

CA IT Process Automation Manager™

CA CMDB Connector Guide

r1



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Chapter 1: Overview

The CA Configuration Management Data Base (CA CMDB) Connector is a module that allows the integration of CA CMDB with CA IT Process Automation Manager (CA IT PAM) to integrate your enterprise data. The CA CMDB Connector uses the CMDBf web service and the General Resource Loader (GRLoader) to allow Management Data Repositories (MDR) such as CA NSM, CA Service Catalog, and BMC Remedy Service Desk to contribute data to and consume data from CA CMDB.

The CA CMDB Module allows you to register Configuration Items (CI) and relationships, deregister CIs and relationships, and perform Graph Queries. The CA CMDB Module includes a base CA CMDB Operator that lets you submit custom SOAP requests. The CA CMDB Connector also allows you to load data to and from the Transaction Work Area (TWA), and register objects to CA CMDB using the GRLoader application.

Intended Audiences

The CA CMDB Connector Guide is intended for administrators who install the CA CMDB Connector or maintain a (CA IT PAM) instance, and developers and maintainers of CA IT PAM processes who want to have their processes interact with CA CMDB.

Administrators are assumed to be familiar with the contents of the CA IT PAM Administration Guide, especially Domain, Environment, Agent administration, and enabling modules. Administrators must also be familiar with CMDB patching procedures and CMDBf web service deployment. For more information about the administration tasks, refer the *CA CMDB Administration Guide*.

Note: The patch installation instructions are stored inside the patch itself.

Developers are assumed to be familiar with creating and running CA IT PAM processes as described in the *CA IT Process Automation Manager User Guide*. They must also be familiar CA CMDB, GRLoader, CI/Relationship registration and deregistration, CI/Relationship reconciliation, MDR management, and CMDBf web services. For more information about technical references, see the *CA CMDB Technical Reference Guide*.

Concepts

Register a CI and Relationship Registration

The MDR registers a CI within CA CMDB and alerts CA CMDB about the registration. Using a specific Identification (ID), CA CMDB determines whether it has received data related to this specific CI from any other MDR and categorizes it as either a new or old CI. If the CI is new, CA CMDB creates an object and assigns a unique ID; otherwise, the new data is merged with the existing data. The MDR uses the unique ID to provide the necessary updates.

Similar to CI registration, the MDR registers a relationship in CA CMDB and alerts CA CMDB about the registration. CA CMDB determines whether it has received data related to this specific relationship from any other MDR and categorizes it as either a new or old relationship. If the relationship is new, CA CMDB creates an object and assigns a unique ID.

This registration process is used by both Operators that use the CMDBf web service and by Operators that use GRLoader.

CI and Relationship Deregistration

Deregistering is the de-linking of the MDR with the CI. The MDR must provide the ID associated with the CI to deregister it.

Deregistration removes the linking between the MDR and the CI. If no other MDRs contribute information to the CI, then the CI is marked as *inactive*. However, if other MDRs are still linked to the CI, then the CI remains *active*.

Deregistering a relationship marks the relationship as inactive in CA CMDB.

This deregistration process is used by both Operators that use the CMDBf web service and by Operators that use GRLoader.

Graph Query

The *Graph Query* queries information from CA CMDB based on the CIs and relationships it contains. The Graph Query is a powerful tool that allows you to gather only the desired information from large and complex data sources such as CA CMDB. The CA CMDB Connector passes the Graph Query structure and the results to and from CA CMDB.

Terminology

ADT

Abstract data types (ADTs) are used to build programs that use high-level abstractions. With abstract data types, we can separate the conceptual transformations that our programs perform on our data from any particular data-structure representation and algorithm implementation.

CI

The term *configuration item* or CI refers to the fundamental structural unit of a configuration management system. Examples of CIs include individual requirements documents, software, models, plans, and people. Configuration Management systems oversee the life of the CIs through a combination of process and tools. The objective of these systems is to avoid the introduction of errors related to lack of testing or incompatibilities with other CIs.

Connector

A module that interfaces with software external to CA IT PAM; in this case, CA CMDB.

CORA

Many CA Unicenter products use the common MDB schema to store and manage their data. As the interface through which these assets are registered and as the only source for updating these tables, the Common Registration API (CORA) helps ensure that asset data flows consistently, supporting the data and referential integrity of the MDB's master asset data model.

GRLoader

The term *General Resource Loader* or GRLoader refers to a CA CMDB executable that allows the creation or update of a CI and its relationships in the MDB through CORA. It is invoked through the CA CMDB web Services UI. Input to the GRLoader is done through an XML file which uses a CA proprietary format.

Applications, such as Cohesions (CENDURA), provide a mechanism to create the XML file in the format needed therefore they can execute GRLoader directly. Otherwise ADT (shipped with the CA CMDB) can be used to transform the data into the desired XML file.

Note: CA CMDB provides ADT interfaces to create the XML File from any source.

MDR

An abbreviation for a *Management Data Repository* such as CA NSM, CA Service Catalog, and BMC Remedy Service Desk.

Module

A set of functionally related Operators that share a common configuration.

Operator

A software element that implements an action and is one of the building blocks of a CA IT PAM Process.

TWA

An abbreviation for *Transaction Work Area* which can be used for the accumulation of data and intermediate results during the execution of a task.

Chapter 2: Installing and Configuring the CA CMDB Module

This section contains the following topics:

[Prerequisites](#) (see page 11)

[Installation](#) (see page 12)

[Default Module Properties Settings](#) (see page 13)

Prerequisites

The CA CMDB Module runs on CA CMDB r11.2 and r12.1. Apply the following patches to help ensure that the module operates properly:

If you are using CA CMDB r12.1

- Patch RO10514—This patch improves CI reconciliation and adds the TWA functionality to CA CMDB.
- Patch T5N7038—This patch allows GRLoader to be run multiple times.
- Patch T5N7044—This patch helps ensure that registration and deregistration of multiple relationships returns a response for each relationship.

If you are using CA CMDB r11.2

- Patch T5PT026—This patch helps ensure that registration and deregistration of multiple relationships returns a response for each relationship

GRLoader Library

Install the GRLoader library (NX_ROOT) on the computer, such as the Agent, where the Operator runs. For more information about the NX_ROOT directory and setting the remote GRLoader library, see the *CA CMDB Technical Reference Guide*.

MDR Registration

Before you use the CA CMDB Module, you must register your MDRs with CA CMDB. For CMDBf Operators, the MdrClass of the MDR must be cmdbf. For more information, see the *CA CMDB Technical Reference Guide*.

Installation

The CA CMDB Module software has a standalone installer. There are two versions of the installer provided:

- IT_PAM_connector_installer_CA_CMDB_1_0.exe for installing on a Primary Domain Orchestrator running on Windows
- IT_PAM_connector_installer_CA_CMDB_1_0.sh for installing on a Primary Domain Orchestrator running on Linux and UNIX

Before installing the CA CMDB Connector software, you must first shut down the Primary Domain Orchestrator.

