled for passive discovery probes.</p>
	<p><b>Expand All.</b> Expands the hierarchical tree structure to display all of the defined IP ranges, including the excluded IP ranges.</p>
	<p><b>Collapse All.</b> Collapses the hierarchical tree structure, hiding excluded IP ranges.</p>
	<p><b>Show/Hide Legend.</b> Shows/Hides the legend for the Ranges pane.</p> <ul style="list-style-type: none"> <li>. Denotes the range of IP addresses included for the selected passive discovery probe.</li> <li>. Denotes a range of IP addresses to exclude from the parent IP range.</li> </ul>
<Ranges grid>	Lists the IP address ranges and ports selected for the passive discovery probe to monitor.

## Passive Discovery Probes Pane

This pane enables you to globally configure notification types for all passive discovery probes that integrate with the Data Flow Probes of the same domain. The passive discovery probes notify UCMDB of changes in traffic, such as an unseen IP address or software not running.

<b>To access</b>	Select <b>Data Flow Management &gt; Data Flow Probe Setup</b> .  In the <b>Domains and Probes</b> pane, select a domain and select <b>Passive Discovery Probes</b> .
<b>Important information</b>	The definitions defined here are valid for all of the passive discovery probes that integrate with the Data Flow Probes of the same domain.
<b>Relevant task</b>	<a href="#">"How to Configure Just-In-Time Discovery" on page 193</a>
<b>See also</b>	<a href="#">"Just-In-Time Discovery" on page 187</a>

## Notification Types Pane

**Note:** By default all types of notifications are enabled.

User interface elements are described below :

UI Element	Description
<b>Report IP notifications</b>	<ul style="list-style-type: none"> <li>• Reports new IP addresses seen on the network.</li> <li>• Reports unseen IP addresses.               <ul style="list-style-type: none"> <li>▪ Select the amount of time that the passive probe should wait before triggering a notification that the IP address was not seen.</li> <li>▪ After this notification is sent, the Data Flow Probe performs a verification. Select an action that should be taken upon verification:                   <ul style="list-style-type: none"> <li>○ set the IP address as a candidate for deletion</li> <li>○ remove the IP address from UCMDB</li> </ul> </li> </ul> </li> </ul>
<b>Report running software notifications</b>	<ul style="list-style-type: none"> <li>• Reports new running software seen on the network</li> <li>• Reports unseen running software.               <ul style="list-style-type: none"> <li>▪ Select the amount of time that the passive probe should wait before triggering a notification that the software is not running.</li> <li>▪ After this notification is sent, the Data Flow Probe performs a</li> </ul> </li> </ul>

UI Element	Description
	verification. Select an action that should be taken upon verification: <ul style="list-style-type: none"> <li>○ set the RunningSoftware CI as a candidate for deletion</li> <li>○ remove the RunningSoftware CI from UCMDB</li> </ul>
<b>Report dependency link notifications</b>	Enables notification of dependency relationships.

## Removal Verification Policy Pane

User interface elements are described below:

UI Element	Description
<b>Verify ports by scanning</b>	Enables verification of listening ports by scanning.
<b>Ping configuration for verification process</b>	Enables you to specify the number and frequency of pings to verify unseen IP addresses before removal, as well as the overall number of simultaneous pings allowed.

## Passive Probes Pane

Lists the passive discovery probes that are connected to Data Flow Probes.

User interface elements are described below:

UI Element (A - Z)	Description
<b>Data Flow Probe</b>	The name of the Data Flow Probe to which the passive discovery probe reports.
<b>IP Address</b>	The IP address of the passive discovery probe (RUM Engine) machine.
<b>Last access time</b>	The date and time the passive discovery probe was last accessed.
<b>Name</b>	The name given to the passive discovery probe (RUM Engine) when it was defined in HP RUM.
<b>Status</b>	Indicates the status of the passive discovery probe: <ul style="list-style-type: none"> <li>● <b>Connected.</b> The passive discovery probe is connected and available to report information to the Data Flow Probe.</li> <li>● <b>Suspended.</b> The passive discovery probe is connected but not available to report information to the Data Flow Probe.</li> <li>● <b>Disconnected.</b> The passive discovery probe is not connected.</li> </ul>
<b>Version</b>	The HP RUM version.

## Protocol Parameter Dialog Box

Displays the attributes that can be defined for a protocol.

<b>To access</b>	<b>Data Flow Management &gt; Data Flow Probe Setup &gt; Domains and Probes &gt; Domain &gt; Credentials</b> , select a protocol and click the <b>Add</b> or <b>Edit</b> button.
<b>Important Information</b>	For a description of each protocol, see the <i>HP Universal CMDB Discovery and Integration Content Guide</i> .

## Scope Definition Dialog Box

Enables you to define ranges of IP addresses that a protocol must discover.



<b>To access</b>	Click the <b>Edit</b> button in the Protocol Parameters dialog box.
------------------	---

User interface elements are described below:

UI Element (A–Z)	Description
<b>Selected Probes</b>	To select specific Probes whose IP range must be changed, click <b>Edit</b> . For details, see " <a href="#">Choose Probe Dialog Box</a> " on page 207.
<b>Selected Ranges</b>	<ul style="list-style-type: none"> <li>• <b>All</b>. The protocol runs discovery on all ranges for the domain.</li> <li>• <b>Selected Range</b>. For the procedure to select a specific range on which the protocol runs discovery or to define an excluded range, see "<a href="#">New/Edit IP Range Dialog Box</a>" on page 35.</li> </ul>

## Selecting Probes

The Choose Probe, Edit Probe Limitations for Query Output, and Edit Related Probes dialog boxes include the following elements:

UI Element (A–Z)	Description
	<b>Add Selected Probe</b> . Click to add a Probe to the Selected Probes column.
	<b>Remove Selected Probe</b> . Click to remove a Probe from the Selected Probes column.
<b>All Data Flow Probes</b>	<ul style="list-style-type: none"> <li>• Select to add all Probes in the Non-selected Probes list.</li> <li>• Clear to add a specific Probe from the Non-selected Probes list.</li> </ul>
<b>Non-selected Probes</b>	Probes that are not included in the policy/filter/limitations.
<b>Selected Probes</b>	Probes that are included in the policy/filter/limitations.

## DataFlowProbe.properties File

A DFM process needs several parameters to be activated. These parameters specify the method to be used (for example, ping five times before declaring a failure) and against which CI a method should be run. If parameters have not been defined by the user, the DFM process uses the default parameters defined in the **DataFlowProbe.properties** file. To edit the parameters, open **DataFlowProbe.properties** in a text editor.

The **DataFlowProbe.properties** file is located in the following folder:  
**C:\hp\UCMDB\DataFlowProbe\conf.**

**Caution:** If you update the parameters in the **DataFlowProbe.properties** file, you must restart the Probe so that it is updated with the changes.

The **DataFlowProbe.properties** file is divided into the following sections:

- **Server Connection Definitions.** Contains parameters that are needed to set up the connection between the server and the Probe, such as the protocol to be used, machine names, default Probe and domain names, time-outs, and basic authentication.
- **Data Flow Probe Definitions.** Contains parameters that define the Probe, such as root folder location, ports, and Manager and Gateway addresses.
- **Probe Gateway Configurations.** Contains parameters that define time intervals for retrieving data.
- **Probe Manager Configurations.** Contains parameters that define Probe Manager functionality, such as scheduled intervals, touching, result grouping, chunking, threading, time-outs, filtering, and reporting multiple updates.
- **I18N Parameters.** Contains parameters that define language settings.
- **Internal Configurations.** Contains parameters that enable DFM to function efficiently, such as thread pool size.

**Caution:** Internal configuration parameters should not be changed without an advanced knowledge of Data Flow Management.

## DataFlowProbe.properties Parameters

This section describes the DataFlowProbe.properties file parameters.

These include:

- "Server Connection Definitions" on next page
- "Data Flow Probe Definitions" on page 58
- "Probe Gateway Configurations" on page 60
- "Probe Manager Configurations" on page 61
- "I18N Parameters" on page 64

## Server Connection Definitions

Parameter Name (A-Z)	Purpose	Type	Value Description
appilog.agent.Probe.BasicAuth.Realm	Used only when the Probe should be connected to the UCMDB server using proxy server	string	Default: None
appilog.agent.Probe.DownloadingTimeout	Timeout in ms. for download configuration files and userExt files (that is, serverData files).	long	Default: 300000
appilog.agent.probe.protocol	Defines the protocol used to communicate between the Probe Gateway and the Server.	string	<b>HTTP</b> or <b>HTTPS</b> (SSL) Default: <b>HTTP</b>
appilog.agent.Probe.ServerTimeout	Timeout in ms. for Probe requests going to the server.	long	Default: 180000
appilog.agent.Probe.BasicAuth.User appilog.agent.Probe.BasicAuth.Pwd	Basic authentication feature of Probe to Server. These properties are supplied by the admin who configured the Web server. <b>Deprecated:</b> certificate-based, mutual SSL authentication should be used instead.	string	All keys must be used to indicate usage of this feature. Values can be empty to represent non-values.
appilog.agent.Probe.JMX.BasicAuth.User appilog.agent.Probe.JMX.BasicAuth.Pwd	Authentication data for the Probe JMX.	string bytes	All keys must be used to indicate usage of this feature. Values can be empty to represent non-values. Password has to be encrypted. Encrypt password using the Probe JMX (that is, the <b>getEncryptedKey Password</b> operation in the <b>MainProbe MBean</b> ).



Parameter Name (A-Z)	Purpose	Type	Value Description
appilog.collectors.domain	The domain which the Probe Gateway belongs to (formerly known as the <b>Domain</b> of the Probe).	string	Default: <b>DefaultProbe</b>
appilog.collectors.domain.type	The type of the domain.	string	<b>customer; external</b> Default: <b>customer</b>
appilog.collectors.probe.name	The Probe name used for identification on UCMDB server	string	Uses the value defined during installation
appilog.collectors.probe.name	The Probe ID attribute. Used to identify the Probe Gateway by the UCMDB server. The server uses this ID to transfer tasks to the appropriate Probe Gateway.	string	Default: the machine name
http.proxyHost	Used only when the Probe should be connected to the UCMDB server using proxy server	string	DNS names
http.proxyPass	Used only when the Probe should be connected to the UCMDB server using proxy server	string	Default: None
http.proxyPort	Used only when the Probe should be connected to the UCMDB server using proxy server	int	Default: None
http.proxyRealm	Used only when the Probe should be connected to the UCMDB server using proxy server	string	Default: None
http.proxyUser	Used only when the Probe should be connected to the	string	Default: None

Parameter Name (A-Z)	Purpose	Type	Value Description
	UCMDB server using proxy server		
jettyHttpPort	The port of the jetty server used by Probe.	int	Default: <b>8090</b>
jettyHttpsPort	The https port of the jetty server used by Probe	int	Default: <b>8453</b>
server.webApp.name	Name of the server Web application (.war file) responsible for the Probe.	string	Default: <b>mam-collectors</b>
serverName	Defines the Server DNS name to which the Probe Gateway connects.	string	The DNS name
serverPort	The port number for HTTP communication.	int	Default: 8080
serverPortHttps	The port number for HTTPS communication.	int	Default: 8443

### Data Flow Probe Definitions

Parameter Name	Purpose	Type	Value Description
appilog.agent.local.jdbc.user appilog.agent.local.jdbc.pwd	My SQL authentication info.	string bytes	To change the DB password: <ol style="list-style-type: none"> <li>1. The OOTB script set_dbuser_password.cmd can be used in order to change the password of the default MySQL user.</li> <li>2. The password value in the properties file should be encrypted. Encrypt the password using the Probe JMX (that is, getEncryptedKey Password operation in MainProbe MBean).</li> </ol>
appilog.agent.probe.jdbc.driver appilog.agent.probe.jdbc.uri	Probe GW database info	string string	Default: <b>com.mysql.jdbc.Driver</b>  Default: <b>jdbc:mysql://localhost/probeMgr?autoReconnect=true</b>

Parameter Name	Purpose	Type	Value Description
appilog.agent.probe.jdbc.user appilog.agent.probe.jdbc.pwd	Probe GW authentication info	string bytes	Password has to be encrypted. Encrypt password using the Probe JMX (that is, <b>getEncryptedKey Password</b> operation in <b>MainProbe MBean</b> ).
appilog.agent.local.jdbc.driver appilog.agent.local.jdbc.uri	Probe Manager database info	string string	Default: <b>com.mysql.jdbc.Driver</b> Default: <b>jdbc:mysql://localhost/probeMgr?autoReconnect=true</b>
appilog.agent.netflow.jdbc.uri	Netflow database info	boolean	jdbc:mysql://localhost/netflow?autoReconnect=true &jdbcCompliantTruncation=false
appilog.collectors.probeLocalUnion	true: Probe GW process should also run a Probe Manager on same JVM.  false: Probe manager runs separately	boolean	Default: <b>true</b>
appilog.collectors.ProbeUseSpecificRMIPortFrom	Internal communication port	int	Default: <b>1199</b> <b>0</b> : Ports are allocated automatically
appilog.collectors.rmi.gw.port	Communication port between Probe GW and Probe Managers in case they are installed on separate processes	int	Default: <b>1742</b> .  Note: This value should be the same for all installed Probe Managers belonging to this Probe Gateway.
appilog.collectors.rmi.port	Internal communication port	int	Default: <b>1741</b> .  Note: This value should be the same for all installed Probe Managers belonging to this Probe Gateway.
appilog.collectors.storeDomainScopeDocument	true: Encrypted DomainScope document is stored on file system and internal DB.  false: Encrypted DomainScope document is retrieved from server each startup	boolean	Default: <b>true</b>

Parameter Name	Purpose	Type	Value Description
	and stored only in memory.		
appilog.collectors.local.ip appilog.collectors.probe.ip	The Probe Manager & Gateway IP addresses or DNS names	string string	DNS Names
appilog.collectors.probe.html.port appilog.collectors.local.html.port	Probe JMX console ports. Used to manage the Probe components.	int int	Default: <b>1977</b> Default: <b>1978</b>

### Probe Gateway Configurations

Parameter Name	Purpose	Type	Value Description
appilog.agent.probe.reconnection.interval	The interval in ms. between reconnection attempts of the Probe Gateway to its Probe Managers.	long	Default: <b>30000</b>
appilog.agent.probe.retrieveTasksFromServer.interval	The interval in ms. between task requests from the server by the Probe Gateway.	long	Default: <b>15000</b>
appilog.agent.probe.saveResultsInBKPTable	<b>true</b> : Results sent to the Server are stored in the database in a backup table. <b>false</b> : Results are not stored in a backup table.	boolean	Default: <b>false</b>
appilog.agent.probe.restartProbeAfterJarDownload.interval	Downloaded jar file resources can cause the Data Flow Probe to restart before all the other resources of an adapter package have downloaded. This parameter prevents the restart from occurring.	long	Default: <b>180000 msec</b> (3 minutes) <b>Note:</b> The delay until a restart on the first resource download (that is, for a first start or after clearing the Probe data) is

Parameter Name	Purpose	Type	Value Description
			10 milliseconds.

### Probe Manager Configurations

Parameter Name	Purpose	Type	Value Description
appilog.agent.local.max.worker.runtime	Maximal time (in msec) which a worker thread is allowed to run. After this period it is considered as stuck.	long	Default: <b>900000</b>
appilog.agent.local.max.stuck	Maximal number of worker threads which can be considered as stuck at the same time. When the number is reached, the Probe schedules a restart to release these threads.	int	Default: <b>10</b>
appilog.agent.local.check.stuck Threads	true - the Probe Manager should detect stuck threads. false - otherwise.	boolean	Default: <b>true</b>
appilog.agent.local.services.maxRemoteProcesses	The maximum number of remote processes allowed to be created during discovery. Remote processes are used to separate specific discovery from Probe process to prevent the Probe from possible memory issues.  Used, for example, in J2EE Discovery.	int	Default: -1 (no limit)
appilog.agent.local.services.maxRemoteProcessesPerJob	The maximum number of remote processes per job that are allowed to run simultaneously.	int	Default: 3
appilog.agent.local.process.result.dataValidation.content	Defines whether to validate data reported to the UCMDDB server by content. Deals mainly with reported values (i.e. attribute value), rather than metadata of objects.	boolean	Default: <b>true</b>
appilog.agent.local.process.result.checkMultiUpdate	Defines whether to check data consistency on objects.	boolean	Default: true

Parameter Name	Purpose	Type	Value Description
appilog.agent.local.process.result.filterRedundant.filterIgnoredCIs	<ul style="list-style-type: none"> <li><b>true.</b> If CIs were ignored by reconciliation on a discovery cycle, as long as they have not undergone any changes, they are filtered by the Probe on subsequent discovery cycles, and a warning is displayed on the trigger CI level. To resend these objects, you must clear the results cache.</li> <li><b>false.</b> Even if CIs that were ignored by reconciliation, they are still sent to the UCMDB on each discovery cycle, together with new and updated CIs.</li> </ul>	boolean	Default: <b>true</b>
appilog.agent.local.services.poolThreads	Maximal number of concurrent threads allocated for the multi-threaded job's execution activity.	int	Default: <b>80</b>
appilog.agent.local.services.defaultMAXJobThreads	Maximal number of concurrent threads running on a specific job.	int	Default: <b>8</b>
appilog.agent.local.services.adHocMaxThreads	Maximal number of threads for ad-hoc tasks.	int	Default: <b>20</b>
appilog.agent.local.process.result.dataValidation.validLinks	<p>true - validate links are legal.</p> <p>false - do not validate links.</p>	boolean	Default: true
appilog.agent.local.process.result.filterRedundant	<p>true - filter results which have been already sent to server.</p> <p>false - disable filter.</p>	boolean boolean	Default: <b>true</b> Default: <b>true</b>
appilog.agent.local.discoveryAnalyzerFromEclipse	<p>True: DiscoveryAnalyzer is executed from Eclipse.</p> <p>False: DiscoveryAnalyzer is not executed from Eclipse.</p>	boolean	Default: <b>false</b>
appilog.agent.local.maxTaskResultSize	Chunk maximal size of results being sent to the server.	int	Default: <b>20000</b>

Parameter Name	Purpose	Type	Value Description
appilog.agent.local.probe.restart.interval	Interval (in msec) before auto-restarts of the Probe Manager.	long	Default: <b>900000</b>
appilog.agent.local.process.result.autoDelete	true - send autodelete notification to Server for aged objects, not discovered by the Probe.  false - do not send  <b>Note:</b> This can be enabled only if <b>appilog.agent.local.process.result.filterRedundant</b> is enabled.	boolean	Default: <b>true</b>
appilog.agent.local.process.result.filterCI	true - filter results be predefined rules (CI types).  false - otherwise	boolean	Default: <b>true</b>
appilog.agent.local.process.result.fixLinksDirection	true - fix direction of illegal links.  false - otherwise.	boolean	Default: <b>true</b>
appilog.agent.local.process.result.warnOnMultiUpdate	true - Reports multiple update warnings to the UCMDB server.  <b>Note:</b> This parameter is global. It can be overridden on the adapter level by the <b>warnOnDuplicates</b> parameter which is absent by default, but gets its value from the global parameter.	boolean	Default: <b>true</b>
appilog.agent.local.serverdata.sync.timeout	Timeout (in msec) for the Probe to sync with Server data before starting executing tasks.	long	Default: <b>60000</b>
appilog.agent.local.specialCharactersRemove	Filter characters from string attributes of result objects which are reported to server by Probe.	string	Default: empty string (do not filter)
appilog.collectors.probemgr.DefaultResultGroupMaxObjs  appilog.collectors.probemgr.DefaultResultGroupMinTime	Probe Mgr - Result Grouping defaults (used when DFM adapter does not override). Grouping means holding on to results and sending them to the Gateway only upon meeting one of the grouping thresholds. This is used to control the rate of data flowing from Probes to the Server.	long  long	Default: <b>5000</b>  Default: <b>30000</b> (in ms.)  Relation between two keys: <b>OR</b>

Parameter Name	Purpose	Type	Value Description
appilog.agent.probe.touchWindowMechanism.isActive	The touch window defines the period when touch process is allowed . The parameter defines whether the touch window mechanism is active.	boolean	Default: <b>false</b>
appilog.agent.probe.touchWindowMechanism.startTime	Defines the time, in hours and minutes, when the touch window starts	string	Format: HH:MM  Values: 00:00-23:59  Default: <b>00:00</b>
appilog.agent.probe.touchWindowMechanism.endTime	Defines the time, in hours and minutes, when the touch window ends	string	Format: HH:MM  Values: 00:00-23:59  Default: <b>23:59</b>

### I18N Parameters

Parameter Name	Purpose	Type	Value Description
appilog.collectors.encoding.ANSI	Default encoding used for Windows applications (requiring ANSI encoding)	string	Default: empty (ANSI encoding is chosen from the Data Flow Probe operating system)
appilog.collectors.encoding.OEM	Default encoding used for DOS/UNIX Shells/IBM encoded applications.	string	Default: empty (OEM encoding is chosen from the Data Flow Probe operating system)
chcpCodeToCharasetName. xxx	Mapping entry between <b>chcp</b> code page to specific encoding name (used for cases where the <b>cp+&lt;code&gt;</b> rule is not followed)	string	Syntax: <b>chcpCodeToCharasetName.&lt;code&gt;=&lt;encoding_name&gt;</b>  Example: <b>chcpCodeToCharasetName.932=MS932</b>



Parameter Name	Purpose	Type	Value Description
collectors_ language	Language settings (must be manually configured for non-English environments).	string	Default: <b>English</b> Options: get=German rus=Russian

## Content Data Validation Jython Scripts

The Content Data Validation Jython scripts are divided into main scripts and library scripts. Each "main" script must have the **ValidateData** function which is the entry point for the execution of data validation. The **ValidateData** function has the following parameters:

- **TaskResults.** Provides the API accessing data objects.
- **Environment.** Provides the API for accessing Environment information, such as the Probe Gateway name, the Probe Gateway IP, and the domain name.

The **dataValidationlibs.xml** file is a configuration file where you define which scripts to execute and which to execute as libraries. The file is divided into sections which logically define the data validation execution.

### Example of the dataValidationlibs.xml File

```
<datavalidation parserClassName="com.hp.ucmdb.discovery.  
library.communication.downloader.cfgfiles.  
ContentDataValidationConfigFile">  
  
    <script name="dataValidator1.py">  
        <library name="validator1.py"/>  
    </script>  
  
    <script name="dataValidator2.py" cit="Node,Process">  
        <library name="validator2.py"/>  
        <library name="validator3.py"/>  
    </script>  
  
</datavalidation>
```

where:

- **validator<x>.py** is a library script.  
  
Libraries must be ordered according to their dependency. In this example, **validator3.py** uses **validator2.py**, so **validator3.py** appears after first **validator2.py**.
- The **cit** parameter lists the CITs that the script receives for validation. In this example, the **dataValidator2.py** script receives only **Node** and **Process** CITs for validation.

## Handling Errors and Warnings

- **addError/addWarning.** Use this API from the TaskResults parameter to attach error/warning to triggered CIs. Bulk is reported to the UCMDB server.
- **raise ContentDataValidationException.** Use to report an error message if the bulk should be discarded.

### Example of API Usage

- **Main Script**

```
#dataValidator1.py

import validator1

def ValidateData(TaskResults, Environment):
    logger.info('probe gateway is :', Environment.
getProbeGatewayID())

    logger.info('probe gateway ip is :', Environment.
getProbeGatewayIP())

    logger.info('probe domain is :', Environment.
getProbeManagerDomain())

objectsForUpdate = TaskResults.getResultObjects()
size = objectsForUpdate.size()

if size > 0:
    for i in range(0, size):
        object = objectsForUpdate.get(i)
        validator1.validate(object, TaskResults)
        if object.getObjectClass() == 'host':
            TaskResults.addError(100, 'host CIT is not in class
model')
    pass
```

- **Library Script**

```
#validator1.py
```

```
from com.hp.ucmdb.discovery.library.results.resultprocess import
ContentDataValidationException

def validate(object, TaskResults):
    if object.getAttribute('description') == None:
        TaskResults.addWarning(100, 'No description set for the object
of type ' + object.getObjectClass())
    if object.getAttribute('host_hostkey') == None:
        // fatal error, all bulk and all previous errors will be removed
from bulk
        // this error will be shown in UI
        raise ContentDataValidationException, 'Attribute host_hostkey is
absent'
```

## Data Flow Probe Log Files

Probe logs store information about job activation that occurs on the Probe Gateway and Probe Manager. The log files can be accessed from the following location:

**C:\hp\UCMDB\DataFlowProbe\runtime\log**

**Note:** Alternatively, to access the Probe's log files, log in to the JMX console ([http://<probe\\_machine>:8090/jmx-console/](http://<probe_machine>:8090/jmx-console/)) and, from the main page, select the **GeneralUtils** mbean. Activating the **executeLogGrabber** function zips all the Probe's log files. Save the .zip file locally on your client machine.

Log files include:

- "General Logs" below
- "Probe Gateway Logs" on next page
- "Probe Manager Logs" on page 69

## General Logs

### WrapperProbeGw.log

Records all the Probe's console output in a single log file.

Level	Description
Error	Any error that occurs within the Probe Gateway.
Information	Important information messages, such as the arrival or removal of a new task.
Debug	N/A

**Basic Troubleshooting.** Use this file for any Probe Gateway problems to verify what occurred with the Probe Gateway at any time as well as any important problems it encountered.

### **probe-error.log**

Summary of the errors from the Probe.

Level	Description
Error	All errors in the Probe components.
Information	N/A
Debug	N/A

**Basic Troubleshooting.** Check this log to verify if errors occurred in the Probe components.

### **probe-infra.log**

List of all infrastructure messages.

Level	Description
Error	All infrastructure errors.
Information	Information about infrastructure actions.
Debug	Messages mainly for debug purposes.

**Basic Troubleshooting.** Messages from the Probe's infrastructure only.

### **wrapperLocal.log**

When running the Probe in separate mode (that is, the Probe Manager and Probe Gateway are installed on separate machines), a log file is also saved to the Probe Manager.

Level	Description
Error	Any error that occurs within the Probe Manager.
Information	Important information messages such as received tasks, task activation, and the transferring of results.
Debug	N/A

**Basic Troubleshooting.** Use this file for any Probe Manager problems to verify what occurred with the Probe Manager at any time as well as any important problems it encountered.

## **Probe Gateway Logs**

### **probeGW-taskResults.log**

This log records all the task results sent from the Probe Gateway to the server.

Level	Description
Error	N/A
Information	Result details: task ID, job ID, number of CIs to delete or update.
Debug	The <b>ObjectStateHolderVector</b> results that are sent to the server (in an XML string).

#### Basic Troubleshooting

- If there is a problem with the results that reach the server, check this log to see which results were sent to the server by the Probe Gateway.
- The results in this log are written only after they are sent to the server. Before that, the results can be viewed through the Probe JMX console (use the **ProbeGW Results Sender** MBean). You may have to log in to the JMX console with a user name and password.

#### probeGW-tasks.log

This log records all the tasks received by the Probe Gateway.

Level	Description
Error	N/A
Information	N/A
Debug	The task's XML.

#### Basic Troubleshooting

- If the Probe Gateway tasks are not synchronized with the server tasks, check this log to determine which tasks the Probe Gateway received.
- You can view the current task's state through the JMX console (use the **Discovery Scheduler** MBean).

## Probe Manager Logs

#### probeMgr-performance.log

Performance statistics dump, collected every predefined period of time, which includes memory information and thread pool statuses.

Level	Description
Error	N/A
Information	N/A
Debug	N/A

#### Basic Troubleshooting

- Check this log to investigate memory issues over time.
- The statistics are logged every 1 minute, by default.

### **probeMgr-adaptersDebug.log**

This log contains messages that are created following a job execution.

## Troubleshooting and Limitations

### Troubleshooting

**Problem. You cannot transfer a Data Flow Probe from one domain to another. Once you have defined the domain of a Probe, you can change its ranges, but not the domain.**

**Solution.** Install the Probe again:

1. (Optional) If you are going to use the same ranges for the Probe in the new domain, export the ranges before removing the Probe. For details, see "[Data Flow Probe Setup Window - Details Pane](#)" on page 40.
2. Remove the existing Probe from UCMDDB. For details, see the **Remove Domain or Probe** button in "[Domains and Probes Pane](#)" on page 47.
3. Install the Probe. For details, see the section about installing the Data Flow Probe in the *HP Universal CMDB Deployment Guide*.
4. During installation, make sure you give a different name to the Probe from the one used by the old Probe.

**Problem. Discovery shows a disconnected status for a Probe.**

**Solution.** Check the following on the Probe machine:

- That the Probe is running
- That there are no network problems

**Problem. The connection between the HP Universal CMDB server and the Probe fails due to an HTTP exception.**

**Solution.** Ensure that none of the Probe ports are in use by another process.

**Problem. A Data Flow Probe node name cannot be resolved to its IP address. If this happens, the host cannot be discovered, and the Probe does not function correctly.**

**Solution.** Add the host machine name to the Windows HOSTS file on the Data Flow Probe machine.

**Problem. After uninstalling the Data Flow Probe, mysql.exe and associated files are not deleted.**

**Solution.** To delete all files, restart the machine on which the Data Flow Probe was installed.

### Limitations

**Limitation.** If you reconfigure a Data Flow Probe to work with a different UCMDDB server, you must first run the clearProbeData.bat file before you restart the Probe.

# Chapter 3

---


## Data Flow Probe Status

This chapter includes:

Data Flow Probe Status Overview.....	71
View Current Status of Discovered CIs.....	71
Data Flow Probe Status User Interface.....	71

### Data Flow Probe Status Overview

You use Data Flow Probe Status to view the current status of the discovered CIs in the Probes. Data Flow Probe Status retrieves the status from the Probes and displays the results in a view.

The view is not automatically updated; to refresh the status data, click the **Get snapshot**  button .

### View Current Status of Discovered CIs

This task describes how to view the current status of discovered CIs.

This task includes the following steps:

- "Prerequisites" below
- "Access Data Flow Probe status" below



#### 1. Prerequisites

Verify that the Probe is enabled and is connected to the HP Universal CMDB server. For details, see "How to Start the Data Flow Probe" on page 27.

#### 2. Access Data Flow Probe status

- a. Go to **Data Flow Management > Data Flow Probe Status**.
- b. Select a connected Probe.

All current jobs in the Probe are listed, together with their status. For details, see "Data Flow Probe Status Window" on next page.

- c. Click the **Get Snapshot**  button.
- d. Select jobs from the Progress list and click the **View Job progress**  button. The Job Details window opens.


### Data Flow Probe Status User Interface

This section includes:

- "[Job Name] Dialog Box" below
- "Data Flow Probe Status Window" below

## [Job Name] Dialog Box

Enables you to view details about a job, including its scheduling, as well as job statistics.

<b>To access</b>	In the Progress pane of the Data Flow Probe Status window do one of the following: <ul style="list-style-type: none"> <li>• Select a job and click the <b>View job progress</b>  button</li> <li>• Double-click a job</li> </ul>
------------------	--

User interface elements are described below:

UI Element (A–Z)	Description
<b>Job Details</b>	<ul style="list-style-type: none"> <li>• <b>Status.</b> Can be <b>Scheduled</b> (the job runs according to a defined schedule) or <b>Running</b> (the job is running now).</li> <li>• <b>Last updated.</b> The last time that the job was updated.</li> <li>• <b>Threads.</b> The number of threads currently allocated to this job.</li> <li>• <b>Progress.</b> The number of Trigger CIs in the job and the number of Trigger CIs that the Probe has finished working on.</li> </ul>
<b>Schedule</b>	<ul style="list-style-type: none"> <li>• <b>Previous invocation.</b> The last time that Universal Discovery ran the job.</li> <li>• <b>Next invocation.</b> The next time that Universal Discovery is scheduled to run the job.</li> <li>• <b>Last duration.</b> The length of time, in seconds, taken to run the job in the previous invocation. This is calculated according to the start time of the first trigger until the end time of the last trigger, even if triggers were added later on.</li> <li>• <b>Average duration.</b> The average duration (in seconds) per trigger of the time it took the Probe to run this job.</li> <li>• <b>Recurrence.</b> The number of times the job ran via the scheduler (manual runs are not counted).</li> </ul>
<b>Statistics Results</b>	For details, see " <a href="#">Statistics Results Pane</a> " on page 75.

## Data Flow Probe Status Window

Enables you to view the current status of discovered CIs and all active jobs running on the Probes.

<b>To access</b>	<b>Data Flow Management &gt; Data Flow Probe Status</b>
------------------	---



<b>Important Information</b>	<p>Depending on what you select in the Domains Browser pane, different information is displayed in the viewing pane.</p> <p>If you select:</p> <ul style="list-style-type: none"> <li>• a domain, you can view details and CIT statistics for the domain.</li> <li>• a Probe, you can view details on the Probe (such as the Probe IP), the progress of a job and you can view CIT statistics.</li> </ul> <p>For details see</p> <ul style="list-style-type: none"> <li>▪ <a href="#">"Details Pane (Domain)" below</a></li> <li>▪ <a href="#">"Details Pane (Probe)" below</a></li> <li>▪ <a href="#">"Progress Pane" on next page</a></li> <li>▪ <a href="#">"Statistics Results Pane" on page 75</a></li> </ul>
<b>Relevant tasks</b>	<p><a href="#">"View Current Status of Discovered CIs" on page 71</a></p>
<b>See also</b>	<p><a href="#">"Data Flow Probe Status Overview" on page 71</a></p>

## Domain Browser Pane

Displays the domains and Probes defined in the UCMDB system in a tree view.

## Details Pane (Domain)


Displays the details of the domain selected in the Domains Browser pane.

User interface elements are described below:

<b>UI Element (A–Z)</b>	<b>Description</b>
<b>Domain Type</b>	<ul style="list-style-type: none"> <li>• <b>Customer.</b> A private domain used for your site. You can define several domains and each domain can include multiple Probes. Each Probe can include IP ranges but the customer domain itself has no range definition.</li> <li>• <b>External.</b> Internet/public domain. A domain that is defined with a range. The external domain can contain only one Probe whose name equals the domain name. However, you can define several external domains in your system.</li> </ul> <p>For details on defining domains, see <a href="#">"Add New Domain Dialog Box" on page 38.</a></p>

## Details Pane (Probe)


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Refresh.</b> Displays the most current status of the discovered CIs and jobs on the selected Probe.
<b>Last updated</b>	The date and time at which the Get snapshot button was last pressed (that is, the date and time of the data displayed in Data Flow Probe Status).
<b>Probe IP</b>	The IP address which the Probe communicates with UCMDB.
<b>Running jobs</b>	The number of jobs running on the Probe.
<b>Scheduled jobs</b>	The number of jobs that are scheduled to run according to the settings in the Discovery Scheduler. For details, see " <a href="#">Discovery Scheduler Dialog Box</a> " on page 227.
<b>Status</b>	The status of the Probe: <ul style="list-style-type: none"> <li>• <b>Connected.</b> The Probe has successfully connected to the server (the Probe connects every few seconds).</li> <li>• <b>Connected (suspended).</b> The Probe is suspended such that no jobs can run on the Probe.</li> <li>• <b>Disconnected.</b> The Probe is not connected to the server.</li> </ul>
<b>Threads</b>	The sum of all threads currently allocated to the running jobs.

## Progress Pane

Displays the progress of the jobs on the selected Probe.

User interface elements are described below:

UI Element (A–Z)	Description
	<p><b>View Job progress.</b> Opens the [Job Name] dialog box, enabling you to view the view details of the selected job.</p> <p><b>Available:</b> When a job in the Progress pane is selected.</p> <p><b>Tip:</b> Alternatively, double-click a job to display its details. For details, see "<a href="#">[Job Name] Dialog Box</a>" on page 72.</p>
<b>Job</b>	The name of the job scheduled to run on the Probe.
<b>Next invocation</b>	The next time that the Probe is scheduled to run.



UI Element (A–Z)	Description
<b>Previous invocation</b>	The last time that the Probe ran.
<b>Progress</b>	<ul style="list-style-type: none"> <li>If a job has not started running, the Progress column displays <b>Scheduled</b>.</li> <li>If a job is running, the progress of the running job is displayed.</li> </ul>
<b>Thread count</b>	The number of threads currently allocated to this job.
<b>Triggered CIs</b>	The number of CIs triggered in the job.

### Statistics Results Pane

Enables you to view details and CIT statistics.

<b>To access</b>	Click the Default Domain or Probe name in the Domains Browser pane.
------------------	---

User interface elements are described below:

UI Element (A–Z)	Description
	<p>Enables you to retrieve the latest data from the Probe.</p> <p><b>Note:</b> This data is not automatically updated.</p>
	<p><b>Set Filter.</b> Enables you to set the time range for which to display statistics about the CITs.</p> <ul style="list-style-type: none"> <li><b>All.</b> Displays statistics for all job runs.</li> <li><b>Last Hour/Day/Week/Month.</b> Choose a period of time for which to display statistics about the CITs.</li> <li><b>Custom Range.</b> Click to open the Change Timeframe dialog box: Enter the date or click the arrow to choose a date and time from the calendar, for the <b>From</b> and <b>To</b> dates (or click <b>Now</b> to enter the current date and time). Click <b>Last Day</b> to enter the current date and time in the <b>To</b> box and yesterday's date and time in the <b>From</b> box. Click <b>OK</b> to save the changes.</li> </ul>
<b>CIT</b>	The name of the discovered CIT.
<b>Created</b>	The number of CIT instances created by the Probe.
<b>Deleted</b>	The number of CIT instances deleted by the Probe.
<b>Discovered CIs</b>	The sum of all the CIs for all the invocations.
<b>Filter</b>	The time range set with the <b>Set Filter</b> button.
<b>Last updated</b>	The date and time that the statistics table was updated for a particular Probe.

<b>UI Element (A–Z)</b>	<b>Description</b>
<b>Updated</b>	The number of CIT instances that have been updated.

---

# Adapter Management

# Chapter 4

---

## Adapter Configuration

This chapter includes:

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## Discovering Running Software

You can discover software (for example, a specific Oracle database) running in your environment.

This section includes the following topics:

- "Discovery Process" below
- "Running Software Default View" on next page

### Discovery Process

The discovery process runs as follows:

- The Host Resources and Applications jobs are activated.
- DFM searches for processes on the machines in your environment.
- DFM saves the process data (including open port and command line information) to the Probe database.
- The jobs run on this data in the Probe database, build the new RunningSoftware CIs according to the data in the database, and extract the key attributes from the process data. The jobs send the CIs to the UCMDB Server.

## Running Software Default View

A default view displays the mapping of relationships between applications: **Modeling > Modeling Studio > Resources** pane > **Root > Application > Deployed Software**.

You can configure DFM to discover running software. For details, see "[How to Discover Running Software – Scenario](#)" on page 83.

## Identifying Running Software by Processes

An application is identified by the existence of one or more running processes which are defined by their names and by command line (optional).

A process can be optionally marked as a key process or as a main process.

An application is identified if the following holds true:

- At least one process was found.
- All processes that are marked as key processes exist.

If an application is identified, a result RunningSoftware CI is created for the application obeying the following rules:

- If none of the processes is marked as a main process, a single RunningSoftware CI will be created, linked to all discovered processes by dependency relationships.
- If there are processes that are marked as main processes, a RunningSoftware CI will be created for each instance of these main processes.

For example, assume that rules are defined for the identification of two applications, **application\_a** and **application\_b**:

- **application\_a** is identified by **proc.exe** and **unique\_proc\_a.exe**.
- **application\_b** is identified by **proc.exe** and **unique\_proc\_b.exe**.

Say that **proc.exe** is found but none of its processes are marked as key or main processes. In this case, **RunningSoftware** CIs are created for both **application\_a** and **application\_b**. These CIs are linked by a dependency relationship to the same process (that is, **proc.exe**).

Assume too that **unique\_proc\_a.exe** and **unique\_proc\_b.exe** are marked as key processes:

- If the **proc.exe** process only is discovered, a **RunningSoftware** CI is not created.
- If **unique\_proc\_a.exe** is discovered, **RunningSoftware** CIs are created for **application\_a** linked by a dependency link to **unique\_proc\_a.exe**. If in addition, **proc.exe** is discovered, it is linked to the same CI. The same holds for **application\_b**.

Assume that two instances of **unique\_proc\_a.exe** are discovered:

- If the process is not marked as a main process, a single **RunningSoftware** CI is created for **application\_a** linked to both processes.
- If the process is marked as a main process, two separate **RunningSoftware** CIs are created for **application\_a**.

For details on the key field in the Software Identification Rule Editor dialog box, see "[Identifying Processes](#)" on page 122.

## Automatically Deleted CIs and Relationships and Candidates for Deletion CIs

During discovery, the Data Flow Probe compares CIs found during the previous, successful invocation with those found during the current invocation. A missing component, such as a disk or software, is assumed to have been removed from the system, and its CI is deleted from the Probe's database.

You can define that CI instances are to be deleted for specific jobs. For details, see ["How to Configure the Data Flow Probe to Automatically Delete CIs"](#) on page 32.

By default, the Data Flow Probe deletes CI instances of certain CITs, for example, the current configuration for the Host Resources and Applications jobs (snmp: file system, installed software, osuser, service).

**Note:** The Data Flow Probe does not wait for the aging mechanism to perform the calculation but immediately sends a deletion request to the server. For details about aging, see ["The Aging Mechanism Overview"](#) in the *HP Universal CMDB Administration Guide*.

### Candidates for Deletion

You can mark a CI instance as a candidate for deletion. This enables you to isolate CIs instead of them being automatically deleted when they are not discovered.

**Note:**

- The change is defined on the job's adapter.
- If discovery fails and errors occur, objects are sent for deletion according to how the results are managed. For details, see ["Results Management Pane"](#) on page 97.
- Carefully choose the CIs that are to be candidates for deletion. For example, process CITs are not good candidates because they are often shutting down and starting up again and as a result may be deleted at every invocation.
- You can use this procedure to delete relationships, too. For example, the **containment** relationship is used between a node and an IP address. A laptop machine is allocated a different IP address very often; by deleting the relationship, you prevent the accumulation of old IP addresses attached to this node.

### Example of Automatic Deletion

During the previous invocation, the Data Flow Probe ran the **Host Resources and Applications by WMI** job and discovered a host with disks a, b, c, and d. During the current invocation, the Probe discovers disks a, b, and c, compares this result with the previous result, and deletes the CI for disk d.



## More Information

- You can view deleted CIs in the Probe log and in the Deleted column in the Statistics Results pane. For details, see ["Data Flow Probe Log Files"](#) on page 67 and ["Statistics Results Pane"](#) on page 220.
- For details on setting automatic deletion, see ["Adapter Configuration Tab"](#) on page 96 in the Results Management pane.

# How to Configure Adapter Settings

You should edit adapter and XML files in one of the following ways:

## Change the adapter's definitions in the Adapter Management module

**Note:** This method is recommended.

1. Navigate to **Data Flow Management > Adapter Management**.
2. In the Resources pane, select the adapter file in the **Packages > <package name> > Adapters** folder.
3. Do one of the following:
  - To edit general adapter settings, use the **Adapter Definition** and **Adapter Configuration** tabs. For details, see ["Adapter Definition Tab"](#) on page 89 and ["Adapter Configuration Tab"](#) on page 96.
  - To define specific settings for the selected adapter, right-click the adapter and select **Edit Adapter Source** from the shortcut menu.

## Edit the adapter package and redeploy it using the Package Manager

Export the package to your local drive, edit the package and redeploy it. For information see, [Export a Package](#) and [Deploy a Package](#) in the *HP Universal CMDB Administration Guide*.

## Use the JMX Console

1. Launch the Web browser and enter the server address, as follows:  
**http://<UCMDB Server Host Name or IP>:8080/jmx-console.**  
You may have to log in with a user name and password.
2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.
3. Locate the **listSubsystems** operation.
4. Enter the Customer ID value and click **Invoke**.
5. Click the **discoveryPatterns** or **discoveryConfigFiles** link.
6. Click the resource to edit.

## How to Configure Full Population Run

Because the UCMDB 9.0x adapter only synchronizes changes, over time CIs are not touched and are aged out. Therefore, by default, the UCMDB 9.0x adapter runs a full population job every seven days.

To change the full population value of the UCMDB 9.0x adapter:

1. Open the CmdbAdapter adapter source.
  - a. Select **Data Flow Management > Adapter Management > Resources pane > CmdbAdapter**.
  - b. Under **Adapters**, right-click **CmdbAdapter**, and select **Edit Adapter Source**.
2. In the source file, locate the following tag:

```
<full-population-days-interval>  
    7  
</full-population-days-interval>
```

3. Edit the value as follows:

Value	Description
7	Run full population job every 7 days
1	Run full population job each day
0	Always run a full population job
-1	The option is disabled

## How to Configure CI Aging Settings

This task explains how to configure the aging mechanism for adapters.

To learn more about aging, see "[The Aging Mechanism Overview](#)" in the *HP Universal CMDB Administration Guide*.

To enable aging of CIs:

1. Select the adapter: **Adapter Management > Resources pane > Packages > <adapter>**
2. In the **Adapter Configuration** tab, under **Results Management**, select an **Enable Aging** option as follows:

<b>System Default</b>	Enables aging of CIs using the default aging setting defined in each CIT type's attribute settings.  For details, see " <a href="#">Configuration Item Properties Dialog Box</a> " on page 1 in the <i>HP Universal CMDB Modeling Guide</i> .
-----------------------	---

<b>Always Enabled</b>	Always enables aging of CIs discovered by jobs that use this adapter. <b>Note:</b> When this option is selected, the default aging setting defined in each CIT type's attribute settings is ignored.
<b>Always disabled</b>	Disables aging of CIs discovered by jobs that use this adapter. <b>Note:</b> This option overrides the default aging setting defined in each CIT type's attribute settings.

3. Save your changes.

## How to Discover Running Software – Scenario

This scenario explains how to set up the discovery of Oracle databases so that there is no need to enter a specific set of credentials to discover each database instance. DFM runs an `extract` command that retrieves the database name attribute.

In this scenario, we assume that the following syntax is used in the Oracle command lines:

```
c:\ora10\bin\oracle.exe UCMDB
```

This task includes the following steps:

- "Prerequisites" below
- "Create a Command Line Rule" on next page
- "Define the Value of an Attribute" on next page
- "Activate the Job" on page 85

### 1. Prerequisites

Display the Attribute Assignment Rules dialog box:

- a. Select **Data Flow Management > Discovery Control Panel**. In the **Discovery Modules** pane, select the **Network Discovery** module > **Host Resources and Applications > Software Element CF by Shell**. In the **Properties** tab, select **Global Configuration Files > applicationSignature.xml**. For details, see "Global Configuration Files Pane" on page 95.

**Tip:** If the Global Configuration Files pane does not display, click the arrow below the Trigger Queries pane.

- b. Click the **Edit** button to open the Software Library dialog box. For details, see "Software Library Dialog Box" on page 122.
- c. Choose the signature to be edited. Click the **Edit** button to open the Software Identification Rule Editor dialog box. For details, see "Software Identification Rule Editor Dialog Box" on page 121.

- d. Click the **Set Attributes** button to open the Attributes Assignment Editor dialog box. For details, see "Attribute Assignment Editor Dialog Box" on page 102.

## 2. Create a Command Line Rule

The command line rule is text that identifies the process to be discovered, for example, `oracle.exe c:\ora10\bin\oracle.exe UCMDB`. You can substitute the text entry with a regular expression, so that discovery is more flexible. For example, you can set up a rule that discovers all Oracle databases, whatever their name.

Subsequently, DFM uses the information in the command lines discovered by the regular expression to populate a CI's `name` attribute with the database name.

