



Third-Party Integrations 1.4.4

ServiceNow Calm Plug-In Administrator Guide

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NUTANIX CALM PLUG-IN FOR SERVICENOW

Nutanix Calm plug-in for ServiceNow enables you to launch Calm blueprints or MPIs in ServiceNow platform as service catalog items. The Calm plug-in helps to automate the application provisioning and life-cycle management of Calm product. The plug-in allows you to control the resources by using IT services management (ITSM) and IT operations management (ITOM) processes that are defined by the customers in ServiceNow to reduce the time in Nutanix Marketplace.

Note: To configure and use Calm plug-in, you must be familiar with the basic concepts of Nutanix Calm and ServiceNow platform.

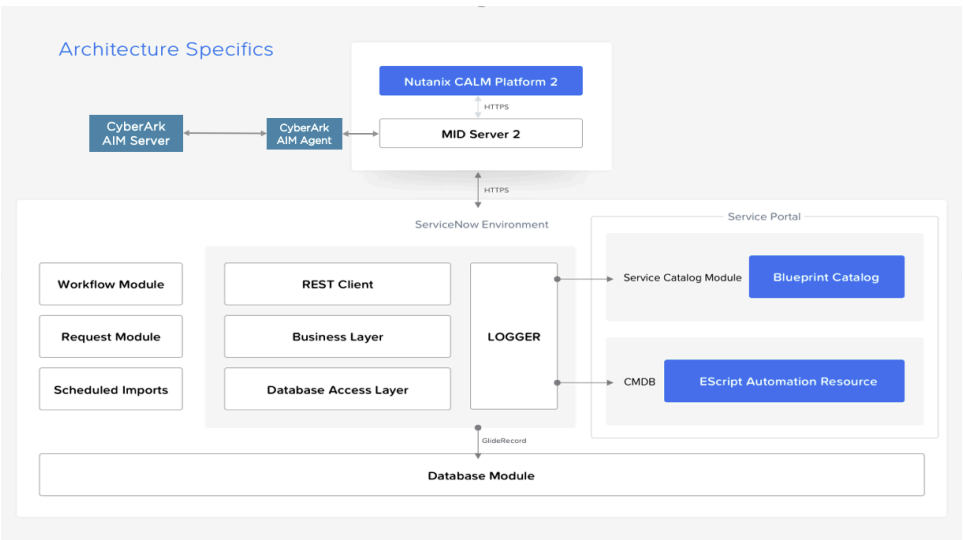


Figure 1: Architecture

Supported Versions

The following table shows the supported versions in this release.

Entity	Supported versions
ServiceNow	Orlando and Paris
Nutanix Calm	2.4.0, 2.5.0, 2.6.0, 2.7.0, 2.7.1, 2.9.1, 2.9.7, 2.10, 3.0.0, 3.0.6, 3.1.0, and 3.2.0
Web-browser	Latest versions of Chrome and Firefox

Note: If you are upgrading the Calm plug-in from v1.1 to v1.2, click the **Save Properties** button in Application Properties page. The page automatically displays the calm version.

Roles and Responsibilities

You must have access privileges to perform certain actions. The following table describes the various roles and their respective responsibilities.



Table 1: Roles and Responsibilities

Role	Responsibility
System administrator	<ul style="list-style-type: none"> Assigns Calm administrator role to one of the LDAP imported users.
x_nuta2_nutanix_ca.calm_admin	<ul style="list-style-type: none"> Plug-in configuration Runtime configuration Importing Calm resources in ServiceNow platform Creating catalog items Entitling users or groups
catalog	<ul style="list-style-type: none"> Accesses and launches catalog items on ServiceNow Native UI.
x_nuta2_nutanix_ca.user	<ul style="list-style-type: none"> Launch catalog items Perform actions on applications Check logs <div> <p>Note: When the Calm administrator creates a catalog item in the ServiceNow application, the x_nuta2_nutanix_ca.user role is automatically allocated to either LDAP imported users or groups and local group if the Use Local Groups option is enabled on the Application property page.</p> </div>
mid_server	<ul style="list-style-type: none"> Connects Calm environment by using CyberArk integrations with ServiceNow action designer. <div> <p>Note: When the Calm administrator creates a catalog item by using CyberArk setup in the ServiceNow application, the mid_server role is automatically allocated to either LDAP imported users or groups and local group if the Use Local Groups option is enabled on the Application property page.</p> </div>
approval_user	<ul style="list-style-type: none"> Approves or rejects approval requests.

Prerequisites for Nutanix Calm ServiceNow Plug-in

Before you start using the Nutanix Calm ServiceNow plug-in, ensure that the following prerequisites are completed:



Warning: When you migrate from a previous version of Calm ServiceNow plug-in to version 1.4, the following custom tables are deleted:

Nutanix, AWS, GCP, Vmware, Azure, Storage, Disk, Blank Disks, Disk List, Data Disks, Networking, Network Profiles, Secrets, Tag List, Staging Vmware, Staging Nutanix, Staging Azure, Staging GCP, and Staging AWS.

You must take a backup of the required data before the migration.

- You need system administrator privileges to install the Calm plug-in.
- If you use connect to Calm option by using the ServiceNow credential store object with CyberArk as the external storage, the following components must be enabled.
 - External credential store plug-in
 - Discovery plug-ins
 - ServiceNow IntegrationHub Standard pack Installer if you are using New York version
- You must configure Nutanix Calm and ServiceNow with the same AD or LDAP instance. This configuration is required because the user entitlement on either side is based on the user mapped to catalog item on the ServiceNow side and Project users on the Calm side.
- You need an ITSM license that includes incident management module. This license is used to create incidents to report blueprint and other events launch failures.

Note: Without the ITSM license, installation of application from the store does not work as this dependency is bundled with the application.

- You must enable the user criteria scoped API plug-in (**ID:com.glideapp.user_criteria.scoped.api**). This plug-in is used to create, modify, or delete user criteria records by using scripts.
- You must install and configure the ServiceNow MID server. For information on how to install and configure MID server, refer to the *MID Server* section in the *ServiceNow Documentation*. To refer to a video about setting up a MID server, [click here](#).
- You must ensure that the MID server is running in your environment. Calm is reachable from the machine or environment where MID server is installed.
- MID server users (users managing the MID server) must have the "mid_server" role privileges.
- The MID server must be up and validated.
- You need to contact your ServiceNow Administrator (one who manages the entire instance) for making the plug-in available on to the ServiceNow instance from the ServiceNow application store.



