Ngenea Hub

Ngenea Hub is a centralized control system designed to manage the movement of data across diverse storage environments. It simplifies the synchronization of files, migration to more efficient storage, and ensures data is moved according to business needs.

Features

- **Web-Based Interface**: A user-friendly dashboard that allows easy management of data across different storage systems, monitors synchronization, and sets migration policies without requiring technical expertise.
- **CLI and API**: Command-line tools and APIs provide advanced users the flexibility to automate tasks and integrate them into larger systems, offering greater control and customization of workflows.
- **Pixstor Integration**: Enables users to create Spaces for datasets across multiple Pixstor environments, managing synchronization, data manipulation through workflows, and system settings from a unified interface.

Uses

- **Data Synchronization**: Effortlessly synchronize files across multiple storage environments, ensuring data consistency and accessibility.
- **Data Migration**: Migrate data to more cost-effective storage resources, including cloud, object storage, NAS, and tape resources, based on usage and value.
- **Business-Driven Data Movement**: Automatically move data into the most suitable storage resource, ensuring efficient allocation and reducing operational costs based on business needs.
- **Centralized Control**: Streamline system settings and manage all Pixstor environments from one administrative interface, enhancing operational efficiency and control.

Ngenea Hub 2

Ngenea Hub 2 expands on the original Hub by giving you even more control, especially if you’re managing multiple Pixstor systems. It helps you create “Spaces”—logical groupings of datasets—so you can organize your data more effectively. With Ngenea Hub 2, you can synchronize data across different locations and automatically migrate it to the most cost-efficient storage, ensuring that your storage solution always aligns with your business goals.

What is the Role of the Ngenea Worker?

The Ngenea Worker is the engine that orchestrates the actual movement and synchronization of data behind the scenes. It carries out tasks like migrating data

between storage tiers and ensuring that files are synchronized between Pixstor and other storage systems, including cloud platforms. By automating these tasks, Ngenea Worker saves time and ensures that your data is always in the right place, ready for when you need it.

How can I Interact with Ngenea Hub and Manage Data Easily?

You can use the **Web UI** or **ngclient**, a command-line tool designed to make managing data migrations simple and efficient. With either, you can:

- **Migrate**: Move data between storage locations, such as from your local system to cloud storage.
- **Recall**: Retrieve data from a lower-cost storage tier back to high-speed storage when needed.
- **Send**: Transfer data to other endpoints like cloud platforms or long-term archives.
- **Send**: Transfer data to other Hub sites.

To keep everything secure, token-based authentication is used, ensuring that only authorized users can execute data management tasks.

What does Ngenea Hub Orchestrate?

Ngenea HSM

Ngenea HSM (Hierarchical Storage Management) is an important feature that helps you manage where your data is stored. Not all data is the same—some is accessed frequently, and some is rarely used. Ngenea HSM moves less critical data to more cost-effective storage options, like cloud storage or archives, freeing up your high-performance storage for the data you need most.

It integrates with popular cloud storage platforms like Amazon S3, Google Cloud, and Microsoft Azure, as well as on-premises systems, so you can easily manage your data across different environments.

Pixstor

Pixstor is a powerful and flexible storage platform designed to manage large amounts of data in high-demand environments. It offers fast, reliable, and scalable storage that adapts to your needs, whether you’re working on-premises, in the cloud, or both. With Pixstor, you get a comprehensive solution to organize and control your data effectively.

How does Pixstor work?

Pixstor is built on two key components:

- **Infrastructure Management with Saltstack**: Saltstack is an advanced tool that automates and simplifies complex tasks like setting up servers, updating

software, and scaling resources. It helps keep your storage environment running smoothly and efficiently, without requiring much manual effort.

- **Configuration CLI (Command Line Interface)**: The Pixstor CLI is a tool that allows administrators to manage everything from setting up storage pools to controlling access and monitoring the health of the system. It also supports automation, so routine tasks can be integrated into your workflows easily. This means you can manage your storage with minimal hassle and greater precision.

Ngenea Hub Architecture Configurations

Ngenea Hub can be configured in different architectural setups, depending on the infrastructure and deployment environment. Each setup influences how Ngenea Hub and Workers interact with Pixstor nodes and other system components.

Pixstor-Centric Architecture: In this setup, the Ngenea Hub is hosted on a Pixstor Management Node. However, for most environments, the Worker is typically run on separate Ngenea nodes, rather than on the management node itself. This ensures better scalability and performance.

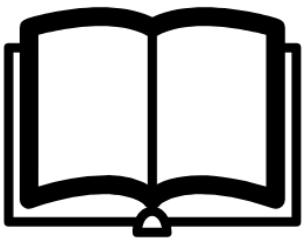
This configuration is ideal for environments where Pixstor serves as the primary storage infrastructure, and high-performance data access is required directly from the storage nodes.

Independent Hub Architecture: In this architecture, the Ngenea Hub is installed on a separate node running Enterprise Linux 8/9 (EL8/EL9), independent of the Pixstor storage system. Workers are deployed exclusively on the Pixstor nodes to handle the actual data processing tasks, allowing for separation between control and execution layers.

This configuration is suitable for organizations preferring to decouple the management layer from the processing layer, especially in cloud or hybrid environments.

Pick your area of interest:

Please refer to the provided links below, which will direct you to both the Administration and User Guides for Pixstor-Centric Architecture.



User Guide

Administration Guide

Release Notes

2.7.0

What’s new

- Spaces can now be viewed in table layout
- Schedules are now specified relative to the site timezones rather than UTC+0
- Site workflow batch size options to control workflow task processing performance
- Policies support more file systems than mmfs1
- Global settings now provides Timeout controls for Hub behaviours
- API performance can be scaled with the new GUNICORN_THREADS setting

What you need to know

- Where NAS user(s) and group(s) exist prior to additional sites being joined, automatic creation of existing NAS users and groups as part of setup on the new Site may fail if the Site is still undergoing joining. Should this occur, re-submit the failed ‘Creating NAS group’ and/or ‘Creating NAS user’ job after a few minutes.

What’s Fixed

- Consult the Changelog for individual fixes

User Guide

Overview

Ngenea Hub provides a management and control interface for data and systems across a global pixstor estate.

Using Ngenea Hub, users can create Spaces for datasets across multiple pixstors, enable data synchronisation, perform data manipulation through workflows and control system settings for all pixstors from one administrative interface.

Accessing Hub

To login to Hub enter the URL of the hub into the browser address bar. E.G. https://myhub

On successful connection to the Hub a login page is presented.

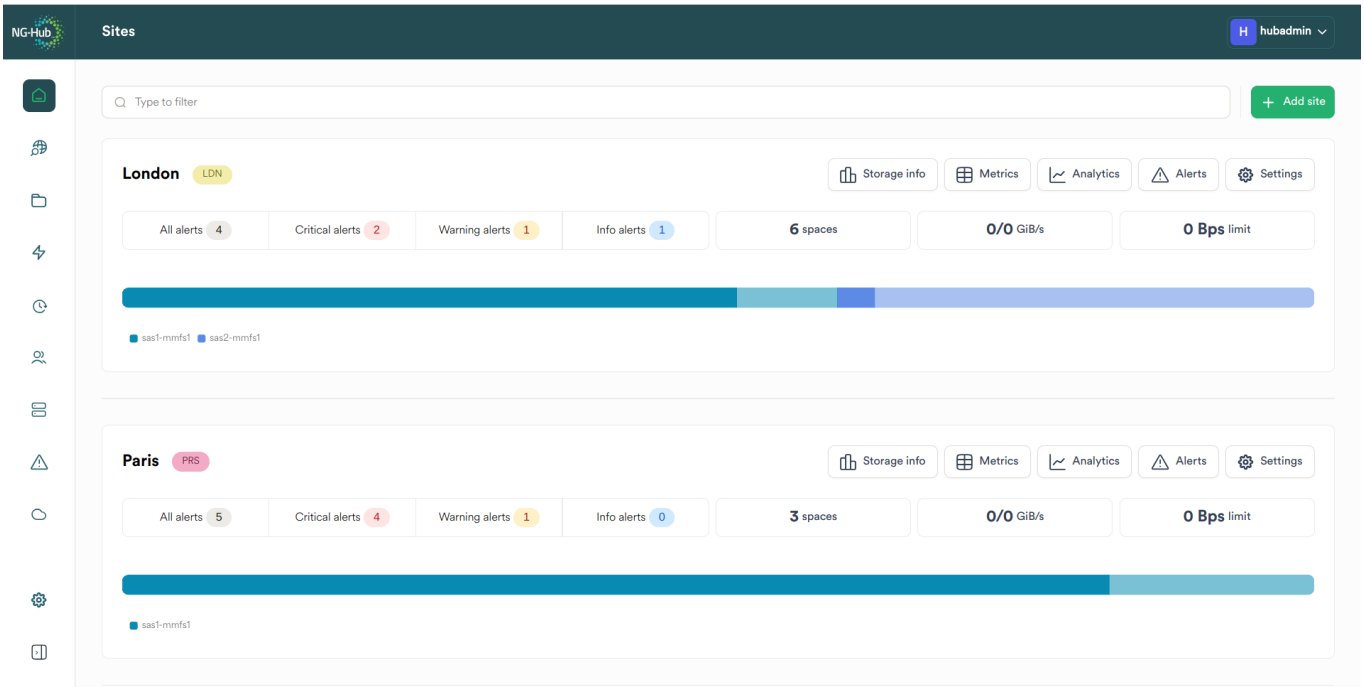
Enter your Username and Password to authenticate with Hub and login.

Logging Out Of Hub

After successful login, from the User Profile control in the top right of the screen select the Log out option.

The Main Screen

The main Hub screen is comprised of several areas.



Menu Bar

The menu bar is positioned on the far left of the Hub screen.

Menu Buttons

The menu buttons perform the following functions when clicked:

Home

	Navigates to the page first presented after Login

Spaces

	Navigates to the Spaces screen

Jobs

	Navigates to the Jobs screen

Groups & Users

	Navigates to the Groups & Users screen

Sites

	Navigates to the Sites screen

Alerts

	Navigates to the Global Alerts screen

Targets

	Navigates to the Targets screen

Global Settings

	Navigates to the Global Settings screen

Enlarge/Reduce

	Clicking the toggle widens the menu bar to show:	• Menu button descriptions	• Hub version

Clicking the toggle button again shrinks the menu bar.

Page Location

The page location is positioned to the top of the Hub screen.

Main page content

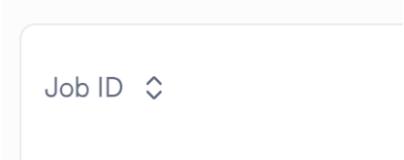
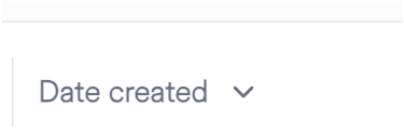
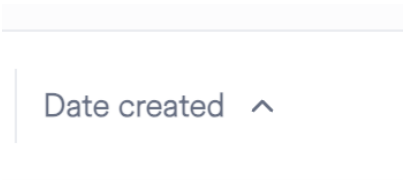
The main page content is positioned to the center of the Hub screen.

Tables

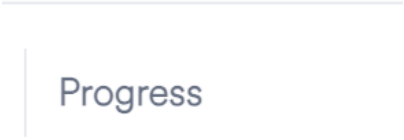
Most tables offer the following common functions:

Sorting Values In a Column

When it is possible to sort the values in a column, a control button is provided for you near the name of the column:

	Indicates that the values in this column are sortable
	Indicates that the values in this column are sorted in descending order
	Indicates that the values in this column are sorted in ascending order

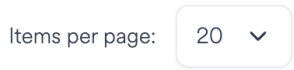
If the values in a column are not sortable, then no control button is provided:



Indicates that the values in this column are not sortable

Pagination

Tables do not show all of the items. The User interface offers controls to see more results when these controls are used.



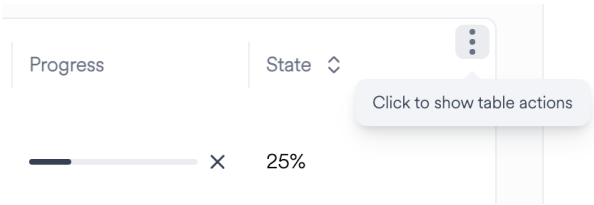
The users are able to view 20, 50 or 100 items on the current page.

The users can change the current page by clicking to a page number.

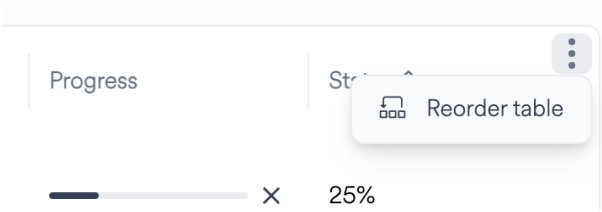
The users are able to switch to previous or next page.

Reordering Columns

Table columns can be reordered:



The users are able to open the table controls menu by clicking this



The users are able to open the table controls menu by clicking this

The table field organizer is presented for table customization:

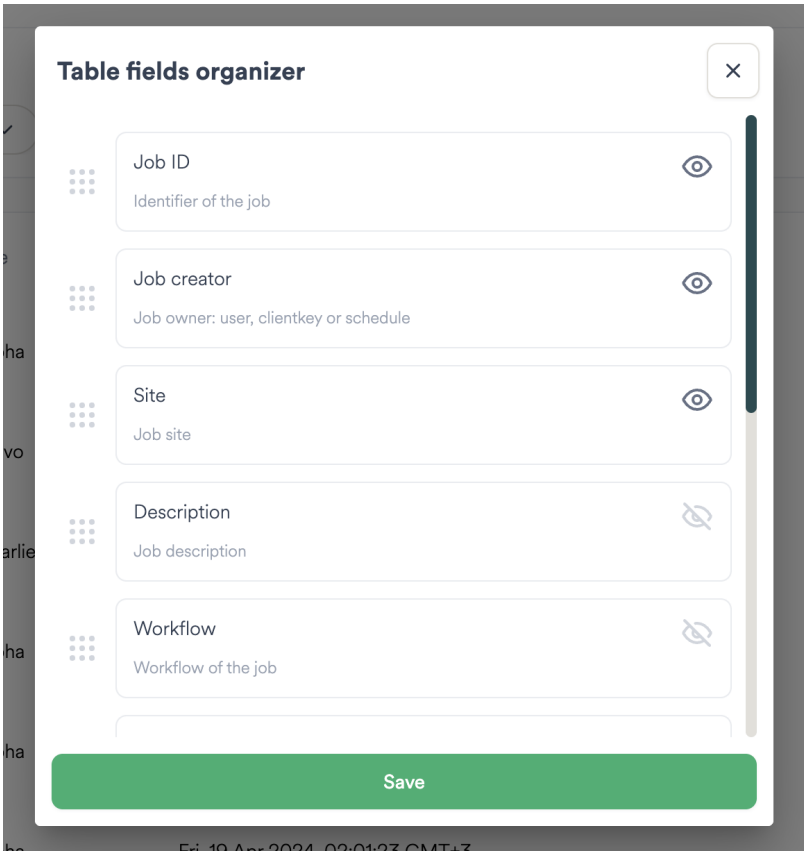
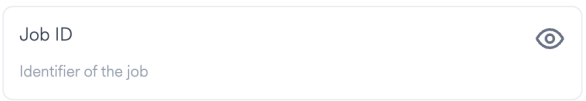
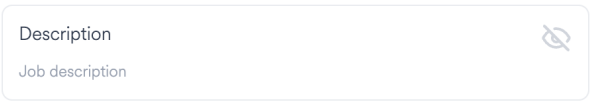


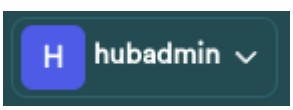
Table fields can be organized using the following controls:

	By clicking and dragging this button, users are able to change the appearance order of the columns.
	When a table column is visible, it is represented as open eye icon and clicking it will hide the column.
	When a table column is hidden, it is represented as closed eye icon and clicking it will show the column.

User Profile

The User Profile control is positioned to the top right of the Hub screen.

The User Profile control displays the name of the user logged into Hub using the current browser session.

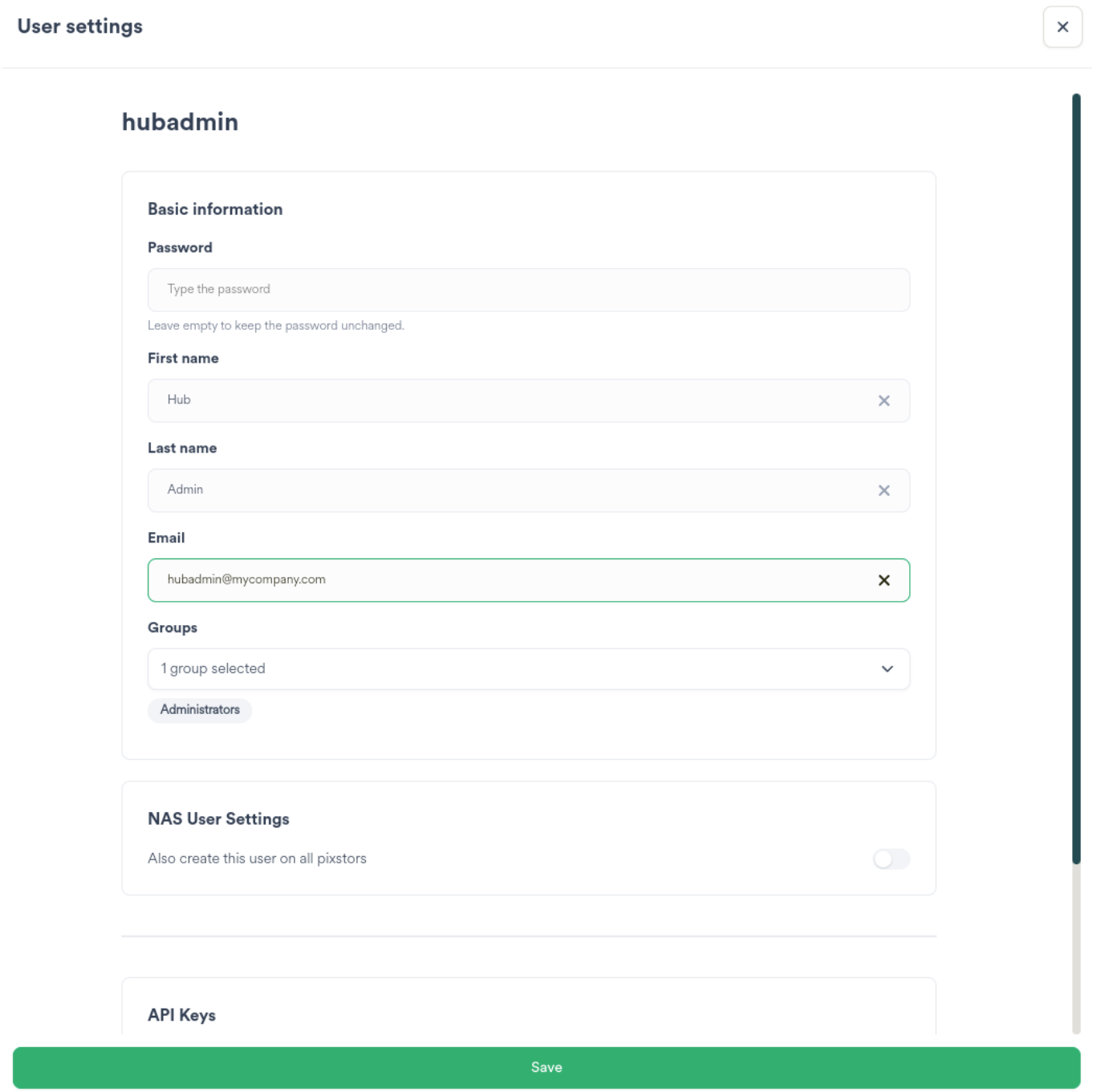


Use this control to Log out of Hub and update your User settings.

User Profile

Selecting the Profile option from the drop down menu presents the User settings dialog of the logged in user.

Clicking the Save button at the bottom of the User settings dialog saves any changes made.



Password

Enter a new Password to change your Password.

First name

Enter a new first name to change your First name.

Last name

Enter a new Last name to change your Last name.

Email

Enter a new valid email address to change your email address.

Groups

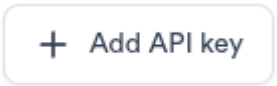
A list of groups your user account belongs to is displayed.

API Keys

Provides the capability to add and remove API keys.

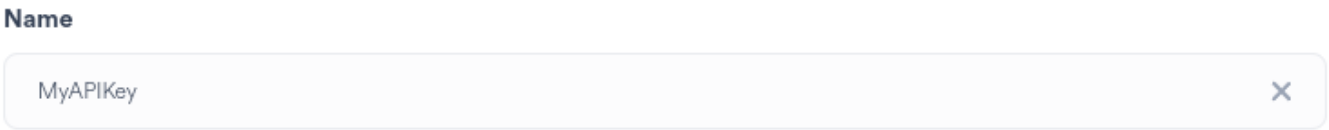
An API key is typically used for by 3rd party software to connect to Hub to perform automation.

Adding an API Key



To add a new API key, click the Add API key button.

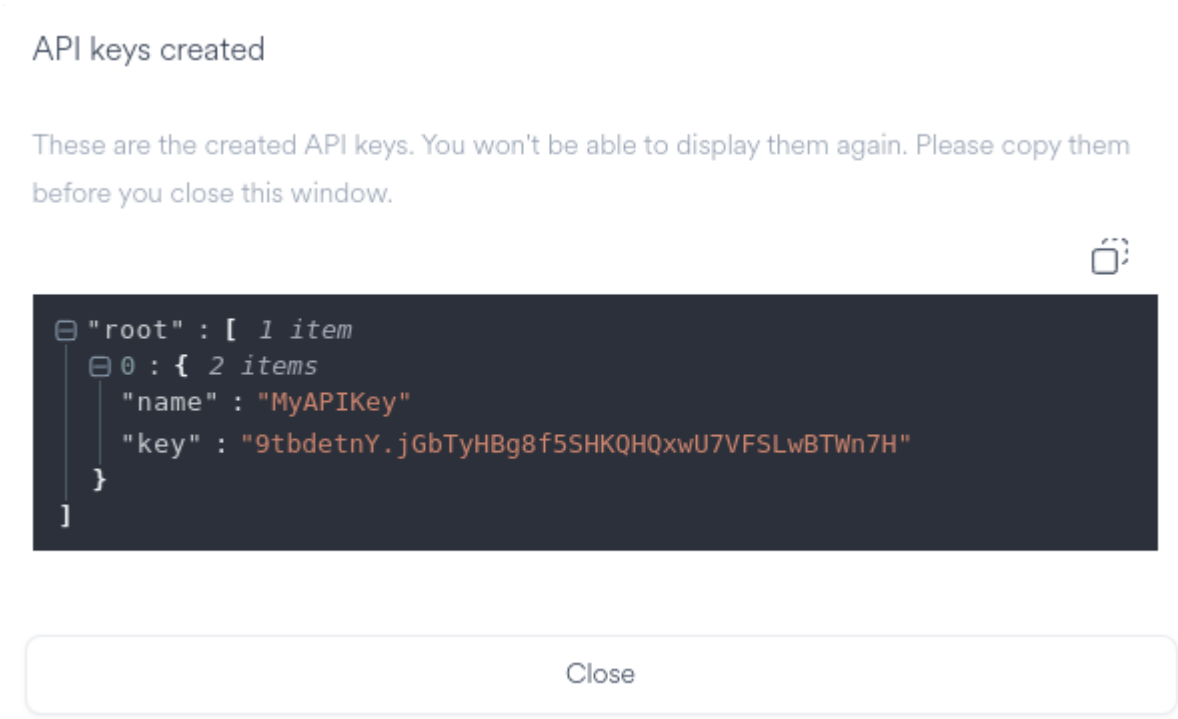
Enter a name for the API Key .



Tip: It is not possible to change the name of an API key once the key has been created.

Add additional API keys as required.

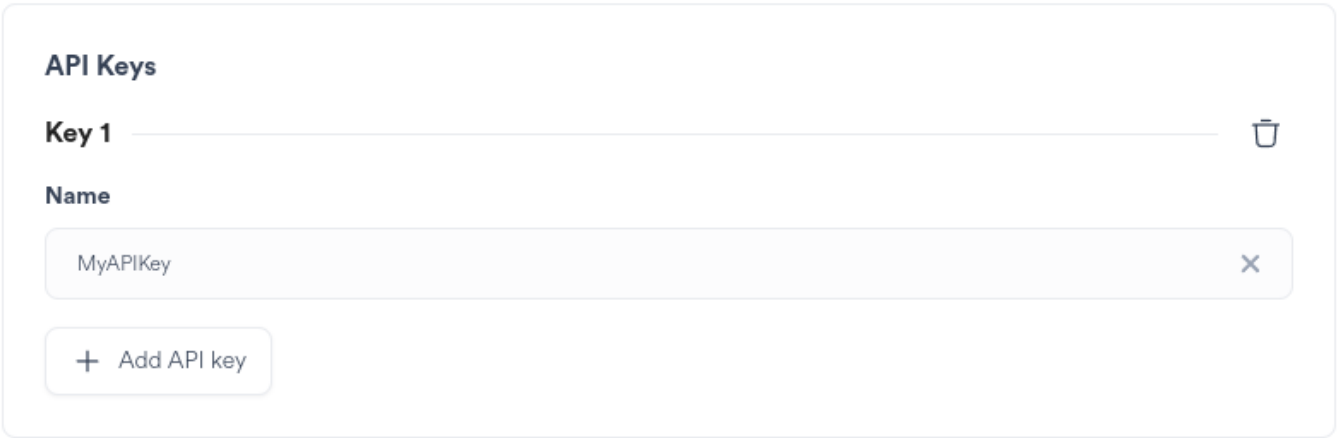
Upon pressing Save the API Key dialog is raised displaying the API Keys created.



Ensure to save the generated keys safely as once the API Key dialog is closed the keys cannot be viewed again.

Removing an API key

Created API Keys are listed



To remove an API key, click the dustbin icon next to the API Key.

Tip: Deleted API Keys are non-recoverable. If an API Key has been inadvertently removed, do not press the Save button, instead click off the User settings dialog to the main area of the screen.

Clicking the Save button at the bottom of the User settings dialog saves any changes made.

Search

Hub provides the ability to Search for assets across all Hub managed Sites.

Where proxies are enabled for Search supported asset types, thumbnails and proxies are displayed.

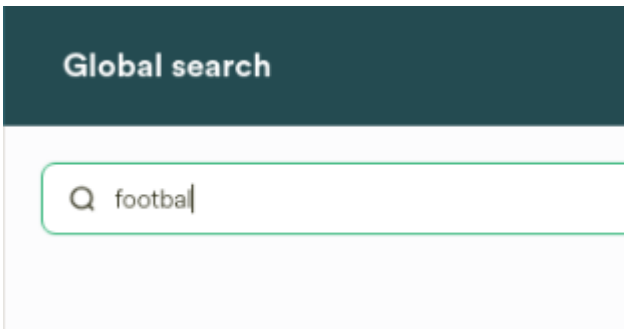
Asset locations, Spaces, metadata and Tags are searchable providing rich criteria to locate assets.

Located assets can be processed using the Jobs Panel to perform Workflow actions.

Searching

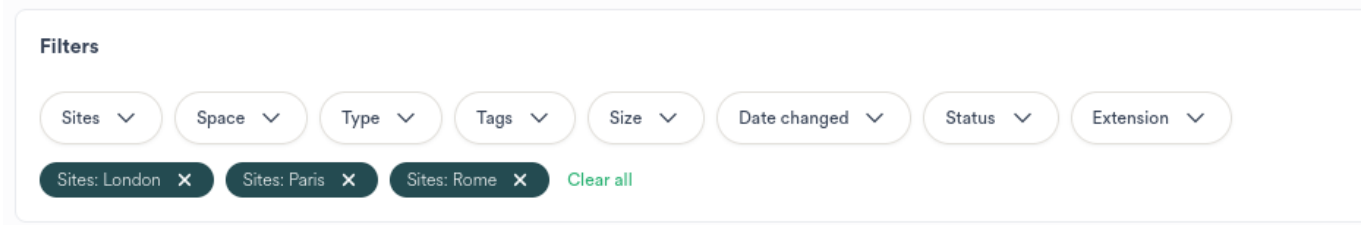
Enter a term in the Search bar to start a Search. E.G.: *football*.

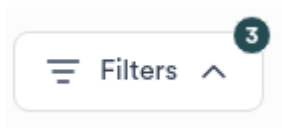
Terms are automatically wildcarded to enable wide Searching. E.G.: **football**.



Filters

Search provides several high level filters each of which apply additional criteria to narrow the Search to return only the required assets.





Click the filter button to display the available filters. The number of applied filters is displayed on the filter button.

Sidebar

Clicking the toggle displays the side bar to show:

- Item Info
- Tags
- Metadata

Clicking the toggle button again hides the side bar.

Item info —

Name	football hd001.png
Path	/mmfs1/data/datasync/footbal...
Size	3.2 MB

Tags —

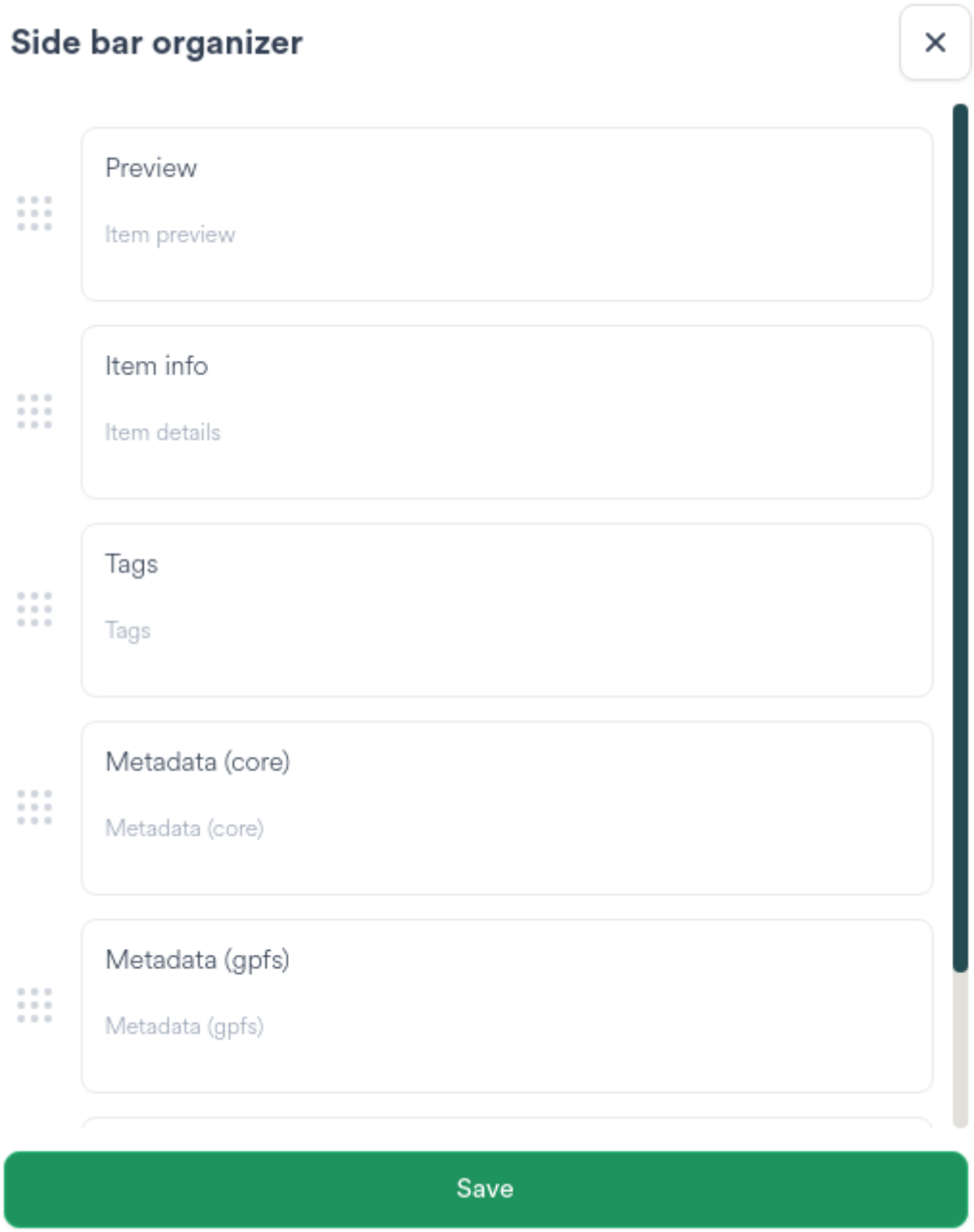
Empty (add tags)

Metadata (core) —

accesstime	24.01.2024, 10:25 GMT
blocksize	8388608
changetime	24.01.2024, 10:25 GMT
deviceid	250609814
directory	/mmfs1/data/datasync/footbal...

Reordering

Re-arrange items in top to bottom order by dragging vertically up or down.



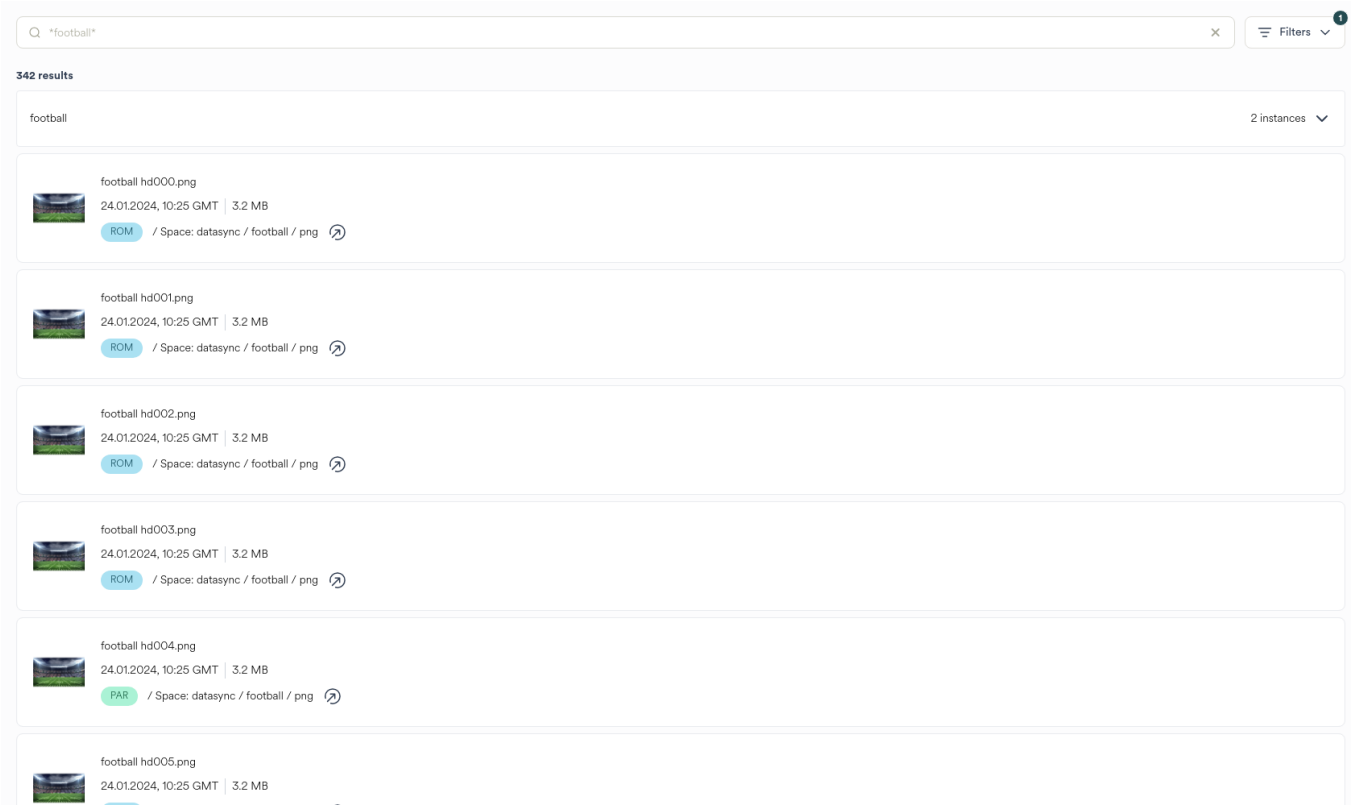
Click Save to store the sequence which is reflected in the Job side bar.

Results

Search matches assets to the Search input returning collated results to screen.

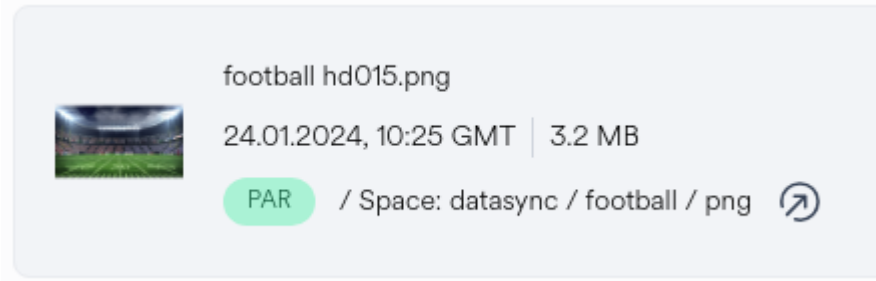
Searches are processed asynchronously, therefore some results may take longer to return to screen than others.

Where a Site is unavailable or takes too long to return results, information messages appear at the top of the screen allowing for deselection of the Site or Site(s).



Result Card

Returned assets appear as a Result Card.



Where multiple instances of the same asset are present on more than one Site, the results are collated.

2 instances	Open the instances drop down to display all the assets from all Sites

The Result Card displays:

Item	Description
Thumbnail	The generated thumbnail or a default icon where no thumbnail exists
Name	The name of the asset
Date and Size	The date and time of last modification, the size of the file on the pixstor file system
Site chip	The site on which the asset is found

Item	Description
Space Location	The location of the asset in the Space
	The filebrowser navigation button

Tags

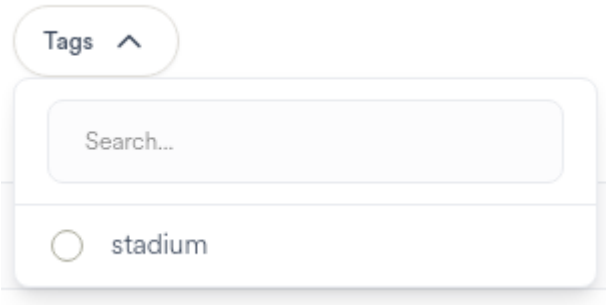
Search provides the ability to Tag assets.

Apply Search Tags to assets in order to collate assets into collections or curate as required.

Tip: Applied Tags are added to Site Search services asynchronously. Dependent on workload there may be a small delay between the addition of the Tag in the UI and the ability to Search for the asset by the Tag.