- In a cluster configuration, the first Orchestrator installed is the Primary Orchestrator, and this can be confirmed by seeing that `oasis.server.isPrimary=true` is set in the `OasisConfig.properties` file found in `<itpam_root_directory>\server\c2o\.config`, where `<itpam_root_directory>` is the directory where CA IT PAM was installed.
- In a non-clustered configuration, the sole Domain Orchestrator is the Primary Domain Orchestrator.

To install the Connector

1. Log onto the computer and account used to install the CA IT PAM Primary Domain Orchestrator.
2. Run the appropriate version of the installer for your operating system. For Linux and UNIX systems, run the installer as follows to help ensure that it is run under the Bourne shell, and to avoid the need to use `chmod` to set this file as an executable.

```
sh IT_PAM_connector_installer_CMDB_1_0.sh
```

3. When the Welcome screen displays, click Next to proceed or click Cancel to exit the installation.

The Licensing terms for this Connector display.

4. If you accept the licensing terms, select "I accept the agreement", and click Next to proceed; otherwise click Cancel to terminate the installation.
5. Specify the directory where the CA IT PAM Primary Domain Orchestrator was installed (if it differs from the default value) by entering the complete path to the directory, or by clicking Browse and locating the directory.
6. Click Next.

The installer will verify that the Primary Domain Orchestrator is down, and a dialog displays where you select the components to install. (You will only have the choice of this Connector.)

7. Click the check box to select this Connector, and click Next to continue.

The installer will deploy the components of the new module to the Primary Domain Orchestrator (this may take a few minutes).

8. Click Finish to complete the installation.
9. Restart the Primary Domain Orchestrator.

The installation.log file is located here: `<itpam_root_directory>\server\c2o` where `<itpam_root_directory>` is the folder specified in Step 5.

The newly installed module will not be available immediately on any secondary Orchestrators, but all components will be mirrored within the time specified by the mirroring interval for the secondary Orchestrator.

10. After all components have been mirrored, you must stop and restart each Orchestrator and Agent to make the new module available for use.

Important! If you installed the Connector software in an existing CA IT PAM 2.1 environment, you must use the Configuration Browser to enable the newly installed module in each environment, on each Orchestrator, and on each Agent where the new module and its Operators will be used.

Default Module Properties Settings

You can set the following default properties for the CA CMDB Module in the Configuration Browser:

Default Maximum Result Length

Defines the maximum length of XML values stored in CA IT PAM Datasets. If the value exceeds the maximum result length, the result is truncated. The default is 1048576 bytes.

Default CMDBf registration URL

Defines the location of the registration web service. This location is used to perform both registration and deregistration of CIs. The default is `http://localhost:8080/axis/services/RegistrationPort`.

Default CMDBf graph query URL

Defines the location of the Graph Query web service. The default is `http://localhost:8080/axis/services/QueryPort`.

Enable r12 features

The Enable r12 features parameter is used when running GRLoader commands. If Disable is selected, then using Load to TWA and Load from TWA Operators generate an error. Also, using the tenant option with the Register via GRLoader Operator generates an error. The default is Enable.

Default Server URL

Defines the URL of the CA CMDB server. This parameter is used when you run GRLoader commands. The default is `http://localhost:8080`.

Default CA CMDB login user

Defines the default CA CMDB user. You must have the necessary permissions to perform graph queries, and to register or deregister relationships and CIs. The default is ServiceDesk.

Default user password

Defines the password for the default user.

To specify default module properties

1. In the CA IT PAM Client, select File, Open Configuration Browser (if it is not already open).
2. On the left side of the window, right-click the desired component, and select Lock:
 - Domain (Browser palette)
 - Environment (Browser palette)
 - Orchestrator (Orchestrators palette)
 - Agent (Agents palette)
3. Click the Modules tab in the right pane of the window.
4. Double-click the CA CMDB Module to display the Properties tab for this module.
5. Specify the appropriate default settings for this module.
6. Click Apply.
7. Click the Save toolbar button.
8. Right-click the component you locked in Step 2 and select Unlock to unlock the component.

The CA CMDB Module Operators use the default properties unless you specify Operator-specific properties for each Operator.

Chapter 3: Using the CA CMDB Module

This section contains the following topics:

- [Register CI Operator](#) (see page 15)
- [Deregister CI Operator](#) (see page 20)
- [Register Relationship Operator](#) (see page 22)
- [Deregister Relationship Operator](#) (see page 27)
- [Base CA CMDB Interface Operator](#) (see page 29)
- [Graph Query Operator](#) (see page 33)
- [Base GRLoader Interface Operator](#) (see page 36)
- [GRLoader Register Operator](#) (see page 37)
- [Load to TWA Operator](#) (see page 42)
- [Load from TWA Operator](#) (see page 47)

Register CI Operator

The Register CI Operator registers one or more CIs.



Operator Input Parameters

The Register CI Operator specifies the CI registration properties.

CA CMDB Login Parameters

CA CMDB Login Parameters define CMDBf web service information to use or override module level information. The values can be strings or expressions. CA CMDB Login parameters are as follows:

CMDBf registration URL

Defines the location of the registration web service. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

CI Attributes

CI Attributes specify the properties of the registered CI. The values can be strings or expressions. The CI attributes are as follows:

MDR ID

Defines the ID of the MDR in CA CMDB (required).

Use ValueMap Array

Verifies that CI properties are read from a specified Value Map. Selecting this field disables the XML file. Either Use ValueMap Array or Use XML file must be specified.

Use XML file

Verifies that CI properties are loaded from the specified XML file. Selecting this option disables the Value Map use. Either Use ValueMap Array or Use XML file must be specified.

ValueMap Array

Specifies the array of Value Maps that holds attributes for the specified CIs. The attribute is enabled after you select the Use ValueMap Array field and must be specified if Use ValueMap is selected. Each Value Map requires the following attributes:

mdrId

Defines the MDR ID in CA CMDB.

localId

Defines the ID of the CI in the source MDR.

name

Defines the CI name.

family

Defines the CI family.

class

Defines the CI class.

Specify the following attributes in the map to reconcile CIs properly:

- serial_number
- asset_num
- system_name
- dns_name
- mac_address

You can also specify additional fields in the Value Map as long as these fields are valid CI properties. For example, you can specify a description for your CI by adding a field "description" to the input Value Map.

XML file name

Specifies the XML file that contains the CIs to load in CA CMDB. The attribute is disabled when you select the Use ValueMap Array field and must be specified if you select Use XML file.

The input XML contains one or more non-root <ci> elements. The child nodes of these <ci> elements must be valid CI attributes. The <ci> elements require the following child nodes:

mdrId or mdr_name

Defines the MDR ID or name in CA CMDB.

localId or federated_asset_id

Defines the ID of the CI in the source MDR.

name

Defines the CI name.

family

Defines the CI family.

class

Defines the CI class.

Specify the following child nodes in the XML to assure that the CIs are reconciled properly:

- serial_number
- asset_num
- system_name
- dns_name
- mac_address

You can also specify additional child elements in the XML file as long as these elements are valid CI properties. For example, you can specify a description for your CI by adding an element "description" to the input XML file. See the appendix [Examples](#) (see page 61) for a sample input CI XML file.

Use inline XSLT for transformation

Verifies that the XSLT is read from the XSLT text field.

Note: Transform the XML if the structure differs from the format expected or the CI attribute names do not match the CA CMDB attributes.