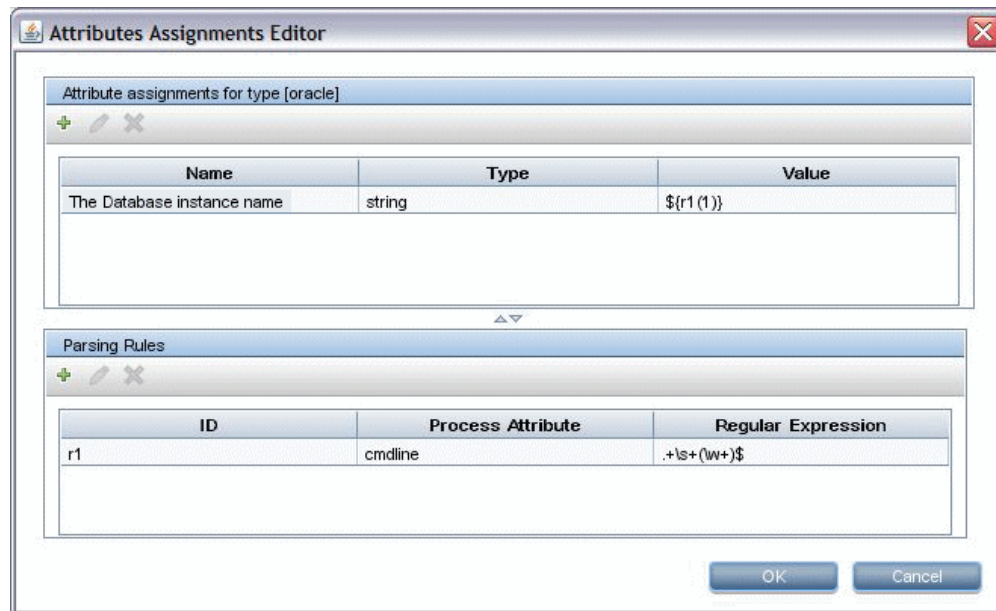
- a. To create a Command Line rule that includes a regular expression, in the Attributes Assignment Rules dialog box, click the **Add** button in the Parsing Rules pane. For details, see "Parse Rule Editor Dialog Box" on page 113.
- b. In the Parse Rules Editor dialog box, build the rule:
  - o Enter a unique name in the Rule ID field: **r1**.
  - o Choose **Command Line** in the Process Attribute field.
  - o Enter the following regular expression in the Regular Expression field: **.+\**s+**(\**w+**)\$**:

This expression searches for any character (`.`), followed by a space or spaces (**+`s+`**), followed by a word or words (**(`w+`)**) that appear at the end of the line (**\$**). You can use the following characters: a-z, A-Z, or 0-9. The following command line fulfils this expression: `c:\ora10\bin\oracle.exe UCMDB`.

## 3. Define the Value of an Attribute

In this step, you define which attribute is used by DFM to discover the Oracle databases, and the value it should take.

- a. In the Attributes Assignment Rules dialog box, click the **Add** button in the Attribute Assignments pane, to select the attribute.
- b. In the Attribute Editor dialog box:
  - o Choose the attribute that holds the database name, from the list of Oracle CIT attributes, in this case **The Database instance name**.
  - o Enter a value, using the following syntax: **\${<rule ID name>(<group number>)}**, in this case, **\${r1(1)}**.



This dialog box is configured as follows: DFM enters the value of the first group ( $(w+)$ ) in the command line regular expression ( $\{r1(1)\}$ ) in the name attribute of the Oracle database CI.

That is, during discovery, DFM searches through the process files for command lines with a word or words at the end of the line. For example, the following command line matches this regular expression: `c:\ora10\bin\oracle.exe UCMDB.`

#### 4. Activate the Job

For details, see "How to Manually Activate Modules/Jobs/CIs" on page 195 and "Discovery Modules Pane" on page 222.


## How to Attach Discovery Documentation to a Discovery Package

This task describes how to attach updated or new documentation to a discovery package.


### 1. Prerequisites

- a. Create the help document in PDF format.
- b. Create a folder called **docs**, and copy your PDF into that folder.
- c. Zip the **docs** folder, and copy it to your local file system.

### 2. Deploy the document on the UCMDB server

Navigate to **Administration > Package Manager**, and click the **Deploy packages to server**  button to deploy the .zip file containing the PDF you want to deploy. For details, see "Deploy a Package" (on page 1) in the *HP Universal CMDB Administration Guide*.

### 3. Attach the document to the relevant discovery package

- a. Navigate to **Data Flow Management > Adapter Management**.
- b. In the **Resources** pane, expand the adapter file: **Packages > <package name> > Adapters** and select the adapter to which to attach the document.
- c. Do one of the following:
  - In the **Adapter Definition** tab, under **Details**, click the **Edit**  button adjacent to the **Content Help** box, and select the help document that you deployed.
  - Right-click the adapter and select **Edit Adapter Source** from the shortcut menu. Look for **RelatedDocument** in the code, and replace the line with:

```
<RelatedDocument>name_of_pdf.pdf</RelatedDocument>
```

where **name\_of\_pdf** is the name of the help document you deployed.

## How to Attach Readme to a Discovery Package

This task describes how to attach an updated or new Readme file to a discovery package.

### 1. Prerequisite


To attach a Readme file to a discovery package, the package's .zip file must be located somewhere on your local file system.

If you are updating the Readme file of a discovery package that is already deployed on your UCMDB server, you must export the package's .zip file to your local file system before attaching the updated file. For details on exporting packages, see "[Export a Package](#)" in the *HP Universal CMDB Administration Guide*.

### 2. Add the Readme file to the discovery package's .zip file

- Create or update the Readme file, and save it with the name, **Readme.txt**.
- Copy the **Readme.txt** file into the root of the package's .zip file.

### 3. Deploy the package on the UCMDB server

Navigate to **Administration > Package Manager**, and click the **Deploy packages to server**  button to deploy the .zip file containing the Readme. For details, see "[Deploy a Package](#)" in the *HP Universal CMDB Administration Guide*.

## How to Filter Probe Results

**Global filtering** enables you to filter Probe results for all adapters, so that only results of interest to you are sent to the UCMDB Server.

You can also filter specific adapters. For details, see "[Adapter Configuration Tab](#)" on page 96.

#### Note:

- You can use regular expressions in filters.
- Attributes in the filter should be of type **string** only. For details on CI attribute types, see

"Attributes Page" in the *HP Universal CMDB Modeling Guide*.

- A result is considered to be a match only if all filter attributes have the same values as those in the CI. (If one of a CI's attributes is not specified in the filter, all the results for this attribute match the filter.)
- A CI can match more than one filter. The CI is removed or remains according to the filter in which it is included.
- **Recursive Filtering.** Using global filtering, you can filter out a CI so that it is not included in the filter results. This CI may be a root CI, containing other CIs or relationships. By default, during the filter process, the contained CIs and relationships, as well as any CIs related to them, are added to the filter results—including the root CI. This causes undesired filter results. **Recursive filtering** corrects this by ensuring that if a root CI is filtered out, then any contained CIs or relationships are filtered out too, such that the root CI cannot be found again.

**To enable recursive filtering:**

In the `globalFiltering.xml` file, set the `recursiveFilter`, attribute to `true`.

**Note:** By default, recursive filtering is disabled, that is `recursiveFilter = false`.)

- DFM filters first according to the `<includeFilter>` and then applies the `<excludeFilter>` on the results of `<includeFilter>`.

## Configure a Filter

Open the `globalFiltering.xml` file. (**Adapter Management module > Resources pane > Packages > DDM Infra > Configuration Files**)

The code in displayed in the View pane:

```
<resultFilters>
  <excludeFilter>
    <vector />
  </excludeFilter>
  <includeFilter>
    <vector />
  </includeFilter>
</resultFilters>
```

- **<excludeFilter>**. When a vector marker is added to this filter, all CIs that match the filter are removed. If this marker is left empty, all results are sent to the server.
- **<includeFilter>**. When a vector marker is added to this filter, all CIs that do not match the filter are removed. If this marker is left empty, all results are sent to the server.

The following example shows an IpAddress CI that has address and domain attributes:

```
<vector>
```

```

    <object class="ip_address">
      <attribute name="name"
type="String">192\.168\.82\.17.*</attribute>
      <attribute name="routing_domain"
type="String">DefaultProbe</attribute>
    </object>
  </vector>

```

If this vector is defined in **<includeFilter>**, all results **not** matching the filter are removed. The results sent to the server are those where the ip\_address matches the regular expression **192.168.82.17.\*** and the ip\_domain is **DefaultProbe**.

If this vector is defined in **<excludeFilter>**, all results matching the filter are removed. The results sent to the server are those where the ip\_address does **not** match the regular expression **192.168.82.17.\*** and the ip\_domain is **notDefaultProbe**.

The following example shows an ip\_subnet CI that has no attributes.

```

<vector>
  <object class="ip_subnet">
  </object>
</vector>

```

## Configure a Filter to Ignore Case

You can configure a filter to ignore case by prefixing a regular expression with **(?i)**. For example, **(?i)DefaultProbe** finds **defaultprobe** as well as **DefaultProbe**.

The following example removes all occurrences of the **DefaultdoMain** attribute because the vector code is located in the **<excludeFilter>** section:

```

<resultFilters>
  <excludeFilter>
    <vector>
      <object class="ip_address">
        <attribute name="routing_domain" type="String">(?i)
          DefaultdoMAin</attribute>
      </object>
    </vector>
  </excludeFilter>
  <includeFilter>
    <vector />
  </includeFilter>
</resultFilters>

```

## Adapter Management User Interface

This section describes:



- "Adapter Definition Tab" below
- "Adapter Configuration Tab" on page 96
- "Adapter Management Window" on page 101
- "Adapter Source Editor Window" on page 101
- "Attribute Assignment Editor Dialog Box" on page 102
- "Attribute Editor Dialog Box" on page 103
- "Choose Discovered Class Dialog Box" on page 104
- "Configuration File Pane" on page 105
- "Edit Process Dialog Box" on page 107
- "Find Resource/Jobs Dialog Box" on page 108
- "Find Text Dialog Box" on page 109
- "Input Query Editor Window" on page 110
- "Parse Rule Editor Dialog Box" on page 113
- "Permission Editor Dialog Box" on page 114
- "Resources Pane" on page 116
- "Script Editor Window" on page 118
- "Script Pane" on page 119
- "Software Identification Rule Editor Dialog Box" on page 121
- "Software Library Dialog Box" on page 122



## Adapter Definition Tab

Enables you to define an adapter by specifying which CITs the adapter should discover and which protocols are needed to perform discovery.

<b>To access</b>	<b>Adapter Management &gt; Resources pane &gt; Packages &gt; &lt;adapter&gt;</b>
<b>Relevant tasks</b>	"Implement a Discovery Adapter" in the <i>HP Universal CMDB Developer Reference Guide</i>






User interface elements are described below:




UI Element (A–Z)	Description
<b>Adapter Category</b>	Used to arrange adapters by category.
<b>Content Help</b>	The Help document associated with the adapter, in PDF format.  To change the Help document associated with the adapter, do one of the following:

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>Click  and select the relevant PDF file.</li> <li>Right-click the adapter in the Packages tree and click <b>Edit adapter source</b>. Find the following line in the code:                     <pre>&lt;RelatedDocument&gt;name_of_pdf.pdf&lt;/RelatedDocument&gt;</pre>                     and change the name of the PDF file.                 </li> </ul> <p>To detach the selected Help document, click .</p>
<b>Description</b>	A detailed description of the adapter's purpose, including relevant comments.
<b>Display Name</b>	A display name to identify the adapter.
<b>Type</b>	For <b>Discovery</b> adapters: <b>jython</b> ; for <b>Integration</b> adapters: can be of various types.
<b>Used as Integration Adapter</b>	Select to define that this adapter is an integration adapter. <b>Note:</b> These adapters cannot be used for defining Discovery jobs, and are accessible only through the Integration Studio.

## Input Pane

User interface elements are described below:

UI Element (A–Z)	Description
<b>Input CI Type</b> 	The input CIT is used as the adapter input. For details, see " <a href="#">Define Adapter Input (Trigger CIT and Input Query)</a> " in the <i>HP Universal CMDB Developer Reference Guide</i> .  Click the button to choose a CIT to use as the input.
	<b>Edit Input Query.</b> Enables you to edit the input query.
	<b>Remove Input Query.</b> Enables you to delete the input query.
<b>Input Query</b>	Defines a query for validation of the triggered CIs for jobs that run this adapter. (CIs matching the job's triggered query must match the Input query as well.) <ul style="list-style-type: none"> <li>Click the <b>Edit Input Query</b>  button to open the Input Query Editor window.</li> <li>Click the <b>Remove Input query</b>  button to remove the Input query from the adapter.</li> </ul> <p>To define which CIs can be Trigger CIs for jobs that run a specific adapter, see</p>





UI Element (A–Z)	Description
	<p>"Input Query Editor Window" on page 110. For more information, see "Trigger CIs and Trigger Queries" on page 20.</p> <p>For an example of an input query definition, see "Example of Input Query Definition" in the <i>HP Universal CMDB Developer Reference Guide</i>.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>Because this field is optional, not all adapters include an Input query. <b>None</b> signifies this adapter does not have an Input query definition.</li> <li>To ensure that the Data Flow Probe is always kept up to date with possible changes to the Trigger CI data, you can configure UCMDB to periodically recalculate the Trigger CI data and send any changes to the Data Flow Probe. For details, see "How to Configure Periodic Data Flow Task Updates" on page 29. This option is disabled by default because it can interfere with performance.</li> </ul>
<p><b>Triggered CI Data</b></p>	<p> . Add Trigger CI data to the adapter.</p> <p> . Remove Trigger CI data from the adapter.</p> <p> . Edit the Trigger CI data in the Parameter Editor dialog box.</p> <ul style="list-style-type: none"> <li><b>Name.</b> The information that is needed to perform a task on a specific CI. This information is passed to the CI queried in the task.</li> </ul> <p><b>Important:</b> Do not use <b>id</b> for a Triggered CI Data entry, as it is a reserved name.</p> <ul style="list-style-type: none"> <li><b>Value.</b> The attribute value. Variables are written using the following syntax:  <code>\${VARIABLE_NAME.attributeName}</code>                      where <b>VARIABLE_NAME</b> can be one of three predefined variables:                     <ul style="list-style-type: none"> <li><b>SOURCE.</b> The CI that functions as the task's trigger.</li> <li><b>HOST.</b> The node in which the triggered CI is contained.</li> <li><b>PARAMETERS.</b> The parameter defined in the <b>Parameter</b> section.</li> </ul> </li> </ul> <p>You can create a variable. For example, <code>\${SOURCE.network_netaddr}</code> indicates that the trigger CI is a network.</p>

### Used Scripts Pane

Displays the scripts used by the selected adapter.

<b>Important Information</b>	Available for Jython adapters only
------------------------------	------------------------------------

User interface elements are described below (unlabeled elements are shown in angle brackets>):






UI Element (A–Z)	Description
	<b>Move up/Move down.</b> Enables you to change the order of the scripts. DFM runs the scripts in the order in which they appear here.
	<b>Add script.</b> Enables you to add a script to the adapter.
	<b>Remove script.</b> Enables you to remove a script from the adapter.
	<b>Edit.</b> Enables you to edit the selected script in the Script Editor that opens.
<Scripts>	A list of Jython scripts used by the adapter.

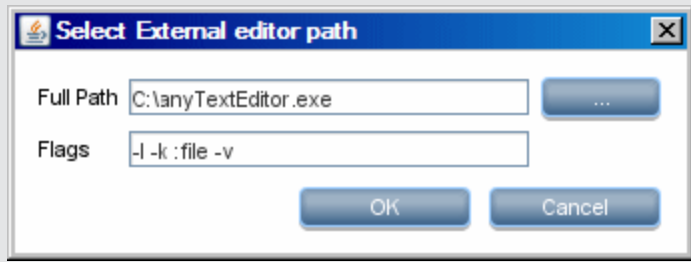



### Workflow Steps Pane

Displays only the **workflow** element of the selected adapter script.

<b>Important Information</b>	<p><b>Available:</b> Only for the adapters that contain workflows</p> <p><b>Example:</b> UDAgentManagement adapters</p>
------------------------------	---

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Find text.</b> Enables you to find specific text in the workflow steps. For details, see "Find Text Dialog Box" on page 109.
	<b>Go to line.</b> Enables you to jump to a specific line in the workflow steps. In the Go To Line dialog box, enter the line number, and press <b>ENTER</b> .
	<p><b>Open External Editor.</b> Opens the workflow steps in an external text editor.</p> <p><b>Prerequisite:</b> Click the <b>Edit the External Editor Preferences</b>  button to define the path to an external editor. If no external editor path is defined, you will be prompted to provide one when you try to open the external editor.</p>
	<p><b>Edit the External Editor Preferences.</b> Click to edit the external editor preferences. You can run the editor by adding flags to the path.</p> <p><b>Note:</b> You cannot specify the file name. Instead, you can use flags relevant to your external editor to retrieve the file name, such as <b>:file</b>.</p> <p>In the following example, <b>:file</b> sets the place of the file in relation to the flags.</p>






UI Element (A–Z)	Description
	 <p>If no flags are defined, the file name is automatically added to the end of the path.</p>
	<p><b>Switch Editor Mode.</b> Enables you to switch between the default advanced editor and a simple text editor.</p>
<p><b>Validation Information</b></p>	<p>Displays if the definition is valid or not:</p> <ul style="list-style-type: none"> <li>  <ul style="list-style-type: none"> <li>• Indicates that the definition is valid.</li> </ul> </li> <li>  <ul style="list-style-type: none"> <li>• Indicates that there is an error in the definition.</li> </ul> </li> </ul>

### Required Permissions Pane

Enables you to view the permissions that you have configured for an adapter.



<p><b>To access</b></p>	<p><b>Data Flow Management &gt; Adapter Management &gt; select an adapter &gt; Adapter Definition tab &gt; Required Permissions pane.</b></p>
<p><b>Important Information</b></p>	<ul style="list-style-type: none"> <li>• Workflow:           <ul style="list-style-type: none"> <li>▪ Configure the permissions in the Permission Editor dialog box.</li> <li>▪ View the permissions in this pane.</li> <li>▪ When working with jobs in the Discovery Control Panel window, view these permissions for a specific job.</li> </ul> </li> <li>• For details on the fields in this pane, see <a href="#">"Permission Editor Dialog Box" on page 114.</a></li> </ul>
<p><b>See also</b></p>	<ul style="list-style-type: none"> <li>• <a href="#">"Permission Editor Dialog Box" on page 114</a></li> <li>• <a href="#">"Discovery Permissions Window" on page 226</a></li> <li>• <a href="#">"Viewing Permissions While Running Jobs" on page 188</a></li> </ul>

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add.</b> Opens the Permission Editor dialog box, enabling you to add a permission object. The Permission Editor dialog box opens. For details, see " <a href="#">Permission Editor Dialog Box</a> " on page 114.
	<b>Edit.</b> Opens the Permission Editor dialog box, enabling you to edit a selected permission object. For details, see " <a href="#">Permission Editor Dialog Box</a> " on page 114.
	<b>Remove.</b> Enables you to delete a selected permission object.
	<b>Move up/Move down.</b> Enables you to change the order of the permissions. Select the permission object and click the up or down button. The order given here is the order in which the credentials are verified.
	<b>Export Data to File.</b> Enables you to export a permission object in Excel, PDF, RTF, CSV, or XML format. For details, see " <a href="#">Browse Views Mode</a> " in the <i>HP Universal CMDB Modeling Guide</i> .


### Required Discovery Protocols Pane



User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A–Z)	Description
	<b>Add required protocol.</b> Enables you to add a required protocol.
	<b>Remove required protocol.</b> Enables you to remove an existing protocol that is no longer required.
<Protocols>	List of protocols required by the adapter for the task. For example, the <b>NTCMD</b> protocol, together with its user name, password, and other parameters, is needed for DFM to access a Windows system.  For information about the supported protocols, see the <i>HP Universal CMDB Discovery and Integration Content Guide</i> .

### Discovered CITs Pane

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Discovered CIT.</b> Opens the Choose Discovered Class dialog box, enabling you to select a CIT to be discovered by the adapter. For details, see " <a href="#">Choose Discovered Class Dialog Box</a> " on page 104.




UI Element (A–Z)	Description
	<b>Remove Discovered CIT.</b> Enables you to remove the CIT from the list of CITs that the adapter discovers.
	<b>View Discovered CITs as Map.</b> Opens the Discovered CITs Map window enabling view a graphical map of the CITs and relationships that are discovered by the adapter.
<b>CITs</b>	List of CITs that the adapter discovers.

### Global Configuration Files Pane

Enables you to add default configuration files to the adapter, as well as the specific configuration files that the adapter needs.



<b>Important Information</b>	<p>The <b>applicationsSignature.xml</b> file contains a list of all applications that DFM attempts to find in the environment.</p> <p>The configuration file <b>applicationsSignature.xml</b> opens the Software Library dialog box. For details, see "<a href="#">Software Library Dialog Box</a>" on page 122.</p>
<b>Relevant tasks</b>	" <a href="#">How to Discover Running Software – Scenario</a> " on page 83


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add.</b> Opens the Global Configuration Files dialog box, enabling you to select configuration files that are needed by the adapter.
	<b>Remove.</b> Enables you to delete a selected configuration file.
	<b>Edit.</b> Opens the selected configuration file in an appropriate editor. For example, the file msServerTypes.xml opens the Script Editor.

### Adapter Parameters Pane

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Parameter.</b> Opens the Parameter Editor dialog box, enabling you to enter details about a new parameter. The value you enter here is assigned to the attribute.
	<b>Remove Parameter.</b> Enables you to remove a selected parameter.

UI Element (A–Z)	Description
	<b>Edit Parameter.</b> Opens the Parameter Editor dialog box, enabling you to make changes to the parameter definition.
<b>Name</b>	Each row represents the definitions for one parameter.
<b>Value</b>	Separate values with commas.

## Adapter Configuration Tab

Enables you to define additional options relevant to adapter execution and result filtering.

<b>To access</b>	Select a specific adapter in the <b>Resources</b> pane and click the <b>Adapter Configuration</b> tab.
<b>Important Information</b>	Click the <b>Save</b> button to save any changes you make.
<b>See also</b>	<a href="#">"DataFlowProbe.properties File " on page 55</a>

### Probe Selection Pane

Enables you to specify which Probe to use with an adapter. For more information, see the section [Override Probe Selection - Optional](#) in the *HP Universal CMDB Developer Reference Guide*.

### Execution Options Pane

User interface elements are described below:

UI Element (A–Z)	Description
<b>Create communication log</b>	<p>Choose to create a log file that logs the connection between the Probe and a remote machine.</p> <ul style="list-style-type: none"> <li>• <b>Always.</b> A communication log is created for this session.</li> <li>• <b>Never.</b> A communication log is not created for this session.</li> <li>• <b>On Failure.</b> A communication log is created for this session, only if the execution fails.</li> </ul> <p>That is, DFM reports an error (report of a warning does not create a communication log). This is useful when you need to analyze which queries or operations take most of the time, send data for analysis from different locations, and so on. If the job completes successfully, no log is created.</p> <p>When requested (in the Discovery Status pane), DFM displays the log</p>




UI Element (A–Z)	Description
	<p>retrieved from the Probe (if a log has been created). For details, see <a href="#">"Discovery Status Pane"</a> on page 216.</p> <p><b>Note:</b> For debug purposes, you can always retrieve the communication logs for the last 10 executions, even if <b>Create communication logs</b> is set to <b>On Failure</b>.</p> <p>Communication log files are created on the Probe Manager under the <b>C:\hp\UCMDB\DataFlowProbe\runtime\communicationLog</b> folder. For details on how the communication logs work, see <a href="#">Record DFM Code</a> in the <i>HP Universal CMDB Developer Reference Guide</i>.</p>
<b>Include results in communication log</b>	Select to enable capturing the discovered results with the created communication log; these discovered results may help in investigating various discovery problems.
<b>Max. execution time</b>	The maximum time allowed for an adapter to run on one Trigger CI.
<b>Max. threads</b>	<p>Each job is run using multiple threads. You can define a maximum number of threads that can be used concurrently when running a job. If you leave this box empty, the Probe's default threading value is used (8).</p> <p>The default value is defined in the <b>DiscoveryProbe.properties</b> file, in the <b>appilog.agent.local.services.defaultMaxJobThreads</b> parameter.</p> <p><b>Note:</b> The jobs in the <b>Network – Host Resources and Applications</b> module require a permanent connection to the Probe's internal database. Therefore, these jobs are limited to a maximum number of 20 concurrent threads (which is the maximum number of concurrent connections permitted to the internal database). For details, see "Host Resources and Applications Discovery" in the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</p>

## Results Management Pane

User interface elements are described below:

UI Element (A–Z)	Description
<b>Enable aging</b>	<p>The aging mechanism specifies how long a period must pass in which CIs are discovered, before DFM treats these CIs as no longer relevant and removes them. Choose from one of the following aging options:</p> <ul style="list-style-type: none"> <li>• <b>System Default:</b> Use the system's default value for the Enable Aging attribute of each CI type.</li> </ul>

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Always Enabled:</b> Select this option to always enable the aging mechanism.</li> <li>• <b>Always Disabled:</b> Select this option to always disable the aging mechanism.</li> </ul> <p>The value you set here is for each CI result that is reported to the UCMDB by the jobs of this adapter.</p> <p>For details on aging, see <a href="#">The Aging Mechanism Overview</a> in the <i>HP Universal CMDB Administration Guide</i>.</p>
<p><b>Enable Automatic Deletion</b></p>	<p>Choose between:</p> <ul style="list-style-type: none"> <li>• <b>Always.</b> Automatic Deletion or Candidate for Deletion is always enabled, regardless of whether discovery succeeds or fails.</li> <li>• <b>On Success or Warnings.</b> Automatic Deletion or Candidate for Deletion is enabled only when discovery finishes with a success or warning status. In the case of a discovery error, nothing is removed and CIs are not marked as a candidate for deletion.</li> <li>• <b>Only on Success.</b> Automatic Deletion or Candidate for Deletion is enabled only when discovery finishes with a success status. In the case of a discovery error or warning, nothing is removed and CIs are not marked as a candidate for deletion (this is the default).</li> </ul> <p>Selecting this option enables the <b>Automatic Deletion</b> box where you select specific CITs for deletion or as candidates for deletion, if the Data Flow Probe does not find them during its next invocation.</p> <p>To select CITs, click the <b>Add</b>  button. In the Choose Discovered Class dialog box, choose the CITs that should be automatically deleted.</p> <p>The changes you make here are added to the adapter file, for example:</p> <pre>&lt;resultMechanism isEnabled="true"&gt;   &lt;autoDeleteCITs isEnabled="true"&gt;     &lt;CIT&gt;shell&lt;/CIT&gt;     &lt;candidateForDeletionCIT&gt;node   &lt;/candidateForDeletionCIT&gt;   &lt;/autoDeleteCITs&gt; &lt;/resultMechanism&gt;</pre> <p>For details on how the Data Flow Probe handles CI deletion, see <a href="#">"Automatically Deleted CIs and Relationships and Candidates for Deletion CIs"</a> on page 80.</p>
<p><b>Enable collecting 'Discovered by' data</b></p>	<ul style="list-style-type: none"> <li>• <b>Selected.</b> DFM collects data on the results of running the adapter. This data is then used to enable rediscovery of CIs. The data is necessary for the Discovery tab in IT Universe to function correctly. It is also used for the View Based Discovery Status functionality which leverages the data to aggregate the complete discovery status for certain views.</li> </ul>

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Cleared.</b> DFM does not collect this data. The check box needs to be cleared for adapters where rediscovery is not helpful. For example, the <code>Range IPs by ICMP</code> job has this check box cleared by default because its Trigger CI is the Probe Gateway and so all CIs discovered by this job have the same Trigger CI. If the check box was not cleared, a rediscovery attempt on any view containing any single IP would result in a ping sweep throughout the entire customer network, certainly not desirable behavior.</li> </ul> <p>The job results of this adapter are displayed in the Discovery for View dialog box only if this check box is selected. For details, see <a href="#">Check Status of Application Discovery (Rediscover a View)</a> and <a href="#">Show Discovery Status and Changes Dialog Box</a> in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<b>Enable reporting of empty values</b>	<p>When selected, the Data Flow Probe reports empty values for discovered properties to UCMDB.</p> <p><b>Default:</b> Enabled</p>
<b>Enable update 'Last Access Time'</b>	<p>When selected, if a CI is touched when a discovery or integration job runs, the <b>Last access time</b> property of the CI is updated. This indicates that the CI represents an active component in the system, and prevents the CI from becoming a deletion candidate.</p> <p>For details about the aging mechanism and deletion candidates, see <a href="#">The Aging Mechanism Overview</a> in the <i>HP Universal CMDB Administration Guide</i>.</p> <p><b>Note:</b> If this option is not selected:</p> <ul style="list-style-type: none"> <li>• For new CIs, the <b>Last access time</b> property is given the same value as the <b>Create Time</b> property</li> <li>• For existing CIs, subsequent activations of the job do still update the <b>LastModifiedTime</b> property, but the <b>Last access time</b> property is not updated.</li> </ul> <p><b>Use-Case Example</b></p> <p>When importing data from an external data source, this data may include meta-data about CIs. If this option is enabled, the CIs are updated with the metadata and their <b>Last Access Time</b> value is updated. Disabling this option can be useful if you do not want to affect the aging status or the deletion candidacy of these CIs. In this case, the information is added to the CIs but their Last Access Time remains unchanged.</p>
<b>Fail entire bulks due to invalid CIs</b>	<p>If a set of objects (for example, 1,000 objects) includes even one invalid CI (for example, a node cannot be identified because of missing topological information), the reconciliation engine drops the entire set and does not send it to the CMDB. This is the default behavior.</p> <p>Clear the check box to have the results sent to the CMDB with only the invalid</p>

UI Element (A–Z)	Description
	CIs (and their topology) dropped from the results. In the above example, 999 objects would be processed. UCMDB displays an error message when you view the results.

## Result Grouping Pane

User interface elements are described below:

UI Element (A–Z)	Description
<b>Grouping Interval (Seconds)</b>	<p>To group results in the Probe before they are sent to the server, type the value that indicates how long results are stored in the Probe before being transferred to the server.</p> <p>The default value is 30 seconds.</p> <p><b>Note:</b> If you enter a value in both boxes, DFM applies the value of whichever occurs first.</p>
<b>Max. CIs in group</b>	<p>Specify the number of CIs that should accumulate in the Probe before being transferred to the server.</p> <p>The default value is 5000.</p>

## Adapter Management Window

Enables you to view or edit default parameter values used for the DFM process.





<b>To access</b>	<b>Data Flow Management &gt; Adapter Management</b> or right-click a job in the Discovery Control Panel window and click <b>Go to Adapter</b> .
<b>Important Information</b>	<p><b>Note:</b> An asterisk (*) next to a resource (adapter, script, or configuration file) signifies that the resource has changed since the package (in which it is included) was deployed. If the original package is redeployed, the changes are deleted from the resource. To save the changes, move the resource to a new package and deploy the package (the asterisk disappears).</p> <p><b>Caution:</b> Only administrators with an expert knowledge of the DFM process should delete packages.</p>
<b>See also</b>	<ul style="list-style-type: none"> <li>• "Adapter Definition Tab" on page 89</li> <li>• "Global Configuration Files Pane" on page 95</li> <li>• "Adapter Configuration Tab" on page 96</li> <li>• "Script Pane" on page 119</li> <li>• "Resources Pane" on page 116</li> <li>• "Configuration File Pane" on page 105</li> <li>• <i>HP Universal CMDB Discovery and Integration Content Guide</i></li> </ul>


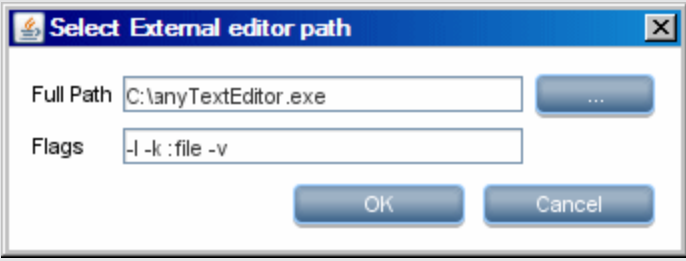




## Adapter Source Editor Window

Enables you to edit an adapter script.

<b>To access</b>	Right-click an adapter in the Resources pane and select <b>Edit Adapter Source</b> .
<b>See also</b>	"Resources Pane" on page 116

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Find text.</b> Enables you to find specific text in the adapter definition. For details, see "Find Text Dialog Box" on page 109.
	<b>Go to line.</b> Enables you to jump to a specific line in the adapter definition. In the Go To Line dialog box, enter the line number, and press <b>ENTER</b> .
	<p><b>Open External Editor.</b> Opens the adapter definition in an external text editor.</p> <p><b>Prerequisite:</b> Click the <b>Edit the External Editor Preferences</b>  button to define the path to an external editor. If no external editor path is defined, you will be prompted to provide one when you try to open the external editor.</p>

UI Element (A–Z)	Description
	<p><b>Edit the External Editor Preferences.</b> Click to edit the external editor preferences. You can run the editor by adding flags to the path.</p> <p><b>Note:</b> You cannot specify the file name. Instead, you can use flags relevant to your external editor to retrieve the file name, such as <b>:file</b>.</p> <p>In the following example, <b>:file</b> sets the place of the file in relation to the flags.</p> <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;">  </div> <p>If no flags are defined, the file name is automatically added to the end of the path.</p>
	<p><b>Switch Editor Mode.</b> Enables you to switch between the default advanced editor and a simple text editor.</p>
<p><b>Validation Information</b></p>	<p>Displays if the definition is valid or not:</p> <ul style="list-style-type: none"> <li>• . Indicates that the definition is valid.</li> <li>• . Indicates that there is an error in the definition.</li> <li>• . Indicates that the definition could not be validated.</li> </ul> <p><b>Note:</b> This may occur due to an internal error while performing the validation. This does not, under any circumstances, harm the process of saving your definition to the server. See <b>%temp%\UcldbLog\error.log</b> for details. For further assistance, contact HP Software Support.</p>




## Attribute Assignment Editor Dialog Box

Enables you to define a regular expression that discovers specific running software according to a CIT's attribute value.

<b>To access</b>	Click <b>Set Attributes</b> in the Software Identification Rule Editor dialog box.
<b>Relevant tasks</b>	<a href="#">"How to Discover Running Software – Scenario" on page 83</a>

<b>See also</b>	<ul style="list-style-type: none"> <li>• <a href="#">"Parse Rule Editor Dialog Box" on page 113</a></li> <li>• <a href="#">"Attribute Editor Dialog Box" below</a></li> <li>• <a href="#">"Software Identification Rule Editor Dialog Box" on page 121</a></li> </ul>
-----------------	---

User interface elements are described below:

UI Element (A–Z)	Description
	Click to add a regular expression that determines the attribute of the CI to be discovered, or to add an attribute.
	Click to edit an existing regular expression or attribute.
	Click to delete the regular expression or the attribute.
<b>Attribute assignments for type</b>	For details, see <a href="#">"Attribute Editor Dialog Box" below</a> .
<b>Parsing Rules</b>	For details, see <a href="#">"Parse Rule Editor Dialog Box" on page 113</a> .

## Attribute Editor Dialog Box

Enables you to define a rule that discovers a CIT according to an attribute. The attribute is defined according to a regular expression.

<b>To access</b>	<b>Software Identification Rule Editor &gt; Set Attributes button &gt; Attributes Assignment Editor.</b> Click the <b>Add</b> button in the <b>Attributes Assignment for Type</b> pane.
<b>Relevant tasks</b>	<a href="#">"How to Discover Running Software – Scenario" on page 83</a>
<b>See also</b>	<a href="#">"Parse Rule Editor Dialog Box" on page 113</a>

User interface elements are described below:

UI Element (A–Z)	Description
<b>Name</b>	Choose from the list of attributes of the CIT selected in the Editor. This attribute name is replaced by the value found by the regular expression. To find an attribute, start typing the name.
<b>Type</b>	The type of operation defined for the attribute, for example, Boolean, string, date, and so on.
<b>Value</b>	The value that replaces the name in the Rule ID field in the Parse Rule Editor dialog box.

UI Element (A–Z)	Description
	<p>Use the following syntax for the value:</p> <pre>\${&lt;rule ID name&gt;(&lt;group number&gt;)}</pre> <p>For example, <b>\${DB_SID(1)}</b> means that DFM should search for the Rule ID with the name <b>DB_SID</b> and retrieve its regular expression.</p> <p>DFM should then retrieve the code for the first group (<b>1</b>). For example, in the regular expression <b>.\s+(\w+)\\$</b>, the first group is <b>(\w+)\\$</b>, that is, a word or words that appear at the end of the line.</p>


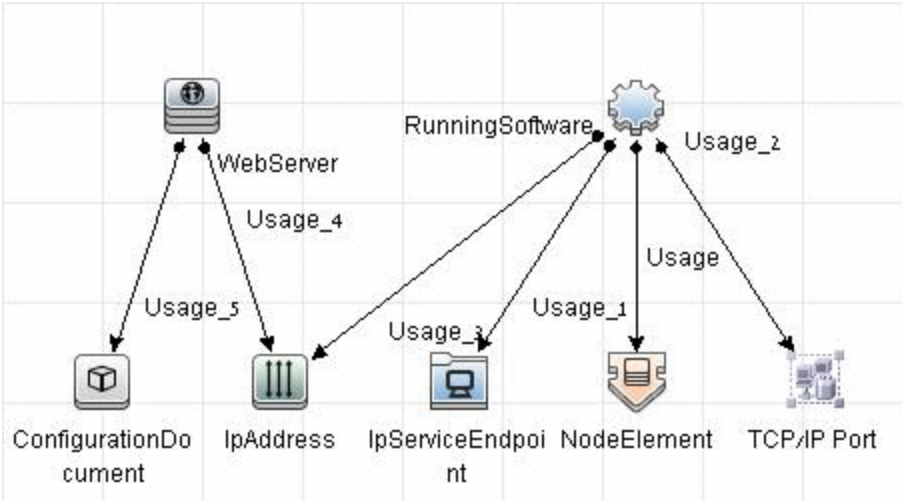
## Choose Discovered Class Dialog Box

Enables you to choose CITs that are to be discovered by a selected adapter and to limit links so that they are mapped only when they connect specific CITs.

<p><b>To access</b></p>	<ul style="list-style-type: none"> <li>• <b>Data Flow Management &gt; Adapter Management.</b> In the Resources pane, select an adapter. In the <b>Adapter Definition</b> tab &gt; <b>Discovered CITs</b> pane, click the <b>Add Discovered CIT</b> button.</li> <li>• <b>Data Flow Management &gt; Adapter Management.</b> In the Resources pane, select an adapter. In the <b>Adapter Configuration</b> tab &gt; <b>Results Management</b> pane, select the <b>Enable Automatic deletion</b> check box and click the <b>Add</b> button in the <b>Automatic Deletion</b> pane.</li> </ul>
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User interface elements are described below:

UI Element (A–Z)	Description
<b>Link</b>	<p>Enables DFM to discover CITs only when they are linked by link types you choose in this box.</p> <p><b>Note:</b> This section is relevant only when adding a discovered CIT, not for defining CITs for automatic deletion.</p> <p>Select a link type from the list and click the  button in the End 1 and End 2 boxes to open the Choose Configuration Item Type dialog box. Choose the CITs that DFM should map when they are linked by the selected link type.</p> <p><b>Note:</b> DFM automatically recognizes the links between CIs and adds them to the map of discovered CITs. However, during adapter writing, you may need to exclude links between certain CITs. For example, both nodes and IPs and nodes and ports are linked by <b>usage</b>. You may need to receive results only for nodes and IPs that are connected by the <b>usage</b> link, and not nodes and ports. The End 1 and End 2 links determine the result received from the adapter, and this result is reflected in the map, as can be seen in the following example:</p>  <p>The diagram illustrates a network of Configuration Items (CITs) and their relationships. At the top left is a 'WebServer' icon. Below it are 'Configuration Document', 'IpAddress', and 'IpServiceEndpoint' icons. To the right is a 'RunningSoftware' gear icon. Below it are 'NodeElement' and 'TCP/IP Port' icons. Arrows labeled 'Usage_1' through 'Usage_5' connect these icons: 'WebServer' to 'Configuration Document' (Usage_5), 'WebServer' to 'IpAddress' (Usage_4), 'RunningSoftware' to 'Configuration Document' (Usage_3), 'RunningSoftware' to 'IpAddress' (Usage_1), 'RunningSoftware' to 'NodeElement' (Usage), and 'RunningSoftware' to 'TCP/IP Port' (Usage_2).</p>
<b>Object</b>	<p>Select a CIT to be added to the list of CITs that an adapter is to discover. Save the changes by clicking the <b>Save</b> button at the bottom of the <b>Adapter Definition</b> pane.</p>






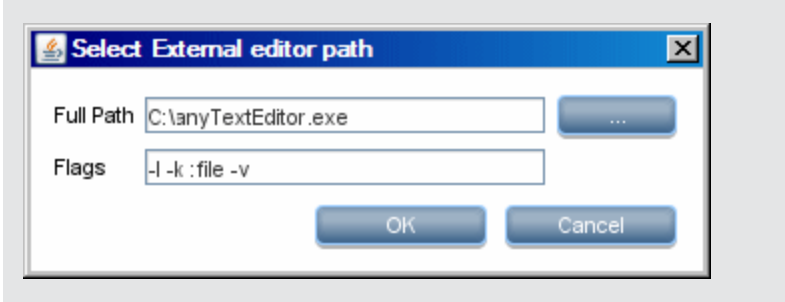

## Configuration File Pane



Enables you to edit a specific configuration file that is part of a package. For example, you can edit the **portNumberToPortName.xml** file so that specific port numbers, names, or types are discovered.

<b>To access</b>	Click a specific configuration file in the Resources pane.
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<b>Important Information</b>	<p>The following files are for internal use only and should only be changed by users with an advanced knowledge of adapter-writing:</p> <ul style="list-style-type: none"> <li>• discoveryPolicy.xml</li> <li>• jythonGlobalLibs.xml</li> </ul> <p>For details, see "How to Define Discovery Rules" on page 125 and "Internal Configuration Files" on page 123.</p>
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User interface elements are described below:

UI Element (A–Z)	Description
	Find specific text in the configuration file. For details, see "Find Text Dialog Box" on page 109.
	Click to go to a specific line in the configuration file. In the Go To Line dialog box, enter the line number.
	<p>Click to opens the configuration in an external text editor.</p> <p><b>Prerequisite:</b> Click the <b>Edit the External Editor Preferences</b>  button to define the path to an external editor. If no external editor path is defined, you will be prompted to provide one when you try to open the external editor.</p>
	<p><b>Edit the External Editor Preferences.</b> Click to edit the external editor preferences. You can run the editor by adding flags to the path.</p> <p><b>Note:</b> You cannot specify the file name. Instead, you can use flags relevant to your external editor to retrieve the file name, such as <b>:file</b>.</p> <p>In the following example, <b>:file</b> sets the place of the file in relation to the flags.</p> <div style="text-align: center;">  </div> <p>If no flags are defined, the file name is automatically added to the end of the path.</p>
	Click to toggle between the advanced editor and a simple text editor. You can use the simple editor when the advanced editor causes problems.

UI Element (A–Z)	Description
	For XML files, signifies that the code is valid.
	For XML files, signifies that the code is not valid.

## Edit Process Dialog Box

Enables you to add a process that can identify specific running software.

<b>To access</b>	Click the <b>Add</b> button in the <b>Identifying Processes</b> pane in the Software Identification Rule Editor dialog box.
<b>See also</b>	<a href="#">"Software Identification Rule Editor Dialog Box" on page 121</a>

User interface elements are described below:


UI Element (A–Z)	Description
<b>Attributes</b>	Opens the Attributes Assignments Editor dialog box for the identifying process.
<b>Command Line</b>	The running software can also be mapped using the process name. In this case, you must add a process command line (or part of it) with which the process name uniquely identifies the software, for example, <b>c:\ora10\bin\oracle.exe UCMDB</b> .
<b>Key Process</b>	Select this check box if, during discovery, DFM must distinguish between applications that run similar processes (IP, port, command line, or owner). For an explanation of this box, see <a href="#">"Identifying Running Software by Processes" on page 79</a> .
<b>Main process</b>	Select this check box to mark this process as a unique and distinguishing process. For such processes there need to be several instances of the software CI.
<b>Name</b>	Enter the exact name of the process, for example, <b>java.exe</b> .
<b>Port</b>	Add a port number or name, either by typing a number or by clicking the <b>Add</b> button then selecting the ports in the Global Ports List. <ul style="list-style-type: none"> <li>If the process has to listen at a specific port, the port should be listed. You can enter more than one port, separated by commas, for example, <b>8888,8081,8080,81,8000,82,80</b>.</li> <li>If the process does not have to listen at a specific port (that is, the running software can use any port), select the <b>All Ports</b> option.</li> </ul>
<b>Port match is optional</b>	<ul style="list-style-type: none"> <li>Select this check box to enable discovery of processes that are not listening at any of the ports entered in the Port field (that is, identification is by process name only).</li> <li>Clear this check box to enable discovery of processes based on process name and the port number entered in the Port field.</li> </ul>

## Find Resource/Jobs Dialog Box

Enables you to build a search query to find a particular resource or job.

<b>To access</b>	<ul style="list-style-type: none"> <li><b>Discovery Control Panel &gt; Discovery Modules</b> pane. Click the <b>Search for Discovery Job</b> button.</li> <li><b>Adapter Management &gt; Resources</b> pane. Click the <b>Find resource</b> button.</li> </ul>
<b>See also</b>	<a href="#">"Resources Pane" on page 116</a>

User interface elements are described below:



UI Element (A–Z)	Description
	Click to select a CIT from the dialog box that opens. Click <b>OK</b> to return to the Find Resource dialog box.  <b>Note:</b> This button is not accessible when <b>Name</b> is selected.
<b>Direction</b>	Searches forwards or backwards through the packages.
<b>Find All</b>	Click to highlight all instances of the text entered in <b>Name</b> .
<b>Find Discovery Job by/ Find Discovery resource by</b>	Choose between: <ul style="list-style-type: none"> <li>• <b>Name.</b> Enter the name, or part of it, of the resource.</li> <li>• <b>Input type/Adapter input type.</b> CIs that trigger the job. Click the button to open the <b>Choose Configuration Item Type</b> dialog box. Locate the CI type that you are searching for.</li> <li>• <b>Output type/Adapter output type.</b> CIs that are discovered as a result of the job or the adapter.</li> </ul>
<b>Find Next</b>	The next job/resource meeting the search criteria is highlighted in the Discovery Modules/Resources pane.

## Find Text Dialog Box

Enables you to find text in a script or configuration file.

<b>To access</b>	Select a script or configuration file and click the <b>Find text</b> button in the file pane.
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User interface elements are described below:

UI Element (A–Z)	Description
 	<ul style="list-style-type: none"> <li>• Click <b>Find</b> to find one instance of the text you are searching for.</li> <li>• Click <b>Find All</b> to find all instances of the text.</li> </ul>
<b>Direction</b>	Search forwards or backwards through the script or configuration file.
<b>Find what</b>	Type the text to be found or click the down arrow to choose from previous searches.  Click the adjacent arrow to display a list of symbols you can use in wildcard or regular expression searches. This arrow is enabled when you select the <b>Use</b> option.
<b>Options</b>	Select an option to narrow your search.
<b>Origin</b>	Enables a search of the entire scope or from the current cursor position.

UI Element (A–Z)	Description
Target	<ul style="list-style-type: none"> <li>• <b>Global.</b> Searches throughout the file.</li> <li>• <b>Selected Text.</b> Searches through the selected text.</li> </ul>

## Input Query Editor Window

Enables you to define which CIs can be Trigger CIs for jobs that run a specific adapter.