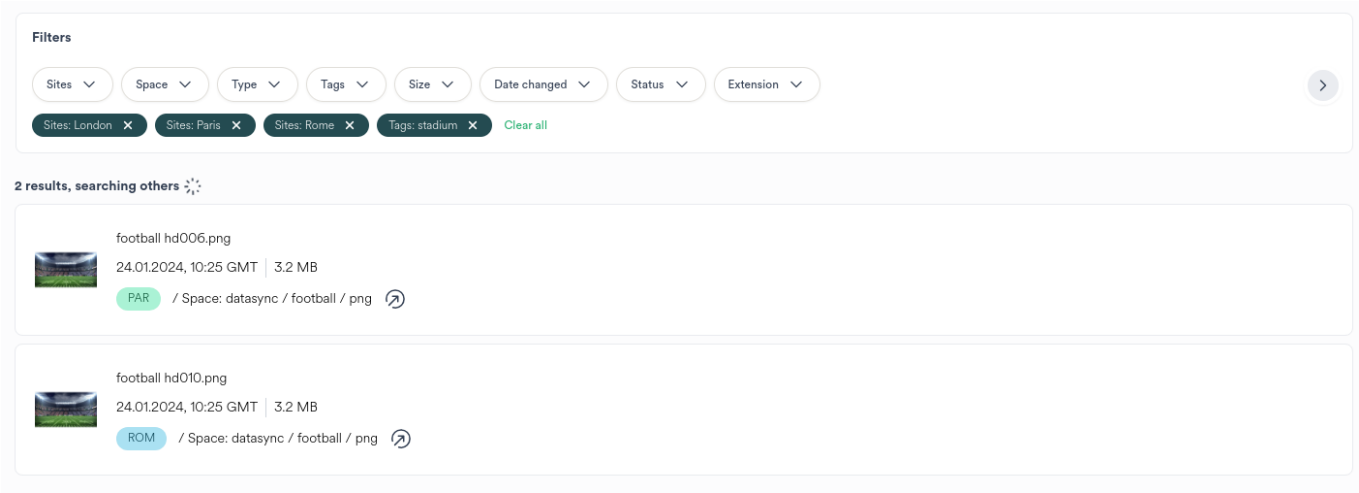
Searching By Tag

- To Search for an asset by Tag, open the Search filter bar and select the Tag from the drop down menu
- Entering text into the Tag filter matches available Tags to provide a shorter selection list



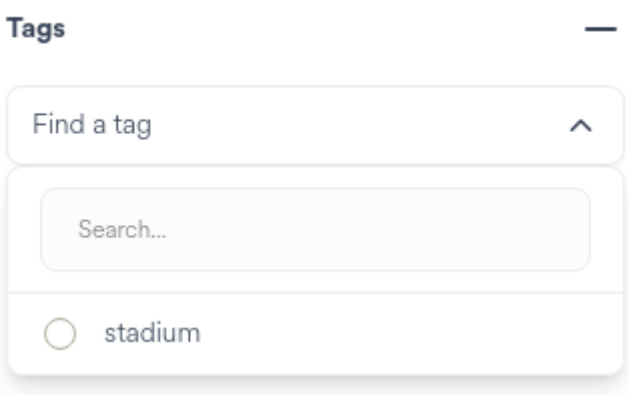
Applied Tags are denoted with a chip below the filter bar. Click the *x* to remove the Tag from the filter.

Example of Searching for assets where the Tag *stadium* is applied:

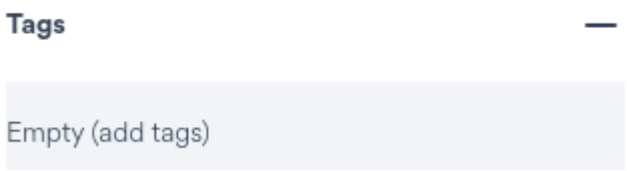


Tagging An Asset

To add a Tag to an asset, open the side bar and locate the Tags section in the bar.

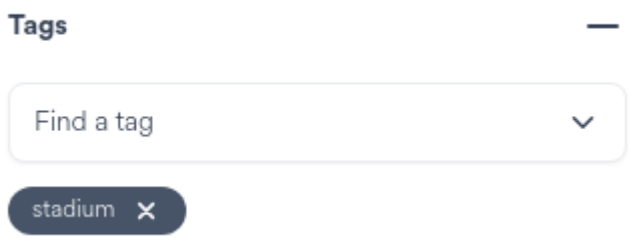


Where no Tags are set on the asset, a prompt to add Tags is shown. Click the entry box to start.

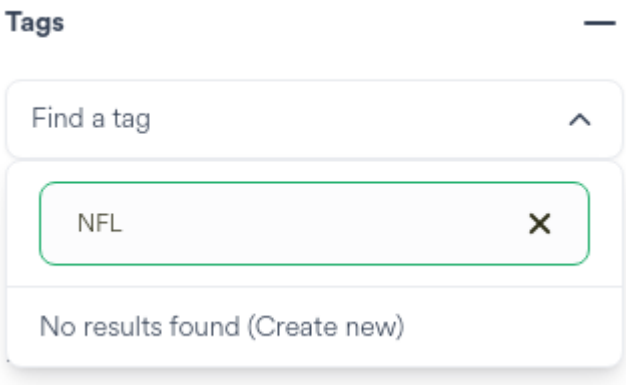


To apply an existing Tag to the asset, select the Tag.

Applied Tags are denoted with a chip below the filter bar. Click the *x* to remove the Tag from the filter.



If no Tags exist, enter a Tag (case sensitive) in the Tag entry box and press Enter to create and apply the new Tag.



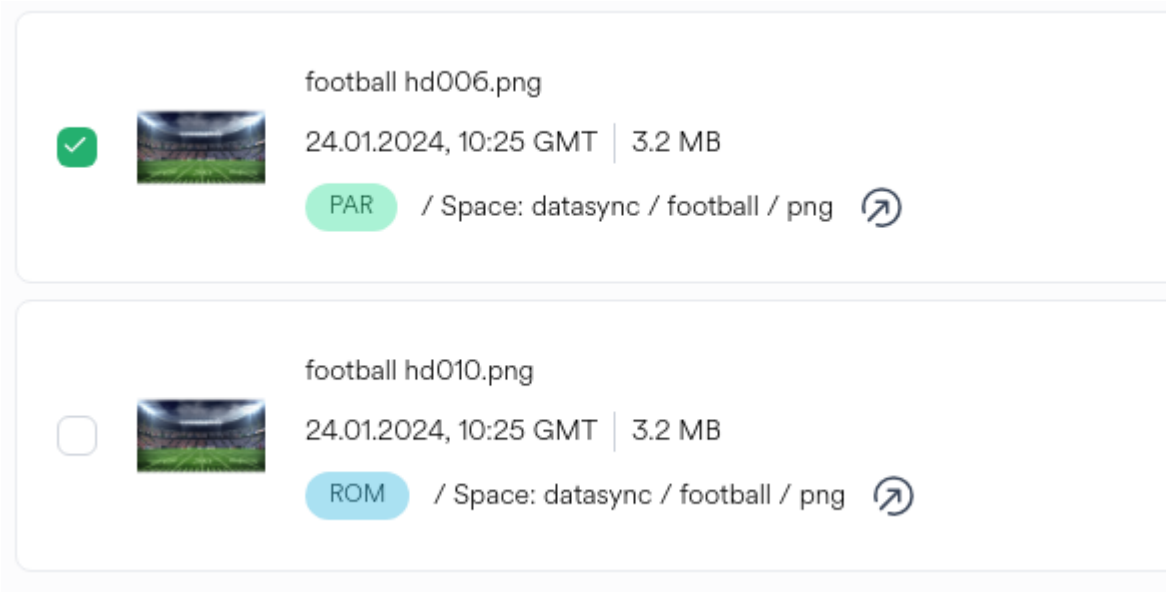
Actions

Post Search, assets can be actioned by Workflows using the Job Panel.

To enable asset selection first select an individual Space from the Search filters.

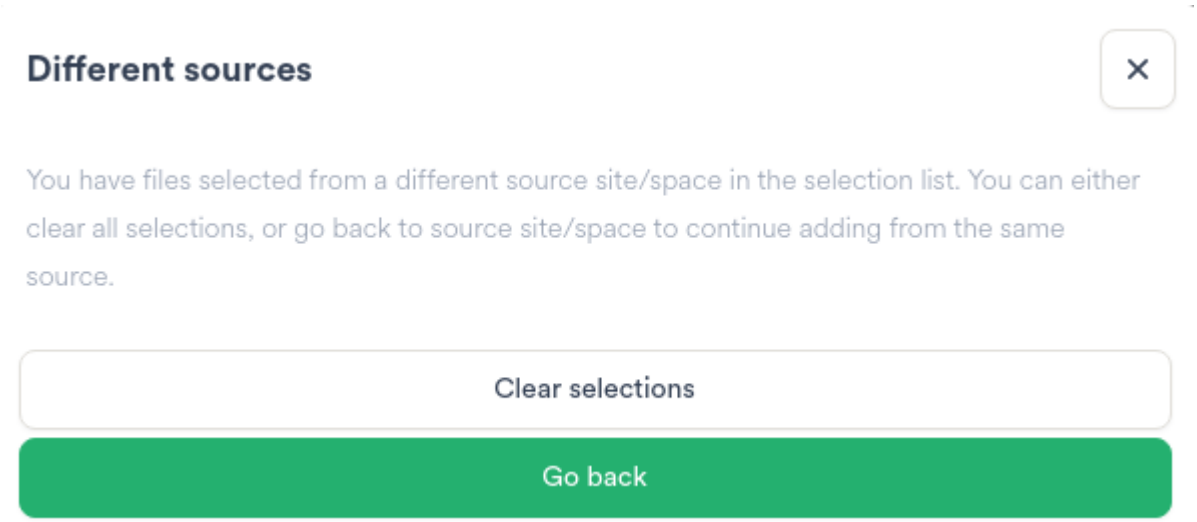
Selecting an individual Space enables asset selection.

- Click the checkbox to the left of an asset to add the asset to the Job Panel selection list



Assets in the Job Panel are processed per Space, per Site. Selecting assets from additional Sites raises a confirmation dialog.

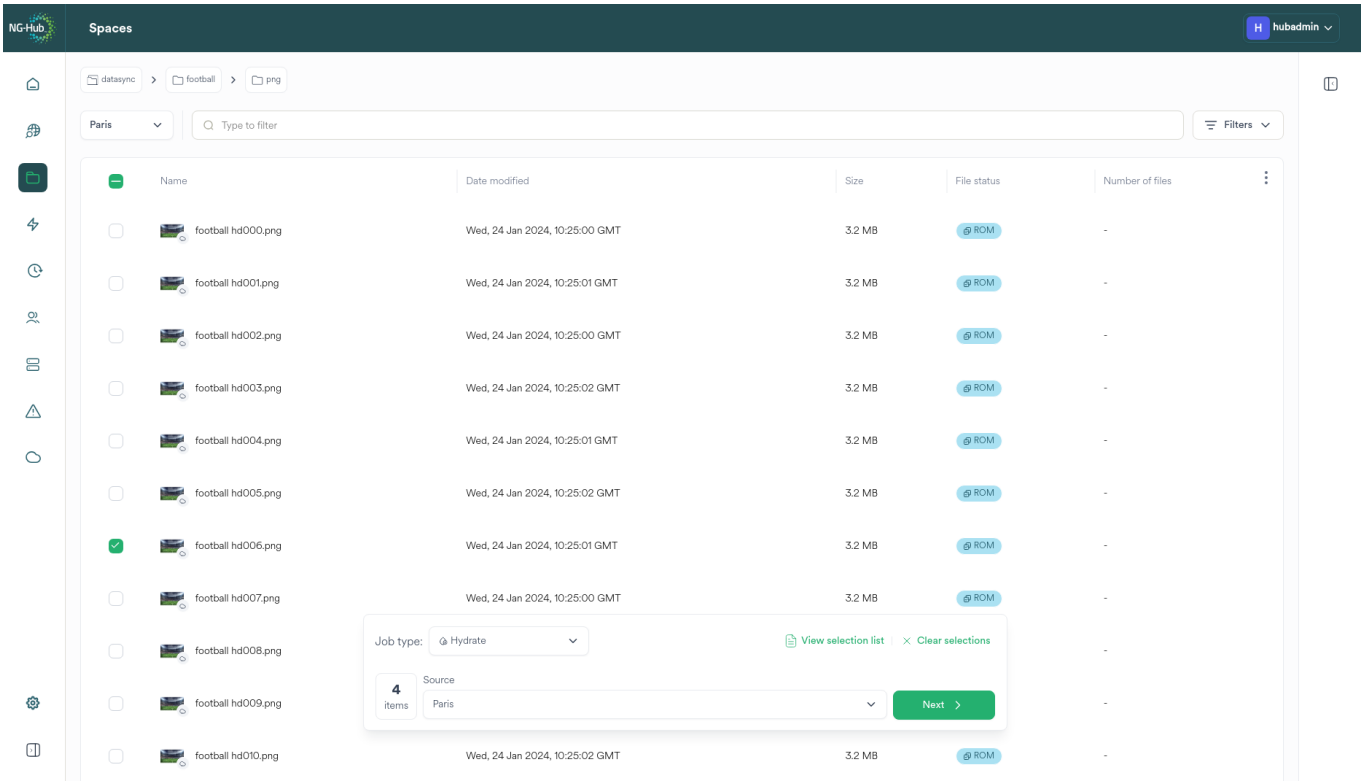
- Choose whether to retain the assets from the current Site or to clear all the current selections in order to add new selections from other Site(s)



When the Job Panel selection contains selected items, navigating to the Space on the selected Site retains the selections in the Job Panel selection list.

	Click the filebrowser navigation button on the Space card to navigate to the selected Space, filtered by Site. Any assets already selected remain in the Job Panel selection list.

Example of asset selections after navigating to the Space on the Site with assets selected from the Search results:



Spaces

A Space is an area of storage present on or across one or more pixstor which comprises the following capabilities:

- name
- location
- size
- data protection
- performance
- file share

Viewing Spaces

To view available spaces, click the Spaces menu button.

	Navigates to the Spaces screen

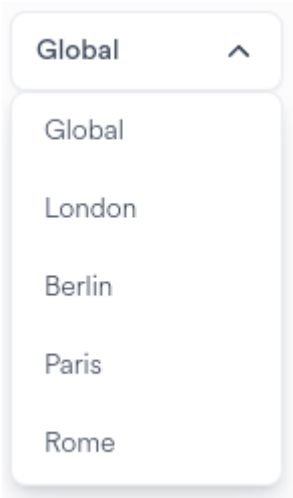
The ability to view spaces is restricted by group membership.

- Administrators can view and administrate all Spaces across all Sites
- Users can view and use all Spaces across all Sites
- Restricted users can view and use a defined subset of Spaces on associated Sites

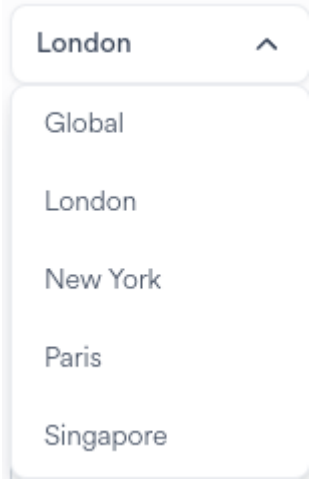
Hub provides two views of Spaces - Global and Local.

- Global displays all Spaces on all Sites
- Local displays the Spaces on a specific site

The default view of Spaces is Global.



To switch to a site-centric view, select the specific site from the Spaces drop-down menu.

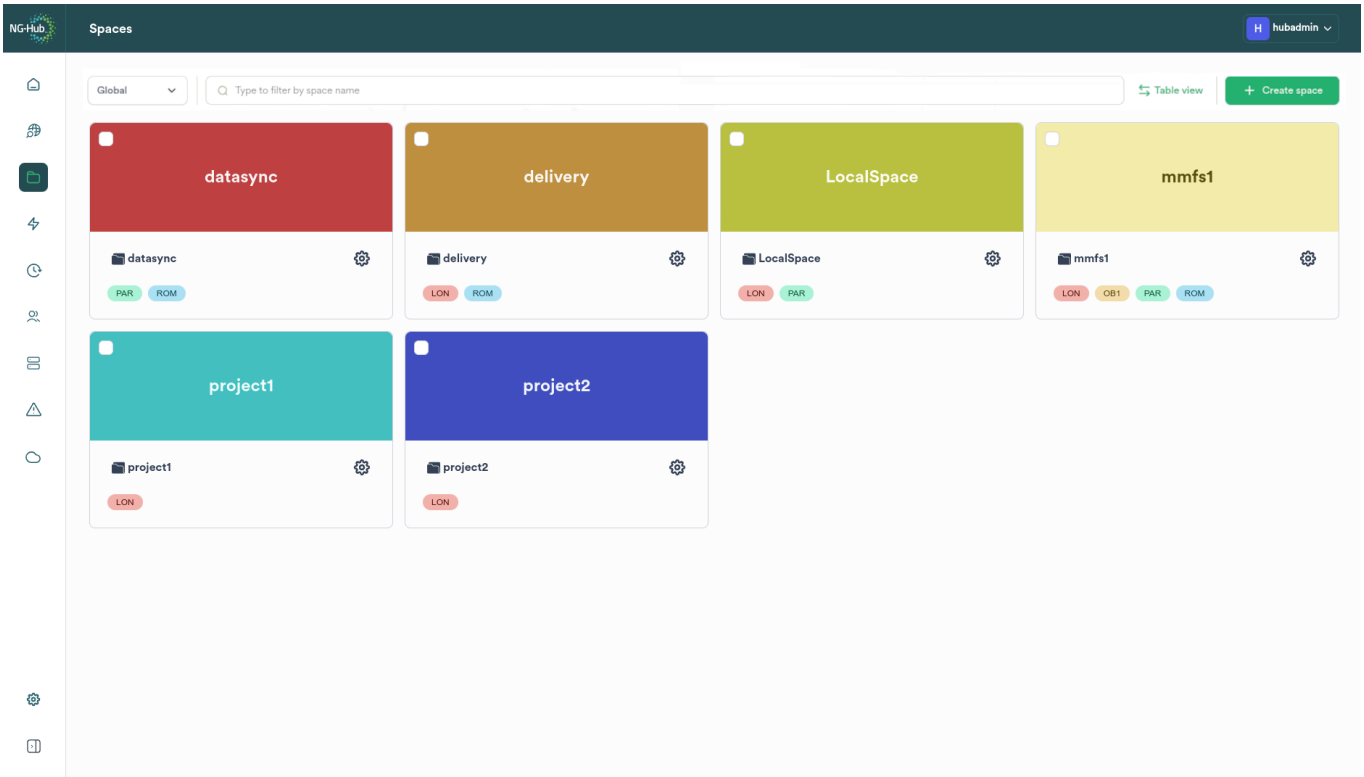


To switch to Global view, select Global from the Spaces drop-down menu.

Global View

Global view displays all Spaces on all Sites.

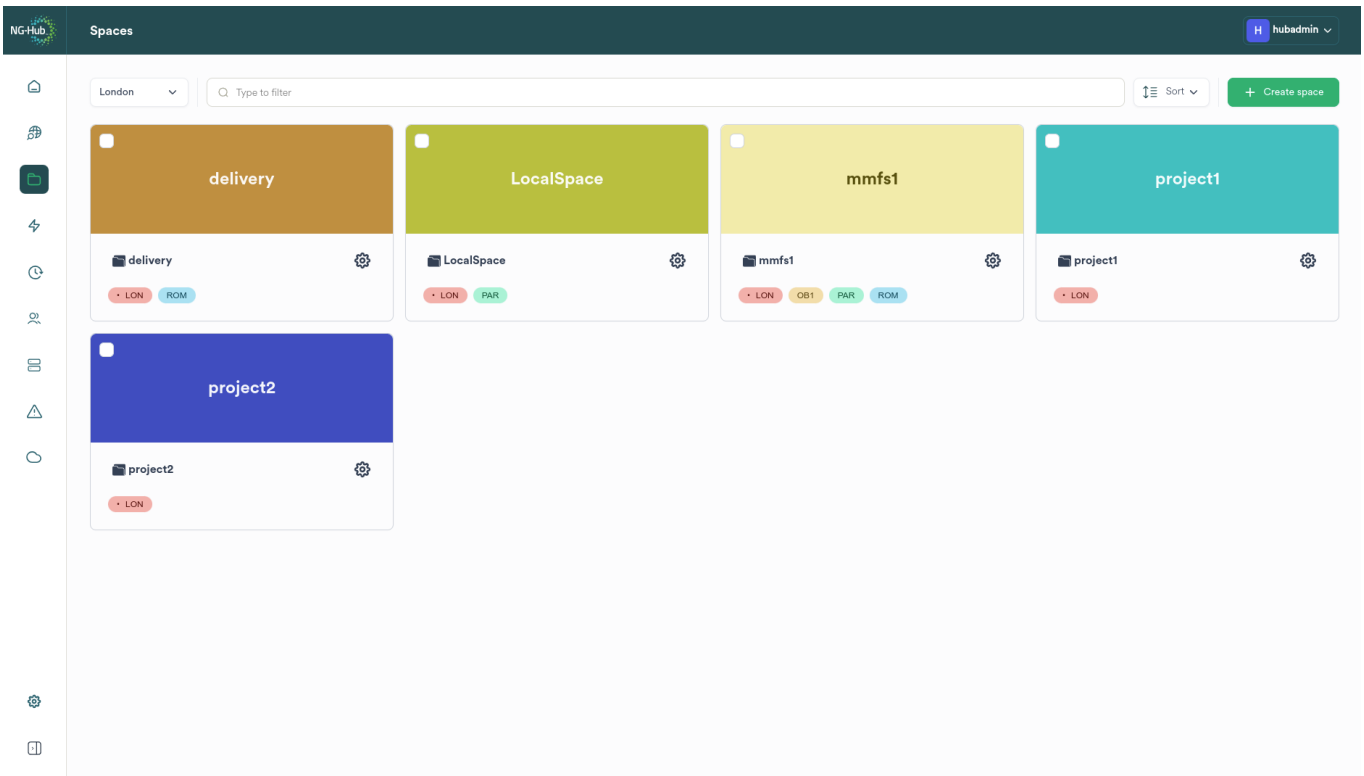
The example below displays all the Spaces across all Sites.



Local View

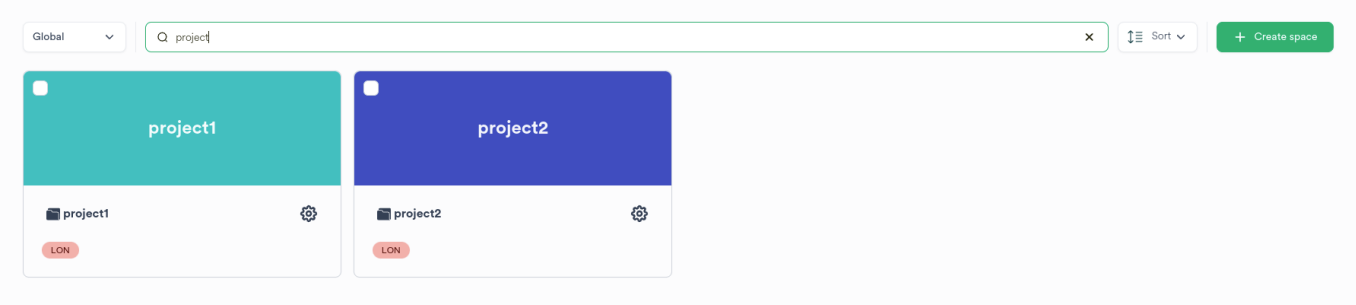
Local view displays the Spaces on a specific Site.

The example below displays less Spaces than Global as the site is participating in fewer Spaces.



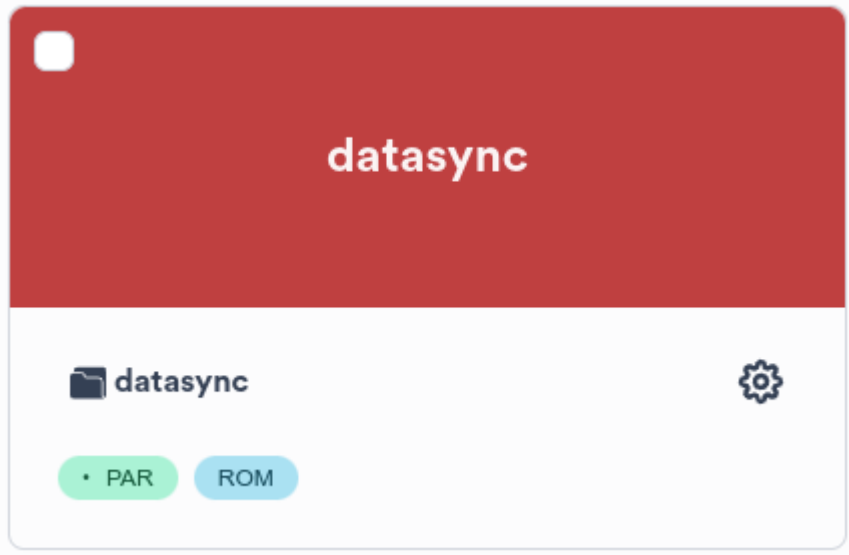
Filtering the Space View

To display Spaces matching keywords, enter the keywords in the filter bar.

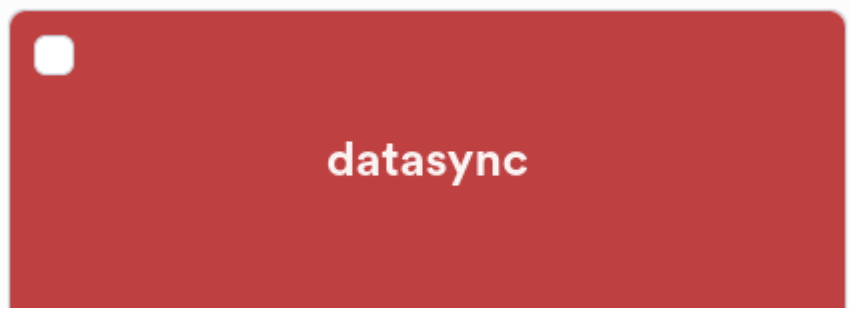


The Space Card

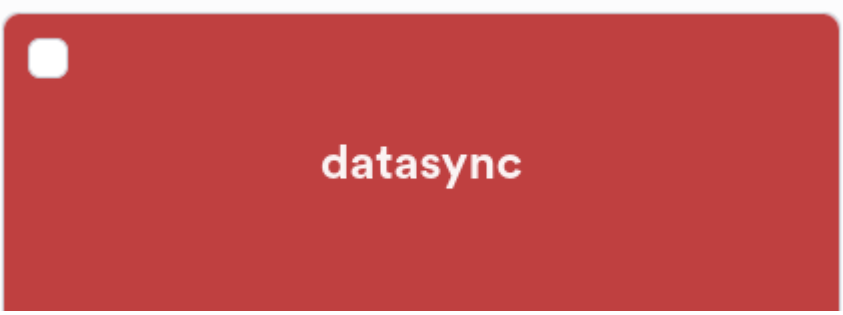
A Space is displayed as a card in the Space view.



A Space Card comprises:



Space Card Header



Denotes the name of the Space.

Click the Header to view the Space File Browser.

Space Name

Denotes the name of the Space.

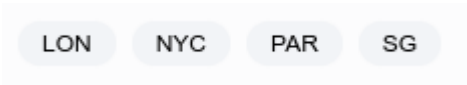
Click the Space Name to view the Space File Browser.

For more information on the Space File Browser, see Browsing Spaces

Space Site Chips

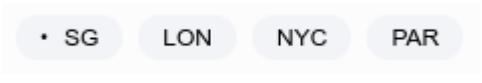
Site Chips denote the sites on which a Space is present.

Click a Site Chip to change the view to the Local View of the Space File Browser for a specific Site.



In Global view all sites are listed in alphabetical order.

In Local View, the selected site is identified with a dot.



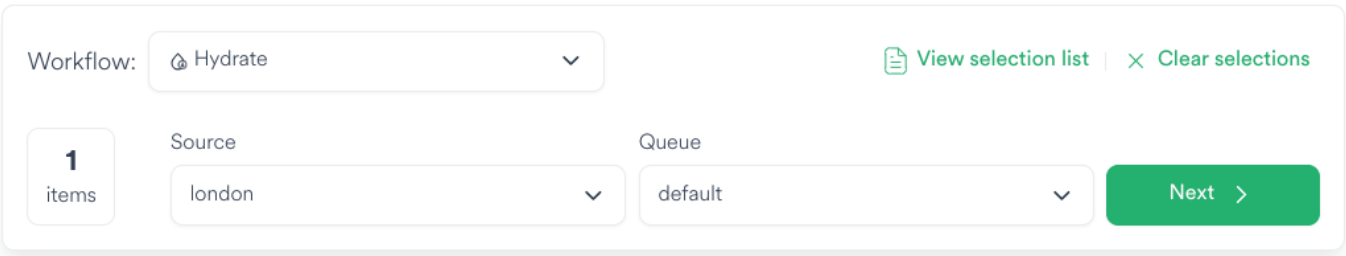
All other sites are listed in alphabetical order after the local site.

Space Selector Checkbox

Selecting the Space Selector Checkbox raises the Job Creator Panel to perform data operations on the entire Space.

Tip: To perform more granular operations on data inside the Space, refer to Selecting files and folders

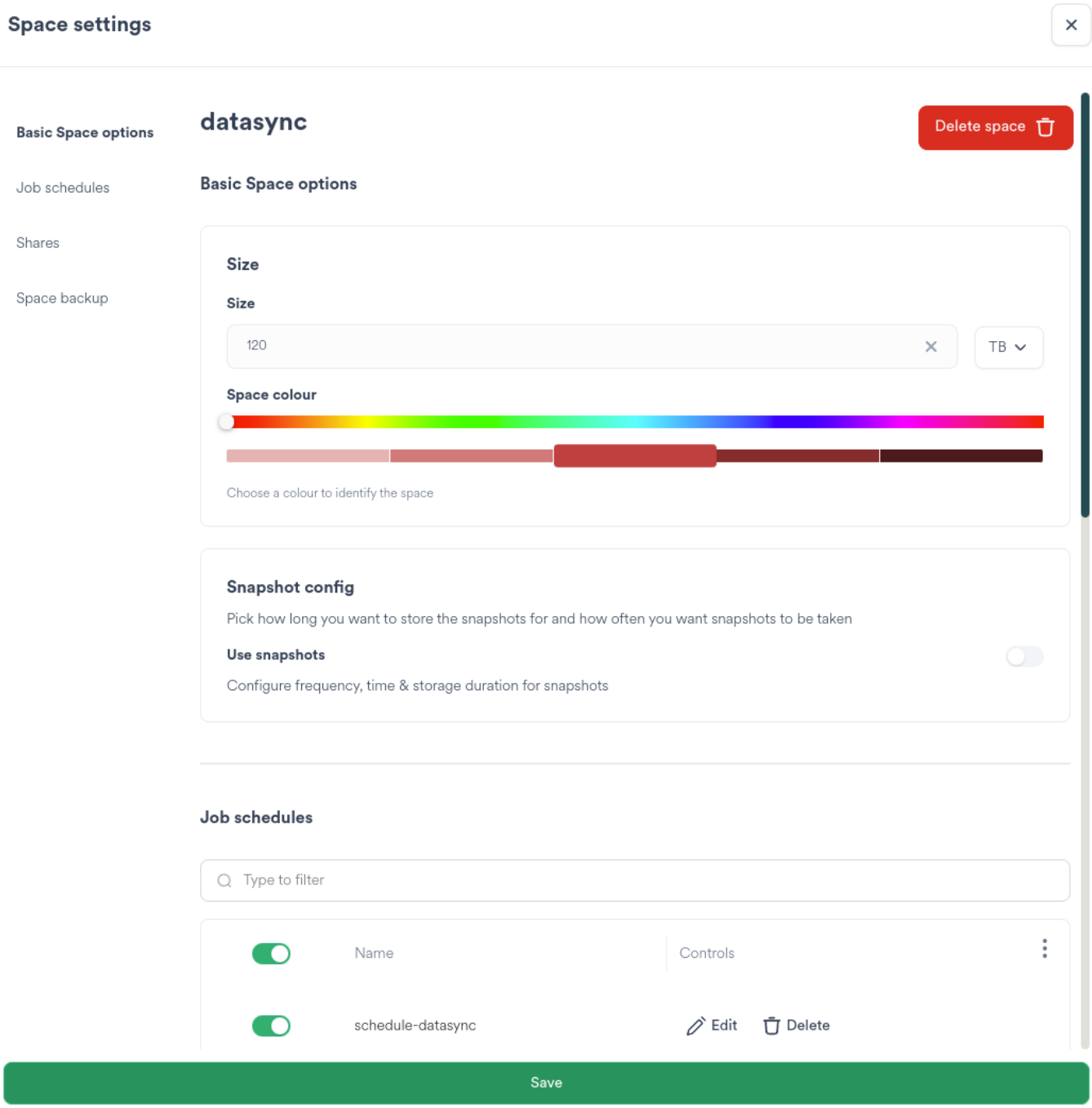
The Job Creator Panel allows data operations on the Space as a whole.



For further information refer to Using the Job Creator Panel.

Space Settings

Clicking the Settings button on the Space card raises the Settings dialog for the Space.



Important: Adding or Configuring a Space can only be performed by a Hub Administrator or User with Space Administration rights granted through group management.

Table View

Hub provides an alternative table layout for Spaces.

Table layouts can be preferable for viewing many Spaces or extended high level Space information.

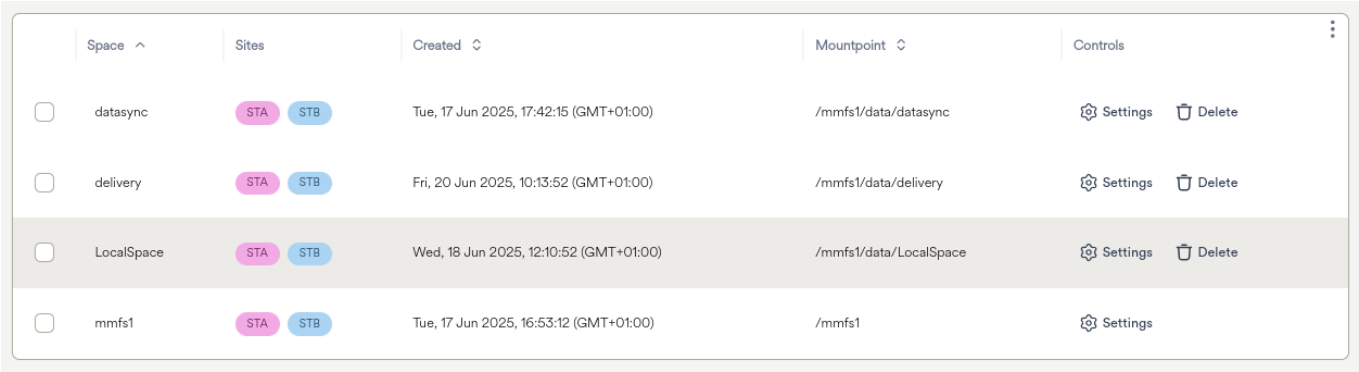


Table view	Clicking the Table view button to switch to Table Layout
Cards view	Click the Cards view button to switch to Cards Layout

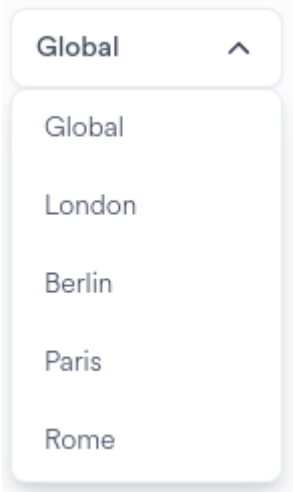
Browsing Spaces

The Spaces File Browser displays the file and folder contents of a Space across multiple or specific sites including additional contextual information such as file counts, size, metadata and status.

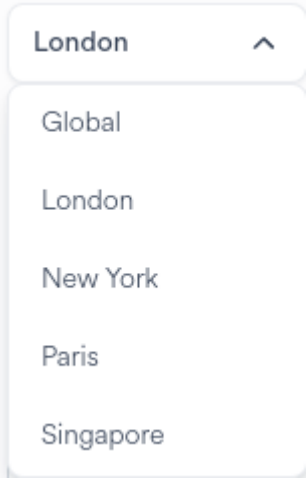
The Space File Browser provides two views of Spaces file and folder content - Global and Local.

- Global displays the file and folder content for a Space across all Spaces on all associated Sites
- Local displays the file and folder content for a Space on a specific Site

The default view of the Spaces File Browser is Global.



To switch to a site-centric view, select the specific site from the Spaces drop-down menu.

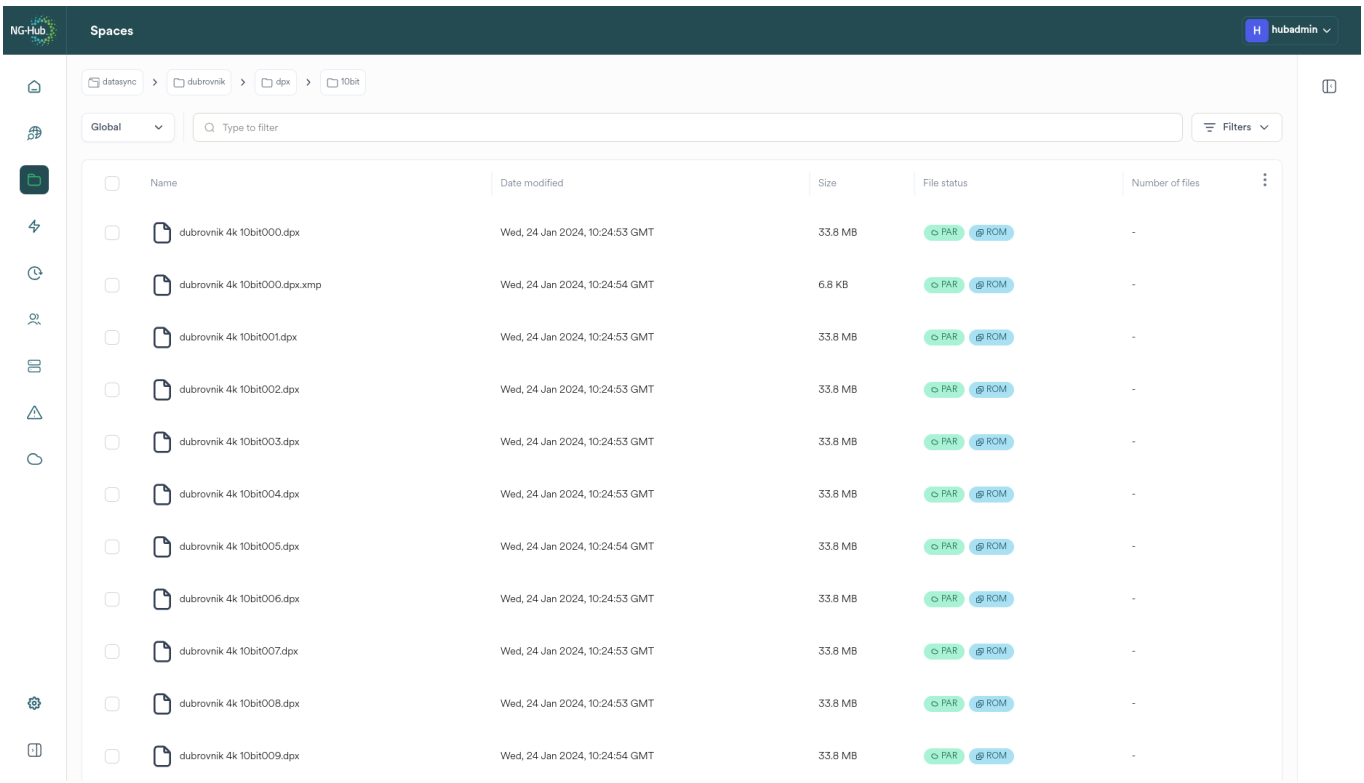


To switch to Global view, select Global from the Spaces drop-down menu.