Use XSLT file for transformation

Verifies that the XSLT is from the file specified in the XSLT file name.

Note: Transform the XML if the structure differs from the format expected or the CI attribute names do not match the CA CMDB attributes.

XSLT text

Defines the XSLT to transform the XML file. The field is enabled after you select Use inline XSLT for transformation.

XSLT file name

Defines the file that holds the XSLT. This field is enabled after you select Use XSLT file for transformation.

Operator Outputs

The output for the Register CI Operator is described in this section.

Request_Results

Request_Results indicates an array of Value Maps that contains the results of the registration operation for each CI. Each Value Map contains the following information:

Status

Indicates the registration status. The possible values are as follows:

Accepted

Indicates that the CI is submitted successfully to CA CMDB.

Declined

Indicates that CA CMDB declined the registration of the CI.

Unknown

Indicates that CA IT PAM is unable to process the result received from CA CMDB.

Unsubmitted

Indicates that the CI has not been sent to CA CMDB for registration, because an error occurred during the CI processing.

Mdr_Id

Identifies the MDR ID in CA CMDB.

Local_Id

Identifies the ID of the CI in the MDR.

UUID

Identifies the UUID of the CI in CA CMDB. The UUID value is populated only when the registration is successful.

Failure Cause

Identifies that the register request is declined, and the field is populated with the reason for the declination.

Mdr_Id

Identifies the MDR ID in CA CMDB.

Operator Ports

Success

Indicates that the registration of the CI is successful.

Failure

Indicates that the registration of one or more CIs is unsuccessful. In addition to the exceptions given by CMDBf, the operator will fail when:

- The ValueMap Array is not specified and Use ValueMap is selected.
- The "XML file name" is not specified and Use XML File is selected.
- The CI describe in the Value Maps or XML does not include the required fields.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Deregister CI Operator

The Deregister CI Operator is used to deregister one or more CIs.



Operator Input Parameters

The Deregister CI Operator defines the deregistration properties.

CA CMDB Login Parameters

CA CMDB Login Parameters define CMDBf web service information to use or override module level information. The values can be strings or expressions. CA CMDB Login parameters are as follows:

CMDBf registration URL

Defines the location of the registration web service. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

CI Attributes

Specifies the properties of the CI to deregister from CA CMDB. The attributes values can be strings or expressions.

MDR ID

Defines the MDR ID in CA CMDB (required).

Local ID array

Defines the array of IDs in the source MDR (required).

Operator Outputs

The results of the Deregister CI Operator are stored in a data set that contains the following:

Request_Results

Indicates an array of ValueMaps that contains the following information:

Status

Indicates the status of the deregistration.

The possible values are:

Accepted

Indicates that the CI is submitted successfully to CA CMDB.

Declined

Indicates that CA CMDB declined the CI deregistration.

Mdr_Id

Identifies the MDR ID in CA CMDB.

Local_Id

Identifies the CI ID in the MDR.

Failure Cause

Identifies that the deregister request is declined, and the field is populated with the reason for the failure.

Mdr_Id

Identifies the MDR ID in CA CMDB.

Operator Ports

Success

Indicates that the CI deregistration is successful.

Failure

Indicates that the deregistration of one or more CIs is unsuccessful. In addition to exceptions given by CMDBf, the operator fails when Local ID Array or MDR ID is not specified.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Register Relationship Operator

The Register Relationship Operator is used to register one or more relationships.



Operator Input Parameters

The Register Relationship Operator defines relationship properties. The values can be literal strings or expressions.

CA CMDB Login Parameters

CA CMDB Login Parameters define CMDBf web service information to use or override module level information. The values can be strings or expressions. CA CMDB Login parameters are as follows:

CMDBf registration URL

Defines the location of the registration web service. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Relationship Attributes

Specifies the properties of the relationships to be registered. The attributes values can be literal strings or expressions.

MDR ID

Defines the MDR ID in CA CMDB (required).

Use ValueMap Array

Verifies that the properties for each relationship are read from value maps in the specified array. Either Use ValueMap Array or Use XML File must be specified.

Use XML file

Verifies that the relationship is loaded from the specified XML. Selecting this field disables the Use ValueMap Array. Either User ValueMap Array or Use XML file must be specified.

ValueMap Array

Specifies the value maps that hold attributes for the specified relationships. The attribute is enabled after you select the Use ValueMap Array field and must be specified if Use ValueMap is selected. Each value map requires the following fields:

mdrId

Defines the MDR ID in CA CMDB.

sourceId

Defines the ID of the source CI in the source MDR.

targetId

Defines the ID of the target CI in the source MDR.

relationshipId

Defines the relationship ID in the MDR.

relationship

Defines the valid relationship between the two CIs in CA CMDB.

XML file name

Specifies the XML file that contains one or more non-root relation elements. The attribute is enabled after you select Use XML File and must be specified if Use XML File is selected.

The relation elements require the following child nodes:

sourceId or provider

Defines the ID of the source CI in the MDR.

targetId or dependent

Defines the ID of the target CI in the MDR.

mdrId or mdr_name

Defines the MDR ID in CA CMDB.

relationshipId

Defines the relationship ID in the MDR.

type

Defines the valid relationship between the two CIs in CA CMDB.

See the appendix [Examples](#) (see page 61) for a sample relationship input XML file.

Use inline XSLT for transformation

Verifies that the XSLT is read from the XSLT text field.

Note: Transform the XML if the structure differs from the format expected or the attribute names of the relationship do not match the CA IT PAM attributes.

Use XSLT file for transformation

Verifies that the XSLT is from the file specified in XSLT file name.

Note: Transform the XML if the structure differs from the format expected or the attribute names of the relationship do not match the CA IT PAM attributes.

XSLT text

Defines the XSLT to transform the XML file. The XSLT text field is enabled after you select Use inline XSLT for transformation.

XSLT file name

Defines the file that holds the XSLT. The XSLT file field is enabled after you select the Use XSLT file for transformation.

Operator Outputs

The output of the Register Relationship Operator contains the following information:

Request_Results

Indicates an array of ValueMaps that contains the registration results for each relationship. Each ValueMap contains the following information:

Status

Indicates the status of the registration. The possible values are as follows:

Accepted

Indicates that the relationship is submitted successfully to CA CMDB.

Declined

Indicates that the relationship registration is declined.

Unknown

Indicates that CA IT PAM is unable to process the result received from CA CMDB.

Unsubmitted

Indicates that the relationship is not sent to CA CMDB for registration, because an error occurred during relationship processing.

Mdr_Id

Identifies the MDR ID in CA CMDB.

Local_Id

Identifies the relationship ID in the MDR.

UUID

Identifies the relationship UUID in CA CMDB. The value is populated only when the registration is successful.

Failure Cause

Identifies that the register request is declined, and the field is populated with the reason.

Mdr_Id

Indicates the MDR ID in CA CMDB.

Operator Ports

Success

Indicates that the relationship registration is successful.

