EMC Isilon

Cisco UCS Director Support for EMC Isilon

Cisco UCS Director manages, monitors, and does reporting for the EMC Isilon system. Data is collected through the Isilon cluster platform and namespace REST API, which is connected to Cisco UCS Director through HTTP or HTTPS. This data is parsed and bound to the output as Plain Old Java Objects (POJOs), and these objects are distributed throughout the pod.

Adding an EMC Isilon Account

Step 1 Choose **Administration** > **Physical Accounts**.

Step 2 On the **Physical Accounts** page, click **Physical Accounts**.

Step 3 Click **Add**.

Step 4 On the **Add Account** screen, complete the following fields:

Name	Description
Pod drop-down list	Choose the pod for this account. The pod can be one of the following types: • **Default Pod** • **Generic** • **VSPEX** • **Vblock**
Category drop-down list	Choose **Storage**.
Account Type drop-down list	Choose **EMC Isilon Cluster**.

Step 5 Click **Submit**.

Step 6 On the second **Add Account** screen, complete the following fields:

Name	Description
Account Name field	A unique name for this Isilon account. For example, isilon-1.
Description field	A description of the Isilon cluster.
Server IP field	The IP address of the Isilon cluster.
Use Credential Policy check box	Check this box if you want to use a credential policy for this account rather than enter the username and password information manually.
Credential Policy drop-down list	If you checked **Use Credential Policy**, choose the credential policy that you want to use from this drop-down list. This field is only displayed if you choose to use a credential policy.
Username field	The username that this account uses to access the Isilon cluster. This username must be a valid account in the Isilon cluster. This field is not displayed if you chose to use a credential policy.

Name	Description
Password field	The password associated with the username. This field is not displayed if you chose to use a credential policy.
Protocol drop-down list	Choose one of the following transport types that you want to use for this account: • **http** • **https** The default transport type protocol for this account is HTTPS.
Port field	The port used to access the Isilon cluster. Port 8080 is the default port for both HTTP and HTTPS.
API Version drop-down list	Choose the API verson that is supported on the Isilon cluster. The default is API version 1.
Connection Timeout (Seconds) field	The length of time in seconds that Cisco UCS Director will wait to establish a connection to the Isilon cluster before timing out. The default value is 30 seconds. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite timeout.
Socket Read Timeout (Seconds) field	The length of time in seconds that Cisco UCS Director will wait for data from the Isilon cluster before timing out. The default value is 30 seconds. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite timeout.
Contact field	The email address that you use to contact the administrator or other person responsible for this account.
Location field	The location of the contact.

Step 7 Click **Submit**.

Cisco UCS Director tests the connection to the EMC Isilon storage system. If that test is successful, it adds the Isilon account and discovers all infrastructure elements in the storage system that are associated with that account. This discovery process and inventory collection cycle takes few minutes to complete.

Storage Pool Tiers

Storage pool tiers are collections of node pools that you group to optimize storage according to need, such as a mission-critical high-speed tier that is best suited to data archiving. You can organize storage pool tiers, into

logical groupings by creating policies that store or move files among these groups automatically, based on a specified criteria.

The following storage pool tiers can be created for specific purposes. Older nodes can be reduced in numerical quantity and new nodes can be added as a new tier in the same cluster.

Storage Pool Tier	Description
EMC Isilon S-Series	This platform has Input/Output Operations Per Second (IOPS) for intensive applications which process large volumes of data and devote most of their processing time to input/output (I/O) and manipulation of data. An EMC Isilon S-Series performance tier can be combined with an archive tier (EMC Isilon NL-Series) in the same cluster. An EMC Isilon S-Series with Solid State Drives (SSDs) latency tier of can be added for latency-sensitive data must meet certain time constraints in order to be acceptable to a user.
EMC Isilon X-Series	This platform is used for high concurrent and sequential throughput workflows.
EMC Isilon NL-Series	This platform is used for cost-effective, scalable near line (NL) on-site storage of data on removable media.

Creating a Storage Pool Tier

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to create the storage pool tier.
Step 5 Click **View Details**.
Step 6 Click **Storage Pool Tiers**.
Step 7 Click **Create**.
Step 8 On the **Create Storage Pool Tier** screen, enter a unique name for the storage pool tier and click **Submit**.
These node pools are grouped to optimize storage according to need.

Storage Node Pools

Storage node pools are sets of physical nodes that are grouped by their equivalence class to optimize reliability and requested data protection settings. The OneFS operating system creates node pools automatically when

you install the system and whenever you add or remove nodes. The automatic creation of node pools is referred to as automated provisioning.

You can organize storage node pools into logical groupings and create policies that store or move files among these nodes automatically, based on a specified criteria.

Creating a Node Pool

You can use a node pool to group equivalence-class nodes.