- When the application is installed, the ServiceNow administrator must manually assign the Calm administrator role to one of the LDAP imported users. The Calm administrator must have the following roles:

- mid_server (to access MID server)
- catalog
- x_nuta2_nutanix_ca.calm_admin
- x_nuta2_nutanix_ca.user

Users with the Calm Administrator role can configure and manage the Calm application plug-in installed on the ServiceNow instance.

- All applications and operations must have access and permissions of the tables. ServiceNow plug-in provides default permissions to a few tables. For more information about the table permissions, see [Required Table Permissions](#) on page vi. If a table does not have the access permission, assign the access to the table. For more information about assigning access to a table, see [Assigning Access to Tables](#) on page vii.
- You must set the **glide.sc.guide.tab.validate** system property to true. For more information about assigning the system property, see [Assigning System Property](#) on page viii.

Note: When you log on with administrator credentials, you need to be in the Global application scope. For information on how to select the Global application scope, see *ServiceNow Documentation*. When you do not use administrator credentials to log on, the platform automatically takes care of the selection of scope.

- You must set the **glide.sc.reset_cascade** system property to true. For more information about assigning the system property, see [Assigning System Property](#) on page viii.

Note: When you log on with administrator credentials, you need to be in the Global application scope. For information on selecting the Global application scope, see *ServiceNow Documentation*. When you do not use administrator credentials to log on, the platform automatically takes care of the selection of scope. This is an out-of-the-box ServiceNow property that is used to manage the cascading of the variables and their values.

- You must enable the email server to send and receive email notifications.

Required Table Permissions

The following table displays the table permissions for the applications and operations.

Note: By default, ServiceNow plug-in provides read, create, update, and delete permissions to few tables. If any of the following tables do not have the access permission, assign the access to the table. For more information about assigning access to table, see [Assigning Access to Tables](#) on page vii.

Table 2: Required Table Permission for Calm ServiceNow Plug-in

Table name	Label	Permission			
		Read	Create	Update	Delete



Table name	Label	Permission			
catalog_script_client	Catalog Client Scripts	Yes	No	Yes	No
sys_user_has_role	User Role	Yes	Yes	Yes	No
sys_user_grmember	Group Member	Yes	Yes	Yes	No
sys_group_has_role	Group Role	Yes	Yes	Yes	No
item_option_new	Variable	Yes	Yes	Yes	No
sys_user_group	Group	Yes	Yes	Yes	No
sc_category	Category	Yes	Yes	Yes	No
sc_catalog	Catalog	Yes	Yes	Yes	No
catalog_ui_policy	Catalog UI Policy	Yes	Yes	Yes	No
question	Question	Yes	Yes	Yes	No
question_choice	Question Choice	Yes	Yes	Yes	No
sysapproval_approver	Approvals	Yes	Yes	Yes	No

Note:

- If the table permission is mentioned as *Yes*, you have to assign the permission for the table. For more information, see [Assigning Access to Tables](#) on page vii.
- If the table permission is mentioned as *No*, you do not require any permission to perform the operation.

Assigning Access to Tables

The system administrator needs to assign access of different tables to the applications.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Global application scope. For information on how to select Global application scope, see *ServiceNow Documentation*. If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Select **Global** as the application scope.
3. Click **System Definition > Tables**.
4. Enter the table name in the **Search** field.
5. Click **To edit this record click here**.



6. Under the **Application Access** tab, assign permissions for the required tables. If any of the table do not have the access permission, assign the access to the table. For more information about assigning access to table, see [Assigning Access to Tables](#) on page vii.
7. Click **Update** to save your changes.

Assigning System Property

The system administrator needs to assign the system property to work with the Calm-ServiceNow plug-in.

About this task

Perform the following procedure to assign the system property:

Procedure

1. Do the following to set the **glide.sc.guide.tab.validate** system property to true:
 - a. In the left navigation pane, type **sys_properties.LIST** and press **Enter**.
 - b. Under the **Name** column, in the **Search** field, type **glide.sc.guide.tab.validate** and press **Enter**.
 - c. Set the value to **true**.
2. Do the following to set the **glide.sc.reset_cascade** system property to true:
 - a. In the left navigation pane, type **sys_properties.LIST** and press **Enter**.
 - b. Under the **Name** column, in the **Search** field, type **glide.sc.reset_cascade** and press **Enter**.
 - c. Set the value to **true**.

Enabling the Email Server

To send and receive email notifications, you must enable the email server.

Procedure

1. Log on to the ServiceNow as administrator.
2. Click **System Properties > Email Properties** to configure the email notifications.

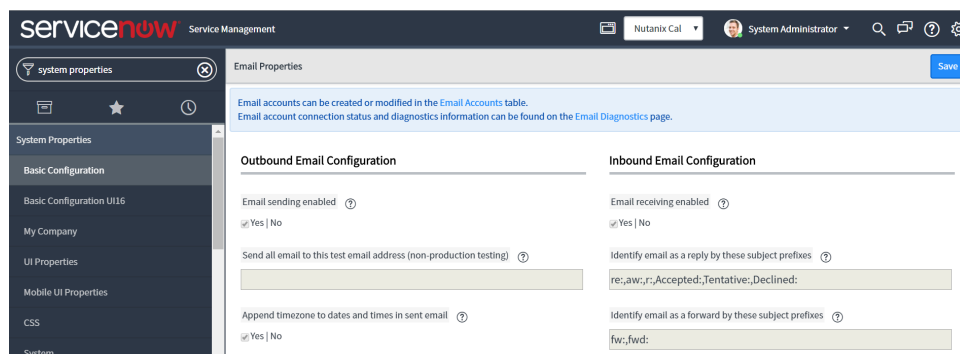


Figure 2: Email Properties Window

3. In the **Outbound Email Configuration** panel, select **Yes** check-box against the **Email sending enable** to enable sending email.
4. In the **Inbound Email Configuration** panel, select **Yes** check-box against the **Email receiving enabled** to enable receiving email.
5. Click **Save** to save the email notification settings.
The email server is configured to send and receive email notifications.
6. ServiceNow application sends an email to the user when the following actions are performed in the application.
 - a. Blueprint launch request is approved by the approval mechanism set on the configuration page, an email is sent to the user who launched the blueprint.
 - b. Blueprint launch request is completed, an email is sent to the user who launched the blueprint.
7. If you do not want to send out the notification email, then click **System Notifications > Notifications**.
8. Set **Request Approved** and **Request Completed** to active false.
For more details on email setup, you can refer to the [ServiceNow Documentation](#).

Configuring LDAP in ServiceNow

A system administrator can enable LDAP integration to allow single sign-on of users from their company LDAP directory. Imported users from AD to ServiceNow can be assigned with either Calm administrator or user role.