Failure

Indicates that the registration of one or more relationships is unsuccessful. In addition to the exceptions given by CMDBf, the operator will fail when:

- The ValueMap Array is not specified and Use ValueMap Array is selected.
- The "XML file name" is not specified and Use XML File is selected.
- The relationships described in the Value Maps or XML does not include the required fields.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Deregister Relationship Operator

The Deregister Relationship Operator is used to deregister one or more relationships.



Operator Input Parameters

The Deregister Relationship Operator defines the properties of the relationships to be deregistered. The attribute values can be literal strings or expressions. In CA CMDB, relationships are tracked by their UUID and not the local ID of the contributing MDR.

CA CMDB Login Parameters

CA CMDB Login Parameters define CMDBf web service information to use or override the module level information. The values can be strings or expressions. CA CMDB Login parameters are as follows:

CMDBf registration URL

Defines the location of the registration web service. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Relationship Attributes

Relationship Attributes specifies the properties of the deregistered relationships.

UUID array

Defines an array of relationship UUIDs in CA CMDB (required).

Operator Outputs

The results of the deregister relationship Operator include the following information:

Request_Results

Indicates an array of ValueMaps. The Value Maps contain the following information:

Status

Indicates the status of the deregistration.

Accepted

Indicates that the relationship is submitted successfully to CA CMDB.

Declined

Indicates that the relationship deregistration is declined.

Mdr_Id

Identifies the MDR ID of CA CMDB.

Local_Id

Identifies the UUID of the relationship of CA CMDB.

Failure_Cause

Identifies that the deregister request is declined, and the field is populated with the reason.

Mdr_Id

Indicates the MDR ID of CA CMDB.

Operator Ports

Success

Indicates that the deregistration of the relationship operator is successful.

Failure

Indicates that the deregistration of the relationship operator is unsuccessful. In addition to the exceptions given by CMDBf, the operator fails when the UUID Array is not specified.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT PAM User Guide*.

Base CA CMDB Interface Operator

The Base CA CMDB Interface Operator allows you to run a custom request against CMDBf.



Operator Input Parameters

The Base CA CMDB Interface Operator defines the SOAP request and how to process the output.

CA CMDB Input Parameters

CA CMDB Input parameters specify information about the following SOAP parameters:

CMDBf URL

Defines the web service URL.

CA CMDB method name

Defines the method name.

CA CMDB user ID

Defines the user name.

Password

Defines the user password.

Use HTTP Basic Authentication

Verifies that HTTP Basic Authentication is used.

SOAP Version

Defines SOAP version the web service uses.

Allows you to select the version of the SOAP server on which the call is made from the drop-down list; this, in turn causes the appropriate SOAP MessageFactory to be used in making the SOAP request. Specify one of the following:

- SOAP 1.1
- SOAP 1.2

Input source

Specifies the source for the SOAP service input request. Any of the following methods should include a complete properly formatted XML message, which may or may not include a SOAP envelope: Inline Text

Preformatted SOAP File

Specifies that the input request is specified in a preformatted SOAP file. If you choose this option, specify the path to the file in the File name box. The file should contain a message in a valid XML document.

Expression

Specifies that the SOAP request is contained in a CA IT PAM expression. If you choose this option, specify the CA IT PAM expression in the Expression box.

Inline text

Defines the user input. The Inline text field is enabled after you select the Inline Text as the Input source. If Input source is set to "Inline Text," click the Browse button (...) to open the Inline Text dialog and type a formatted SOAP input message. To read in a SOAP message from a text file, click the Browse button (...) in the Inline Text dialog to specify an existing file on a local or network drive.

File name

Defines the file name that contains the input. The File name field is enabled after you select the Preformatted SOAP File as the Input source.

Expression

Defines the expression that holds the input. The Expression field is enabled after you select the Expression as the Input source.

Saved call file

Defines the file that stores the SOAP call. Returns the full path to the file to which to write the final outbound SOAP request and also validate the data was sent to the SOAP Module. If the SOAP request is rejected due to erroneous values, the saved file can assist in debugging the request before transmitting it to the SOAP Module again.

Dynamic Parameters

The Dynamic Parameters provide update values in a SOAP request.

Parameter style

Specifies the method with which to update values in a SOAP request. The SOAP Module supports two mechanisms to do this at run time:

Macro Expansions

Specifies that macros are used in the Parameter list to update values in a SOAP request

XPath Assignments

Specifies that XPath expressions are used in the Parameter list to update values in a SOAP request.

Parameters list

Specifies the unique data entries within the SOAP request. Click the Add button to add a parameter, click the Edit button to edit the currently selected parameter, or click the Delete button to delete the currently-elected parameter. It is a best practice to add the parameters in the same order that they are specified by the WSDL for the SOAP call.

Click the Add or Edit button to open the Parameters List dialog, and set the following parameter values:

Macro name/XPath query

Specifies the name of the macro or the XPath query. If it is the name of a macro, the macro name will be substituted by the value. If it is an XPath query, the node returned by the query will be updated with the value.

Value

Returns a run-time value for the parameter.

Type

Specifies one of the following data types for the parameter:

- String Value
- Integer Value
- XML Fragment

Call Results

Call Results specify how to process the response of the SOAP request.

Save Response File

Defines the path to a file that saves the SOAP response. Any existing file is overwritten by a new response.

Extract SOAP response body first-level elements to individual Dataset variables

Saves the first-level element within the body of the SOAP response to separate dataset variable if the SOAP response exceeds 12 KB.

Extract SOAP response body to Dataset variable

Saves the extraction of the response body to a dataset variable.

Extract SOAP Header to Dataset variable

Verifies the extraction of the response header to a dataset variable.

Note: This call result is not available in CA IT PAM r2.1.

Extract first-level SOAP Header elements into individual Dataset variables

Verifies the extraction of header elements to individual dataset variables.

Note: This call result is not available in CA IT PAM r2.1.

Additional Extracted Data

Specifies XPath expressions to extract data from the body of the SOAP response. For each expression specified here, specify a Dataset variable to which to store the extracted data and a data type. Click the Add button to add an expression, click the Edit button to edit a selected existing expression, or click the Delete button to delete a selected expression. The ordering of the expressions has no significance to CA IT PAM.

After you click the Add or Edit button, you can edit the parameter settings:

XPath Expression

Defines the XPath expression that selects the desired information.

Dataset variable

Defines the variable name that stores the result.

Type

Specifies the variable type. Select one of the following currently supported types:

- Integer
- String
- Integer Array
- String Array
- XML Fragment
- XML Fragment Array

MIME Attachments

MIME attachments specify the attachments for the SOAP message. The options are:

Is an expression

Ensures that the attachment is specified using an expression.

Expression

Defines an expression that holds the attachment. The expression field is enabled after you select the "Is an expression".

Use the Add button to add attachments. Specify the following fields to create the attachments:

Content type

Defines the content type of the MIME attachment.

Content ID

Defines the content ID of the MIME attachment.

File URL

Defines the URL of the file attachment.

Graph Query Operator

The Graph Query Operator queries CA CMDB for CI and/or relationship information.



Operator Input Parameters

The Graph Query Operator specifies the query properties.

CA CMDB Login Parameters

CA CMDB Login Parameters defines CMDBf Web service information to use or override the module-level information. The values can be strings or expressions. CA CMDB Login parameters are as follows:

CMDBf graph query URL

Defines the location of the query web service. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Graph Query Attributes

The Graph Query Attributes specifies the properties of the query.