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to create the node pool.

Step 5 Click **View Details**.

Step 6 Click **Node Pools**.

Step 7 Click **Create**.

Step 8 On the **Create Node Pool** screen, complete the following fields:

Name	Description
Node Pool Name field	A unique name for the node pool.
Nodes field	Expand the field, check one or more boxes for the nodes that you want to include in the pool.

Step 9 Click **Submit.**

SMB Shares

The Server Message Block (SMB) Protocol is a network file sharing protocol that was implemented by Microsoft for Windows. SMB shares provide Windows clients network access to file system resources on the cluster.

You can grant permissions to users and groups to carry out operations such as reading, writing, and setting access permissions on SMB shares.

The `/ifs` directory is configured as an SMB share and is enabled by default. OneFS supports both user and anonymous security modes. If the user security mode is enabled, users who connect to a share from an SMB client must provide a valid username with proper credentials.

The SMB protocol uses security identifiers (SIDs) for authorization data. All identities are converted to SIDs during retrieval and are converted back to their on-disk representation before they are stored on the cluster.

Creating an SMB Share

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to create the SMB share.

Step 5 Click **View Details**.

Step 6 Click **SMB Shares**.

Step 7 Click **Create**.

Step 8 On the **Create SMB Share** screen, complete the following fields:

Name	Description
SMB Share Name field	A unique name for the SMB share.
SMB Share Description field	A description of the SMB share.
Path field	The `/ifs` directory path that is configured to be an SMB share.
Allow Variable Expansion check box	Check the box if you want to expand Isilon path variables in the share directory path. The available path variables include the following: • `%D`—NetBIOS domain name • `%L`—Host name of the cluster, in lowercase • `%U`—User name • `%Z`—Zone name For example, if you have a user in the CISCO domain with a username of cisco1, with path varable expansion enabled, the path `/ifs/home/%D/%U` expands to `/ifs/home/CISCO/cisco1`.
Auto-Create Directories check box	Check the box if you want the share to automatically create directories when users access the share for the first time. **Note** This check box is available only if you check **Allow Variable Expansion**.

Step 9 On the **Create SMB Share** screen, expand the **User/Group Mapping** field if you want to restrict access to the SMB share.

Step 10 On the **Add Entry to User/Group Mapping** screen, complete the following fields and then click **Submit**:

Name	Description
Type drop-down list	Choose a mapping type. This can be one of the following: • **User—**Restricts access for a specific user. • **Group—**Restricts access for a group of users. • **Wellknown—**Restricts access for a well-known security identifier (SID).
Name field	The name of the user, group, or well-known SID whose access you want to restrict.
Permission drop-down list	Choose a permission option for the user, group, or well-known SID. This can be one of the following: • **No Access** • **Read Access** • **Read-Write Access** • **Full Access** • **Root Access**

The user/group mappings display in the **User/Group Mapping** table on the **Create SMB Share** screen.

Step 11 Click **Submit**.

Creating an NFS Export

Network File System (NFS) exports provide UNIX clients with network access to file system resources on the cluster.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to create the NFS export.
Step 5 Click **View Details**.
Step 6 Click **NFS Exports**.
Step 7 Click **Create**.
Step 8 On the **Create NFS Export** screen, complete the following fields:

Name	Description
Path field	The `/ifs` directory path that you want to export to UNIX clients.
Description field	A description that helps identify and document the purpose of the export.
Clients field	The UNIX clients that you want to have access to the NFS export.
Read-Only Clients field	The UNIX clients that you want to have read-only access to the NFS export.
Read-Write Clients field	The UNIX clients that you want to have read-write access to the NFS export, even if the NFS export is read-only.
Root Clients field	The uNIX clients that you want to have root access to the NFS export.
Enable Mount Access for Subdirectories check box	Check the box if you want all directories under the specified paths to be mountable.
Restrict Access to Read Only check box	Check the check box to make the NFS export read-only.
Mapping Access drop-down list	Choose the type of UNIX clients that will have mapping access to the export.
Specify Username field	One or more users that you want to have access to the NFS export.
Specify User Group(s) field	One or more user groups that you want to have access to the NFS export.

Step 9 Click **Submit**.

Viewing NFS Datastores

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to view the datastores.

Step 5 Click **View Details**.

Step 6 Click **Datastores**.
You can view information about each Network File System (NFS) datastore, including the datastore name, its NFS export path, ESXi host, NFS remote host, capacity, and free space.

Quotas

Storage quotas contain a set of resources and provide an accounting of each resource type for that set. You can use quotas ao manage storage in the following ways:

- Monitor disk storage.
- Define criteria to track or limit the amount of storage a user, group, or project uses.
- Write notification rules to trigger an action according to event thresholds. A rule can specify a schedule for executing an action or immediate notification of certain state transitions. When an event occurs, a notification trigger can execute one or more actions, such as sending an email or sending a cluster alert to the interface.