Spaces File Browser Global View

Global view displays the file and folder content for a Space across all Spaces on all associated Sites

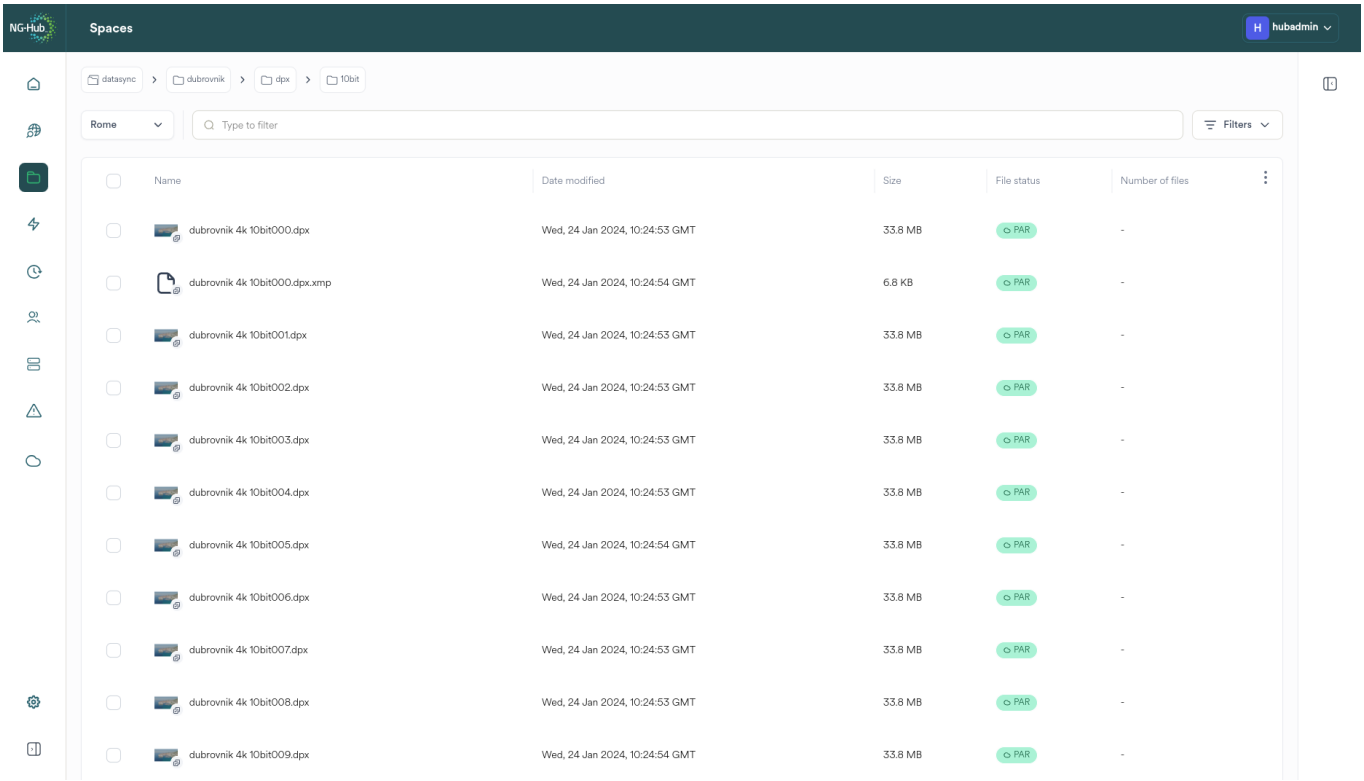
The example below displays the file and folder content for the Spaces across all Sites.



Spaces File Browser Local View

Local view displays the file and folder content for a Space on a specific Site

The example below displays the file and folder content for a Spaces across all Sites with a site-centric view.

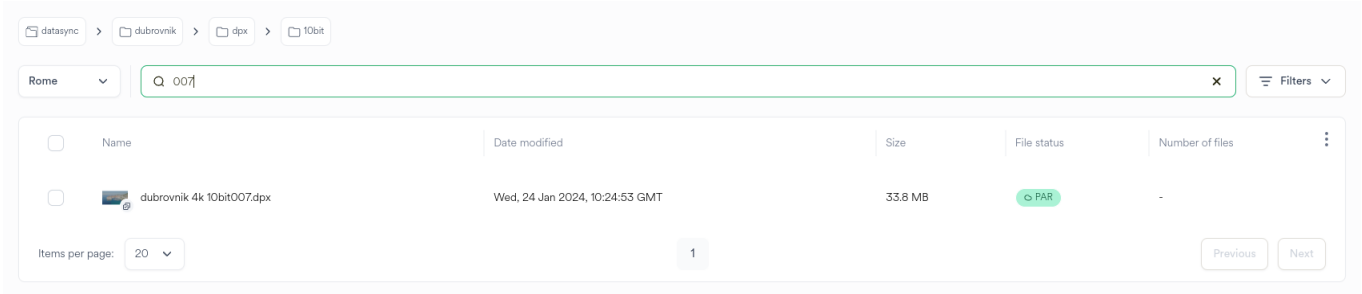


The Space File Browser Screen

The Spaces File Browser screen is comprised of several areas.

Filtering the Space File Browser

To display files or folders matching keywords, enter the keywords in the filter bar.



Space File Browser Icon Statuses

In Local View the Spaces File Browser displays additional information to designate the status of the file on the Site’s pixstor file system.

Spaces File Browser Local View displays the default file icon if the file or folder is unmanaged. An unmanaged file has not yet been processed by Ngenea operations.

	Spaces File Browser Local View displays the cloud icon if the file or folder is Pre-Staged. A pre-staged file is present on the Site’s pixstor file system and has an identical copy in the Ngenea target (E.G. AWS cloud bucket).
	Spaces File Browser Local View displays the cloud icon if the file or folder is dehydrated. A dehydrated file has only metadata present on the Site’s pixstor file system and has a fully hydrated identical copy in the Ngenea target (E.G. AWS cloud bucket).

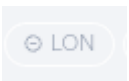
Space File Browser File Statuses

Site Chips denote the sites on which a Space file or folder is present and their status.

In Global view all sites are listed in alphabetical order.

In Local View, the selected site is identified with a dot.

All other sites are listed in alphabetical order after the local site.

	Spaces File Browser Local View displays the default file icon if the file or folder is unmanaged. An unmanaged file has not yet been processed by Ngenea operations.
	Spaces File Browser Local View displays the cloud icon if the file or folder is pre-staged. A pre-staged file is present on the Site’s pixstor file system and has an identical copy in the Ngenea target (E.G. AWS cloud bucket).
	Spaces File Browser Local View displays the cloud icon if the file or folder is dehydrated. A dehydrated file has only metadata present on the Site’s pixstor file system and has a fully hydrated identical copy in the Ngenea target (E.G. AWS cloud bucket).
	Spaces File Browser Local View the file or folder displays a greyed out site with a circled dash where the file is not present on the associated site.

Space File Browser File Attributes

The Space File Browser displays information regarding the files and folders within the Space, globally on all Sites or local to a Site.

Option	Description
Name	The file or directory name
Date Modified	The date and time of last modification
Size	The size of the file on the pixstor file system
File Status	The file status per-site
Number of Files	If the item is a directory, displays the total file count within the directory tree thereunder

Viewing File or Folder Metadata

Metadata Panel

Click a file or directory name to view the associated metadata:

Item info

Name	dubrovnik 4k 10bit000.dpx
Type	file
Path	/mmfs1/data/datasync/dubrov...
Site names	Rome
Size	33.8 MB
Date changed	24.01.2024, 10:24 GMT
Date accessed	24.01.2024, 10:24 GMT
Date modified	24.01.2024, 10:24 GMT

Hydration status

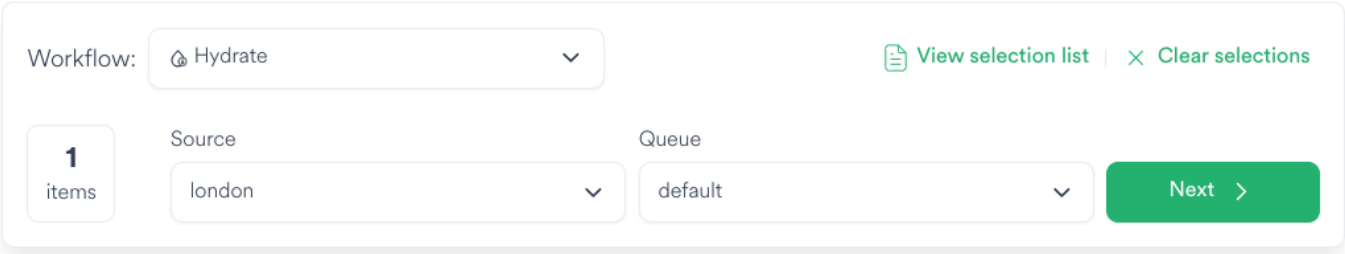
Rome	Premigrated
Paris	Migrated

The metadata panel provides extended metadata, including a summary of the file status on each site participating within a Space.

Where an asset has been ingested via Search thumbnails are displayed for supported file types.

Using the Job Creator Panel

Explain panel areas, buttons and operations

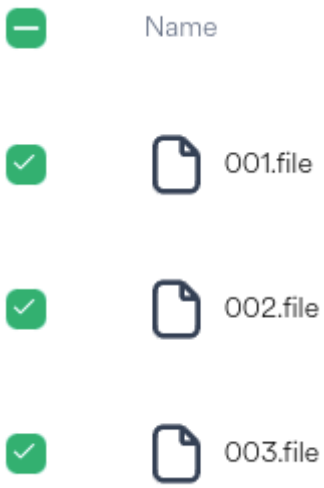


Selecting files and directories

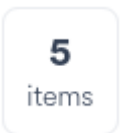
Selecting an individual file or directory populates the selection list with the item. Selecting a directory populates all items within the chosen directory tree.

Selections of the entire Space or a directory are each counted as 1 item.

Select the ‘select all’ checkbox next to the Name field in order to select the entire Space.



As selections are added or removed, the selected item count is updated:

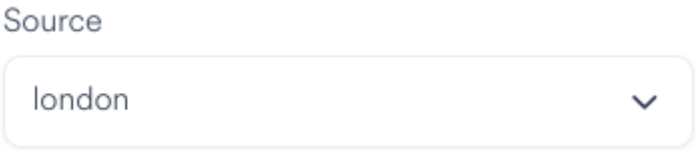


Click the View Selection List button to show the files and directories selected to be processed by the chosen workflow

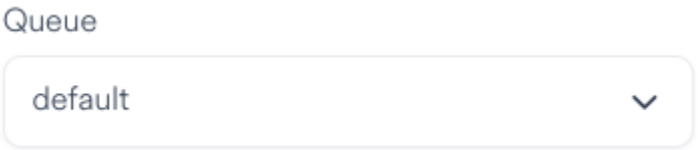
Click the Clear selections to remove all files and directories currently selected from the selection list

Click the Next button to enact the Job

Sites and queues

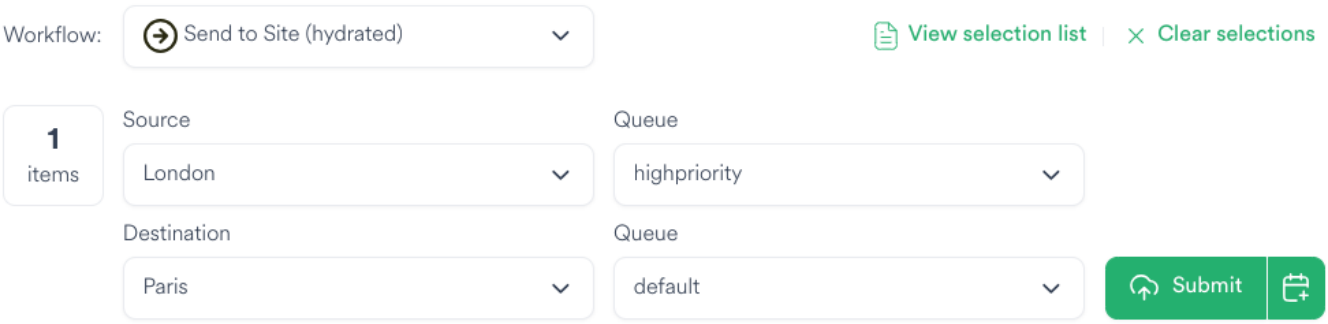


Select the site where the job will run.



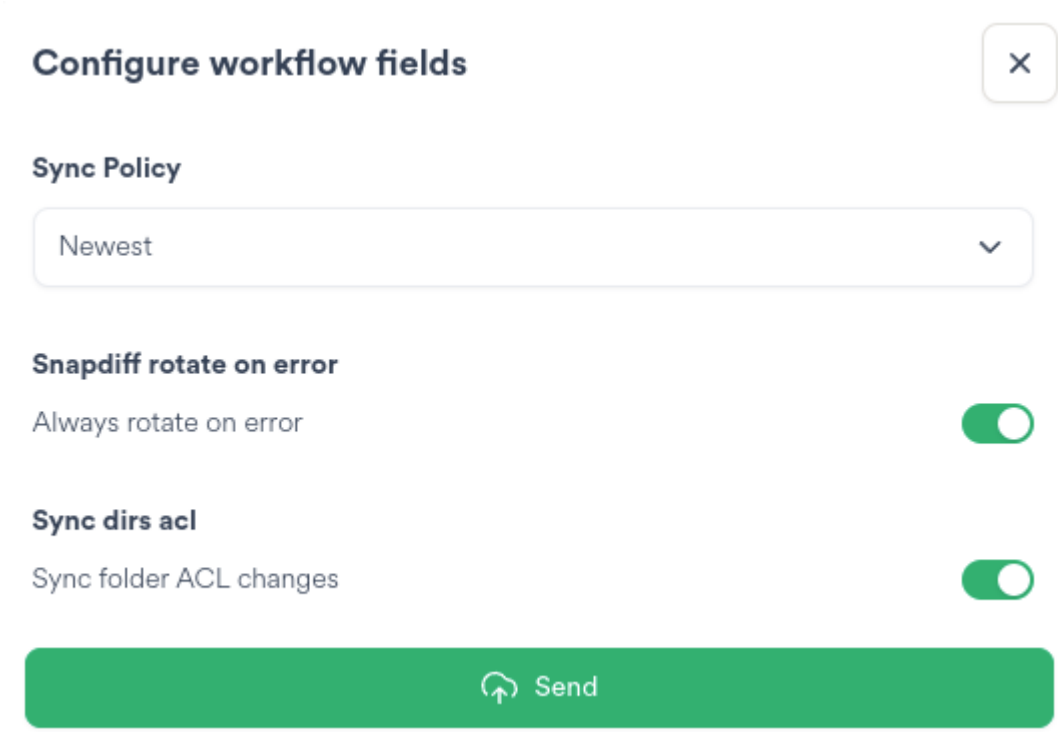
Select the queue the job will be assigned to.

If the workflow runs across multiple sites, such as “Send to Site”, select a source site and queue, and a destination site and queue.

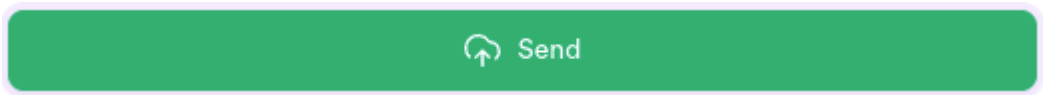


Workflow fields

Jobs with Workflows which require additional user decisions prior to enacting the Job raise the Configure workflow fields dialog:



After entering the field information [if required], select the button at the bottom of the dialog to submit the Job.



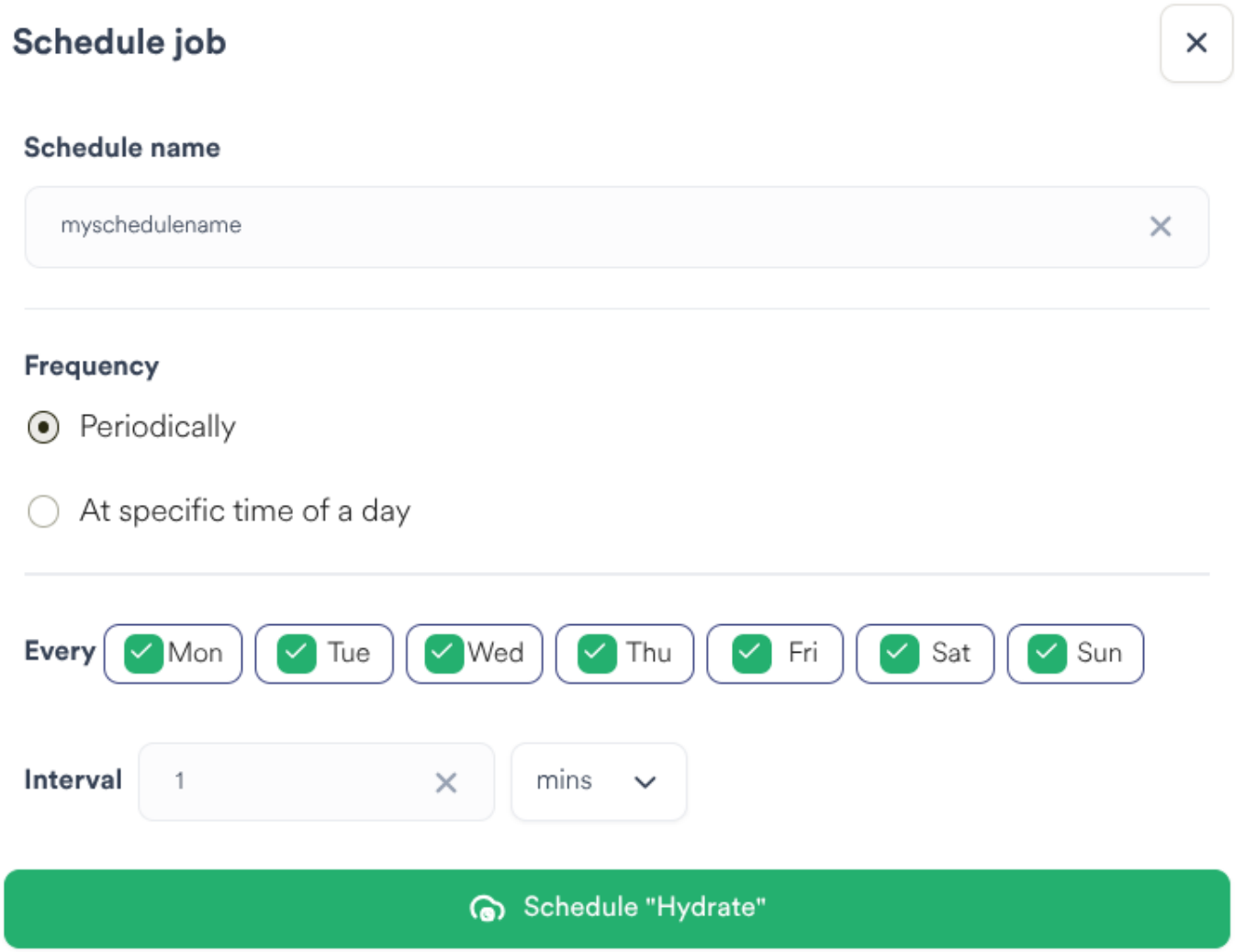
Click the button at the bottom of the dialog to submit the Job immediately. The button label is changed dependent on the workflow chosen.

Scheduling a workflow

To Schedule the Job to run later, click the Schedule button.

Click the Schedule button to Schedule the Job for later

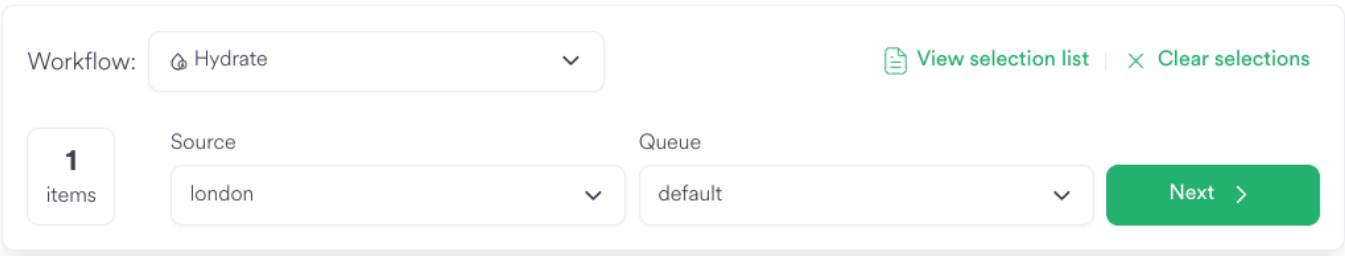
The Schedule button raises the Schedule Job dialog.



- Enter the name of the Schedule
- Select the desired Schedule settings
- Click the Schedule button to create the Schedule

See Schedules for more details for schedule workflows.

Job Types (Workflows)



Default Workflows

Dehydrate

The Dehydrate workflow transfers the file metadata and data to an Ngenea target (E.G. an AWS cloud bucket). After dehydration the file appears to be normally present alike any other file on the pixstor file system, but consumes no space. Reading the file automatically hydrates the file with data content allowing the user to read the file as normal.

Pre-Stage

The Pre-Stage workflow transfers the file metadata and data to an Ngenea target (E.G. an AWS cloud bucket). After migration the file on Ngenea target is an identical instance of the file on the pixstor file system. The file on the pixstor file system is not dehydrated. Reading the file allows the user to read the file as normal. Pre-Staging can reduce the total time to Dehydrate the same data in future.

Hydrate

The Hydrate workflow retrieves the file data from an Ngenea target (E.G. an AWS cloud bucket). After successful transfer the metadata and data content of the file is present on the destination site. Reading the file allows the user to read the file as normal.

Sync Space to Site

The Sync Space to Site uses file system snapshots to disover changes between the last file system snapshot and when the workflow was run. Changes are applied by sending newly created or recently modified files and directories, including deleting or moving files or directories in place on the target site as necessary to match the source site.

Send to Site (hydrated)

The Send to Site (hydrated) workflow transfers data from a source site to a destination site. After successful transfer the metadata and data content of the file is present on the destination site. Reading the file allows the user to read the file as normal.

Send to Site (dehydrated)

The Send to Site (dehydrated) workflow transfers data from a source site to a destination site. After successful transfer the metadata of the file is present on the destination site. To a user the file appears to be normally present alike any other file on the pixstor file system. Reading the file automatically hydrates the file with data content allowing the user to read the file as normal.

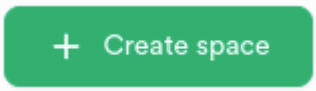
Additional Custom Workflows

Hub can support additional Custom Workflows providing custom operations to data through multiple task steps. Custom workflows are configured and provisioned by a Hub Administrator using the Hub CLI. When provisioned Hub Custom Workflows will appear in the list of workflows available for users to use with their data.

Managing Spaces

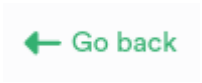
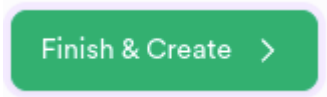
Create a Space Wizard

Click the Create Space button to display a dialog to configure the selected space.



Important: This function can only be performed by a Hub Administrator

Navigating the Wizard

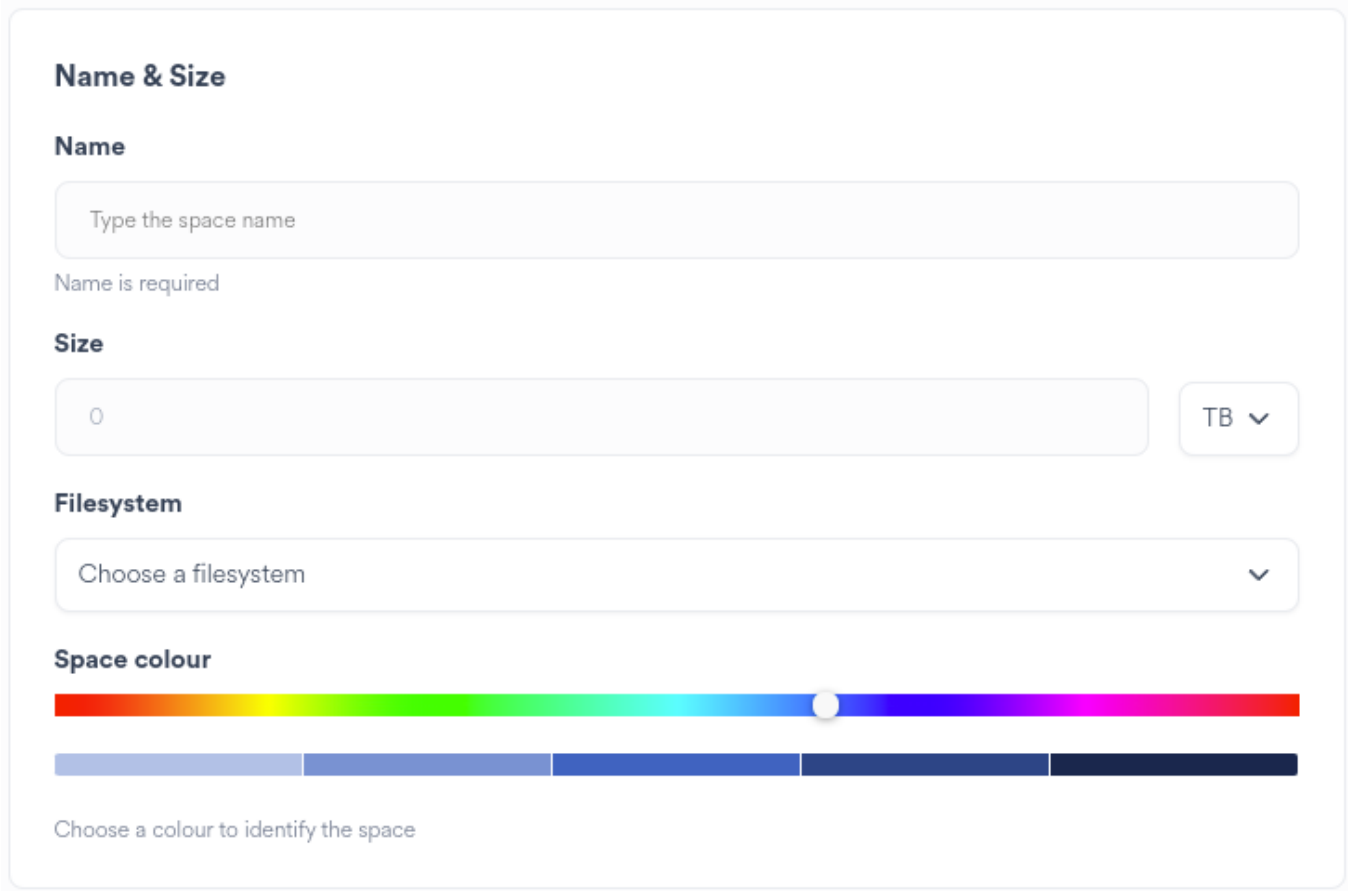
	Click the close button to exit the wizard. Changes are not saved.
	Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.
	Click the Go Back button to return to the previous wizard page.
	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Basic Space Options

Spaces are created on pixstor file systems at /mmfs1/data/[Space] or at an alternative custom location.

Spaces can be restricted to a limited amount of data.

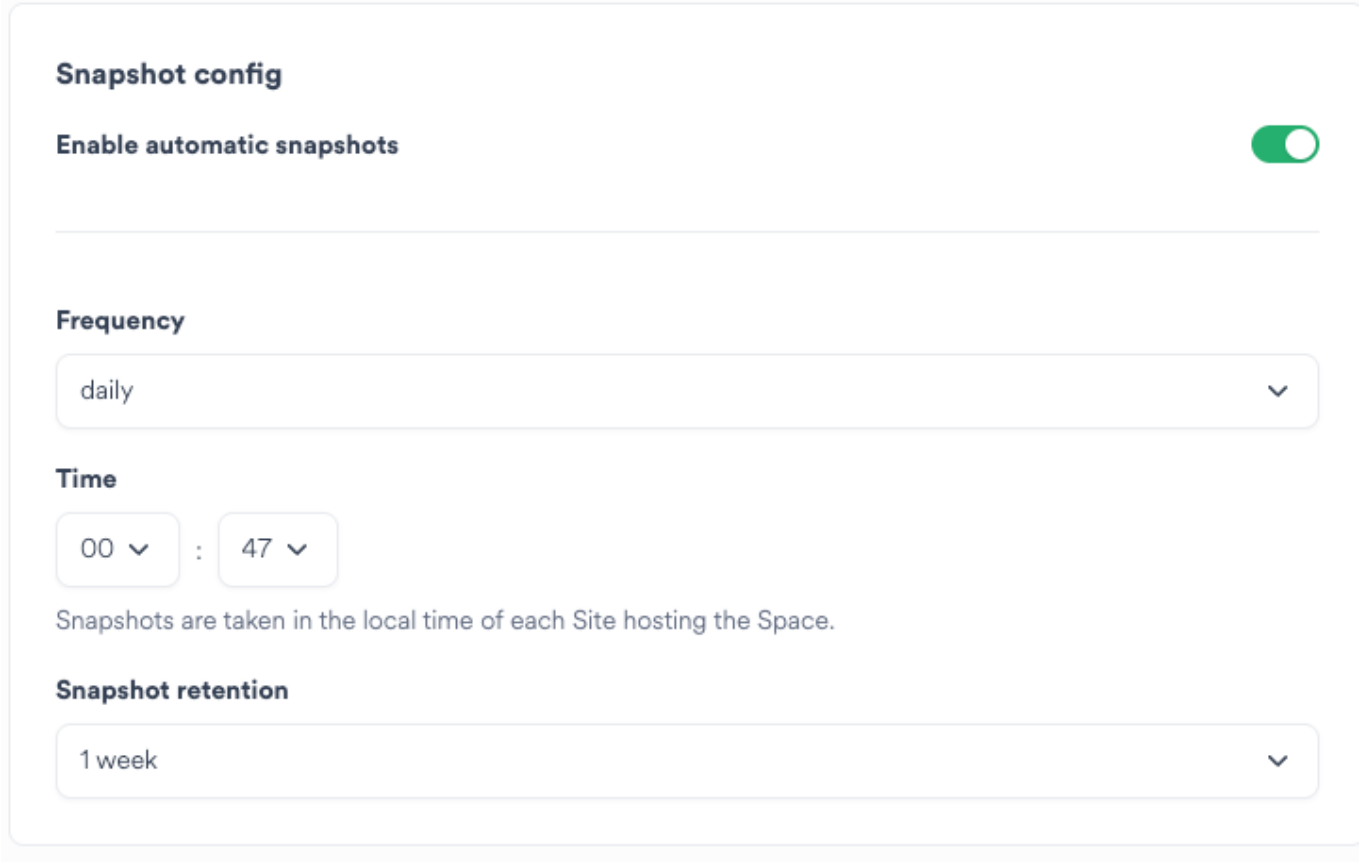
Spaces are defined to a specific file system.



- Enter a name of the Space. The name is case-sensitive.
- Choose the data limit for the Space or unrestricted (Size = 0)
- Select the file system the Space will reside on across all pixstors
- Select a colour for the Space Card

Snapshots create safety copies of data on the pixstor file system.

Snapshots are not backups and should not be used as protection against media failures



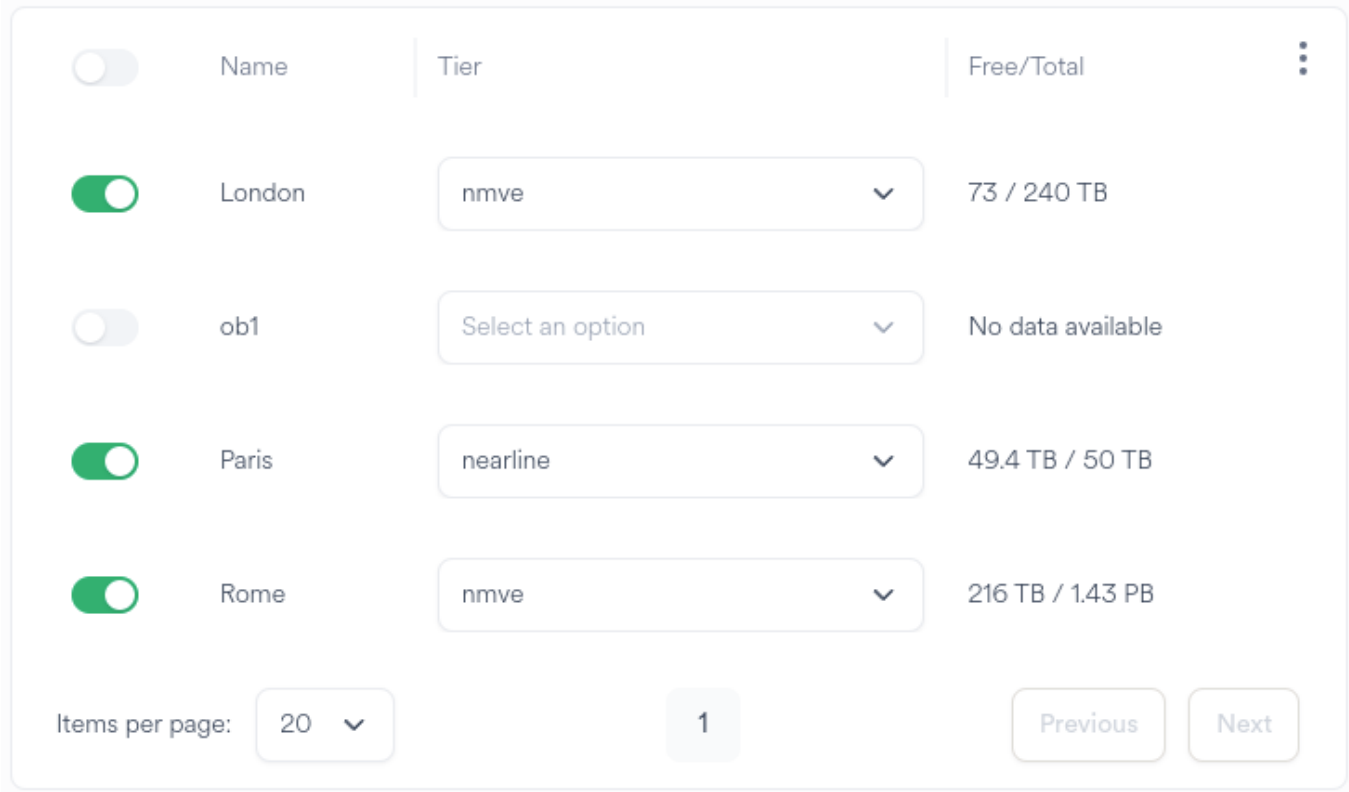
- Choose whether snapshots are required for the Space
- Choose the frequency of the snapshot
- If the frequency is daily or longer, select the time of day on the Site to snapshot the Space
- Snapshots are scheduled and taken based on the local timezone of each Site where the Space is hosted
- Choose how long to retain the snapshots

Select the Sites to create this Space on

A Space can exist across multiple Sites.

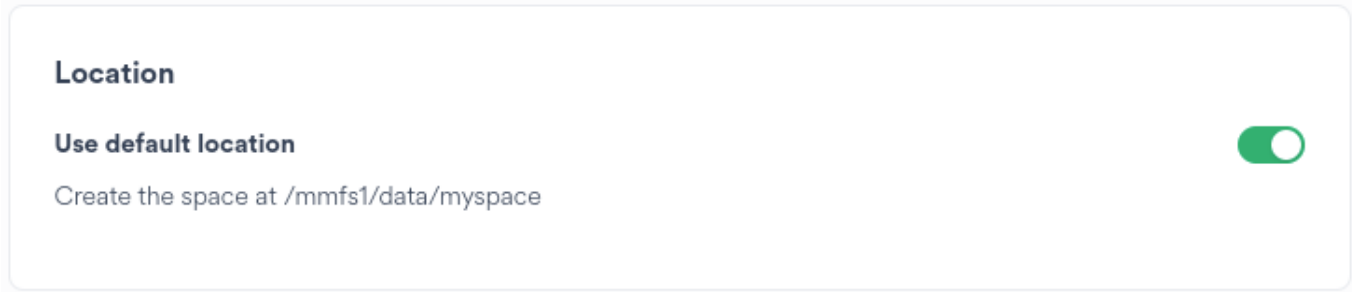
By default data does not move across multiple Sites. Scheduled workflows must be set up to enable cross-site data movement.

Hub provides the ability to synchronise a Space with two Sites - a bi-directional sync.

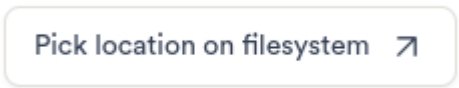


- Select the Sites on which to create the Space
- Select the pixstor file system tier on which to host the files for the Space. The tier is limited to those available for the file system selected in the prior wizard screen.