Use inline text

Ensures that the graph query is read from the Inline text field. Either Use Inline Text or Use XML File must be specified.

Use XML file

Ensures that the graph query is read from a file. Either Use Inline Text or Use XML File must be specified.

Inline text

Defines the XML representation of the graph query. This attribute is enabled after you select Use Inline Text and must be specified if Use Inline Text is selected.

XML file name

Defines the file that stores the graph query. This attribute is enabled after you select Use XML File and must be specified if Use XML File is selected.

Call Results

Call Results specify how to process the response of the SOAP request. The options are as follows:

Extract SOAP response body first-level elements to individual Dataset variables

Specifies the extraction of first-level elements.

Extract SOAP response body to Dataset variable

Specifies the extraction of the response body.

Additional Extracted Data

Defines the set of additional information to extract from the message.

XPath Expression

Defines the XPath expression that selects the desired information

Dataset variable

Defines the variable name to store the result.

Type

Defines the variable type.

Operator Outputs

The results of the graph query are stored in a dataset that contains the following:

XML result

Indicates the string-based result of the graph query.

Additionally the results page contains the additional fields based on the values passed in the Call Results parameters.

Operator Ports

Success

Indicates that the query is successful.

Failure

Indicates that the query is unsuccessful. In addition to the exceptions given by CMDBf, the operator fails when:

- Use Inline Text is selected and no text is entered in Inline Text.
- Use XML file is selected and no text is entered in XML File Name.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Base GRLoader Interface Operator

The GRLoader Generic Operator allows you to perform custom operations on GRLoader.



Note: The use of the slump protocols is not supported by CA IT PAM, so the “-slump” command line parameter should not be specified.

Operator Input Parameters

The Base GRLoader Interface describes the generic GRLoader operation.

GRLoader Command Line Options

GRLoader Command Line Options specify the GRLoader command information.

GRLoader command line parameters array

Defines an array of strings that form the command line parameters to GRLoader (required).

Output line count

Defines the number of lines of the GRLoader output to return. For example, if you specify 10 as the Output line count, the last ten lines of the GRLoader output are returned (required).

Operator Outputs

The results of the Register GRLoader Operator are stored in a dataset that contains the following:

ExitCode

Identifies the code returned by executing a command.

Command_Output

Identifies the last output lines displayed while executing the command. The number of lines returned is specified in the Output line count field.

Operator Ports

Success

Indicates that the Base GRLoader Interface operation is successful.

Failure

Indicates that the Base GRLoader Interface operation is unsuccessful. In addition to exceptions given by GRLoader, the operator fails when:

- GRLoader command line parameters array is not specified
- Output line count is not specified

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

GRLoader Register Operator

The GRLoader Register Operator allows you to update CA CMDB by using GRLoader to load CIs and Relationships.



Operator Input Parameters

The GRLoader Register Operator defines the objects to register in CA CMDB and the registration properties.

GRLoader Connection Options

GRLoader Connection Options define CMDB server information to use or override the module level information. The values can be strings or expressions. The options are:

CA CMDB Server URL

Defines the CA CMDB server location. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Enable r12 features

Enable r12 features overrides the module level default behavior. This parameter is required if it has not been specified at the module level. If 'Disable' is selected, then using the tenant option generates an error. If no option is selected, then the module level value is used. This field also allows expression inputs. The following strings are valid values:

- ENABLE_12
- DISABLE_12

GRLoader Command Line Options

GRLoader Command Line Options describe the registration properties.

NX_ROOT

Defines the NX_ROOT path (required). This path must contain the NX.ENV file. For more information about the NX ROOT options, see the *CA CMDB Technical Reference Guide*.

Input file

Specifies a complete or relative path name to the input XML (required). The Input file translates to the `-i` option on the command line.

Registration type

Specifies the registration type to perform, that is, either Create Only, Create/Update, or Update (required). On the GRLoader command line, the Registration type translates to the `-n` and `-a` options. The field also excludes expression inputs. The following strings are valid values:

- CREATE_ONLY
- UPDATE_ONLY
- CREATE_AND_UPDATE

Relationship prefix

Defines the prefix for a relationship name. If unspecified, GRLoader internally sets the field to GRLoader. The Relationship prefix translates to the `-D` option on the GRLoader command line.

Error file

Defines the file that store errors and warnings. The default error file is XML input file name with `"_err.xml"` appended to it. The Error file translates to the `-e` option on the GRLoader command line.

Allow error file overwrites

Ensures the overwriting of the error file. On the GRLoader command line, this option translates to the `-E` option.

Max errors

Defines the maximum number of errors generated before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the `-maxerror` option.

Max warnings

Defines the maximum number of warnings generated before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the `-maxwarn` option.

Translation rules file

Translation rules set file name. Specifies the XML-based lookup file that contains the rules that GRLoader will use to translate incoming CI attributes to other values. On the GRLoader command line, this option translates to the -tf option.

Ignore case

Ensures the GRLoader performs case-insensitive lookups. On the GRLoader command line, this option translates to the -I option.

Enable symbolic replacement

Replaces the symbolic CMDB values with their appropriate values. On the GRLoader command line, this option translates to the -rs option.

Preload data

Ensures that the data is preloaded to memory to improve processing. We recommend you to use this option for larger entries, that is, more than 50 entries. On the GRLoader command line, this option translates to the -P option.

Configuration file

Defines the GRLoader configuration file to run commands.

Tenant name

Specifies the tenant assignment for CIs and relationships. Enable the Multi-tenancy option to use this option. If the tenant access is not authorized to create public objects, the object is created using the default tenant. On the GRLoader command line, this option translates to the -dt option.

Validate XML

Validates the XML input file without any further processing. On the GRLoader command line, this option translates to the -C option. The operator returns the last ten output lines instead of the normal output.

Operator Outputs

The results of the GRLoader Register operation are stored in a data set that contains the following:

ExitCode

Identifies the error code returned.

If you select the Validate XML option, the following output appears:

Command_Ouput

Identifies the last command output lines.

If you deselect the Validate XML option, the following outputs appear:

ErrorMessage

Indicates that the error message associated with the failed run.

CI_Read

Identifies that the number of CIs processed while reading the input XML.

CI_Skipped

Identifies the number of skipped CIs.

CI_Inserted

Identifies the number of CIs inserted in CA CMDB.

CI_Updated

Identifies the number of CIs updated in CA CMDB.

CI_Errors

Identifies the number of errors in CIs.

CI_Warnings

Identifies the number of generated warnings.

Relationships_Read

Identifies the number of relationships processed while reading the input XML.

Relationships_Skipped

Identifies the number of skipped relationships.

Relationship_Inserted

Identifies the number of relationships inserted in CA CMDB.

Relationship_Updated

Identifies the number of relationships updated in CA CMDB.

Relationship_Errors

Identifies the number of errors associated with the relationships.

Relationship_Warnings

Identifies the number of generated warnings.

Output Ports

Success

Indicates that the GRLoader Register operation is successful.