About this task

Note:

- The default AD or LDAP configuration in ServiceNow uses a Principal name that is mapped to a user email field in the user table. The same Principal name is used for Prism Central authentication used by the Plug-in. If the user tables or fields are customized, contact your ServiceNow administrator to map the fields appropriately.
 - If you have log on by using the administrator credentials, then you need to be in the Global application scope. For information on how to select Global application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.
-
- If you already have an existing LDAP configured on your ServiceNow instance, then ensure that your configuration is inline with the OU definition mentioned in the step 5 of the following procedure. Also, perform Scheduled Load so that all groups are immediately synced and there is no difference between users of ServiceNow and your AD.
 - If you do not have an existing LDAP configuration on your ServiceNow instance, then perform the following procedure.
 - To create an AD, see [Adding users to AD](#).

Procedure

1. Log on to the ServiceNow.



2. Click **System LDAP > Create New Server**.
In the New LDAP server window, Active Directory option is selected by default.
3. Scroll down the window and click **Submit**.
4. In the LDAP server window, enter the name of the server in the **Name** field.
5. Select **Active** check box, if the server is active.
The check-box is enabled by default.
6. Enter the distinguished name (DN) of the user authenticating the LDAP connection in the **Login distinguished name** field.
7. Enter the server password in the **Login password** field.
8. Enter the relative distinguished name (RDN) of the default search directory in the **Starting search directory** field.
9. Under LDAP server URLs, click **+** to add an LDAP server URL.
Enter the URLs of the primary and back up LDAP servers. Servers are first ordered by operational status, with servers that are Up listed first, then ordered by the order value that you specify. The first server listed is the primary LDAP server. The others are redundant servers.
10. Under **Advance Options** panel, enter connection timeout value in the **Connection timeout** field.
Specify the maximum number of seconds that the instance has to establish an LDAP connection. If no connection is made by this time, the connection is terminated.
11. Specify the number of seconds the integration has to read LDAP data in the **Read timeout** field.
The integration stops reading LDAP data after the connection exceeds the read timeout.
12. Select **Listener** check-box to enable the integration to periodically poll Microsoft Active Directory servers or LDAP servers that support persistent search request control.
13. Enter the listener timeout value in minutes in the **Listen interval** field.
Specify the listener timeout value in the number of minutes that the integration listens for LDAP data with every connection. The integration stops listening for LDAP data after the connection exceeds the listen interval.
14. Select **Paging** check-box to have the LDAP server split up LDAP attribute data into multiple result sets rather than submit multiple queries.
15. Under **Related Links**, click **Test Connection** to test the connection configuration.
16. Under **LDAP OU Definitions**, click **New** to define an organization unit (OU) definition for importing.
17. In the LDAP OU Definition New record, enter the name the integration uses when referencing this OU in the **Name** field.
The name you enter here becomes an LDAP target in the data source record.
18. Enter the relative distinguished name of the subdirectory you want to search in the **RDN** field.
This RDN is combined with the start-searching directory from the LDAP server definition to identify the subdirectory containing information for this organizational unit.



19. Enter the name of the attribute within the LDAP server to query for records in the **Query field**.
The query field must be unique in both single and multiple domain instances.
20. Select **Active** check-box to activate the OU definition and to allow administrators to test importing data. However, the integration can only bring data into the system from active OU definitions.
21. Select server by clicking the search icon and select from the available list of servers.
22. Specify the table that receives the mapped data from your LDAP server.
23. Enter an LDAP filter string in the **Filter** field to select specific records to import from the OU.
24. Click **Submit**.
25. Under **Related Links**, click **Test Connection** to test the connection.
26. Click **System LDAP > Schedule Loads** to execute the users import schedule job.
27. From the listed LDAPs, click the LDAP you have imported.
28. In the Scheduled data Import window, click **Execute Now** .
For more information about how to configure LDAP, you can refer to the [ServiceNow documentation](#).

Configuring CyberArk in ServiceNow

If you want to use CyberArk application for authentication, you must configure cyberArk in ServiceNow.

Before you begin

If you use connect to Calm option by using the ServiceNow credential store object with CyberArk as the external storage, the following components should be enabled.

- External credential store plug-in
- Discovery plug-ins
- ServiceNow IntegrationHub Standard pack Installer if you are using New York version

Procedure

CyberArk configuration procedures include both CyberArk and ServiceNow configuration tasks. For more information, see [ServiceNow documentation](#).

Viewing the MID Server Status

The ServiceNow MID server works as a communication bridge between the ServiceNow platform and Nutanix Calm plug-in.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

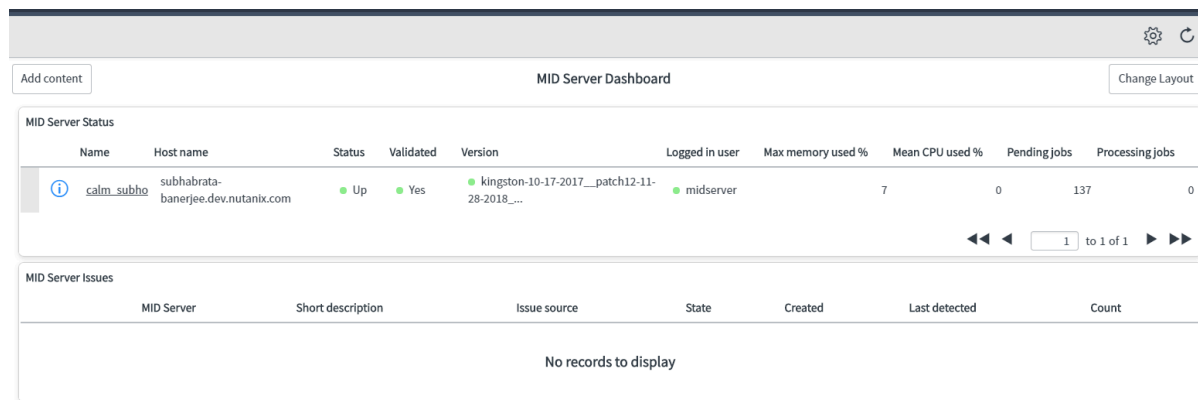


Procedure

1. Log on to the ServiceNow.

2. Click **MID Server > Dashboard**.

The MID server dashboard displays the basic information about the configured MID server.