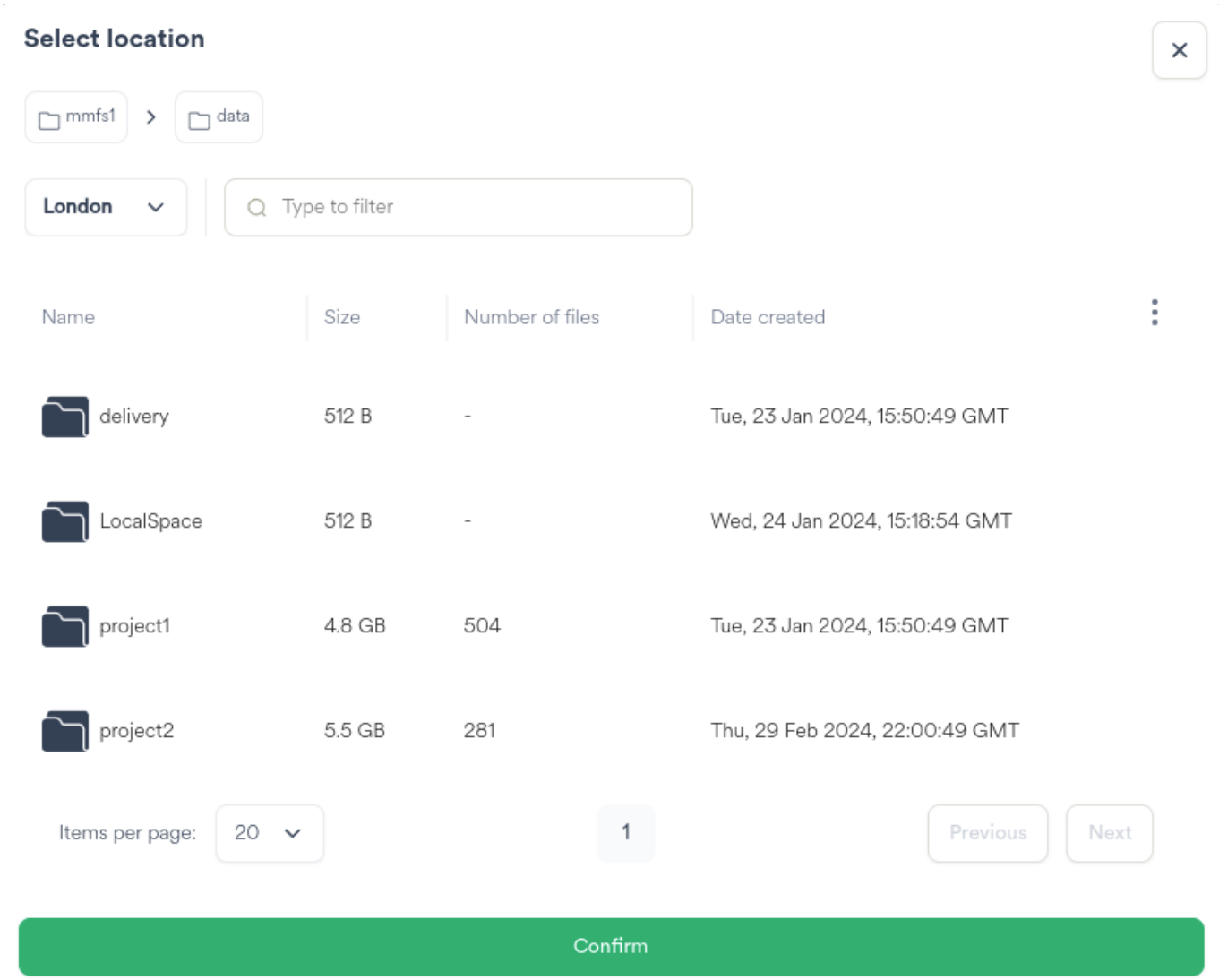
If two Sites are selected the Wizard will prompt to setup a bi-directional sync.



- To select an alternative custom location, deactivate the Use default location slider



Click the Pick location on filesystem button to open the location selector



- Select a Site to browse. Parent directories not present on another Site will be added when a Space is created.
- Navigate to the directory under which to create the Space
- Click the Confirm button to return to the Space creation wizard

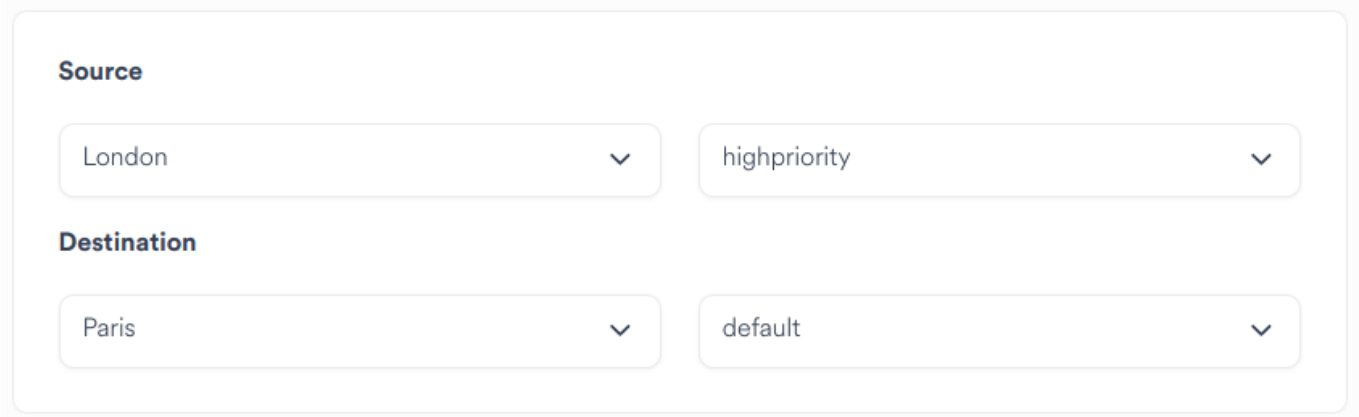
The chosen location is displayed and will be used for all Sites on which the Space is created.

Set up bi-directional sync

If two Sites are selected on the prior wizard page, Hub prompts to setup a bi-directional sync.

Only one bi-directional sync can run at a time.

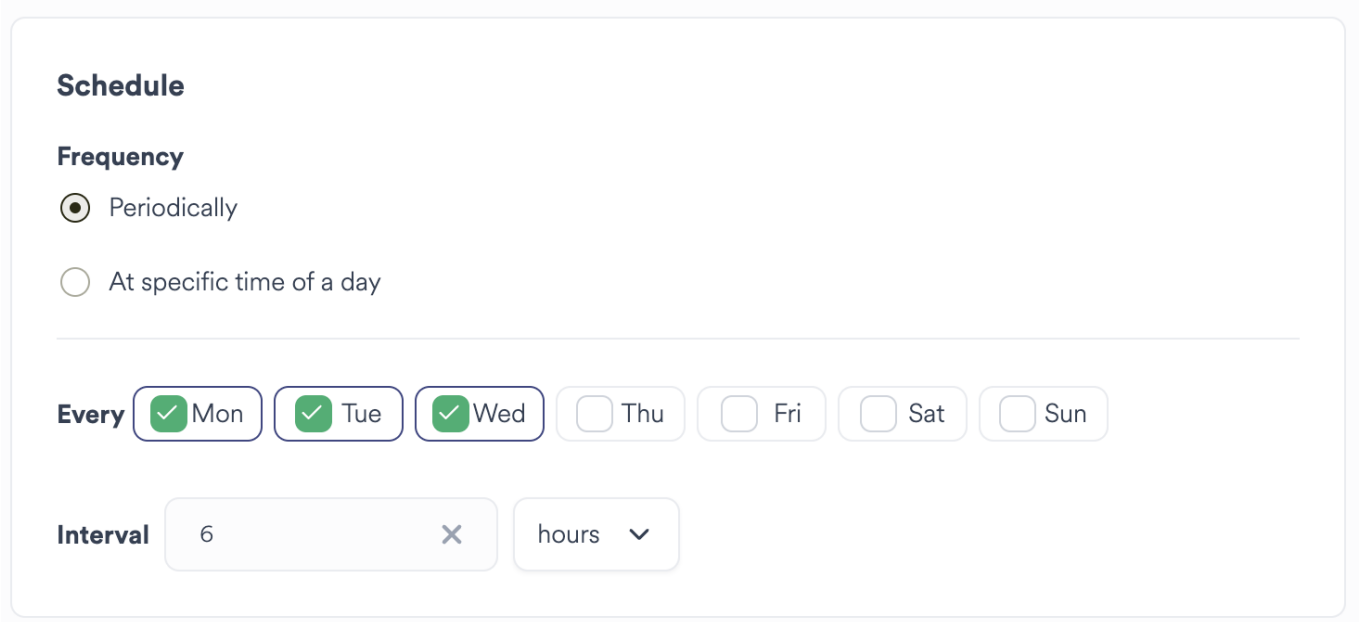
This page can be skipped if no synchronisation is required.



- Select the source Site to launch the first sync from
- Select the other Site as the destination site
- Select the Queue(s) to assign bi-directional sync to

Schedule

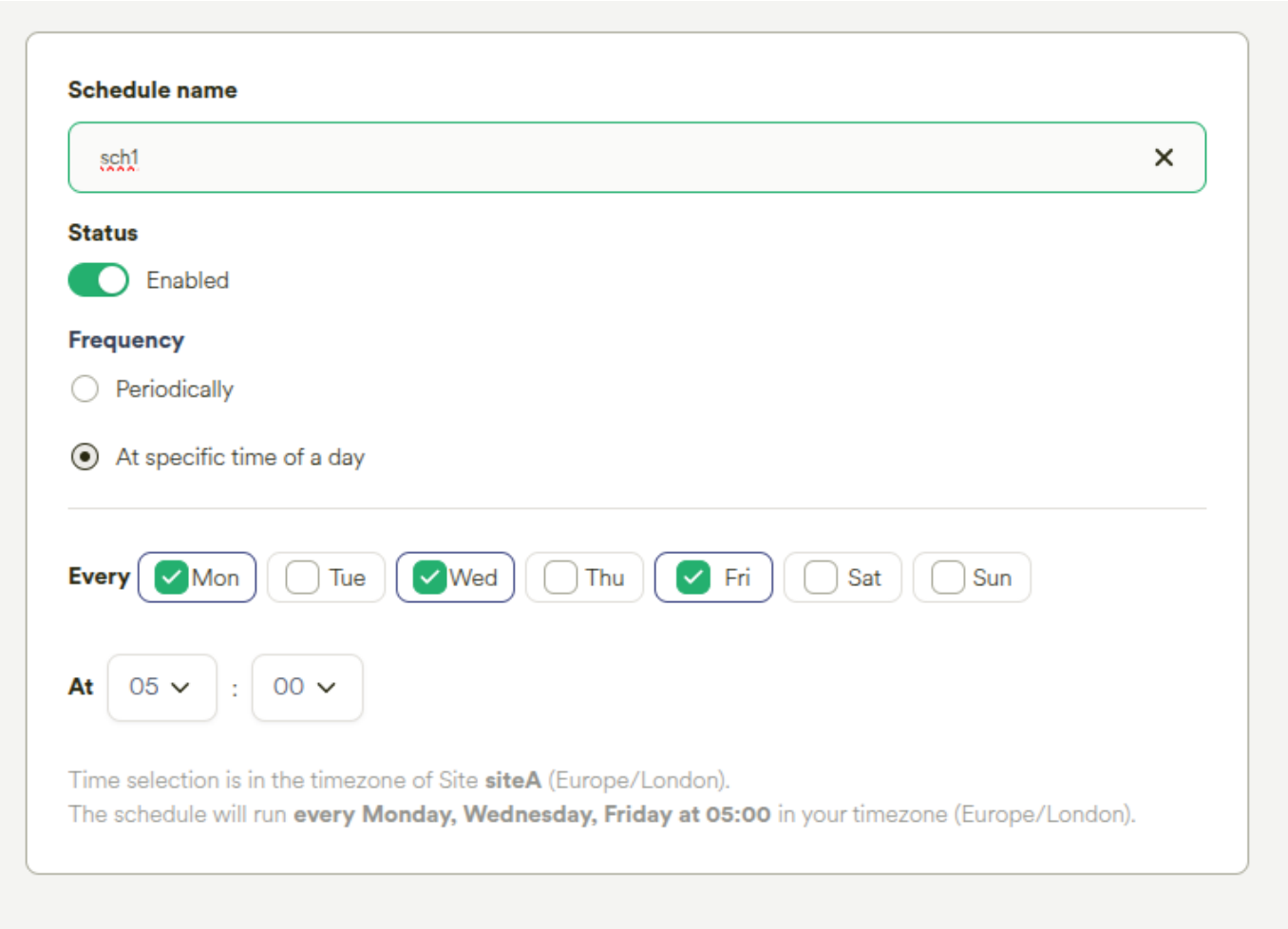
Determine the required frequency of the synchronisation.



Choosing Periodically will ensure that the schedule will run on the next interval set.

E.G:

- 1 hour: The synchronisation will run on the next hour (12.00, 13.00)
- 15 mins: The synchronisation will run on the next 15 minute interval past the hour (15, 30, 45, 00)

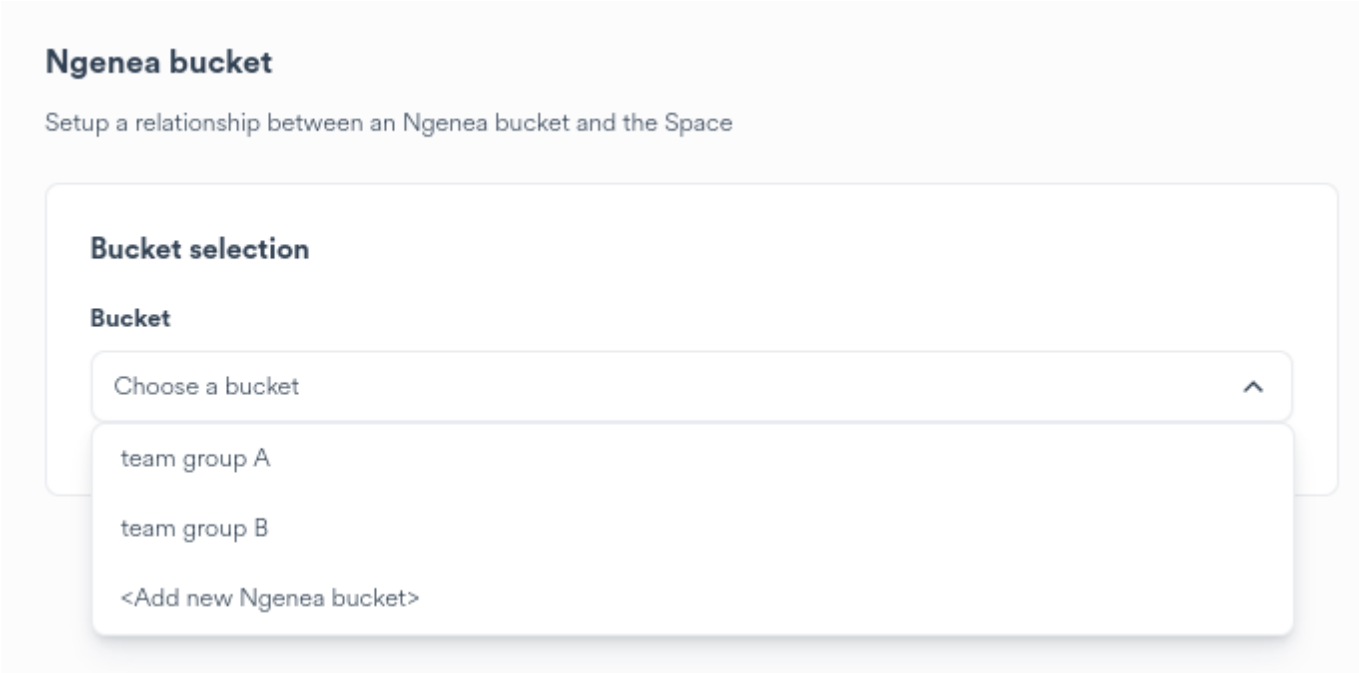


Choosing At Specific Time of A Day allows the Policy to be scheduled once per chosen day at a specific time of day.

Hint: The schedule time is set in the Site's local timezone, but will be stored in the UTC timezone.

Ngenea bucket

Select a pre-defined Bucket or choose to *Add a new Bucket* to associate with the Space.

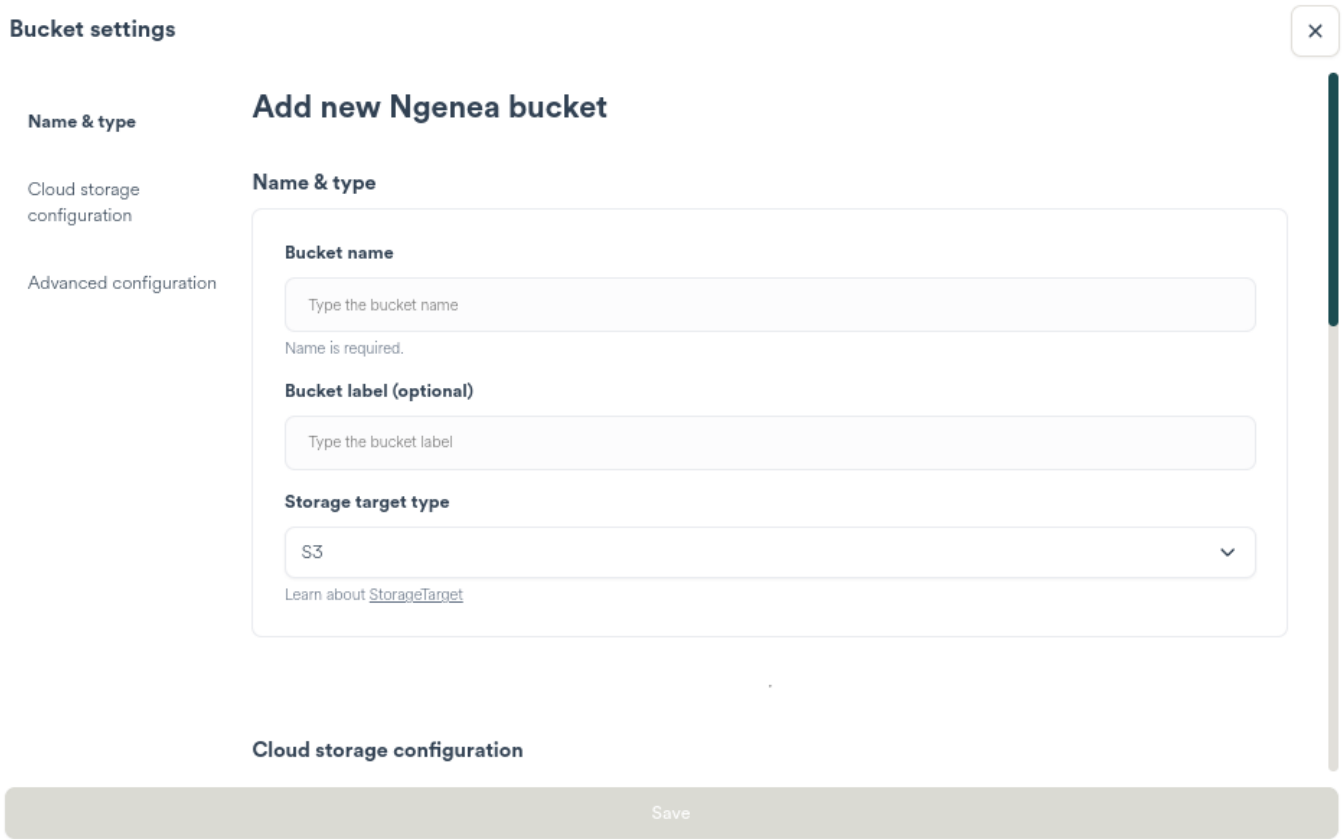


- Select a pre-defined bucket for this Space
- Choose to add a new bucket for the Space

Adding a New Bucket

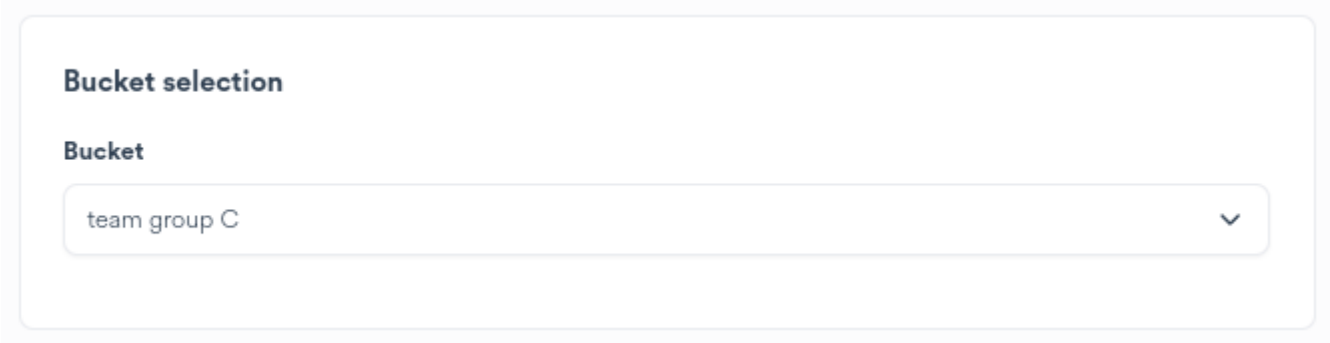
Adding a new Bucket raises the *Add new Ngenea Bucket* dialog.

See Ngenea for more details.



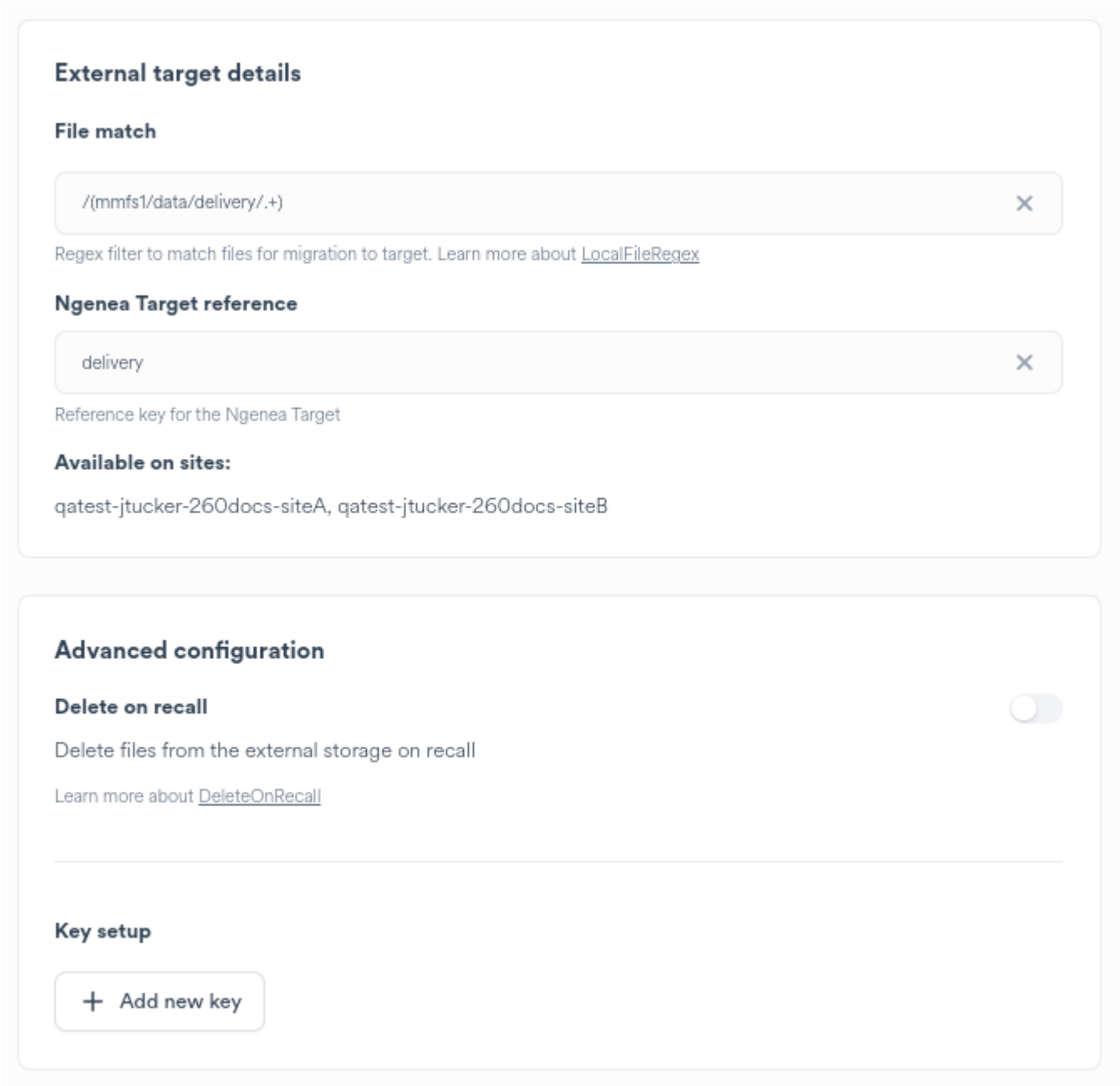
Selecting a Pre-defined Bucket

Selecting a pre-defined Bucket displays the chosen Bucket in the Bucket drop down.



External target details

After either adding a new Bucket, or selecting a pre-defined Bucket the External target details are generated for the Space to review and configure as required.



- Review the external target details and configure as required

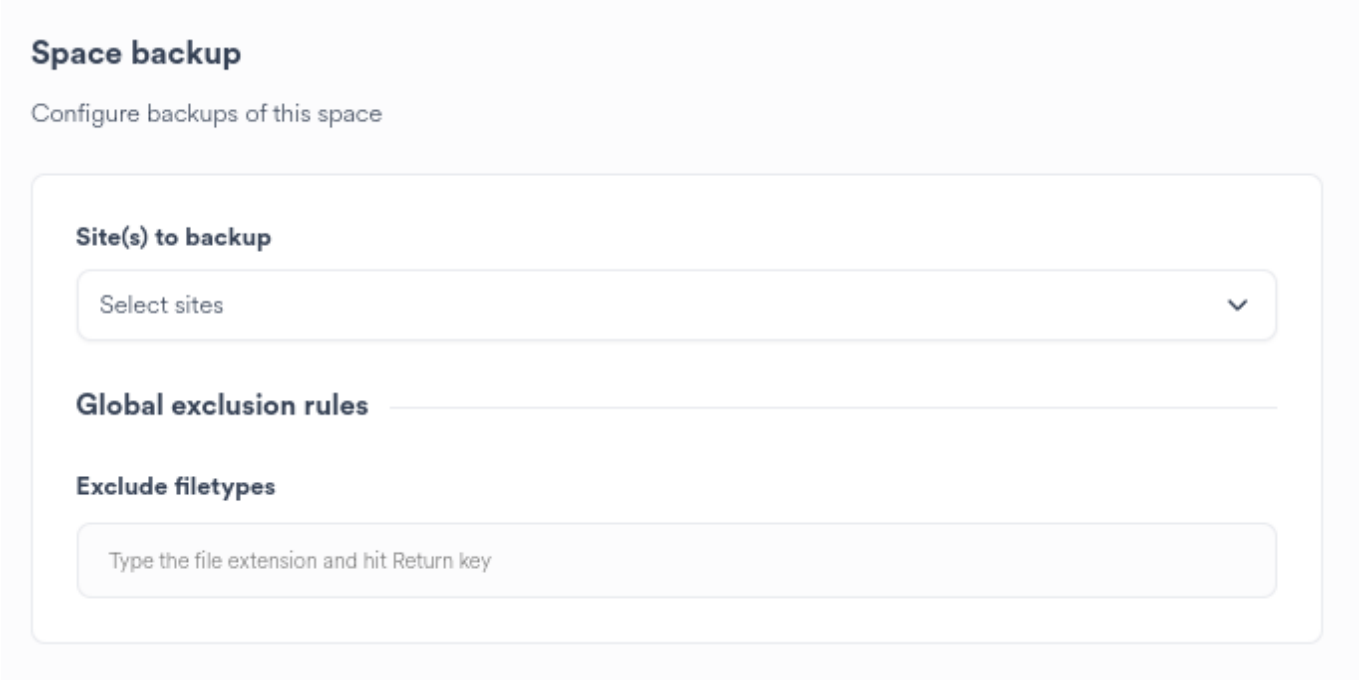
See Ngenea for more details

Shares

Prior to Space creation Shares can be assigned.

See Shares for more details

Spaces backup



- Select the Sites which will perform backups for this space
- Define file extensions which must be excluded from backups across all Sites. E.G. `*.tmp`

Choosing Site(s) to backup presents further backup options.

For more information refer to Backups.

Important: Multiple Sites are not permitted to backup to the same Ngenea Target.

Updating a Space

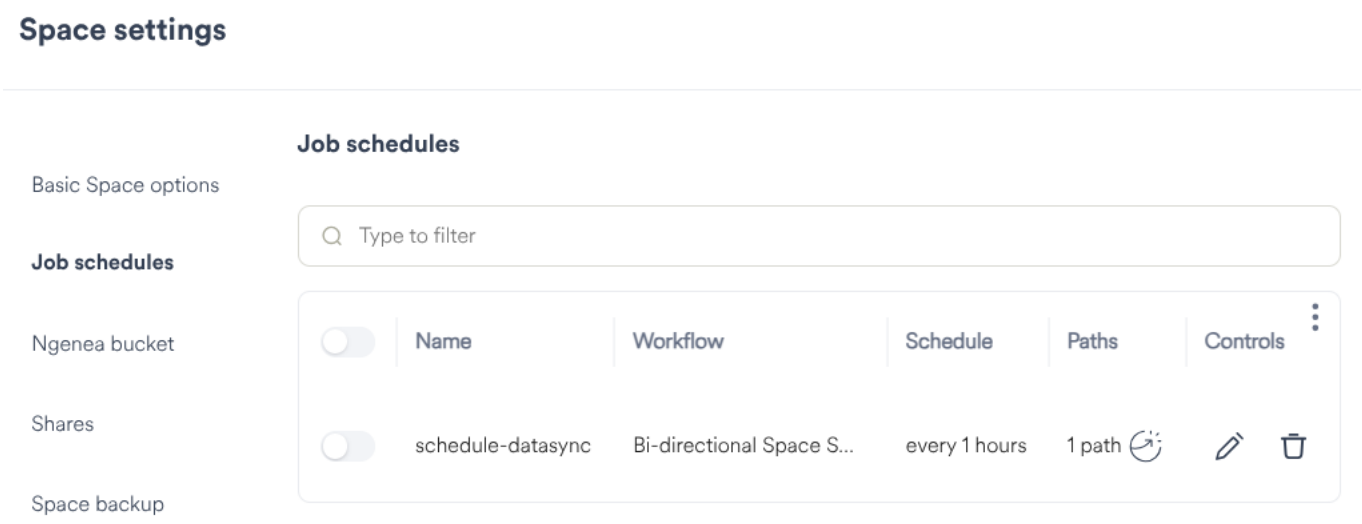
Settings can be modified as required.

	Clicking the Settings button on the Space card raises the Settings dialog for the Space.

Important: Adding or Configuring a Space can only be performed by a Hub Administrator or User with Space Administration rights granted through group management.

Schedules

Click the `Job Schedules` menu item on the Space settings dialog.

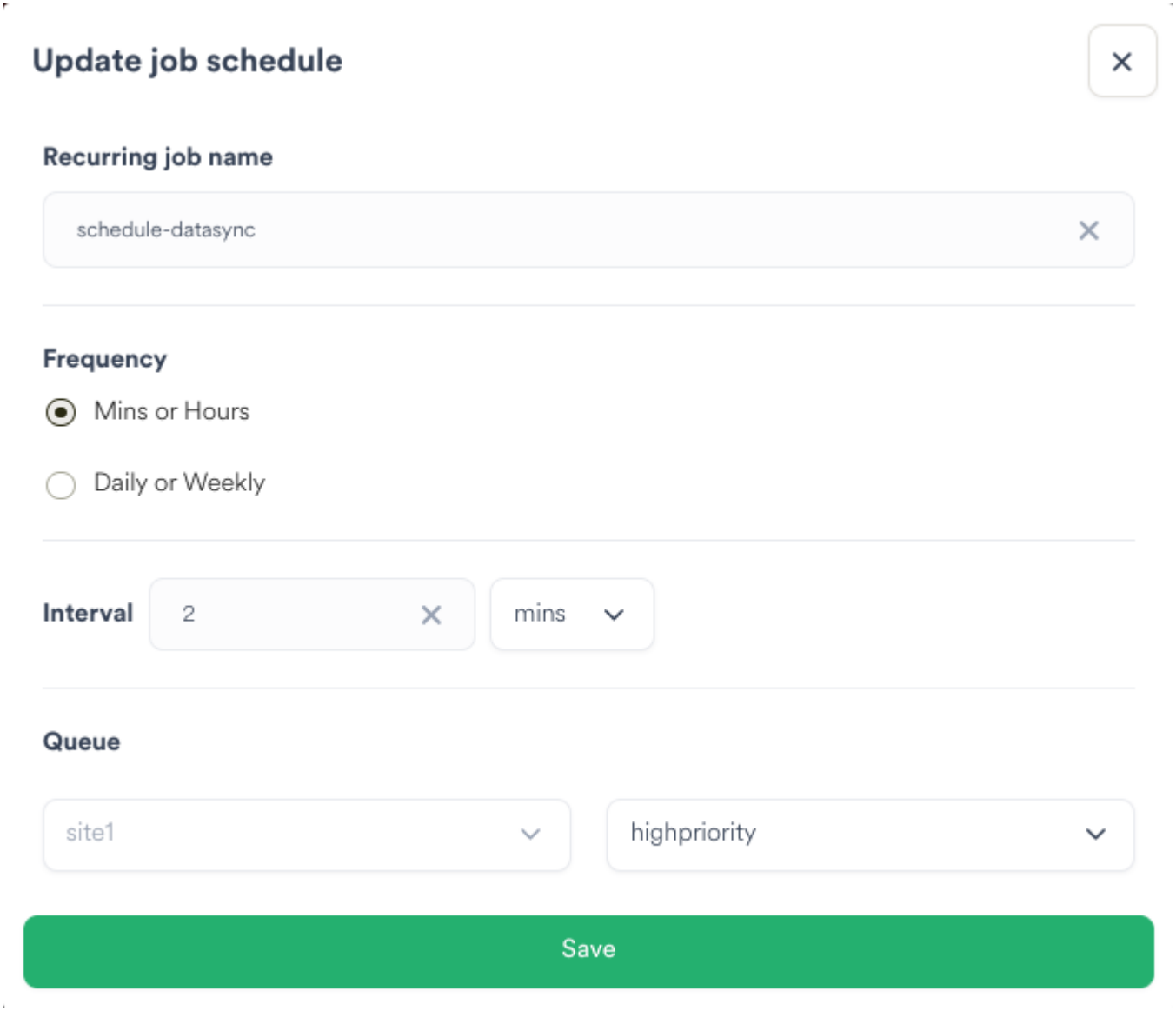


The Schedules for the Space are viewable.

Editing a Schedule

Edit	Click the Edit button for the Schedule to be modified

Clicking the Edit button raises the Update job schedule dialog.



- Modify the desired Schedule settings
- Click the Save button to store the modified Schedule settings

Clicking the Save button at the bottom of the Space settings dialog saves any changes made.

Deleting a Schedule

Delete	Click the Delete button for the Schedule to be deleted

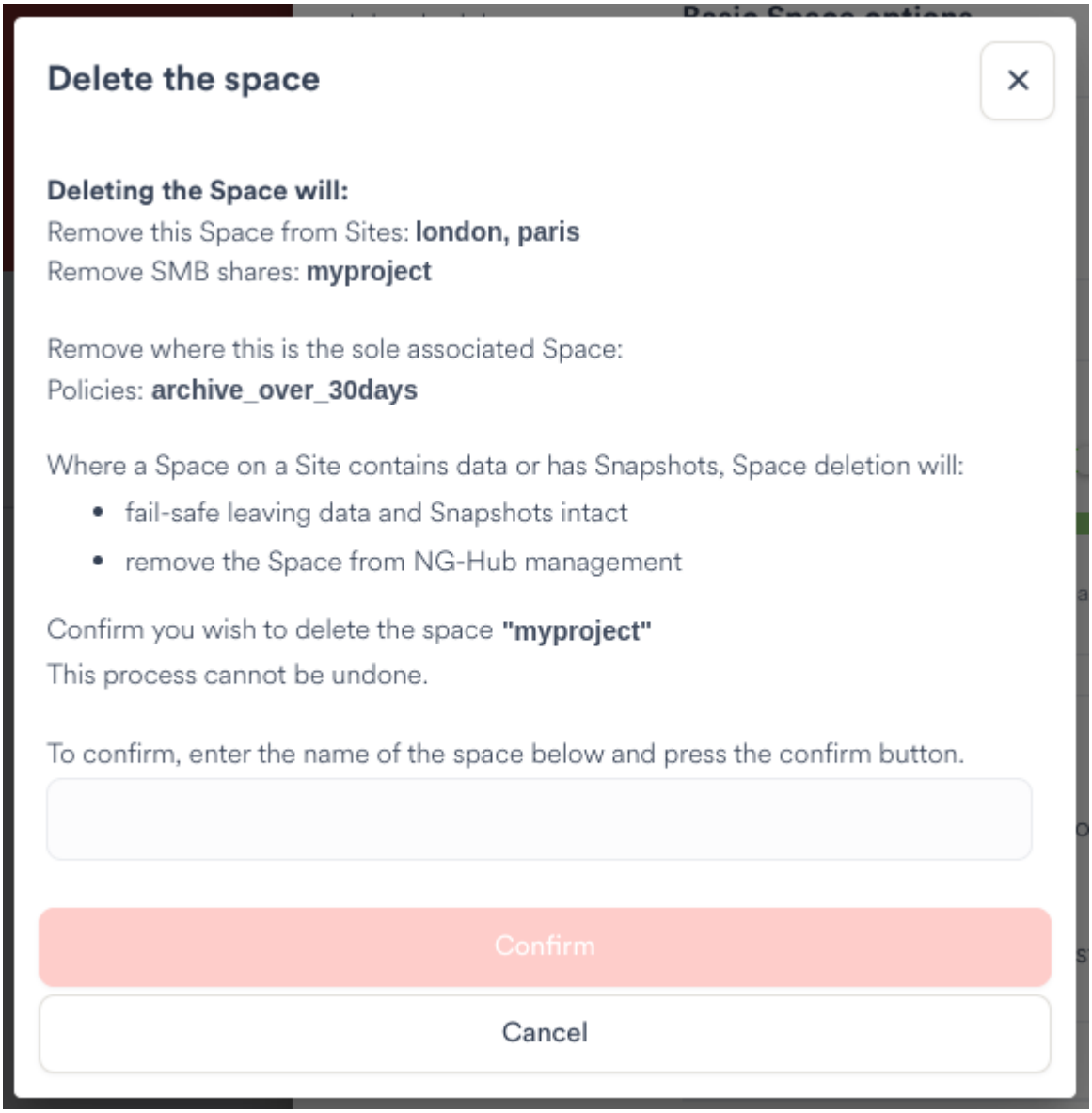
Tip: Deleted Schedules are non-recoverable. If a Schedule has been inadvertently removed, do not press the Save button, instead click off the Space settings dialog to the main area of the screen.

Clicking the Save button at the bottom of the Space settings dialog saves any changes made.

Deleting a Space

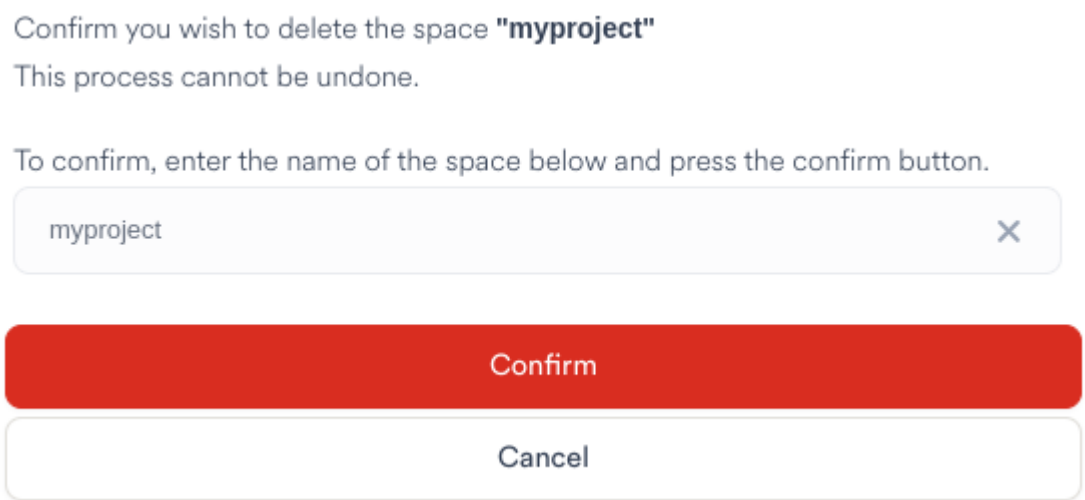
Clicking the Settings button on the Space card raises the Settings dialog for the Space.