<b>To access</b>	<b>Data Flow Management &gt; Adapter Management &gt; select an adapter &gt; Adapter Definition tab &gt; Input pane &gt; click the <b>Edit Input Query</b> button next to the <b>Input Query</b> box.</b>
<b>Important information</b>	To ensure that the Data Flow Probe is always kept up to date with possible changes to the Trigger CI data, you can configure UCMDB to periodically recalculate the Trigger CI data and send any changes to the Data Flow Probe. For details, see " <a href="#">How to Configure Periodic Data Flow Task Updates</a> " on page 29. This option is disabled by default because it can interfere with performance.
<b>See also</b>	<ul style="list-style-type: none"> <li>• "<a href="#">Trigger CIs and Trigger Queries</a>" on page 20</li> <li>• "<a href="#">Trigger Query Editor Window</a>" on page 243</li> </ul>

User interface elements are described below:

UI Element (A–Z)	Description
<Panes>	<ul style="list-style-type: none"> <li>• "CI Type Selector Pane" below</li> <li>• "Editing Pane" on next page</li> <li>• "Information Pane" on next page</li> </ul>
<b>Query Name</b>	The name of the adapter's Input query.

### CI Type Selector Pane

Displays a hierarchical tree structure of the CI Types found in the CMDB. For more details, see "[CI Type Manager User Interface](#)" in the *HP Universal CMDB Modeling Guide*.

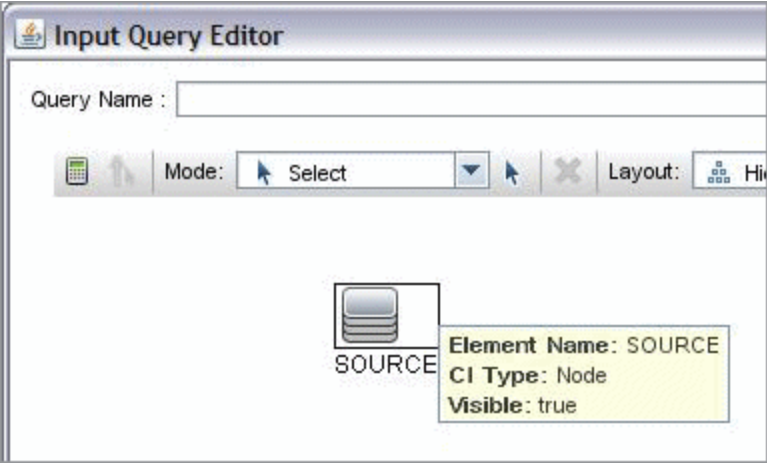
**Note:** The number of instances of each CIT in the CMDB is displayed to the right of each CIT.

<b>To access</b>	<p>To create or modify a query, click and drag nodes to the Editing pane and define the relationship between them. Your changes are saved to the CMDB.</p> <p><b>Note:</b> Each time you select the same object from the tree, you must rename the object node to have a unique name.</p>
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<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• "Define a TQL Query" in the <i>HP Universal CMDB Modeling Guide</i></li> <li>• "Create a Pattern View" in the <i>HP Universal CMDB Modeling Guide</i></li> </ul>
<b>See also</b>	"Add Query Nodes and Relationships to a TQL Query" in the <i>HP Universal CMDB Modeling Guide</i>

## Editing Pane

User interface elements are described below:

UI Element (A–Z)	Description
<node>	<p>Hold the cursor over a node to view information about the node:</p> 
<right-click menu>	For details, see "Shortcut Menu Options" in the <i>HP Universal CMDB Modeling Guide</i> .
<Toolbar>	For details, see "Toolbar Options" in the <i>HP Universal CMDB Modeling Guide</i> .

## Information Pane

Displays the properties, conditions, and cardinality for the selected node and relationship.

<b>Important Information</b>	Hold the pointer over a node to view information:
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Element Name: WMI  
 CI Type: WMI  
 Visible: false  
 Cardinality: Composition (Node\_2, WMI) : 1..\*


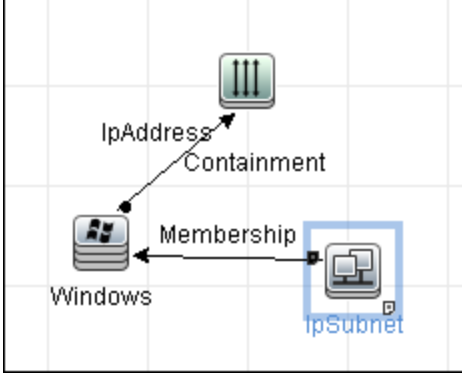
A small green indicator is displayed next to the tabs that include information:

Attributes \* Cardinality Qualifiers  
 Containment (Node, IpAddress\_2) : 1..\*

User interface elements are described below:

UI Element (A-Z)	Description
<b>Attributes</b>	Displays the attribute conditions defined for the node or the relationship. For details, see " <a href="#">Attribute Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Cardinality</b>	Cardinality defines how many nodes you expect to have at the other end of a relationship. For example, in a relationship between node and IP, if the cardinality is 1:3, the query retrieves only those nodes that are connected to between one and three IPs. For details, see " <a href="#">Cardinality Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Details</b>	<ul style="list-style-type: none"> <li><b>CI Type.</b> The CIT of the selected node/relationship.</li> </ul>



UI Element (A-Z)	Description
	<ul style="list-style-type: none"> <li> <b>Visible.</b> A tick signifies that the selected node/relationship is visible in the topology map. When the node/relationship is not visible, a box  is displayed to the right of the selected node/relationship in the Editing pane:           <div style="border: 1px solid black; padding: 10px; margin: 10px 0;">  </div> </li> <li> <b>Include subtypes.</b> Display both the selected CI and its descendants in the topology map.           <p><b>Note:</b> To change the visible and subtype settings, select a node in the Editing pane and click the <b>Edit</b> button. In the <b>Query Node Properties</b> dialog box, select or clear the boxes.</p> </li> </ul>
<b>Edit button</b>	Select a node or relationship in the Editing pane and click the <b>Edit</b> button to open the <b>Query Node Properties</b> dialog box. For details, see " <a href="#">Query Node/Relationship Properties Dialog Box</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Qualifiers</b>	Displays the qualifier conditions defined for the node or the relationship. For details, see " <a href="#">Qualifier Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Selected Identities</b>	Displays the element instances that are used to define what should be included in the query results. For details, see " <a href="#">Identity Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .

## Parse Rule Editor Dialog Box

Enables you to create a rule that matches an attribute to process-related information (IP, port, command line, and owner).

<b>To access</b>	<b>Software Identification Rule Editor &gt; Set Attributes &gt; Attributes Assignment Editor &gt; Parsing Rules &gt; Add</b>
<b>Important Information</b>	Only users with a knowledge of regular expressions should make changes to a rule.
<b>Relevant tasks</b>	<a href="#">"How to Discover Running Software – Scenario"</a> on page 83

<b>See also</b>	<ul style="list-style-type: none"> <li>• "Attribute Editor Dialog Box" on page 103</li> <li>• "Software Identification Rule Editor Dialog Box" on page 121</li> </ul>
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User interface elements are described below:

UI Element (A–Z)	Description
<b>Process Attribute</b>	Choose between the <b>Port</b> , <b>IP</b> , <b>Command Line</b> , <b>Name</b> , or <b>Owner</b> process-related information. The rule is invoked on the attribute you choose here.
<b>Regular Expression</b>	<p>Enables you to create a dynamic expression that finds at least one process that defines this running software. The regular expression is invoked on the value in the Process Attribute field.</p> <p>For example, a command line process includes the following regular expression:</p> <p><b>.+ls+(lw+)\$</b></p> <p>This expression searches for any character, followed by a space or spaces, followed by a word or words (a-z or A-Z or 0-9) that appear at the end of the line.</p> <p>The following command line matches this regular expression:</p> <p><b>c:\ora10\bin\oracle.exe UCMDB</b></p>
<b>Rule ID</b>	Enter a unique name for the rule. The Rule ID is needed to identify the rule in the Attributes Assignment Editor pane. For details, see " <a href="#">Additional Attributes</a> " on page 121.

## Permission Editor Dialog Box




Enables you to configure an adapter you have written, so that users can view permissions for the job.

<b>To access</b>	<b>Data Flow Management &gt; Adapter Management &gt; select an adapter &gt; Adapter Definition tab &gt; Required Permissions pane &gt; click the Add button.</b>
<b>Important Information</b>	The information you define here is not dynamic, that is, if an adapter is changed, the information in this dialog box is not updated.
<b>See also</b>	<ul style="list-style-type: none"> <li>• "Discovery Permissions Window" on page 226</li> <li>• "Viewing Permissions While Running Jobs" on page 188</li> <li>• "Adapter Definition Tab" on page 89</li> <li>• "Discovery Module/Jobs - Details Tab" on page 214</li> </ul>

User interface elements are described below:

UI Element (A–Z)	Description
<b>Operation</b>	The action that is being run.
<b>Permission</b>	Enter a name for the permission, to appear in the Required Permissions pane.
<b>Usage Description</b>	Free text that you enter to describe the permission object and its parameters. This text is usually a general comment on the type of permission object, whereas the description is a more specific comment. For example, you could enter <b>Permissions for host machines</b> here, and <b>Permissions for host machines running on Windows</b> for a particular row.

### Permission Objects and Parameters Pane








UI Element (A–Z)	Description
	Click to open the <b>Permission Object and Parameter</b> pane. You can enter more than one object or parameter for each permission.  The information you enter in this dialog box appears in the <b>Required Permissions</b> pane, in the <b>Objects and Parameters</b> column.
	Click to delete a permission object.
	Click to edit an existing permission object.
<b>Context</b>	Specific information about the permission object's environment, for example, Windows or UNIX.
<b>Parameter</b>	The parameters that are needed during the job run. For example, the UNIX permission object <code>cat</code> needs the <code>/etc/passwd</code> parameter.
<b>Permission Object</b>	The name of the command, table, or other content of the Jython script.


## Resources Pane

Enables you to locate a specific package, adapter, script, configuration file, or external resource. You can also create an adapter, Jython script, configuration file, or Discovery activity, and you can import an external resource.

<b>To access</b>	<b>Data Flow Management &gt; Adapter Management</b>
<b>Important Information</b>	<p>Depending which level you select in the Resources pane, different information is displayed in the View pane.</p> <p>If you select:</p> <ul style="list-style-type: none"> <li>• One of the following folders: Discovery Packages root, a specific package, an adapter, script, configuration file, or external resource: a list of the resources in that folder is displayed. To access a resource directly, double-click the resource in the View pane.</li> <li>• A specific adapter: The <b>Adapter Definition</b> and <b>Adapter Management</b> tabs are displayed. For details, see "<a href="#">Adapter Definition Tab</a>" on page 89 and "<a href="#">Adapter Configuration Tab</a>" on page 96.</li> <li>• A script or configuration file: The script editor is displayed. For details, see "<a href="#">Script Pane</a>" on page 119.</li> <li>• An external resource: Information about the file is displayed.</li> </ul>
<b>See also</b>	" <a href="#">Package Manager User Interface</a> " in the <i>HP Universal CMDB Administration Guide</i> .

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
	<p><b>Create New Resource.</b> Enables you to create a resource in a selected package. Select a resource, enter its details, click the ellipsis  button, and select a package to which to add the resource. If you do not select a package, the new resource is created in the <b>&lt;No Package&gt;</b> folder:</p> <ul style="list-style-type: none"> <li>• <b>New Adapter.</b> Enter the adapter name. Choose whether it should be used as a discovery adapter or for integration. For integration adapters, choose the integration type from the list of available types. Click <b>OK</b>. Edit the adapter. For details, see "Adapter Definition Tab" on page 89 and "Adapter Configuration Tab" on page 96. For details on moving an adapter to a package, see "Create a Custom Package" on page 1 in the <i>HP Universal CMDB Administration Guide</i>. For details on creating integration adapters, see "Discovery and Integration Adapters" on page 18.</li> <li>• <b>New Jython script.</b> Enter the script name. For details, see "Script Pane" on page 119.</li> <li>• <b>New Configuration File.</b> Enter the configuration file name. By default, the file takes an .xml extension. To give the file another extension, for example, *.properties, name the file and include the extension. Add the appropriate XML code or other content. For XML files, you can save the file only if it is valid. For details, see "Configuration File Pane" on page 105.</li> <li>• <b>Import External Resource.</b> In the browser that opens, locate the resource to be imported and click <b>Open</b>.</li> <li>• <b>New Discovery Wizard.</b> Name the new wizard. By default, the file takes an .xml extension. The file is in template format.</li> <li>• <b>New Scanner Configuration</b> Configure the new scanner using the Scanner Configuration Generator wizard. For more information see section about the Scanner Generator in the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</li> </ul>
	<p><b>Delete the Selected Item.</b> Deletes the resource.</p>
	<p><b>Find Resource.</b> Opens the Find Resource dialog box. For details on filtering, see "Filtering Results" on page 26.</p>
	<p><b>Refresh.</b> Refreshes the list of packages.</p>
	<p><b>Packages tree.</b> Displays a list of all packages.</p>
	<p><b>Package root.</b> Displays a list of all resources included in the package. Expand the folders to see available resources:</p> <p>Right-click a resource to do one of the following:</p>

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Save As.</b> Enables you to clone an existing resource. The new resource includes all attributes of the existing resource. Give the resource a name, and click the ellipsis  button to select a package to which to add the resource.</li> <li>• <b>Delete.</b> Enables you to delete the resource. The resource is removed completely from the system.</li> <li>• <b>Open in Frame.</b> Enables you to view or edit the resource script in the Script Editor. <b>Available for:</b> Configuration files and scripts</li> <li>• <b>Go to Discovery Job.</b> Enables you to open the discovery job associated with the selected adapter in the Discovery Control Panel <b>Available for:</b> Adapters only. This option is enabled if the adapter is included in a discovery job.</li> <li>• <b>Go to Integration Point.</b> Enables you to view and edit the integration point that uses this adapter in the Integration Studio. <b>Available for:</b> Adapters only. This option is enabled if the adapter is used by an integration point.</li> <li>• <b>Edit Adapter Source.</b> Enables you to view or edit the adapter's XML file in the Adapter Source Editor. For details, see "<a href="#">Adapter Source Editor Window</a>" on page 101. <b>Available for:</b> Adapters only.</li> </ul>

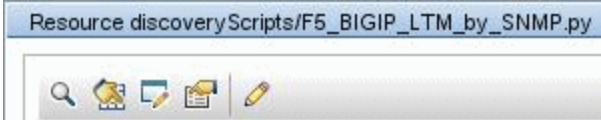
## Script Editor Window

Enables you to edit a specific script that is part of a package.






<p><b>To access</b></p>	<ul style="list-style-type: none"> <li>• Right-click a script in the Resources pane and choose <b>Open in Frame</b>.</li> <li>• Select a configuration file in the Global Configuration Files pane and click the <b>Edit</b> button.</li> </ul> <p>For details, see "<a href="#">Script Pane</a>" on next page.</p>
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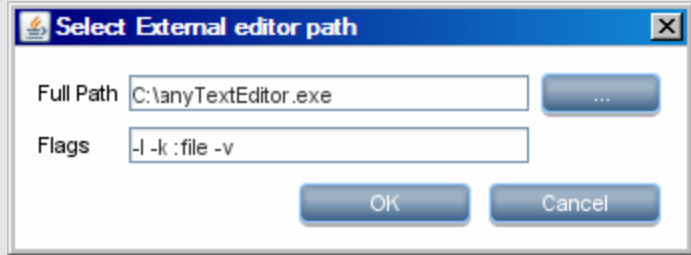





## Script Pane

Enables you to edit a specific script that is part of a package.


<b>To access</b>	Click a specific script in the Resources pane.
<b>Important Information</b>	<p>The script pane title bar includes the actual physical location of the script. For example, the following script is located in <b>C:\hp\UCMDB\DataFlowProbe\runtime\probeManager\discoveryScripts</b> (or <b>probeGateway\discoveryScripts</b>):</p> 
<b>See also</b>	"Adapter Development and Writing" in the <i>HP Universal CMDB Developer Reference Guide</i>

User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A–Z)	Description
	<b>Find text.</b> Enables you to find specific text in the script definition. For details, see "Find Text Dialog Box" on page 109.
	<b>Go to line.</b> Enables you to jump to a specific line in the script definition. In the Go To Line dialog box, enter the line number, and press <b>ENTER</b> .
	<p><b>Open External Editor.</b> Opens the script definition in an external text editor.</p> <p><b>Prerequisite:</b> Click the <b>Edit the External Editor Preferences</b>  button to define the path to an external editor. If no external editor path is defined, you will be prompted to provide one when you try to open the external editor.</p>
	<p><b>Edit the External Editor Preferences.</b> Click to edit the external editor preferences. You can run the editor by adding flags to the path.</p> <p><b>Note:</b> You cannot specify the file name. Instead, you can use flags relevant to your external editor to retrieve the file name, such as <b>:file</b>.</p> <p>In the following example, <b>:file</b> sets the place of the file in relation to the flags.</p>

UI Element (A–Z)	Description
	 <p>If no flags are defined, the file name is automatically added to the end of the path.</p>
	<p><b>Switch Editor Mode.</b> Enables you to switch between the default advanced editor and a simple text editor.</p>
	<p>See "Validation Information" below.</p> <p><b>Note:</b> This button is displayed when a script contains Framework API errors.</p>
<p>&lt;script definition&gt;</p>	<p>The Jython script used by the package. For details on working with Jython, see "<a href="#">Create Jython Code</a>" in the <i>HP Universal CMDB Developer Reference Guide</i>.</p>
<p><b>Validation Information</b></p>	<p>Displays if the script definition is valid or not:</p> <ul style="list-style-type: none"> <li>  For Jython files, indicates that the script definition is valid.         </li> <li>  For Jython files, indicates that the script definition is not valid, and displays the errors in the script.         </li> </ul> <p>For example:</p> <pre>Script has failed validation.  At line 48: Factory.getProtocolProperty( found. This is a problem - Usage of Factory is deprecated. Use Framework.getProtocolProperty instead.</pre> <p>Click , then <b>OK</b> to update the script.</p> <p>The error may occur due to changes in the Framework object's API. For details, see the <i>HP Universal CMDB Developer Reference Guide</i>.</p>








UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li> For Jython files, indicates that the script definition could not be validated.</li> </ul> <p><b>Note:</b> This may occur due to an internal error while performing the validation. This does not, under any circumstances, harm the process of saving your definition to the server. See <code>%temp%\UcmdbLog\error.log</code> for details. For further assistance, contact HP Software Support.</p>

## Software Identification Rule Editor Dialog Box

Enables you to define a new running software rule.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel.</b> In the <b>Discovery Modules</b> pane, select <b>Network Discovery &gt; Host Resources and Applications &gt; Software Element CF by Shell.</b> In the <b>Properties</b> tab, select <b>Global Configuration Files &gt; applicationsSignature.xml.</b> In the <b>Software Library</b> dialog box, click the <b>Add</b> button or select an existing element and click the <b>Edit</b> button.
<b>Important Information</b>	Each parse rule must be matched by at least one process.
<b>Relevant tasks</b>	"How to Discover Running Software – Scenario" on page 83
<b>See also</b>	"Global Configuration Files Pane" on page 95

User interface elements are described below:

UI Element (A–Z)	Description
	Click to add attributes to the component. For details, see "Attribute Assignment Editor Dialog Box" on page 102.
	Click to open the Optional Configuration Files dialog box.
	Click to add a process.
	Select a process and click to delete.
	Select a process and click to edit.
<b>Additional Attributes</b>	To add attributes, click the Set Attributes button. For details, see "Attribute Assignment Editor Dialog Box" on page 102.
<b>Category</b>	You can:

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>Choose the category under which the new running software should appear.</li> <li>Change the category for an existing element.</li> <li>Add a new category by typing its name in this field.</li> </ul> <p>The changes you make here are immediately displayed in the Software Library dialog box.</p>
<b>CI Type</b>	Select the CIT that is to be discovered.
<b>Discovered Product Name</b>	The name of the running software to be created by this signature.
<b>Identifying Processes</b>	To add a process that can identify specific running software, click the <b>Add</b> button. The Edit Process dialog box opens. For details, see " <a href="#">Edit Process Dialog Box</a> " on page 107.
<b>Optional Configuration Files</b>	<p>A list of configuration files.</p> <p>Click the <b>Set Configuration Files</b> button to open the Optional Configuration Files dialog box.</p> <p>To add a configuration file, in the Optional Configuration Files dialog box, click the <b>Add</b> button and, in the <b>Configuration File Names</b> box, enter the full path to the running software's configuration file and the file name.</p>
<b>Software Signature ID</b>	<p>The name of the definition.</p> <p><b>Note:</b> This is not the running software's name but a name you give to differentiate this discovery from similar discoveries.</p>
<b>Supported versions</b>	Versions supported for this running software.
<b>Vendor</b>	The vendor of this running software.






## Software Library Dialog Box

Enables you to view the logical groups of running software.

<b>To access</b>	<ul style="list-style-type: none"> <li><b>Discovery Control Panel window &gt; Network Discovery &gt;</b> select one of the <b>Host Resources and Applications module</b> jobs. Locate the <b>Global Configuration Files</b> pane in the Properties tab. Select <b>applicationsSignature.xml</b> and click the <b>Edit</b> button.</li> <li><b>Adapter Management window &gt;</b> select one of the <b>Host_Resources_By_SNMP/TTY/WMI</b> adapters. Locate the <b>Global Configuration Files</b> pane in the <b>Adapter Definition</b> tab. Select <b>applicationsSignature.xml</b> and click the <b>Edit</b> button.</li> </ul>
------------------	---

<b>Important Information</b>	The software elements are organized in logical categories. You can change the names of these elements, you can move an element to another category, and you can define new elements and categories. For details, see the <b>Category</b> entry in "Software Identification Rule Editor Dialog Box" on page 121.  The code you define in this dialog box and the Software Element Editor dialog box overwrites the code in <b>applicationsSignature.xml</b> .
<b>Relevant tasks</b>	"How to Discover Running Software – Scenario" on page 83
<b>See also</b>	"Global Configuration Files Pane" on page 95

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
	Select a check box to include a category or software element in the discovery.
	Clear a check box to remove the category or element from the discovery.
	Click to define a new software element. For details, see "Software Identification Rule Editor Dialog Box" on page 121.
	Select a software element and click to delete the element.
	Select a software element and click to make changes to the element. For details, see "Software Identification Rule Editor Dialog Box" on page 121.
<List of software elements>	List of objects that are software elements.

## Internal Configuration Files

The following files are for internal use only and should be changed only by users with an advanced knowledge of content writing.

- **discoveryPolicy.xml**. Includes the schedule when the Probe does not execute tasks. For details, see "New/Edit Policy Dialog Box" on page 37. Located in **Data Flow Management > Adapter Management > Packages > AutoDiscoveryInfra > Configuration Files**.
- **jythonGlobalLibs.xml**. A list of default Jython global libraries that DFM loads before running scripts. Located in **Data Flow Management > Adapter Management > Packages > AutoDiscoveryContent > Configuration Files**.

# Chapter 5

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## Discovery Rules Engine

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## Discovery Rules Engine

When Universal Discovery discovers data, the Discovery Rules Engine processes the given set of input data, and returns a set of output attribute values.

For example,

- **Input:** A Node contains the string **Cisco** and the string **Version 12.3a**,
- **Output :** The operating system for the Node is recognized as **Cisco IOS Version 12.3(3a)**.

The Data Flow Probe then activates the Rules Engine to fill in additional information on the discovered data.

All discovery jobs uses the discovery rules engine. Out of the box rules are applied to data that can be completed by the discovery jobs (sys\_object\_id, mac\_address etc.)

Moreover, you can add user-defined rules to the Discovery Rules Engine.

### Limitations

- The Discovery Rules Engine completes empty fields only in UCMDB. It does not overwrite existing values.
- Rules run in a random order. User-defined discovery rules have no priority over out-of-the-box discovery rules. If the input suits more than one rule, the output is returned from the rule that ran first. It is important to make sure that rules are accurate (existing and new rules). If rules are accurate there is no need for prioritization.
- There are no dependencies between rules. A field that was completed using the Discovery Rules Engine cannot be used as input for another rule.

### See Also

- For details on defining new rules, see "[How to Define Discovery Rules](#)" on next page.

- For details on viewing out-of-the-box rules, see ["How to View Discovery Rules in JMX" on next page](#).
- To disable the Rules Engine on a particular population adapter, see ["How to Disable the Discovery Rules Engine" on page 127](#).
- For log files, see ["Discovery Rule Engine Log Files" on page 127](#).


## How to Define Discovery Rules

This task describes how to define a new discovery rule in the Discovery Rules Engine.

If you are working on an upgraded version of UCMDB, you can also edit user-defined rules from your previous version.

To learn more about the Discovery Rules Engine, see ["Discovery Rules Engine" on previous page](#).

### To add new user-defined discovery rules:

1. Go to **Adapter Management**.
2. In the Resources pane, click **New** , and select **New Configuration File**.  
Enter a name for the new discovery rule. The name must begin with **ruleEngine/** and end with **.xml**.  
For example: **ruleEngine/myRule.xml**.
3. In the Package field, select **NormalizationRules**.
4. In the Editor pane that opens on the right, enter the new rule.  
An example of valid rules can be found under **NormalizationRules > Configuration Files, in ruleEngine/samples.xml**.
5. Click **OK**.

### To edit an existing discovery rule from a upgraded version of UCMDB:

1. Go to **Adapter Management**.
2. In the Resources pane, select the **UserDefinedRules** package.
3. Under **Configuration Files**, select the .xml file for the rule that you want to edit.

#### Note:

- Rules that were defined in previous versions of UCMDB (for example in **oidToHostClass.xml**), can be found under the **UserDefinedRules** package, in the configuration file **UserDefinedOidToHostClass.xml**.

- Out-of-the-box **OidToHostClass** rules can be found under **NormalizationRules** > **External resources** in the **ruleEngine/snmp.gz** file.

## How to View Discovery Rules in JMX

The Discovery Rules Engine is very large. You can search the rule base using search commands on the JMX-console.

### To search for a rule:

- Log in to the JMX console using the server administrator credentials (by default: sysadmin,sysadmin)
- Go to the service: **Normalization Rule Base Services**, and enter one of the following search commands:

Command	Description
<b>scanForSNMPRules</b>	Retrieves SNMP discovery rules that apply to the specified input attributes. <b>Note:</b> <ul style="list-style-type: none"><li>■ the <b>sys_object_id</b> value must always have a leading "."</li><li>■ Leave empty to ignore</li></ul>
<b>scanForScanFileRules</b>	Retrieves Scan File discovery rules that apply to the specified input attributes. <b>Note:</b> Leave empty to ignore
<b>viewNormalizationRuleById</b>	Retrieves discovery rules by ID
<b>viewNormalizationRuleByNiceId</b>	Retrieves discovery rules by user friendly ID (NiceRuleID), <b>Example:</b> 4323@SNMP
<b>viewNormalizationRules</b>	Retrieves discovery rule outputs that apply to the specified input attributes <b>Format:</b> <ul style="list-style-type: none"><li>■ Pair attributes in the following format: <b>attrName;attrValue</b></li><li>■ Pairs must be separated by commas.</li></ul> <b>Example:</b> Name;HP,Version;10

## How to Disable the Discovery Rules Engine

All population adapters are set up, by default, to use the Discovery Rules Engine adapters.

**To disable the Discovery Rules Engine for a particular population adapter:**

1. In **Adapter Management**, open the population adapter's configuration file (<adapter>.xml).
2. Search for the following parameter: **normalizationRules isEnabled**
  - If you find it, ensure that the value is set to **false**.
  - If you do not find it, add the following line: **<normalizationRules isEnabled="false"/>**

## Discovery Rule Engine Log Files

The section describes the Discovery Rules Engine log files. These files can be found in <Data Flow Probe Installation>\runtime\log\.

### normalization.audit.log

Logs information about the processing of the Discovery Rules Engine.

Level	Description
Information	Audits the number of element processed and the number of CIs that were changed. <b>Example:</b> <pre>Normalization (OSHV: 8 elements) (Time: 125 ms) (Modified CIs: 1)</pre>

### normalization.log

Logs detailed information about the processing of the Discovery Rules Engine, enabling you to trace detailed information of the Discovery Rule Engine process.

Level	Description
Error	All discovery rule processing errors.
Information	Logs all levels of information about the processing of the Discovery Rules Engine.
Debug	Logs mainly for debugging purposes.

**Basic Troubleshooting.** Check this log when you need to analyze why a CI was not enriched by the Discovery Rules Engine.

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# Performing Integration



# Chapter 6

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## Integration Studio

This chapter includes:

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## Integration Studio Overview

The Integration Studio is where you manage your UCMDB integration points and connect and share information with external repositories, such as other CMDBs, IT Performance Suite products, or third-party products.

Integration with other products is performed over secure communication channels through Data Flow Probes.

Alternatively, if your remote managed data repositories are accessible from the UCMDB server machine, non-Jython-based integrations can be performed using the HP UCMDB Integration service, enabling the Data Flow Probe resources to be used for other discovery tasks.

Integration points in the CMDB are based on adapters, which are entities that are capable of communicating with external data repositories. A basic set of adapters is provided with the CMDB; however, you can create additional adapters using the Federation Framework SDK. For details, see "Add an Adapter for a New External Data Source" in the *HP Universal CMDB Developer Reference Guide*.

You can also create adapters in the Adapter Management module. For details, see "[Resources Pane](#)" on page 116.

For details about how to set up integration points for data integrations, see "[Integration Studio Page](#)" on page 155.

Integration points can be of one of the following types:

- "[Population](#)" below
- "[Federation](#)" below
- "[Data Push](#)" on page 132

## Population

An integration of Population type copies data from an external data repository into the CMDB, so that the CMDB now controls the data.

You use population in one of the following scenarios:

- When you need to track changes made by the CMDB at the CI level.
- When a remote repository is not reliable in terms of response time; for example, a network delay prohibits you from setting up run-time federation with the repository.
- When a remote repository does not support federation capabilities (no appropriate adapter exists).

## Federation

An integration of Federation type includes data in the CMDB from other sources in such a way that the source of the data still retains control of the data.

You use the CMDB's federation capabilities to extend the scope of the existing Topology Query Language (TQL) capabilities to encompass data that is stored and maintained in an external repository. The ability to include such information is important as it prevents you from having to copy large amounts of data and, instead, bring it into your CMDB only when it is really needed.

Federation also has the benefit that the federated data does not burden the CMDB in terms of capacity; theoretically, you can set up an integration that federates trillions of CIs and relationships. Federated data is fetched at runtime, as requested, which lessens the impact on system performance.

**Note:** The CMDB does not offer change tracking on federated data because the data does not reside within the CMDB and the CMDB is not notified when external data is modified.

Federated integration creates a federated integration point, which can then be used when defining TQL queries. For details on TQL, see "[Topology Query Language](#)" in the *HP Universal CMDB Modeling Guide*.

**Note:** Federation can be configured in Actual state only, but can be performed in either Actual

or Authorized state.

## Retrieving Data from Multiple Federated Data Sources

During TQL query calculation, you can retrieve data for the same CIT from several federated data sources. The data is retrieved from the local CMDB, as well as from other federated data sources, according to how you have configured integration points. As data arrives at the CMDB, it is identified and reconciled, with the end result determined according to the configured reconciliation priority given to the various integrations.

Each CI that is retrieved from an external data repository includes an attribute (**Created By**) to show from which federated data source the CI has been retrieved.

For limitations, see ["Limitations"](#) on page 168.

## Retrieving Attributes from an External Data Repository

- You can retrieve the attributes of a CI from an external data repository, when the core CI data is stored in the CMDB.
- The core data repository must be the CMDB.
- The CIT must be located in a data repository for its attributes to be defined.
- The same attributes can be retrieved from multiple data repositories.
- For details on retrieval options, see the CI Type Retrieval Mode field on the ["Federation Tab"](#) on page 146.
- When you configure an integration point to include federated CIs, you must select full federation of a CI or the federation of an attribute alone. You cannot set up two integrations for the same CIT where one is mapped to an external CIT and the other is mapped to that same CIT with an external attribute.
- A CIT can support external attributes if the adapter (which is federating the CIT data) supports mapping information (reconciliation) for this CIT.

## Reconciling Information

Federated queries should use the mapping file to reconcile the CI from the CMDB with the attributes from the external data repository.

For details on the Mapping Engine, see ["Federation Framework Flow for Federated TQL Queries"](#) in the *HP Universal CMDB Developer Reference Guide*.

For details on selecting attributes to be included in the federation, see ["Federation Tab"](#) on page 146.

For details on how reconciliation is performed, see ["Entity Reconciliation"](#) on page 250.

## Use Cases

- You need to discover the SMS or Altiris desktops in your system. The desktop CIT is a core CIT and is already synchronized with the CMDB. However, you do not want to store all the desktop data in the CMDB as this is inefficient and unnecessary. It is enough to store core attributes such as name and MAC address in the CMDB, and to define the other details of the desktops as

external attributes in two data repositories: SMS and Altiris.

- VMware creates virtual machines that contain a virtual machine monitor (hypervisor) that allocates hardware resources dynamically and transparently. Multiple operating systems can run concurrently on a single physical computer. Since the allocation resources—for example, memory—are dynamic, DFM cannot discover these resources (DFM runs once every 24 hours and the resource data can change hourly). To enable UCMDB to always be updated with real-time data, the solution is to divide the data into two: the core data of the virtual hosts should be discovered and placed in the CMDB; the resource attributes should be retrieved from the external source. In this use case, the data for these attributes is retrieved from two data repositories: CMDB and VMware.

## Data Push

An integration of Data Push type copies data from the CMDB to an external data repository, so that the CMDB no longer retains control over this data.

You use data push integrations to feed important data from your CMDB into an external system to facilitate your necessary business processes. An example of this is pushing data discovered by DFM into HP Service Manager, where tickets may be opened that are connected to the actual CIs in your IT infrastructure.

If an authorized state has been defined, you can perform data push from the authorized or actual state.

For limitations on Data Push jobs, see ["Limitations"](#) on page 168.

## Integration in a Multi-Tenancy Environment

When executing integration queries or jobs in a multi-tenancy environment, all CIs and relationships that are federated or populated from the remote data source are assigned an owner tenant.

If the data source environment is multi-tenancy aware, when you run a query or a job, only the CIs and relationships of those tenants that you have permissions to view are federated or populated. The owner tenant value is brought in with all of the other attributes.

If the data source environment is not multi-tenancy aware, when you run the query or a job, UCMDB automatically assigns a specified owner tenant value to each of the federated/populated CIs and relationships. For details about selecting an owner tenant value to assign to federated/populated CIs and relationships, see ["New Integration Point/Edit Integration Point Dialog Box"](#) on page 159.

## HP UCMDB Integration Service

If your remote managed data repositories are accessible from the UCMDB server machine, you can use the **UCMDB Integration Service**, installed on the UCMDB Server to run non-Jython-based integrations, instead of a Data Flow Probe.

This enables running non-Jython-based integrations without using Data Flow Probe resources that may be better used for other discovery tasks.

For information on using the HP UCMDB Integration Service to run integrations, see ["How to Set Up an Integration Point"](#) on page 136.

**Note:**

- The HP UCMDB Integration Service must be started on the UCMDB Server.
- If there is a Data Flow Probe installed and running on the UCMDB Server machine, you must first stop the Data Flow Probe before you can start the UCMDB Integration Service. For details, see ["How to Check the HP Universal CMDB Integration Service Status"](#) on page 144.

## How to Work with Federated Data

This task explains how to set up and work with data that is federated from different CMDB sources.


This task includes the following steps:

- ["Set up the federation type integration "](#) below
- ["Set a reconciliation priority"](#) below
- ["View Instances in IT Universe Manager"](#) below
- ["View Reports"](#) below

### 1. Set up the federation type integration

Set up the integration that will federate the data, including the CITs that should be federated. For details, see ["How to Set Up an Integration Point"](#) on page 136.

### 2. Set a reconciliation priority

In the Integration Point pane, select the integration, and click the **Reconciliation Priority Manager**  button. For more details, see ["Reconciliation Priority Window"](#) on page 274.

### 3. View Instances in IT Universe Manager

For details about viewing the federated CI instances, see ["Working with Views in IT Universe Manager"](#) in the *HP Universal CMDB Modeling Guide*.

### 4. View Reports

You can view reports about the integration in the Modeling Studio. For details see the section about reports in the *HP Universal CMDB Modeling Guide*.

## How to Work with Population Jobs

This task explains how to schedule population jobs and select the queries that are used to populate the CMDB with data.

This task includes the following steps:


- ["Create an integration point"](#) on next page
- ["Set a reconciliation priority"](#) on next page
- ["Run the population job"](#) on next page

- "Build a view of the population results" below
- "View instances in IT Universe Manager" below
- "View reports" below

#### 1. **Create an integration point**

Set up the integration to populate the data. For details, see "How to Set Up an Integration Point" on page 136.



#### 2. **Set a reconciliation priority**

In the Integration Point pane, select the integration, and click the **Reconciliation Priority Manager**  button. For more details, see "Reconciliation Priority Window" on page 274.

#### 3. **Run the population job**

Population jobs are set to run according to a default schedule setting. However, you can manually run the integration at any time from the Integration Jobs pane. For user interface details, see "Integration Jobs Pane" on page 147.

Select the job.

- To synchronize all data for the first time, click the **Run Job - Sync All Data**  button.
- To synchronize only the data changes since the job last ran, click the **Run Job - Sync Changes**  button.

#### 4. **Build a view of the population results**

For details about viewing the populated data, see "Working with Views in IT Universe Manager" in the *HP Universal CMDB Modeling Guide*.

#### 5. **View instances in IT Universe Manager**

For details about viewing the CI instances, see "Working with Views in IT Universe Manager" in the *HP Universal CMDB Modeling Guide*.

#### 6. **View reports**

You can view reports about the integration in the Modeling Studio. For details see the section about reports in the *HP Universal CMDB Modeling Guide*.

## How to Work with Data Push Jobs

This task explains how to schedule data push jobs and select the queries that are used to send data from the CMDB to another data repository.

This task includes the following steps:


- "Create an integration point" on next page
- "Set Reconciliation priority" on next page
- "Run the Data Push job" on next page

- ["Build a view of Data Push results" on next page](#)
- ["View instances in IT Universe Manager" on next page](#)

#### 1. Create an integration point

Set up the integration to push the data from UCMDB. For details, see ["How to Set Up an Integration Point" on next page](#).



#### 2. Set Reconciliation priority

In the Integration Point pane, select the integration, and click the **Reconciliation Priority Manager**  button. For more details, see ["Reconciliation Priority Window" on page 274](#).

#### 3. Run the Data Push job

Data Push jobs are set to run according to a default schedule setting. However, you can manually run the integration at any time from the Integration Jobs pane. For user interface details, see ["Integration Jobs Pane" on page 147](#).

Select the job.

- To synchronize all data for the first time, click the **Run All-Data Sync**  button.
- To synchronize only the data changes since the job last ran, click the **Run Changes Sync**  button.

#### Note:

- If CIs in a data push job fail, the query is displayed in the Query Status tab with the status: **Passed with failures**. You can drill down to see the errors that occurred and the CIs affected. This error data is saved in the system. When the job runs again to synchronize changes, UCMDB remembers the failed CIs and repushes these as well. For user interface details, see ["How to Work with Data Push Jobs" on previous page](#).
- You can define a limit on the number sequential CI failures allowed during a running data push job. When this limit is reached, the job automatically stops running, enabling you to troubleshoot the reason for so many failures before waiting for the entire job to end.

In the Administration module's Infrastructure Setting Manager, select **Integration Settings** and set the value of **Maximum number of data push job failures allowed in a sequence**. The default value for this setting is **20,000**.

- If, since the last synchronization, you have changed a TQL query (other than changes to conditions on existing nodes), all data is synchronized and the following message is written to the log: **TQL was changed between syncs - performing Full sync!**
- **High Availability environment:** If a data push job is running, and there is a failure

on the UCMDB environment, the data push job fails. You can wait for the next invocation of the job schedule, or alternatively rerun the data push job manually.

#### 4. Build a view of Data Push results

For details about viewing the data push results, see ["Working with Views in IT Universe Manager"](#) in the *HP Universal CMDB Modeling Guide*.

#### 5. View instances in IT Universe Manager

For details about viewing the CI instances, see ["Working with Views in IT Universe Manager"](#) in the *HP Universal CMDB Modeling Guide*.

## How to Set Up an Integration Point

This task describes how to set up an integration point for a particular integration with UCMDB.

**Note:** The integration adapters provided with the Discovery and Integration Content Pack come predefined with the basic setup recommended to perform integration with UCMDB, including adapter properties, integration jobs and, where relevant, federation settings. You can use these settings or configure them to suit your needs.

This task includes the following steps:

- ["Prerequisites" below](#)
- ["Create an integration point" below](#)
- ["Add the integration jobs and schedule the jobs to run" on next page](#)
- ["For a federation-type integration, define the data to be federated" on next page](#)
- ["Save the integration point" on next page](#)

### 1. Prerequisites


The integration adapter must be correctly configured before setting up the integration.

- **Pre-configured Integration Adapters:** These are provided out-of-the-box with the product. It is recommended to use the adapters as they come, without any further configuration.

However, if you do need to modify the adapter configuration, you are encouraged to do this from the Adapter Management module rather than manually. For details about adapter configuration, see ["How to Configure Adapter Settings" on page 81](#).

- **New External Data Source Adapters:** To configure an adapter for an new external data source, see ["Add an Adapter for a New External Data Source"](#) in the *HP Universal CMDB Developer Reference Guide*.

### 2. Create an integration point

In UCMDB, select **Data Flow Management > Integration Studio**, and click the **New Integration Point**  button. For user interface details, see ["New Integration Point/Edit"](#)



[Integration Point Dialog Box" on page 159.](#)

- a. Enter a name and description for the integration point.
- b. Select the appropriate integration adapter. For details on existing adapters, see "[Select Adapter Dialog Box" on page 162.](#)
- c. Select whether or not to activate the integration upon creation.
- d. Upon selecting the adapter, the Adapter Properties section is populated with the relevant adapter properties. Provide the relevant information. For details, see the relevant section in *HP Universal CMDB Discovery and Integration Content Guide*.
- e. Configure the adapter's protocol credentials, where required. For a list of supported protocols, see the *HP Universal CMDB Discovery and Integration Content Guide*.
- f. Select the Probes to use for the integration.


**Note:** If your remote managed data repositories are accessible from the UCMDB server machine, you can use the UCMDB Integration Service instead of a Data Flow Probe to run non-Jython-based integrations.

In this case, in the **Probe Name** box, select **UCMDB Integration Service**.

If **UCMDB Integration Service** does not appear in the **Probe Name** list, ensure that the UCMDB Integration Service is running on the UCMDB Server machine. For details, see "[How to Check the HP Universal CMDB Integration Service Status" on page 144.](#)

- g. **For Jython-based integration adapters only:** Create or select a trigger CI instance for the integration.

### 3. Add the integration jobs and schedule the jobs to run

In the Integration Jobs pane, click the **New Integration Job**  button.

- Where relevant, define the job queries.
- Population and Data Push integration jobs are set to run according to a default schedule setting. You can change the schedule in the Schedule Definition pane.

For user interface details, see "[New Integration Job/Edit Integration Job Dialog Box" on page 156.](#)

### 4. For a federation-type integration, define the data to be federated

In the Federation tab, select the CITs to be federated.

For user interface details, see "[Federation Tab" on page 146.](#)

### 5. Save the integration point

Make sure to save the integration point settings.

## How to Save an Integration Point Configuration as an Adapter Default

You can save an integration point configuration as an adapter default. This is useful if you want to use an integration point's configuration to create other integration points with a similar configuration.

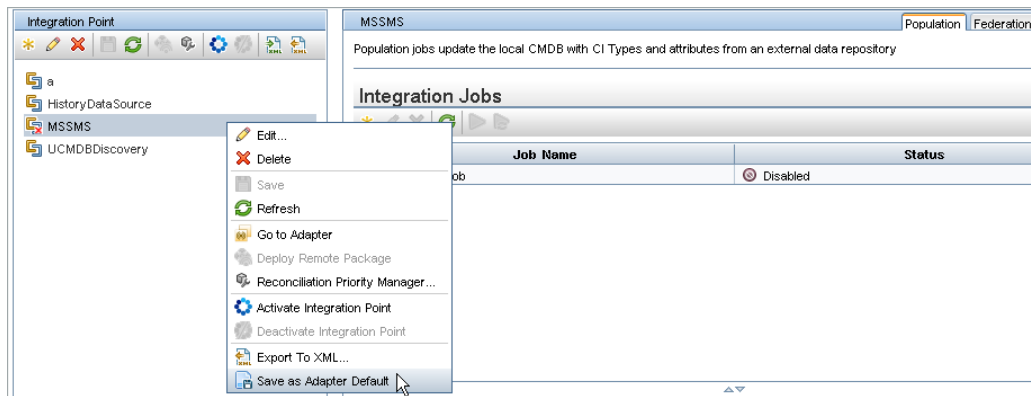
This task describes how to save an integration point configuration as an adapter default.

### 1. Prerequisites

- a. Define an integration point based on a particular adapter. For example, MSSMS, based on the Microsoft SMS adapter.
- b. Define population or push jobs and federation details.
- c. Save the integration point.

### 2. Save the integration point configuration as an adapter default

- a. In the Integration Point pane, right-click the integration point that you created, and select **Save as Adapter Default**.



- b. In the Save as Adapter Default dialog box, enter details for the adapter default as follows:
  - o **Name and Description.** A name for the adapter default and a description.

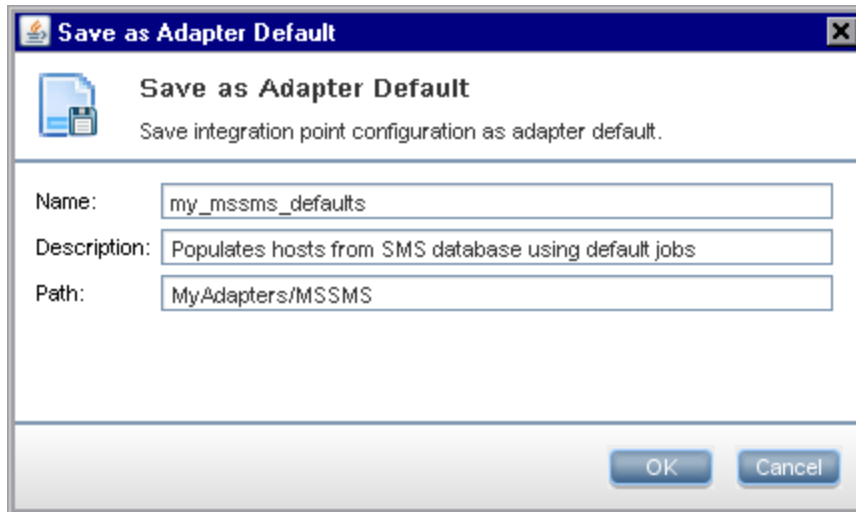
**Caution:** If you give the adapter default the same name as an existing adapter default, UCMDDB treats this as though you are redefining the existing adapter default, and the new definition overwrites the existing definition. If you do not want to overwrite an existing adapter default, give the new adapter default a different name.

- o **Path.** (Optional) The path to the folder under which your adapter should be displayed in the Select Adapter dialog box (when creating a new integration point). The adapter default is displayed under the same category as the adapter that was originally used to create the integration point, in the path that you define here.