MID Server Dashboard									
MID Server Status									
Name	Host name	Status	Validated	Version	Logged in user	Max memory used %	Mean CPU used %	Pending jobs	Processing jobs
calm_subho	subhabrata-banerjee.dev.nutanix.com	Up	Yes	kingston-10-17-2017__patch12-11-28-2018...	midserver	7	0	137	0

MID Server Issues						
MID Server	Short description	Issue source	State	Created	Last detected	Count
No records to display						

Figure 3: MID Server Dashboard

3. Check the **Status** column to view the status of the MID server.

Note: To perform any operations on the Calm plug-in, the MID server status must be **Up** and the validation must be **Yes**.

What to do next

For detailed information about the MID server, see [MID Server Documentation](#).

Clustered MID Server for Load Balancing or Failover Support

MID Server clusters configuration enables the grouping of multiple MID Servers with the appropriate capabilities for load balancing and fail-over protection.

MID Server Capabilities

MID Server capabilities define the specific functions of a MID Server within an IP address range.

Several applications, such as Discovery, Service Mapping, Cloud Management, and Orchestration, can use capabilities, IP ranges, and MID Server selection to narrow the pool of MID Servers that the applications need.

Clusters Workflow

MID Servers in clusters must be able to connect to all the instances and devices with which it needs to communicate. Make sure all the MID Servers get added to any **Access Control List (ACL)** in use. MID Server clusters are managed by the **MID Server Cluster Management** business rule, which checks if the MID Server assigned to a job in the ECC Queue belongs to a cluster.

Load Balancing

- If the cluster business rule determines that a MID Server is part of a load balancing cluster, the application using the MID Server automatically balances the work between the MID Servers in that cluster.



- It is recommended to put MID Servers with the same capabilities in a load balancing cluster.

Fail-over Protection

- Each MID Server in a fail-over cluster has a configured order that the platform uses to determine the MID Server to be used next in the case of failure.
- MID Servers in a fail-over cluster work independently and do not load balance with other MID Servers in that cluster (although they might also be members of the load balancing clusters).
- When a MID Server fails, the MID-Server Cluster-Management business rule selects the highest available MID Server to take over the work. The selected MID Server checks the ECC Queue and starts with jobs that are either processing or ready.
- For performance and reliability reasons, do not use the following data sources with MID Server clusters:
 - LDAP
 - Export sets
 - JDBC data sources

Note: It is always preferred to have a different set of Mid Servers for Load Balancing and Fail-over protection.

MID Server Cluster Event

The following event is triggered when the platform cannot find a MID Server with the appropriate capabilities to replace a MID Server in a fail-over cluster. Use this event to notify the appropriate users about cluster failure through an email.

Event	Table	Description	Business Rule
mid_server.cluster.down	MID Server Cluster [ecc_agent_cluster]	A MID Server cluster has failed.	MID Server Cluster Management

Combining Clusters

You can add a MID Server to two types of clusters simultaneously. The following diagram shows a scenario where a MID Server from a load balancing cluster (MID Server D) is also present in a fail-over cluster. If MID Server D fails, MID Server E in the fail-over cluster becomes available to the load balancing cluster to perform the tasks previously assigned to MID Server D.



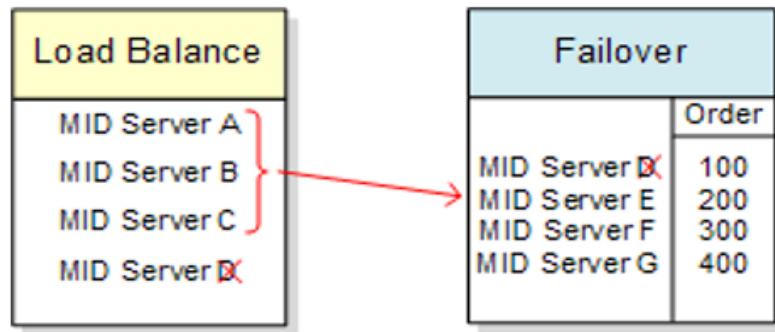


Figure 4: Combining Clusters

Configure a MID Server Cluster

- Group multiple MID Servers to form clusters, then configure clusters for fail-over protection or load balancing.
- Load-balancing clusters automatically balance work between each MID Server to improve stability and performance.
- Fail-over clusters have a configured order used to determine the MID Server to be used next if a failure occurs.
- Ensure that each MID Server in the cluster has the appropriate capabilities for the job. A MID Server in a fail-over cluster must have the same capabilities (or expanded capabilities) as the MID Server it is expected to replace.
- An administrator role is required to configure a MID server cluster.

For detailed information on setup, see [Configure a MID Server cluster](#) section in the *ServiceNow documentation*.

Installing Nutanix Calm Plug-in from ServiceNow Store

You can install the plug-in directly from the ServiceNow store.

About this task

You can download the Nutanix Calm plug-in from the ServiceNow store. To refer to a video about downloading the plug-in, [click here](#).

Before you begin

Ensure that you meet the prerequisites before you install Nutanix Calm Plug-in. For more information, see [Prerequisites for Nutanix Calm ServiceNow Plug-in](#) on page iv.

Procedure

1. Download the application from the ServiceNow store.
The platform auto-manages the installation and there is no need for fixing any errors or committing.
2. You can track the installation from **System Applications > Applications page**.



What to do next

After installation, the platform displays the detail of the application such as version number and state.

Configuring the Application Properties

Using the application properties, you can view and update the Calm plug-in properties and the following attributes.

About this task

Note: If you have logged on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For more information about selecting a scope, see *ServiceNow Documentation*. If you have not used the administrator credentials to log on, then the selection of the scope is automatically taken care by the platform.

- Calm Instance URL: Calm plug-in uses the mentioned URL to import all the Calm resources.
- Approval Workflow: The system uses the approval workflow for approvals, when you create any request blueprint launch operation.
- Support URL: User can use the support URL to contact Nutanix Calm support.
- Logs: Administrator can set the logs that are displayed to the user.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm** > **Configuration** > **Application Properties** to view the Nutanix Calm application properties.