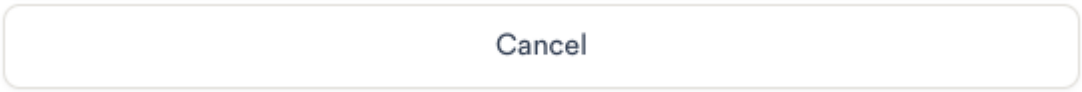
Clicking the Delete Space button raises a confirmation dialog



The delete confirmation dialog describes what will happen when the space is deleted, including what associated objects will also be removed.

Type the name of the space into the text input to activate the Confirm button.



	Click the Cancel button to close the confirmation dialog. The space will not be deleted.
	Click the Confirm button to delete the space.

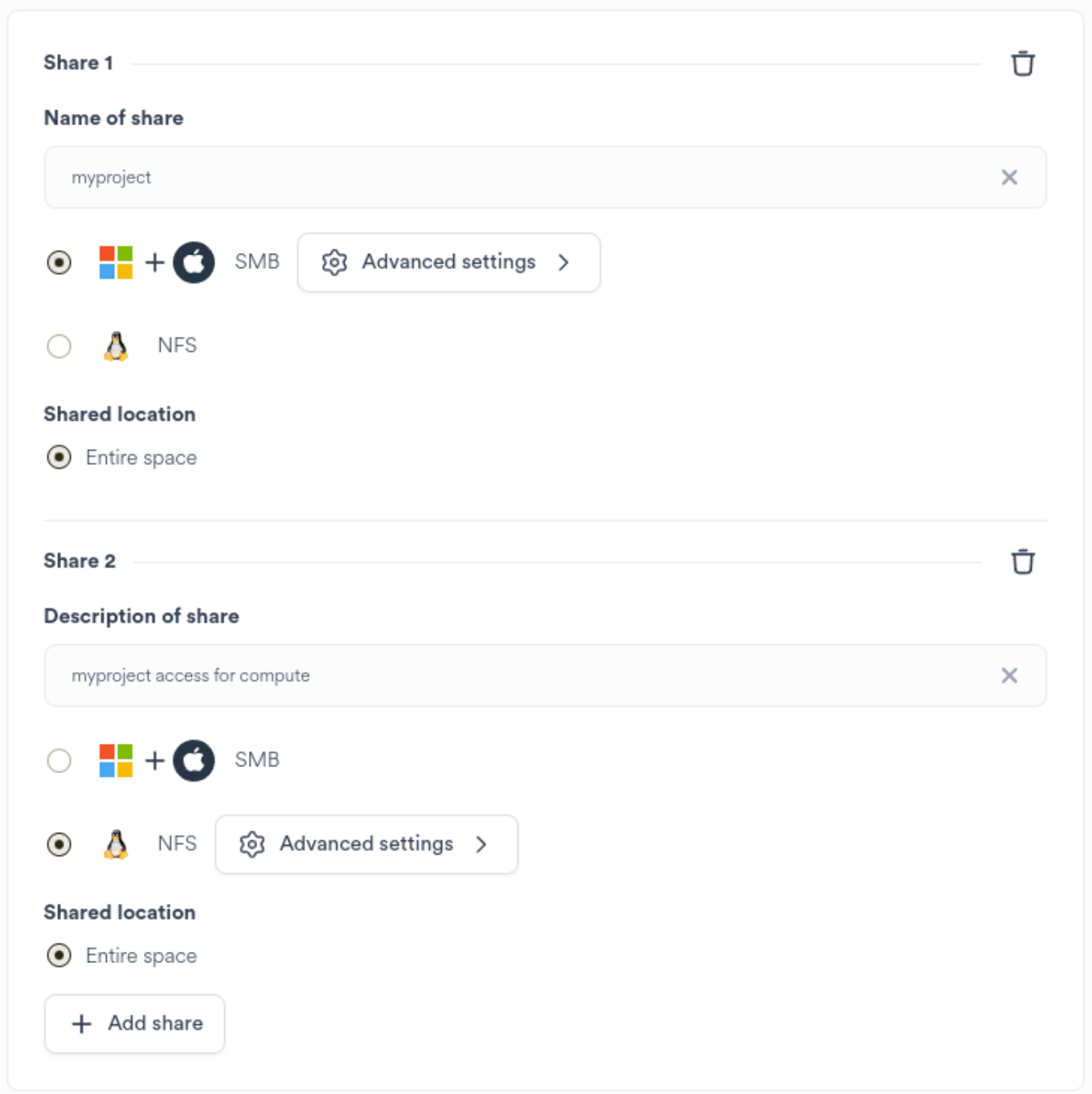
Shares

Prior to Space creation Shares can be assigned.

Shares are created across all Sites where the Space is provisioned.

As the Space is not yet created any Share created is assigned to the whole Space. To create Shares within the Space, edit the Space after creation and add the required Shares.

	To create shares for directories within a Space can be created via the Edit Space button after successful Space creation. Shares are created identically across all Sites participating in a Space.



- Select either protocol type to create a Share

SMB protocol creates a Share with the name provided.

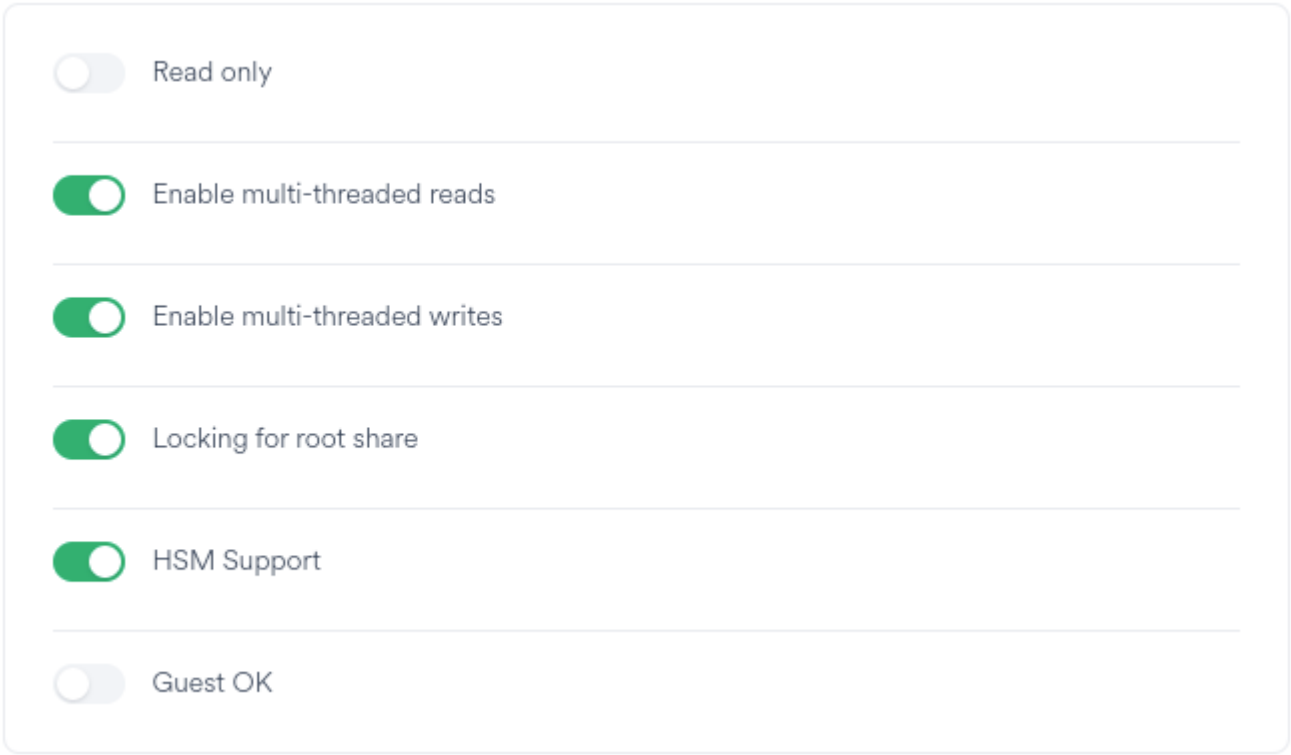
NFS protocol creates a Share at the Space location on the pixstor file system. Set a suitable description of the share.

- Optionally choose to modify the Share configuration in the Advanced settings.

SMB Advanced

Extended SMB options

Modifying the extended SMB options controls the Share capabilities:



Select the available extended SMB options as appropriate:

Option	Description
Read only	If enabled then users of the Share may not create or modify files in the Space.
Enable multi-threaded writes	Enable asynchronous reads and writes
Locking for root share	Enforce file locking
HSM support	Support Ngenea operations to data within the Space
Guest OK	Access will be permitted as the default guest user

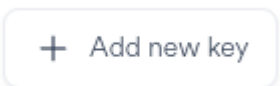
SMB Custom Options

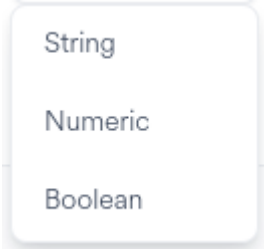
On occasion Administrators may find it necessary to further tailor SMB Shares in order to provide additional capabilities E.G. compatibility or performance tunings.

Pixstor supports additional SAMBA Custom Options per-share. Custom Options defined for a Space's Share are applied across all Sites where the Space is provisioned.

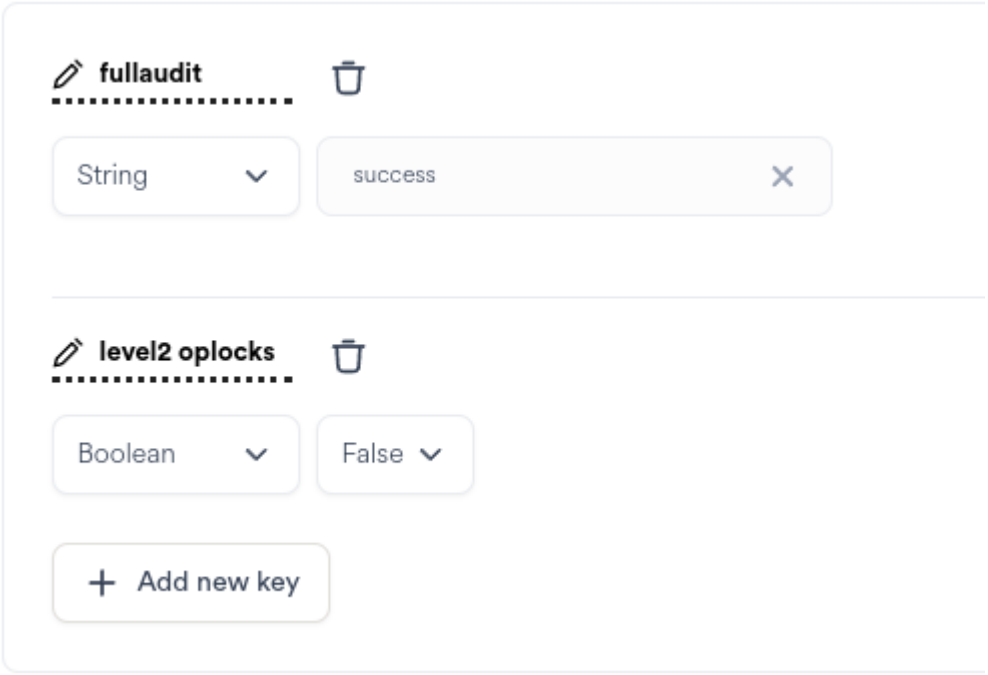
Important: SMB Custom Options are applied verbatium to the underlying SAMBA configuration. Incorrect entries can result in service outage.

Add a new Custom Option as follows:

	Click the Add new key to define a new custom option

	Enter the name of the custom option setting in the Keyword field
	Select the type of custom option from the drop down menu. Choose or enter the value for the custom option.

Example of added Custom Options:



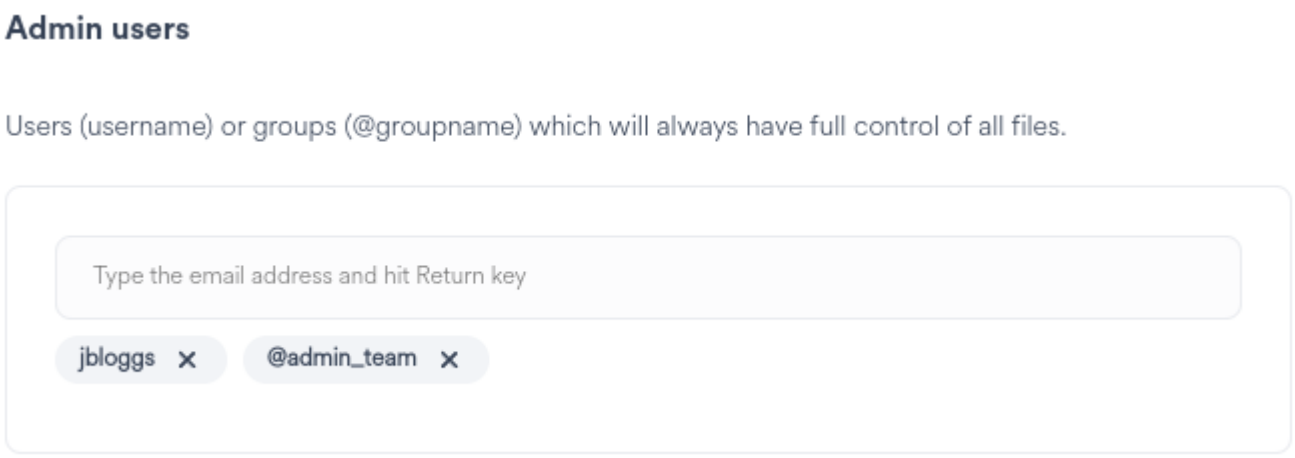
To modify an existing custom option change the keyword, type or values as appropriate.

To delete a custom option select the bin icon next to the item.

	Click the delete button to remove a custom option

Admin Users

Granted full permission to data in the Space to a specific set of users or groups:

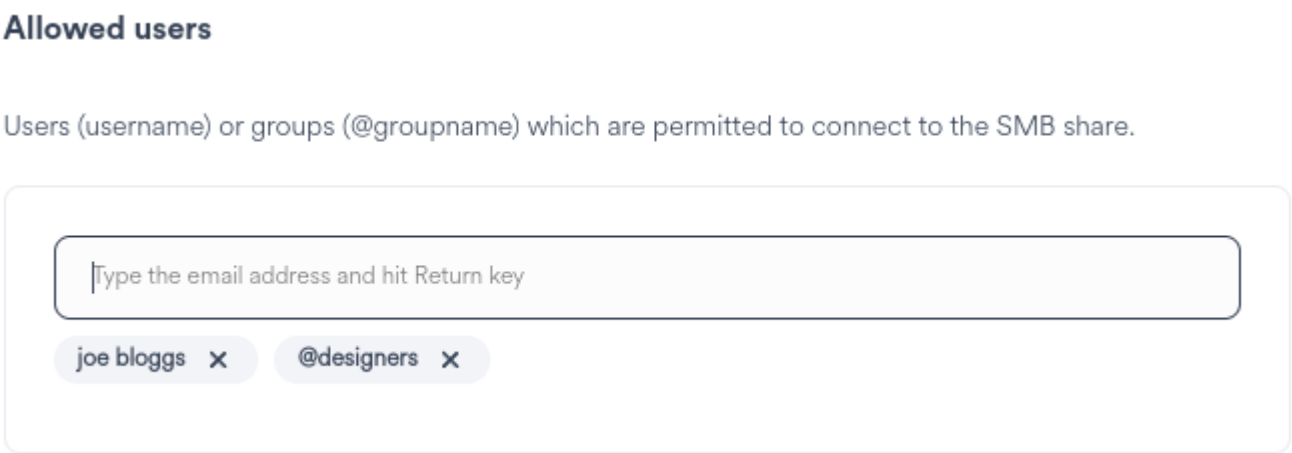


- Add users by username
- Add groups by prefixing the group name with an @ character

Hint: For users or groups containing spaces or symbols, etc. use quotes. E.G. @”Domain Admins”

Allowed Users

Restrict the access to the share to a specific set of users or groups:

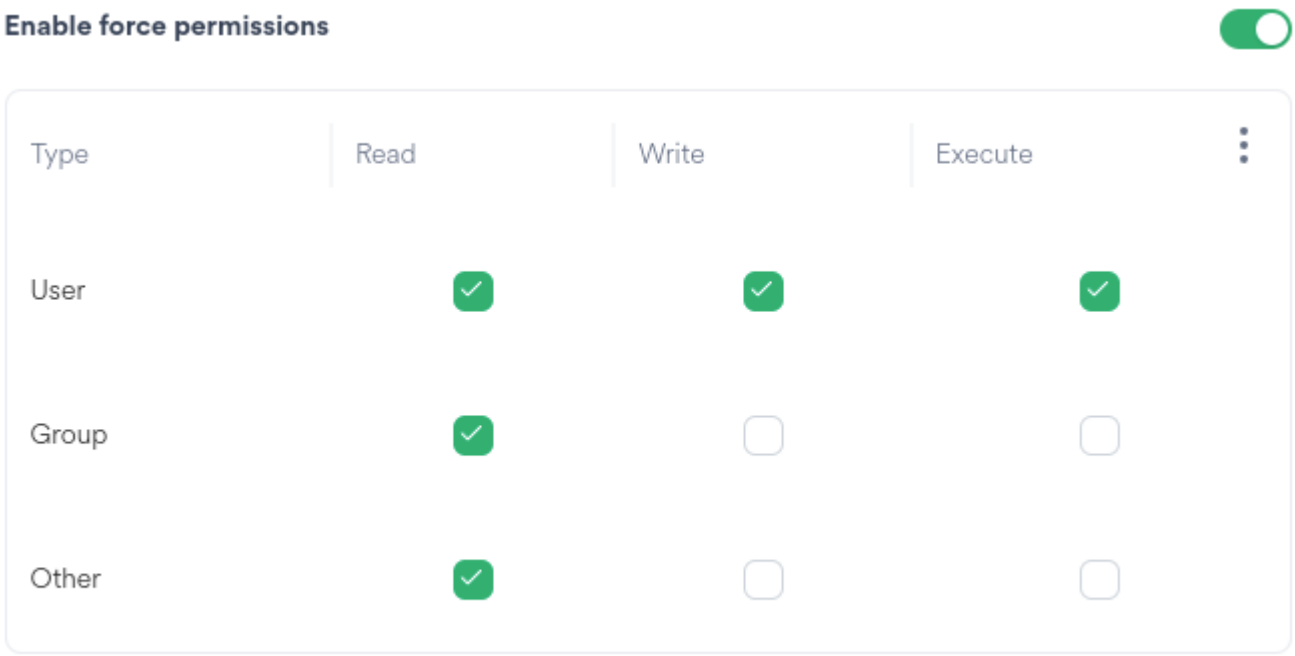


- Add users by username
- Add groups by prefixing the group name with an @ character

Hint: For users or groups containing spaces or symbols, etc. use quotes. E.G. @”Domain Admins”

Force permissions

In some scenarios it may be desirable to force the file and directory permissions to specific values in order to create a consistent known permission model. Typically this is observed where systems are not connected to Identity Management services such as Active Directory, LDAP or similar.



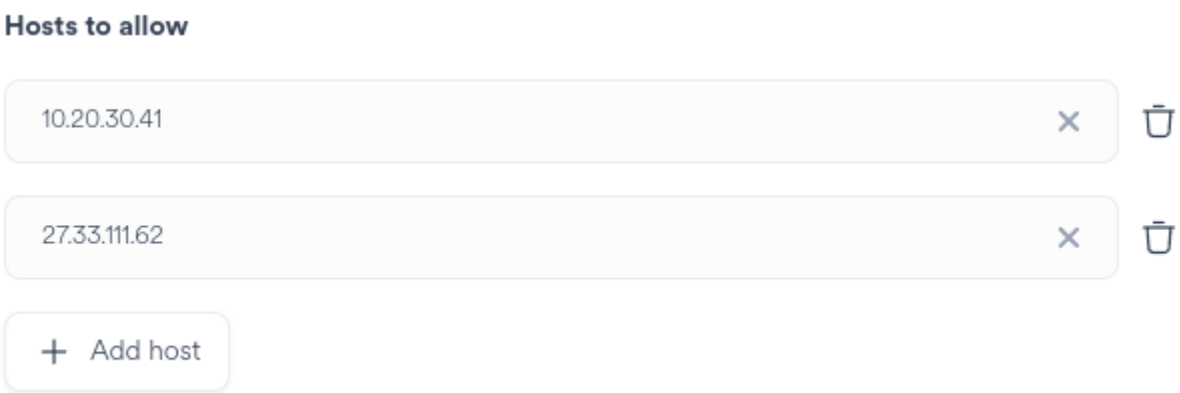
- Set the permission overrides as required

Host access control

pixstor provides the ability to limit connectivity to specific network clients.

1. If no allow or deny options are defined pixstor will allow connections from any system.
2. If only a hosts allow option is defined for a share, only the network clients listed will be allowed to use the share. All others will be denied.
3. If only a hosts deny option is defined for a share, any network client which is not listed will be able to use the share.
4. If both a hosts allow and hosts deny option are defined, a network client must appear in the hosts allow and not appear in the hosts deny to access the share.

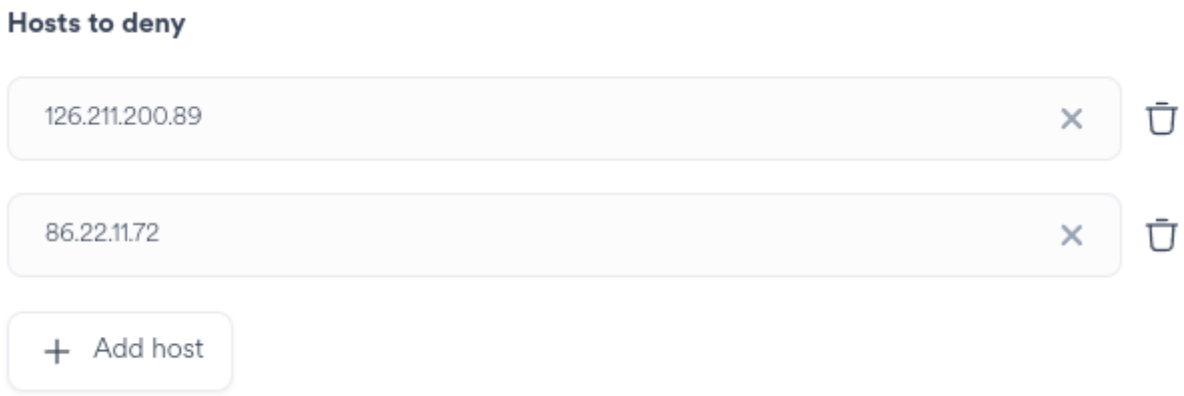
Hosts allow



- Add the required hosts by specifying the IP address

+ Add host	Click the Add host button to add additional hosts
🗑	Click the delete button to remove a host

Hosts deny



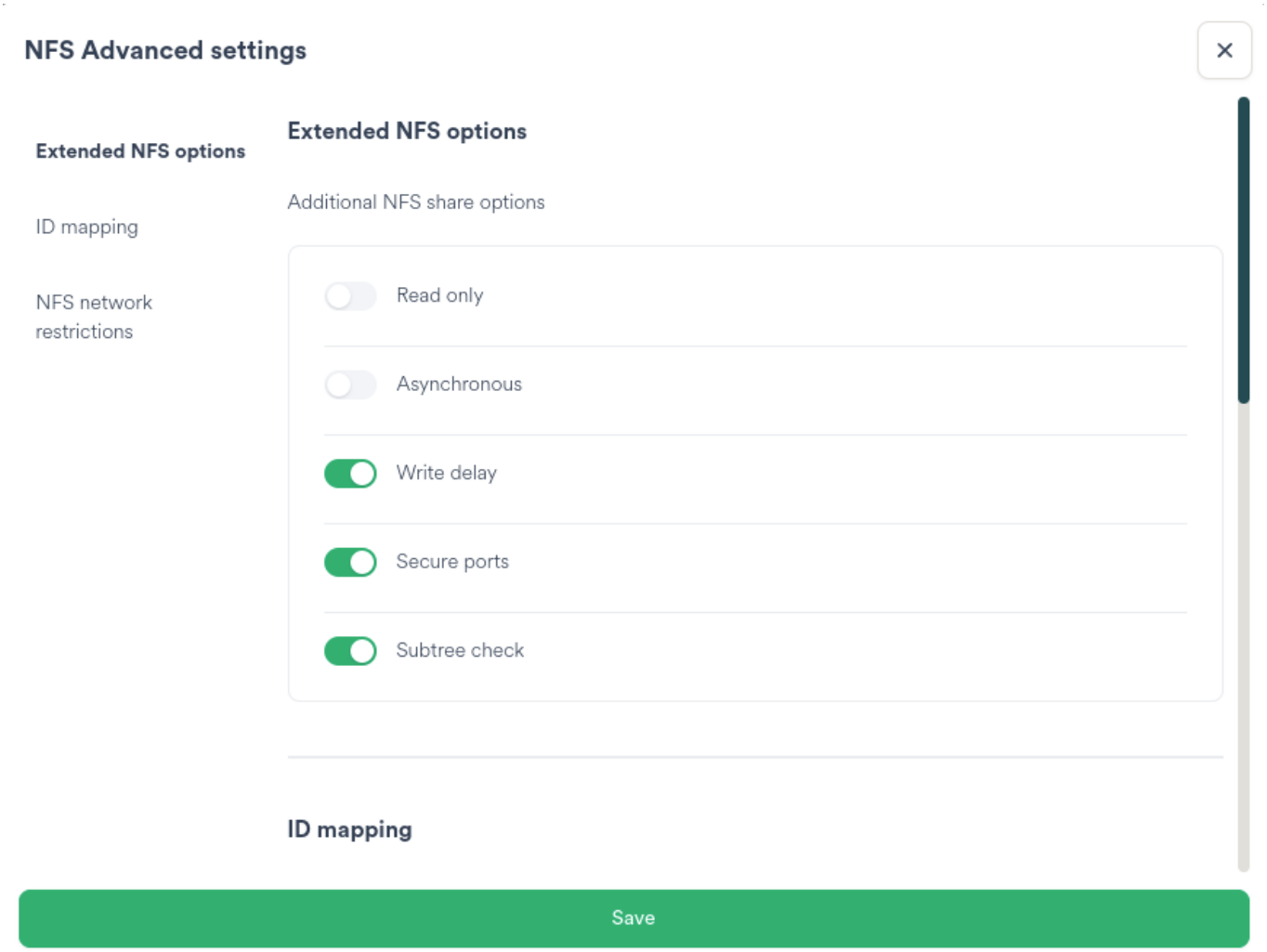
- Add the required hosts by specifying the IP address

+ Add host	Click the Add host button to add additional hosts
🗑	Click the delete button to remove a host

NFS Advanced

Extended NFS options

Modifying the extended NFS options controls the Share capabilities:



Select the available extended SMB options as appropriate:

Option	Description
Read only	If enabled then users of the Share may not create or modify files in the Space.
Asynchronous	Enable asynchronous reads and writes
Write delay	Reply to I/O requests only after the changes have been committed to stable storage at a cost of performance reduction.
Secure ports	Requires that NFS requests originate from a TCP/IP port from 1-1024
Subtree check	Check the accessed file is in the appropriate filesystem and also within the Share

ID Mapping

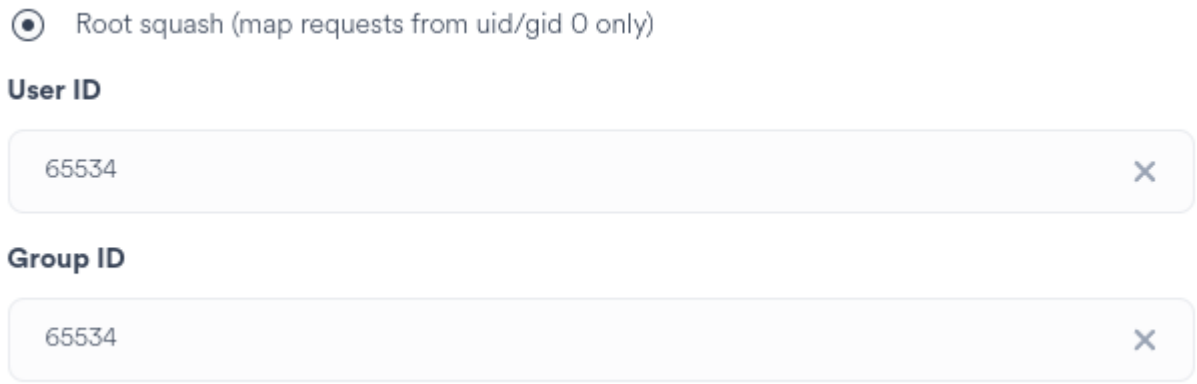
All Squash

All Squash maps all User IDs (UIDs) and group IDs (GIDs) to the anonymous user. This is useful for NFS-exported public FTP directories, news spool directories

Root Squash

Root squash allows the root user on the client to both access and create files on the NFS server as root. This is conceptually equivalent to the Adminstrator in Windows.

Root Squash is needed if you are hosting root filesystems on the NFS server (E.G. for diskless clients). You should not use no_root_squash unless you are aware of the underlying implications.



No Squash

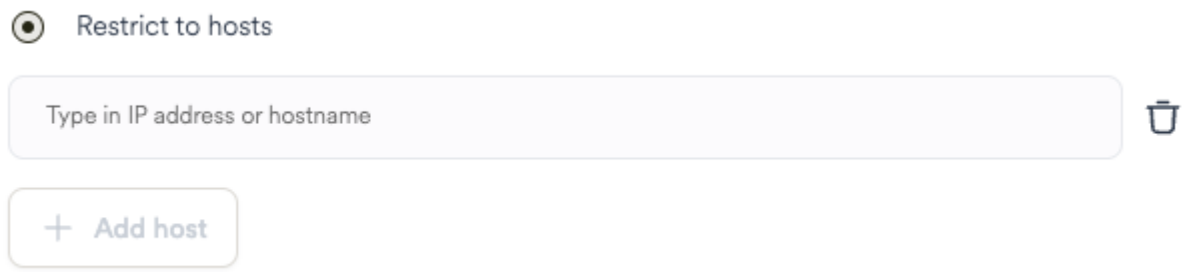
No Squash allows the root user on the NFS client host to access the NFS-mounted directory with the same rights and privileges that the superuser would normally have.

NFS network restrictions

pixstor provides the ability to limit connectivity to specific network clients.

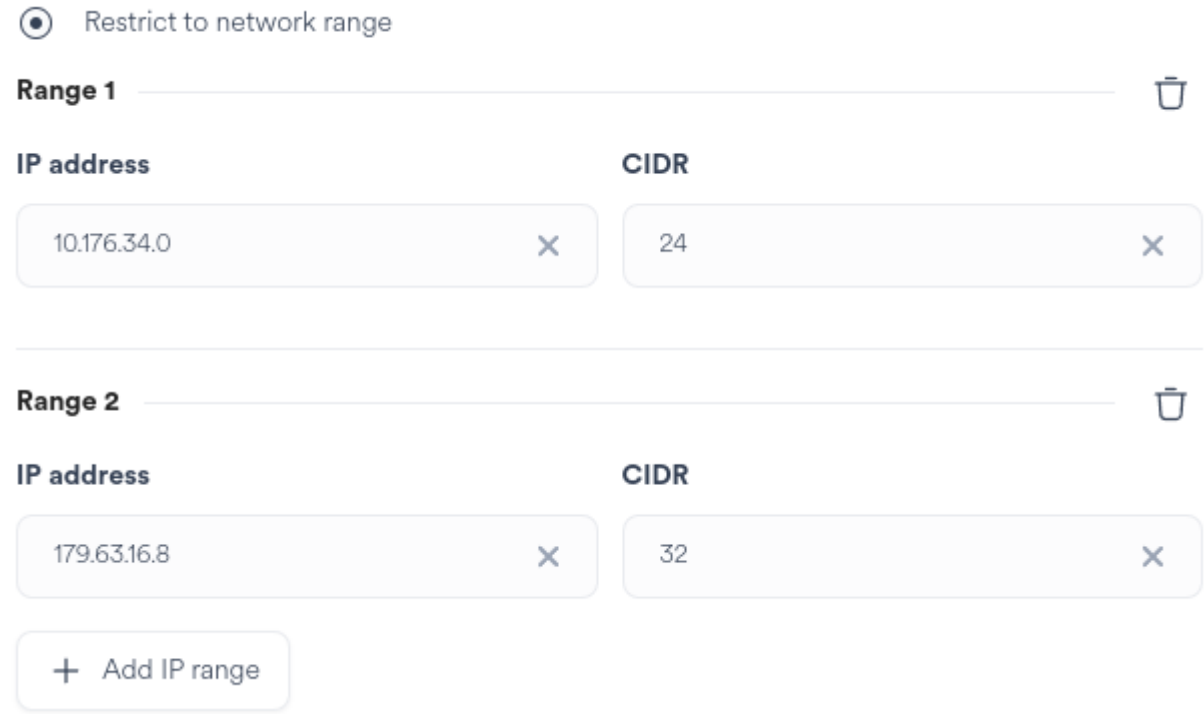
- Select the Available to all clients option for no restrictions

Restrict to hosts

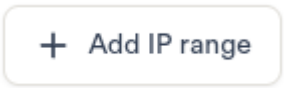


- Add required hosts to restrict by specifying the IP address or the FQDN hostname

Restrict to network range



- Add the required IP address or network range and specify a valid CIDR mask to apply the restriction

	Click the Add IP range button to add additional restrictions
	Click the delete button to remove a host

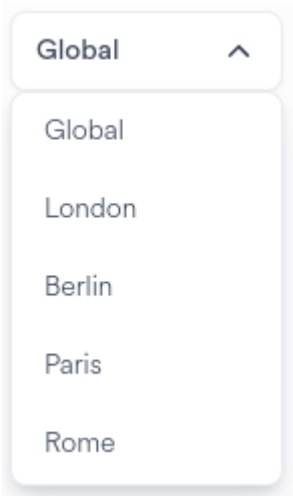
Jobs

A job comprises one or more tasks, each of which perform an action.

Tasks can be data orientated (E.G. hydrate, dehydrate, SendToSite) or can be management or configuration tasks of pixstor sites and/or services.

Viewing Jobs

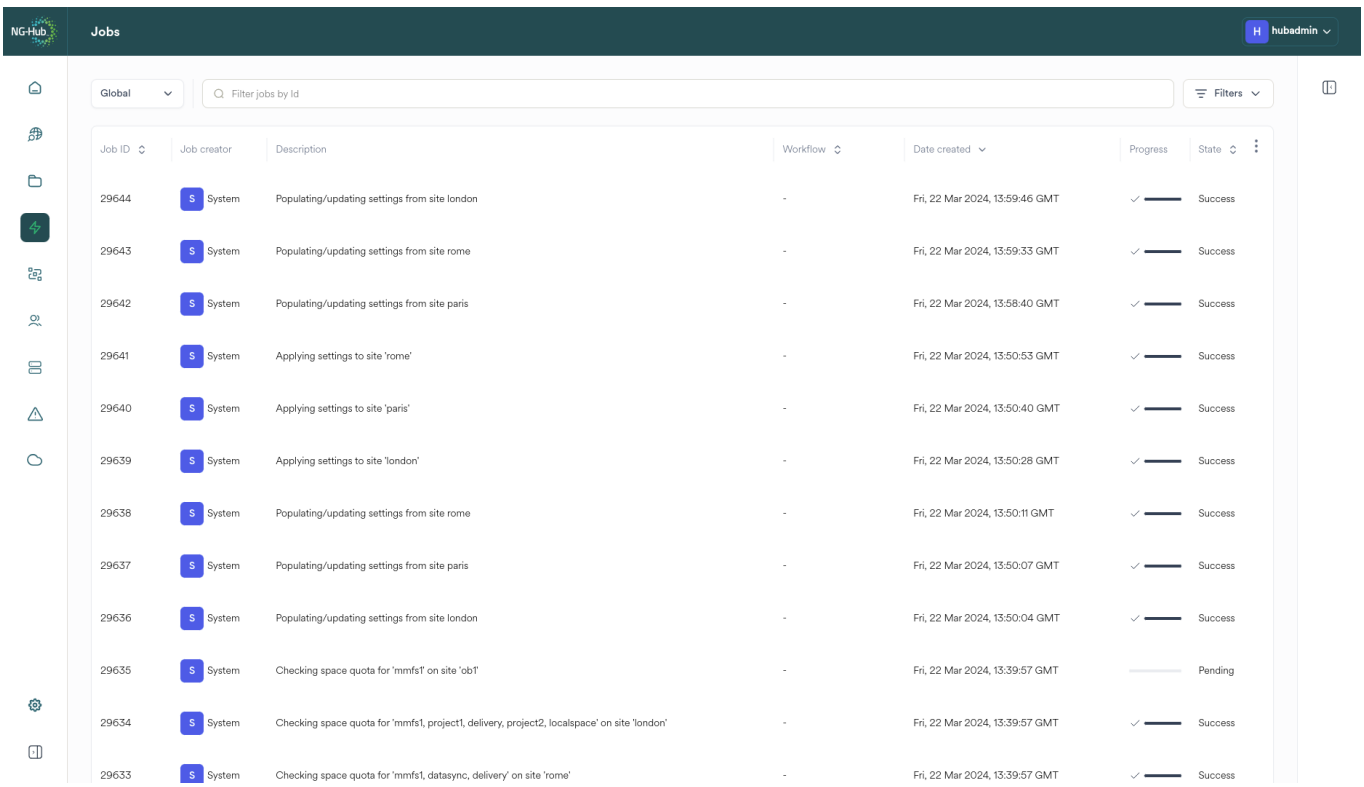
To view Jobs executed on a specific Site, select the Site from the Sites drop down menu or choose Global to display all Jobs from all Sites.



Click and select the site to show the jobs from the selected site.