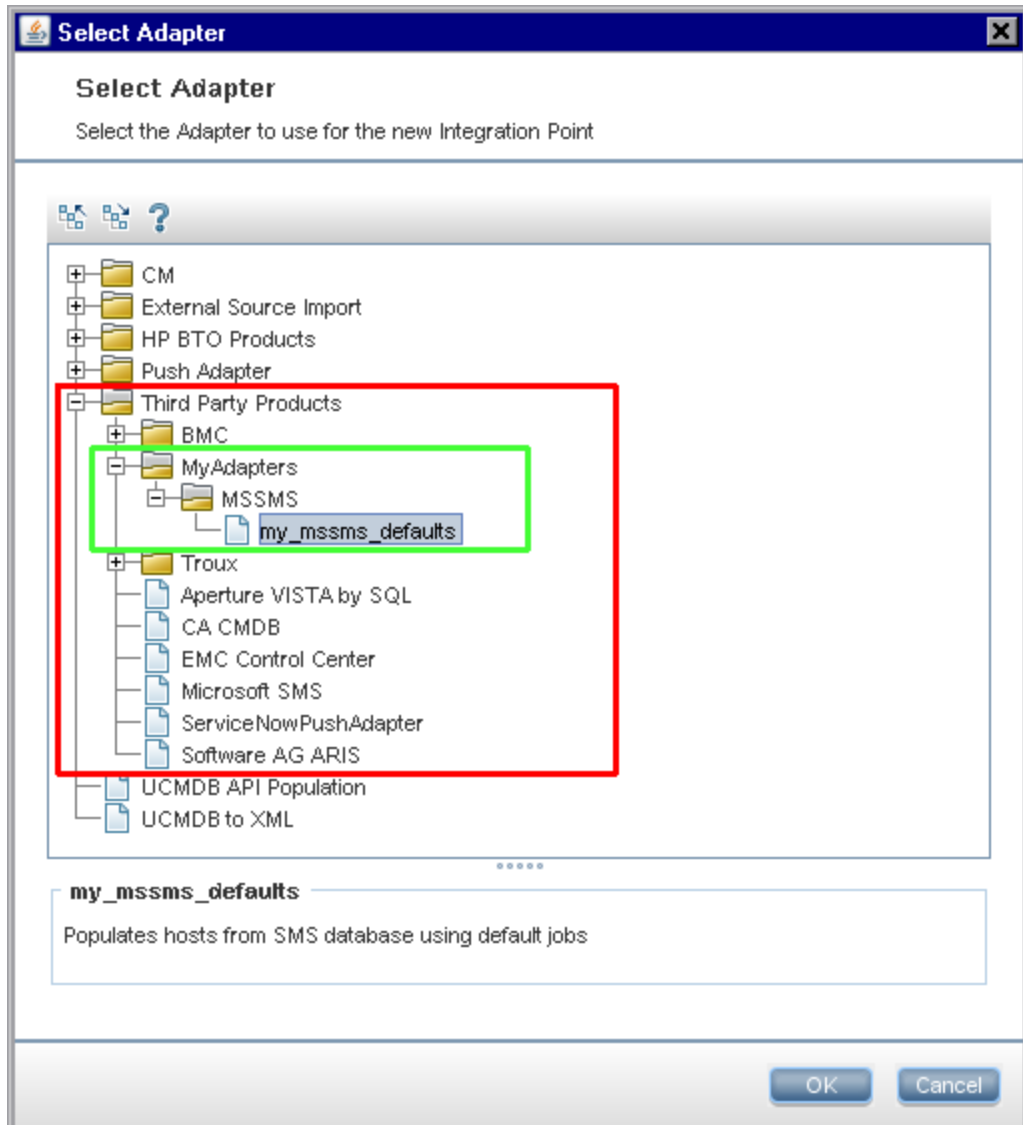
**Note:**

- Use only forward slashes (/) in the path.
- If you define a new folder in the path, the adapter default is displayed in that folder, under the same category as the original adapter.
- If you leave the path empty, the adapter default is displayed directly under the same category as the original adapter.

Using the MSSMS integration point example introduced in the Prerequisites section above, you could save this integration point as an adapter default, calling it **my\_mssms\_defaults** and defining the path as **MyAdapters/MSSMS**.



The next time you create a new integration point, the **my\_mssms\_defaults** adapter default is displayed under the **Third Party Products** category (because the out-of-the-box Microsoft SMS adapter appears under this category), in the **MyAdapters>MSSMS** folder, as you specified in the path:

**Note:**

- When you save the adapter default, integration point parameters that are not related to the connection itself are saved in the adapter default definition.
- The code for the adapter default is added to the adapter's xml file. To delete the adapter default, see "[How to Remove Adapter Defaults](#)" on next page.

## How to Remove Adapter Defaults

To remove an adapter default, you must delete the code that defines it from its base adapter's .xml file.

### To remove an adapter default:

1. Locate the adapter on which the adapter default was based. (**Adapter Management > Resources** pane).

**Tip:** Alternatively, you can access the adapter from the Integration Point pane by right-clicking the relevant integration point and selecting **Go To Adapter**.

2. Right-click the adapter and click **Edit Adapter Source**.

3. In the adapter's .xml file, locate the following line:

- **Non-Jython adapters:**

```
<adapterTemplate name="<adapter_default>" description="">
```

- **Jython adapters:**

```
<adapterJythonTemplate name="<adapter_default>" description="">
```

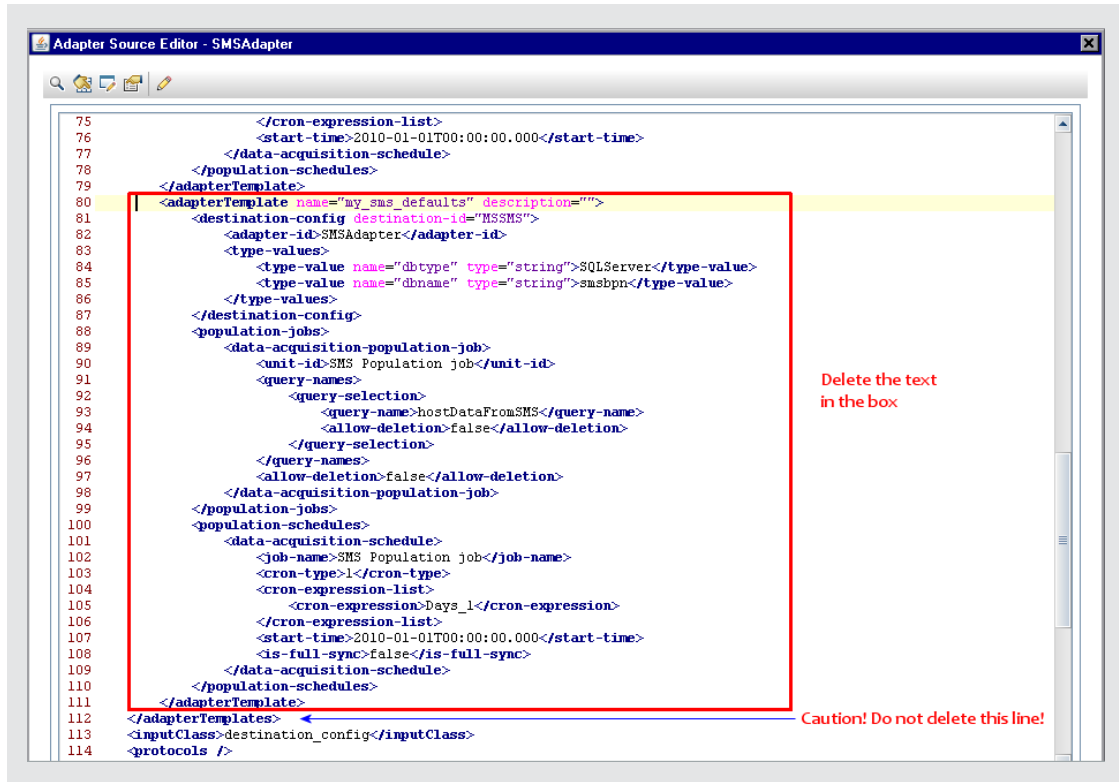
where **adapter\_default** is the name of the adapter default.

4. Delete the all the code from this opening tag to the closing `</adapterTemplate>` (or `</adapterJythonTemplate>`) tag.

**Caution:** Do not delete the following line: `</adapterTemplates>`

5. Save your changes.

### Example



## How to Create a CI Topology

You can save a topology to the CMDB for a new adapter. This adapter can include elements from a defined topology already existing in the CMDB as well as new elements that you have added to the topology.

For details on creating the topology, see "Topology CI Creation Wizard" on page 165.

## How to Deploy a Package to a Remote Data Repository

You can deploy a package to a data repository located on a remote machine without logging in to the remote machine. This feature is useful if you need to deploy queries, views, or other UCMDDB resources created on one machine to other machines running UCMDDB.

**Note:** You perform the following procedure for each data repository that the package is to be deployed to.

This task includes the following steps:

- "Prerequisites" on next page
- "Change timeout - optional" on next page
- "Select the integration point" on next page

- "Select the package" below
- "View deployment results" below
- "View Log files" on next page

#### 1. Prerequisites

- Verify that the Data Flow Probe is configured correctly and is connected to UCMDB.
- Verify that the version of UCMDB running on the remote machine is version 9.02 or later.
- Verify that UCMDB running on the remote machine is up and running.
- Create the package that must be deployed to the remote machine, and deploy this package to the local UCMDB Server.

**Note:** By default, you cannot deploy a package that is larger than 10 MB.

- Create an integration point on the local UCMDB Server, that uses the **UCMDB 9.x/10.x** adapter.

#### 2. Change timeout - optional

You can change the time after which UCMDB times out package deployment. If UCMDB cannot connect to the remote machine in 5 minutes, by default, the deployment is timed out.

To change the default: Select **Administration > Infrastructure Settings Manager > Integration Settings > Remote package deploy Timeout**. (The refresh rate indicates when the change takes effect in UCMDB after the value is modified.)

#### 3. Select the integration point

- a. In the Integration Point pane, select the integration point that you created in "Prerequisites" above. For details, see "Integration Point Pane" on page 153.
- b. Click the **Deploy Remote Package** button.

#### 4. Select the package

- a. In the Deploy Remote Package dialog box, select a package from the list of packages existing on the local UCMDB Server. This is the package that you created in "Prerequisites" above. For details, see "Deploy Package to Remote Data Repository using <Integration Point>" on page 146.
- b. Click **OK** to deploy the package.

#### 5. View deployment results

Answer the message that is displayed: click **OK** to begin deploying the package.


The status of the deployed package is displayed together with the status of each individual resource in the package.

- **Successful deployment:** A package is successfully deployed if all its resources are successfully deployed.
- **Failed deployment:** If even one resource fails, the package deployment is considered to

have failed. Even if package deployment fails, all the successful resources are deployed on the remote machine.

The reason for the failure, for example, a missing CIT, is displayed in the **Deployed resources** section:

### Deployed resources

Resource	Status
tqi/View/testing.xml	 Class not in class model

## 6. View Log files

The following table shows the locations of the log files that record any issues that might arise during deployment:

Location	Log File Name
Remote UCMDB machine, version 9.02 or later	ucmdb-api.log mam.packaging.log
Data Flow Probe	probeTasks.log probe-infra.log adapters.log
Local UCMDB machine	ucmdb-api.log

If a resource fails to deploy, an error is displayed in the Status column as well as in the log file on the remote machine.

## How to Check the HP Universal CMDB Integration Service Status

If your remote managed data repositories are accessible from the UCMDB server machine, you can use the UCMDB Integration Service for non-Jython-based integrations instead of a Data Flow Probe.

To use this service, ensure that it is running on the UCMDB Server machine:

- **Windows:Control Panel > Administration Tools > Services**
- **Linux:/opt/hp/UCMDB/UCMDBServer/integrations/bin/service.sh status**

To start the service if the service is not running, do the following:



- **Windows:**
  - Select **Start > Programs > HP UCMDB > Start HP UCMDB Integration Service**
  - Select **Start > Control Panel > Administration Tools > Services**, and start the **UCMDB Integration Service**
- **Linux:** Enter the following command:  
`/opt/hp/UCMDB/UCMDBServer/integrations/bin/service.sh start`

**Note:** If there is a Data Flow Probe installed and running on the UCMDB Server machine, you must first stop the Data Flow Probe before you can start the UCMDB Integration Service.

To stop the Data Flow Probe:

- **Windows:** Select **Start > Programs > HP UCMDB > Stop Data Flow Probe**.
- **Linux:** Enter the following command:  
`/opt/hp/UCMDB/DataFlowProbe/bin/probegateway.sh stop`

## Integration Studio User Interface

This section includes (in alphabetical order):

- "Data Push Tab" below
- "Deploy Package to Remote Data Repository using <Integration Point>" on next page
- "Federation Tab" on next page
- "Integration Jobs Pane" on page 147
- "Integration Point Pane" on page 153
- "Integration Studio Page " on page 155
- "New Integration Job/Edit Integration Job Dialog Box" on page 156
- "New Integration Point/Edit Integration Point Dialog Box" on page 159
- "Population Tab" on page 162
- "Select Adapter Dialog Box" on page 162
- "Topology CI Creation Wizard" on page 165

## Data Push Tab

This tab enables you to:

- Specify the queries that are used to push data to external data repositories, and to schedule jobs that contain those queries. For details, see "Integration Jobs Pane" on page 147.
- View statistics results for jobs that have run. For details, see "Statistics Tab" on page 150.

<b>To access</b>	Select the Data Push tab on the Integration Studio page.
------------------	--

<b>Important information</b>	This tab is enabled only when data push is supported by the adapter on which you are basing your integration point.
<b>See also</b>	"New Integration Job/Edit Integration Job Dialog Box" on page 156

## Deploy Package to Remote Data Repository using <Integration Point>

Enables you to deploy a package to a remote data repository using an integration point, and to view the results of the deployment.

<b>To access</b>	Click the <b>Deploy a Remote Package</b> button in the <b>Integration Point</b> pane. For details, see "Integration Point Pane" on page 153.
<b>Relevant tasks</b>	"How to Deploy a Package to a Remote Data Repository" on page 142

User interface elements are described below:

UI Element (A-Z)	Description
<b>Deployed resources</b>	The status (success or failure) of each deployed resource in the package named under <b>Deployment status</b> .
<b>Deployment status</b>	The name and status (success or failure) of the complete package.
<b>Package Name</b>	A list of all available packages.


## Federation Tab




This tab enables you to select which CITs or attributes are to be supported by the integration point. For example, if a TQL query includes a node that represents a specific CIT, the instances of this CIT are accepted from this external data repository.

For details about selecting CIs, see "[CI Selector Overview](#)" in the *HP Universal CMDB Modeling Guide*.

<b>To access</b>	Select the Federation tab on the Integration Studio page.
<b>Important information</b>	This tab is enabled only when data federation is supported by the adapter on which you are basing your integration point.

User interface elements are described below:

UI Element (A-Z)	Description
	Click to clear all selected items.






UI Element (A-Z)	Description
	Click to invert the selections.
	Click to expand the entire hierarchical tree structure.
	Click to collapse the hierarchical tree structure.
<b>CI Type Retrieval Mode</b>	<ul style="list-style-type: none"> <li>• <b>Retrieve CIs of selected CI Type.</b> All a CI's data, including all its attributes, are retrieved from the data repository.</li> <li>• <b>Retrieve selected attributes.</b> The selected attributes are retrieved from the data repository. The CIs must already exist in the CMDB.</li> <li>• <b>Retrieve the attribute from the UCMDB too.</b> The attribute can be federated as well as physically retrieved from the CMDB (if any attributes of CI instances exist in the database).</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• A parent CIT and all its child CITs included in an integration point definition must use the same retrieval mode.</li> <li>• You cannot select both CITs and attributes for the same integration point.</li> </ul>
<b>Select Attributes</b>	<p>You can define which attributes of an external CIT are to be included in the federation:</p> <ul style="list-style-type: none"> <li>• In the CI Type Retrieval Mode pane, select <b>Retrieve selected attributes</b>.</li> <li>• In the Select Attributes list, select the attributes that are to be included in the federation.</li> <li>• Save the changes.</li> </ul> <p><b>Note:</b> Attributes are defined in the CIT Manager. For details, see <a href="#">"Add/Edit Attribute Dialog Box"</a> in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<b>Supported and Selected CI Types</b>	<p>Displays a hierarchical tree containing the supported and selected CI Types and attributes.</p> <p>When queried by an TQL query, the CITs you select here are configured to retrieve the data from this external data repository.</p> <p>Select the CITs to be supported by this integration point.</p>



## Integration Jobs Pane

This pane enables you to schedule integration jobs to run with external data repositories. The Statistics, Query Status, and Job Errors tabs display runtime details about the selected jobs.

<b>To access</b>	<ul style="list-style-type: none"> <li>• Select the <b>Population</b> or <b>Data Push</b> tab on the <b>Integration Studio</b> page.</li> <li>• To access the Statistics, Query Status, or Job Error tabs, select an integration point, select the <b>Population</b> or <b>Data Push</b> tab on the <b>Integration Studio</b> page, then select a job.</li> </ul>
<b>Important information</b>	This pane is displayed only when population or data push is supported by the adapter on which you are basing your integration point.
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• <a href="#">"How to Work with Population Jobs"</a> on page 133</li> <li>• <a href="#">"How to Work with Data Push Jobs"</a> on page 134</li> </ul>
<b>See also</b>	<ul style="list-style-type: none"> <li>• <a href="#">"Discovery Scheduler Dialog Box"</a> on page 227</li> </ul>

User interface elements are described below:

UI Element (A-Z)	Description
	<b>New Integration Job.</b> Enables you to create an integration job. For details, see <a href="#">"New Integration Job/Edit Integration Job Dialog Box"</a> on page 156.
	<b>Edit Integration Job.</b> Enables you to edit an existing integration job.
	<b>Delete Integration Job.</b> Deletes the selected integration job from the list.
	<p><b>Refresh.</b> Refreshes the list of integration jobs.</p> <p><b>Note:</b> If you refresh the list of jobs before you save a new job, you are given a choice:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> The job is saved and the integration is refreshed.</li> <li>• <b>No.</b> The job is not saved and the integration is refreshed.</li> <li>• <b>Cancel.</b> The job is not saved and the integration is not refreshed.</li> </ul>
	<p><b>Run Job - Sync Changes.</b> Runs the selected population or data push job and synchronizes only the changes in the data since the last time the job was run.</p> <p>By default, scheduled jobs synchronize only changes except for the first time a job runs. In that case, a full population or data push job runs, in which all relevant data for the job is synchronized.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• If the job is scheduled to run an all-data synchronization while you are running a changes synchronization, the scheduled all-data synchronization will run when the job has finished synchronizing the changes.</li> <li>• If CIs in a data push job fail, the query is displayed in the Query Status tab with the status: <b>Passed with failures</b>. You can drill down to see the errors that occurred and the CIs affected. This error data is saved in the</li> </ul>

UI Element (A-Z)	Description
	<p>system. When the job runs again to synchronize changes, UCMDB remembers the failed CIs and repushes these as well. For details, see <a href="#">"Query Status Tab" on page 151</a>.</p>
	<p><b>Run Job - Sync All Data.</b> Runs a full population or data push job. This job copies or pushes all the relevant data for the job.</p> <p><b>Note:</b> If the job is scheduled to run a changes synchronization while you are running an all-data synchronization, the scheduled changes synchronization will run when the job has finished synchronizing all of the data.</p>
	<p><b>Stop Running Job.</b> Stops running the selected job.</p> <p><b>Available for:</b> Data Push jobs only</p>
<p>&lt;right-click integration job menu&gt;</p>	<p>In addition to the options described above, the right-click menu provides the following functionality:</p> <ul style="list-style-type: none"> <li>• <b>Show Results For Job.</b> DFM sends an ad-hoc request to the Probe and retrieves the latest results of the job.  This ad-hoc request does not run the job, but brings the results of the previous job run that are stored in the Probe's database. If the job has not yet run, a message is displayed.  <b>Available for:</b> Population jobs only.  <b>Note:</b> Results are not displayed if the total number of results exceeds 10,000.</li> <li>• <b>View Communication log.</b> Opens the log that includes information about the connection between the Probe and the remote machine. This is on condition that you have set the <b>Create communication log to Always or On failure</b>. For details, see <a href="#">"Execution Options Pane" on page 96</a>.  <b>Available for:</b> Population jobs based on Jython adapters only.</li> </ul>
<p><b>Job Name</b></p>	<p>Name given to the population or data push job.</p>
<p><b>Last Synchronization Type</b></p>	<p>The type of the last run:</p> <ul style="list-style-type: none"> <li>• <b>None.</b> The job has not yet run.</li> <li>• <b>Changes.</b> The job synchronized only the changes in the data since the last time it ran.</li> <li>• <b>Full.</b> The job synchronized all the relevant data for the job.</li> </ul> <p><b>Available for:</b> Data push jobs only</p>
<p><b>Status</b></p>	<p><b>Population jobs:</b></p> <ul style="list-style-type: none"> <li>• <b>Waiting for Probe.</b> The job is waiting to be received by the Probe.</li> </ul>



UI Element (A-Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Did not run.</b> The job has been received by the Probe but the Probe is not yet ready to run the job.</li> <li>• <b>Preparing to run.</b> The Probe is preparing to run the job. <b>Note:</b> The status is preceded by another instance of the <b>Waiting for Probe</b> status, but this time <b>Waiting for Probe</b> indicates that the Probe is now ready to prepare the job for the run.</li> <li>• <b>Running.</b> The job is running.</li> <li>• <b>Succeeded.</b> The job ran successfully.</li> <li>• <b>Succeeded with warnings.</b> The job ran successfully but warnings were reported.</li> <li>• <b>Failed.</b> The job did not run successfully.</li> <li>• <b>Disabled.</b> The integration point is deactivated or the trigger CI is missing.</li> </ul> <p><b>Data push jobs:</b></p> <ul style="list-style-type: none"> <li>• <b>Did not run.</b> The job has not yet run.</li> <li>• <b>Running.</b> The job is currently running.</li> <li>• <b>Ended.</b> The period between <b>Running</b> and <b>Succeeded</b> or <b>Failed</b>.</li> <li>• <b>Passed with failures.</b> The last run passed , but some CIs failed. These failures can be viewed in the Query Status tab. For details, see "<a href="#">Query Status Tab</a>" on next page.</li> <li>• <b>Succeeded.</b> The last run was successful.</li> <li>• <b>Failed.</b> The last run was not successful.</li> </ul>
<b>Start time / Finish time</b>	<p>The time that the integration job actually started running, and when it finished running. These columns are refreshed every time the job goes into the <b>Running</b> state.</p> <p><b>Available for:</b> Population jobs only</p>

### Statistics Tab

This tab displays information about the CIs synchronized by the job.

**Note:** Statistics for population jobs are accumulative and therefore can be filtered, whereas the data push statistics are always relevant for the last job run only.






User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
	Click to refresh the list of CITs.
	<p>Select the time range or Probe for which to display statistics about the selected job.</p> <ul style="list-style-type: none"> <li>• <b>By Time Range.</b> <ul style="list-style-type: none"> <li>▪ <b>All.</b> Displays statistics for all job runs.</li> <li>▪ <b>From Now/Last Minute/Last Hour/Last Day/Last Week.</b> Choose a period of time for which to display statistics about the CITs.</li> <li>▪ <b>Custom Range.</b> Click to open the Change Timeframe dialog box: Enter the date or click the arrow to choose a date and time from the calendar, for the <b>From</b> and <b>To</b> dates (or click <b>Now</b> to enter the current date and time). Click <b>Last Day</b> to enter the current date and time in the <b>To</b> box and yesterday's date and time in the <b>From</b> box. Click <b>OK</b> to save the changes.</li> </ul> </li> <li>• <b>By Probe.</b> To view statistics for a specific Probe, select to open the Choose Probe dialog box.</li> </ul> <p><b>Available for:</b> Population jobs only</p>
<Statistics table>	<ul style="list-style-type: none"> <li>• <b>CIT.</b> The name of the discovered CIT. Displayed for population jobs only.</li> <li>• <b>Query Name.</b> (Data push jobs only) The name of the query whose data is being pushed.</li> <li>• <b>Created.</b> The number of CIs created in the period selected or for the selected Probe.</li> <li>• <b>Updated.</b> The number of CIs that were updated in the period selected.</li> <li>• <b>Deleted.</b> The number of CIs deleted in the period selected or for the selected Probe.</li> <li>• <b>Failed.</b> (Data push only) The number of CIs that failed to be pushed.</li> </ul> <p><b>Available for:</b> Service Manager 9.3 adapter only</p>
<b>Last updated</b>	The date and time that the Statistics table was last updated for the selected job.
<b>Valid to</b>	The date when the data was last synchronized.

## Query Status Tab

This tab displays information about the queries defined for the job.


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Refresh.</b> Refreshes the list of queries.
	<b>Push Failed Data.</b> Enables you to repush the selected query/CI manually. <b>Available:</b> When a failed query or CI is selected
<Query details>	Displays the details of the selected job's queries: <ul style="list-style-type: none"> <li>• <b>Query Name</b> The name of the query.</li> <li>• <b>Query Status</b> <ul style="list-style-type: none"> <li>▪ <b>Population jobs.</b> The latest status of the query after the job finishes running.</li> <li>▪ <b>Data push jobs.</b> The current status or the last known status of the query. If a query passed with failures, you can double-click the query to view the errors that occurred and on which CIs they occurred. To repush the query, click the <b>Push Failed Data</b>  button.</li> </ul> </li> <li>• <b>Start Time/Finish Time</b> The time at which data push for this query started and finished.</li> </ul> <b>Available for:</b> Data push jobs only
<Errors>	Displays errors that occurred, the CI type affected, and the number of CIs that failed. Double-click a row to see the CIs that failed due to a particular error. To repush the CIs, click the <b>Push Failed Data</b>  button. <b>Available for:</b> Data push jobs only
<Failed CIs>	Displays the exact errors that occurred, the CIs on which they occurred, and when they occurred. To repush the CI, click the <b>Push Failed Data</b>  button. <b>Available for:</b> Data push jobs only


### Job Errors Tab

This tab displays the errors or warnings reported during the job run.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
	Click to refresh the list of errors.



UI Element (A–Z)	Description
	Select a row and click this button to view details of a message.
<List of error messages>	<ul style="list-style-type: none"> <li>• <b>Message.</b> A message describing warnings (if the job succeeded with warnings) or the cause for failure if the job failed.</li> <li>• <b>Severity.</b> For details, see "Error Severity Levels" in the <i>HP Universal CMDB Developer Reference Guide</i>.</li> <li>• <b>Reported.</b> The time at which the error is being reported by the job.</li> <li>• <b>Query.</b> Displayed for data push jobs only. The name of the query for which the error is being reported.</li> </ul>

## Integration Point Pane


This pane enables you to define integration points, and schedule population and data push jobs.












Integration points are based on adapters, each of which is predefined to transmit information in specific ways. For example, **CMDBAdapter** populates CIs and links from a remote CMDB, in which case the CMDB then has a local copy of these CIs, while the **ServiceManagerAdapter** adapter retrieves data from HP ServiceCenter and HP Service Manager, but HP ServiceCenter or HP Service Manager still retains control.


For details about defining a discovery adapter as an integration adapter, see the "Used as Integration Adapter" field in "Adapter Definition Tab" on page 89.

<b>To access</b>	Located in the left pane of the Integration Studio.
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• "How to Set Up an Integration Point" on page 136</li> <li>• "How to Save an Integration Point Configuration as an Adapter Default" on page 138</li> <li>• "How to Deploy a Package to a Remote Data Repository" on page 142</li> </ul>
<b>See also</b>	<ul style="list-style-type: none"> <li>• "Data Push Tab" on page 145</li> <li>• "Federation Tab" on page 146</li> <li>• "Population Tab" on page 162</li> </ul>

User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A-Z)	Description
	<b>New Integration point.</b> Enable you to create an integration point. For details, see "New Integration Point/Edit Integration Point Dialog Box" on page 159.

UI Element (A-Z)	Description
	<b>Edit Integration Point.</b> Enables you to edit an integration point's properties.
	<b>Delete Integration Point.</b> Deletes the selected integration point.
	<b>Save Integration Point.</b> Saves the changes you made to the definition of an integration point.
	<b>Full Integration Refresh.</b> Refreshes the list of integration points and fully refreshes the selected integration point.
	<p><b>Deploy Remote Package.</b> Opens the <b>Deploy Remote Package</b> dialog box, enabling you to deploy a package to a data repository located on a remote machine without logging in to the remote machine. For details, see <a href="#">"How to Deploy a Package to a Remote Data Repository"</a> on page 142.</p> <p><b>Note:</b> This button is enabled for integration points based on the UCMDB 9.x adapter (which supports package deployment capabilities).</p>
	<b>Open Reconciliation Priority Manager.</b> Opens the Reconciliation Priority Manager, a centralized location for viewing and changing the reconciliation priority for all integration points. For details, see <a href="#">"Reconciliation Priority Window"</a> on page 274.
	<b>Activate Integration Point.</b> Activates the selected integration point.
	<b>Deactivate Integration Point.</b> Deactivates the selected integration point.
	<b>Import From XML.</b> Enables you to import the integration point's configuration in XML format.
	<p><b>Export To XML.</b> Enables you to export the integration point's configuration in XML format.</p> <p><b>Note:</b> You must save a new integration point before you can export its configuration.</p>
<List of integration points>	Displays the list of previously defined integration points.
<right-click integration point menu>	<p>In addition to the options described above, the right-click menu provides the following functionality:</p> <ul style="list-style-type: none"> <li> <b>Go to Adapter.</b> Opens the adapter used by the integration job in the Adapter Management module.</li> </ul>


UI Element (A-Z)	Description
	<ul style="list-style-type: none"> <li>  <b>Save as Adapter Default.</b> Opens the Save as Adapter Default dialog box, enabling you to save the configuration of the selected integration point as an adapter default that can be used as a basis for other integration points.         </li> </ul> <p>Enter a name and description for the adapter default, and specify the path where the default adapter should be saved.</p> <p>For example, to save an adapter default in a user-defined folder, in the <b>Path</b> box, enter:</p> <p><b>MyAdapters/Default</b></p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>Use forward slashes (/) to separate folders in the path</li> <li>If a path is not defined, the default adapter template is saved, by default, under the same category as the adapter that it was based on.</li> </ul>

## Integration Studio Page

This page enables you to create and manage integration points.


<b>To access</b>	Select <b>Data Flow Management &gt; Integration Studio.</b>
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User interface elements are described below:

UI Element (A-Z)	Description
	<p><b>Reconciliation Priority Manager.</b> Opens the Reconciliation Priority Manager. For details, see "<a href="#">Reconciliation Priority Window</a>" on page 274.</p>
<b>Integration Point pane</b>	<p>Enables you to create integration points and edit their configuration. For details, see "<a href="#">Integration Point Pane</a>" on page 153.</p>
<b>Right pane</b>	<p>Displays data transfer configuration options for an integration point. Depending on the adapter on which you base your integration point, one or more of the following tabs is enabled:</p> <ul style="list-style-type: none"> <li>"Data Push Tab" on page 145</li> <li>"Federation Tab" on page 146</li> <li>"Population Tab" on page 162</li> </ul>

## New Integration Job/Edit Integration Job Dialog Box




This dialog box enables you to create or edit population and data push jobs and to schedule them to be run at specific times.

<b>To access</b>	Click  on the Population or Data Push tabs.
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• <a href="#">"How to Work with Federated Data"</a> on page 133</li> <li>• <a href="#">"How to Work with Population Jobs"</a> on page 133</li> <li>• <a href="#">"How to Work with Data Push Jobs"</a> on page 134</li> </ul>
<b>See also</b>	<a href="#">"Integration Jobs Pane"</a> on page 147

User interface elements are described below:



UI Element (A-Z)	Description
<b>Name</b>	Enter a name for the job.  <b>Note:</b> The name must not exceed 45 characters.
<b>Job Definition area</b>	Enables you select integration queries for the job definition. For details, see <a href="#">"Job Definition"</a> on next page below.  <b>Available for:</b> Non-Jython adapters only.
<b>Scheduler Definition area</b>	Enables you to schedule when to run the integration job.  For data push jobs, you can set different schedules for all-data synchronization and change synchronization.  For details about the scheduling options, see <a href="#">"Scheduler Definition"</a> on page 158 below.

## Job Definition

UI Element (A-Z)	Description
	<b>Add Query.</b> Opens the Enables you to add an available integration query to the job definition.
	<b>Delete Query.</b> Enables you to delete the selected query from the job definition.
	<b>Move Query Up/Down.</b> Enables you to determine the order in which the queries should run.
<Query table>	Displays the queries selected for the integration job.  <b>For non-Jython-based Data Push jobs:</b> Selecting a query's <b>Allow Deletion</b> check box enables the deletion of CIs or links for the query from the remote data repository.
<b>Allow Integration Job to delete removed data</b>	Enables the deletion of CIs or links per job from the local CMDB.  <b>Available for:</b> Non-Jython-based Population jobs only.
<b>Select the Job Type</b>	Enables you to select the type of job queries to use for the integration. <ul style="list-style-type: none"> <li>• <b>Changes - History-based.</b> CIs and direct links, not virtual links. Has better performance.</li> <li>• <b>RMI - Full Topology Comparison.</b> Supports CIs and all links types. <b>Note:</b> Calculated links are not supported.</li> </ul> <b>Available for:</b> Service Manager Data Push jobs only



## Scheduler Definition

UI Element (A-Z)	Description
<b>All-Data Sync tab</b>	Enables you to schedule an all-data synchronization. <b>Available for:</b> Data Push jobs only
<b>Changes Sync tab</b>	Enables you to schedule a changes synchronization. <b>Available for:</b> Data Push jobs only
<b>Cron Expression</b>	Enter a Cron expression in the proper format. For a description of the fields used in Cron expressions and examples of how to use them, see " <a href="#">Cron Expressions</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Ends</b>	Enables you to select when the job should stop running. <ul style="list-style-type: none"><li>• <b>Never.</b> The job continues to run until manually stopped.</li><li>• <b>Until.</b> Enables you to select the date when the job should stop running.</li></ul> Note: This option is disabled when you select <b>Once</b> .
<b>Repeat</b>	Enables you to select how often to run the integration job. The available options are: <ul style="list-style-type: none"><li>• <b>Once.</b> Runs the job only once.</li><li>• <b>Interval.</b> Runs the job at a set time interval.</li><li>• <b>Day of Month.</b> Runs the job on selected days of the month.</li><li>• <b>Weekly.</b> Runs the job on a weekly basis, on the days of the week selected.</li><li>• <b>Monthly.</b> Runs the job on a monthly basis, according to months selected.</li><li>• <b>Yearly.</b> Runs the job every so-many years, according to the number of years specified.</li><li>• <b>Cron.</b> Use a Cron expression to schedule a job. For a description of the fields used in Cron expressions and examples of how to use them, see "<a href="#">Cron Expressions</a>" in the <i>HP Universal CMDB Modeling Guide</i>.</li></ul>

UI Element (A-Z)	Description
<b>Repeat every</b>	<p>Enables you to type a value for the interval between successive runs.</p> <p><b>Available:</b> When you select <b>Repeat &gt; Interval</b> or <b>Yearly</b>.</p> <p><b>Unit of time:</b></p> <ul style="list-style-type: none"> <li>• <b>Interval.</b> Minutes; Hours; Days; Weeks</li> <li>• <b>Yearly.</b> Years</li> </ul>
<b>Repeat on</b>	<ul style="list-style-type: none"> <li>• <b>Sun - Sat.</b> When you select <b>Repeat &gt; Weekly</b>, enables you to select the day or days of the week to run the job.</li> <li>• <b>January - December.</b> When you select <b>Repeat &gt; Monthly</b>, enables you to select the months of the year to run the job.</li> </ul>
<b>Repeat on the following dates every month</b>	<p>When you select <b>Repeat &gt; Day of Month</b>, enables you select days of the month to run the job. The job runs every month.</p> <p>To clear the selection click the  button.</p>
<b>Scheduler enabled</b>	When selected, you can choose scheduling options for the integration job.
<b>Server Time</b>	The time on the UCMDDB server.
<b>Starts</b>	Enables you to select the date and time when you want the job to begin running.
<b>Time Zone</b>	Enables you to set the required time zone. To reset default settings, click the  button.






## New Integration Point/Edit Integration Point Dialog Box

This dialog box enables you to create a new integration point or edit the properties of an existing integration point.

<b>To access</b>	<p>Do one of the following:</p> <ul style="list-style-type: none"> <li>• Click the <b>New Integration Point</b> button  in the Integration Point pane.</li> <li>• Click the <b>Edit Integration Point</b> button  in the Integration Point pane.</li> </ul>
<b>Important information</b>	<p>The list of fields contains all of the items that may be specified when you create an integration point. Not all of the fields are displayed for all adapters.</p> <p>Each mandatory field is marked with an asterisk.</p>

<b>Relevant tasks</b>	<a href="#">"How to Create a CI Topology" on page 142</a>
<b>See also</b>	<b>For Multi-tenancy users:</b> <a href="#">"Integration in a Multi-Tenancy Environment" on page 132</a>

User interface elements are described below

UI Element (A-Z)	Description
	<p>Enables you to verify Probe connectivity using the parameters provided.</p> <p><b>Note:</b> If you have defined additional Probes, these Probes are tested for connectivity as well.</p>
<b>Additional Probes</b>	<p>Enables you to select additional probes over which to run a data push or federation-type integration. Click  to select the additional probes.</p> <p>When the integration runs, if additional Data Flow Probes are defined, the server uses the most available Probe.</p> <p><b>Available for:</b> Data push and federation-type integrations only.</p>
<b>Adapter</b>	<p>The adapter for the integration point. Click  to select an adapter. For details about each adapter, see <a href="#">"Out-of-the-Box Integration Adapters" on page 163</a>.</p> <p>For help on the selected adapter, click the <b>Show Content Help</b>  button.</p>
<b>CMDB State (Data Push)</b>	<p>The state of the source machine. Values are:</p> <ul style="list-style-type: none"> <li>• Actual</li> <li>• Authorized</li> </ul> <p><b>Note:</b> This field is visible only when using an adapter that supports data push and on a UCMDB for which authorized state has been defined.</p>
<b>Credentials ID</b>	<p>Enables you to select protocol credentials for relevant adapter integration points. Click  to open the <b>Choose Credentials</b> dialog box.</p> <p><b>Note:</b> Only the required protocols for the selected integration adapter are displayed here. For information about protocols required for each integration adapter see <a href="#">"Required Discovery Protocols Pane" on page 94</a>.</p>
<b>Default Owner Name</b>	<p>The name of the owner tenant that should be assigned to the federated or populated CIs and relationships.</p> <p><b>Note:</b></p>



UI Element (A-Z)	Description
	<ul style="list-style-type: none"> <li>This field is displayed when creating a federation or population type integration point in a multi-tenancy environment only.</li> <li>If no owner tenant is specified, or if the data source is not a multi-tenancy environment, the system owner tenant is assigned by default.</li> </ul>
<b>Integration Description</b>	Enter a brief description of the integration point.
<b>Integration Name</b>	Enter a name for the integration point. <b>Note:</b> The name may not exceed 45 characters.
<b>Is Integration Activated</b>	Select this check box to create an active integration point. You clear the check box if you want to deactivate an integration, for example, to set up an integration point without actually connecting to a remote machine.
<b>Probe Name</b>	The name of the Data Flow Probe used to run integration jobs. Do one of the following: <ul style="list-style-type: none"> <li>Use the <b>Auto-Select</b> option. In this case, the CMDB attempts to choose the correct Probe according to the IP ranges that were defined for the available Probes.</li> <li>Select the name of a specific Probe to use for these integration jobs. When you manually select a Probe, any IP ranges that you defined in the Probe settings are ignored.</li> </ul> <p><b>Note:</b> If your remote managed data repositories are accessible from the UCMDB server machine, you can use the <b>UCMDB Integration Service</b> option to run non-Jython-based integrations, instead of a Data Flow Probe.</p> <p>If <b>UCMDB Integration Service</b> does not appear in the <b>Probe Name</b> list, ensure that the UCMDB Integration Service is running on the UCMDB Server machine. For details, see "<a href="#">How to Check the HP Universal CMDB Integration Service Status</a>" on page 144.</p> <p><b>Note:</b> A Probe installed on a Linux machine is defined as an Integration Probe and appears in this list.</p>
<b>Trigger CI Instance</b>	Displays the CI that is to be used by the new integration point as a trigger during integration with CIs on a remote machine. <ul style="list-style-type: none"> <li><b>Select Existing CI.</b> Enables you to select the trigger CI through which data is collected during integration. For details, see <a href="#">Element Instances Dialog Box</a> in the <i>HP Universal CMDB Modeling Guide</i>.</li> <li><b>Create New CI.</b> Enables you to create the topology of the CI to be used as the trigger. For details, see "<a href="#">Topology CI Creation Wizard</a>" on page 165.</li> </ul>

UI Element (A-Z)	Description
	<p>To manage or view the trigger CI, right-click the CI. For details on these operations, see <a href="#">IT Universe Manager Shortcut Menu</a> in the <i>HP Universal CMDB Modeling Guide</i>.</p> <p><b>Available for:</b> Jython-based integration adapters only</p> <p><b>Note:</b> If the trigger CI instance used for the integration point is deleted, the integration point's jobs become disabled and cannot run. In this case, you must edit the integration point and select a new trigger CI for the integration.</p>

**Note:** Additional fields are available, depending on the adapter you select. Descriptions of each field may be viewed by hovering your mouse over that field on the screen. See the *HP Universal CMDB Developer Reference Guide* for details about specific adapters.

## Population Tab

This tab enables you to:

- Schedule jobs that populate the CMDB with data from external data repositories. For details, see ["Integration Jobs Pane"](#) on page 147.
- View statistics results for jobs that have run. For details, see ["Integration Jobs Pane"](#) on page 147.


<b>To access</b>	Select the Population tab on the Integration Studio page.
<b>Important information</b>	This tab is enabled only when data population is supported by the adapter on which you are basing your integration point.
<b>See also</b>	<a href="#">"New Integration Job/Edit Integration Job Dialog Box"</a> on page 156

## Select Adapter Dialog Box

This dialog box enables you to select from a list of predefined adapters that are provided out of the box.




You also have the option of adding a custom adapter for a new external data repository. For details, see [Add an Adapter for a New External Data Source](#) in the *HP Universal CMDB Developer Reference Guide*.

The Integration Framework SDK enables you to create new adapters that connect HP Universal CMDB with external products and services. For details, see [Developing Java Adapters](#) in the *HP Universal CMDB Developer Reference Guide*.

<b>To access</b>	Click  in the New Integration Point/Edit Integration Point Dialog Box.
<b>Important information</b>	The list of adapters displayed depends on your UCMDDB License. If you


	have the UCMDB Foundation License, only the HP Product adapters are displayed.
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• <a href="#">"How to Work with Federated Data"</a> on page 133</li> <li>• <a href="#">"How to Work with Population Jobs"</a> on page 133</li> <li>• <a href="#">"How to Work with Data Push Jobs"</a> on page 134</li> </ul>
<b>See also</b>	<a href="#">"New Integration Job/Edit Integration Job Dialog Box"</a> on page 156

User interface elements are described below:

UI Element (A-Z)	Description
	Click to collapse the hierarchical tree structure.
	Click to expand the hierarchical tree structure.
	Click to display help about the selected adapter.
<list of adapters>	Displays a list of out-of-the-box adapters. For details, see <a href="#">"Out-of-the-Box Integration Adapters"</a> below.

## Out-of-the-Box Integration Adapters

**Note:** Most of the adapters listed below are provided with the Discovery and Integrations Content Pack. Unless otherwise indicated, information about each of these adapters can be found in *HP Universal CMDB Discovery and Integration Content Guide*, or by clicking the

**Show Content Help**  button for each adapter.

Adapter Name (A-Z)	Description
<b>HP Product Adapters</b>	
<b>AM population and federation</b>	Used to populate and federate data from Asset Manager.
<b>Asset Manager Push Adapter</b>	Used to push data from UCMDB to Asset Manager.
<b>BSM 9.x</b>	Used to perform a population sync from BSM to UCMDB.
<b>CMKpiAdapter</b>	Used to federate Kpi data from Configuration Manager.
<b>CM Policy Adapter</b>	Used to federate Policy data from Configuration Manager.
<b>DDMI</b>	Used to populate and federate data from DDMI.
<b>NNMi: Population from NNMi</b>	Used to populate data from NNMi.

Adapter Name (A-Z)	Description
<b>NNMi: Push IDs into NNMi</b>	Used to push UCMDB Node IDs to NNMi.
<b>ServiceCenter 6.2x</b>	Used to federate data from HP ServiceCenter version 6.2x.
<b>Service Manager 7.0x</b>	Used to federate data from HP Service Manager version 7.0x.
<b>Service Manager 7.1x - 9.2x</b>	Used to federate data from and push data to HP Service Manager versions 7.1x-9.2x.
<b>ServiceManagerAdapter 9.x</b>	Used to federate data from and push data to HP Service Manager version 9.3 and later.
<b>Storage Essentials</b>	Used to populate CIs and relationships from Storage Essentials.
<b>Systems Insight Manager</b>	Used to populate CIs and relationships from HP SIM.
<b>UCMDB 9.x</b>	Used for populating and federating data from UCMDB version 9.x.  For details, see " <a href="#">Multiple Deployments with Version 9.x/10.x CMDBs</a> " on page 171.
<b>UCMDB 10.x</b>	Used for population and federating data from UCMDB version 10.x.  For details, see " <a href="#">Multiple Deployments with Version 9.x/10.x CMDBs</a> " on page 171.
<b>UCMDB to XML</b>	Used to export the results (CIs and relationships) of TQL queries and convert these to XML files.
<b>Third Party Product Adapters</b>	
<b>Atrium to UCMDB</b>	Used to populate CIs and relationships from Atrium.
<b>CiscoWorks Layer 2</b>	Used to populate server data from CiscoWorks.
<b>CiscoWorks NetDevices</b>	Used to populate network device data from CiscoWorks.
<b>CA CMDB</b>	Used to push CIs and relationships to CA CMDB.
<b>Data Push into Atrium</b>	Used to push CIs and relationships to BMC Atrium.
<b>EMC Control Center</b>	Used to populate CIs and relationships from EMC Control Center.
<b>Import topology (CSV, Database, Excel, Properties File)</b>	Used to import topology from a specified file type.
<b>Microsoft SMS</b>	Used to populate and federate data from Microsoft SMS.
<b>Service-Now Integration</b>	Used to push CIs and relationships to ServiceNow.

Adapter Name (A-Z)	Description
<b>Software AG ARIS</b>	Used to populate CIs and relationships from IDS Scheer ARIS.
<b>Troux: Population from Troux</b>	Used to populate CIs from Troux.
<b>Troux: Data Push into Troux</b>	Used to push data to Troux.
<b>Other</b>	
<b>UCMDB API Population</b>	Used to define an integration that specifies the reconciliation priority for data that is added to the CMDB using the CMDB API. For details, see the <i>HP Universal CMDB Developer Reference Guide</i> .

## Topology CI Creation Wizard

This wizard enables you to save a topology to the CMDB for a new adapter. This adapter can include elements from a defined topology already existing in the CMDB as well as new elements.

For example, say a node and its IP address exist in the CMDB as a defined topology. However, the adapter Input query defines a Microsoft SQL Server database element related to that node. This extended topology does not exist in the CMDB. When using the wizard to create the topology, CMDB identifies the existing node and IP address by the properties values you enter, connects the new MSSQL database CI to the topology, and saves the complete topology in the CMDB.