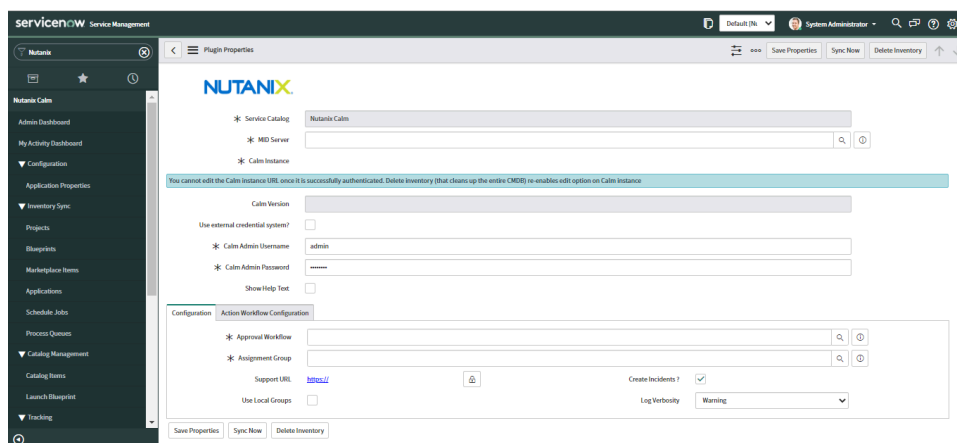


Figure 5: Application Properties

3. The **Service Catalog** field displays the name of the service catalog item. The default value for the **Service Catalog** field is Nutanix Calm. The catalog name groups all the catalog items that are created in the ServiceNow application.



4. Do the following in the **MID Server** field.
 - a. Click the tooltip icon to view the MID server details.
 - b. Click the search icon to view the status of the MID server.
In the MID servers window, check the status column to determine whether the server is up or down.
5. Do the following in the **Calm Instance** field.
 - a. Click the lock icon to edit the field.
 - b. Enter the URL of the CALM instances that needs to be registered. For example, **https://10.0.1.20:9440**.
 - c. Click the unlock icon to lock the field.
6. Enter the administrator username in the **Calm Admin Username** field.
7. Enter the administrator password in the **Calm Admin Password** field.
8. Optionally, if you want to connect to Calm by using the ServiceNow credential store object with CyberArk as the external storage, select the **Use external credential system?** check-box.

Selecting the **Use external credential system?** check-box enables the **Credential** and **MID Application** fields.

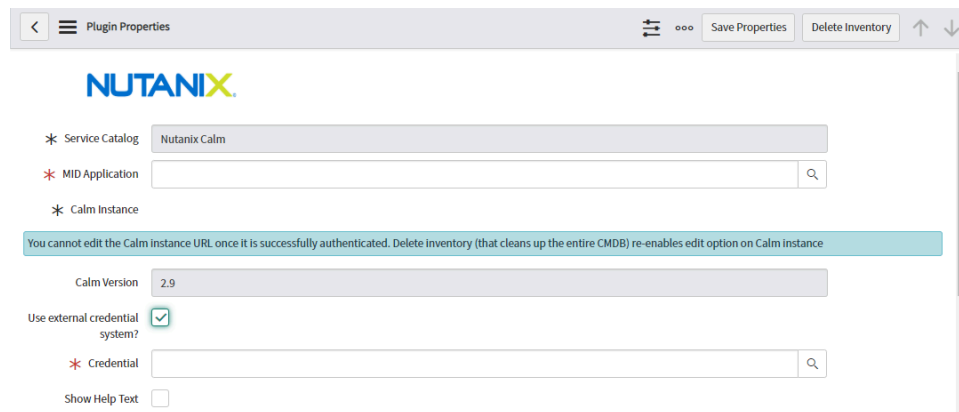


Figure 6: Plug-in Properties

Do the following in the **Credential** field.

- a. Click the search icon to view the available credentials in the store.
- b. From the list of the available credentials, select the credential you want to use.

Do the following in the **MID Application** field.

- a. Click the search icon to view the available MID applications in the ServiceNow instance.
- b. From the list of the available MID applications, select the MID application you want to use.

By default, the **Show Help Text** check-box is set to true to show annotations for all the fields and assist users to fill correct details.

9. Optionally, to connect to the cloud-based Calm instance, select the **Connect to Calm on Public Cloud** check-box.

When you select the **Connect to Calm on Public Cloud** check-box, you can connect to Calm instance directly without using the MID Server.

Authentication Successful.

NUTANIX

Service Catalog: Nutanix Calm

Connect to Calm on Public Cloud: ☒

* Calm Instance: <https://10.44.77.39:9440/>

You cannot edit the Calm instance URL once it is successfully authenticated. Delete inventory (that cleans up the entire CMDB) re-enables edit option on Calm instance

Calm Version: 3.1

* Calm Admin Username: admin

* Calm Admin Password: *****

Show Help Text: ☐

Configuration: Action Workflow Configuration

* Approval Workflow: Nutanix - Auto Approve

* Assignment Group: Service Desk

Support URL: <https://>

Use Local Groups: ☐

Create Incidents?: ☒

Log Verbosity: Debug

Save Properties Sync Now Delete Inventory

Related Links

Sync Now

Figure 7: Plug-in Properties: Public Cloud

Do the following:

- Click the lock icon in the **Calm Instance** field, and enter the URL of the CALM instances that needs to be registered. For example, **https://10.0.1.20:9440**. Click the unlock icon to lock the field.
- Enter the administrator username in the **Calm Admin Username** field.
- Enter the administrator password in the **Calm Admin Password** field.

Note:

- For cloud-based Calm instance, you need an API key to configure Calm plug-in. You cannot configure the plug-in with a local user.
- The IDP configuration is not qualified for cloud-based Calm instance.

10. Under the **Configuration** tab, do the following in the **Approval Workflow** field to select an approval workflow.

- a. Click the search icon and select the required workflow.

Workflows are defined for the following tasks.

- Auto approval workflow for Catalog Creation: Created on the table **sc_req_item**.
- Auto approval workflow for Catalog Launch: Created on the table **sc_req_item**.
- Auto approval workflow for Application action creation: Created on the table **x_nuta2_nutanix_ca_app_action_workflow_trigger**.

There are two approval workflows configured for:

- System: The type is set to **system**.
- User: The type is set to **user**.

Note:

- An Approver must have an **approval_user** role to approve the assigned request.
- You can customize workflows according to your requirements and use them within the plug-in. You can also create and use additional workflows on the mentioned tables.

- b. Click the tool tip icon to view details of the selected workflow.

11. From the **Assignment Group** drop-down menu, select an assignment group to whom the incident needs to be triggered for resolution.

When a request associated with a Catalog item creation or launch fails, an incident is created and assigned to the assignment group.

Note: To work on the assigned incident, the assignment group must have the *itil* or *sn_incident_read* role.

12. Do the following in the **Support URL** field.

- a. Click the lock icon to unlock the field.
- b. Enter the support URL to direct the users in failure instances.
The mentioned support URL is displayed in the support page.
- c. Click the unlock icon to lock the field.

13. Select **Create Incidents** check-box to automatically create incidents in failure instances.
If the check-box is not selected, then application only logs a message under logs and does not create an incident.