Failure

Indicates that the GRLoader Register operation is unsuccessful. In addition to exceptions given by GRLoader, the operator fails if NX ROOT is not specified.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Load to TWA Operator

The Load to TWA Operator allows you to update CA CMDB Transaction Work Area (TWA) using the GRLoader. You can run this operator in CA CMDB only when the TWA enhancement is installed.



Operator Input Parameters

The Load to TWA Operator defines the transaction to load into the TWA.

GRLoader Connection Options

GRLoader Connection Options define CMDB server information to use or override the module level information. The values can be strings or expressions. The options are:

CA CMDB Server URL

Defines the CA CMDB server location. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Enable r12 features

Enable r12 features overrides the module level default behavior. This parameter is required if it has not been specified at the module level. If 'Disable' is selected, then using the tenant option generates an error. If no option is selected, then the module level value is used. This field also allows expression inputs. The following strings are valid values:

- ENABLE_12
- DISABLE_12

GRLoader Command Line Options

Describes which transactions to load from the TWA and how these transactions should be processed.

NX_ROOT

Defines the NX_ROOT path (required). This path must contain the NX.ENV file. For more information about the NX ROOT options, see the *CA CMDB Technical Reference Guide*.

Input File

Specifies a complete or relative path name to the input XML (required). The Input file translates to the `-i` option on the GRLoader command line.

Relationship prefix

Defines the prefix for a relationship name. If unspecified, GRLoader internally sets the field to "GRLoader". The Relationship prefix translates to the `-D` option on the GRLoader command line.

Error file

Defines the file that store errors and warnings. The default error file is XML input file name with "`_err.xml`" appended to it. The Error file translates to the `-e` option on the GRLoader command line.

Allow error file overwrites

Ensures the overwriting of the error file. On the GRLoader command line, this option translates to the `-E` option.

Max errors

Defines the maximum number of errors generated before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the `-maxerror` option.

Max warnings

Defines the maximum number of warnings generated before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the `-maxwarn` option.

Translation rules file

Specifies the XML-based lookup file that contains the rules that GRLoader will use to translate incoming CI attributes to other values. On the GRLoader command line, this option translates to the `-tf` option.

Enable symbolic replacement

Replaces the symbolic CMDB values with their appropriate values. On the GRLoader command line, this option translates to the `-rs` option.

Preload data

Ensures that the data is preloaded to memory to improve processing. We recommend you to use this option for larger entries, that is, more than 50 entries. On the GRLoader command line, this option translates to the -P option.

Configuration file

Defines the GRLoader configuration file to run commands.

Tenant name

Specifies the tenant assignment for CIs and relationships. Enable the Multi-tenancy option to use this option. If the tenant access is not authorized to create public objects, the object is created using the default tenant. On the GRLoader command line, this option translates to the -dt option.

Validate XML

Validates the XML input file without any further processing. On the GRLoader command line, this option translates to the -C option. The operator returns the last ten output lines instead of the normal output.

Operator Outputs

The results of the Load to TWA operation are stored in a data set that contains the following:

ExitCode

Identifies the error code returned.

If you select the Validate XML option, the following output appears:

Command_Ouput

Identifies the last command output lines.

If you deselect the Validate XML option, the following outputs appear:

ErrorMessage

Indicates that the error message associated with the failed run.

CI_Read

Identifies that the number of CIs processed while reading the input XML.

CI_Skipped

Identifies the number of skipped CIs.

CI_Inserted

Identifies the number of CIs inserted into the TWA.

CI_Updated

Identifies the number of CIs updated in the TWA.

CI_Errors

Identifies the number of errors in CIs.

CI_Warnings

Identifies the number of generated warnings.

Relationships_Read

Identifies the number of relationships processed while reading the input XML.

Relationships_Skipped

Identifies the number of skipped relationships.

Relationship_Inserted

Indicates that the number of relationships inserted into the TWA.

Relationship_Updated

Indicates that the number of relationships updated in the TWA.

Relationship_Errors

Identifies the number of errors associated with the relationships.

Relationship_Warnings

Identifies the number of generated warnings.

Output Ports

Success

Indicates that the Load to TWA operation is successful.

Failure

Indicates that the Load to TWA operation is unsuccessful. In addition to the exceptions given by GRLoader, the operator fails when NX ROOT is not specified.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Load from TWA Operator

The Load from TWA Operator allows the user to update CA CMDB with transactions in the Transaction Work Area (TWA) using the GRLoader. For GRLoader to process a transaction, it must be set to Ready (tran_status=1). See the *CA CMDB Enhanced Reconciliation Overview* for more information about updating transaction status. You can run Load from TWA Operator in CA CMDB only when the TWA enhancement is installed.



Operator Input Parameters

The Load from TWA Operator defines the transaction to load from the TWA to CA CMDB.

GRLoader Connection Options

GRLoader Connection Options define CMDB server information to use or override the module level information. The values can be strings or expressions. The options are:

CA CMDB Server URL

Defines the CA CMDB server location. This parameter is required if it has not been specified at the module level.

User name

Defines the user name. This parameter is required if it has not been specified at the module level.

User password

Defines the user password. This parameter is required if it has not been specified at the module level.

Enable r12 features

Enable r12 features overrides the module level default behavior. This parameter is required if it has not been specified at the module level. If 'Disable' is selected, then the Operator will fail, as r12 features such as the Transaction Work Area are not available. If no option is selected, then the module level value is used. This field also allows expression inputs. The following strings are valid values:

- ENABLE_12
- DISABLE_12

GRLoader Command Line Options

Describes which transactions to load from the TWA and how these transactions should be processed.

NX_ROOT

Defines the NX_ROOT path (required). This path must contain the NX.ENV file. For more information about the NX ROOT options, see the *CA CMDB Technical Reference Guide*.

Registration type

Specifies the type of registration to perform, that is, either Create Only, Create/Update, or Update (required). On the GRLoader command line, the Registration type translates to the -n and -a options. The field also allows expression inputs. The following strings are valid values:

- CREATE_ONLY
- UPDATE_ONLY
- CREATE_AND_UPDATE

Relationship prefix

Defines the prefix for relationship name. If unspecified, GRLoader internally sets the field to GRLoader. The Relationship prefix translates to the -D option on the command line.

Change order filter

Selects only those transactions associated with the change order ticket. On the GRLoader command line, this option translates to the -chg option.

Max errors

Defines the maximum number of errors that can occur before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the -maxerror option.

Max warnings

Defines the maximum number of warnings that can occur before remaining CIs and relationships are skipped. On the GRLoader command line, this option translates to the -maxwarn option.

Translation rules file

Specifies the XML-based lookup file that contains the rules that GRLoader will use to translate incoming CI attributes to other values. On the GRLoader command line, this option translates to the `-tf` option.

Ignore case

Verifies that the GRLoader performs case-insensitive lookups. On the GRLoader command line, this option translates to the `-I` option.

Enable symbolic replacement

Replaces the symbolic CMDB values with their appropriate values. On the GRLoader command line, this option translates to the `-rs` option.

Preload data

Verifies that the data is preloaded to memory to improve processing. We recommend you to use this option for larger, that is, > 50 entries. On the GRLoader command line, this option translates to the `-P` option.

Configuration file

Defines the GRLoader configuration file to use to run commands.