**Note:** You cannot use an abstract or federated CIT to create a Trigger CI.

<b>To access</b>	<p>Select a discovery Jython adapter in the <b>New Integration Point</b> dialog box. In the Trigger CI Instance menu, choose <b>Create New CI</b>.</p> <p><b>Note:</b> This wizard is available for discovery Jython adapters only, when the <b>Used as Integration Adapter</b> check box is selected. Moreover:</p> <ul style="list-style-type: none"> <li>• All conditions (attributes, cardinality, qualifiers, and so on) are disregarded in the Input query.</li> <li>• Only regular links (that is, not join or compound links) are allowed in the Input query.</li> </ul> <p>For details on the <b>Used as Integration Adapter</b> check box, see "<a href="#">Adapter Definition Tab</a>" on page 89.</p>
<b>Important information</b>	<ul style="list-style-type: none"> <li>• <b>Prerequisite:</b> To ensure that reconciliation rules work with the created topology, prepare details of the CIs (for example, values for key properties) as these details are needed during the wizard creation procedure.</li> </ul>


	<ul style="list-style-type: none"> <li>• If there are any errors during creation, the <b>Summary</b> page includes an error message and a link to the error details.</li> <li>• At the end of the topology creation, the source CI is defined as the Trigger CI instance.</li> </ul>
<b>See also</b>	"New Integration Point/Edit Integration Point Dialog Box" on page 159
<b>Wizard Map</b>	The Topology CI Creation wizard contains:  "Topology Preview" > "Define CI: <CI name>" > "Define Credentials" > "Topology Creation" > "Summary"

## Topology Preview

Enables you to preview the topology definition of the integration point.

<b>Wizard Map</b>	The Topology CI Creation wizard contains:  " <b>Topology Preview</b> " > "Define CI: <CI name>" > "Define Credentials" > "Topology Creation" > "Summary"
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User interface elements are described below:

UI Element (A–Z)	Description
	<b>Show Legend.</b> Toggles between hiding and displaying the topology legend.
<toolbar and legend>	For details, see "Toolbar Options" in the <i>HP Universal CMDB Modeling Guide</i> .

## Define CI: <CI name>

Enables you to define properties of a new CI instance of the CIT.

<b>Important Information</b>	<ul style="list-style-type: none"> <li>• This page of the wizard is displayed for each element in the query.</li> <li>• Several elements of the same CIT may exist in the query.</li> </ul>
<b>Wizard Map</b>	The Topology CI Creation wizard contains:  "Topology Preview" > " <b>Define CI: &lt;CI name&gt;</b> " > "Define Credentials" > "Topology Creation" > "Summary"

User interface elements are described below:

UI Element (A–Z)	Description
<b>Define New CI Properties</b>	Drill down to the property to be used to identify the CIT. Select the field next to the property name and enter a new value (or choose from existing values).  <b>Note:</b> If the selected CIT is abstract or federated, the properties are not displayed.
<b>Select CI Type</b>	Select the CIT for which you are defining a new CI instance.

## Define Credentials

Enables you to define credentials for the new CI.

<b>Important Information</b>	<ul style="list-style-type: none"> <li>Any changes you make here to a protocol (updating, adding, or removing) affect the protocol throughout DFM. Therefore, you must ensure that changes you make (for example, to a password) are valid. If the change is not valid, the Data Flow Probe will fail to connect at the next attempt.</li> <li>Any updates you make here can be viewed in the Data Flow Probe Setup window. For details, see <a href="#">"Data Flow Probe Setup Window - Details Pane" on page 40</a>.</li> <li>This page is displayed if the adapter writer has defined that credentials are needed to access the discovered component.</li> </ul>
<b>See Also</b>	<p>For details on using the buttons and shortcut menus, see <a href="#">"Domains and Probes Pane" on page 47</a>.</p> <p>For details on the protocols, see the <i>HP Universal CMDB Discovery and Integration Content Guide</i>.</p>
<b>Wizard Map</b>	<p>The Topology CI Creation wizard contains:</p> <p>"Topology Preview" &gt; "Define CI: &lt;CI name&gt;" &gt; <b>"Define Credentials"</b> &gt; "Topology Creation" &gt; "Summary"</p>

## Topology Creation

Enables you to read through the topology details (the CIs and relationships that are to be created) and make changes if required.

<b>Important Information</b>	Review the topology. To make changes, click the <b>Back</b> button.
<b>Wizard Map</b>	<p>The Topology CI Creation wizard contains:</p> <p>"Topology Preview" &gt; "Define CI: &lt;CI name&gt;" &gt; "Define Credentials" &gt; <b>"Topology Creation"</b> &gt; "Summary"</p>

## Summary

Displays the result of the topology creation.

<b>Important Information</b>	<ul style="list-style-type: none"><li>• If DFM displays a success message, click <b>Finish</b>.</li></ul> <p><b>Note:</b> For Population integration points, if at least one query ends with a warning and no errors are encountered, a <b>Success with warnings</b> message is displayed.</p> <ul style="list-style-type: none"><li>• A CI in the topology you create may be ignored by the reconciliation process if it matches an existing CI. If the SOURCE CI in the topology is ignored, the topology creation process fails. If another CI is ignored (any other node in the query), creation succeeds. This is because the SOURCE CI is needed by the query to create the Trigger CI. If it is ignored, the trigger cannot be identified and used for the integration. For details on the reconciliation process, see <a href="#">"Reconciliation Services" on page 254</a>.</li></ul> <ul style="list-style-type: none"><li>• If DFM cannot create the topology, an error message is displayed. Click the link to review the error details in the <b>ui-server.log</b> file, located in the following folder: <b>C:\hp\UCMDB\UCMDBServer\runtime\log\</b>.</li></ul> <p>Then, click <b>Back</b> to fix the error and run the wizard again.</p>
<b>Wizard Map</b>	The Topology CI Creation wizard contains:  "Topology Preview" > "Define CI: <CI name>" > "Define Credentials" > "Topology Creation" > <b>"Summary"</b>

## Limitations

This section describes certain limitations on the Integration Studio functionality.

This section includes the following topics:

- ["Limitations on Population Integrations" below](#)
- ["Limitations on Federation Integrations" on next page](#)
- ["Limitations on Data Push Integrations" on next page](#)

### Limitations on Population Integrations

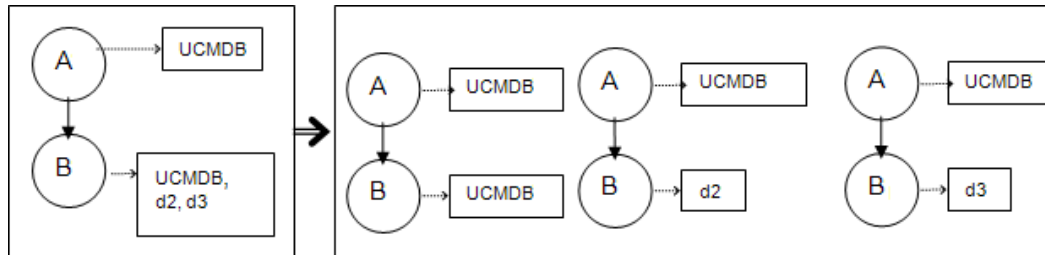
1. When configuring a population job between two CMDBs, verify that the synchronized CITs are the same in the two CMDBs.
2. When modifying a TQL query that is used in a population job, it is recommended to run a differential synchronization before modifying the TQL and a full synchronization after modifying the TQL. The differential synchronization removes any data that is no longer necessary as a result of the updated query, and the full synchronization creates new baseline data on the target system.
3. After a job runs successfully, its status remains **Succeeded** even after the job definition is



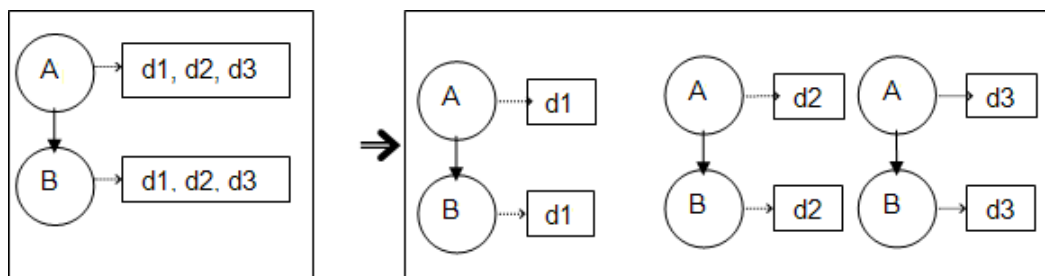
changed (for example, selecting another TQL query or enabling deletion) and saved.

## Limitations on Federation Integrations

- When a virtual link exists between two data repositories, HP Universal CMDB supports mapping in the following cases only:
  - The UCMDB integration point lies at one end of the link and multiple data repositories lie at the other end. The Cartesian product is calculated for A's data repository (UCMDB) and B's data repositories (UCMDB, d2, d3).



- The same data repositories lie at both ends of the link. The link is an internal link of each data repository and no mapping is required.



- When changes are made in the Modeling Studio and these changes affect the results of a TQL query, federated CIs in the view are not updated. This is because federated TQL queries are calculated ad-hoc only and are not updated when a view is recalculated. To update the federated CIs, select the view in the CI Selector and click the **Refresh CIs Tree** button. (Note that the recalculation may take a long time.) For details, see "[Browse Views Mode](#)" in the *HP Universal CMDB Modeling Guide*.
- You cannot edit the values of attributes that are configured to be retrieved from both an external data repository and UCMDB during federation.

## Limitations on Data Push Integrations

- After modifying a TQL query that is used in a data push job, it is recommended to run a differential synchronization before modifying the TQL and a full synchronization after modifying the TQL. The differential synchronization removes any data that is no longer necessary as a result of the updated query, and the full synchronization creates new baseline data on the target system.
- The Universal CMDB cannot push static attributes.

# Chapter 7

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## Integrating Multiple CMDBs

This chapter includes:

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## Integrating Multiple CMDBs Overview

Multiple CMDBs is a solution that allows setting up a multiple number of CMDBs for delegating the workload and responsibility of the solution to the different CMDBs.

**Note:** Synchronization between multiple CMDBs of different versions can be performed only between UCMDB versions 9.02 or later.

## Configuration Management System (CMS)

The CMS is the central CMDB server and is the authority for configuration management in the multiple CMDBs solution. It is responsible for integrating between the different CMDB server instances and other services in the solution, as well as for generating global IDs. Most of the integrations are defined in the CMS, and other CMDBs or services only access the CMS to access the data from these CMDBs or services.

The CMS allows integration with other services using:

- Population
- Federation
- Data Push

- Data Flow Management Web Service API
- Soap Web Service

## Global ID

The global ID is a unique CI ID (generated by the CMS or another CMDB that has been designated as a global ID generator for that CI type), that identifies that CI across the entire portfolio, making it easier to work in multiple CMDB environments.

The class model contains the **global\_id\_scope** attribute, which is used to specify the scope to which a particular CI type belongs.

In the JMX console, you can specify the scopes for which global IDs will be generated. For details, see "How to Configure Global ID Generation" on page 176.

## Use Cases – Multiple CMDB Deployments: Discovery-CMS Solution

The Discovery-CMS solution enables the division of the workload and Discovery capacity over more than one CMDB.

- Discovery 1 CMDB
- Discovery 2 CMDB
- The central CMDB acting as the CMS

Both Discovery CMDBs are responsible for running different discovery jobs in the domain, and containing all the discovered topology. The CMS populates the node, interface, and IP from both Discovery CMDBs, and federates the node resource CIs (CPU, file system, and printer) from Discovery 1 CMDB. The CMS federates the node resource CIs (OS user, process, and printer) from Discovery 2 CMDB. When a user runs a view that requests these resources on the CMS, they are brought seamlessly using federation.

## Multiple Deployments with Version 9.x/10.x CMDBs

This section includes:

- "Population from UCMD 9.x/10.x (CMS Synchronization)" below
- "Query Support" on next page
- "Global ID Synchronization" on next page
- "Automatic Completion of Reconciliation Data" on page 174

### Population from UCMD 9.x/10.x (CMS Synchronization)

When you use the UCMD 9.x or UCMD 10.x adapter to create an integration point, you are able to synchronize data between different CMDB instances using population. For details on population, see "How to Work with Population Jobs" on page 133.

During population, global IDs are synchronized. For details, see "Global ID Synchronization" on next page below.

## Query Support

Two types of queries are supported for population jobs:

- Live queries—all non-federated TQL queries, when they are used for population with the UCMDDB 9.x/10.x adapter.

Live queries require less bandwidth, and cause less load on the source system. There may be a short delay from the time the change is made until the live query mechanism or the population job receives the change (this may take up to several minutes).

Subgraphs and compound relationships are supported in queries. When using compound relationships, you must select **Show full path between source and target CIs** in the Compound Relationship properties of the query.

- Federated queries—queries that contain at least one federated node or attribute.

When the UCMDDB 9.x/10.x adapter is used, federated queries may also be used for population.

Federated queries are calculated each time the integration is performed; the entire result set is retrieved and filtered by the Probe.

The deletion of CIs is not supported. The aging mechanism must be used, since no information about the deletion of CIs or links is populated. For details, see "[CI Lifecycle and the Aging Mechanism](#)" in the *HP Universal CMDB Administration Guide*.

You can create TQL queries for integration. For details, see "[Topology Query Language](#)" in the *HP Universal CMDB Modeling Guide*.

## Global ID Synchronization

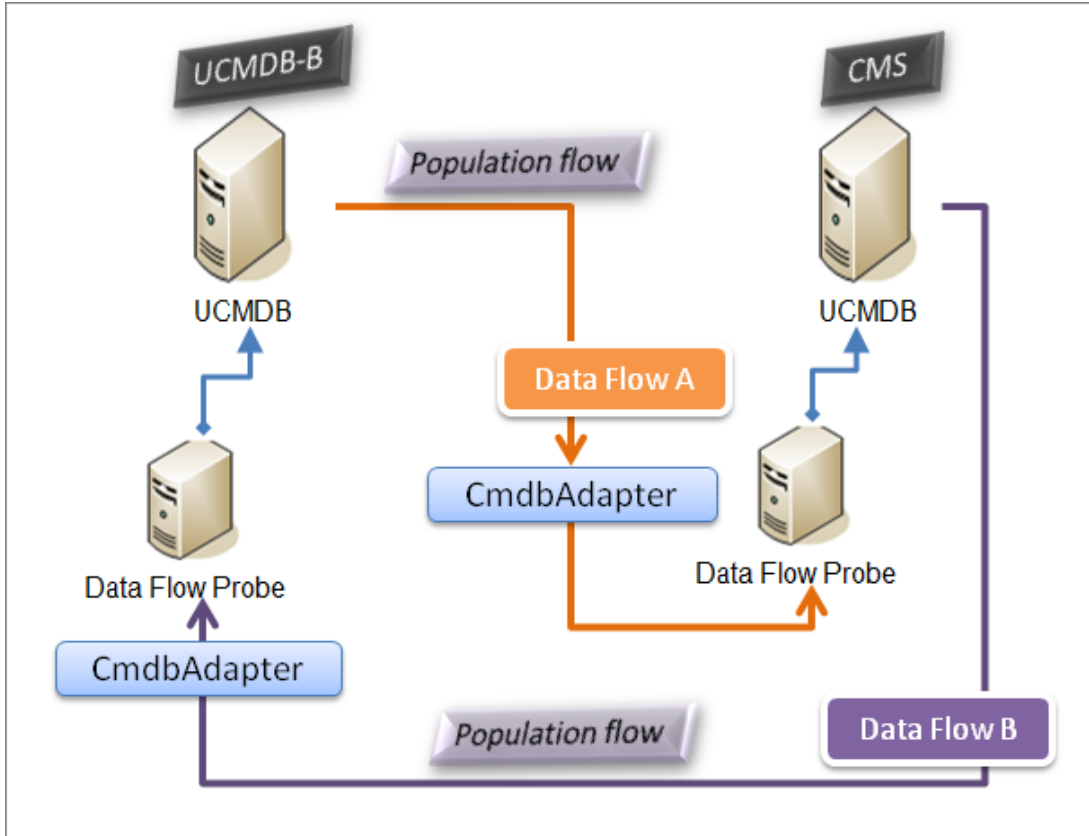
The following examples describe two types of synchronization that can be performed:

- Two-way ID synchronization

Synchronization of data occurs in both directions between two UCMDDB instances.

The CMS uses the population flow to retrieve data from UCMDDB-B, which may be any UCMDDB. UCMDDB-B uses the population flow to populate data from the CMS.

Because synchronization is performed in two directions, global IDs are also updated on UCMDDB-B.



- Pushback of IDs

The CMS uses the population flow to retrieve data from UCMDB-B. CIs are reconciled with the data in the CMS.

The global-ID in the CMS for each CI received is pushed back to UCMDB-B.



- name
- routing\_domain
- Interfaces, with layout
  - mac\_address
  - interface\_name

**Note:**

- The automatic completion feature may actually synchronize many more CIs or links than you intend.
- The automatic completion feature always retrieves the Global ID.
- By default, if data required for the reconciliation of a particular CI cannot be retrieved (for example, if the data is missing in the source), that CI is ignored without causing the entire job to fail. You can change this behavior in the CmdbContextAdapter configuration. For details, see ["Adapter Configuration Tab" on page 96](#).

## Federation in Version 9.x/10.x CMDBs

Federation allows the CMDB to retrieve data in real time (on-the-fly) from any remote data repository, and combine it with CMDB's internal data to show a complete picture of the configuration it manages, including multiple sources. For more information about federation, see ["How to Work with Federated Data" on page 133](#).

Using the UCMDB 9.x/10.x adapter to federate data from different CMDBs, enables the federation of any CIT in the model. This means that only a small portion of data from the remote CMDBs can be populated, and the rest of the data is federated on demand. This ability enables the delegation of the information to multiple CMDBs, with the CMS always showing the most updated data available and at the same time not overloading its capacity.

A CMS populates the Node, Interface, and IP from a Discovery CMDB (a CMDB whose role is to run Discovery), and defines the CPU, File System, OS, User, Printer, and Process CIs as federated from the same source. When a user runs a TQL query or view that has any federated CITs, these specific CIs are brought in real time from the Discovery CMDB. They are therefore as updated as the Discovery CMDB and do not depend on the population schedule to receive updated information. In addition, these CIs only reside on the Discovery CMDB, and do not burden the capacity of the CMS.

The CMDB 9.x/10.x adapter supports the delegation of the federation capabilities, providing the ability to set up a single point for data retrieval (usually the CMS). Any CMDB or service that uses the CMDB's ability to delegate federation uses the CMDB as a virtual black box, and is unaware of whether data comes directly from the CMS or from an external integration.

**Note:** When you set up a federation flow, be careful not to cause an endless loop. For example, do not set up CMDB-X to federate data from CMDB-Y, and at the same time CMDB-Y to federate data from CMDB-X.

## How to Perform Initial Synchronization

This procedure performs a full synchronization of CIs and relations between CMDBs, while retaining the original CMDB IDs. CIs are replicated from the external CMS to the UCMDB. The procedure is generally intended to be performed only once, on a new system.

1. Launch a Web browser that connects to the CMS, and enter the following address:  
**http://<CMS server>:8080/jmx-console.**
2. Click **UCMDB:service=Multiple CMDB Instances Services** to open the JMX MBEAN View page.
3. Click the **fetchAllDataFromAnotherCMDB** method.
4. Enter values as required for the following fields:

**Note:** You must enter information in fields that do not have default values.

- Customer ID
  - Remote user name
  - Remote password
  - Remote host name
  - Remote port **8080**
  - Remote Customer name (default value is **Default Client**)
  - Maximum chunk size
  - CI type to sync (default value is **managed\_object**, causing all CI types to be synchronized)
  - Relation type to sync (the default value is **managed\_relationship**, causing all relation types to be synchronized)
5. Click **Invoke**.

## How to Configure Global ID Generation

1. Launch the Web browser and enter the following address:  
**http://<CMS server>:8080/jmx-console.**
2. Click **UCMDB:service=Multiple CMDB Instances Services** to open the JMX MBEAN View page.
3. Click one of the following methods and enter values as required:
  - **setAsGlobalIdGenerator** - specifies that the CMDB will act as the global ID generator for all locally existing scopes.
  - **setAsGlobalIdGeneratorForScopes** - specifies the scopes for which global IDs will be generated.



- **setAsNonGlobalIdGenerator** - stops the CMDB from acting as the global ID generator for all scopes.

4. Click **Invoke**.

**Note:** If you want to check which scopes are currently set, use the **getGlobalIdGeneratorScopes** method.

## How to Use SSL with the UCMDB 9.x/10.x Adapter

If the remote UCMDB server uses a certificate signed by a known certificate authority, selecting the HTTPS (SSL) value in the **Protocol** field is sufficient.

If not, add the remote UCMDB server certificate to the local UCMDB JVM Trusted Stores as follows:

1. Export the remote UCMDB self-signed certificate by executing the following command (on the remote server machine):

```
c:\hp\UCMDB\UCMDBServer\bin\jre\bin\keytool.exe -exportcert -  
keystore c:\hp\UCMDB\UCMDBServer\conf\security\server.keystore -  
alias hpcert -storepass hppass -file remoteServer.cert
```

2. Copy the certificate to UCMDB at **C:\hp\UCMDB\UCMDBServer\bin\jre\bin** and to the Data Flow Probe at **C:\hp\UCMDB\DataFlowProbe\bin\jre\bin**.
3. Locate the JRE security folder, by default located in **C:\hp\UCMDB\UCMDBServer\bin\jre\lib\security\** and also at **C:\hp\UCMDB\DataFlowProbe\bin\jre\lib\security\**.
4. Back up the **cacerts** file by copying it to another folder.
5. Open a command line window and execute the following commands on the local UCMDB and Data Flow Probe (to import the previously created or copied certificate):

```
cd C:\hp\UCMDB\<UCMDBServer/DataFlowProbe>\bin\jre\bin  
keytool.exe -import -storepass changeit -keystore  
c:\hp\UCMDB\<UCMDBServer/DataFlowProbe>\bin\jre\lib\security\  
cacerts -trustcacerts -file  
C:\hp\UCMDB  
\<UCMDBServer/DataFlowProbe>\bin\jre\bin\remoteServer.cert
```

6. At the command line prompt "Trust this certificate?", enter 'yes'.
7. Restart the UCMDB service and the Data Flow Probe service.

## How to Set Up Integrations Between Multiple CMDBs


The following steps describe how to create integration points and jobs to integrate between multiple CMDBs

- "Define an integration point" below
- "Define a population job" on next page
- "Run the population job " on page 180
- "Select CI types and attributes to be federated" on page 180


**1. Define an integration point**

- Navigate to **Data Flow Management > Integration Studio**.
- Click the **New Integration Point**  button to open the New Integration Point Dialog Box. For details, see "New Integration Point/Edit Integration Point Dialog Box" on page 159.

Enter the following information:

Name (A-Z)	Recommended Value	Description
<b>Adapter</b>	UCMDB 9.x or UCMDB 10.x	The adapter that is used to integrate between multiple CMDBs.
<b>Additional Probe Name</b>	<user defined>	Additional probes over which to run a federation-type integration. Click  to select the additional probes. When the integration runs, if additional Data Flow Probes are defined, the server uses the most available Probe.
<b>Credentials</b>	Remote UCMDB	If you must create a new credential protocol, use the Generic Protocol as a basis. For details, see <i>HP Universal CMDB Discovery and Integration Content Guide</i> .
<b>Customer Name</b>	<user defined>	The name of the remote UCMDB from which you want to retrieve data.
<b>Default Owner Name</b>	<user defined>	The name of the owner tenant that should be assigned to the federated or populated CIs and relationships.  <b>Note:</b> <ul style="list-style-type: none"> <li>○ This field is displayed when creating a federation or population type integration point in a multi-tenancy environment only.</li> <li>○ If no owner tenant is specified, or if the data source is not a multi-tenancy environment, the system owner tenant is assigned by default.</li> </ul>
<b>Hostname/IP</b>	<user defined>	The name or IP address of the remote CMDB machine.

Name (A-Z)	Recommended Value	Description
<b>Integration Description</b>	<user defined>	Free text that describes the integration point.
<b>Integration Name</b>	<user defined>	The name you give to the integration point.
<b>Is Integration Activated</b>	selected	Select this check box to create an active integration point.
<b>Port</b>	8080	The port listened to by the HP UCMDB API.
<b>Probe Name</b>	<user defined>	The name of the probe on which the population jobs are run. If this field is left empty, UCMDB uses IP ranges to attempt to select the correct Probe.
<b>Protocol</b>	HTTP	Selects the protocol to be used for connecting to the remote CMDB. Valid values are: <ul style="list-style-type: none"> <li>○ HTTP</li> <li>○ HTTPS (SSL)</li> </ul>
<b>Push Back Ids</b>	<user defined>	Specifies whether to push back the global IDs after CIs are populated into UCMDB.
<b>State</b>	<user defined>	The state with which you want to connect when integrating with multi-state CMDBs. <ul style="list-style-type: none"> <li>○ Actual</li> <li>○ Authorized</li> <li>○ Leave this field empty for a single-state UCMDB (default).</li> </ul>
<b>Web application Root Context</b>	<user defined>	The root context value of the remote CMDB. If no root context is defined on the remote CMDB, leave this field empty.

- c. Click **Save** .
- d. Click **Test Connection** to ensure that the integration point has been successfully created, and then click **OK**.

## 2. Define a population job


An out-of-the-box integration point already contains population jobs. This step is relevant only when creating additional population jobs.

Select the **Population** tab to define a population job that uses the integration point you defined above. For details, see ["New Integration Job/Edit Integration Job Dialog Box"](#) on page 156.

**Note:**

- When integrating between multiple CMDBs, population queries must be set up for the source CMDB.
- Select the **Allow Delete** check box if you want your population job to allow deletion of CIs and links from the source CMDB.
- By default, infrastructure CIs and containment relationships are deleted. All other CIs and relationships are retained.

3. **Run the population job**

Click the **Run Changes Sync**  button to make sure that the integration has been successfully configured.

4. **Select CI types and attributes to be federated**

- a. Navigate to **Data Flow Management > Integration Studio**.
- b. Click the **Federation** tab.
- c. Select the CI types you want to federate from the source CMDB.

If desired, you can select only attributes to be federated. For details, see ["Federation Tab"](#) on page 146.

- d. Click **Save Integration** .

## Multiple CMDB Integration Troubleshooting and Limitations

### Troubleshooting

When performing troubleshooting, be sure to check both CMDB server and Probe logs.

- CMDB server logs
  - fcldb.log
  - fcldb.adapters.log
  - error.log
  - cmdb.reconciliation.log (for population jobs)
- Probe logs
  - wrapperProbeGw.log
  - fcldb.log

- fcldb.adapters.log
- probe-infra.log

Following are some problems that you may encounter and their solutions.

- **Problem.** TQL query not active/persistent error message.  
The Query settings have been changed manually.  
**Solution.** Run full population to reactivate/persist the query.
- **Problem.** The number of CIs that is populated is much larger than the requested amount.  
**Solution.** Since the automatic completion feature for reconciliation is turned on by default, it may populate the CMDB with additional CIs or links, in order to contain sufficient information to insert the CIs into the CMDB.
- **Problem.** Changes are not populated immediately after a job is run.  
Changes may take a few minutes to be detected by the live mechanism.  
**Solution.** Wait a few minutes for changes to be populated by your next population job.
- **Problem.** CIs are not populated into the CMDB.  
Changes may take a few minutes to be detected by the live mechanism.  
**Solution.** Wait a few minutes for changes to be populated by your next population job.  
Check the CMDB reconciliation logs for more information.
- **Problem.** Deletions are not populated.  
**Solution:**
  - Make sure that you have selected the **Allow Delete** check box in the population job properties.
  - Check the query you are running. Deletes are not supported on federated queries, and the aging mechanism must be used.
- **Problem.** Queries that contain compound relationships fail.  
**Solution.** Select **Show full path between source and target CIs** in the query's Compound Relationship properties.
- **Problem.** Authentication fails.  
**Solution.** Since the UCMDB 9.x /10.x adapter uses the UCMDB API for connection, set up an integration user to ensure that you provide proper credentials. For details, see [Create an Integration User](#) in the *HP Universal CMDB Developer Reference Guide*.
- **Problem.** TQL query not active/persistent error message.  
The Query settings have been changed manually.  
**Solution.** Run full population to reactivate/persist the query.
- **Problem.** The number of CIs that is populated is much larger than the requested amount.

**Solution.** Since the automatic completion feature for reconciliation is turned on by default, it may populate the CMDB with additional CIs or links, in order to contain sufficient information to insert the CIs into the CMDB.

- **Problem.** Changes are not populated immediately after a job is run.

Changes may take a few minutes to be detected by the live mechanism.

**Solution.** Wait a few minutes for changes to be populated by your next population job.

- **Problem.** CIs are not populated into the CMDB.

Changes may take a few minutes to be detected by the live mechanism.

**Solution.** Wait a few minutes for changes to be populated by your next population job.

Check the CMDB reconciliation logs for more information.

- **Problem.** Deletions are not populated.

**Solution:**

- Make sure that you have selected the **Allow Delete** check box in the population job properties.
- Check the query you are running. Deletes are not supported on federated queries, and the aging mechanism must be used.

- **Problem.** Queries that contain compound relationships fail.

**Solution.** Select **Show full path between source and target CIs** in the query's Compound Relationship properties.

- **Problem.** Authentication fails.

**Solution.** Since the UCMDB 9.x/10.x adapter uses the UCMDB API for connection, set up an integration user to ensure that you provide proper credentials. For details, see [Create an Integration User](#) in the *HP Universal CMDB Developer Reference Guide*.

## Limitations

- If the TQL query for a population job (defined on the source) includes CI types or links that do not exist on the target, or links that are not valid, those types or links are ignored in the target data repository.
- Since the UCMDB 9.x/10.x adapter works with the "changes" population engine, if a population flow retrieves federated data, no removals are made in the CMDB, since the federation brings only added or updated data.

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# Discovery

# Chapter 8

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## Universal Discovery

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## Universal Discovery Overview

Universal Discovery enables you to activate discovery of components that make up your system. You can discover Zones in your environment by running discovery activities in those Zones. Alternatively, you can set up and run individual discovery jobs on any Node in your environment:

### Zone-Based Discovery

Zone-based discovery enables you to:

- Limit the scope of a discovery activity to a sub-set (zone) of the entire network
- Run multiple instances of the same discovery activity on different zones in the network



- Configure each discovery activity instance with different settings (parameters, scheduling)
- Diagnose discovery problems (using the Discovery Troubleshooter)

#### Definitions

- **Management Zone.** A Management Zone is a region in the network defined by a collection of IP ranges. A region of an organization's infrastructure should be defined as a Management-Zone when you want to discover all the managed objects of the region using the same scheduling policy and parameters.
- **Discovery Activity.** You configure a Discovery activities to perform discovery inside a specific Management Zone. The activities discover infrastructure (IPs, nodes), basic software (shallow running software including application servers, databases, and web servers), deep database configuration, and inventory ( for example, CPUs, installed software, logical volumes), among other information. A Discovery activity includes:
  - Discovery parameters that are specific to the type of the Discovery activity
  - A scheduling policy

For more information on Discovery activities and instructions on how to activate them, see the *HP Universal CMDB Discovery and Integration Content Guide*.

#### Example: How to Define Management Zones

Organization-X has two data-centers: DC-A and DC-B. Each data center is owned/managed by a different administration group: Admin-Group-A and Admin-Group-B. Each administration group would like to run its own "instance" of a Discovery activity within its data center. On DC-A, you want to discover all machines operating on Windows once every week using the same discovery parameters. Therefore, DC-A should be defined as a Management Zone. On DC-B, you want to discover all the J2EE servers once every day using the same discovery parameters. DC-B should also be defined as a Management Zone.

For details on the Zone-Based Discovery tab, see "[Zone-Based Discovery Tab](#)" on page 246.

For details on creating a Management Zone, see "[New/Edit Management Zone Dialog Box](#)" on page 236.

For details on the Discovery Troubleshooter, see "[Discovery Troubleshooter](#)" on page 187.

#### Discovery Modules/Jobs-Based Discovery

Enables you to customize discovery by making changes to an out-of-the-box discovery job or building your own discovery jobs.

For details, see "[Module/Job-Based Discovery Workflow](#)" on page 190.

For details about the jobs and how they are organized in modules, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## Agent-Based vs Agentless Discovery

### Agent-Based Discovery

To collect inventory information, you can deploy Universal Discovery agents on client or server machines. The UD agent provides a secured communication channel between the Data Flow Probe

and the Nodes being discovered. After setting up the secure communication channel, Universal Discovery deploys and activates scanners onto the Nodes being discovered. The Scanners scan the Nodes for inventory information and store the scanned results in scan files which are downloaded to the Data Flow Probe through the secured communication channel established with the UD agent.

When the UD agent is installed, collection of software utilization information is enabled. The UD Agent also enables you to benefit from the Call Home feature. Call Home is useful in the case where a Node was unavailable for scanning for a long period. It enables the UD agent to notify the Data Flow Probe that the Node is currently available for scanning.

### **Agentless Discovery**

Although agentless discovery does not require the installation of dedicated agents on the servers that are to be discovered, it does depend on native OS or standard agents that are already installed such as SNMP, WMI, TELNET, SSH, NETBIOS, and others. Other discovery capabilities are based on application-specific protocols such as SQL, JMX, SAP, Siebel, and so on. For details on supported protocols, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## **Inventory Discovery**

Universal Discovery determines which devices are in your network and gathers basic information about each of them. This process allows you to get a good overview of the number and types of devices in your network, as well as a basic set of attributes for each. It also serves as the foundation for the other modules of discovery.

Discovery can be based on Management Zones. Universal Discovery can use a variety of methods to discover devices, and provides out-of-the-box discovery activity wizards that allow you to choose the appropriate settings for your different Management Zones. For example, UNIX servers in the Data Center may have different requirements for discovery than laptops in the Finance group.

After discovering a device, Universal Discovery runs a Scanner on the device to gather detailed hardware, configuration and software license information. This process is referred to as Inventory Discovery and makes it possible to drive standardization and compliance initiatives, manage risk, implement chargeback policies, and so on.

The Scanners can be launched automatically according to a configurable schedule, allowing complete control over network bandwidth usage and any impact on the end-user.

To automatically manage the Scanners, the Universal Discovery (UD) Agent needs to be in place. This is a small component deployed on the discovered device that enables secure communication with the Data Flow Probe. The UD Agent can be automatically deployed to Windows machines in your network, and must be manually deployed to UNIX machines. Once this is done, Universal Discovery can automatically upgrade the Scanners and agents when necessary.

Universal Discovery includes Agents and Scanners for most common desktop and server operating systems.

The Scanner can also be installed manually. This is known as agentless inventory discovery.

Universal Discovery can also gather information about what software is used on the machines on your network. This is referred to as Software Utilization and the information collected is necessary to optimize software license cost, for example by eliminating unused or under-utilized software installations.

For details on setting up the Inventory discovery and other activities, see the *HP Universal CMDB Discovery and Integration Content Guide*.

## Just-In-Time Discovery

Universal Discovery integrates with RUM to provide real time, passive discovery and monitoring of topology changes in a given environment. This is known as the Just-In-Time (JIT) discovery mechanism.

One or more RUM Engines can be configured to interact with Universal Discovery's Data Flow Probes. The RUM Engine gathers information from RUM Probes in its network, and passes relevant information on to the Data Flow Probes. From the Universal Discovery perspective, the RUM Engines behave as passive discovery probes, where the Data Flow Probes are the active probes.

The passive probes also send notifications about discovered information to the Data Flow Probes. Notifications can include, for example, changes in environment topology, such as an unseen IP address, or software that is not running. You configure these notifications in Universal Discovery. Based on these notifications, the Data Flow Probes report, add, or remove relevant CIs to or from the UCMDB Server, or designate them as candidates for deletion.

For details about setting up the passive discovery probes and running JIT Discovery, see "[How to Configure Just-In-Time Discovery](#)" on page 193.

## Discovery Troubleshooter

It is possible that after running discovery, you will not find a particular CI in the discovery results. There are various types of errors that can occur that would cause this to happen. The Discovery Troubleshooter allows you to search for the missing CI, and even if you are unable to locate the missing CI, the Discovery Troubleshooter also detects and lists errors that occurred during the discovery process. By attempting to solve these errors, this can lead you to the missing CI.

Currently the Discovery Troubleshooter allows you to locate missing Running Software CIs. When invoking the Discovery Troubleshooter, you are requested to enter the IP of the target host you are looking for and choose a detection method before searching for the missing running software CI. If the Discovery Troubleshooter does not initially succeed in connecting to the target host, it allows you to rerun discovery with a different detection method. If the Discovery Troubleshooter does succeed in connecting to the target host, it lists all the running software currently connected to the detected Node CI. If the CI you are looking for is not in the list, the Discovery Troubleshooter lets you update available application signatures, which may provide a more extensive list of all running software connected to the detected Node CI and enable you to find the missing CI.

**Note:** The Discovery Troubleshooter can be run on a Management Zone only after the Infrastructure and Basic Software Configuration discovery activities have been run on that Management Zone.

**See also:** "[Discovery Troubleshooter Wizard](#)" on page 229

## Viewing Permissions While Running Jobs

During a job run, you often need to know which credentials are being used to connect to a component in the system. You also often need to know the effect of a run on network performance, for example, whether the job should be run at night instead of during the day. View Permissions enables you to view the objects and parameters of a job's Jython script commands, as can be seen in the following image:

Permission	Operation	Usage Description	Objects and Parameters
shellprotocol	exec	Basic login	uname ver
shellprotocol	exec	CPU Info	AIX: lsattr   grep "proc" AIX: prtconf   grep "proc" FreeBSD: dmesg   grep "cpu Multiprocessor" FreeBSD: dmesg   grep -A 1 "CPU:" FreeBSD: sysctl hw.model hw.ncpu hw.clockrate HPUX: model Linux: cat /proc/cpuinfo SunOS: /usr/sbin/psrinfo -v SunOS: prtconf Windows: reg query HKEY_LOCAL_MACHINE\HARDWARE\DESCRIP...

**Note:** The information you define here is not dynamic, that is, if an adapter is changed, the information in this dialog box is not updated.

For details, see "[Discovery Permissions Window](#)" on page 226.

### Example of Using the Discovery Permissions Window:

You are running the **Host Connection by Shell** job to discover a host running on a UNIX system. An error message in the Discovery Status pane shows that DFM could not access a host through SSH because permission was denied. You display the Discovery Permissions window and see that the command to access the host requires a user with a certain level of permissions. You check the SSH Protocol window and discover that the user defined there does not have that level of permissions.

To resolve the problem, change the user in the SSH protocol or update the permissions for the existing user in the external system.

## Managing Problems With Error Reporting

During discovery, many errors may be uncovered, for example, connection failures, hardware problems, exceptions, time-outs, and so on. You can drill down from the Trigger CI that caused the problem to view the error message itself.

DFM differentiates between errors that can be ignored (for example, an unreachable host) and errors that must be dealt with (for example, credential problems or missing configuration or DLL files). Moreover, DFM reports errors once, even if the same error occurs on successive runs, and reports an error even if it occurs once only.

For details on severity levels, see "[Error Severity Levels](#)" in the *HP Universal CMDB Developer Reference Guide*.

## Error Table in Database

All DFM errors are saved to the **discovery\_problems** table in the Probe Manager database schema. (The error information is saved to the database—and is not handled in the Probe's memory—to guarantee delivery to the server.) The Probe holds the latest list of problems for each Trigger CI. After each run, the Probe checks for changes and reports them in the Discovery Status pane. For details, see "Discovery Module/Jobs - Details Tab" on page 214.

## Permissions Document

You can view a list of DFM jobs together with the protocols and permissions needed to access the job components. For example, you can view information about what is needed to execute a basic login when running the **Host Resources by Shell** job.

To view the list, access this file: **http://<UCMDB Server>:8080/ucmdb-ui/docs/permissions.jsp**.

The list is organized by module and consists of the following information:

- Module
- Job
- Protocol
- Operation, usage description, objects and parameters

### Example of Permissions Document Contents

**Database - Oracle.** The module name.

**Oracle RAC Topology by Shell.** The job name.

**Discovers Oracle RAC Topology by Shell.** The job description. This section is omitted if no description is defined in the application.

**Protocol: Shell.** The protocol name: SQL, Shell, WMI, SNMP, and so on. For a full list of supported protocols, see the *HP Universal CMDB Discovery and Integration Content Guide*.

Operation	Usage Description	Objects and Parameters
file read	Parsing of listener and tnsnames configuration files	cat \$ORACLE_HOME\network\listener.ora  cat \$ORACLE_HOME\network\admin\tnsnames.ora

## Zone-Based Discovery Workflow

This workflow describes how to run discovery over a Management Zone.


This workflow includes the following steps:

- ["Prerequisites" below](#)
- ["Create a Management Zone" below](#)
- ["Set up and run Discovery activities" below](#)
- ["Run the Discovery Troubleshooter - Optional" below](#)

#### 1. Prerequisites

Verify that the Data Flow Probe is installed.

#### 2. Create a Management Zone

- In Data Flow Management, go to **Discovery Control Panel > Zone-Based Discovery tab**, and click the **New**  button .
- In the New Management Zone dialog box that opens:
  - Enter a name for the Management Zone. **This field is mandatory.**
  - Select a method for defining IP ranges for the Management Zone. You can use full Data Flow Probe ranges or define partial IP ranges for the Management Zone. By default, **Use full probe ranges** is selected. For more information on the differences between these two options and on the user interface, see ["New/Edit Management Zone Dialog Box" on page 236](#).

#### 3. Set up and run Discovery activities

- In the list of Management Zones in the **Zone-Based Discovery tab**, select the zone in which you want to create and run the discovery activity.
- Right-click the zone and select **New Discovery Activity**.
- Select the type of discovery activity that you want to set up and run.
- Continue with the wizard for setting up and running the discovery activity. For more information about setting up and running discovery activities, see *HP Universal CMDB Discovery and Integration Content Guide*.

#### 4. Run the Discovery Troubleshooter - Optional

If you do not find a particular CI in the discovery results, run the Discovery Troubleshooter to search for the missing CI. For more information about running the Discovery Troubleshooter, see ["Discovery Troubleshooter Wizard" on page 229](#)

**Note:** The Discovery Troubleshooter can be run in a Management Zone only after the Infrastructure and Basic Software Configuration Discovery Activities have run in that zone.

## Module/Job-Based Discovery Workflow

This task describes how to begin mapping your system and its components. You would use this workflow to customize the components of a module.

**Note:** For details about running Zone-based discovery, see ["Zone-Based Discovery Workflow"](#)

[on previous page.](#)

This task includes the following steps:

- ["Prerequisites" below](#)
- ["Determine the network range" below](#)
- ["Set the relevant credentials" below](#)
- ["Activate the relevant jobs" below](#)
- ["Make changes to relevant adapters" on next page](#)
- ["Monitor the discovery process" on next page](#)
- ["View Result Statistics" on page 193](#)
- ["Troubleshoot the Results" on page 193](#)

#### 1. Prerequisites

- a. Verify that the Data Flow Probe is installed on a Windows machine.

**Note:** The Data Flow Probe installed on a Linux platform is intended only for integrations, and not for discovery

- b. Verify that the relevant packages are deployed.

If you need to deploy discovery packages, see [Deploy a Package](#) in the *HP Universal CMDB Administration Guide*.

#### 2. Determine the network range

Define the range of the network to be discovered. For details, see ["New/Edit IP Range Dialog Box" on page 35](#).

**Note:** Adapters try to connect to every IP address in a range. Therefore, if a range is wide, network performance may be affected.

#### 3. Set the relevant credentials

To enable the Data Flow Probes to connect to servers or applications using specific protocols, you must set the relevant credentials (for example, UD, NTCMD, SNMP, TTY, or WMI). For details on protocol parameters, see the *HP Universal CMDB Discovery and Integration Content Guide*.

**Note:** The Data Flow Probe tries to connect to a node by using each credential in turn. Universal Discovery then saves the successful credential. The next time the Data Flow Probe connects to this node, it first tries to connect using the successful credential.

#### 4. Activate the relevant jobs

Once you have defined the network range and set credentials, you can run discovery on specific jobs. For details on running specific jobs, see *HP Universal CMDB Discovery and Integration Content Guide*.

**Tip:**

- You can view a full description of a selected job in the **Properties tab > Description pane**.
- You can search for all jobs that discover a particular connection type.

For example, to search for all jobs that discover SNMP connections:

In the **Discovery Control Panel > Discovery Modules/Jobs tab**, click the **Search for Discovery Job**  button. In the Find Jobs dialog box, enter **SNMP** in the **Name** box and click **Find All**. For details, see "[Find Jobs Dialog Box](#)" on page 235.

## 5. Make changes to relevant adapters

You can customize adapters to discover infrequent system components. For details on adapter writing, see [Adapter Development and Writing](#) in the *HP Universal CMDB Developer Reference Guide*.

**Caution:** Do not make changes to default adapters without consulting HP Software Support.

## 6. Monitor the discovery process

For details on monitoring the CIs that are discovered by the run, see "[Statistics Results Pane](#)" on page 220.

### a. Define a query

You create a query that retrieves information about CIs and CITs from the CMDB. For details, see [Define a TQL Query](#) in the *HP Universal CMDB Modeling Guide*.

If necessary you can trigger queries to manually discover objects. For details, see "[Trigger Queries Pane](#)" on page 240.

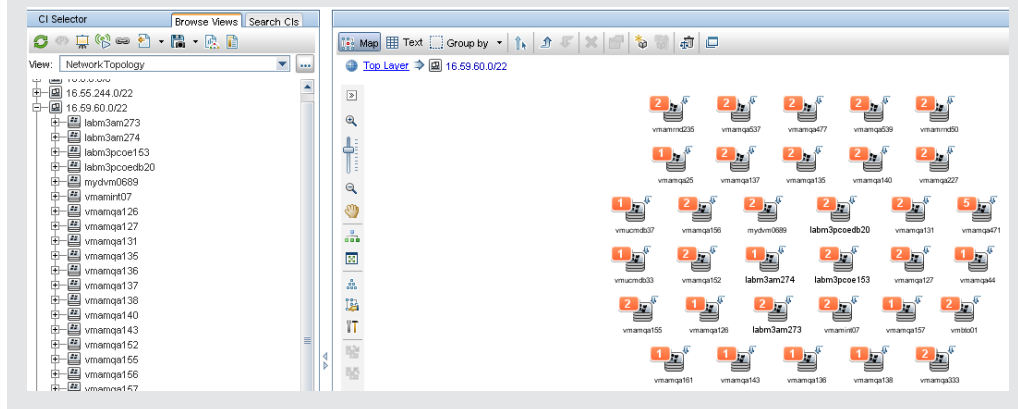
### b. Build a view for each query

A view enables you to build a subset of the overall IT universe model, containing only those CIs in the CMDB that relate to a specific discovery. For details, see [Pattern View Editor](#) in the *HP Universal CMDB Modeling Guide*.

**Example – Creating a View to Display Discovered CI Instances:**



To view the number of instances found by during discovery, select **Modeling > IT Universe Manager**, and display the view you created, as seen in the following illustration:



## 7. View Result Statistics

You can display overall statistics for a job or you can filter the results by time range or by Data Flow Probe. Each time you log in to UCMDB and access the Discovery Control Panel, the statistical data is updated so that the data displayed is the latest for the selected module or job.

For details on working with the statistical data, see ["Statistics Results Pane"](#) on page 220.

You can also view discovered CIs from the Data Flow Probe Status Window. For details, see ["Data Flow Probe Status Window"](#) on page 72.

## 8. Troubleshoot the Results

You can check discovery results to see which errors are being reported. For details, see the ["Discovery Status Pane"](#) on page 216.

# How to Configure Just-In-Time Discovery

This task describes how to set up Just-in-Time discovery to provide passive, real-time discovery and monitoring of traffic in a given environment.

To learn more about Just-In-Time discovery, see ["Just-In-Time Discovery"](#) on page 187.