14. Select the applicable log to show the users from the **Log Verbosity** drop-down menu.



15. To assign the catalog item to the local ServiceNow group, click the **Use Local Groups** field.
 - By default, the Calm plug-in uses the LDAP groups that are imported using the AD or LDAP configured within ServiceNow for entitlement.
 - Select the **Use Local Groups** check-box to use the local groups that are created within ServiceNow for entitlement during the catalog creation process.

Note: If the Calm administrator uses the local group support, users belonging to the local groups can be entitled to any catalog item along with applications and actions associated with it. All the requests carried out by local users on the ServiceNow side get processed as an admin user on the Calm side.

16. Optionally, to manage the workflow of application actions in ServiceNow, click the **Enable/Disable workflow for action** check box and do the following.

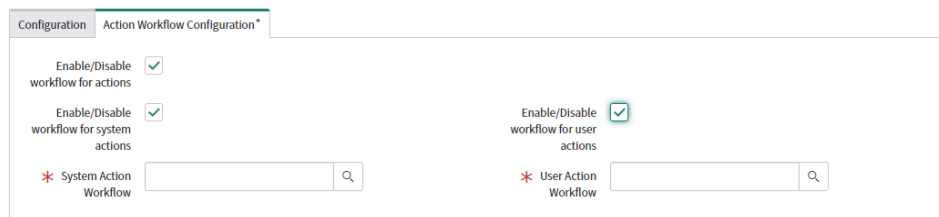


Figure 8: Action Workflow Configuration

The **Enable/Disable workflow for system actions** and the **Enable/Disable workflow for user actions** fields are available for selection.

- a. Click the **Enable/Disable workflow for system actions** field to trigger this workflow on any system action triggered by the user.
- b. Click the **Enable/Disable workflow for user actions** field to trigger this workflow on any user action triggered by the user.

Note: Calm plug-in provides two default workflows as **Nutanix - User Actions Auto Approval** and **Nutanix - System Actions Auto Approval**. If you want to create a custom workflow for user or system action, you can create it on **Application Action Request** table after setting the value of approval_status as either approved or rejected.

17. Click **Save Properties** to save the application properties.
After the authentication is successful, **Sync Now** and **Delete Inventory** buttons are displayed and the **Calm Version** field is automatically filled.

Sync Now Operation

The Sync Now option is not displayed in the following cases:

- When Calm is not authenticated.
- When the sync or delete operation for the inventories is in progress.

After you click the **Save Properties** option and get the **Authentication Successful** message, click the **Sync Now** option visible on the Application Property page.

Clicking **Sync Now** imports Calm resources such as projects, blueprints, profiles, marketplace items, applications, and actions. The calm administrator can then create catalog items based on the imported data.



Note: You must sync the data after upgrading the plug-in to version 1.4.4.

Inventory Sync

Inventory sync menu option is used to sync the ServiceNow application with the Nutanix Calm database. By using Inventory sync, you can do the following:

- View the draft and published blueprints. Only the active blueprints and published MPIs are synced.
- Run and view the jobs that are scheduled to run at a predefined time interval.

Inventory sync updates the following objects in Configuration Management Database (CMDB):

Table 3: Inventory Sync

Entity	Objects
Projects	<ul style="list-style-type: none">• Environments• Providers• Credentials
Blueprints	<ul style="list-style-type: none">• Published blueprints• Unpublished blueprints
Applications	<ul style="list-style-type: none">• Actions• Run logs• Recovery points

For detailed information about CMDB, see [Configuration Management Database Documentation](#).

Data Migration after Upgrading to Version 1.4.4

Calm Plug-in version 1.4.4 migration scenarios are controlled automatically.

- Blueprints that have common profile variables (variables with the same name) between multiple profiles are deleted, and the catalog items associated with the blueprints are marked inactive.
- Specific log messages are added in the log and on the Application Properties page.
- After the sync operation, the deleted blueprints are synchronized again and are made available for the catalog creation.

Inventory Negative Sync

Calm ServiceNow plug-in runs a scheduled or on-demand job to synchronize the Calm entities, for example, blueprints (unpublished), marketplace items (published blueprints), projects, and applications with ServiceNow Configuration Management Database (CMDB). Negative sync refers to the updating of ServiceNow CMDB after the corresponding entities in Calm are removed or the state changed.



Inventory negative sync does not allow you to launch or edit blueprints or marketplace items in ServiceNow. Negative sync of blueprints, profile associated with blueprints, marketplace items, and projects associated with marketplace items happens automatically in the following scenarios.

The following sections describe various scenarios of catalog item impact in ServiceNow.

Negative Sync for Blueprints

If a blueprint goes into a non-active state (draft or deleted state in Calm), then the catalog items created from the blueprint cannot be launched or edited in ServiceNow.

An onLoad script runs on the **Catalog Launch** page that checks the state of a blueprint in Calm. In next sync up job, the non-active blueprints in Calm are marked as inactive in ServiceNow and are not available for launch or edit. Only delete action is available.

Note: If you change a variable in a blueprint that is already synced in ServiceNow, user with admin or x_nuta2_nutanix_ca.calm_admin role can delete blueprint from serviceNow by clicking the **Delete** button till the next sync operation is performed. It deletes the blueprint record from CMDB, and removes all its references on the plug-in side and the catalog item related to that blueprint is marked as inactive.

Negative Sync for Profiles Associated with Blueprints

If the profiles associated with a blueprint are deleted in Calm, then the catalog items created from the blueprint and the profile combinations cannot be launched or edited in ServiceNow.

An onLoad script runs on the **Catalog Launch** page and checks for the Calm profiles in a blueprint.

In the next sync up job, note the following two cases:

- If a catalog item had only a single profile associated with a blueprint and the profile was deleted in Calm, the sync job marks this catalog item as inactive in ServiceNow. Hence, this catalog item is not available for ordering or editing the configuration, whereas you can delete this catalog item.
- If a catalog item had multiple profiles of a blueprint configured and a profile was deleted in Calm, the sync job removes this deleted Profile from the catalog selection and is not available for the users to select during ordering (launch) operation.

Negative Sync for Marketplace Items

If you delete a project from Calm, then the associated project in marketplace item is also deleted. In that case, the catalog item created by that marketplace item cannot be launched or edited from ServiceNow.

An onLoad script runs on the **Catalog Launch** page that checks the state of marketplace items in Calm. In the next sync up job, the unpublished marketplace items are marked as inactive in ServiceNow and are not available for launch or edit. Only delete action is available. After you publish the marketplace item in Calm and run the sync job, the inactive state of the marketplace item becomes active.