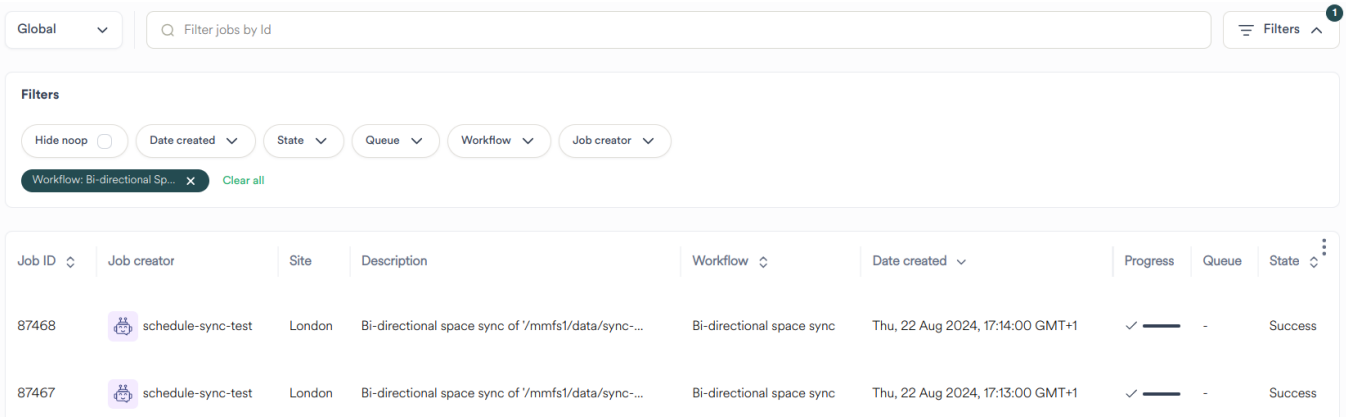
After selection the Jobs from the selected Site are displayed including high level information for each Job.

Click a Job ID to view in depth information for the job.

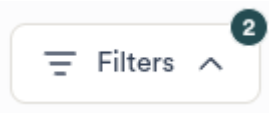


Filtering the Jobs View

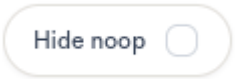
To display a specific Job ID, enter the ID in the filter bar.



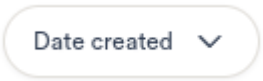
Jobs for a site can be additionally filtered through selection of various criteria.



Click the filter button to display the available filters. The number of applied filters is displayed on the Jobs filter button.

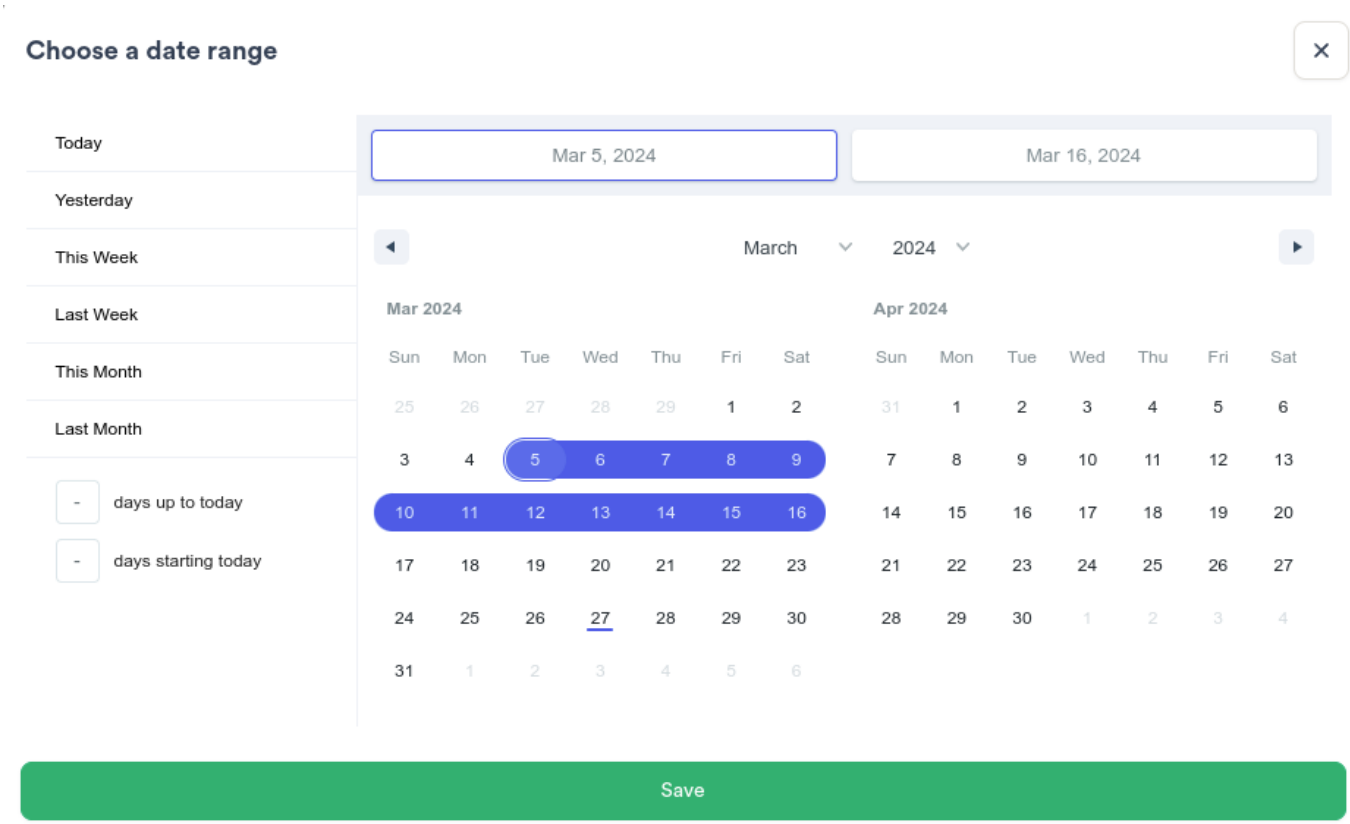


Select the Hide noop filter option to hide any job which did not perform any action as the job determined that no actions were required.



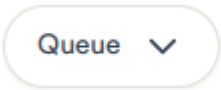
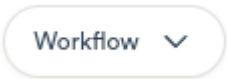
Click the Date Created button to filter for any job which was created between two date ranges.

Clicking the Date Created button raises the date selection dialog. Choose the criteria required and click the Save button to apply the date range.

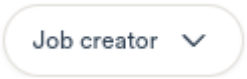


	Click the Job State button to display jobs matching the status. Available statuses are:

Status	Description
New	A job has been created
Pending	The job is waiting to run
Started	The job is running
Succeeded	The job finished successfully
Error	The job finished with one or more error conditions
Failure	The job finished with one or more failure conditions
Skipped	The job was skipped as the work assigned to the job was not required to be undertaken - no change would have occurred if the job had run.
Cancelled	The job was cancelled
Cancelling	The job is in the process of cancelling
Pausing	The job is in the process of Pausing
Unknown	The job experienced a result which could not be matched to a Status

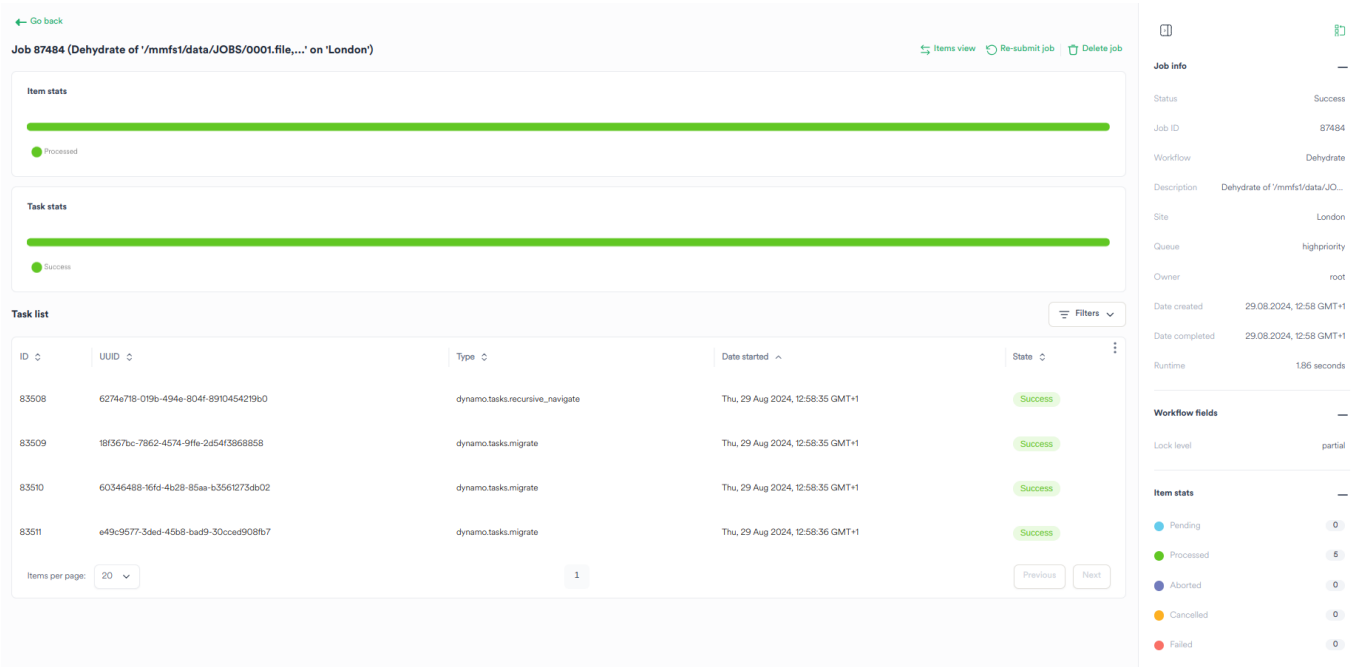
	Click the Queue button to filter for jobs matching the Queue.
	Click the Workflow button to filter for jobs matching the Workflow. Available workflows are:

Type	Description
Bi-Directional Sync	Data synchronisation between two sites
Delete File	Deletion of a designated data
Dehydrate	Dehydration of data
Pre-Stage	Staging of data to an Ngenea target. Subsequent dehydrations save time as there is no requirement to stage data prior to dehydration.
Hydrate	Hydration of data
Reverse Stub	Creation of dehydrated files not prior existing which reference data in an Ngenea target
Send	Deliver data from a source to a destination site
Send to Site (hydrated)	Deliver data from a source to destination site as hydrated files
Send to Site (dehydrated)	Deliver data from a source to destination site asdehydrated files

Type	Description
Sync Space to Site	Synchronising data from a source to a destination site
Transparent Recall	User or application initiated hydration of data on reading
	Click the Job creator button and select the name of one or more creator(s) to view jobs by the selected creator(s)

Viewing a Job

Clicking a Job ID in the main Job screen displays the in depth information for the job.



The Job View comprises:

Task stats

The total count of types operation result per task is represented by the horizontal bar segments.

Hovering over the bar provides the count of each task status for the tasks processed.

File/Item stats

The total count of types operation result per item is represented by the horizontal bar segments.

Items may be files, directories or Objects.

Hovering over the bar provides the count of each type processed.

Bi-Directional Sync and Site Sync workflows only provide File stats.

The Job Side bar

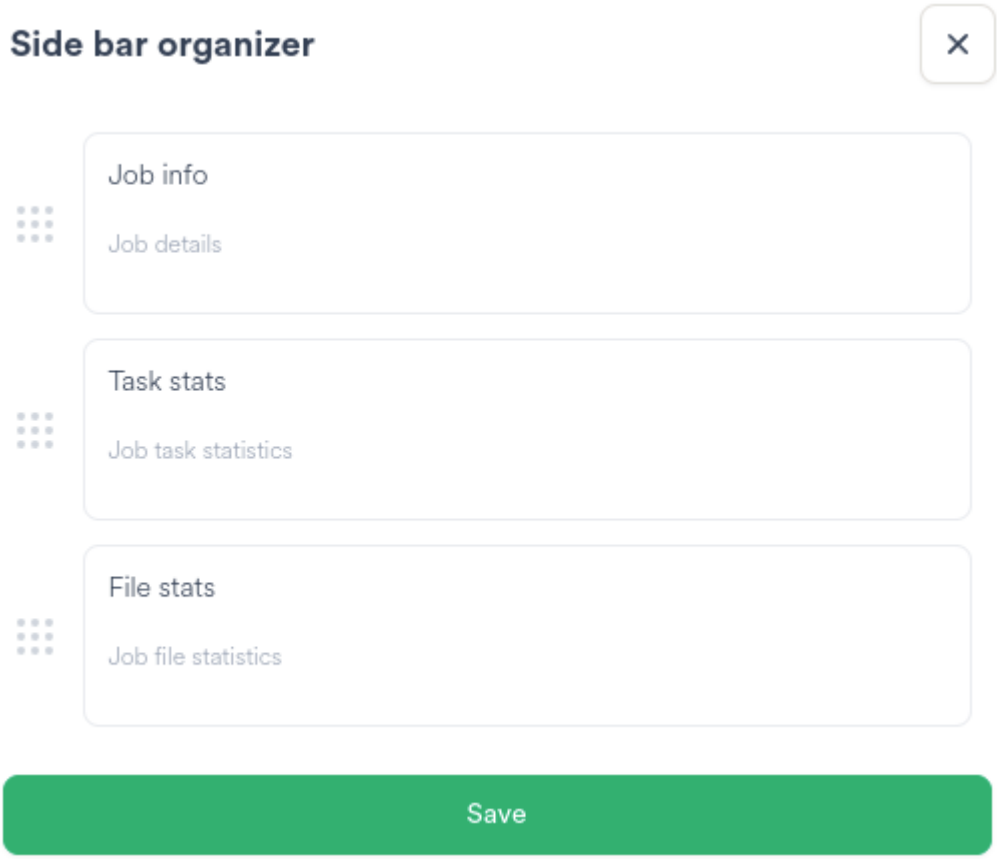
Enlarge/Reduce

	Clicking the toggle displays the Job Side bar to show: • Job info • Task stats • File Stats (Item stats)

Clicking the toggle button again hides the Job Side bar.

Reordering

Re-arrange items in top to bottom order by dragging vertically up or down.



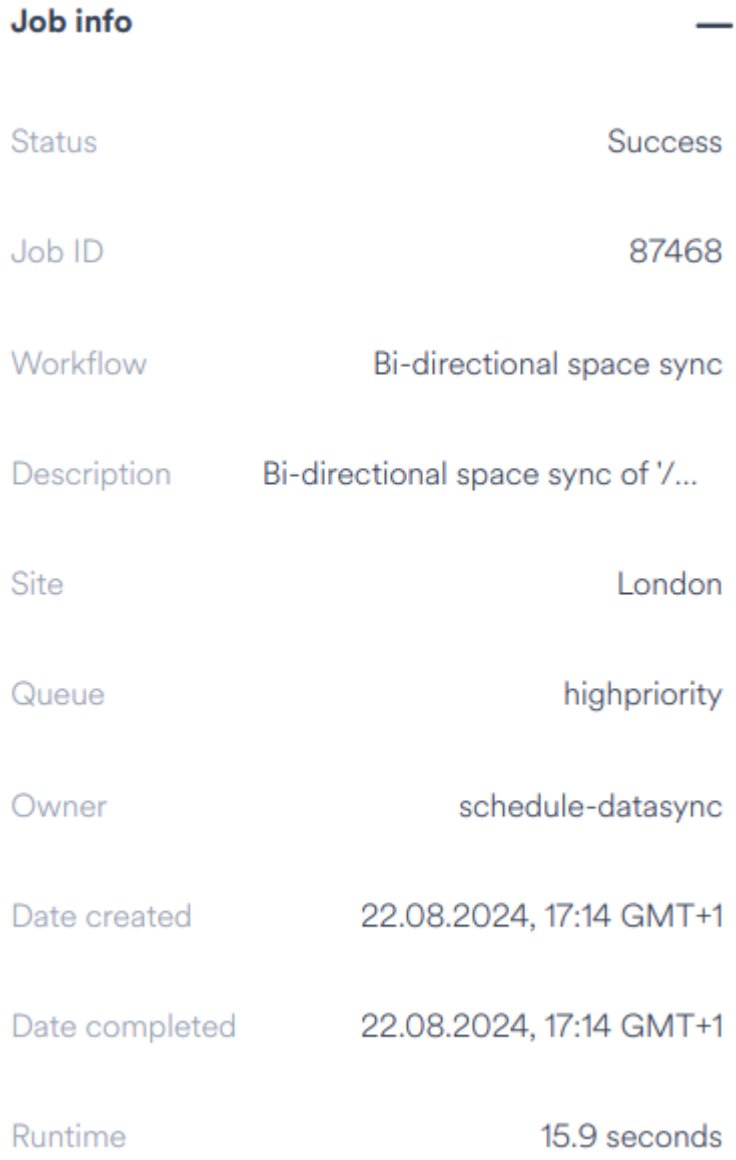
Job Controls

Jobs provide the following controls where supported by the Workflow:

Pause job	If supported by the Workflow, click the Pause job button to pause the Job. Tasks which are not running will be paused.
Resume job	If supported by the Workflow, click the Resume job button to resume a paused Job.
Cancel job	Click the Cancel Job button to cancel any future tasks from running and no longer proceed with the Job
Re-submit job	Click the Re-submit job button to launch an identical Job on the Job queue
Delete job	Click the Delete Job button to remove the records of the Job and associated tasks from the Hub database

Job Info Summary

Provides an overview of high level information of the Job.



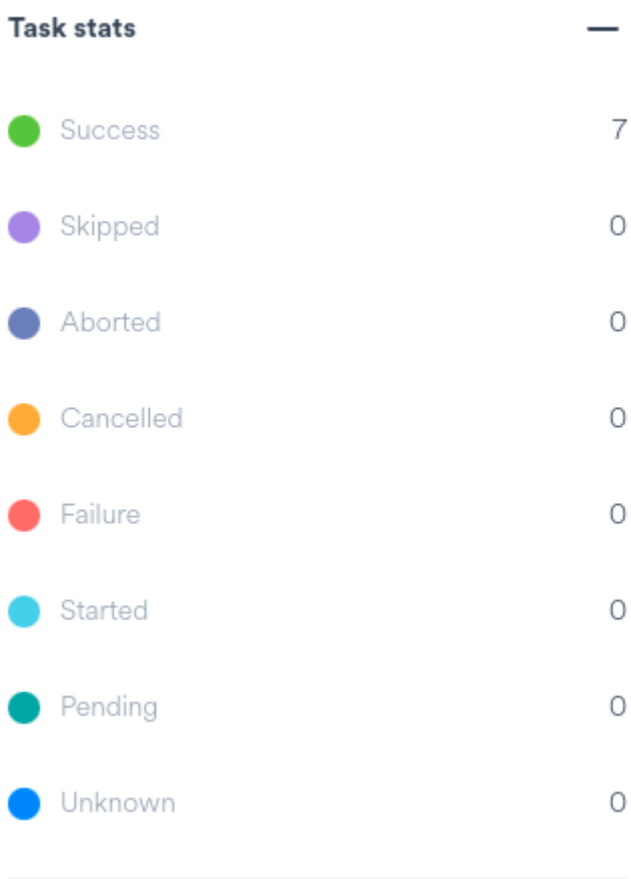
Job Workflow Fields

Provides a listing of any workflow fields the job was executed with.

Job Info Task Stats

Jobs undertake tasks to process one or more actions, files, directories or objects as defined by the Workflow.

The Task stats displays the total count of types operation result per task.

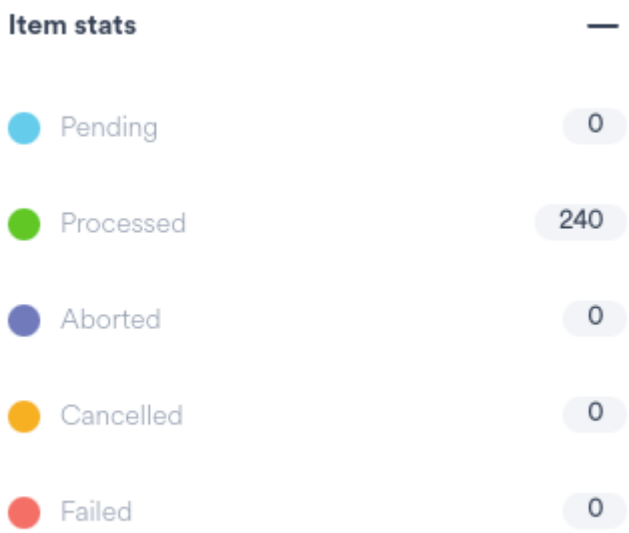


Item stats

The total count of types operation result per item is represented by the horizontal bar segments.

Items may be files, directories or Objects.

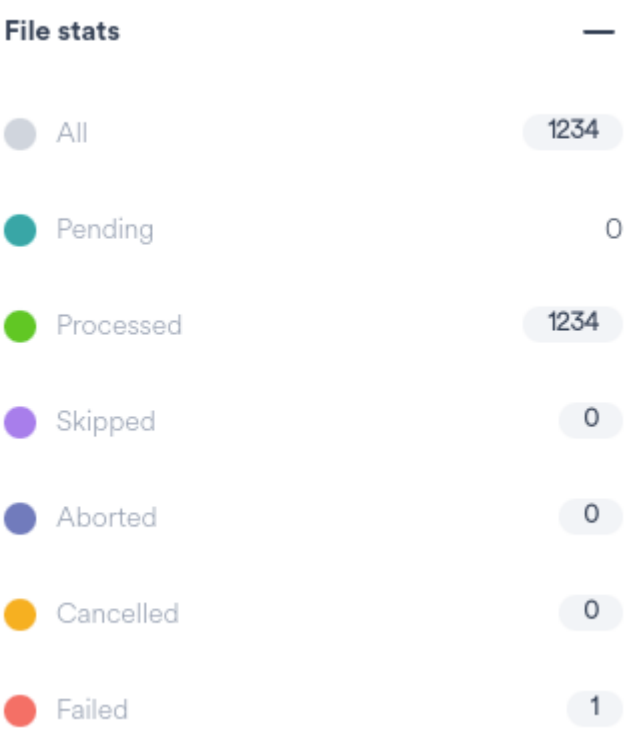
Hovering over the bar provides the count of each operation type for the files processed.



File stats

Bi-Directional Sync and Site Sync workflows only provide File stats.

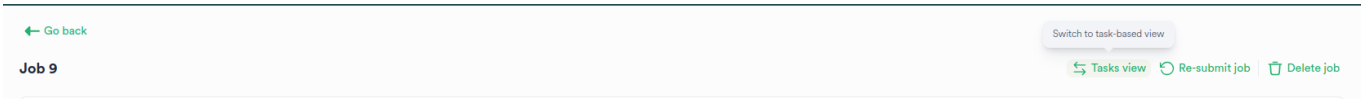
The File stats displays the total count of types operation result per file or directory.



The Job Task List

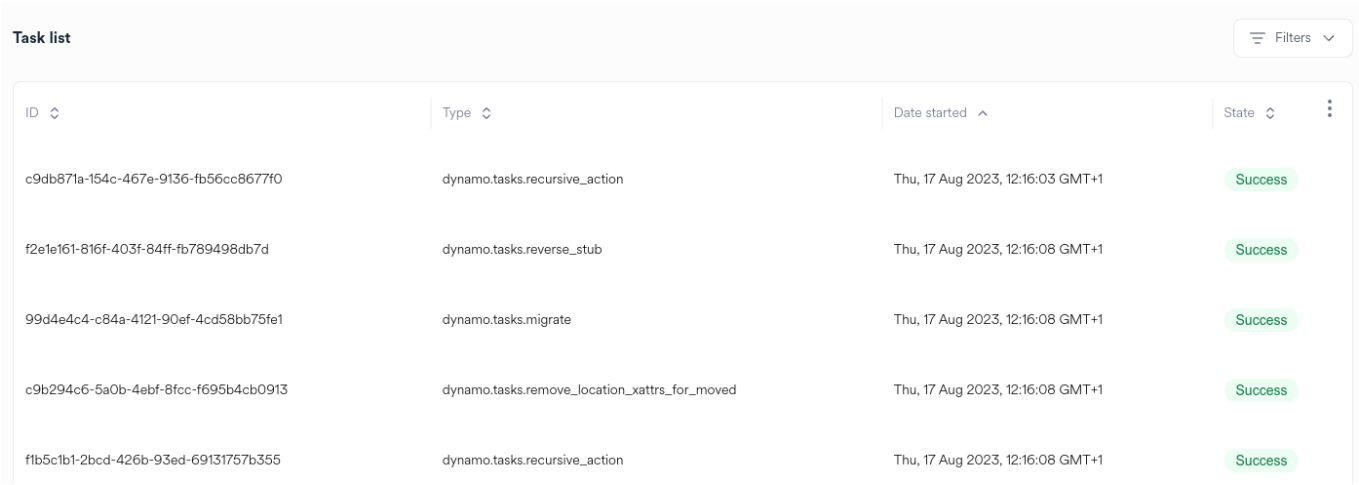
The Job details page is viewed with a `task-based view` or with a `item-based view`.

Switching between views can be done by clicking `Tasks view` or `Items view` on the top right corner of Job Tasks page.



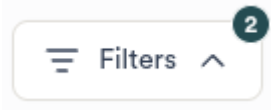
Tasks View

The Task view displays all tasks comprising a job, their ID, type, start time and status.

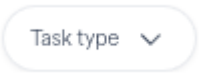


Filtering the Job Task List

Tasks for a job can be additionally filtered through selection of various criteria.

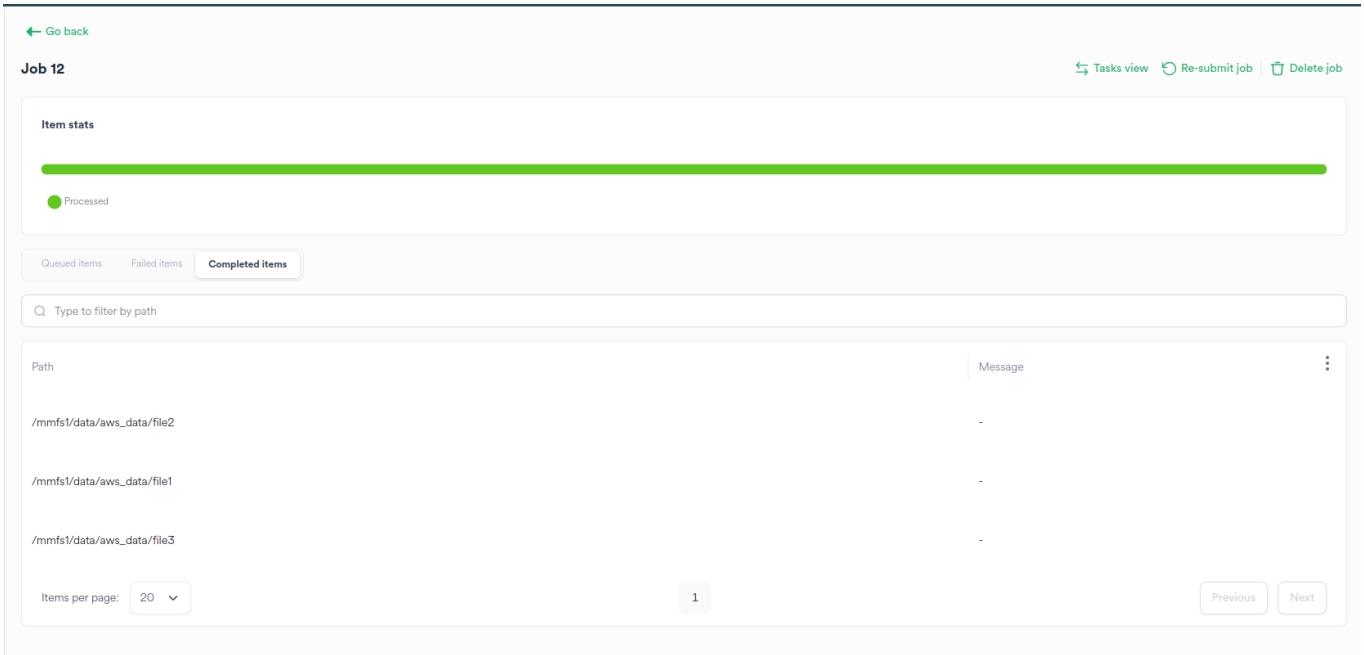
	Click the filter button to display the available filters. The number of applied filters is displayed on the Task list filter button.
	Click the State button to display jobs matching the status. Available statuses are:

Status	Description
New	A task has been created
Pending	The task is waiting to run
Started	The task is running
Succeeded	The task finished successfully
Error	The task finished with one or more error conditions
Failure	The task finished with one or more failure conditions
Skipped	The task was skipped as the work assigned to the job was not required to be undertaken - no change would have occurred if the job had run.
Cancelled	The task was cancelled
Cancelling	The task is in the process of cancelling

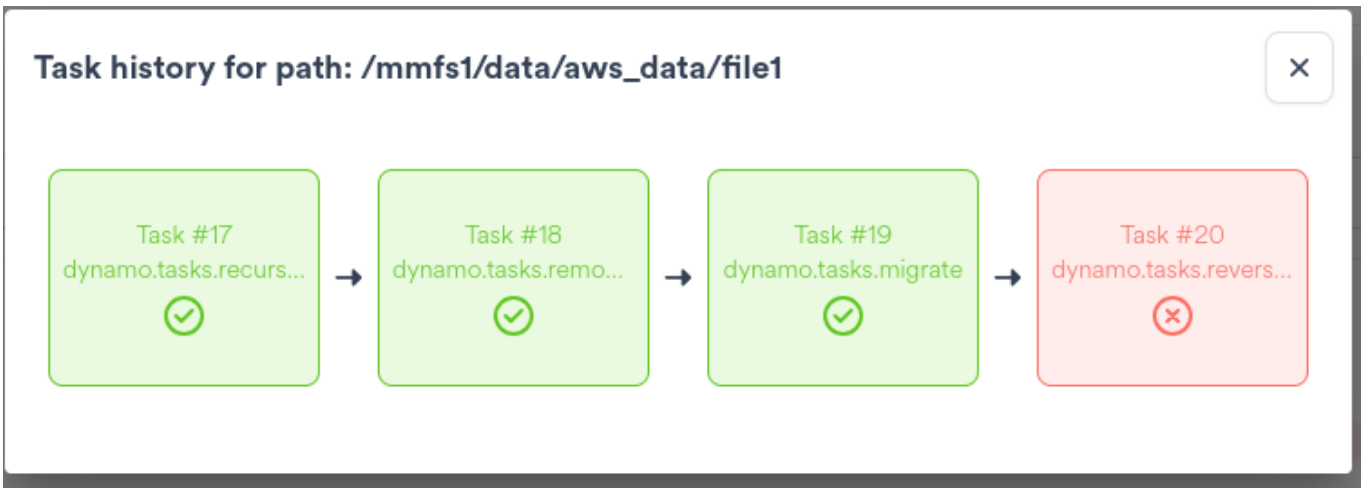
Status	Description
Aborted	Whilst running, the task was unable to proceed correctly and aborted the in progress action
Paused	The task is paused
Pausing	The task is in the process of pausing
Unknown	The task experienced a result which could not be matched to a Status
	Click the Task type button to filter for a specific task type which comprises the Job. The task types are dynamic therefore the displayed types may differ per job type.

Items View

The Item view displays the object paths for all tasks across the job. When the `Failed items` tab is selected, the error message is displayed for failed items.



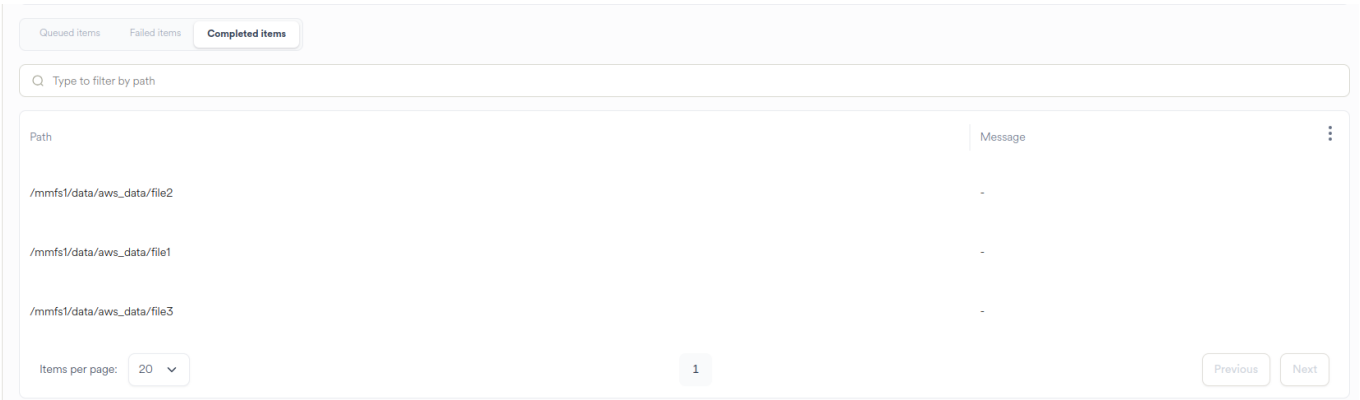
Clicking on a path displays the task history across the job.



Clicking on each task in task history displays the task details for the chosen task ID.

Filtering the Items List

To search for a specified item, enter the path in the filter bar. It will only search paths based on the state of the active tab out of the `Queued/Failed/Completed` options.



Task information Dialog

Clicking a task ID in the Job Task List displays the information for the chosen task.

Dependent on the number of operations and the quantity of inputs to the task, the information displayed can range from short to extensive.

Optionally select an action button to more easily view the Task Information.

	Click the Full Screen button to display the Task Information in a larger view
	Click the Copy button to copy the Task Information output to the clipboard.
	Click the Download button to download the Task Information locally
	Click the Close button to close the Task Information dialog

Settings Task Jobs

All settings tasks are shown as submitted by System. This includes tasks triggered automatically in the background (like for shares and spaces), where the system doesn’t have information about the user who started the action.

Schedules

Hub can regularly perform the same action to a Space via Job Schedules.

Spaces which are deployed with Bi-Directional Sync automatically have a Schedule added.

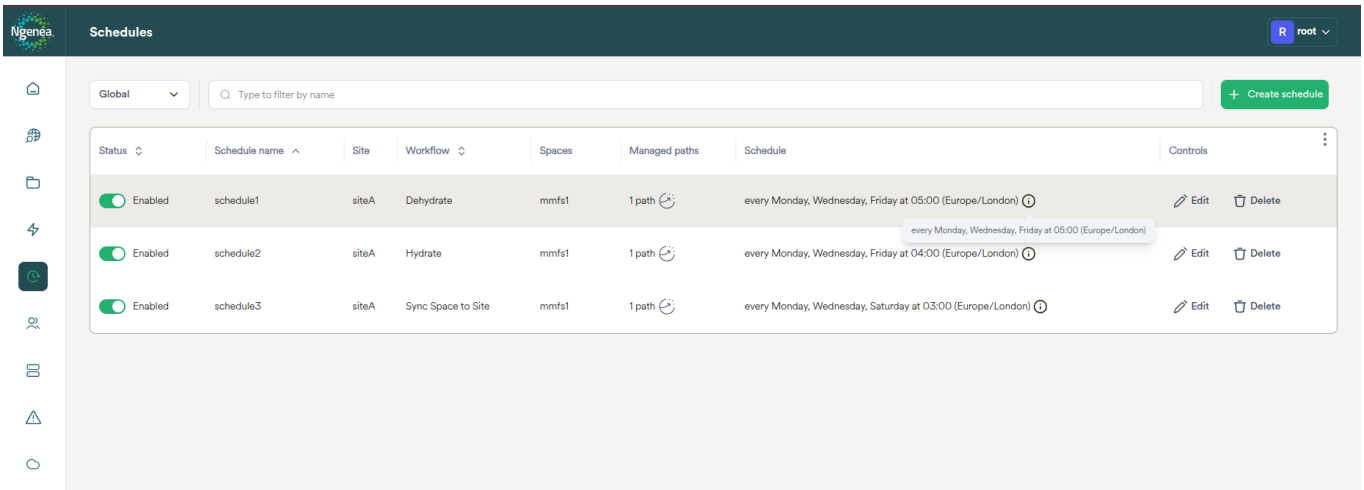
Schedules can be added to the entirety of a Space. It is also possible to schedule more granular activities within a Space for some workflow types, E.G. regular Hydration of an individual file or directory.

`Policy-based Tiering` has different configuration options to other workflow types. See the Policies page for more details.

Viewing Schedules

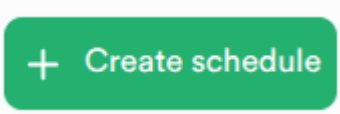
To view available Schedules, click the Schedules menu button.

Navigates to the Schedules screen



Adding a Schedule

Click the Create Schedule button to display a dialog to configure a Schedule.

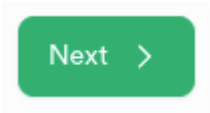
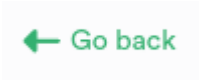
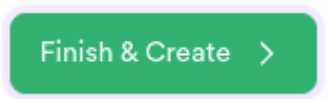


Important: This function can only be performed by a Hub Administrator

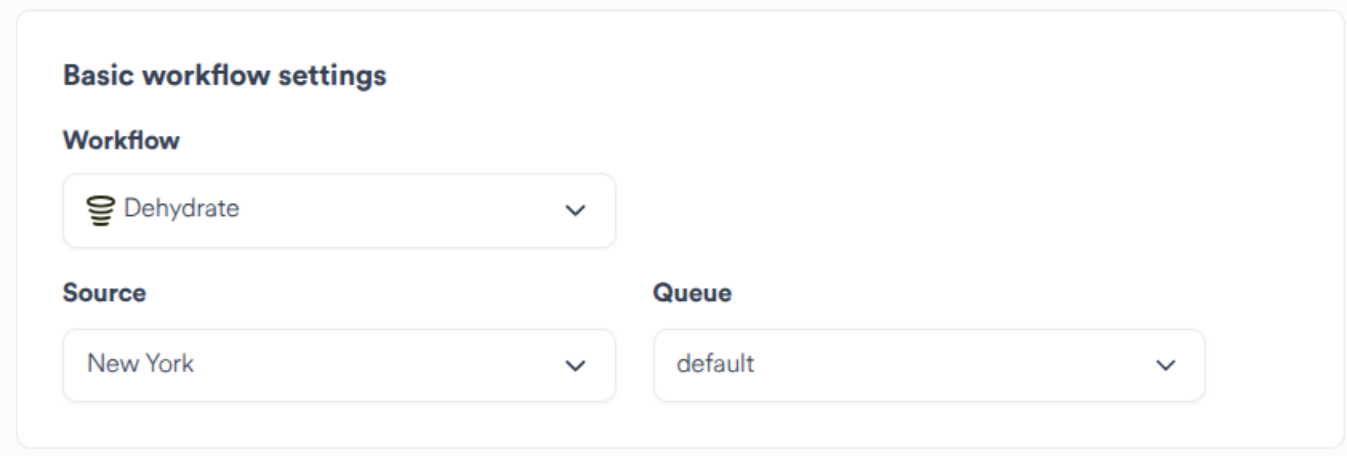
Creating a Schedule Wizard

Navigating the Wizard

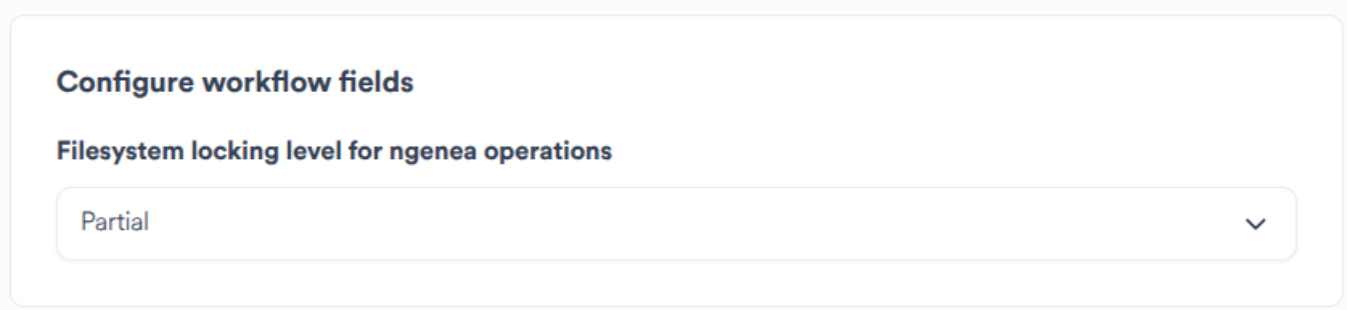
Click the close button to exit the wizard. Changes are not saved.

	Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.
	Click the Go Back button to return to the previous wizard page.
	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Workflow



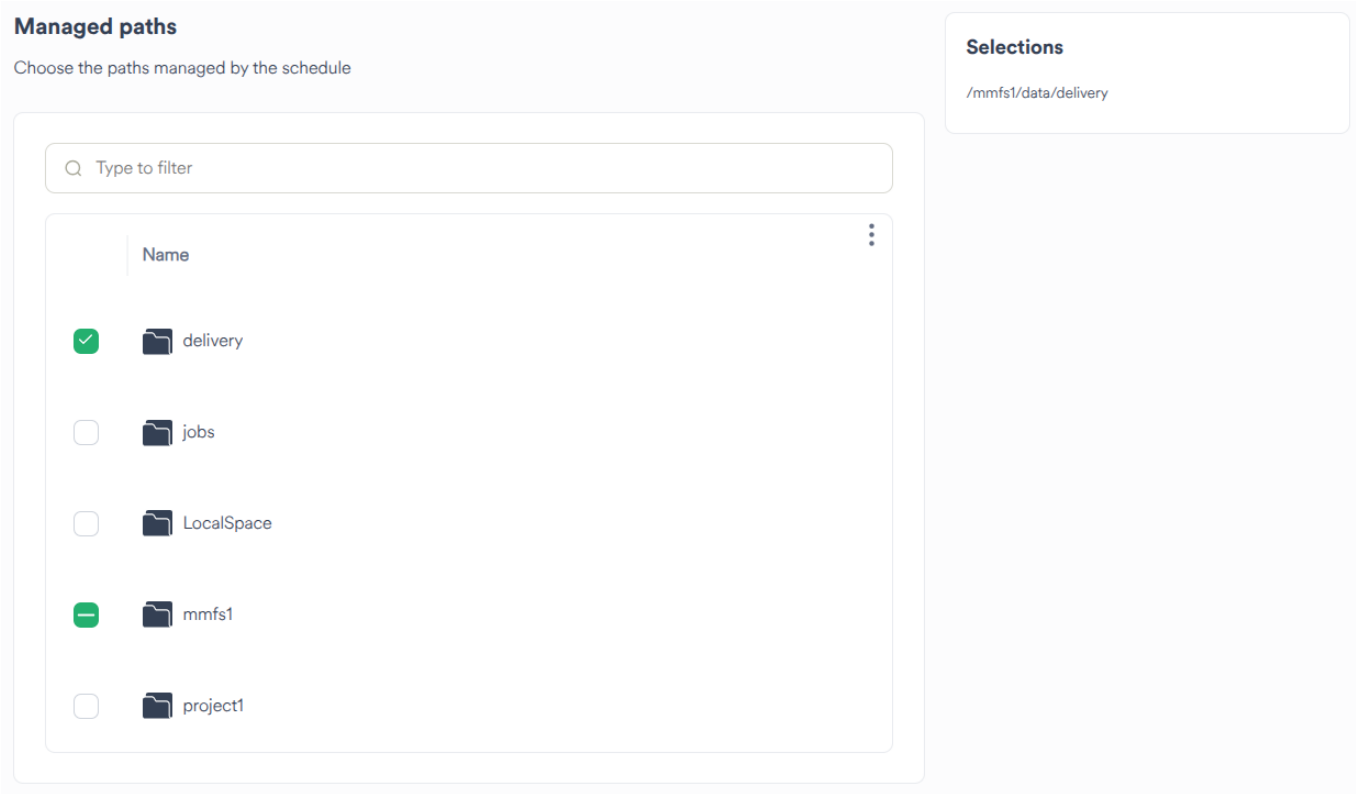
- Set the desired workflow type
- Select the Site and Queue the workflow will run on



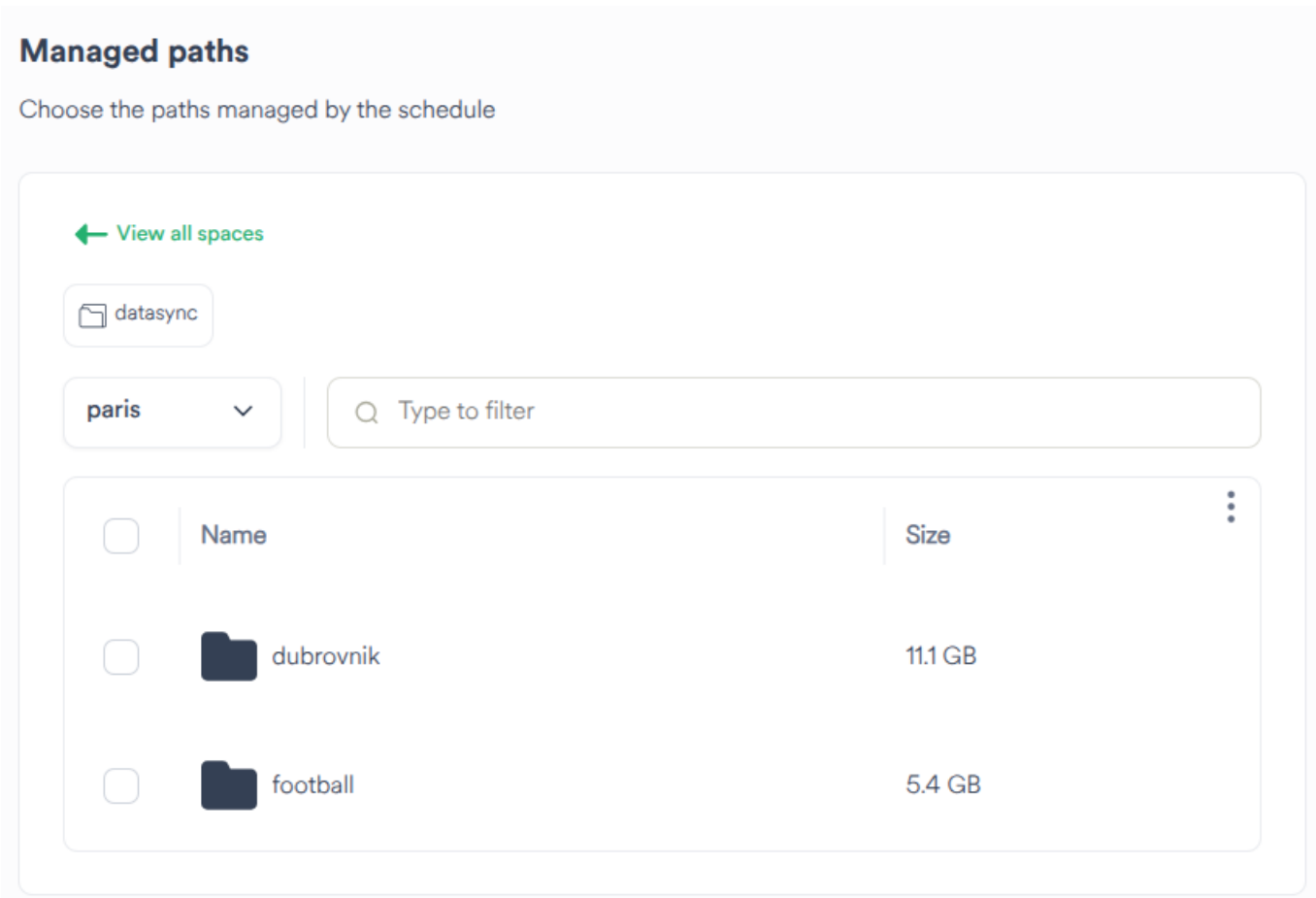
- Configure workflow-specific fields (if applicable)

Managed paths

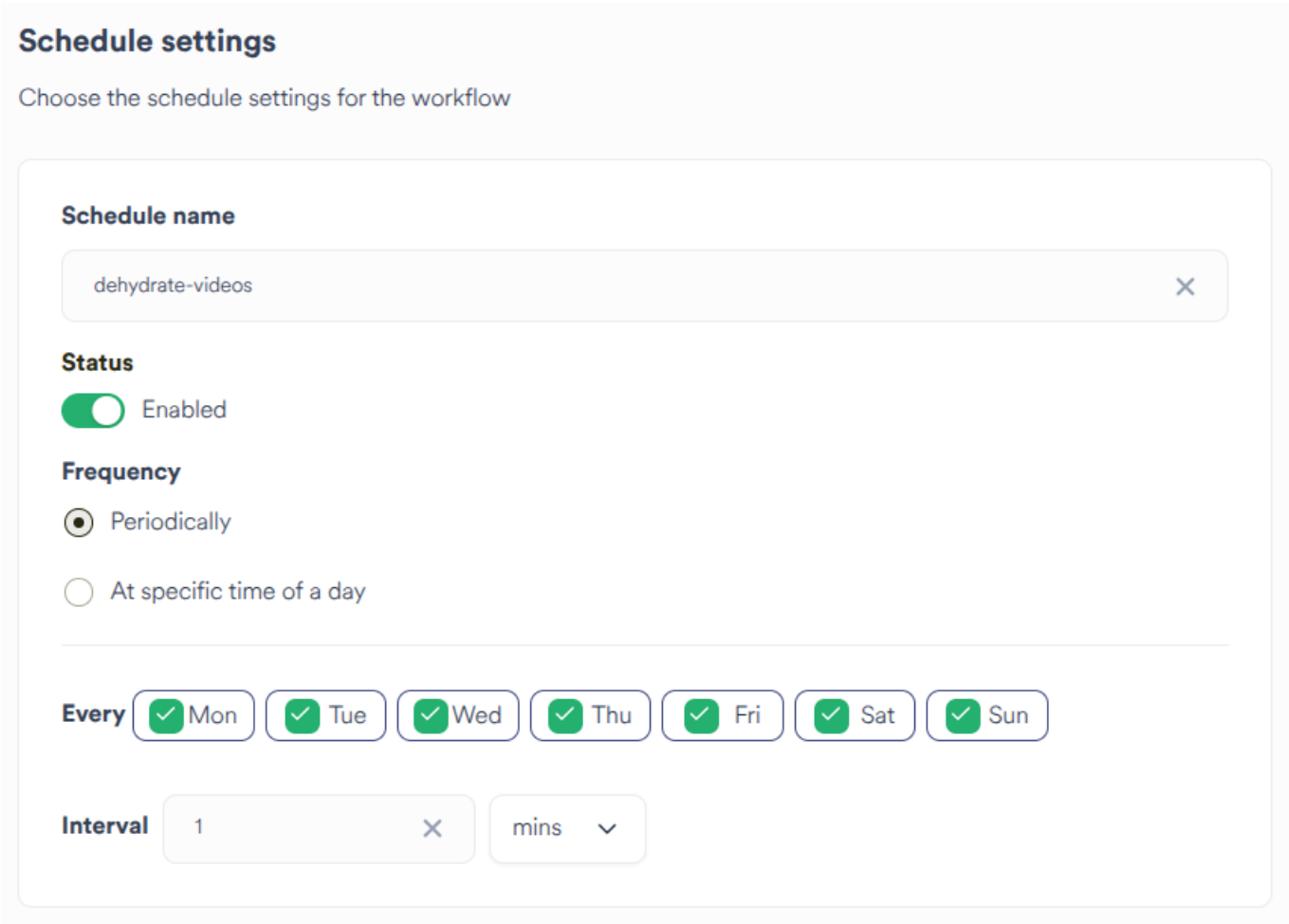
Select paths which the schedule should manage



Initially, a list of spaces is displayed.



Click a space name to view and select space contents.



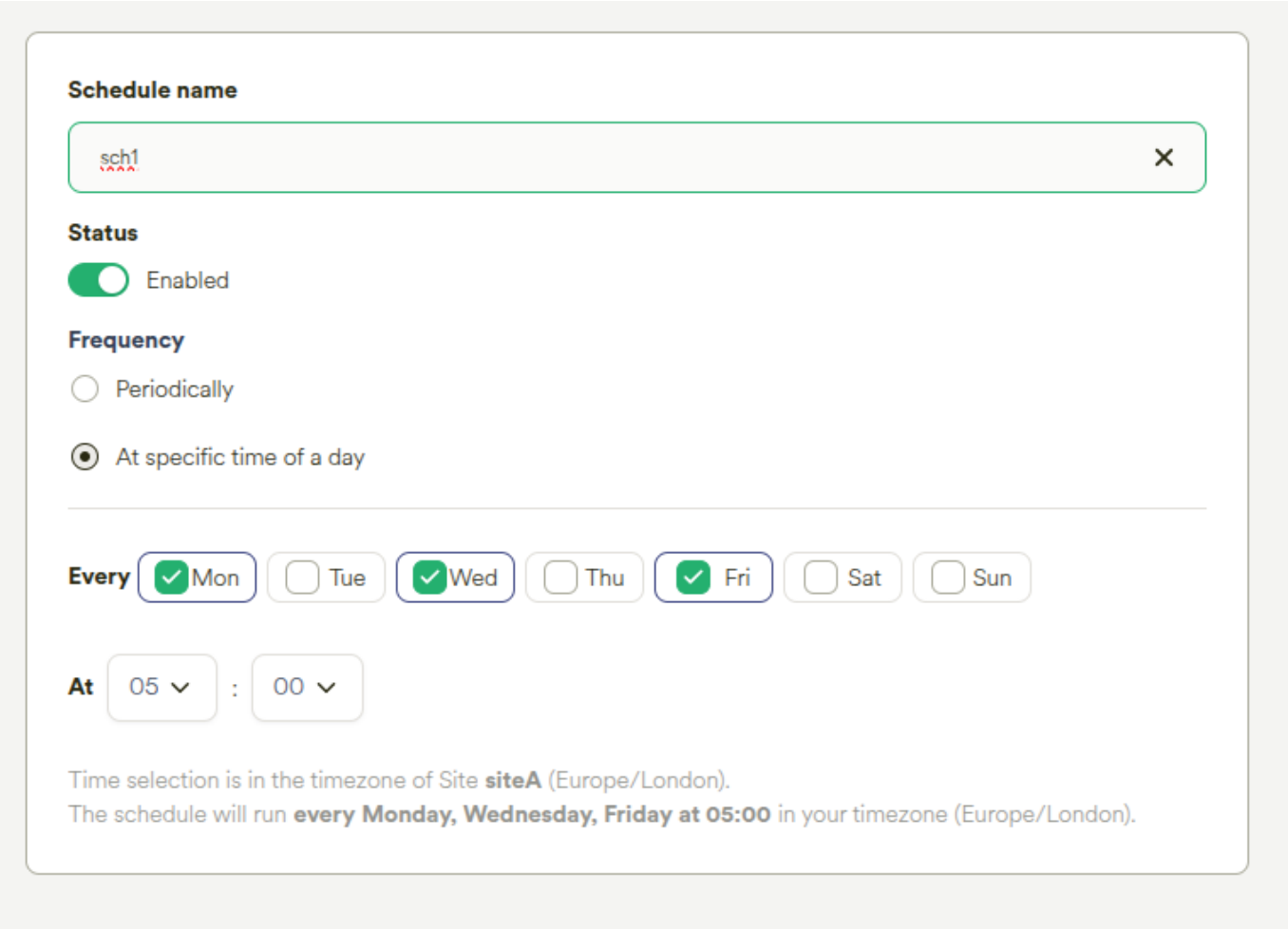
Give the Schedule a descriptive name

Determine the required frequency of the Scheduled run.

Choosing Periodically will ensure that the Schedule will run on the next interval set.

E.G:

- 1 hour: The Schedule will run on the next hour (12.00, 13.00)
- 15 mins: The Schedule will run on the next 15 minute interval past the hour (15, 30, 45, 00)



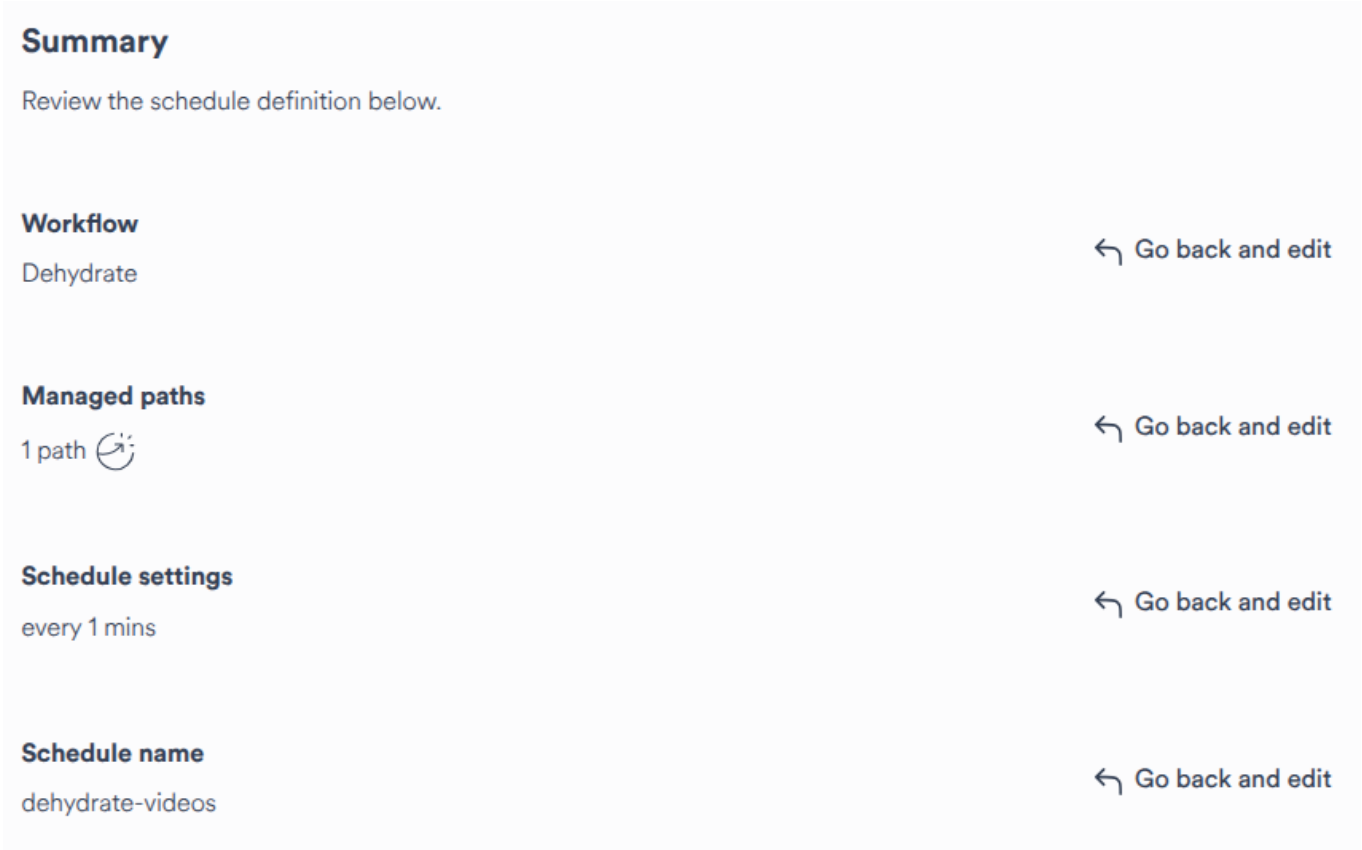
Choosing At Specific Time of A Day allows the Schedule to run once per chosen day at a specific time of day.

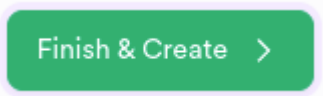
Hint: The schedule time is set in the Site's local timezone, but will be stored in the UTC timezone.

The schedule may be disabled at the point of creation by switching the `Enabled` toggle to `Disabled`.

Summary

Upon completing the wizard steps a summary is presented:





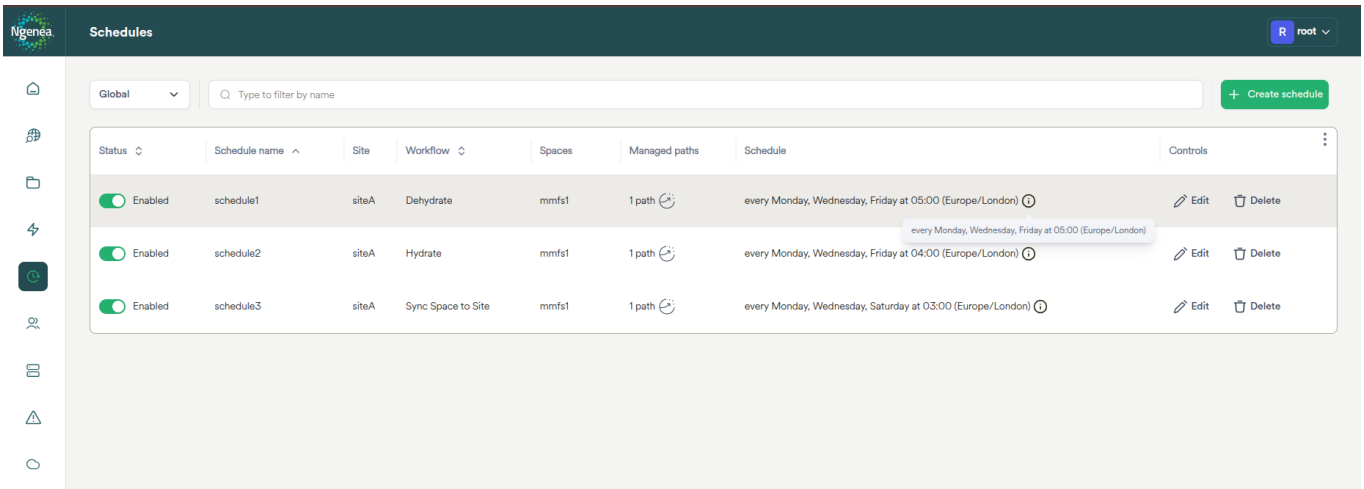
Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Alternatively `Go back` and change the proposed configuration as required or `close` the wizard to cancel the creation of the Schedule.

Editing a Schedule

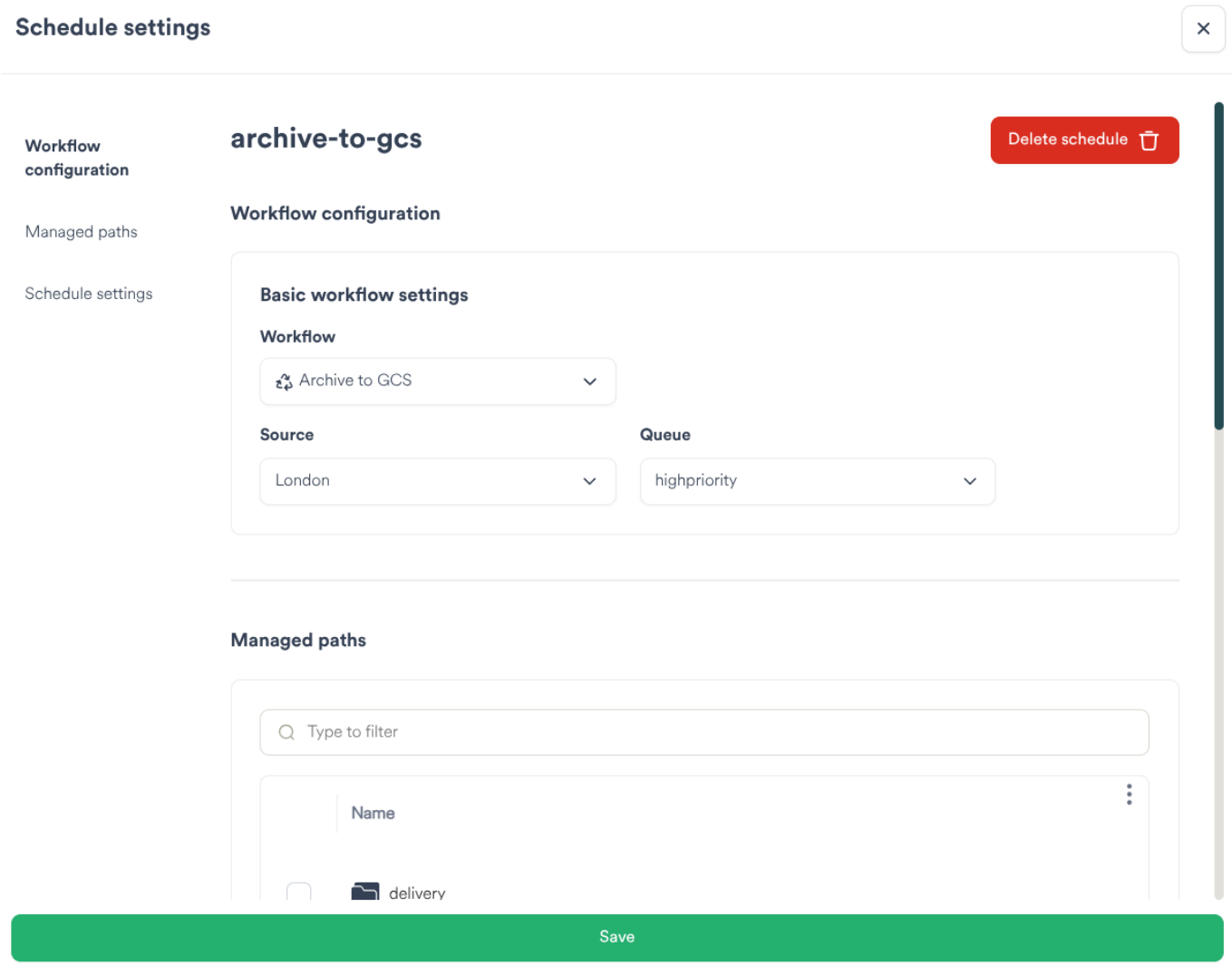
Important: This function can only be performed by a Hub Administrator.

Clicking the Schedules button in the main menu bar displays the list of schedules:



Edit	Click the edit icon on the required Policy row to edit the Policy

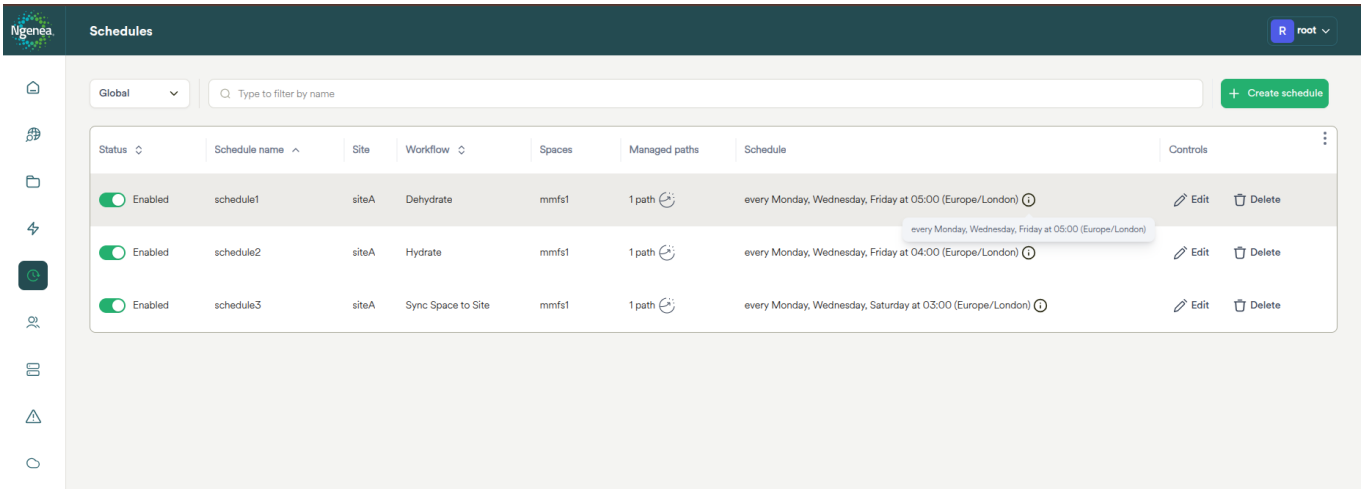
- Modify the Schedule settings as required. Refer to Adding a Schedule for settings guidance.



Deleting a Schedule

Important: This function can only be performed by a Hub Administrator.

Clicking the Schedules button in the main menu bar displays the list of Schedules:



Delete	Click the delete icon on the required Schedule row to delete

A confirmation dialog is raised:

- Click Yes to delete the Schedule. This action is irreversable.
- Alternately click no, or close the confirmation dialog.

Disabling a Schedule

Important: This function can only be performed by a Hub Administrator.

Enabled	Click the Enabled toggle to disable the schedule

When a schedule is disabled it will not run.

Click the toggle again to re-enable the schedule.

Policies

Hub provides the capability to perform actions to data via Policies.

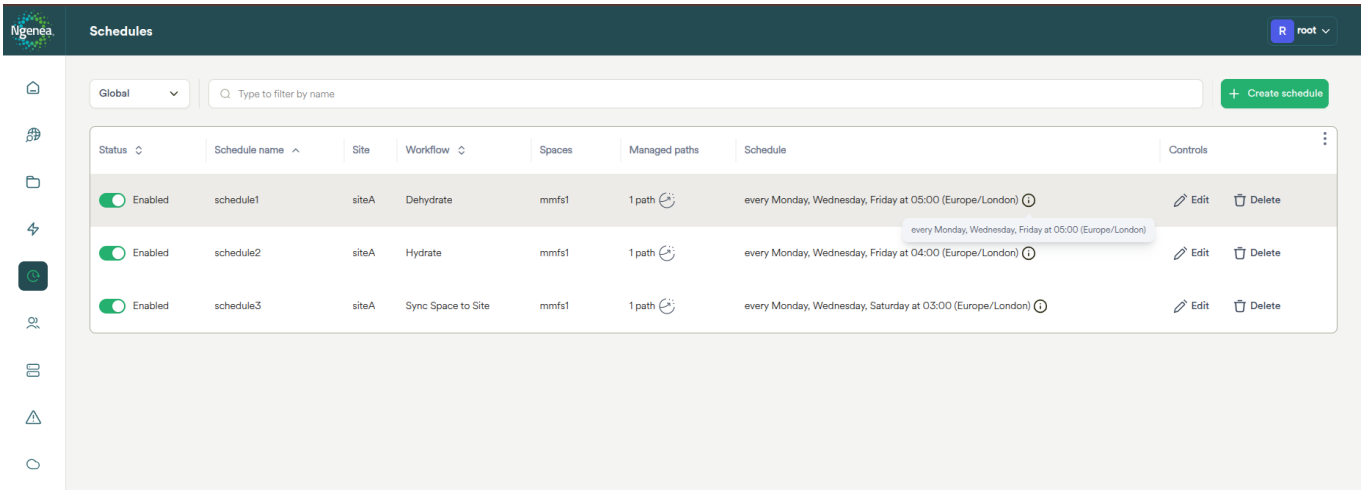
Policies comprise criteria, conditions and triggers which are applied to data within one or more Spaces residing on a Site.

Viewing Policies

To view available Policies, click the Schedules menu button.

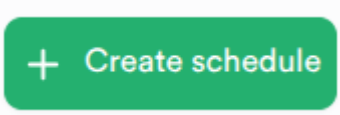
	Navigates to the Schedules screen

Policies are displayed alongside other workflow schedules. Policies have workflow type *Policy-based Tiering*



Adding a Policy

Click the Create Schedule button to display a dialog to configure a Schedule.

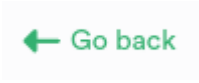
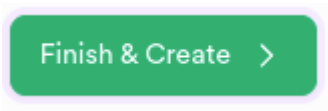


Important: This function can only be performed by a Hub Administrator

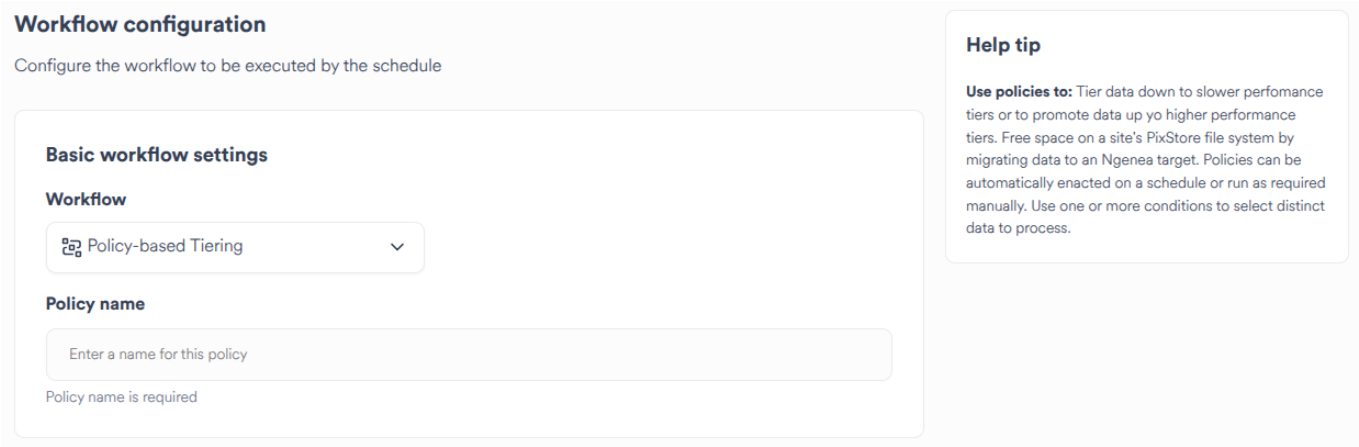
Creating a Schedule Wizard

Navigating the Wizard

	Click the close button to exit the wizard. Changes are not saved.
	Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.

	Click the Go Back button to return to the previous wizard page.
	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Workflow



- Set the Workflow type to “Policy-based Tiering”

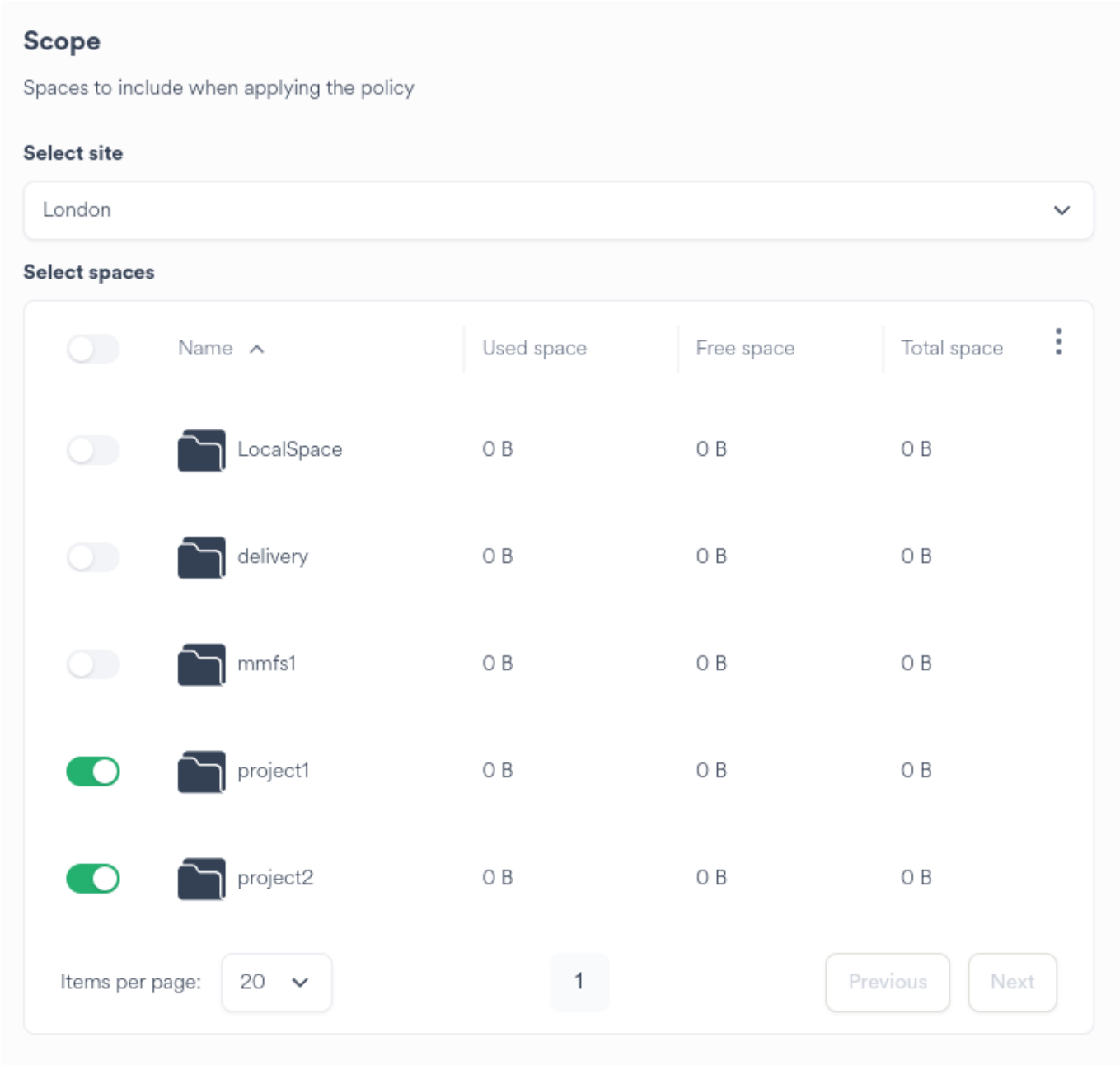
Name

- Provide a descriptive name for the Policy

Scope

The same Policy can run against one or more Spaces concurrently for a Site.

Policies are specific to a Site.



- Select the Space or Spaces to run the Policy against on the Site.