Quota types, also known as quota domains, are used to organize storage quotas. Each quota type is defined by a directory or an entity, which encapsulate the files and subdirectories to be tracked. The following identifiers are used to describe quota types:

- The directory where the quota is located
- The quota entity
- The snapshots that are to be tracked against the quota limit, if any

Creating a Quota

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to create the quota.
Step 5 Click **View Details**.
Step 6 Click **Quotas**.
Step 7 Click **Create**.
Step 8 On the **Create Quota** screen, complete the following fields:

Name	Description
Type drop-down list	Choose a quota type. This can be one of the following. • **Directory—**Specifies the directory and its subdirectories where you want to locate the quota. • **User—**Defines a specific user that you want to associate with the storage quota. • **Group—**Defines a group of users that you want to associate with the storage quota. • **All Users——**Associates all users with the storage quota. • **All Groups—**Associates all user groups with the storage quota.
Path field	The `/ifs` directory path for the storage quota.
Include Snapshots check box	Check the box if the quota governs snapshot data and head data. If you do not check the box, the quota cannot include snapshots.
Thresholds Include Overhead check box	Check the box if the thresholds that apply to the quota include the file system overhead required to store the data for physical usage. If the check box is not checked, thresholds do not include any overhead.
Enforced check box	Check the box to have the quota provide enforcement. Once checked, you can configure additional parameters, such as a hard limit and soft limit. If you do not check this box, the quota is considered to be an accounting quota.

Step 9 Click **Submit**.

Manually Generating a Quota Report

All manually generated quota reports are stored in the directory on `/ifs` that you configured in the quota report settings. For information about how to specify that directory or to set up scheduled quota reports, see Updating Quota Report Settings, on page 11.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to create the quota report.
Step 5 Click **View Details**.
Step 6 Click **Quota Reports**.
Step 7 From the **More Actions** drop-down list, choose **Create**.
Step 8 Click **Submit**.

Updating Quota Report Settings

The quota report settings allow you to configure the following:

- Manual reports—Directory where manual reports are stored and the maximum number of reports to be retained.
- Scheduled reports—Schedule that determines when the reports are run, the directory where the reports are stored, and the maximum number of reports to be retained.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to update the quota report settings.
Step 5 Click **View Details**.
Step 6 Click the **Quota Report Settings** tab.
Step 7 Click **Modify**.
Step 8 In the **Modify Quota Report Settings** dialog box, complete the following fields:

Name	Description
Live Directory field	The directory path on `/ifs` where manual or live quota reports are stored.
Live Retain field	The maximum number of manual or live quota reports to keep.

Name	Description
Schedule field	The schedule used to generate automated quota reports. For example, this could be every Sunday at 11pm
Schedule Directory field	The directory path on `/ifs` where scheduled quota reports are stored.
Scheduled Retain field	The maximum number of scheduled quota reports to keep.

Step 9 Click **Submit**.

Configuring a Namespace Access Point

The Isilon One FS cluster creates a single namespace and file system that is distributed across all nodes in the cluster and is accessible by clients connecting to any node in the cluster. You can assign a name to a namespace access point and the path to its file system.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to configure the namespace access point.
Step 5 Click **View Details**.
Step 6 Click the **Namespace** tab.
Step 7 Click **Create**.
Step 8 On the **Create Namespace Access Point** screen, complete the following fields:

Name	Description
Namespace Access Point Name field	A unique name for the namespace access point.
Path field	The `/ifs` home directory path for the namespace access point.

Step 9 Click **Submit**.

Viewing the Access Zones

An access zone is a context that is set up through the EMC Isilon CLI to control access to the EMC Isilon cluster based on an incoming IP address. Access zones are used to define a list of authentication providers that apply only in the context of these zones.

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to view the access zones.

Step 5 Click **View Details**.

Step 6 Click **Access Zones**.
You can view all of the available information about the access zones, including the name, whether it's built-in, the SMB share use, authentication providers, system providers, and NetBIOS name.

Data Snapshots

You can take snapshots of specific data on the Isilon cluster. This data can also be backed up automatically and as frequently as required to meet your recovery point objectives. You can easily move directories, assign resources, and change directory names.

You can take up to 1,024 snapshots per directory to provide scalability and data protection in a large data environment.

Creating a Snapshot

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to create the NFS export.

Step 5 Click **View Details**.

Step 6 Click **Snapshots**.

Step 7 Click **Create**.

Step 8 On the **Create Snapshot** screen, complete the following fields:

Name	Description
Snapshot Name field	The name of the snapshot.