Tenant name

Specifies the tenant assignment for CIs and relationships. Enable the Multi-tenancy option to use this option. If the tenant access is not authorized to create public objects, the object is created using the default tenant. On the GRLoader command line, this option translates to the `-dt` option.

Operator Outputs

The results of the Load from TWA operation are stored in a data set that contains the following:

ExitCode

Identifies the error code returned.

ErrorMessage

Indicates that the error message associated with the failed run.

CI_Read

Identifies the number of CIs processed while reading the input XML.

CI_Skipped

Identifies the number of skipped CIs.

CI_Inserted

Identifies the number of CIs inserted into CA CMDB from the TWA.

CI_Updated

Identifies the number of CIs updated in CA CMDB from the TWA.

CI_Errors

Identifies the number of errors in CIs.

CI_Warnings

Identifies the number of generated warnings.

Relationships_Read

Identifies the number of relationships processed while reading the input XML.

Relationships_Skipped

Identifies the number of skipped relationships.

Relationship_Inserted

Identifies the number of relationships inserted into CA CMDB from the TWA.

Relationship_Updated

Identifies the number of relationships updated in CA CMDB from the TWA.

Relationship_Errors

Identifies the number of errors associated with the relationships.

Relationship_Warnings

Identifies the number of generated warnings.

Output Ports

Success

Indicates that the Load from TWA operation is successful.

Failure

Indicates that the Load from TWA operation is unsuccessful. In addition to the exceptions given by GRLoader, the operator will fail when NX ROOT is not specified.

Custom

Indicates a custom exit condition.

The Process Designer can define a Boolean expression to define a custom exit link based on the Operator results and the value of variables accessible to Operators in the Process. For more information about creating a custom exit condition, see the *CA IT Process Automation Manager User Guide*.

Chapter 4: Troubleshooting

This section contains the following topics:

[CA CMDB Operators Fail during Execution of a Process](#) (see page 53)

[Cannot Connect via CMDBf Operators](#) (see page 57)

[Cannot Connect via GRLoader Operators](#) (see page 59)

[GRLoader Operator Saves Values Between Runs](#) (see page 60)

[Registration or Deregistration of Relationships Returns Incorrect UUID](#) (see page 60)

CA CMDB Operators Fail during Execution of a Process

Valid On Windows

Symptom:

A CA CMDB Operator fails during execution of a Process.

Solution: 1

Verify that the CA IT PAM Server service is running:

1. Open the Start menu, and click Programs, Administrative Tools, Services.
2. Locate the CA IT PAM Server service in the list to see if it is running.

If the CA IT PAM Server service is stopped, restart it.

Note: If you have recently rebooted your computer and have not configured the CA IT PAM Server service to start when the system starts, you will need to start the service manually.

Solution: 2

Verify that the CA CMDB application is running:

1. Open the Start menu, and click, Programs, Administrative Tools, Services.
2. Locate the CA CMDB service in the list and verify that the CA CMDB application is running.

If the CA CMDB service is stopped, restart it.

Note: If you have recently rebooted your computer and have not configured the CA CMDB service to start when the system starts, you must start the service manually.

3. Verify that you can successfully open the CA CMDB client in a web browser and log in to the client.
4. Verify that the licensing information is valid. CA CMDB must run using a valid license; otherwise, the CA CMDB Operator will fail.
5. Verify that you have sufficient privileges to access Automation objects and run Processes.

For more information about installation and configuration, see the *CA IT PAM Installation and Configuration Guide*.

Solution: 3

Verify that CA IT PAM is installed properly and that you have the appropriate access rights.

1. Verify that you have privileges to run the CA IT PAM Orchestrator and Agents.

For more information about installation and configuration, see the *CA IT PAM Installation and Configuration Guide*.

2. Verify that the CA IT PAM database system is running properly:
- a. When CA IT PAM database is installed on a Microsoft SQL Server database system, open a command prompt window and run the sqlcmd command using the following parameters :

```
sqlcmd -S <machine name> -U <itpamuser> -P <itpampwd> -d  
itpam
```

where <itpamuser> and <itpampwd> are the CA IT PAM database user and password.

For other CA IT PAM supported databases types, run the appropriate command:

- For an Oracle database, use SQL Plus to test the connection to the database from a command prompt:

```
sqlplus <username>[/<password>] @connect_identifier
```

where@connect_identifier consists of an Oracle Net connect identifier. The computer information where Oracle is installed is contained in the @connect_identifier. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information about Oracle database, refer to the Oracle documentation appropriate for your protocol or contact your database administrator.

- For a MySQL Server database, test the database connection from a command prompt:

```
mysql -h<hostname> -u<username> -p<password>
```

- b. After connecting successfully to CA IT PAM database, run a SQL query, for example:

```
Select * from SOAPClientCall
```

```
go
```

If you are able to connect to the CA IT PAM database, and the previous statements execute successfully, then the database system is running properly; otherwise, check the database login user name and password and retry. If the database login user name and password are correct, then there may be another problem with the database system.

3. Decrease the logging level for Orchestrators and Agents to WARNING or INFO to get more information about the error. Debug the Orchestrator issues using c2o.log and boot.log at `<server_install_path>/server/c2o/log` location.
 - boot.log contains all messages logged by core components (for example, JBoss) before CA IT PAM starts execution.
 - c2o.log contains all messages logged by all components after CA IT PAM starts execution.
4. Use the main log file (c2o.log) that contains messages from all the components to debug Agent issues. The c2o.log is located here: `<agent_install_path>\log`. To get more information, do the following:
 - Decrease the default logging level for Agent in log4j.xml.
This file is located here: `<agent_install_path>\.c2orepository\.c2oagentresources\properties`.
FILE and CONSOLE are the logging categories and are set by default to level ERROR. For more information for a category, do the following:
 - Change the "threshold" parameter for the required category and decrease the level from ERROR to WARN, or INFO.
 - Change the "root" category to include the required categories and set the log level to the lowest level specified in any category.
 - Decrease the default logging level for Orchestrator in log4j.xml. This XML file is located here: `<orchestrator_install_path>\server\c2o\conf`.
Similarly, you can change the Agent logging server, C2OFILE, and CONSOLE logging categories to obtain more log information.

Solution: 4

Validate the CA CMDB Operator connection parameters. The parameters could be incorrectly set, thus causing the failure of the CA CMDB Operator.

Solution: 5

Validate the URL specified for the Operator. Specifying the wrong web service URL can lead to XML parsing errors. For example, specifying the registration web service URL to the Graph Query operator generates the following message:

"org.xml.sax.SAXException: SimpleDeserializer encountered a child element, which is *not* expected, in something it was trying to deserialize."

Solution: 6

Verify the Execution Settings and specify a valid Touchpoint in the Target section.

Validate CI attributes. Specifying invalid CI attributes in the CI Value Map or XML can cause the registration to fail. For more information about the attributes to use for a specific family or class, see the *CA CMDB Technical Reference Guide*.

Note: During a register request, if an invalid CI is specified with valid CIs, the operator result set may include information about the invalid response.