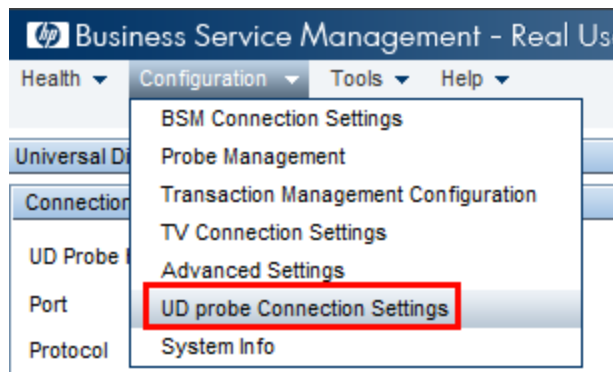
### 1. Prerequisites

HP Real User Monitor (HP RUM) version 9.20 or later must be installed on a separate server, and must be running and configured to integrate with a Data Flow Probe.

**Note:** The HP RUM Installation can be downloaded from the [HP Software Support Online Portal](http://support.openview.hp.com/selfsolve/patches) (<http://support.openview.hp.com/selfsolve/patches>). Search for **Application Performance Management (BAC) > BAC Real User Monitor**


To configure HP RUM to integrate with a Data Flow Probe:

- a. In HP RUM, select **Configuration > UD Probe Connection Settings**.



- b. Enter the host name of the Data Flow Probe to which the RUM Engine is to report, and port through which it is to send data to the Data Flow Probe.
- c. Select a connection protocol.
- d. Leave Authentication, Proxy, and SSL settings empty.
- e. Save your configuration.

## 2. Configure passive discovery probe notifications and removal verification policy

- a. In **Data Flow Management > Data Flow Probe Setup >**, select the domain where the passive discovery probe (RUM Engine) resides.
- b. In the Domains and Probes pane, click **Passive Discovery Probes**.
- c. In the **Passive Discovery Probes Pane** configure the passive probe notification options and removal verification policy. For details see "[Passive Discovery Probes Pane](#)" on page 52.
- d. In the **Domains and Probes** pane select the passive discovery probe that you want to configure
- e. In the **Passive Discovery Probe details > Passive Discovery Integrated Ranges** pane, configure the IP ranges over which the passive discovery probe should perform discovery, and the ports it should monitor. For details, see "[Passive Discovery Probe Details Pane](#)" on page 49.
- f. Ensure that the passive probe status is **Connected**, If it is suspended, click the **Resume Probe**  button in the Domains and Probes pane toolbar.

## 3. Activate passive Just-in-Time discovery


- a. Go to the **Discovery Control Panel > Discovery Modules/Jobs** tab.
- b. Under **Network Infrastructure > JIT Discovery** select **JIT Passive Discovery**.
- c. Click the **Activate Selected Discovery Jobs**  button. When the passive probes are activated, they download configuration (ranges and notifications) and start to report

notifications to the Data Flow Probe.



## How to Manually Activate Modules/Jobs/CIs

You can manually activate modules/jobs/CIs in the Discovery Modules/Jobs tab.

**To manually activate a module/job:**

- In the Discovery Modules pane, select the module/job, and click **Activate** .

**To manually activate a CI :**

- Select the job with the CI you want to activate manually.
- Disable the Data Flow Probes for the job: In the job's **Properties** tab > **Trigger Queries** pane, select the query, and in the Probe Limit column, click the  button and ensure that no Probes are selected.
- Manually activate CIs: In the **Details** tab, in the **Discovery Status** pane, click the **Add CI**  button and manually add CIs.

The job runs using only the redispached CIs. For details, see "Discovery Modules Pane" on page 222.

## How to View Job Information on the Data Flow Probe

This task describes how to invoke job information (for example, job threads and Trigger CIs) saved to the Data Flow Probe's MySql database. You work with the JMX console.

This task includes the following steps:

### 1. Access the MBean operations

Use the following procedure to access the JMX console on the Data Flow Probe and to invoke the JMX operations.

- a. Launch the Web browser and enter the following address:

**http://<machine name or IP address>.<domain\_name>:1977/**

where **<machine name or IP address>** is the machine on which the Data Flow Probe is installed. You may have to log in with the user name and password.

- b. Click the **Local\_<machine name or IP address> > type=JobsInformation** link.

### 2. Locate the operation to invoke

In the MBean View page, locate the operation. For details, see "Discovery Job Operation Commands" on page 197 and "Job Operation Parameters" on page 203.

### 3. Run the operation

Click the button to run the operation. A message is displayed with the results of the operation run.

<b>Reload</b>	The number of seconds between automatic reloads of the JMX interface.  <b>0:</b> The interface is never reloaded.  Click the <b>Reload</b> button to manually reload the current page (if more operations have been added or removed).
<b>Unregister</b>	Do not touch (the view becomes inaccessible to the application that is running).

## How to Manage Discovery Errors

This task describes how to investigate problems that arise during a discovery run.

**Note:** For details about severity levels and so on, see ["Managing Problems With Error Reporting"](#) on page 188.

This task includes the following steps:

- ["Prerequisites"](#) below
- ["Run the discovery job"](#) below
- ["Locate the problem CI"](#) below
- ["Troubleshoot the problem"](#) below

### 1. Prerequisites

Set up DFM. For details, see ["Data Flow Management Setup"](#) on page 22

### 2. Run the discovery job

You can view error messages for one job, one module, or all modules. For details on running a job, see ["Module/Job-Based Discovery Workflow"](#) on page 190.

### 3. Locate the problem CI

Use the Discovery Status pane to drill down to the error messages. For details, see ["Discovery Status Pane"](#) on page 216.

#### Example:

DFM displays the error message:

```
<< Progress message, Severity: Fatal>>
Probe DefaultProbe is missing at least one of the discovery pattern's required protocols for job:
DB2 Connection by SQL
```

OK

### 4. Troubleshoot the problem

- For Fatal errors, you should contact HP Software Support.

- For other errors, check the CIs. For example, a Trigger CI that does not fall within the Probe's range may show an error.
- For details on setting communication logs, see "Execution Options Pane" on page 96.
- For details on managing problems, see "Managing Problems With Error Reporting" on page 188.

## How to Find Discovery Errors

This task describes how to investigate problems that arise during discovery.

**Note:** For details about severity levels and so on, see "Managing Problems With Error Reporting" on page 188.

This task includes the following steps:

- "Prerequisites" below
- "Select the Module/Job" below
- "Locate the Problem CI" below

### 1. Prerequisites

Set up DFM. For details, see "Data Flow Management Setup" on page 22.

### 2. Select the Module/Job

You can view error messages for one job, one module, or all modules. For details on running a job, see "Module/Job-Based Discovery Workflow" on page 190.

### 3. Locate the Problem CI

Use the Discovery Status pane to drill down to the error messages. For details, see "Discovery Status Pane" on page 216.

#### Example of an error message:

```
<< Progress message, Severity: Fatal>>  
Probe DefaultProbe is missing at least one of the discovery pattern's required protocols for job:  
DB2 Connection by SQL
```

OK

## Discovery Job Operation Commands

For details on viewing job information, see "How to View Job Information on the Data Flow Probe" on page 195.

### activateJob

Enter the name of a job and click the button to activate the job immediately. This operation returns a

message, for example, **<job name> was triggered.**

**Note:** The following message is displayed if the job has not been activated and there is no information about the job in the Probe's database:

**Job '<job name>' does not exist in the Jobs Execution table (job was not activated!).**

### **activateJobOnDestination**

Enter the name of a job and a Trigger CI and click the button to activate the job immediately on a specific Trigger CI. This operation returns a message, for example, **The operation returned with the value: Job <job name> was triggered on destination <CI name>.**

**Note:** Both the **JobID** and **triggerCI** fields are mandatory.

### **start/stop**

These operations start and stop the **JobsInformation** service. Do not use these operations; instead, restart the Probe itself.

### **viewJobErrorsSummary**

Enter the name of a job to return a list of error messages reported on this job, together with the error severity, the last time that the error was reported, and the number of Trigger CIs that have the error.

For details on the job operation parameters, see "[Job Operation Parameters](#)" on page 203.

Click the entry in the **Number of Trigger CIs** column to view a list of one job's Trigger CIs with errors in the [viewJobTriggeredCIsWithErrorId](#) page (see below).

### **viewJobExecHistory**

Enter the name of a job to retrieve a history of job invocations. A message is displayed showing the job invocations (the last invocation is shown first).

For details on the job operation parameters, see "[Job Operation Parameters](#)" on page 203.

For each invocation the number of Triggered CIs and the total running time is shown. The Execution Details column shows at which times the job was executed. If the Probe shut down in the middle of a job execution and then resumed running or if there were blackout periods during the job execution, several time ranges are shown.

### **viewJobProblems**

Enter the name of a job or the name of a Trigger CI to retrieve a list of Trigger CIs that have problems.

**Note:** You must fill in at least one of the fields.

For details on the job operation parameters, see "[Job Operation Parameters](#)" on page 203.

### **viewJobResultCiInstances**

Fill in one or more of the parameters to return a list of CIs that have been discovered by a job.

For details on the job operation parameters, see "[Job Operation Parameters](#)" on page 203.

The Object State Holder column displays the code for the CI or relationship defined in the CMDB. For details on creating object state holders for common CITs, see **modeling.py** in "Jython Libraries and Utilities" in the *HP Universal CMDB Developer Reference Guide*. For details on the **appilog.common.system.typesClass ObjectStateHolder** method, see the **ObjectStateHolder** method in the online API documentation.

### viewJobResults

Fill in one or more of the parameters to return a list of CIs that have been discovered by a job.

For details on the job operation parameters, see "Job Operation Parameters" on page 203.

When **Hide Touched CIs Info** is set to **True**, the results page displays the following information:

Column	Description
<b>Job Name</b>	Displayed if the <b>jobID</b> field is left empty.  The job name as it appears in Data Flow Management.  Click a job to go to its <a href="#">viewJobStatus</a> page, to view its status and scheduling information.
<b>CI Type</b>	Click to filter the list to show results for one CIT only.
<b>Total CIs</b>	Click to go to the <a href="#">viewJobResultCiInstances</a> page, to view a list of all CIs that have been discovered by a job.
<b>Triggered CIs</b>	Click to go to the <a href="#">viewJobTriggeredCIs</a> page, to view a list of all Trigger CIs that have been discovered by a job.
<b>Last Discover Time</b>	The date and time that the job was invoked.

When **Hide Touched CIs Info** is set to **False**, the results page displays the following information:

Column	Description
<b>Job Name</b>	Displayed if the <b>jobID</b> field is left empty.  The job name as it appears in Data Flow Management.  Click a job to go to its <a href="#">viewJobStatus</a> page, to view its status and scheduling information.
<b>CI Type</b>	Click to filter the list to show results for one CIT only.
<b>Touched CIs</b>	Click to go to the <a href="#">viewJobResultCiInstances</a> page, to view a list of those CIs discovered by the job that are <b>Touched CIs</b> . For details, see "Job Operation Parameters" on page 203.
<b>Non Touched CIs</b>	Click to go to the <a href="#">viewJobResultCiInstances</a> page, to view a list of those CIs discovered by the job that are not Touched CIs.

Column	Description
<b>Triggered CIs for Touched CIs</b>	Click to go to the <a href="#">viewJobTriggeredCIs</a> page, to view a list of those Trigger CIs included in a job that are Touched CIs.
<b>Triggered CIs for Non Touched CIs</b>	Click to go to the <a href="#">viewJobTriggeredCIs</a> page, to view a list of those Trigger CIs included in the job that are not Touched CIs.
<b>Last Discover Time</b>	The date and time that the job was invoked.

You can further filter results in the results page by entering text filters in one of the fields, and clicking the **Search** button.

### viewJobsStatuses

Click the **viewJobsStatuses** button to return status and scheduling information for all jobs. You can choose to filter the results. For details, see "[Job Operation Parameters](#)" on page 203.

**Note:** This page is saved under `\DataFlowProbe\runtime\jobsStatuses` once a day.

The results page displays the following information:

Column	Description
<b>No.</b>	The number of the job in the list.
<b>Job Name</b>	The job name as it appears in Data Flow Management. Click a job to go to its <a href="#">viewJobStatus</a> page, to view its status and scheduling information.
<b>Status</b>	The severity of the job's status, as calculated by the Probe. <ul style="list-style-type: none"> <li>• <b>Blocked.</b> Not in use.</li> <li>• <b>Removed.</b> The job is no longer active.</li> <li>• <b>Running.</b> The job is currently running.</li> <li>• <b>Scheduled.</b> The job is scheduled to run. For details on scheduling jobs, see "<a href="#">Discovery Scheduler Dialog Box</a>" on page 227.</li> </ul> A red background signifies that a thread has run longer than expected and may be stuck. A green background signifies that the job is running as expected.
<b>Errors</b>	The number of errors for a specific job. Click to go to the <a href="#">viewJobErrorsSummary</a> page, to view a list of error messages reported on this job.
<b>Triggered CIs</b>	The Trigger CIs that have been run by the job. Click to go to the <a href="#">viewJobTriggeredCIs</a> page.
<b>Last</b>	The date and time that the job was last run.



Column	Description
<b>Invocation</b>	
<b>Next Invocation</b>	The date and time that the job is next scheduled to run.
<b>Last Total run duration (seconds)</b>	The total time that it took for the job to run in the last invocation. Compare this result with the average time taken for a job to run. The discrepancy is probably due to periods of time when a job waits for another job to finish.
<b>Avg run duration (seconds)</b>	The average time that the job ran, calculated from all previous invocations.
<b>Recurrence</b>	The number of times that the job was invoked. Click to go to the <a href="#">viewJobExecHistory</a> page, to retrieve a history of job invocations.
<b>Results</b>	The number of CITs that have been discovered by the job. Click to go to the <a href="#">viewJobResults</a> page to view the CITs.

### viewJobStatus

Enter the name of a job to return its status and scheduling information.

For details on the job operation parameters, see "[Job Operation Parameters](#)" on page 203.

The results page displays the following information:

Column	Description
<b>Threading info</b>	The total number of worker threads created by the invocation, the free worker threads, and the stuck worker threads.
<b>Total work time</b>	The time that the Probe took to run this job.
<b>Tasks waiting for execution</b>	A list of jobs together with the number of Trigger CIs that are awaiting activation.
<b>Max. Threads</b>	The number of threads that are serving this job.
<b>Progress</b>	A summary of the current run, that is, since the specific run was activated.  For example, <code>Progress: 2017 / 6851 destinations (29%)</code> means that out of 6851 CIs, 2017 CIs have already run.
<b>Working Threads information</b>	<ul style="list-style-type: none"> <li>• <b>Thread Name.</b> The thread that is now running this job. Click to go to the <a href="#">viewJobThreadDump</a> page. You use this page when a thread is running for a long time, and you must verify that this is because the thread is working hard,</li> </ul>

Column	Description
	<p>and not because there is a problem.</p> <ul style="list-style-type: none"> <li>• <b>Curr Dest. ID.</b> The name of the node on which the job is running.</li> <li>• <b>Curr Dest. IP.</b> The IP for which the job is discovering information.</li> <li>• <b>Work Time (Sec).</b> The length of time that this thread is running.</li> <li>• <b>Communication Log.</b> Click to go to the <b>viewCommunicationLog</b> page, to view an XML file that logs the connection between the Probe and a remote machine. For details, see the <b>Create communication logs</b> field in the "Execution Options Pane" on page 96.</li> </ul>
<b>Discovery Jobs Information table</b>	<ul style="list-style-type: none"> <li>• <b>Status.</b> The severity of the job's status, as calculated by the Probe. For details, see "Status" on page 200.</li> <li>• <b>Errors.</b> Click to go to <a href="#">viewJobErrorsSummary</a> page, to view a list of error messages reported on this job.</li> <li>• <b>Triggered CIs.</b> Click to go to <a href="#">viewJobTriggeredCIs</a> page, to view a list of Trigger CIs that are part of a job.</li> <li>• <b>Last invocation.</b> The date and time that the job was last run.</li> <li>• <b>Next invocation.</b> The date and time that the job is next scheduled to run.</li> <li>• <b>Last Total run duration (seconds).</b> For details, see "Last Total run duration (seconds)" on previous page.</li> <li>• <b>Avg run duration (seconds).</b> For details, see "Avg run duration (seconds)" on previous page.</li> <li>• <b>Recurrence.</b> The number of times that the job was invoked. Click to go to <a href="#">viewJobExecHistory</a> page, to view a history of job invocations.</li> </ul>
<b>Results</b>	The number of CITs that have been discovered by the job. Click to go to the <a href="#">viewJobResults</a> page to view the CITs.

### viewJobTriggeredCIs

Fill in one or more of the parameters to return a list of Trigger CIs that are part of a job.

For details on the job operation parameters, see "Job Operation Parameters" on next page.

The results page displays the following information:

Column	Description
<b>No.</b>	The number of the job in the list.
<b>Triggered CI ID</b>	The CI instances that have been discovered by the job. Click to go to the <a href="#">viewJobTriggeredCIs</a> page to view information about their CITs.

Column	Description
<b>Last Execution</b>	The date and time that the job was last run.
<b>Service Exec. Duration (ms)</b>	The maximum time that it took for a job to run in the last invocation, not including periods when the job did not run. Compare this result with the total execution duration.  For example, when several jobs run simultaneously, but there is only one CPU, a job might have to wait for another job to finish. The service duration does not include this waiting time, whereas the total duration does.
<b>Total Exec. Duration (ms)</b>	The time that it took for a job to run in the last invocation, including the periods when the job did not run.
<b>Last Run Status</b>	The status of the last run, that is, whether the run succeeded or failed. In case of failure, click to go to the <a href="#">viewJobProblems</a> page, to view a list of Trigger CIs with problems.
<b>Priority</b>	The priority of the job.  <b>Note:</b> The lower the value, the higher the priority.

### viewJobTriggeredCIsWithErrorId

**Note:** This operation is part of the inner interface and serves as a helper function. Do not use this page to view Trigger CIs information; instead, use the [viewJobTriggeredCIs](#) page.

## Job Operation Parameters

The following list includes job operation parameters.

- **ciType.** The name of the CI type (for example, `ip`, `host`).
- **data.** A textual field in the **DiscoveryResults** table that contains information about the discovered object. For example:

```
<object class="ip">
  <attribute name="ip_probename" type="String">EBRUTER02</attribute>
  <attribute name="ip_address" type="String">16.59.58.200</attribute>
  <attribute name="ip_domain" type="String">DefaultDomain</attribute>
</object>
```
- **Error Id.** The error message hash string (error hash ID) that is displayed in the **Jobs\_Problems** table.
- **HideRemovedJobs.True:** do not display jobs that have run previously and are not relevant to the current run.
- **Hide Touched CIs Info.** Touched CIs are CIs which were discovered in previous invocations.

DFM already has information about these CIs, so there is no need for the Probe to send the information to the server again. The server identifies that these CIs are relevant and that there is no need to enforce the aging mechanism on them. For details on aging, see "[The Aging Mechanism Overview](#)" in the *HP Universal CMDB Administration Guide*.

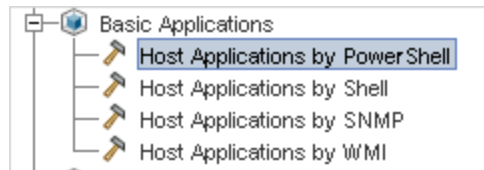
**True:** the table displays the total number of CIs and the total number of Trigger CIs for each CIT.

**False:** The table displays the total number of CIs and Trigger CIs divided between touched CIs and non-touched CIs.

- **includeNonTouched.** Enables filtering the table to view non-touched CIs. Choose between viewing non-touched CIs only, all CIs (touched and non-touched), or none:

	Non-touched CIs	All CIs	No CIs
(boolean)includeTouchedCis	<input type="radio"/> True <input checked="" type="radio"/> False	<input checked="" type="radio"/> True <input type="radio"/> False	<input type="radio"/> True <input checked="" type="radio"/> False
(boolean)includeNonTouchedCis	<input checked="" type="radio"/> True <input type="radio"/> False	<input checked="" type="radio"/> True <input type="radio"/> False	<input type="radio"/> True <input checked="" type="radio"/> False

- **includeNonTouchedCIs.** See **includeNonTouched**.
- **includeTouched.** Enables filtering the table to view touched CIs. Choose between viewing touched CIs only, all CIs (touched and non-touched), or none.
- **includeTouchedCIs.** See **includeTouched**.
- **jobID.** The name of the job, for example, **Host Applications by PowerShell**:



- **maxRows.** The maximum number of rows that should be displayed in the results table. The default is 100 or 1000.
- **maxTriggeredCIs.** See **maxRows**.
- **objectID.** The CMDB object ID.
- **showRemovedJobs.** Shows information about jobs that are not currently scheduled to run, but that have run previously. These jobs take the state of **REMOVED**.
- **showResults.** Indicates whether to display the **Show Results** column. If the Show Results column is present, you can navigate from [viewJobsStatuses](#) to [viewJobResults](#).
- **triggerCI.** The CMDB object ID of the trigger for a job.
- **triggeredCiID.** See **triggerCI**.

## Discovery Control Panel User Interface


This section describes:

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## Choose CIs to Add Dialog Box

Enables you to choose CIs to run with selected jobs.

<b>To access</b>	<ul style="list-style-type: none"><li>• <b>Data Flow Management &gt; Discovery Control Panel.</b> In the <b>Details</b> tab, locate the <b>Discovery Status</b> pane. Click the <b>Add CI</b>  button.</li></ul>
------------------	---

User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A–Z)	Description
<right-click a title>	<p>Choose from the following options:</p> <ul style="list-style-type: none"> <li>• <b>Hide Column.</b> Select to hide a specific column.</li> <li>• <b>Show All Columns.</b> Displayed when a column is hidden.</li> <li>• <b>Select Columns.</b> Select to display or hide columns and to change the order of the columns in the table. Opens the Select Columns dialog box.</li> <li>• <b>Auto-resize Column.</b> Select to change a column width to fit the contents.</li> </ul> <p>For details, see "<a href="#">Select Columns Dialog Box</a>" (on page 1) in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<b>Add button</b>	<p><b>Note:</b> If you choose CIs with an error status to add to the trigger list, a message is displayed when you click the <b>Add</b> button.</p>
<b>Search CIs</b>	<p>Contains filters with which you can limit the number of CIs that appear in the Search Results pane.</p> <ul style="list-style-type: none"> <li>• <b>By Discovery Query.</b> Select a Discovery query to search for those CIs that match the query.</li> <li>• <b>Show only CIs containing.</b> To search for CIs that include a certain text, enter the text here.</li> <li>• <b>Exact match.</b> Select to search for CIs with the exact match of the text label. (By default, you search by entering part of a text. For example, searching for <b>10</b> within the IP CIs finds all the IPs that contain 10 in their address. Entering <b>10</b> then selecting <b>Exact match</b> finds no results.)</li> <li>• <b>Search.</b> Click to display the search results.</li> </ul>
<b>Search Results</b>	<p>Displays a list of triggered CIs answering to the criteria set in the filter. To add the CIs to the list in the triggered CIs pane, select the CIs. You can make multiple selections.</p> <ul style="list-style-type: none"> <li>• <b>CIT.</b> The CI type of the selected triggered CI.</li> <li>• <b>CI.</b> The label of the triggered CI.</li> <li>• <b>Related Host.</b> The label for the node related to the triggered CI.</li> <li>• <b>Related IPs.</b> The IPs of the related node.</li> <li>• <b>Reported.</b> The time that the CI is added to the Discovery Status table.</li> </ul> <p><b>Page.</b> The list of CIs is divided into pages. The number in the Page box indicates which page is currently displayed. To view other pages, use the up and down arrows, or type the page number, and press <b>Enter</b>.</p> <p>To determine the number of CIs that appear on a page, right-click the up or down button and choose the required number. The default is 25.</p>

## Choose Discovery Query Dialog Box

Enables you to add a Trigger query to a job.

<b>To access</b>	Click the <b>Add Query</b> button in the <b>Trigger Queries</b> pane.
------------------	---

User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A–Z)	Description
<Discovery query name>	The query that queries the CMDB for the selected CIT.
<b>Query Preview</b>	Hold the cursor over an element to view details.

## Choose Probe Dialog Box

Enables you to filter the Probe list.

<b>To access</b>	<p>Click a <b>Filter</b> button in the <b>Discovery Control Panel &gt; Details</b> tab:</p> <ul style="list-style-type: none"> <li>• <b>Triggered CIs</b> pane <b>Filter</b> button. For details on the menu options, see "<a href="#">Discovery Status Pane</a>" on page 216.</li> <li>• <b>Statistics</b> pane <b>Filter</b> button. For details on the menu options, see "<a href="#">Statistics Results Pane</a>" on page 220.</li> </ul>
------------------	---

## Configuration Item Properties Dialog Box

Enables you to view CI properties.

<b>To access</b>	In the <b>Discovered CIs</b> dialog box, right-click a CI and choose <b>Properties</b> .
<b>Important Information</b>	For details, see " <a href="#">Configuration Item Properties Dialog Box</a> " in the <i>HP Universal CMDB Modeling Guide</i> .



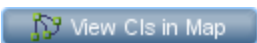

## Create New Discovery Job Dialog Box

Enables you to create a job.

<b>To access</b>	Navigate to <b>Data Flow Management &gt; Discovery Control Panel &gt; Discovery Modules/Jobs</b> , right-click a module in the Discovery Modules pane, and select <b>New &gt; Job</b> .
------------------	---

### Discovery Job Details Pane

User interface elements are described below:

UI Element (A–Z)	Description
	Opens the Help document related to the selected job's adapter. To update or modify this document, see <a href="#">"Adapter Definition Tab" on page 89</a> .
	Click to go to the adapter in the Resources pane.
	You can choose to view a map of the CIs and links that are discovered by the adapter, instead of a list. Click the button to open the <b>Discovered CIs Map</b> window. The selected adapter is shown together with its CIs and relationships. Hold the cursor over a CIT to read a description in a tooltip.
	Click to view permissions that are defined for specific adapters. For details, see <a href="#">"Discovery Permissions Window" on page 226</a> . For details on editing these permissions, see <a href="#">"Permission Editor Dialog Box" on page 114</a> .
<b>Adapter</b>	The adapter needed by the job to discover the CIs.
<b>Discovered CIs</b>	The CIs that are discovered by this job.
<b>Input CI Type</b>	The CIT that triggers the CIs for this job.
<b>Job Name</b>	The name and description of the job and the package in which it is located. <b>Note:</b> <ul style="list-style-type: none"> <li>Job names cannot start with a numeric value.</li> <li>Job names must be limited to a length of 50 characters.</li> </ul>
<b>Required Protocols</b>	The protocols needed by the activated job to access the system components.

## Parameters Pane

Enables you to override adapter behavior.

To view a description, hold the pointer over the parameter.

<b>To access</b>	Select a job in the <b>Discovery Modules</b> pane in the <b>Discovery Control Panel</b> window.
<b>Important Information</b>	You can override a default adapter parameter for a specific job, without affecting the default value.

User interface elements are described below:








UI Element (A–Z)	Description									
<b>Name</b>	The name given to the adapter.									
<b>Override</b>	<p>Select to override the parameter value in the adapter.</p> <p>When this check box is selected, you can override the default value. For example, to change the <b>protocolType</b> parameter, select the <b>Override</b> check box and change <b>MicrosoftSQLServer</b> to the new value. Click <b>OK</b> in the Properties tab to save the change:</p> <table border="1"> <thead> <tr> <th colspan="3">Parameters</th> </tr> <tr> <th>Override</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>protocolType</td> <td>MicrosoftSQLServer</td> </tr> </tbody> </table> <p>For details on editing parameters in the Adapter Parameters pane, see "<a href="#">Adapter Definition Tab</a>" on page 89.</p>	Parameters			Override	Name	Value	<input checked="" type="checkbox"/>	protocolType	MicrosoftSQLServer
Parameters										
Override	Name	Value								
<input checked="" type="checkbox"/>	protocolType	MicrosoftSQLServer								
<b>Value</b>	The value defined in the adapter.									

### Trigger Queries Pane

Enables you to define one or more queries to be used as triggers to activate the selected job.


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Query.</b> You can add one or more non-default TQL queries to be used as triggers to activate the selected job. Click to open the <b>Choose Discovery Query</b> dialog box.
	<b>Remove Query.</b> Select the query and click the button. (No message is displayed. To restore the query, click the <b>Cancel</b> button.) <b>Note:</b> If a query is removed for an active job, Discovery no longer receives new CIs coming from that query. Existing Trigger CIs that originally came from the query are not removed.
	Click to add or remove Probes for a specific query. For details, see " <a href="#">Edit Probe Limitation for Query Output Dialog Box</a> " on page 234.
	Click to open the <b>Trigger Query Editor</b> . For details, see " <a href="#">Trigger Query Editor Window</a> " on page 243. <b>Available:</b> In the job's Properties tab only.

UI Element (A–Z)	Description
	Click to open the Modeling Studio. <b>Available:</b> In the job's Properties tab only.
<b>Probe Limit</b>	The Probes being used for the discovery process. To add or remove Probes, click the button.
<b>Query Name</b>	The name of the Trigger query that activates the job.

### Global Configuration Files Pane


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Edit.</b> Opens the selected configuration file in an appropriate editor. For example, the file msServerTypes.xml opens the Script Editor.

### Discovery Scheduler Pane

Enables you to set up a schedule for this job.

User interface elements are described below:

UI Element (A–Z)	Description
	Click to add times to the <b>Allow Discovery to run at</b> list. The <b>Time Templates</b> dialog box opens. To add a time template to the list, in the <b>Time Templates</b> dialog box, click the <b>Add</b> button to open the <b>Edit Time Template</b> dialog box. For details, see " <a href="#">Edit Time Template Dialog Box</a> " on page 235.
<b>Allow Discovery to run at</b>	Choose a template that includes the days and times when the job should run.
<b>Edit scheduler</b>	Click to open the <b>Discovery Scheduler</b> . For details, see " <a href="#">Discovery Scheduler Dialog Box</a> " on page 227.
<b>Invoke on new triggered CIs immediately</b>	Enables the job to run as soon as the Trigger CI reaches the Probe. When this option is not selected, the job runs according to the schedule defined in the <b>Schedule Manager</b> .  <b>Note:</b> If this option is not selected and a job is running, new triggered CIs are not run by the job.

UI Element (A–Z)	Description
	<p>Although new triggered CIs are not run, they are counted into the status bar. This means the status bar does not reach 100% completed, even though the job successfully completed, and the user has to wait until the next run of the job for the status bar to reach 100% completed.</p>

## Created by Window

Enables you to view CI instances of a CIT discovered by a job.

<b>To access</b>	<ul style="list-style-type: none"> <li>In the <b>Statistics Results</b> pane, select a CIT, and click the <b>View instances</b> button.</li> <li>In the <b>Dependency Map</b> tab, select <b>Show Discovered CIs</b> or <b>Show all instances</b>.</li> </ul>
<b>Important Information</b>	<ul style="list-style-type: none"> <li>The Discovered by &lt;job name&gt; window includes the same information as the Element Instances window. For details, see "<a href="#">Element Instances Dialog Box</a>" in the <i>HP Universal CMDB Modeling Guide</i>.</li> <li>Depending on whether you select <b>Show discovered CIs</b> or <b>Show all instances</b> in the <b>Dependency Map</b>, you can view all CIs discovered by a selected job or all CIs of a selected type.</li> <li>The CI instances displayed are retrieved from the server upon opening this window. The number of CIs may differ from the number of CIs displayed in the <b>Statistics Results</b> pane because some created CIs may have been merged or deleted since they were created by the job.</li> </ul>

## Dependency Map Tab

Displays a visual representation of the real-time progress of the discovery process. The map displays:

- CIs that were triggered by a job
- CIs that were discovered as a result of the activated job.

<b>To access</b>	Click the <b>Dependency Map</b> tab in the <b>Discovery Control Panel</b> window.
<b>Important Information</b>	<p>Depending which level you select in the Discovery Modules pane, different information is displayed in the Dependency Map tab.</p> <p>If you select:</p> <ul style="list-style-type: none"> <li><b>The Discovery Modules root</b>, and select the <b>Show only active Discovery jobs</b> check box, the Dependency Map displays only active jobs and their interdependencies.</li> </ul>

	<ul style="list-style-type: none"> <li>▪ <b>The Discovery Modules root</b>, and clear the <b>Show only active Discovery jobs</b> check box, the Dependency Map displays all DFM jobs and their interdependencies.</li> <li>▪ <b>A module</b>, a topology map is displayed showing the module's active and inactive jobs.</li> <li>▪ <b>A job</b>, the topology map highlights the job in the module's map.</li> </ul>
<b>See also</b>	"Created by Window" on previous page

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<b>&lt;right-click menu&gt;</b>	<p>Use the right-click menu to view details for a job, CI, or link, for example, the number of CI instances (of a specific type) in the CMDB or the number of CI instances created by a specific job.</p> <p>Depending on which object is selected, the following menu options are displayed:</p> <ul style="list-style-type: none"> <li>• When a job is selected: <ul style="list-style-type: none"> <li><b>Show discovered CIs.</b> Click to view the CIs discovered by the job. To filter the query, select a CIT from the menu.</li> <li><b>Show trigger CIs.</b> Click to view the CIs that triggered the job.</li> </ul> </li> <li>• When a CI is selected: <ul style="list-style-type: none"> <li><b>Show all CIT instances.</b> Click to view all CIs of this CI type.</li> </ul> </li> <li>• When a link from a CI to a job is selected: <ul style="list-style-type: none"> <li><b>Show trigger CIs for job.</b> Click to view CIs (of the selected type) that triggered the job.</li> </ul> </li> <li>• When a link from a job to a CI is selected: <ul style="list-style-type: none"> <li><b>Show discovered instances.</b> Click to view CIs (of the selected type) that were discovered by the job.</li> </ul> </li> </ul>
<b>&lt;Toolbar&gt;</b>	For a description of the icons, see " <a href="#">Toolbar Options</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>&lt;Tooltip&gt;</b>	Hold the pointer over a CI or job to display a description.
<b>Show only active Discovery jobs</b>	<p>When the Discovery Modules root is selected in the Discovery Modules pane, this check box is displayed.</p> <p>Select to display all active jobs (from any module).</p>

## Discovered CIs Window

Enables you to view all CI instances found for a selected TQL node.

<b>To access</b>	<ul style="list-style-type: none"> <li>• <b>Data Flow Management &gt; Discovery Control Panel &gt; Dependency Map tab.</b> Right-click a CIT and select <b>Show Triggered CIs</b></li> <li>• In the <b>Discovery Status</b> pane, click the <b>Show additional data</b> button</li> </ul>
<b>Important Information</b>	The <b>Triggered CIs</b> window includes the same information as the <b>Element Instances</b> window. For details, see " <a href="#">Element Instances Dialog Box</a> " in the <i>HP Universal CMDB Modeling Guide</i> .

## Discovery Control Panel

You activate jobs that discover the components of your system from the Discovery Control Panel.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel.</b>
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• "<a href="#">Zone-Based Discovery Workflow</a>" on page 189</li> <li>• "<a href="#">Module/Job-Based Discovery Workflow</a>" on page 190</li> </ul>
<b>See also</b>	<ul style="list-style-type: none"> <li>• "<a href="#">Universal Discovery Overview</a>" on page 184</li> </ul>

User interface elements are described below:

UI Element (A–Z)	Description
<b>Discovery Modules/Jobs tab</b>	<p>Enables you to activate discovery by setting up and run individual discovery jobs. For details, see "<a href="#">Discovery Modules/Jobs Tab</a>" on next page</p> <p><b>Note:</b> This tab is suitable for when you want to run discovery on a particular node rather than within a Management Zone.</p>
<b>Zone-Based Discovery tab</b>	<p>Enables you to activate discovery in a user-friendly way by setting up Management Zones with various discovery activities. For details, see "<a href="#">Zone-Based Discovery Tab</a>" on page 246.</p> <p><b>Note:</b> This tab is displayed by default when accessing the Discovery Control Panel.</p>

## Discovery Modules/Jobs Tab

Enables you to view and manage modules and jobs, to activate jobs, and to follow job progress.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel</b>
<b>Important Information</b>	<ul style="list-style-type: none"> <li>This tab is suitable for advanced users of Universal Discovery only.</li> <li>Each change you make in Discovery Control Panel is delivered to and stored in the CMDB. From there, the changes are sent to the Probe. You can verify that changes have been sent to the Probe by opening the <b>wrapperProbe.log</b> file located in <b>C:\hp\UCMDB\DataFlowProbe\runtime\logs\</b> and searching for the following lines: <pre>processing document domainScopeDocument.bin Processing document domainScopeDocument.bin is done.</pre> </li> </ul>
<b>Relevant tasks</b>	<a href="#">"Module/Job-Based Discovery Workflow" on page 190</a>

User interface elements are described below:

<b>UI Element (A–Z)</b>	<b>Description</b>
<b>Dependency Map tab</b>	Displays a visual representation of the real-time progress of the process. For details, see <a href="#">"Dependency Map Tab" on page 211</a> .
<b>Details tab</b>	Enables you to manage a module's CIs and view CI statistics. For details, see <a href="#">"Discovery Module/Jobs - Details Tab" below</a> .
<b>Discovery Modules pane</b>	Each module includes jobs. You activate a module or job to discover a specific group of CIs. For details, see <a href="#">"Discovery Modules Pane" on page 222</a> .
<b>Properties tab</b>	Enables you to view and administer the properties of modules and jobs. For details, see <a href="#">"Properties Tab" on page 238</a> .

## Discovery Module/Jobs - Details Tab





Enables you to view and administer modules and jobs, to follow the progress of the DFM process, and to manage errors during discovery.

<b>To access</b>	<b>Discovery Control Panel &gt; Discovery Modules/Jobs tab &gt; Details tab.</b>
<b>Important Information</b>	<p>Depending which level you select in the <b>Discovery Modules</b> pane on the left, different information is displayed in the <b>Details</b> tab.</p> <p>If you select:</p>

	<ul style="list-style-type: none"> <li>• <b>The Discovery Modules root</b> or a <b>Discovery module</b>, the following is displayed:             <ul style="list-style-type: none"> <li>▪ "Discovery Status Pane"</li> <li>▪ "Statistics Results Pane"</li> </ul> <p>These panes display information and statistics about all active jobs and errors discovered during a run.</p> </li> <li>• <b>A job</b>, the following is displayed:             <ul style="list-style-type: none"> <li>▪ "Discovery Job Details Pane"</li> <li>▪ "Discovery Status Pane"</li> <li>▪ "Statistics Results Pane"</li> </ul> </li> <li>• <b>Several jobs or modules</b>, the following is displayed:             <ul style="list-style-type: none"> <li>▪ "Selected Items Pane"</li> </ul> </li> </ul>
<p><b>Relevant tasks</b></p>	<p>"Error Messages Overview" in the <i>HP Universal CMDB Developer Reference Guide</i></p>

### Discovery Job Details Pane

User interface elements are described below:

UI Element (A–Z)	Description
	<p>Opens the Help document related to the selected job's adapter.</p> <p>To update or modify this document, see "<a href="#">Adapter Definition Tab</a>" on page 89.</p>
	<p>Click to go to the adapter in the Resources pane.</p>
	<p>You can choose to view a map of the CIs and links that are discovered by the adapter, instead of a list. Click the button to open the <b>Discovered CIs Map</b> window. The selected adapter is shown together with its CIs and relationships. Hold the cursor over a CIT to read a description in a tooltip.</p>
	<p>Click to view permissions that are defined for specific adapters. For details, see "<a href="#">Discovery Permissions Window</a>" on page 226.</p> <p>For details on editing these permissions, see "<a href="#">Permission Editor Dialog Box</a>" on page 114.</p>
<p><b>Adapter</b></p>	<p>The adapter needed by the job to discover the CIs.</p>
<p><b>Discovered CIs</b></p>	<p>The CIs that are discovered by this job.</p>
<p><b>Input CI Type</b></p>	<p>The CIT that triggers the CIs for this job.</p>



UI Element (A–Z)	Description
<b>Job Name</b>	The name and description of the job and the package in which it is located.  <b>Note:</b> <ul style="list-style-type: none"> <li>• Job names cannot start with a numeric value.</li> <li>• Job names must be limited to a length of 50 characters.</li> </ul>
<b>Required Protocols</b>	The protocols needed by the activated job to access the system components.

### Discovery Status Pane








Enables you to view a run status and drill down to problematic Trigger CIs, to uncover specific problems that DFM encountered during the run. For example: incorrect credentials. You can also add newly discovered CIs to the Trigger CI list.



<b>To access</b>	Select a module or job, click the <b>Details</b> tab, and locate the <b>Discovery Status</b> pane.
<b>Important Information</b>	<ul style="list-style-type: none"> <li>• This pane enables you to view the results of the previous run for a selected module or job, or for all modules, depending which level you select</li> </ul> <p><b>Note:</b> Jobs that are running via the <b>Scheduler</b> do not automatically appear as running in the <b>Discovery Control Panel</b>.</p> <ul style="list-style-type: none"> <li>• You can use the SHIFT and CTRL keys to select adjacent and non-adjacent CIs in a list.</li> <li>• The information in this pane is automatically refreshed every thirty seconds.</li> </ul>
<b>Relevant tasks</b>	" <a href="#">Check Status of Application Discovery (Rediscover a View)</a> " in the <i>HP Universal CMDB Modeling Guide</i>
<b>See also</b>	" <a href="#">Error Messages Overview</a> " in the <i>HP Universal CMDB Developer Reference Guide</i>


User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A-Z)	Description
	<b>Up one level.</b> Click to return to the upper pane.
	<b>Show triggered CIs.</b> Click to drill down to the Trigger CI that includes the problem.  <b>Note:</b> This icon is enabled only when you can drill down from error or warning links.



UI Element (A-Z)	Description
	<b>Refresh.</b> Click to refresh the status view.
	<b>Add CI.</b> Click to add a newly-discovered CI to the Trigger CI list. For details, see <a href="#">"Choose CIs to Add Dialog Box" on page 205.</a>
	<b>Remove CI.</b> If the CI is no longer of interest, click to remove a CI from the list. The CI is deleted from the specific job.
	<p><b>Filter CIs.</b> Click and choose an option from the menu:</p> <ul style="list-style-type: none"> <li>• <b>By Status.</b> (This option is available only when the Total number of CIs is displayed.) Displays a list of Trigger CIs: <ul style="list-style-type: none"> <li>▪ <b>All.</b> Displays all the Trigger CIs.</li> <li>▪ <b>Waiting for Probe.</b> Displays the Trigger CIs that are ready to be dispatched and are waiting for the Probe to retrieve them.</li> <li>▪ <b>In Progress.</b> Displays the Trigger CIs that are active and are running on the Probe.</li> <li>▪ <b>In progress (being removed).</b> Displays the Trigger CIs that are being removed from the <b>Trigger CIs</b> list.</li> <li>▪ <b>Success, Failed, Warning.</b> Displays only those CIs that have the selected status.</li> </ul> </li> <li>• <b>By Probe.</b> Displays only the CIs triggered by a selected Probe. Click to open the <b>Choose Probe</b> dialog box.</li> <li>• <b>By Dispatch Type.</b> Displays a list of CIs according to one of the following options: <ul style="list-style-type: none"> <li>▪ <b>All.</b> Displays both CIs that are used to manually activate the job and Discovery TQL queries that are used to automatically activate the job.</li> <li>▪ <b>Manually Added.</b> Displays the CIs that are used to manually activate the job.</li> <li>▪ <b>By Discovery Query.</b> Displays the CIs that are used to automatically activate the job.</li> </ul> </li> <li>• <b>Reset.</b> Click to remove any filters.</li> </ul>
	<b>Handle errors.</b> Opens a message box containing an explanation of the selected failure. (You can also view messages by right-clicking the CI and selecting <b>Show error details.</b> )
	<b>Show additional data.</b> Click to open the Triggered CIs dialog box with additional information about the CI. For details, see <a href="#">"Discovered CIs Window" on page 212.</a>
	<b>Show results for triggered CI.</b> DFM sends an ad-hoc request to the Probe and

UI Element (A-Z)	Description
	<p>retrieves the latest results of the job (CIT name and number of discovered CIs) that is running on a specific Trigger CI.</p> <p>This ad-hoc request does not run the job, but brings the results of the previous job run that are stored in the Probe's database. If the job has not yet run for this Trigger CI, a message is displayed. See <a href="#">"Show Results for Triggered CI Dialog Box"</a> on page 242.</p> <p>If no communication log exists in the Probe, a message is displayed. You can choose that DFM always creates communication logs. For details, see <a href="#">"Adapter Configuration Tab"</a> on page 96.</p>
	<b>Rerun Discovery.</b> Enables you to rerun the discovery.job.
	<p><b>Pause / Resume.</b> Enables you to pause an active job or resume a paused job.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• When you pause an active job: <ul style="list-style-type: none"> <li>▪ triggers that are currently running continue to run until they are finished</li> <li>▪ all the execution information is retained, including errors</li> </ul> </li> <li>• Jobs are paused based on their defined job execution policies. For details, see <a href="#">"Job Execution Policies"</a> on page 23.</li> </ul>
<right-click menu>	<p>In addition to some of the functionality described above, right-clicking a CI enables you to do the following:</p> <ul style="list-style-type: none"> <li>• <b>Run from step.</b> Enables you to manually run the job on the selected CI from a particular step in the job's workflow. This is useful if you do not want to rerun the whole discovery job on the CI, but only a part of it.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• The workflow steps are defined in the job's adapter file. You can view or edit the workflow in the Adapter Definition tab for the relevant adapter. For details, see <a href="#">"Adapter Definition Tab"</a> on page 89</li> <li>• You cannot run the job from particular step if the status of the CI is <b>Waiting for probe</b> or <b>In Progress</b>.</li> </ul> <p><b>Available:</b> For CIs that trigger workflow-based jobs</p>
<b>Failed</b>	<p>Displays those CIs that returned a severity of type <code>Error</code> or <code>Fatal</code>.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• When you pause an active job:</li> </ul>

UI Element (A-Z)	Description
	<ul style="list-style-type: none"> <li>■ triggers that are currently running continue to run until they are finished</li> <li>■ all the execution information is retained, including errors</li> <li>● Jobs are paused based on their defined job execution policies. For details, see "Job Execution Policies" on page 23.</li> </ul> <p>Double-click a job to display the error message.</p> <p>Right-click an error to deactivate or rerun a job.</p>
<b>In progress</b>	<p>Displays the number of Trigger CIs that are running in the probe. Click to view the jobs that are running.</p> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> For consecutive runs of a job via the Scheduler, it does not appear as <b>In progress</b>, but only the final status (<b>Success</b> or <b>Failed</b>) is updated.</p> </div>
<b>Look for</b>	<p>To search for a specific Probe, related host, or related IP, enter part of its name in the box and click the  button.</p>
<b>Progress</b>	<p>The indicator shows a summary of the current discovery run, that is, since the specific run was activated.</p>
<b>Success</b>	<p>DFM displays the number of CIs that have been run successfully, that is, without errors.</p> <p>Click to view the jobs (and the number of CIs in each job) that completed successfully.</p> <p>Select a CI and use the right-click menu to view information about the CI.</p> <p><b>With warnings.</b> Click to view a warning message for each job.</p> <ul style="list-style-type: none"> <li>● Double-click a message to view the CIs that finished successfully with a warning.</li> <li>● Right-click a message to access information about the CI.</li> </ul>
<b>Total</b>	<p>Displays the status of all of a job's Trigger CIs. Double click a <b>Warning</b> or <b>Error</b> status to open the Message dialog box.</p>
<b>Waiting for Probe</b>	<p>The Trigger CIs that are waiting for the Probe or are waiting to run.</p>

### Selected Items Pane



User interface elements are described below (unlabeled elements are shown in angle brackets>):



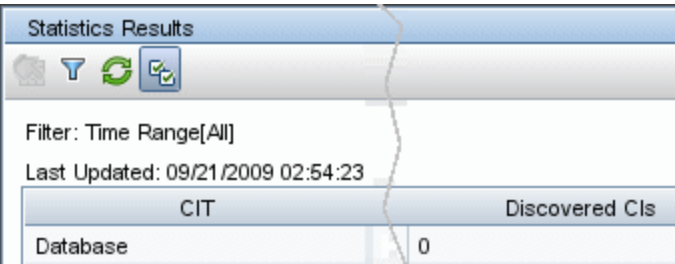
UI Element (A–Z)	Description
<right-click menu>	<b>Edit Scheduling.</b> Click to open the <b>Discovery Scheduler</b> to define a schedule for a specific job. For details, see " <a href="#">Discovery Scheduler Pane</a> " on page 241.
<b>Invoke immediately</b>	<ul style="list-style-type: none"> <li>A check mark signifies that the DFM job runs as soon as the triggered CI reaches the Probe. In this case, the <b>Invoke on new triggered CIs immediately</b> check box is selected in the <b>Properties</b> tab.</li> <li>If this column does not contain a check mark, the job runs according to the schedule defined in the <b>Schedule Manager</b>.</li> </ul>
<b>Job name</b>	The name of the job.
<b>Schedule info</b>	The scheduling information of the job as defined in the <b>Discovery Scheduler</b> .
<b>Trigger Queries</b>	The name of the query that activated the job. For details, see " <a href="#">Trigger Queries Pane</a> " on page 240.