Name	Description
Snapshot Path field	The `/ifs` directory that is contained by the snapshot.
Alias check box	Check the check box if you want to create an alias for the snapshot name.
Alias Name field	An alias name for the snapshot name. This field is only available if you check the **Alias** box.
Snapshot Expiration drop-down list	Choose the expiration date for the snapshot. This can be one of the following: • **Never Expires** • **Snapshot Expires On**
Snapshot Expiration Date calendar	The expiration date for the snapshot. You can configure the expiration date as follows: • Enter the date in the field, using the MM/DD/YYYY format. • Click the calendar and choose an expiration date. This field is only visible if you chose **Snapshot Expires On**.

Step 9 Click **Submit.**
The snapshot is created and appears in the list of snapshots.

Viewing Snapshot Schedules

You must create snapshot schedules in EMC Isilon. You can view only the details of the available snapshot schedules in Cisco UCS Director.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to create the NFS export.
Step 5 Click **View Details**.
Step 6 Click **Snapshot Schedules**.
You can view all of the available information about snapshot schedules, including the snapshot name, pattern, path, expiration, description, next run, and next scheduled snapshot.

System Jobs

System jobs are maintenance functions that use system resources and can take several hours to complete. These jobs can include running a virus scan, monitoring and optimizing performance, detecting and mitigating drive and node failures, and freeing up available space. Some system jobs may run at scheduled intervals or they may be configured to only run when you manually start them.

Cisco UCS Director enables you to do the following with system jobs:

- Collect the available system jobs when you collect inventory from the EMC Isilon cluster
- View the available system jobs
- Manually run a system job
- View the details of system job policies
- View the details of system job reports

A complete list of sytem jobs is available in your EMC Isilon documentation.

Manually Running a System Job

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to run the system job.

Step 5 Click **View Details**.

Step 6 Click **System Jobs**.

Step 7 Click the row with the system job that you want to run and then click **Start**.

Step 8 On the **Start System Job** screen, complete the following fields:

Name	Description
Allow Duplicate Jobs check box	Check the box if you want to allow duplicate jobs to be run at the same time as this job.
Priority drop-down list	Choose a priority for this job. This can be from 1 to 10, with 1 being the highest priority job.

Step 9 Click **Submit**.

Monitoring System Jobs

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to run the system job.
Step 5 Click **View Details**.
Step 6 To view a summary of information about active jobs on the Isilon cluster, click **Job Summary**.
Step 7 To refresh the information available about active jobs, click **Collect Inventory**.

Modifying an Active Job

You can only modify an active running job. After the active job is complete, the job summary might not have any data and you cannot modify the job.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to modify the system job.
Step 5 Click **View Details**.
Step 6 Click **Job Summary**.
Step 7 Click the row with the job that you want to modify and click **Modify**.
Step 8 On the **Modify Active Job** screen, complete the following fields:

Name	Description
Impact Policy field	Check the appropriate box to choose a single Isilon policy. **Note** You can find details about the available policies on the **System Job Policy** tab to view specific details for each of these Isilon policies.
Priority drop-down list	Choose a priority for this job from 1 to 10, with 1 being the highest priority job.
State drop-down list	Choose a state for this job. This can be one of the following: • **Run** • **Pause** • **Cancel**

Step 9 Click **Submit**.

Viewing System Job Results

You can view all of the available information about the report, including the snapshot name, pattern, path, expiration, description, next run, and next snapshot.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to view the system job results.
Step 5 Click **View Details**.
Step 6 Click **System Job Reports**.
Step 7 Choose a report and click **View Details** to see the logged results of the system job.

Viewing Storage Efficiency Through Deduplication Results

You can use data deduplication to maximize storage efficiency by scanning the cluster for identical blocks and then eliminating the duplicates, which decreases the amount of physical storage required.

Step 1 Choose **Physical** > **Storage**.
Step 2 On the **Storage** page, choose the pod.
Step 3 On the **Storage** page, click **Storage Accounts**.
Step 4 Click the row with the EMC Isilon account where you want to view the deduplication results.
Step 5 Click **View Details**.
Step 6 Click **Deduplication**.
Step 7 Choose a deduplication report and click **View Details** to see the logged results of the deduplication report.

Managing EMC Isilon System Tasks

For more infomration about system tasks, see the Cisco UCS Director Administration Guide.

Step 1 Choose **Physical** > **Storage**.

Step 2 On the **Storage** page, choose the pod.

Step 3 On the **Storage** page, click **Storage Accounts**.

Step 4 Click the row with the EMC Isilon account where you want to manage the system tasks.

Step 5 Click **View Details**.

Step 6 Click **System Tasks**.

Step 7 Click the row with the system task and click one of the following:

- **Manage Task—**Complete the fields to update the execution, schedule, and policy configuration of the task.
- **Run Now—**Starts the system task immedialely.
- **View Details—**View the system task history, including the results of task execution, and trending reports.