Note: The catalog items created from a marketplace item that is marked as draft are not affected by the negative sync.

Negative Sync for Projects Associated with Marketplace Item

If you do not add any project to a marketplace item and publish the marketplace item in Calm, then the catalog items created from the marketplace item cannot be launched or edited in ServiceNow.



An onLoad script runs on the **Catalog Launch** page that checks the state of marketplace items in Calm. In the next sync up job, the unpublished marketplace items are marked as inactive in ServiceNow and are not available for launch or edit. Only delete action is available. After you add a project to the marketplace item in Calm and run the sync job, the inactive state of the marketplace item becomes active.

Negative Sync for Projects

If a project is deleted from Calm, then the catalog items created from that project cannot be launched or edited in ServiceNow.

An onLoad script runs on the Catalog Launch page and checks the state of a project in Calm.

In the next sync up job, note the following two cases:

- If a catalog item had only a single Project associated with a blueprint and the project was deleted in Calm, the sync job marks this catalog item as inactive in ServiceNow. Hence, this catalog item is not available for ordering or editing the configuration, whereas you can delete this catalog item.
- If a catalog item had multiple Projects configured and one of the Projects was deleted in Calm, the sync job removes this deleted Project from the catalog selection. This Project is not available for the users to select during ordering (launch) operation.

Negative Sync for Variable

After a blueprint is synced into ServiceNow CMDB, the blueprint can undergo a lot of changes in Calm, for example, renaming a variable in a blueprint. On the next sync, the updated variable is reflected in the blueprint in CMDB.

Deleting Inventory

About this task

When you have successfully authenticated and synced the inventory, the **Delete Inventory** button appears.

Note: The Calm admin must have the permission to use the **Delete Inventory** option.

You can only use the **Delete Inventory** option in the following cases:

- If you want to register a new Calm instance for the plug-in.
- If it is essential to delete the entire plug-in synced data within ServiceNow.

Note: Data once deleted using the **Delete inventory** option will no longer be available in ServiceNow.

Executing a Schedule Job

Scheduled Jobs are automated pieces of work that can be performed at either a particular time, or on a recurring schedule. Calm administrator can view the jobs that are scheduled to run at a predefined time. The scheduled jobs enable you to sync the Calm plug-in with Nutanix Calm and update the ServiceNow database as per the job script. You can also use the **Sync Now** button to sync the ServiceNow Calm plug-in with Nutanix Calm.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application



scope, see [ServiceNow documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm** > **Inventory Sync** > **Schedule Jobs** to view the scheduled jobs.
3. Click the scheduled job to view the job details.
4. Click **Execute Now** to run the job.
After the data is imported in the Calm ServiceNow plug-in, you can browse to blueprint and marketplace to view the imported data and assign these catalog items to the users as a runtime variable.

Viewing Nutanix Projects

The Nutanix Projects window displays the list of available projects in the Nutanix Calm plug-in. You can also view the blueprints associated with a project.

About this task

Note:

- If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.
- The Nutanix Calm v1.3 plug-in provides support for multi-PC architecture in Calm.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm** > **Inventory Sync** > **Nutanix Projects** to view the projects.
3. Click the project name to view the project details.

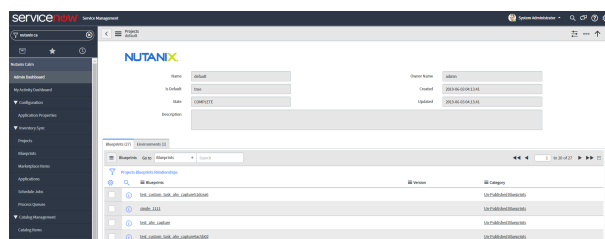


Figure 9: Nutanix Calm Projects

The list of associated blueprints is displayed at the bottom.

Viewing Nutanix Blueprints

The Nutanix Blueprints window displays the list of unpublished blueprints available in the Nutanix Calm plug-in. From this window, you can also view the list of available variable and application profiles associated with a blueprint.

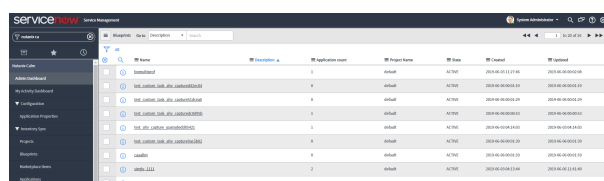


About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm > Inventory Sync > Blueprints** to view the blueprints.
The list of active blueprints is displayed.



Name	Application count	Project Name	Role	Status	Updated
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45
Nutanix_Calm_2018-08-01-11-27-45	1	adnan	adnan	ACTIVE	2018-08-01 11:27:45

Figure 10: Nutanix Blueprints

3. Click the blueprint name to view the blueprint details.
The list of available variables and application profiles is displayed at the bottom.

Nutanix Marketplace Items

The Nutanix Marketplace Items window displays the list of published MPIs available in the Nutanix Calm plug-in. From this window, you can also view the list of available variable and associated application profiles available in a blueprint.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm > Inventory Sync > Marketplace Items** to view the blueprints.



Name	Owner Name	Author	Version	App Profile	App Date	Status	Updated
Nutanix_Calm_2018-08-01-11-27-45	adnan	adnan	1.0.0	PUBLISHED	2018-08-01 11:27:45	ACTIVE	2018-08-01 11:27:45

Figure 11: Nutanix Marketplace Items

3. Click the MPI name to view the MPI details.
The list of available variables and application profiles is displayed at the bottom.

Viewing Nutanix Applications

The applications window displays the list of applications available in the Nutanix Calm plug-in.



About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm > Inventory Sync > Applications** to view the deployed applications.
3. Click the application name to view the application details.

You can view the list of available actions, recovery points, and audit logs.

Note:

- Recovery Points tab is only available for single VM applications running on Nutanix and VMware cluster for Calm v2.9.7.
- AMIs tab is only available for single VM applications running on AWS cluster for Calm v2.9.7.

Catalog Items Creation

Calm administrator can use the catalog items creation feature to mark the attributes while creating the catalog item so that those attributes can be modified at the time of launching the application blueprint. Calm administrator has access to runtime configuration flow to create a catalog item and performs user entitlement. From this window, administrator can also assign a catalog item to the users.

Note: If a catalog item is broken due to Calm-ServiceNow plug-in v1.0 issue (For example, Catalog Item is not correctly created in v1.0), then the catalog item remains broken on the Calm-ServiceNow plug-in v1.1 and v1.2. The administrator needs to delete and create new catalog item..