### Statistics Results Pane

<b>Important Information</b>	<p>UCMDB includes a purging mechanism for managing old discovery result statistics. This mechanism enables faster display of discovery result statuses. That is, the old statistics records are merged and therefore they are still available for the user. This feature is controlled by two system parameters:</p> <ul style="list-style-type: none"> <li><b>appilog.collectors.ResetDiscoveryStatisticsIntervalHours.name=Reset Discovery Statistics Interval by Hours.</b> This property defines the interval of merging discovery statistics (the interval for running the purging mechanism).</li> <li><b>appilog.collectors.DiscoveryStatisticsArchiveDays.name=Discovery results statistics archive period.</b> This property defines the number of days after which results statistics are being archived (the number of days after which the statistics are considered old).</li> </ul>
<b>See also</b>	<ul style="list-style-type: none"> <li>"<a href="#">Data Push Tab</a>" on page 145</li> <li>"<a href="#">Population Tab</a>" on page 162</li> </ul>

User interface elements are described below (unlabeled elements are shown in angle brackets>):

UI Element (A–Z)	Description
	Click to retrieve the latest data from the server (job results are not automatically updated in the <b>Statistics</b> pane).
	<p>Select a CIT and click the <b>View Instances</b> button to view created or updated CI instances and their attributes.</p> <p>A message is displayed when:</p>

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• All the CIs that were discovered by this job were already discovered by another job.</li> <li>• All the CIs that this job discovered have been deleted.</li> <li>• The CI instances were discovered in a previous version.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• You can also view CI instances by double-clicking a row.</li> <li>• Only instances <b>created by</b> the job are shown. If there are no such instances, this button is not available.</li> <li>• CITs with no instantiated instances are displayed.</li> </ul>
	<p>Select the time range or Probe for which to display statistics about the CITs.</p> <ul style="list-style-type: none"> <li>• <b>By Time Range:</b> <ul style="list-style-type: none"> <li>▪ <b>All.</b> Displays statistics for all job runs.</li> <li>▪ <b>From Now/Last Minute/Last Hour/Last Day/Last Week.</b> Choose a period of time for which to display statistics about the CITs.</li> <li>▪ <b>Custom Range.</b> Click to open the <b>Change Timeframe</b> dialog box: Enter the date or click the arrow to choose a date and time from the calendar, for the <b>From</b> and <b>To</b> dates (or click <b>Now</b> to enter the current date and time). Click <b>Last Day</b> to enter the current date and time in the <b>To</b> box and yesterday's date and time in the <b>From</b> box. Click <b>OK</b> to save the changes.</li> </ul> </li> <li>• <b>By Probe:</b> To view statistics for a specific Probe, select to open the Choose Probe dialog box.</li> </ul>
	<p><b>Show all declared CI Types.</b> By default, only discovered CITs are listed in the table; the Discovered CIs column includes CITs if the number of CIs found is greater than zero. Click the button to display every CI that can be discovered by the job, even if the Discovered CIs value is zero:</p> 
<p>&lt;Column title&gt;</p>	<p>Click a column title to change the order of the CITs from ascending to descending order, or the other way round.</p>
<p>&lt;right-click a title&gt;</p>	<p>Choose from the following options:</p>








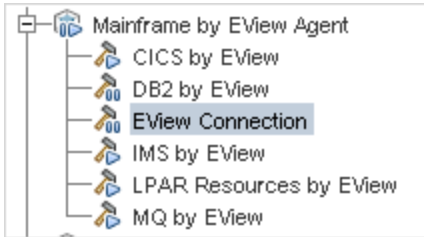

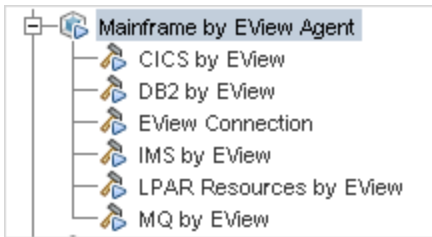

UI Element (A–Z)	Description
	<ul style="list-style-type: none"> <li>• <b>Hide Column.</b> Select to hide a specific column.</li> <li>• <b>Show All Columns.</b> Displayed when a column is hidden.</li> <li>• <b>Select Columns.</b> Select to display or hide columns and to change the order of the columns in the table. Opens the Select Columns dialog box.</li> <li>• <b>Auto-resize Column.</b> Select to change a column width to fit the contents.</li> </ul> <p>For details, see "<a href="#">Select Columns Dialog Box</a>" in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<b>CIT</b>	<p>The name of the discovered CIT.</p> <p>You can configure discovery so that any object reported by the job and whose CIT is not defined in the adapter's <b>discovered CITs</b> list is marked in red. Objects include those added by the Probe result mechanism.</p> <p><b>To set this parameter:</b></p> <ol style="list-style-type: none"> <li>1. Select <b>Administration &gt; Infrastructure Settings Manager</b>.</li> <li>2. Select the <b>General Settings</b> category.</li> <li>3. Locate the <b>Enable statistics results validation according to adapter</b> parameter.</li> <li>4. Change the value to <b>True</b>.</li> </ol>
<b>Created</b>	The number of CIT instances created in the period selected or for the selected Probe.
<b>Deleted</b>	The number of CIT instances deleted in the period selected or for the selected Probe.
<b>Discovered CIs</b>	The number of CIs that were discovered for each CI type.
<b>Filter</b>	The time range set with the <b>Set Time Range</b> button.
<b>Last updated</b>	The date and time that the statistics table was last updated for a particular job.
<b>Total</b>	The total number of CIs in each column.
<b>Updated</b>	The number of CIT instances that were updated in the period selected.




## Discovery Modules Pane

Enables you to view and manually manage modules and jobs. Each module includes the jobs necessary to discover specific CIs.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; Discovery Modules/Jobs tab.</b>
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User interface elements are described below:





UI Element (A–Z)	Description
	<b>Refresh All.</b> Updates the modules.
	<b>Search for Discovery Job.</b> Click to open the <b>Find Jobs</b> dialog box. For example, to search for all jobs that discover SNMP connections, in the <b>Find Jobs</b> dialog box, enter <b>SNMP</b> in the <b>Name</b> box and click <b>Find All</b> . For details, see " <a href="#">Find Jobs Dialog Box</a> " on page 235.
	<b>Activate Selected Discovery Jobs.</b> You can run one job or several jobs in a module, and one or several modules.  Select the jobs or modules and click <b>Activate</b> .
	<b>Deactivate Selected Discovery Jobs.</b> Select the jobs or modules to be stopped and click <b>Deactivate</b> .
	Represents the module root.  To create a module, right-click to enter the name of the module you are creating.  <b>Note:</b> A name is case sensitive. Names beginning with an upper case letter appear in the Discovery Modules list before names beginning with a lower case letter.
	Represents a module.  <ul style="list-style-type: none"> <li> . Indicates that some of a module's jobs are activated.</li> </ul> <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;">  </div> <ul style="list-style-type: none"> <li> . Indicates that all of a module's jobs are activated.</li> </ul> <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;">  </div>
	Represents a job.

UI Element (A–Z)	Description
	<ul style="list-style-type: none"><li>• . Indicates that the job is active.</li><li>• . Indicates that the job is paused.</li></ul> <p>To view an adapter description, hold the pointer over the icon.</p> <p>Jobs contain configuration information derived from adapters and other resources and are the entities controlled by users, for example, when activating or deactivating a module.</p> <p>For details on the right-click menu, see <a href="#">"Right-Click Menu" on next page</a>.</p>
	<p>An exclamation mark signifies that one or more of the jobs is experiencing a problem that could affect the discovery process, for example, a protocol connection failure.</p> <p>To view the reason for the problem, click the <b>(show errors)</b> link in the Discovery Status pane. For details, see <a href="#">"Failed" on page 218</a>.</p> <p><b>Note:</b> If a problem is resolved by clicking the <b>Refresh All</b> button, the Problem Indicator disappears.</p>



## Right-Click Menu

UI Element (A–Z)	Description
 <b>Activate</b>	<p><b>Module:</b> Runs the jobs in the selected module.</p> <p><b>Job:</b> Runs the selected jobs</p> <p>The Discovery Module discovers CITs and relationships of the types that are described in each job, and places them in the CMDB. For example, the Class C IPs by ICMP job discovers the <b>Dependency</b>, <b>IpAddress</b>, and <b>Membership</b> CITs and relationships.</p>
 <b>Clear Probe Results Cache</b>	<p>Clears the job's results cache on the probes.</p> <p><b>Note:</b> If a job's results cache is cleared, all discovery results are sent again the next time the job runs</p>
 <b>Content Help</b>	<p>Opens the Help document related to the selected job's adapter.</p> <p>To update or modify this document, see "<a href="#">Adapter Definition Tab</a>" on page 89.</p> <p>To see the full <i>HP Universal CMDB Discovery and Integration Content Guide</i>, select <b>Help &gt; Discovery and Integrations Content Help</b>.</p>
 <b>Create New &gt; Job</b>	<p>Opens the Create New Discovery Job dialog box, enabling you to create a job. For details, see "<a href="#">Create New Discovery Job Dialog Box</a>" on page 207.</p>
 <b>Create New &gt; Module</b>	<p>Enables you to define a new name for the module root.</p> <p><b>Note:</b> Module names must be limited to a length of 50 characters.</p>
 <b>Deactivate</b>	<p><b>Module:</b> Stops the running jobs in the selected module.</p> <p><b>Job:</b> Stops the selected running jobs.</p> <p><b>Note:</b> To stop all the running jobs simultaneously, right-click the <b>Discovery Modules</b> root folder and click <b>Deactivate all jobs</b>.</p>
 <b>Delete</b>	<p>Enables you to delete the selected module.</p> <p><b>Caution:</b> Only administrators with an expert knowledge of the Universal Discovery process should delete modules.</p>
 <b>Delete job</b>	<p>Enables you to delete the selected job.</p>
 <b>Edit Scheduling</b>	<p>Opens the <b>Discovery Scheduler</b> to define a schedule for the selected job.</p>
<b>Edit Script</b>	<p>Enables you to select and edit one of the selected job's scripts.</p>


UI Element (A–Z)	Description
 <b>Go to adapter</b>	Opens the details of the selected adapter in the Adapter Management module, enabling you to view and edit its definition.
<b>Move to</b>	Enables you to move the selected module folder or job to a different folder.
 <b>Pause</b>	<p>Click to pause an active job.</p> <p>To pause all active jobs simultaneously, right-click the <b>Discovery Modules</b> root folder and click <b>Pause jobs</b>.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>When you pause an active job: <ul style="list-style-type: none"> <li>triggers that are currently running continue to run until they are finished</li> <li>all the execution information is retained, including errors</li> </ul> </li> <li>Jobs are paused based on their defined job execution policies. For details, see "<a href="#">Job Execution Policies</a>" on page 23.</li> </ul>
<b>Rename</b>	<p>Enables you to enter a new display name for the selected module.</p> <p><b>Available:</b> When you right click a module</p>
<b>Rename Job</b>	<p>Opens the <b>Rename Job</b> dialog box, enabling you to enter a new display name for the job.</p> <p><b>Note:</b> You cannot rename active jobs.</p> <p><b>Available:</b> When you right click a job</p>
<b>Rerun Discovery</b>	Reruns the selected job using the selected Trigger CIs.
 <b>Resume</b>	<p>Enables you to resume a paused job.</p> <p>To resume all paused jobs simultaneously, right-click the <b>Discovery Modules</b> root folder and click <b>Resume jobs</b>.</p>
 <b>Save as...</b>	Enables you to clone the selected job.

## Discovery Permissions Window

Enables you to view permissions data for jobs.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; Discovery Module/Jobs tab.</b> Select a job. Locate the <b>Discovery Job Details</b> pane in the <b>Details</b> tab. Click the <b>View Permissions</b> button.
<b>See also</b>	<ul style="list-style-type: none"> <li>"<a href="#">Viewing Permissions While Running Jobs</a>" on page 188</li> <li>"<a href="#">Adapter Definition Tab</a>" on page 89</li> <li>"<a href="#">Permission Editor Dialog Box</a>" on page 114</li> </ul>

User interface elements are described below:


UI Element (A-Z)	Description
	Export a permission object in Excel, PDF, RTF, CSV, or XML format. For details, see "Browse Views Mode" in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Objects and Parameters</b>	The commands that appear in the relevant Jython scripts.
<b>Operation</b>	The action that is being run.
<b>Permission</b>	The name of the protocol as defined for the job.
<b>Usage Description</b>	A description of how the protocol is used.

## Discovery Scheduler Dialog Box

Enables you to define a schedule for a specific job, for example, every day Data Flow Management starts running an IP ping sweep on class C networks at 6:00 AM.

<b>To access</b>	<ul style="list-style-type: none"> <li>Right-click a job and choose <b>Edit scheduling</b>.</li> <li>Click the <b>Edit Scheduler</b> button in the <b>Discovery Scheduler</b> pane of the <b>Properties</b> tab in the <b>Discovery Control Panel</b> window.</li> </ul>
<b>Important Information</b>	<ul style="list-style-type: none"> <li>The <b>Discovery Scheduler</b> defines the frequency of the discovery (daily, monthly) whereas the time template defines when the job should run (during the day, at night, at weekends only). You can run the same schedule with different time templates. For example, you can define a schedule that runs every day and you can define a time template that runs at night from 01:00 AM to 05:00 AM. A job defined in this way runs every day from 01:00 AM to 05:00 AM. You can define a second time template to run at a different time, and you also can use this time template with the same schedule.</li> <li>If you change a schedule for a job, DFM next runs the job according to the following calculation: The current date and time plus the selected interval. For example, if you choose <b>Once</b>, the Invocation Time is in one hour.</li> </ul> <p>For details on creating a time template, see "Edit Time Template Dialog Box" on page 235.</p>

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
	Click to validate the Cron expression you entered.
<Days of month>	(Displayed when you select <b>Monthly</b> .) Click the button to choose the days of


UI Element (A–Z)	Description
	<p>the month on which the action must run. The Select Days dialog box opens. Choose the required days by selecting the check boxes. You can select multiple days.</p> <ul style="list-style-type: none"> <li>• <b>Select all.</b> Select all the days.</li> <li>• <b>Unselect all.</b> Clear all the selected days.</li> </ul>
<Days of the week>	(Displayed when you select <b>Weekly</b> .) Select the day or days on which the action should run.
<Frequency>	<ul style="list-style-type: none"> <li>• <b>Once.</b> Define the task to run only once. (</li> <li>• <b>Interval.</b> Defines the interval between successive runs.</li> <li>• <b>Daily.</b> Run a task on a daily basis.</li> <li>• <b>Weekly.</b> Run a task on a weekly basis.</li> <li>• <b>Monthly.</b> Run a task on a monthly basis.</li> <li>• <b>Cron.</b> Enter a Cron expression in the correct format.</li> </ul>
<Months of the year>	(Displayed when you select <b>Monthly</b> .) Select the month or months in which the action must run.
<b>End by</b>	<p>Select the date and time when the action should stop running by selecting the <b>End by</b> check box, opening the calendar, selecting the date and time, and clicking <b>OK</b>.</p> <p><b>Note:</b> This step is optional. If you do not need to specify an ending date, leave the <b>End by</b> check box cleared.</p>
<b>Invocation hour</b>	<p>(Displayed when you select <b>Daily</b>, <b>Weekly</b>, or <b>Monthly</b>.) Select the time to activate the action. Click the button to open the <b>Select Hours</b> dialog box. Choose the required time by selecting the check boxes. You can select multiple times.</p> <ul style="list-style-type: none"> <li>• <b>Select all.</b> Select all the times.</li> <li>• <b>Unselect all.</b> Clear all the selected times.</li> </ul> <p><b>Note:</b> You can also enter the time manually in the <b>Invocation hour</b> box. Separate times by a comma and enter <b>AM</b> or <b>PM</b> after the hour. The manually entered action times are not restricted to the hour and half hour only: you can assign any hour and minute combination. Use the following format: <b>HH:MM AM</b>, for example, <b>8:15 AM</b>, <b>11:59 PM</b>.</p>
<b>Invocation Time</b>	(Displayed when you select <b>Once</b> .) Choose the date and time the action should begin running by opening the calendar and choosing a date and time, or accept the default.
<b>Repeat every</b>	(Displayed when you select <b>Interval</b> .) Type a value for the interval between successive runs and choose the required unit of time (minutes, hours, or days).

UI Element (A–Z)	Description
	<b>Note:</b> After each change, the next time that the job runs is the current time plus the interval, that is, the job does not start immediately.
<b>Start at</b>	Choose the date and time when the action must begin running by selecting the <b>Start at</b> check box, opening the calendar, selecting the date and time, and clicking <b>OK</b> .
<b>Time zone</b>	Select the time zone according to which the Probe must schedule jobs.  The default is << <b>Data Flow Probe Time Zone</b> >>: the Probe uses its own system-defined time zone. This enables scheduling to take place at different times in different geographical locations.  For all Probes to start working at the same time, select a specific time zone. (This assumes that the Probes' system date/time and time zone are correctly configured.)

## Discovery Troubleshooter Wizard

The Discovery Troubleshooter allows you to troubleshoot for running software CIs that do not show up when you run an activity on the Management Zone. This is useful for customers who are running activities for discovering running software, and they see that the running software is not found.

This wizard page allows you to initiate the Discovery Troubleshooter.

<b>To access</b>	Select a Management Zone in the Management Zones tree structure on the left and click the <b>Troubleshooting button</b>  .
<b>Important information</b>	<ul style="list-style-type: none"> <li>• The Discovery Troubleshooter wizard can be activated only within the context of a Management Zone.</li> <li>• The Discovery Troubleshooter wizard can be run on a Management Zone only after the Infrastructure and Basic Software Configuration Discovery activities have been run on that Management Zone.</li> <li>• If any discovery activities are still running when you start this wizard, the <b>Wait for Jobs</b> screen appears after clicking Next in the first screen of this wizard. If the <b>Wait for Jobs</b> screen appears, wait until the activities finish and then continue with the wizard.</li> </ul>
<b>Relevant tasks</b>	"Zone-Based Discovery Workflow" on page 189
<b>Wizard map</b>	The Discovery Troubleshooter Wizard contains:  "Discovery Troubleshooter Wizard" above > "Activity Instances Mapping Page" on next page > "Target Host Page" on next page > "Additional Information Is Required Page" on page 231 > "Investigate Missing Node CI Page" on page 232 > "Retrieve Running Software CIs Page" on page 233

<b>See also</b>	<ul style="list-style-type: none"> <li>• "Discovery Troubleshooter" on page 187</li> <li>• "Universal Discovery Overview" on page 184</li> <li>• "Zone-Based Discovery Tab" on page 246</li> </ul>
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## Activity Instances Mapping Page

This wizard page allows you to select a Discovery Activity Instance associated with the Management Zone on which you are running the Troubleshooter.

<b>Important information</b>	This wizard page only appears if you have more than one Infrastructure or Basic Software Configuration Discovery activity associated with the Management Zone.
<b>Wizard map</b>	<p>The Discovery Troubleshooter Wizard contains:</p> <p>"Discovery Troubleshooter Wizard" on previous page &gt; "Activity Instances Mapping Page" above &gt; "Target Host Page" below &gt; "Additional Information Is Required Page" on next page &gt; "Investigate Missing Node CI Page" on page 232 &gt; "Retrieve Running Software CIs Page" on page 233</p>

User interface elements are described below:

UI Element (A-Z)	Description
<b>Activity Type</b>	Lists the types of Discovery Activities that are prerequisites for running the Troubleshooter. Currently, only Infrastructure and Basic Software Configuration Discovery activity types are listed here.
<b>Activity Instance</b>	Lists the instances of the Activity Type. If there is more than one instance, they are listed in a drop-down menu.
<b>Troubleshooter Log</b>	This log lists all actions performed by the Troubleshooter that occur in the background and do not appear in the user interface.

## Target Host Page

This wizard page allows you to enter the name or IP address of the host that you want to discover.

<b>Important information</b>	<ul style="list-style-type: none"> <li>• The name or IP address that you enter in this page should be within the range of at least one of the probes in the Management Zone. If it is not, an error message appears.</li> <li>• After clicking Next on this page, the <b>Validate</b></li> </ul>
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	<p><b>Target Host IP Address</b> page appears. Wait briefly while the Discovery Troubleshooter validates the target host IP address. If the target host you entered is not within the range of the Management Zone, the <b>Validate Target Host IP Address</b> page offers you an option to choose a different target host, or close the wizard. If you choose a different target host, the <b>Target Host</b> page appears again.</p> <ul style="list-style-type: none"> <li>Once an IP address is defined, the Discovery Troubleshooter checks if a CI exists for that IP. If no CI exists, the Discovery Troubleshooter automatically creates a CI for that IP address.</li> </ul>
<p><b>Wizard map</b></p>	<p>The Discovery Troubleshooter Wizard contains:</p> <p>"Discovery Troubleshooter Wizard" on page 229 &gt; "Activity Instances Mapping Page" on previous page &gt; "Target Host Page" on previous page &gt; "Additional Information Is Required Page" below &gt; "Investigate Missing Node CI Page" on next page &gt; "Retrieve Running Software CIs Page" on page 233</p>

User interface elements are described below:

UI Element (A-Z)	Description
<p><b>Target host:</b></p>	<p>Enter here the name or IP address of the host that you want to discover.</p>
<p><b>Troubleshooter Log</b></p>	<p>This log lists all actions performed by the Troubleshooter that occur in the background and do not appear in the user interface.</p>

## Additional Information Is Required Page

This wizard page allows you to select a method for detecting the target host.

<b>Important information</b>	<ul style="list-style-type: none"> <li>• After clicking <b>Next</b> in this page, the Discovery Troubleshooter attempts to activate a specific job. If this job is not active, a message appears stating that the job is about to be activated and that if you activate it, this may invoke the job on all potential trigger CIs that are relevant to this job.</li> <li>• After clicking <b>Next</b> in this page, the <b>Discovery Progress</b> screen appears and informs you that Discovery is currently running.</li> </ul>
<b>Wizard map</b>	<p>The Discovery Troubleshooter Wizard contains:</p> <p>"Discovery Troubleshooter Wizard" on page 229 &gt;          "Activity Instances Mapping Page" on page 230 &gt;          "Target Host Page" on page 230 &gt; "Additional Information Is Required Page" on previous page &gt;          "Investigate Missing Node CI Page" below &gt;          "Retrieve Running Software CIs Page" on next page</p>

User interface elements are described below:

UI Element (A-Z)	Description
<b>Select detection method for the requested host:</b>	Discovery uses detection methods to communicate with the remote machine. Choose from one of the following detection methods: WMI, Shell, Power Shell, SNMP.
<b>Troubleshooter Log</b>	This log lists all actions performed by the Troubleshooter that occur in the background and do not appear in the user interface.

## Investigate Missing Node CI Page

This wizard page lists errors found if the Troubleshooter does not succeed in connecting to the host, and offers options for trying to resolve those errors.

<b>Important information</b>	This page only appears if the Troubleshooter does not succeed in connecting to the host.
<b>Wizard map</b>	<p>The Discovery Troubleshooter Wizard contains:</p> <p>"Discovery Troubleshooter Wizard" on page 229 &gt;          "Activity Instances Mapping Page" on page 230 &gt;          "Target Host Page" on page 230 &gt; "Additional Information Is Required Page" on previous page &gt;          Investigate Missing Node CI Page &gt; "Retrieve Running Software CIs Page" on next page</p>

User interface elements are described below:



UI Element (A-Z)	Description
<error messages>	<p>Various error messages can occur when running the Troubleshooter.</p> <p>One of the more common types of error messages is <b>Permission Denied</b>. This error occurs if there is a problem with the user credentials. You can attempt to fix this error by clicking <b>Fix</b> by the error message. If you do this, the <b>Update Credentials</b> dialog box appears, and you can update the user credentials as explained in "<a href="#">Data Flow Probe Setup Window - Details Pane</a>" on page 40, "<a href="#">[Protocol] Pane</a>" on page 44. After updating user credentials, you should choose <b>Rerun relevant discovery job to find missing CI</b> in this wizard page and continue with the wizard.</p>
<b>Rerun relevant discovery job to find missing CI</b>	<p>Choose this option if you see an error in the list for which rerunning a job might help (for example, a timeout error). If you choose this option, the <b>Discovery Progress</b> screen appears.</p>
<b>Choose a different detection method to find missing CI</b>	<p>If you choose this option, the wizard returns to the "<a href="#">Additional Information Is Required Page</a>" on page 231</p>
<b>Close the Troubleshooter and save support log</b>	<p>Choosing this option exits the wizard and saves the log file to a location on the server machine (the exact location is indicated on the page that follows).</p>
<b>Troubleshooter Log</b>	<p>This log lists all actions performed by the Troubleshooter that occur in the background and do not appear in the user interface.</p>

## Retrieve Running Software CIs Page

This wizard page lists all running software that is currently listed as connected to the detected Node CI.

<b>Wizard map</b>	<p>The Discovery Troubleshooter Wizard contains:</p> <p>"<a href="#">Discovery Troubleshooter Wizard</a>" on page 229 &gt; "<a href="#">Activity Instances Mapping Page</a>" on page 230 &gt; "<a href="#">Target Host Page</a>" on page 230 &gt; "<a href="#">Additional Information Is Required Page</a>" on page 231 &gt; "<a href="#">Investigate Missing Node CI Page</a>" on previous page &gt; "<a href="#">Retrieve Running Software CIs Page</a>" above</p>
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User interface elements are described below:

UI Element (A-Z)	Description
<b>Yes, the CI was discovered</b>	Check this option if the running software CI that you are looking for is in the list, or just close the Troubleshooter since you have successfully completed troubleshooting.
<b>No, the CI is still missing</b>	<p>Check this option if the running software CI that you are looking for is not in the list. If you choose this option, the <b>Software Identification Rules Management</b> screen appears, and you can continue the search for the missing CI as followings:</p> <ul style="list-style-type: none"> <li>• In the <b>Software Identification Rules Management</b> screen, update the available application signatures as explained in "<a href="#">Software Identification Rule Editor Dialog Box</a>" on page 121.</li> <li>• The Troubleshooter then attempts again to find the missing CI (by re-running its corresponding job) and this wizard page appears with a potentially more extensive list of all running software that is connected to the detected Node CI.</li> <li>• If the running software CI that you are looking for is still not in the list, select again <b>No, the CI is still missing</b>, and the <b>Additional Information Is Required</b> page appears (see below).</li> </ul>
<b>Additional Information Is Required page</b>	<p>If after updating the available application signatures the Troubleshooter still does not find the missing CI, this page appears. You can choose either <b>Update software identification rules and rerun discovery</b> or <b>Close the Troubleshooter and save support log</b>.</p> <p>If you choose <b>Update software identification rules and rerun discovery</b>, the <b>Software Identification Rules Management</b> screen appears again and you can continue to update the software identification rules.</p>
<b>Troubleshooter Log</b>	This log lists all actions performed by the Troubleshooter that occur in the background and do not appear in the user interface.


## Edit Probe Limitation for Query Output Dialog Box

Enables you to change the Probes on which a Trigger query is running. For details on selecting the Probes, see "[Selecting Probes](#)" on page 54.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; &lt;selected job&gt; &gt; Properties tab &gt; Trigger Queries pane &gt; Probe Limit column &gt;  .</b>
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## Edit Time Template Dialog Box

Enables you to define a time template to use when scheduling jobs.

<b>To access</b>	Use one of the following: <ul style="list-style-type: none"><li>• Click the <b>Add</b> button in the Time Templates dialog box.</li><li>• In the Time Templates dialog box, select a time template and click .</li></ul>
<b>Important Information</b>	The name of the time template must be unique.
<b>See also</b>	"Discovery Scheduler Dialog Box" on page 227

User interface elements are described below:


UI Element (A–Z)	Description
<b>Every day between</b>	Define a daily schedule when a job must run. You can also type in times. You can assign any hour and minute combination.
<b>Time Template name</b>	Enter a unique name.
<b>Week Time</b>	Define a weekly schedule when a job must run. Select this option to select a time in the Time Definition grid. To select adjacent cells in the grid, click and drag the pointer over the grid. To clear a time, click a cell in the grid a second time.

## Find Jobs Dialog Box

Enables you to search for jobs answering to specific criteria. The results of the search are displayed in the Selected Items pane in the Details tab.


<b>To access</b>	Click the <b>Search for Discovery Jobs</b>  button in the Discovery Modules pane.
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User interface elements are described below:





UI Element (A–Z)	Description
<b>Direction</b>	Searches forwards or backwards through the modules.
<b>Find All</b>	All jobs meeting the search criteria are highlighted.
<b>Find Discovery job by</b>	Choose between: <ul style="list-style-type: none"> <li>• <b>Name.</b> Enter the name of the job or part of it.</li> <li>• <b>Input type.</b> CIs that triggered the job. Click the  button to open the CI type list. Locate the CI type that you are searching for.</li> <li>• <b>Output type.</b> CIs that are discovered as a result of the activated job.</li> </ul>
<b>Find Next</b>	The next job meeting the search criteria is highlighted.




## New/Edit Management Zone Dialog Box

This dialog box enables you to create or edit a Management Zone.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; Zone-Based Discovery tab &gt; Click New button</b> 
<b>Important information</b>	You must have at least one Data Flow Probe set up to create a Management Zone.
<b>Relevant tasks</b>	<a href="#">"Zone-Based Discovery Workflow" on page 189</a>
<b>See also</b>	<ul style="list-style-type: none"> <li>• <a href="#">"Universal Discovery Overview" on page 184</a></li> <li>• <a href="#">"Zone-Based Discovery Tab" on page 246</a></li> <li>• <a href="#">"Zone-Based Discovery Workflow" on page 189</a></li> <li>• <a href="#">"Discovery Troubleshooter" on page 187</a></li> </ul>

User interface elements are described below:

UI Element	Description
	<b>Add Probe.</b> Click this button to add a probe to the Management Zone (you must first select the probe in the <b>Non-selected Probes</b> column).
	<b>Remove Probe.</b> Click this button to remove a probe from the Management Zone (you must first select the probe in the <b>Selected Probes</b> column).
	<b>Add All.</b> Click this button to add all the probes listed in the <b>Non-selected Probes</b> column to the Management Zone.
	<b>Remove All.</b> Click this button to remove all the probes listed in the <b>Selected Probes</b> column from the Management Zone.

UI Element	Description
	<p><b>Open Data Flow Probe Setup.</b> Click this button to change the IP range of a probe (you must first select the probe from the Domains and Probes tree structure on the left). This button appears only if you select <b>Define partial IP ranges on probes</b>.</p> <p>Clicking this button opens the <b>Edit Probe Configuration</b> dialog box. For instructions on how to edit probe configuration, see "<a href="#">Data Flow Probe Setup Window - Details Pane</a>" on page 40 "<a href="#">Details Pane (Probe)</a>" on page 42 and "<a href="#">Ranges Pane</a>" on page 46.</p>
	<p><b>Select IP Range.</b> Click this button to select the sub-ranges you want to include or exclude from the full probe range (you must first select the probe from the Domains and Probes tree structure on the left). This button appears only if you select <b>Define partial IP ranges on probes</b>.</p> <p>Clicking this button opens the Select IP Range window. In the Select IP Range window, you can select multiple sub-ranges by pressing the Ctrl key and clicking on sub-ranges with the mouse. If a sub-range has more than one excluded section, you cannot choose to exclude only one section. If you choose to exclude only one section, all sections will be excluded.</p>
	<p><b>Delete IP Range.</b> Click this button to delete a sub-range from the Management Zone. This button appears only if you select <b>Define partial IP ranges on probes</b>, and is active only if you have previously added at least one sub-range of the probe to the Management Zone.</p> <p>Clicking this button deletes the sub-range from the Management Zone, but not from the probe.</p>
<b>Name</b>	The name of the Management Zone. <b>This field is mandatory.</b> You can enter only alphanumeric characters (a-z, A-Z, 0-9), hyphens (-), underscores ( _ )and spaces.
<b>Description</b>	The description of the Management Zone. This field is optional. This description appears in the Details table in the right pane after creating the Management Zone.
<b>IP Ranges</b>	<ul style="list-style-type: none"> <li>• Select <b>Use full probe ranges</b> if you want to perform Discovery using the ranges that have already been defined for the probe(s).</li> <li>• Select <b>Define partial IP ranges on probes</b> if you want to select a sub-range(s) from the ranges defined for the probe(s).</li> </ul> <p>By default, <b>Use full probe ranges</b> is selected.</p> <p><b>Note:</b> If you bind a probe to the Management Zone with <b>Use full probe ranges</b>, any future changes to the probe range will be applied to the Management Zone.</p>
<b>All Data Flow Probes</b>	Check this option to bind the entire list of available probes (all probes of all domains defined in the system) to the Management Zone. If you check this option, any additions or deletions to the available probes in the future will be applied to the Management Zone. The difference between this option and

UI Element	Description
	clicking the <b>Add All</b> button (described below) is that if you click the <b>Add All</b> button, this will not apply to the Management Zone any changes made in the future to the available probes in the system.
<b>Non-selected Probes column</b>	This column lists the available probes in the system that you have not selected for your Management Zone.
<b>Selected Probes column</b>	This column lists the available probes in the system that you have selected for your Management Zone.

## Properties Tab


Enables you to view and administer the properties of modules and jobs.



To access	Discovery Control Panel > Discovery Modules/Jobs tab > Properties tab
<b>Important Information</b>	<p>Depending which level you select in the <b>Discovery Modules</b> pane, different information is displayed in the <b>Properties</b> tab.</p> <p>If you select:</p> <ul style="list-style-type: none"> <li>• <b>The Discovery Modules root</b>, all active jobs are displayed with scheduling information. Click any of the columns to sort the list by that column. Right-click a job to edit its scheduling. For details, see "<a href="#">Discovery Scheduler Dialog Box</a>" on page 227.</li> <li>• <b>A Discovery module</b>, the <b>Description</b> and <b>Module Jobs</b> panes are displayed. To edit a description, make changes in the <b>Description</b> pane and click <b>OK</b>. See also "<a href="#">Module Jobs Pane</a>" below.</li> <li>• <b>A job</b>, the <b>Parameters</b>, <b>Trigger Queries</b>, <b>Global Configuration Files</b>, and <b>Discovery Scheduler</b> panes are displayed. For details, see below.</li> </ul>

### Module Jobs Pane

Enables you to view the active jobs for the selected module.

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Discovery Job to Module.</b> Opens the <b>Choose Discovery Jobs</b> dialog box where you can select jobs from more than one zip file. (Use the SHIFT or CTRL key to select several jobs.)

UI Element (A–Z)	Description
	<b>Remove Selected Discovery Job from Module.</b> Select the job and click the button. (No message is displayed. To restore the job, click the <b>Cancel</b> button.)
	<b>Show results as a map.</b> You can choose to view a map of the CIs and links that are discovered by the adapter, instead of a list. Click the button to open the <b>Discovered CITs Map</b> window. The selected adapter is shown together with its CIs and relationships. Hold the cursor over a CIT to read a description in a tooltip.
<Column title>	<ul style="list-style-type: none"> <li>Click a column title to change the order of the CITs from ascending to descending order, or vice versa.</li> <li>Drag a column head to a different location in the table columns.</li> <li>Right-click a column title to customize the table. Choose from the following options: <ul style="list-style-type: none"> <li><b>Hide Column.</b> Select to hide a specific column.</li> <li><b>Show All Columns.</b> Displayed when a column is hidden.</li> <li><b>Select Columns.</b> Select to display or hide columns and to change the order of the columns in the table. Opens the Columns dialog box.</li> <li><b>Auto-resize Column.</b> Select to change a column width to fit the contents. For details, see "<a href="#">Select Columns Dialog Box</a>" in the <i>HP Universal CMDB Modeling Guide</i>.</li> </ul> </li> </ul>
<List of jobs>	<p>All jobs included in the module. (Displayed when a specific module is selected in the <b>Discovery Modules</b> pane.)</p> <p>Right-click a row to open the <b>Discovery Scheduler</b> for the selected job. For details, see "<a href="#">Discovery Scheduler Dialog Box</a>" on page 227.</p>
<b>Invoke Immediately</b>	<ul style="list-style-type: none"> <li>A check mark signifies that the Discovery job runs as soon as the triggered CI reaches the Probe. In this case, the <b>Invoke on new triggered CIs immediately</b> check box is selected in the <b>Properties</b> tab.</li> <li>If this column does not contain a check mark, the job runs according to the schedule defined in the <b>Schedule Manager</b>.</li> </ul>
<b>Job Name</b>	<p>The name of the job and the package in which the job is included.</p> <p>(Displayed when a job is selected in the <b>Discovery Modules</b> pane.)</p>
<b>Schedule Information</b>	The scheduling information of the job as defined in the <b>Discovery Scheduler</b> .
<b>Trigger Queries</b>	The name of the query that activated the job.

### Parameters Pane

Enables you to override adapter behavior.

To view a description, hold the pointer over the parameter.

<b>To access</b>	Select a job in the <b>Discovery Modules</b> pane in the <b>Discovery Control Panel</b> window.
<b>Important Information</b>	You can override a default adapter parameter for a specific job, without affecting the default value.



User interface elements are described below:

UI Element (A–Z)	Description									
<b>Name</b>	The name given to the adapter.									
<b>Override</b>	<p>Select to override the parameter value in the adapter.</p> <p>When this check box is selected, you can override the default value. For example, to change the <b>protocolType</b> parameter, select the <b>Override</b> check box and change <b>MicrosoftSQLServer</b> to the new value. Click <b>OK</b> in the Properties tab to save the change:</p> <table border="1"> <thead> <tr> <th colspan="3">Parameters</th> </tr> <tr> <th>Override</th> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>protocolType</td> <td>MicrosoftSQLServer</td> </tr> </tbody> </table> <p>For details on editing parameters in the Adapter Parameters pane, see "<a href="#">Adapter Definition Tab</a>" on page 89.</p>	Parameters			Override	Name	Value	<input checked="" type="checkbox"/>	protocolType	MicrosoftSQLServer
Parameters										
Override	Name	Value								
<input checked="" type="checkbox"/>	protocolType	MicrosoftSQLServer								
<b>Value</b>	The value defined in the adapter.									




### Trigger Queries Pane

Enables you to define one or more queries to be used as triggers to activate the selected job.

User interface elements are described below:

UI Element (A–Z)	Description
	<b>Add Query.</b> You can add one or more non-default TQL queries to be used as triggers to activate the selected job. Click to open the <b>Choose Discovery Query</b> dialog box.
	<p><b>Remove Query.</b> Select the query and click the button.</p> <p>(No message is displayed. To restore the query, click the <b>Cancel</b> button.)</p> <p><b>Note:</b> If a query is removed for an active job, Discovery no longer receives new CIs coming from that query. Existing Trigger CIs that originally came from the query are</p>




UI Element (A–Z)	Description
	not removed.
	Click to add or remove Probes for a specific query. For details, see "Edit Probe Limitation for Query Output Dialog Box" on page 234.
	Click to open the <b>Trigger Query Editor</b> . For details, see "Trigger Query Editor Window" on page 243. <b>Available:</b> In the job's Properties tab only.
	Click to open the Modeling Studio. <b>Available:</b> In the job's Properties tab only.
<b>Probe Limit</b>	The Probes being used for the discovery process. To add or remove Probes, click the button.
<b>Query Name</b>	The name of the Trigger query that activates the job.

## Global Configuration Files Pane

Lists the global configuration files defined for the adapter used by the selected job.


User interface elements are described below:

UI Element (A–Z)	Description
	<b>Edit.</b> Opens the selected configuration file in an appropriate editor. For example, the file msServerTypes.xml opens the Script Editor.

## Discovery Scheduler Pane

Enables you to view information about the schedule set up for the selected job.

User interface elements are described below:

UI Element (A–Z)	Description
	Click to add times to the <b>Allow Discovery to run at</b> list. The <b>Time Templates</b> dialog box opens. To add a time template to the list, in the <b>Time Templates</b> dialog box, click the <b>Add</b> button to open the <b>Edit Time Template</b> dialog box. For details, see "Edit Time Template Dialog Box" on page 235.
<b>Allow Discovery to run at</b>	Choose a template that includes the days and times when the job should run.
<b>Edit</b>	Click to open the <b>Discovery Scheduler</b> . For details, see "Discovery Scheduler

UI Element (A–Z)	Description
<b>scheduler</b>	Dialog Box" on page 227.
<b>Invoke on new triggered CIs immediately</b>	<p>Enables the job to run as soon as the Trigger CI reaches the Probe.</p> <p>When this option is not selected, the job runs according to the schedule defined in the <b>Schedule Manager</b>.</p> <p><b>Note:</b> If this option is not selected and a job is running, new triggered CIs are not run by the job.</p> <p>Although new triggered CIs are not run, they are counted into the status bar. This means the status bar does not reach 100% completed, even though the job successfully completed, and the user has to wait until the next run of the job for the status bar to reach 100% completed.</p>

## Related CIs Window

Enables you to view, in map format, the CIs that are related to a selected CI.

<b>To access</b>	In the <b>Discovered CIs</b> dialog box, right-click a CIT and select <b>Get Related CIs</b> .
<b>Important Information</b>	Related CIs are CIs that are the parent, child, or sibling of an existing CI.

User interface elements are described below (unlabeled elements are shown in angle brackets):



UI Element (A-Z)	Description
<right-click menu>	For details, see "Shortcut Menu" in the <i>HP Universal CMDB Modeling Guide</i> .
<menu>	For details, see "Toolbar Options" in the <i>HP Universal CMDB Modeling Guide</i> .
<Topology Map>	For details, see "Topology Map Overview" in the <i>HP Universal CMDB Modeling Guide</i> .

## Show Results for Triggered CI Dialog Box

Enables you to view the results of running an ad-hoc request to the Probe. Discovery acquires the results by running the job on a selected Trigger CI. In the case of an error, a message is displayed.


<b>To access</b>	<b>Discovery Control Panel</b> , select a module or job, select the <b>Details</b> tab. In the <b>Discovery Status</b> pane, drill down to a CI, right-click it, and choose <b>Show Results for Triggered CI</b> .
------------------	--

User interface elements are described below:




UI Element (A-Z)	Description
	Select a CIT and click to display additional information in the <b>Show Results for Triggered CI</b> dialog box.
	Click to open a topology map showing a result map for the Triggered CI. Right-click a CIT to view its properties.

## Time Templates Dialog Box

Enables you to define a daily or weekly schedule to run selected jobs.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; Properties tab &gt; Discovery Scheduler pane &gt; Edit &gt; Time Template</b>  button
------------------	--

User interface elements are described below:

UI Element (A-Z)	Description
	Click to add a time template. Opens the <b>Edit Time Template</b> dialog box.
	Select a time template and click to delete.
	Select a time template and click to edit it. Opens the <b>Edit Time Template</b> dialog box.

## Trigger Query Editor Window

Enables you to edit a TQL query that has been defined to trigger jobs.

<b>To access</b>	<b>Data Flow Management &gt; Discovery Control Panel &gt; Properties tab &gt; Trigger Queries pane &gt; select a TQL query and click the Open the Query Editor</b> button
<b>Important Information</b>	A Trigger query associated with a job is a subset of the Input query, and defines which specific CIs should be the Trigger CIs for a job. That is, if an Input query queries for IPs running SNMP, a Trigger query queries for IPs running SNMP in the range 195.0.0.0-195.0.0.10.
<b>See also</b>	<ul style="list-style-type: none"> <li>"Trigger CIs and Trigger Queries" on page 20</li> <li>"Input Query Editor Window" on page 110</li> </ul>

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
<Panes>	<ul style="list-style-type: none"> <li>• "CI Type Selector Pane" below</li> <li>• "Editing Pane" below</li> <li>• "Information Pane" below</li> </ul>
Query Name	The name of the Trigger query that activates the job.

## CI Type Selector Pane

Displays a hierarchical tree structure of the CI Types found in the CMDB. For more details, see "[CI Type Manager User Interface](#)" in the *HP Universal CMDB Modeling Guide*.

**Note:** The number of instances of each CIT in the CMDB is displayed to the right of each CIT.

<b>Important Information</b>	To create or modify a TQL query, click and drag nodes to the Editing pane and define the relationship between them. Your changes are saved to the CMDB. For details, see " <a href="#">Add Query Nodes and Relationships to a TQL Query</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• "<a href="#">Define a TQL Query</a>" in the <i>HP Universal CMDB Modeling Guide</i></li> <li>• "<a href="#">Create a Pattern View</a>" in the <i>HP Universal CMDB Modeling Guide</i></li> </ul>

## Editing Pane

Enables you to edit the node selected in the **Trigger Queries** pane.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
<node>	Click to display information about the node in the information pane.
<right-click menu>	To view a list of icons, see " <a href="#">Shortcut Menu Options</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<Toolbar>	To view a list of icons, see " <a href="#">Toolbar Options</a> " in the <i>HP Universal CMDB Modeling Guide</i> .

## Information Pane

Displays the properties, conditions, and cardinality for the selected node and relationship.