Solution: 7

Correct the GRLoader input errors. If there is an error registering a CI/Relationship, the GRLoader Register Operator generates an error XML file. This XML file contains comments describing why the CI/Relationship could not be registered. Correct these errors and then use the error XML file as input to rerun the command.

Note: The GRLoader API does not always log errors. For example, if you use the Base GRLoader Interface Operator to specify an invalid command-line parameter, no error message is logged and the call returns with a 0 exit code. Some error messages are only logged at the INFO level. Increase the level of your CA IT PAM logging.

Cannot Connect via CMDBf Operators

Symptom:

I am unable to log in the CA CMDB Operators. The following error messages occur when I run the CA CMDB operators (Base c operator, Deregister CI, Deregister Relationship, Graph Query, Register CI, or Register Relationship operator):

- java.security.PrivilegedActionException:
com.sun.xml.messaging.saaj.SOAPEXceptionImpl: Message send failed
- invalid login name1000
- invalid login password 1000

Solution:

The CA CMDB Connector operator parameters could be incorrectly set, thus causing the failure of the c operator. Validate the CA CMDB connection parameters to log in to CA CMDB operators.

To validate the CMDBf URL

1. Open a web browser and navigate to the CA CMDB web service URL. The CA CMDB web service has following format:
 - `http://<servername>:<CA Portal>/axis/services/RegistrationPort`
 - `http://<servername>:<CA Portal>/axis/services/QueryPort`An Axis web service welcome message appears. If the message does not appear, verify the CMDBf URL has been entered correctly.
2. To get the correct values for <servername> and <CA Portal>, open Start, Programs, CA, CA CMDB, and CMDB web Client command.
A login page appears
3. Use the URL shown in the address bar to validate the values for <servername> and <CA Portal>.

To check the credentials passed in connection parameters

1. Open Start, Programs, CA, CA CMDB menu, and CMDB web Client command.
A login page appears.
2. Enter the user and password specified in CMDB User name and CMDB User password fields.
If the credentials are wrong, the login fails.

Cannot Connect via GRLoader Operators

Symptom:

I am unable to connect to the c Server. The following messages appear in the result set Reason or c2o.log when I run the c operators (Base GRLoader operator, Register using GRLoader, Load from TWA, or Load to TWA operators):

- Unable to connect to server(<servername>) port(<CA Portal>)
- ERROR during login to server(http:// <servername>: <CA Portal>) error(Error - invalid login password)
- ERROR during login to server(http:// <servername>: <CA Portal>) error(Error - invalid login name)

Solution:

The CA CMDB Connector Operator parameters could be incorrectly set, thus causing the failure of the CA CMDB Operator. Do the following:

- Validate the CMDB URL.
- Verify the credentials passed in Connection Parameters and start the CMDB Web client.

To validate the CMDB URL

1. Open a web browser and navigate to CA CMDB URL. The CA CMDB URL has the format: http://<servername>:<CA Portal>

You are directed to the CA CMDB web client. If not, validate the web service URL.
2. Select Start, Programs, CA, and CA CMDB, and open the CA CMDB web client.

Obtain the correct values for <servername> and <CA Portal>.

To check the credentials passed in connection parameters

1. Open Start, Programs, CA, CA CMDB menu, and CMDB web Client command.
A login page appears.
2. Enter the user and password specified in CMDB User name and CMDB User password fields.

If the credentials are wrong, the login fails.

GRLoader Operator Saves Values Between Runs

Valid On Windows

Symptom:

The GRLoader command line values persist between various Operator executions. For example, the registration type of the GRLoader Operator is unchanged between runs, even though the values in the Operator are different. One operator specifies "Create and Update" and other specifies "Update Only" but the log shows "Create and Update" for both.

Solution:

Install patch T5N7038. This patch is an installation requirement and should be installed against the target CA CMDB prior to using the Connector.

Registration or Deregistration of Relationships Returns Incorrect UUID

Valid On Windows

Symptom:

The user runs either "Register Relationship" or "Deregister Relationship" specifying multiple relationships. The Operator succeeds but the incorrect UUID is returned: either too few UUIDs are returned or the same UUID is returned multiple times.

Solution:

Prerequisite patches have not been installed on CA CMDB. Install either T5N7044 (if running CA CMDB r12.1) or T5PT026 (if running CA CMDB r11.1). This patch must be installed on CA CMDB before using the Connector.

Appendix A: Examples

The examples in this appendix are meant to demonstrate proper syntax only, and are *not* meant to be used "as is". For complete information about the appropriate CI attributes that you can specify for CA CMDB, see the *CA CMDB Technical Reference Guide*.

This section contains the following topics:

[Example CI Input XML](#) (see page 61)

[Example Relationship Input XML](#) (see page 62)

Example CI Input XML

When specifying input XML for the Register CI Operator, the input XML must comply with the expected format.

The input XML contains one or more non-root <ci> elements. The child nodes of these <ci> elements must be valid CI attributes. The <ci> elements require the following child nodes:

mdrId or mdr_name

Defines the MDR ID or name in CA CMDB.

localId or federated_asset_id

Defines the ID of the CI in the source MDR.

name

Defines the CI name.

family

Defines the CI family.

class

Defines the CI class.

Specify the following child nodes in the XML to assure that the CIs are reconciled properly:

- serial_number
- asset_num
- system_name
- dns_name
- mac_address

You can also specify additional child elements in the XML file as long as these elements are valid CI properties. For example, you can specify a description for your CI by adding an element "description" to the input XML file.

The following input XML example specifies two Linux servers for registration:

```
<?xml version="1.0" encoding="UTF-8"?>
<myProduct>
  <ci>
    <mdrId>myProductRegistrationService</mdrId>
    <localId>7777777</localId>
    <name>JUnitServer</name>
    <family>Hardware.Server</family>
    <class>Linux</class>
    <role>production</role>
  </ci>
  <ci>
    <mdrId>myProductRegistrationService</mdrId>
    <localId>980dsaf9df0</localId>
    <name>DevMachine</name>
    <family>Hardware.Server</family>
    <class>Sun</class>
    <role>test</role>
  </ci>
</myProduct>
```

Example Relationship Input XML

When specifying input XML for the Register Relationship Operator, the input XML must comply with the expected format.

The input XML contains one or more non-root relation elements. The relation elements require the following child nodes:

sourceId or provider

Defines the ID of the source CI in the MDR.

targetId or dependent

Defines the ID of the target CI in the MDR.

mdrId or mdr_name

Defines the MDR ID in CA CMDB.

relationshipId

Defines the relationship ID in the MDR.

type

Defines the valid relationship between the two CIs in CA CMDB.

The following input XML specifies two "uses" relationships for registration:

```
<?xml version="1.0" encoding="UTF-8"?>
<myProduct>
  <relation>
    <sourceId>gq1234890</sourceId>
    <targetId>4527890524</targetId>
    <relationshipId>machUse3249804</relationshipId>
    <mdrId>myProdRegService</mdrId>
    <type>uses</type>
  </relation>
  <relation>
    <provider>gq1234890</provider>
    <dependent>980342980342</dependent>
    <relationshipId>machUse23498034</relationshipId>
    <mdr_name>myProdRegService</mdr_name>
    <type>uses</type>
  </relation>
</myProduct>
```


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