Assigning a Blueprint or MPI to a User

You must assign a blueprint to a user by performing the following procedure.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see *ServiceNow Documentation*. If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm > Catalog Management > Catalog Items**.
3. Click **New**.
The **New** button is not displayed when a sync or deletion of inventories is in progress.



4. In the **Select Type of Blueprint to Configure** field, select one of the following.
 - **Unpublished blueprints:** To assign an active blueprint to user, an administrator can view the list of active blueprints in the **Blueprints** option under the **Inventory Sync** menu.
 - **Published blueprints:** To assign a published MPI to user, an administrator can view the list of published MPI in the **Marketplace Items** option under the **Inventory Sync** menu.
5. From the **Blueprint** drop-down list, select a blueprint or MPI.
6. From the **Project** multi-select list, select a project.
 - In the case of a single project associated with blueprint, the project gets updated automatically on the list.
 - In the case of multiple projects associated with the blueprint, you will get an option to select a project from the available list.
7. From the **Application Profile** multi-select list, select an application profile for a blueprint or MPI.
 - In the case of a single profile associated with blueprint, the profile gets updated automatically on the list.
 - In the case of multiple profiles associated with the blueprint, you will get an option to select a profile from the available list.
8. Click **Choose Options**.

In the Choose Options window, the available fields in the **Variables**, **Service configuration**, **Credentials**, and **General Settings** tabs are dynamic. The available fields for the tabs may differ for each blueprint.

Note: Advance variable support is available for Calm v2.7 or above.

9. Under the **General Configuration** tab, do the following.
 - a. In the **Item Name** field, enter the item name.
 - b. (Optional) In the **Description** field, update the description for the catalog in the markdown format.
 - c. In the **Assign User** field, click the lock icon to unlock the **Assign User** field.
 - d. In the **Assign Group** field, click the lock icon to unlock **Assign Group** field.
 - e. Click the lock icon to unlock the **Support URL** field.
10. In the **Choose Options** window, enter the values for all the mandatory fields.
11. Click **Checkout**.

The catalog item is assigned to a user or group.

Available Actions on a Catalog Item

The following actions are available on a catalog item.

- **Launch:** Launches the catalog item.
- **Edit:** Edits the catalog item.



- **Delete:** Deletes the catalog item.

Note: Delete action is an irreversible action, that means the deleted catalog items cannot be retrieved. However, you can view the deleted catalog items by clicking the **Show Deleted Catalogs** button.

- **Move to Draft:** Moves the catalog item to draft stage and the item is not available to the entitled users. After moving the catalog item to draft, the item appears as **Active catalog item**.
- **Active Catalog Item:** Reactivates the draft catalog item. This action appears when the catalog item is in draft stage.

Viewing Application Action Request Details

Perform this procedure to track the approval state of an action performed on an application. If any action is performed by user, it go for the approval flow. We can check our action approval state here.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm** > **Tracking** > **Application Action Requests** > .

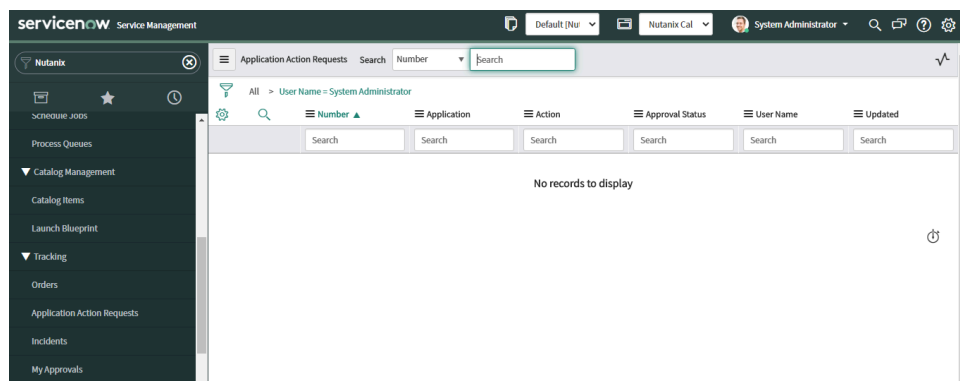


Figure 12: Application Action Request

The **Application Action Requests** page displays the list of actions performed by users.

Viewing Support Details

Calm administrator and end-user can access the Nutanix Calm support contact details.

About this task

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.



2. Click **Nutanix Calm > Support > Contact Support**.

The contact support detail is displayed.

Contact Support	
Nutanix	
Your Role	Action
Non-Admin Users	Report to Admin Users.
Admin Users	Check The Error Logs and Consult The Documentation. If issue is not Resolved or not mentioned in the Document Contact us by visiting The Portal at Nutanix ServiceNow Plugin support website
Note:- Use This Option Only When Required.	

Figure 13: Support Details

Viewing Logs

Logs module is visible to both Calm administrator and end user. From the Logs menu, user can access the following options:

About this task

- Emails: To view the various notifications sent or received.
- User Logs: To view the error details.

Note: If you have log on by using the administrator credentials, then you need to be in the Nutanix Calm application scope. For information on how to select Nutanix Calm application scope, see [ServiceNow Documentation](#). If you have not used the administrator credentials to log on, then the selection of scope is automatically taken care by the platform.

Procedure

1. Log on to the ServiceNow.
2. Click **Nutanix Calm > Logs > Emails or User Logs**.

The logs detail is displayed.

Created	Recipients	Subject	Type	Notification type	User ID
2023-06-06 11:32:33	admin@nowexample.com	Your request REQ0010004 has been approved	sent	SMTP	[snip@]
2023-06-06 11:33:33	admin@nowexample.com	Request REQ0010004 has been opened on your behalf	sent	SMTP	[snip@]
2023-06-06 11:34:00	admin@nowexample.com	Your request REQ0010004 has been completed	sent	SMTP	[snip@]
2023-06-06 11:35:00	admin@nowexample.com	Request REQ0010005 has been opened on your behalf	sent	SMTP	[snip@]

Figure 14: Email Logs



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Conventions

Convention	Description
<code>variable_value</code>	The action depends on a value that is unique to your environment.
<code>ncli> command</code>	The commands are executed in the Nutanix nCLI.
<code>user@host\$ command</code>	The commands are executed as a non-privileged user (such as nutanix) in the system shell.
<code>root@host# command</code>	The commands are executed as the root user in the vSphere or Acropolis host shell.
<code>> command</code>	The commands are executed in the Hyper-V host shell.
<code>output</code>	The information is displayed as output from a command or in a log file.

Version

Last modified: May 7, 2021 (2021-05-07T11:29:06+05:30)