<b>Important Information</b>	Hold the pointer over a node to view information:
------------------------------	---


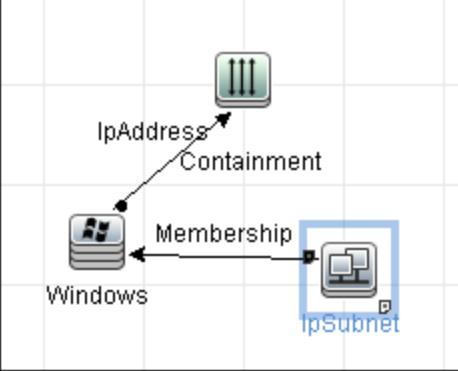
Element Name: WMI  
 CI Type: WMI  
 Visible: false  
 Cardinality: Composition (Node\_2, WMI) : 1..\*

A small green indicator is displayed next to the tabs that include information:

Cardinality \*  
 Containment (Node, IpAddress\_2) : 1..\*

User interface elements are described below:

UI Element (A-Z)	Description
<b>Attributes</b>	Displays the attribute conditions defined for the node or the relationship. For details, see " <a href="#">Attribute Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Cardinality</b>	Cardinality defines how many nodes you expect to have at the other end of a relationship. For example, in a relationship between host and IP, if the cardinality is 1:3, the query retrieves only those hosts that are connected to between one and three IPs. For details, see " <a href="#">Cardinality Tab</a> " in the <i>HP Universal CMDB Modeling Guide</i> .
<b>Details</b>	<ul style="list-style-type: none"> <li>• <b>CI Type.</b> The CIT of the selected node/relationship.</li> <li>• <b>Visible.</b> A tick signifies that the selected node or relationship is visible in the</li> </ul>

UI Element (A-Z)	Description
	<p>topology map. When the node/relationship is not visible, a box  is displayed to the right of the selected node/relationship in the Editing pane:</p>  <ul style="list-style-type: none"> <li>• <b>Include subtypes.</b> Display both the selected CI and its descendants in the topology map.</li> </ul>
<p><b>Edit button</b></p>	<p>To view information, select a node or relationship in the <b>Editing</b> pane, select the tab in the <b>Information</b> pane, and click the <b>Edit</b> button. For details on the <b>Node Condition</b> dialog box, see "Query Node/Relationship Properties Dialog Box" in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<p><b>Qualifiers</b></p>	<p>Displays the qualifier conditions defined for the node or the relationship. For details, see "Qualifier Tab" in the <i>HP Universal CMDB Modeling Guide</i>.</p>
<p><b>Selected Identities</b></p>	<p>Displays the element instances that are used to define what should be included in the query results. For details, see "Identity Tab" in the <i>HP Universal CMDB Modeling Guide</i>.</p>









## Zone-Based Discovery Tab







This tab enables you to:

- Create or edit a Management Zone
- Create and run a Discovery Activity on a Management Zone
- Reload Data
- Run the Discovery Troubleshooter on a Management Zone

<p><b>To access</b></p>	<p><b>Data Flow Management &gt; Discovery Control Panel &gt; Zone-Based Discovery tab</b></p>
<p><b>Important information</b></p>	<ul style="list-style-type: none"> <li>• You must have at least one Data Flow Probe set up to create a Management Zone.</li> <li>• This page includes a tree structure displaying all Management Zones and Discovery Activities that have been run on them.</li> </ul>

	<b>Note:</b> This tab is displayed by default when accessing the Discovery Control Panel.
<b>Relevant tasks</b>	"Zone-Based Discovery Workflow" on page 189
<b>See also</b>	<ul style="list-style-type: none"> <li>• "Universal Discovery Overview" on page 184</li> <li>• "New/Edit Management Zone Dialog Box" on page 236</li> <li>• "Discovery Troubleshooter" on page 187</li> <li>• "Discovery Troubleshooter Wizard" on page 229</li> </ul>

UI Element (A-Z)	Description
	<b>New.</b> Click this button to create a Management Zone or create and run a Discovery Activity on a Management Zone. For more information on creating a Management Zone see " <a href="#">New/Edit Management Zone Dialog Box</a> " on page 236, for more information on creating and running a Discovery Activity see <i>HP Universal CMDB Discovery and Integration Content Guide</i> .
	<b>Edit.</b> After you have created a Management Zone or Discovery Activity, click this button to make changes to it.
	<b>Delete.</b> Click this button to delete a Management Zone from the list of Management Zones that you created, or to delete a Discovery Activity from a Management Zone. If you delete a Management Zone, all activities associated with it are also deleted.
	<b>Reload Data.</b> Click this button to refresh the list of Management Zones and Discovery Activities.
	<b>Expand All.</b> Click this button to expand the Management Zone tree structure so that all Discovery Activities that have been run on Management Zones are listed.
	<b>Collapse All.</b> Click this button collapse the Management Zone tree structure so that only Management Zones (and no Discovery Activities) are displayed.
	<b>Troubleshoot Missing CIs.</b> If a CI is missing from the results of a Data Flow Probe and you expected to see it, click this button to run the Discovery Troubleshooter wizard and try to find the missing CI. This button is only active if a Management Zone is selected in the tree structure. The Troubleshooter can only be run on a Management Zone on which the Infrastructure and Basic Software Configuration Discovery activities have been run. For more information on Discovery Troubleshooter, see " <a href="#">Discovery Troubleshooter</a> " on page 187.
 <b>Clear Probe Results Cache</b>	Clears the activity's results cache on the probes.  <b>Note:</b> If an activity's results cache is cleared, all Discovery results are sent again the next time the activity runs.

UI Element (A-Z)	Description
	<p><b>Available:</b> When right-clicking on a Discovery Activity.</p>
<p><b>Management Zones pane</b></p>	<p>Displays the defined Management Zones and their activities.</p> <ul style="list-style-type: none"> <li>• . Represents the Management Zone root directory.</li> <li>• . Represents a Management Zone <ul style="list-style-type: none"> <li>▪ . Indicates that the activities in the Management Zone are activated.</li> <li>▪ . Indicates that the activities in the Management Zone are paused.</li> <li>▪ . Indicates that some of the activities in the Management Zone are activated and some are paused.</li> </ul> </li> <li>• . Represents an activated/paused activity in a Management Zone.</li> </ul>
<p><b>Right Pane: Details table</b></p>	<p>Appears at the top of the right pane.</p> <ul style="list-style-type: none"> <li>• <b>If a Management Zone is selected:</b> The table shows the Zone description, ranges method (either full or partial), and information on Probes in the Zone.</li> <li>• <b>If a Discovery Activity is selected:</b> The table shows the activity type, status (either Activated or Paused), and summary information on the activity. There are also buttons to pause and resume the activity.</li> </ul>
<p><b>Right Pane: Discovery Overview</b></p>	<p>Appears at the bottom of the right pane.</p> <ul style="list-style-type: none"> <li>• <b>If a Management Zone is selected:</b> This pane shows a Progress tab and a Statistics tab. In the Progress tab you can view the progress of all activities defined for the Management Zone. In the Statistics tab, you can view statistics of all activities defined for the Management Zone that are running or have finished running.</li> <li>• <b>If a Discovery Activity is selected:</b> This pane shows a Progress tab and a Statistics tab. In the Progress tab you can view the progress of the selected activity. In the Statistics tab, you can view statistics on the activity that is running or has finished running.</li> </ul>



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# Reconciliation

# Chapter 9

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## Entity Reconciliation

This chapter includes:

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## Reconciliation Overview

Reconciliation is the process of identifying and matching entities from different data repositories (for example, UCMDB Discovery, DDML, ticketing, or BSM). This process is designed to avoid duplicate CIs in UCMDB.

Many different data collectors can send CIs to UCMDB. In actuality, each different source might be providing information about the same CI. The reconciliation engine is responsible for identifying and matching entities from different data collectors and storing them, without duplicating CIs, in UCMDB.

Three main services provide support for the reconciliation engine:

- **Data Identification.** Responsible for comparing input CIs, according to reconciliation rules. For details, see ["Identification Service" on page 255](#).
- **Data In.** Responsible for inserting data into UCMDB. This service decides:
  - whether to merge data into existing CIs in UCMDB
  - whether to ignore input CIs in the case of multiple matches

For details, see ["Data In Service" on page 256](#).

- **Merge.** Responsible for merging CIs (used in Federation and Data In flows). Merging is done according to the reconciliation priority definitions. For details, see ["Merge Service" on page 259](#).

These services operate during reconciliation for inserting data from different sources into UCMDB, and during federation for connecting or merging information from different data repositories during TQL query calculations.

The reconciliation engine contains out-of-the-box identification and match criteria rules for most usable and problematic CITs, such as node, running software, and so on.

## Stable ID

UCMDB now generates stable IDs during CI creation. This means that the ID of the CI is no longer calculated from the CI's properties. This stable ID therefore remains the same when the name, attribute name, or property values (during normalization) change.

## Identification Configuration

The reconciliation engine uses XML configuration files that contain identification and match criteria to determine how CIs are identified during federation or data insertion. Configuration files for out-of-the-box CI types are provided when packages are deployed, but you can modify the provided files or create additional files. For details, see ["How to Create an Identification Rule Document" on page 259](#).

The following rules are used during reconciliation:

1. Identification criteria – a set of criteria that defines all possible conditions to find all candidate CIs for matching to a newly introduced CI.
2. Match criteria – There are two types of match criteria:
  - Match verification criteria – a set of criteria that are applied to all candidates left over after performing identification (in the previous step). Match verification ends successfully only when all applied verification criteria are true or NA (missing data).
  - Match validation criteria – an ordered set of criteria that are applied to all candidates left over after performing match verification. For each criterion, the following results are possible:
    - a true result implies a match
    - a false result implies no match
    - NA (missing data) causes reconciliation to proceed to the next criterion. If all validation criterion are NA, then the all candidates left after match verification will be implied as matched.

**See also:**

- ["Identification and Match Criteria Configuration" below](#)
- ["Examples of Identification Configuration" on page 253](#)

## Identification and Match Criteria Configuration

Due to the discovery method (local or remote), the available credentials (for example, remote access to SNMP or WMI), and specific system security settings (for example, the system responds to a ping), an integration point may have access to only a limited set of attributes when identifying a CI. For example, IP range discovery detects two IP addresses (10.12.123.101 and 16.45.77.145), and creates two nodes. However, detailed system discovery may detect that those two IP addresses are actually configured on two network interfaces in the same node.

This means that you cannot always rely on a single matching set of attributes for identification – other possible attributes that can potentially help to identify the CI should also be listed. In the previous example, the node identification attributes can be the IP address and the network

interface. If you use the IP address to identify the CI, you see that all three discovered nodes are the same node.

However, suppose that detailed system discovery detects a node with IP address 10.12.123.101 and network interface MAC1. At some point, that node was shut down, and the same IP address (10.12.123.101) was given to another node with network interface MAC2. These two nodes have the same IP address; however, it is obviously not the same CI. Performing match validation on the network interface data helps us to realize that it is not the same node.

The identification criteria are used to select candidates, and the match criteria are used to approve the identification result or dismiss it. For example, while handling input CI A, we may get identification candidates B and C, and the match criteria will dismiss B. In that case, we are left with C, which means that A is identified as C.

### Identification Criteria

Data that the reconciliation engine receives from different data sources may contain different subsets of the attributes (topology) necessary for identifying a CI. The identification criteria should contain all potential attributes on which CI matching can be done.

#### Specifications

Each identification criterion defines a potential condition for CI matching. The criterion can be an attribute such as node name, or topology such as IP address. A criterion may contain two or more conditions, to create a more complex matching rule. It may also contain different condition operators such as equals or contains, or it may contain some master value that defines a value in the CI that will always allow a match.

During the identification process, all identification criteria are running to find all candidate CIs for matching.

#### Possible Node Identification Criteria

- HW ID
- Network interface (containing a condition operator)
- Node name
- IP address (containing a condition operator)

### Match Criteria

While identification criteria list all potential attributes for matching the data, match criteria contain the attributes that are essential for matching CIs, if any exist. This means that if two CIs are marked as candidates to be matched by the identification criteria, the match criteria will check if the data exists in both CIs in order to match the condition.

Match criteria are also used during the Data In process in case of multiple matches, to make the decision to merge CIs from the CMDB. The CIs are merged only if the match criteria are satisfied. If one of the CIs does not satisfy the match criteria, the merge is not performed.

#### Specifications

A match criterion is satisfied if two candidate CIs have the same essential data (as defined in the that criterion), the data matches the condition, or if at least one of the CIs has no essential data.

Match criteria can be divided into two categories:

- Match verification criteria – if the verification criterion is not satisfied on two candidate CIs, these CIs are not matched.
- Match validation criterion – if the criterion with higher priority is satisfied (without missing data) on two candidate CIs, the validation criterion with lower priority is even not checked and the CIs are marked as matched. Similarly, if the validation criterion with higher priority is refuted on two candidate CIs, the criterion with lower priority is even not checked and the CIs are marked as not matched.

**Possible Node Match Criteria**

- Match verification criteria uses the discovered OS data for verification. This means that if two nodes have discovered OS data and this data does not match, these two nodes are not matched.
- Match validation criteria (ordered from highest to lowest priority):
  - Network interface with a **contains** operator
  - Node name with an **equals** operator
  - HW ID with an **equals** operator

This means that if two nodes with the same HW ID are discovered, they are marked as matched even if they have different network interfaces or node names. On the other hand, if the discovered HW IDs on the nodes are not the same, the nodes are not marked as matched even if the network interfaces and node names are the same. The network interface rule is checked only if one of the nodes has no discovered HW ID.

## Examples of Identification Configuration

**Sample "vlan" CI Type Identification Configuration**

```
<identification-config type="vlan">
  <identification-criteria>
    <identification-criterion>
      <attribute-condition attributeName="vlan_id"/>
      <connected-ci-condition ciType="physical_port"
linkType="membership">
        <overlap-fixed-operator number-of-matches="1"/>
      </connected-ci-condition>
    </identification-criterion>
  </identification-criteria>
</identification-config>
```

**Sample "Installed Software" CI Type Identification Configuration**

```
<identification-config type="installed_software" xmlns:xsi=
"http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
```

```
"C:\StarTeam\UCMDB\mam\ws\assets\dc\backend\reconciliation\src\main\
resources\schema\reconciliation.xsd"
    description="Installed Software is identified by a
combination of their
container Node and either its Name or DML Product Name.
Two similarly identified installed software will be considered
different
entities in case of mismatch of either File System Path, DML
Product Name or
its Name.">
    <identification-criteria>
        <identification-criterion>
            <attribute-condition attributeName="dml_product_name"/>
            <attribute-condition attributeName="root_container"/>
        </identification-criterion>
        <identification-criterion>
            <attribute-condition attributeName="name"/>
            <attribute-condition attributeName="root_container"/>
        </identification-criterion>
    </identification-criteria>
    <match>
        <verification-criteria>
            <verification-criterion>
                <attribute-condition attributeName="file_system_
path"/>
            </verification-criterion>
        </verification-criteria>
        <validation-criteria>
            <validation-criterion priority="1">
                <attribute-condition attributeName="dml_product_
name"/>
            </validation-criterion>
            <validation-criterion priority="2">
                <attribute-condition attributeName="name"/>
            </validation-criterion>
        </validation-criteria>
    </match>
</identification-config>
```

## Reconciliation Services

This section includes:

- ["Identification Service" on next page](#)
- ["Data In Service" on page 256](#)
- ["Merge Service" on page 259](#)

## Identification Service

The Identification service uses identification rules to identify CIs. An identification rule is composed of three criterion sets:

- Identification criteria – for two CIs to be the same, one of these criteria must be satisfied.
- Match verification criteria – for two CIs to be the same, all the criteria must be satisfied, or there is not enough information to evaluate all of the criteria.
- Match validation criteria – for two CIs to be the same, one validation criterion must be satisfied, or there is not enough information to evaluate all of the criteria.

When trying to determine whether or not two CIs are the same (according to the identification rule), each criterion is evaluated. Each criterion, in one of above sections, contains one or more conditions. There are two types of conditions:

- Attribute conditions – tests whether or not two CIs have the same value (or same value while ignoring case) of the given attribute define for the condition.
- Connected CI conditions – tests whether or not the two CIs share the given amount of connected CIs defined for the condition.

For a criterion to evaluate to a `true` value, all of the conditions must evaluate to `true`. If one condition evaluates to `false`, the entire criterion evaluates to `false`. If one condition cannot be evaluated (its required data is missing in one of the two CIs being identified), the condition returns `unknown`, and therefore the entire criterion that contains it, returns as `unknown`.

The identification process is as follows:

1. **Must have at least one identification criteria that returns true.** If there is at least one identification criterion that returns `true`, we continue to the next step. Otherwise the two CIs are not the same.
2. **Are there contradictions between the CIs?** If there is no verification criterion that returns `false`, that is, all of the verification data returns either `true` or `unknown`, continue to the next step. Otherwise, there is a contradiction between the two CIs, and they are not the same.
3. Evaluate the validation criteria one by one and according to their priority:
  - a. When a validation criterion is satisfied, mark the two CIs as the same.
  - b. If none of the validation criteria are satisfied, and a validation criterion returns `false`, the two CIs are unmatched.
  - c. If none of the validation criteria are `satisfied` or `refuted`, evaluate the criteria from the next priority.
  - d. If there are no more criteria (the last priority was evaluated), then the two CIs are the same.

### Identification Process Example

The following items are used in this example:

<b>Input node</b>	name = n1, ip_address = ip1, MAC address = m1, os_family = nt
<b>UCMDB nodes</b>	<ul style="list-style-type: none"> <li>• N1 = name=n2</li> <li>• N2 = ip_address=ip1,ip2, MAC address=m1, os_family=nt</li> <li>• N3 = name=n3, MAC address = m1, hw_id = id1, os_family = unix)</li> </ul>

1. For each UCMDB node, run the identification criteria:
  - Node N1 does not match any identification criteria, so it will not be added to the candidates list.
  - Node N2 matches the IP identification criterion of the input node, so it will be added to the candidates list.
  - Node N3 does not match the input node by the IP identification criterion, but does match by the MAC address identification criterion, so it will be added to the candidates list.

Therefore, the candidates list is: N2 and N3.

2. For each node in the candidates list, run OS match verification criteria. Node N3 does not satisfy this rule, since its OS is UNIX and the input node's OS is NT. Therefore, N3 will be removed from the candidates list.

The candidates list is: N2.

3. Run the match validation criteria one by one on node N2. Since node N2 has no data conflicts, the match validation criteria are approved and N2 is marked as matched.

The result of the identification process is: N2 = ip\_address=ip1,ip2, MAC address=m1, os\_family=nt.

## Data In Service

After the Identification service runs, the identified data is merged and inserted into the UCMDB by the Data In service.

One of the major problems that the Data In service solves is deciding what to do if the input CI matches multiple UCMDB CIs. You can:

- merge all matched CIs into one
- ignore the input CI

The Data In service uses match criteria to make the decision. The process is as follows:

1. Merge the input CI with each matching UCMDB CI.
2. For each pair of CIs resulting from the step above, run match criteria (verification and validation criteria).



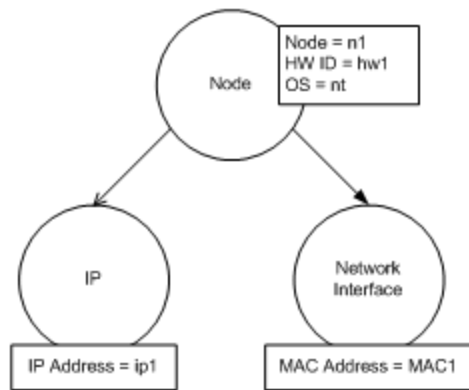
If at least one pair does not pass the match criteria check, the CIs are not merged. If all pairs pass the match criteria check, the CIs are merged.

3. If the CIs are not merged, the Data In service decides to ignore the input CI. This occurs when the current match criterion causes a pair to fail the match criteria checking, and as a result the service does not merge the CIs.

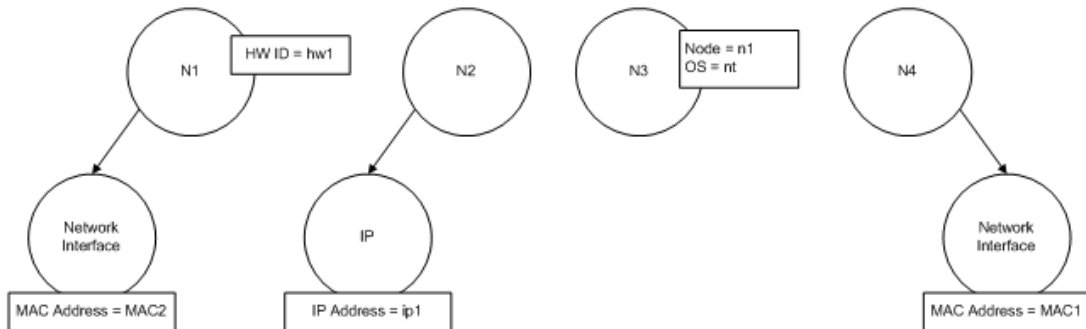
## Multiple Matching Examples

### Multiple matching by different identification criteria without conflicts

- Input bulk data

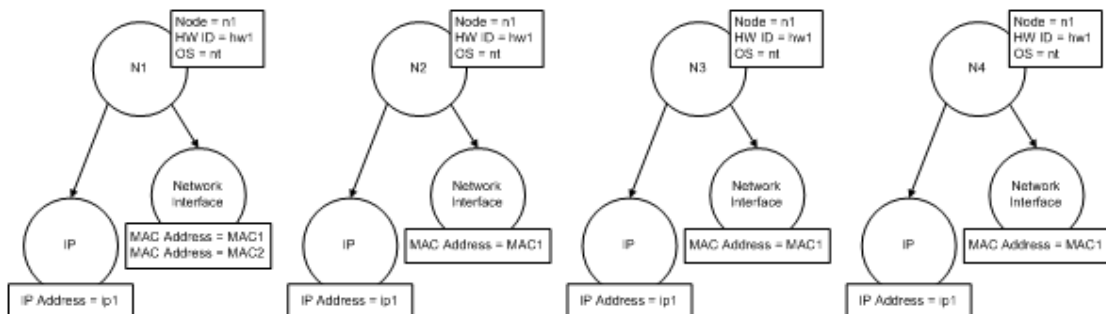


- Identified data in the CMDB



In this example, the input node matches four nodes in the CMDB having different identification criteria, and there are no conflicts with any of the CMDB matched nodes. The process is as follows:

- Merge the input CI with each matched CI in the CMDB.

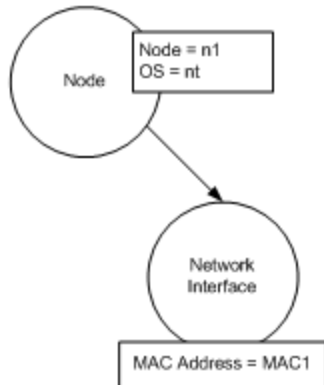


- Check for conflicts between the resulting merged CIs. In this example, there is no conflict between the merged CIs. Nodes N2, N3, and N4 are the same CI; therefore, it is obvious that there is no conflict between them. The only difference between nodes N1 and N2 is the additional MAC address in N1. Since the MAC address match validation criterion uses the **contains** operator, there is no conflict between nodes N1 and N2 either.

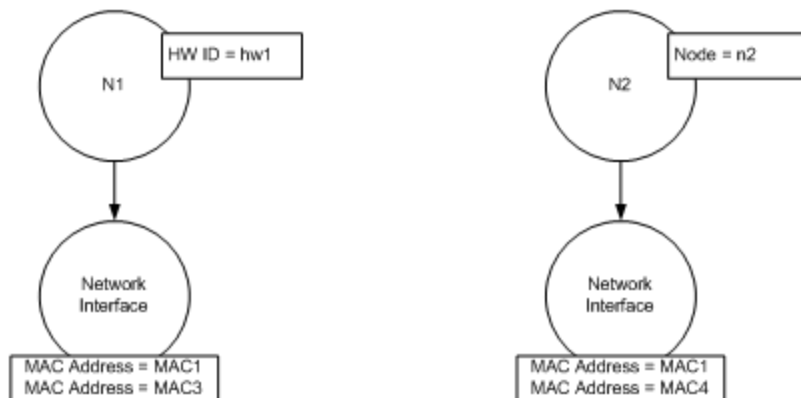
The decision here is to merge all CIs into one.

### Multiple matching by different identification criteria with conflicts

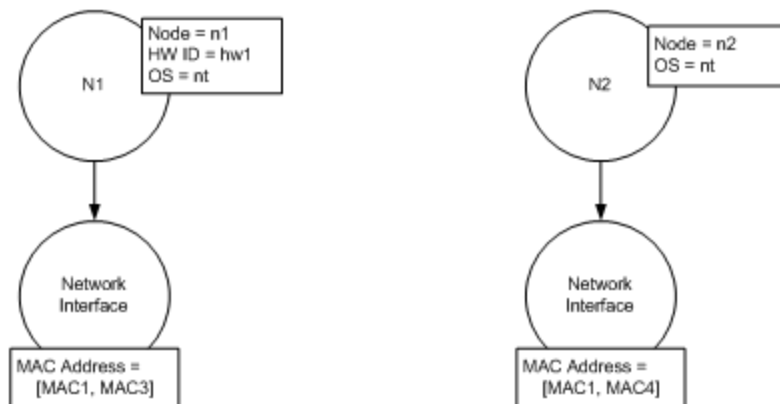
- Input bulk data



- Identified data in the CMDB



- Merge the input CI with each matched CI in the CMDB.



In this example, the input node matches two nodes in the CMDB having different identification criteria, and there are conflicts with the CMDB matched nodes.

- Merge the input CI with each matched CI in the CMDB.
- Check the conflicts between the resulting merged CIs. In this example, nodes N1 and N2 have conflicting MAC address match criteria.

The decision is to not merge all CIs to one.

The decision of whether to ignore data or pass it on for manual reconciliation depends on the flag setting for the MAC address match criterion.

## Merge Service

The merge service is responsible for merging two or more CIs into one CI. This service is used by the Data In service and the Federation service.

## How to Add an Identification Rule to an Existing CIT

1. Go to **Modeling > CI Type Manager > Details** tab and select **Advanced identification** as the identification method. For details, see "Details Page" in the *HP Universal CMDB Modeling Guide*.
2. Click the **Edit** button to open the XML editor. Create the identification rule. For details, see "How to Create an Identification Rule Document" below.

## How to Create an Identification Rule Document

This task describes how to prepare the XML schema for an identification rule file. For details about the schema elements and attributes, see "Identification Rule Schema" on page 261.

The identification rule document is an XML file that describes the required reconciliation data for a specific CI type. This identification rule is applied to the CI type and each of its descendants, unless one of them has a identification rule of its own.

You can create an identification rule document from a blank document or use existing information as a basis. To do this:

1. Navigate to **Modeling > CI Type Manager**.
2. Click the Details tab.
3. Select the information in the Identification field.

#### Example of the identification section

```
<identification-criteria> <identification-criterion> <connected-ci-condition
ciType="interface" linkType="composition"> <overlap-operator match-percent="66"/>
<attribute-condition attributeName="mac_address"/> </connected-ci-condition>
</identification-criterion> <identification-criterion> <attribute-condition
attributeName="name" operator="EqualIgnoreCase"/> </identification-criterion>
<identification-criterion> <connected-ci-condition ciType="ip_address"
linkType="containment"> <overlap-operator match-percent="66"/> <attribute-
condition attributeName="name"/> <attribute-condition attributeName="routing_
domain"/> </connected-ci-condition> </identification-criterion> <identification-
criterion> <attribute-condition attributeName="bios_uuid"/> </identification-criterion>
</identification-criteria>
```

In this example:

- A 66% match of the mac\_address attribute from the connected interfaces CI types is required.
- The name attribute is not case sensitive.
- The rule requires both the ip\_address name and routing\_domain to be the same.
- Only one of the identification criteria needs to be fulfilled for the reconciliation engine to find a possible match.

#### Example of the match section

```
<match> <verification-criteria> <verification-criterion> <attribute-condition
attributeName="os_family"/> </verification-criterion> </verification-criteria>
<validation-criteria> <validation-criterion priority="1"> <attribute-condition
attributeName="bios_uuid"/> </validation-criterion> <validation-criterion priority="2">
<connected-ci-condition ciType="interface" linkType="composition">
<overlap-operator match-percent="66"/> <attribute-condition attributeName="mac_
address"/> </connected-ci-condition> </validation-criterion> <validation-
criterion priority="3"> <attribute-condition attributeName="name"/> </validation-
criterion> </validation-criteria> </match>
```

In this example:

- The structure of the conditions is the same as those conditions in the Identification field.
- Only one priority criterion is given in this example, but there may be many criteria with the same priority.

## Identification Rule Schema

Element		
Name and Path	Description	Attributes
identification-config	The parent element for the identification rule document.	<b>Name.</b> description <b>Description.</b> A textual description of the identification rule. <b>Is required.</b> Optional <b>Type.</b> String
		<b>Name.</b> type <b>Description.</b> The CI type to which the identification rule will apply. <b>Is required.</b> Required <b>Type.</b> String
identification-criteria (Identification-config)	The parent element for all the possible identification criteria for the CI type. For details, see <a href="#">"Identification Criteria" on page 252</a> . The identification criteria may contain many <b>identification-criterion</b> elements. Can appear at most once.	
match (Identification-config)	The parent element for all the possible match criteria for the CI type. For details, see <a href="#">"Match Criteria" on page 252</a> . Can appear at most once.	
multiple-match-resolving (Identification-config)	When two or more CIs of the CI type are identified to one another, they may be of any descendant CI type as well. This element states that one of the descendant CI types is preferred over the others. Can appear at most once.	<b>Name.</b> preferred-type <b>Description.</b> Specifies the CI type of the CI that will be preferred when there are multiple matches which cannot be merged. <b>Is required.</b> Optional <b>Type.</b> String

Element		
Name and Path	Description	Attributes
preferred-property (identification-config > multiple-match-resolving)	This element specifies the property value of the CI that will be preferred when there are multiple matches which cannot be merged.	<p><b>Name.</b> name</p> <p><b>Description.</b> The name of the property.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> String</p>
		<p><b>Name.</b> value</p> <p><b>Description.</b> The value of the property.</p> <p><b>Is required.</b> required</p> <p><b>Type.</b> String</p>
		<p><b>Name.</b> priority</p> <p><b>Description.</b> The priority of this preferred property.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Integer</p>
identification-criterion (Identification-config > identification-criteria)	This element defines a single identification criterion. The criterion may contain many conditions for identification, and for the criterion to return <b>True</b> , all of them must return <b>True</b> .	<p><b>Name.</b> targetType</p> <p><b>Description.</b> Indicates for which CI type this criterion is valid. If this attribute is omitted, then the criterion is applied to any derived type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> String</p>
		<p><b>Name.</b> isTargetTypeDerived</p> <p><b>Description.</b> Specifies whether the target type is a derived type of the current CI type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> String</p>
key-attributes-condition (identification-config > identification-criteria > identification-criterion)	This special condition states that the CI type is identified by its key properties and CI type name, and not by any	

Element		
Name and Path	Description	Attributes
	identification criteria. If this condition exists, it should be the only one in the criterion, as well the only criterion in the identification section. Can appear at most once.	
attribute-condition (identification-config) identification-criteria > identification-criterion -OR- identification-config identification-criteria > identification-criterion > connected-ci-condition - OR- identification-config > match > validation-criteria )	Defines a condition based on an attribute.	<b>Name.</b> attributeName <b>Description.</b> The name of the attribute. <b>Is required.</b> Required <b>Type.</b> String
		<b>Name.</b> masterValue <b>Description.</b> For the purpose of fulfilling the condition, the value defined here is considered equal to any other value. <b>Is required.</b> Optional <b>Type.</b> String
		<b>Name.</b> operator <b>Description.</b> Specifies whether the equality of attribute values should be case sensitive or not. The default is case sensitive. <b>Is required.</b> Optional <b>Type.</b> One of the values: Equals or EqualsIgnoreCase
		<b>Name.</b> includeNullValue <b>Description.</b> Specifies whether a CI should still be considered as a valid value if it has a null (empty) value in the attribute, and the condition will process normally; or is the condition ignored and the

Element		
Name and Path	Description	Attributes
		<p>reconciliation engine moves to the next criterion. Default value is False</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Boolean</p> <p>reconciliation engine moves to the next criterion. Default value is False</p> <p>reconciliation engine moves to the next criterion. Default value is False</p>
		<p><b>Name.</b> conditionType</p> <p><b>Type.</b> One of the following values:  <b>approveAndContradict</b> condition is used for both approving and contradicting CIs (default) or <b>contradictOnly</b> condition is used to contradict two CIs.</p>
connected-ci-condition (Identification-config identification-criteria > identification-criterion -OR- identification-config > match > verification-criteria -OR- identification-config > match)	Defines a condition based on connected CIs. The connected condition may contain attribute conditions. If no attribute conditions exist, the condition matches the connected CI type using its own identification rule.	<p><b>Name.</b> ciType</p> <p><b>Description.</b> The type of CI that is assumed to be connected to the CI type to which this rule belongs using the linkType attribute.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> String</p>
		<p><b>Name.</b> linkType</p> <p><b>Description.</b> The type of link that the ciType attribute uses to connect to the CI type to which this rule belongs</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> String</p>
		<p><b>Name.</b> isDirectionForward</p>



Element		
Name and Path	Description	Attributes
		<p><b>Description.</b> The direction of the link. Default value is True (from the rule's CI type to ciType).</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Boolean</p>
overlap-fixed-operator (Identification-config > identification-criteria > identification-criterion > connected-ci-condition)	Defines the fixed number of matches to connected CIs that are needed to fulfill the condition for the connected-ci-condition element to return True. Either this or overlap-operator must exist.	<p><b>Name.</b> number-of-matches</p> <p><b>Description.</b> The number of matches.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> Integer</p>
overlap-operator (Identification-config > identification-criteria > identification-criterion > connected-ci-condition)	Defines the percent of connected CIs (from the total input number of connected CIs) that are needed to fulfill the condition for the connected-ci-condition element to return True. Either this or overlap-fixed-operator must exist.	<p><b>Name.</b> match-percent</p> <p><b>Description.</b> The percent of matches.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> Integer between 1 and 100</p>
verification-criteria (Identification-config > match)	The parent element for all the possible verification criteria for the CI type. For details, see "Match Criteria" on page 417. The verification criteria must contain at least one verification-criterion element. Can appear at most once.	
verification-criterion (Identification-config > match > verification-criteria)	This element defines a single verification criterion. The criterion may contain many conditions for verification.	<p><b>Name.</b> targetType</p> <p><b>Description.</b> The derived CI type for which this criterion is valid. If this attribute is omitted, then the criterion is applied to any derived type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> String</p> <hr/> <p><b>Name.</b> isTargetTypeDerived</p>

Element		
Name and Path	Description	Attributes
		<p><b>Description.</b> Specifies whether the target type is a derived type of the current CI type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Boolean</p> <hr/> <p><b>Name.</b> numberOfConflictsToFail Identification</p> <p><b>Description.</b> The number of conflicting conditions that will cause the current criterion to fail. Default Value: 1.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Integer</p>
validation-criteria (Identification-config > match)	The parent element for all possible validation criteria for the CI type. For details, see "Match Criteria" on page 417. The validation criteria must contain at least one validation-criterion element. Can appear at most once.	
validation-criterion (Identification-config > match > validation-criteria)	This element defines a single validation criterion. The criterion may contain many conditions for validation.	<p><b>Name.</b> priority</p> <p><b>Description.</b> The criterion's priority.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> Integer</p> <hr/> <p><b>Name.</b> targetType</p> <p><b>Description.</b> The derived CI type for which this criterion is valid. If this attribute is omitted, then the criterion is applied to any derived type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> String</p>

Element		
Name and Path	Description	Attributes
		<p><b>Name.</b> isTargetTypeDerived</p> <p><b>Description.</b> Specifies whether the target type is a derived type of the current CI type.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Boolean</p> <hr/> <p><b>Name.</b> numberOfConflictsToFail Identification</p> <p><b>Description.</b> The number of conflicting conditions that will cause the current criterion to fail. Default Value: 1.</p> <p><b>Is required.</b> Optional</p> <p><b>Type.</b> Integer</p>

# Chapter 10

---

## Reconciliation Priority

This chapter includes:

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How to Create a Reconciliation Priority Document.....	269
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## Reconciliation Priority Overview

Reconciliation Priority (conflict resolution) specifies how matched CIs are merged. You set these priorities in the Reconciliation Priority Manager. For details, see "Reconciliation Priority Window" on page 274.

For details about the reconciliation process and its rules, see "Entity Reconciliation" on page 250.

## Reconciliation Priority Configuration

When a CI is matched with another CI, they should be merged. This behavior becomes relevant in the following situations:

- During Data In service – to insert an already existing CI into the CMDB.
- During Federation – when multiple data repositories supply the same CI with different values.

To solve this problem, you can define priorities for each data repository to each CIT and attribute.

For details, see "Reconciliation Priority Window" on page 274.

## How to Add Reconciliation Priorities to an Existing CIT

1. Create an XML reconciliation file that contains reconciliation priorities. For details, see "How to Create a Reconciliation Priority Document " on next page.
2. Create a package that contains the XML priorities file. The XML file should be located in a folder called **reconciliationPriority** at the root level in the package. For details, see "Create a Custom Package" in the *HP Universal CMDB Administration Guide*.
3. Deploy the package. For details, see "Deploy a Package" in the *HP Universal CMDB Administration Guide*.

## How to Create a Reconciliation Priority Document

This task describes how to prepare the XML file according to the reconciliation priority schema. For details about the schema elements and attributes, see "Reconciliation Priority Schema " on next page.

The reconciliation priorities document is an XML file that describes the priorities of integration points in the Data In flow for a specific CI type. The priority is applied to the CI type and each of its descendants, unless one of them has a priority of its own for a given integration point.

You can create a reconciliation priority document from a blank XML document.

### Example

```
<reconciliation-priority-config type="node">
  <reconciliation-priority dataStoreName="CMS_Sync"
priority="80"/>
  <reconciliation-priority dataStoreName="DDMI_DS"
priority="70"/>
  <attributes-reconciliation-priorities>
    <attribute-reconciliation-priorities attribute-name="name">
      <reconciliation-priority dataStoreName="DDMI_DS"
priority="100"/>
    </attribute-reconciliation-priorities>
    <attribute-reconciliation-priorities attribute-name="snmp_
sys_name">
      <reconciliation-priority dataStoreName="CMS_Sync"
priority="50"/>
    </attribute-reconciliation-priorities>
  </attributes-reconciliation-priorities>
</reconciliation-priority-config>
```

In this example:

1. We first define a priority value for all attributes of **node**. This is optional. If omitted, the default value is 100.
2. For specific attributes we changed one of the data repositories. The other has the same value as the one defined at the top of the document.

## Reconciliation Priority Schema

Element		
Name and Path	Description	Attributes
reconciliation-priority-config	The parent element of a reconciliation priority section for a specific CI type.	<b>Name.</b> type <b>Description.</b> The CI type to which the reconciliation priorities will apply <b>Is required.</b> Required <b>Type.</b> String
reconciliation-priority (reconciliation-priority-config -OR- reconciliation-priority-config > attributes-reconciliation-priorities)	When this appears under the reconciliation-priority-config element, it defines priorities for all attributes in an integration point. When it appears under the attribute-reconciliation-priorities element, it defines a priority for a specific attribute. Must appear at least once when it is the child of the attributes-reconciliation-priorities element.	<b>Name.</b> dataStoreName <b>Description.</b> The name of the integration point. <b>Is required.</b> Required <b>Type.</b> String <b>Name.</b> priority <b>Description.</b> The priority of the dataStoreName attribute. <b>Is required.</b> Required <b>Type.</b> String <b>Value:</b> -1,000,000 to 1,000,000 <b>Default:</b> 100
attributes-reconciliation-priorities (reconciliation-priority-config)	The parent element for the section of the document that defines priorities for specific attributes. Can appear at most once.	
attribute-reconciliation-priorities (reconciliation-priority-config > attributes-	Defines the priorities of integration points for specific attributes of the current CI type.	<b>Name.</b> attribute-name

Element		
Name and Path	Description	Attributes
reconciliation-priorities)		<p><b>Description.</b> The name of the attribute for which to define priorities.</p> <p><b>Is required.</b> Required</p> <p><b>Type.</b> String</p>


## Reconciliation Priority Manager User Interface

This section includes:


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CI Types Pane .....	272
<CI Type> - Reconciliation Priority Overrides Pane.....	273
Reconciliation Priority Window.....	274

### Add Attribute Dialog Box

The Add Attribute dialog box enables you to select specific attributes and specify a priority override value for each.

<b>To access</b>	Select a CI type in the CI Types tree and click  in the Attribute Overrides area.
------------------	--

User interface elements are described below:

UI Element (A-Z)	Description
<b>Attributes</b>	<p>Enables you to specify an attribute for which you want to specify a priority override.</p> <p>Select the <b>&lt;Show hidden attributes&gt;</b> check box to include hidden attributes in the displayed list. Hidden attributes are not marked as <b>Visible</b> in the Attributes pane of the CI Type Manager. For details, see "<a href="#">Attributes Page</a>" in the <i>HP Universal CMDB Modeling Guide</i>.</p> <p>To change the priority of an attribute, do the following:</p> <ul style="list-style-type: none"> <li>Click in the <b>Priority</b> field and enter a new value. This value can range from -1,000,000 to 1,000,000.</li> <li>Press <b>Enter</b>.</li> <li>Click  in the CI Types pane.</li> </ul>
<b>Integration Point</b>	<p>Displays a list of all defined integration points.</p> <p>Select the integration point for which you want to change an attribute's priority. If an integration point is selected, only attributes for this integration point can be added to the list.</p>



## CI Types Pane

The CI Types pane displays the list of CI types and attributes that are supported by the selected integration point.





When you select a node in the CI Types tree, all integration points that support the selected item are displayed in the CI Type Overrides area.

If there is a manual override on an item in the tree, that item and all its parent items will be displayed with an asterisk next to the CI type.

User interface elements are described below:

UI Element (A-Z)	Description
	Click to expand the entire hierarchical tree structure.
	Click to collapse the hierarchical tree structure.





UI Element (A-Z)	Description
<b>Tree View</b> 	Click Tree View to select the display format of the CI types tree. The following options are available: <ul style="list-style-type: none"> <li>• Display label</li> <li>• Class name</li> <li>• Legacy class name</li> </ul>
	Toggles the display of the legend at the bottom of the CI Types pane.
	Saves the changes to the priority override settings.
	Filters the tree to display only those CI types that have reconciliation priority overrides, and their parents.


## <CI Type> - Reconciliation Priority Overrides Pane

When you select a CI type in the Reconciliation Priority Manager, the Reconciliation Priority Overrides pane lists all integration points that contain the selected item and the priority overrides for those CI types, if any.

### Attribute Overrides Area


User interface elements are described below:

UI Element (A-Z)	Description
	Opens the Add Attribute dialog box, which enables you to specify attributes for which you want to set overrides. For details, see "Add Attribute Dialog Box " on page 271.
	Resets the value of the selected attribute to its default value.  If you reset the priority for an attribute, and this priority is not overridden in any parent of this CIT, the attribute override row is removed from the list, and the value is restored to 100. If a parent of this CIT does have an attribute override for this attribute, the value is set to the parent's value.
<b>Attribute</b>	The name of the attribute for which you are specifying a priority override.
<b>Inherited From</b>	The name of the CI type from which the priority level is inherited.
<b>Integration Name</b>	The name of the integration point for which the override is defined.
<b>Priority</b>	Displays the priority that is assigned to a particular attribute. This value can range

UI Element (A-Z)	Description
	<p>from -1,000,000 to 1,000,000. The default priority level for all items is 100. If you change the priority of an entry, the new value propagates downwards to all descendants of that particular CI type.</p> <p>To change the priority of an item, do the following:</p> <ul style="list-style-type: none"> <li>• Click in the <b>Priority</b> field and enter a new value.</li> <li>• Press <b>Enter</b>.</li> <li>• Click  in the CI Types pane.</li> </ul>

### CI Type Overrides Area

User interface elements are described below:

UI Element (A-Z)	Description
<b>Inherited From</b>	The name of the CI type from which the priority level is inherited.
<b>Integration Name</b>	The name of the integration point for which the override is defined.
<b>Priority</b>	<p>Displays the priority that is assigned to a particular CI Type. This value can range from -1,000,000 to 1,000,000. The default priority level for all items is 100. If you change the priority of an entry, the new value propagates downwards to all descendants of that particular CI type.</p> <p>To change the priority of a CI type, do the following:</p> <ul style="list-style-type: none"> <li>• Click in the <b>Priority</b> field and enter a new value.</li> <li>• Press <b>Enter</b>.</li> <li>• Click  in the CI Types pane.</li> </ul>


## Reconciliation Priority Window

This window enables you to specify the reconciliation priority for a particular integration point, CIT, or attribute.

The Reconciliation Priority Manager provides a centralized location where you can view and change the reconciliation priority for all integration points.

**Note:** In the Integration Point Pane, you can modify the reconciliation priority for the selected integration point only. For details, see ["Integration Point Pane" on page 153](#).

For details about the reconciliation engine, see ["Entity Reconciliation" on page 250](#).

<b>To access</b>	Do one of the following: <ul style="list-style-type: none"> <li>• Select <b>Data Flow Management &gt; Reconciliation Priority</b>.</li> <li>• Select <b>Data Flow Management &gt; Integration Studio</b> and click  .</li> </ul>
<b>Relevant tasks</b>	<ul style="list-style-type: none"> <li>• <a href="#">"How to Work with Federated Data"</a> on page 133</li> <li>• <a href="#">"How to Work with Population Jobs"</a> on page 133</li> <li>• <a href="#">"How to Work with Data Push Jobs"</a> on page 134</li> </ul>

User interface elements are described below:

<b>UI Element (A-Z)</b>	<b>Description</b>
<b>Integration</b>	<p>Enables you to select a specific integration point for which to specify the reconciliation priority, or to set priorities for all integration points.</p> <p>If you have selected a specific integration point, its name is highlighted in the right pane. You can then change the reconciliation priority for that integration point only.</p>

---

# Troubleshooting and Limitations

This section describes general troubleshooting and limitations related to working with Universal Discovery.

- ["Troubleshooting" below](#)
- ["Limitations" on next page](#)

**Note:**

- For details on using the log files to perform basic troubleshooting, see:
  - ["Data Flow Probe Log Files" on page 67](#)
  - ["Data Flow Management Log Files" on page 1 in the \*HP Universal CMDB Administration Guide\*](#)

## Troubleshooting

- ["Troubleshooting" above](#)
- ["Discovery Results Do Not Appear in the Topology Map" below](#)
- ["Networks and IPs" below](#)
- ["TCP Ports" on next page](#)
- ["Discover Resources on a Windows XP Machine" on next page](#)
- ["Troubleshooting" above](#)

### Discovery Results Do Not Appear in the Topology Map

**Problem.** Data that should have been discovered during the Discovery process does not appear in the topology map.

**Verification.** The CMDB cannot retrieve the data or build the query results. Check the Statistics Results pane. If the CIs were not created, the problem is occurring during the Discovery process.

**Solution.** Check the error messages in the **probeMgr-services.log** file located in **C:\hp\UCMDB\DataFlowProbe\runtime\logs**.

### Networks and IPs

**Problem.** Not all networks or IPs have been discovered.

**Indication.** Not all the networks or IPs appear in the topology map results.

**Verification.** The IP address range in the Data Flow Probe Setup window does not encompass the scope of the networks or IPs that should have been discovered.

**Solution.** Change the scope of the Discovery range:

1. Select **Data Flow Management > Data Flow Probe Setup**.
2. Select the Probe and the range.
3. Change the IP address range in the Ranges box as required.

## TCP Ports

**Problem.** Not all TCP ports have been discovered.

**Indication.** Not all TCP ports appear in the topology map results.

**Verification.** Open the `portNumberToPortName.xml` file (**Data Flow Management > Adapter Management > DDM Infra > Configuration Files > portNumberToPortName.xml**), and search for the missing TCP ports.

**Solution.** Add the port numbers that should be discovered to the `portNumberToPortName.xml` file.

## Discover Resources on a Windows XP Machine

**Problem.** Failure to discover resources on a machine running on the Windows platform.

- **Solution 1.** **Start > Settings > Control Panel > System.** In the Remote tab, verify that the following check box is selected: **Allow users to connect remotely to this computer.**
- **Solution 2.** In Windows Explorer, select **Tools > Folder Options.** In the View tab, clear the **Use simple file sharing (Recommended)** check box.

# Limitations

- When Discovery is installed on a non-English operating system, job and module names are still limited to English characters.
- Naming Conventions: When naming entities in Data Flow Management, you can use the following characters: `a-z`, `A-Z`, `0-9`. When entering IP addresses, use only digits and asterisks (\*).
- Each Content Pack installation overrides all out-of-the-box resources with the contents of that Content Pack. This means that any changes you made to these resources are lost. This applies to the following resources: Queries, Views, Enrichments, Reports, Discovery Jython scripts, Discovery adapters, Discovery jobs, Discovery resources, Discovery configuration files, Discovery modules, CI Types, and Relationships. (Attributes added to CI Types and Relationships are not overridden).

In general, you should refrain from making changes to out-of-the-box resources. If you must do so, be sure to track your changes so that they can be re-applied after you install a Content Pack. Important general fixes (not specific to your environment) should be sent to CSO so that they can be analyzed and included as part of one of the next Content Packs.