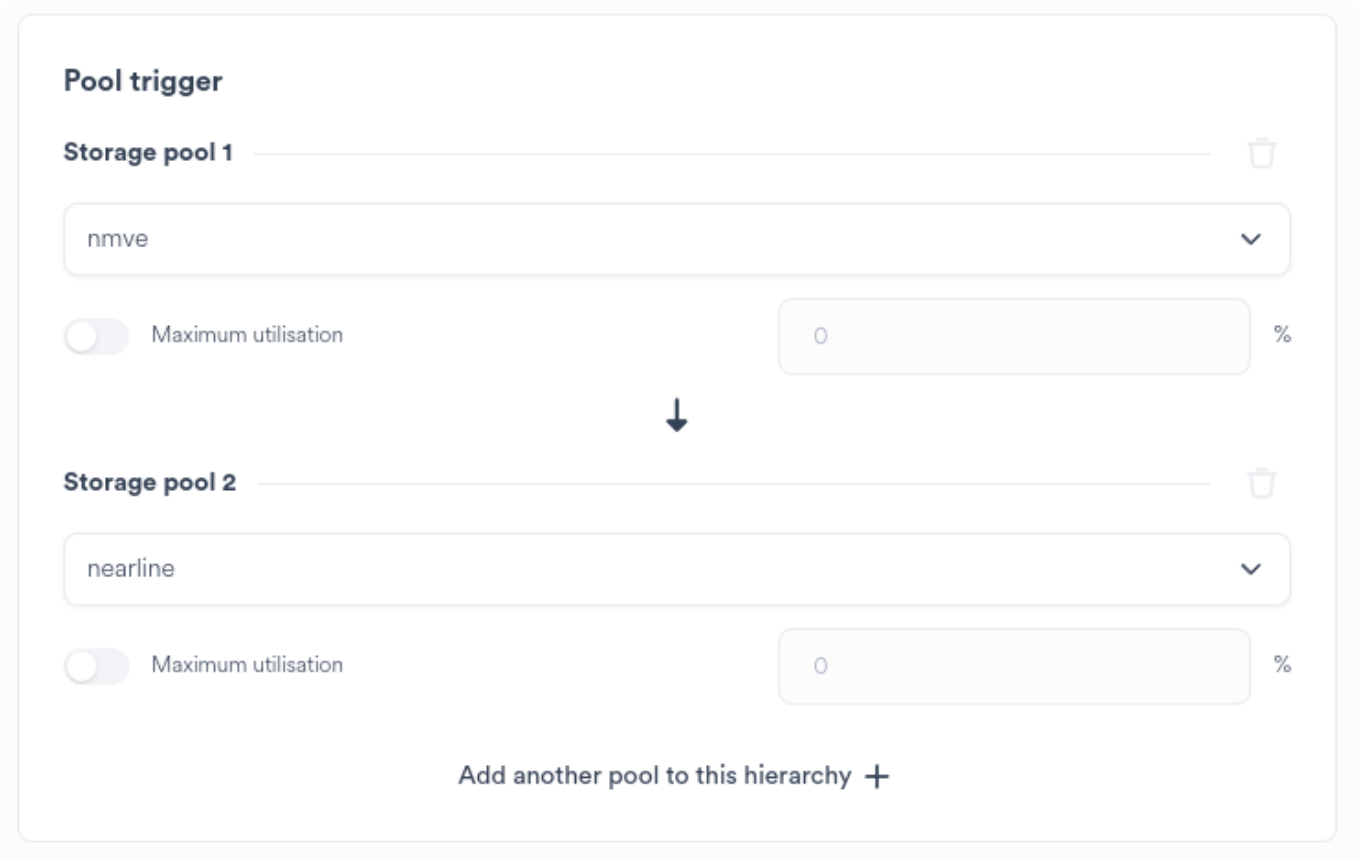
Pool triggers

Setup a pool trigger to define the flow of data.

Examples of supported data flows are:

Pool to Pool

Data in pool `nvme` is tiered to pool `nearline` according to the Policy conditions.



Pool with Utilisation Limit

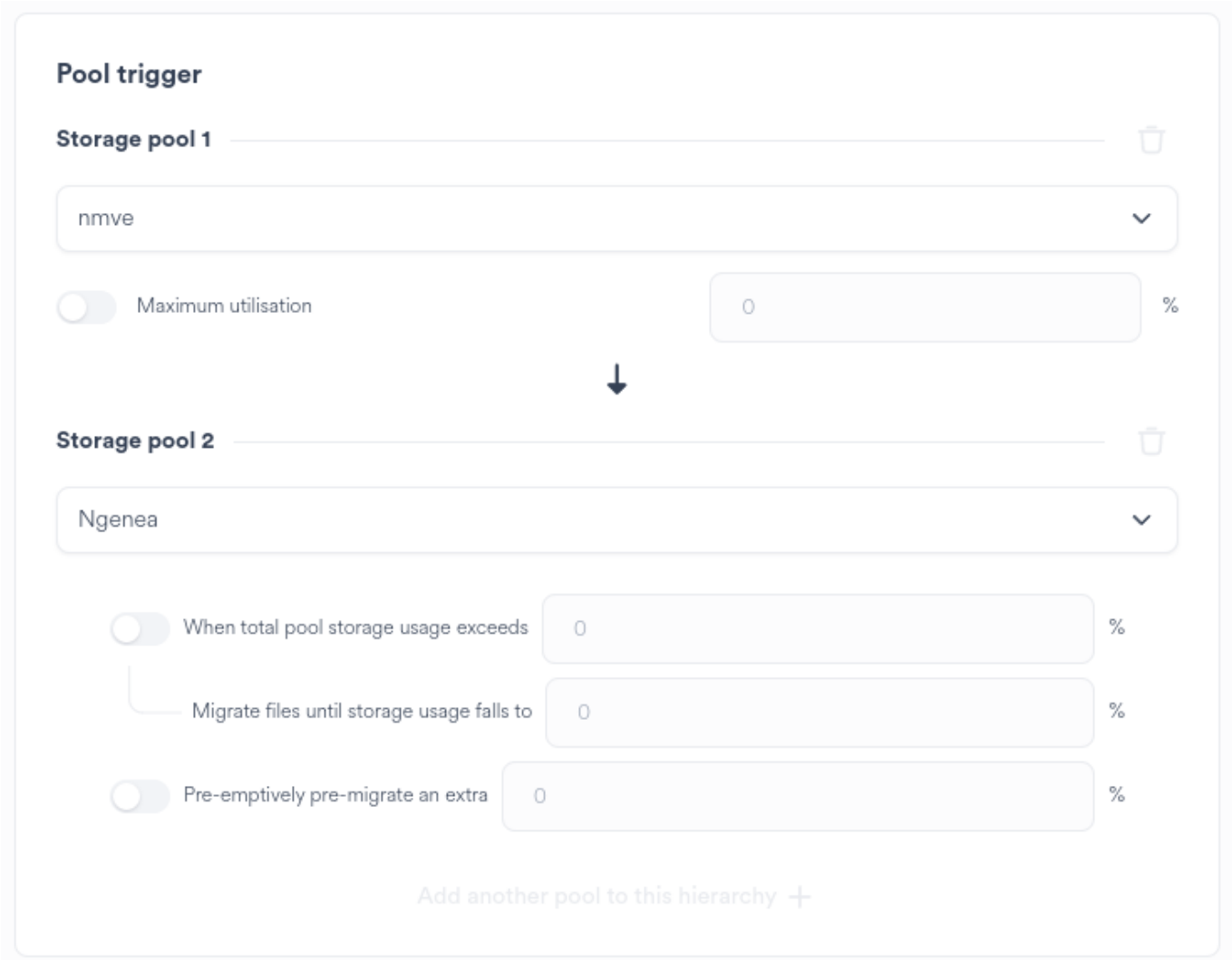
Data in pool `nvme` is tiered to pool `nearline` according to the Policy conditions.

Assuming a full `nvme` pool, data over which matches Policy conditions and is filling the pool over the 40% maximum utilisation is targeted for tiering to pool `nearline`. Data will be tiered until `nearline` reaches 80% utilisation or the `nvme` reaches 40% utilisation. If neither can be achieved, a best fit results.

Hint: Ngenea source/destinations are only supported with *one* additional pool. Specifying more than two pools, including Ngenea will result in no data orchestation to/from Ngenea Targets.

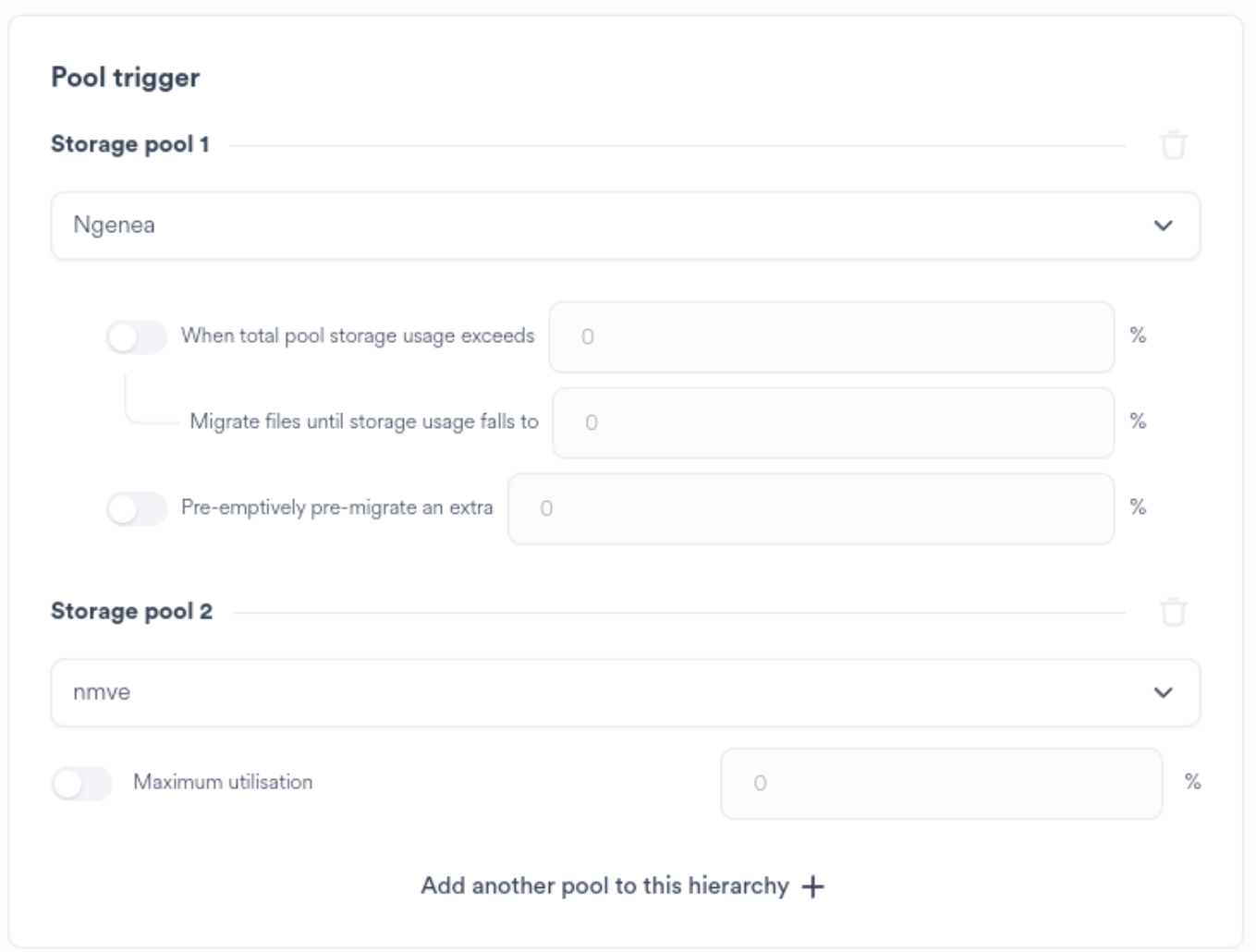
Pool to Ngenea

Data in pool `nvme` is dehydrated to an Ngenea Target according to the Policy conditions.



Ngenea to Pool

Data in an Ngenea Target is rehydrated to pool `nvme` according to the Policy conditions.



Ngenea Watermarks

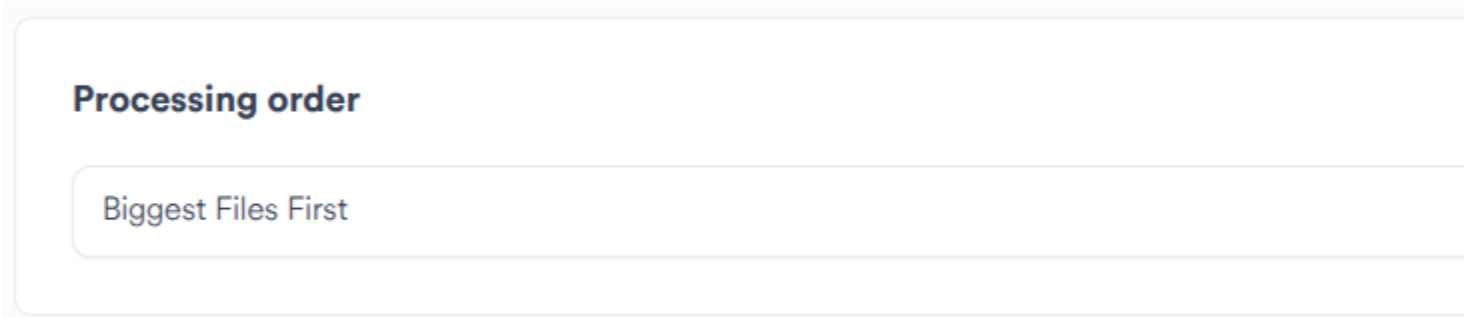
Utilise Ngenea watermarks to provide finite control over data states during Policy processing.

The following example provides (assuming 93% utilisation):

- Data will only be de-hydrated when the Storage Pool 1 (E.G. `nvme` in the above example) is utilised over 90%
- 13% of data residing on the pool will be de-hydrated, reducing utilisation to 80%
- A further 10% of data residing on the pool will be Pre-Staged, ensuring that future de-hydrations process the first 10% of data faster as the data is already present in the Ngenea Target

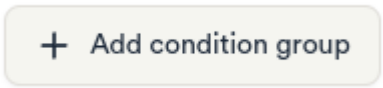
Processing order

Select the processing order of the data.



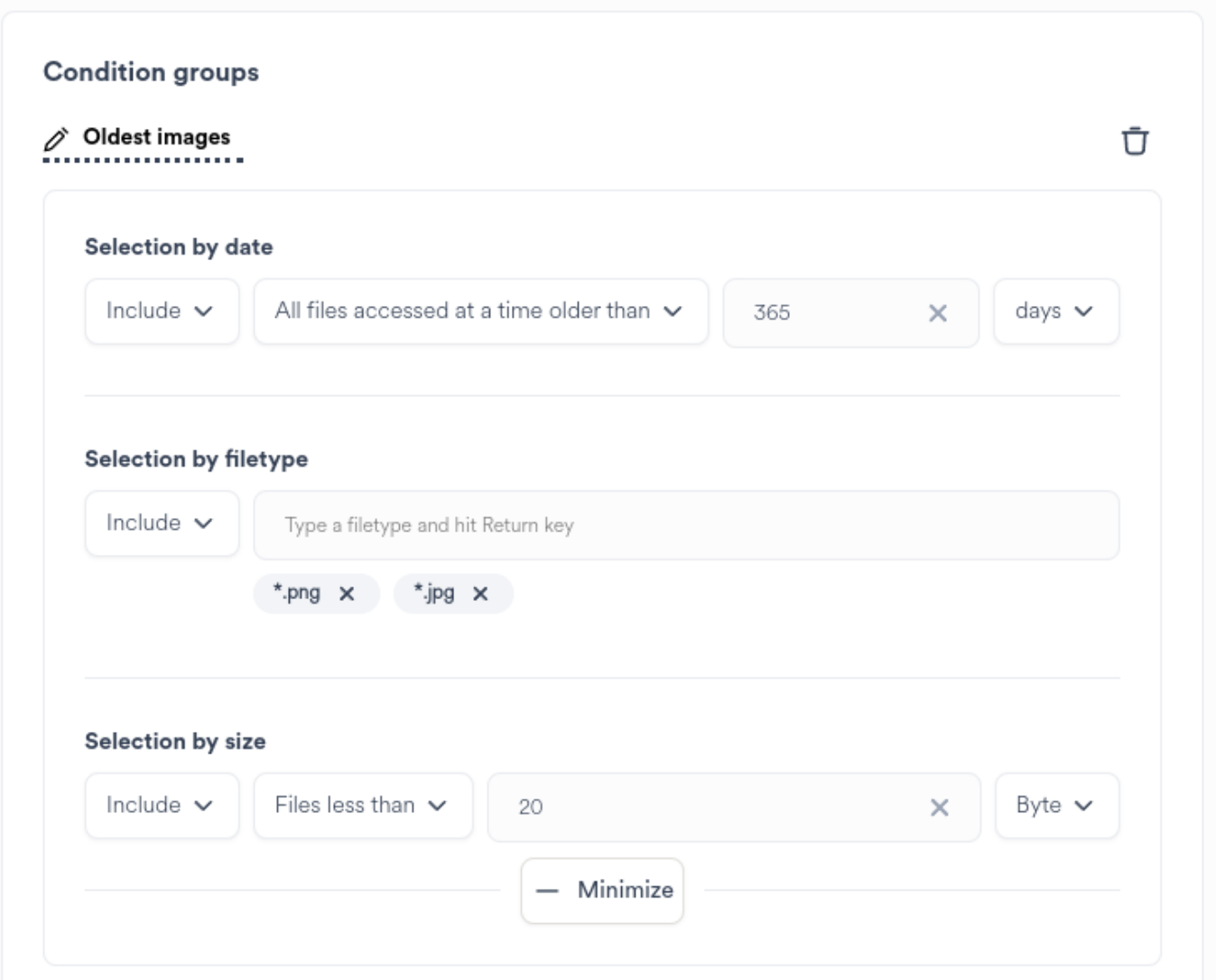
Conditions

For more finite control of the data targeted, add a Condition group.



Click the `Add condition group` button to add a Condition group

- Specify the criteria for the condition group as necessary
- It is not required to specify all selections of the Condition group



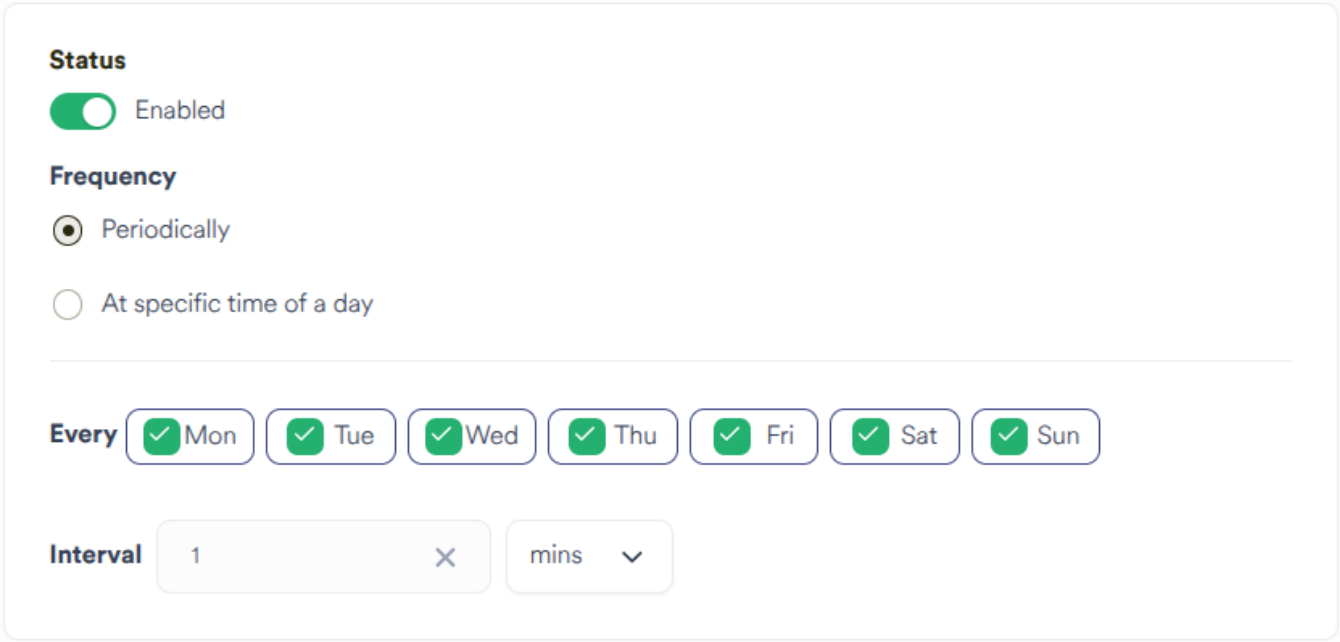
Perform optional actions:

Condition group	Click the Condition Group Edit button to name the Condition group
	Click the delete icon to remove the Condition group
+ Add condition group	Click the `Add condition group` button to add further Condition groups

Automation

To setup a regular scheduled Policy run, enable the Automate Schedule slider.

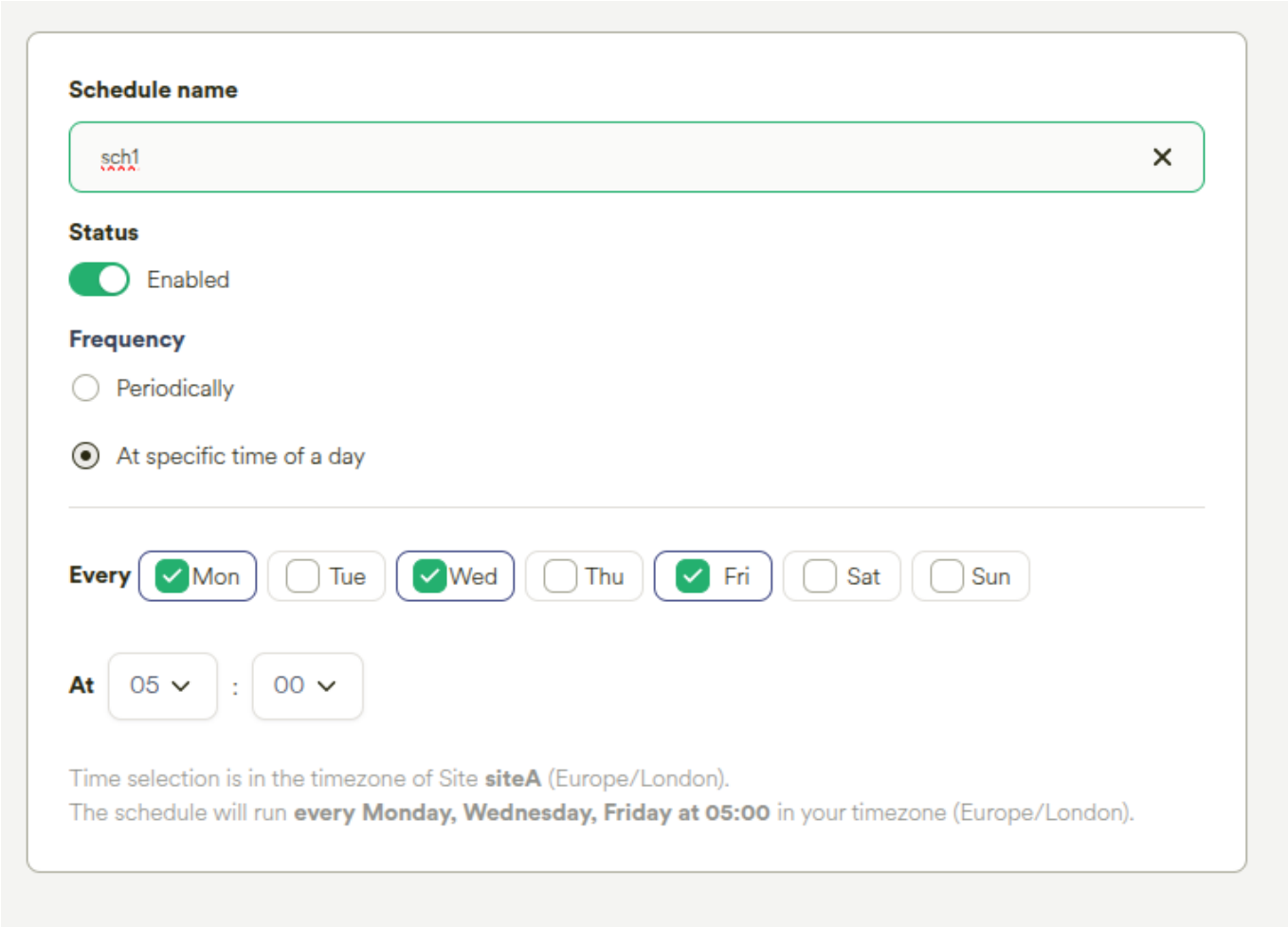
Determine the required frequency of the Policy run.



Choosing Periodically will ensure that the Policy will run on the next interval set.

E.G:

- 1 hour: The Policy will run on the next hour (12.00, 13.00)
- 15 mins: The Policy will run on the next 15 minute interval past the hour (15, 30, 45, 00)

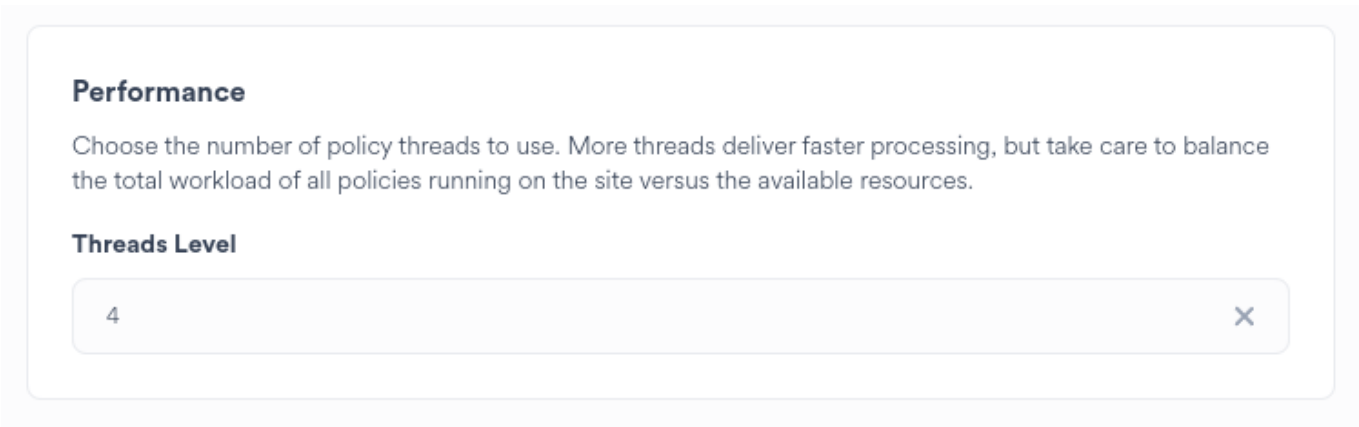


Choosing At Specific Time of A Day allows the Policy to be scheduled once per chosen day at a specific time of day.

Hint: The schedule time is set in the Site's local timezone, but will be stored in the UTC timezone.

The schedule may be disabled at the point of creation by switching the `Enabled` toggle to `Disabled`.

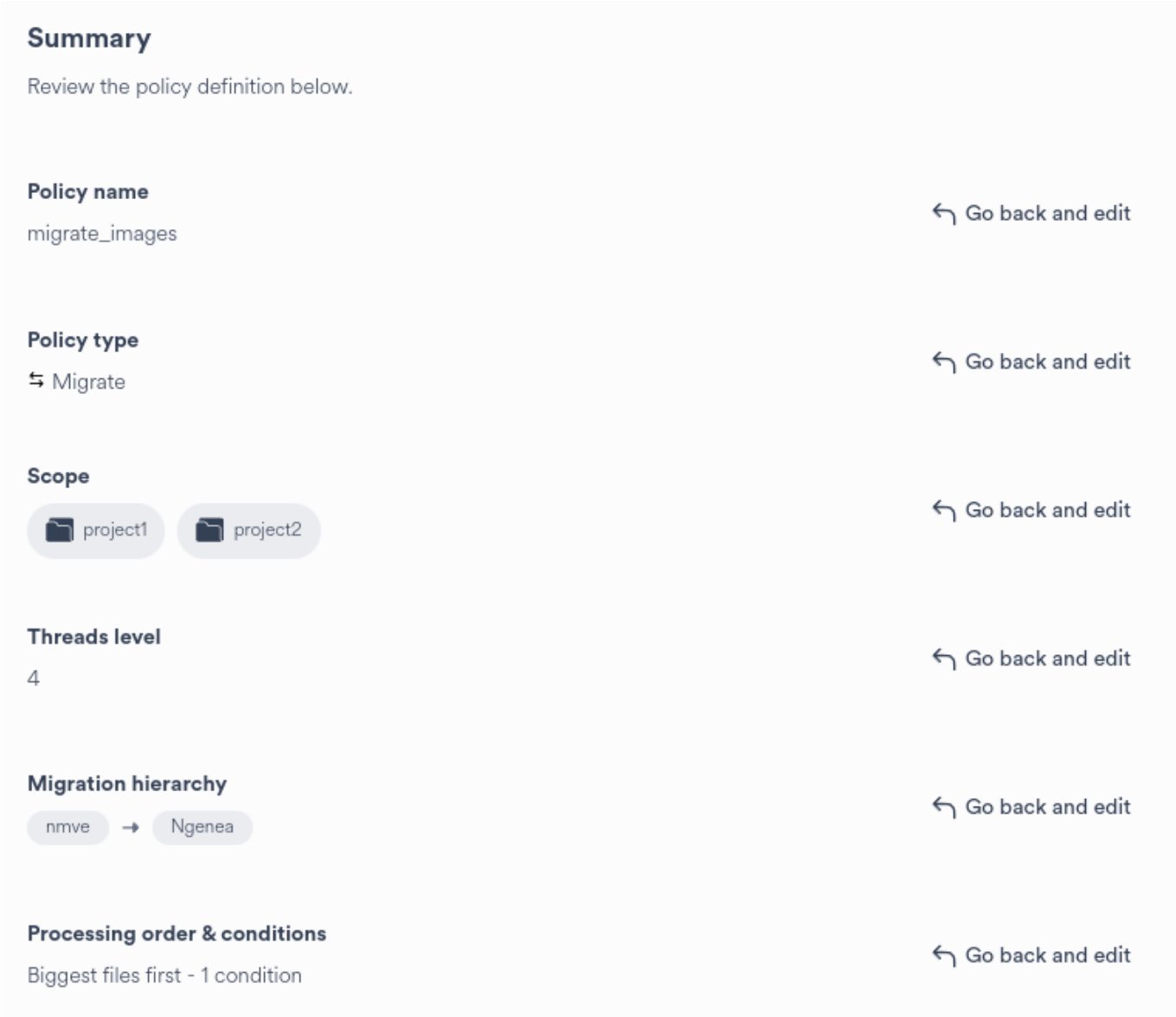
Choose the number of Threads to assign to the policy run.



Hint: Best practice is to start small and increase after assessing the impact of the policy to the Site.

Summary

Upon completing the wizard steps a summary is presented:



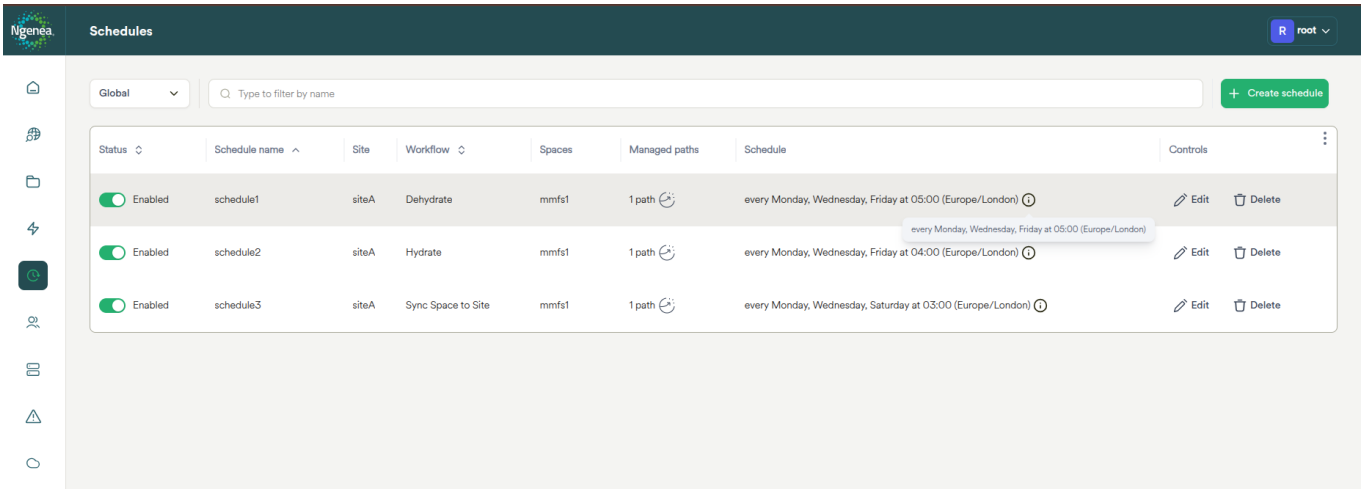
Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Alternatively `Go back` and change the proposed configuration as required or `close` the wizard to cancel the creation of the Policy.

Editing a Policy

Important: This function can only be performed by a Hub Administrator.

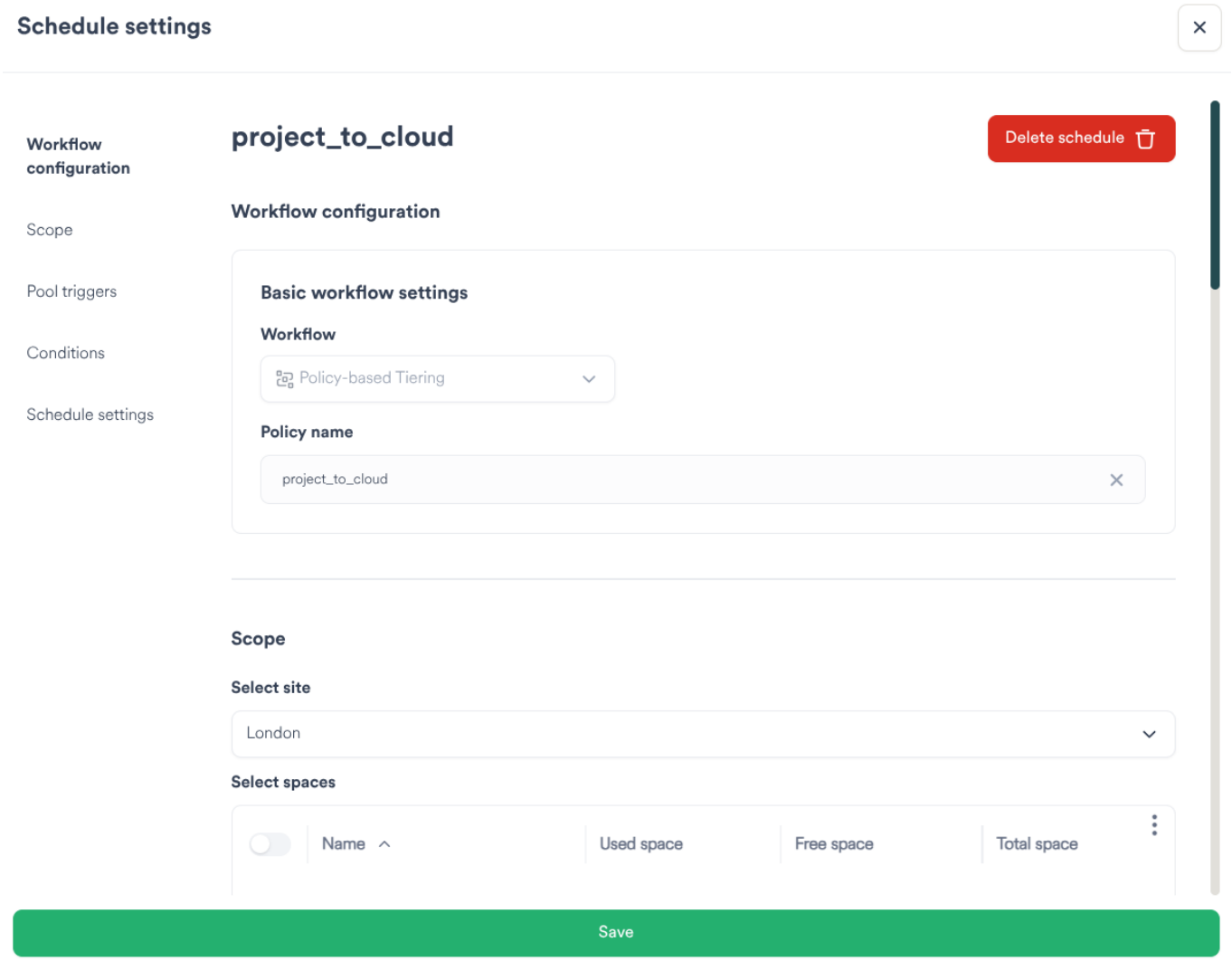
Clicking the Schedules button in the main menu bar displays the list of schedules:



Edit

Click the edit icon on the required Policy row to edit the Policy

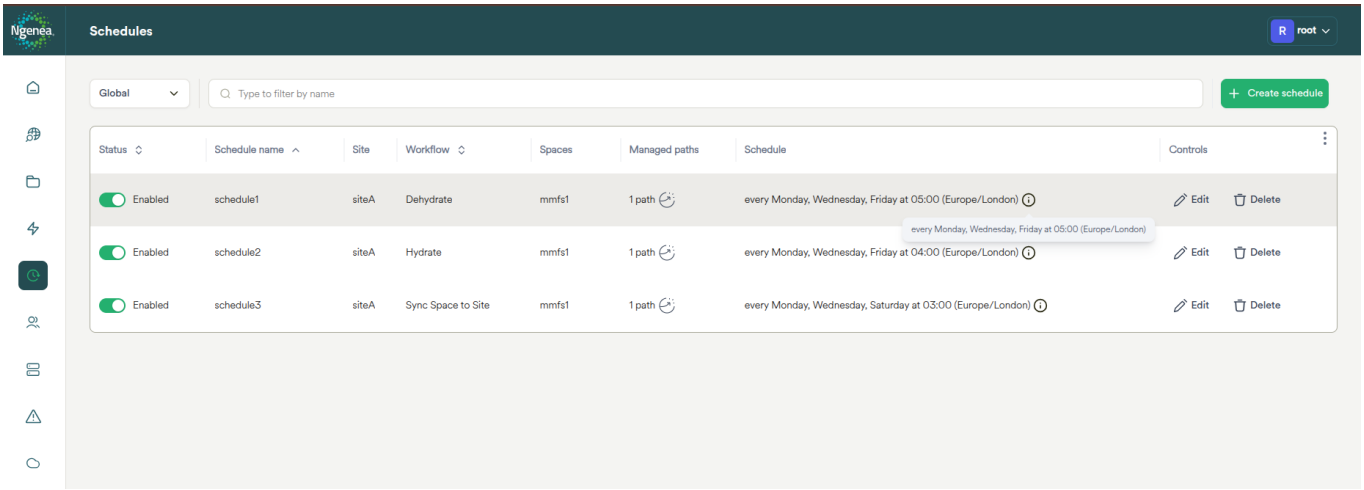
- Modify the Policy settings as required. Refer to Adding a Policy for settings guidance.



Deleting a Policy

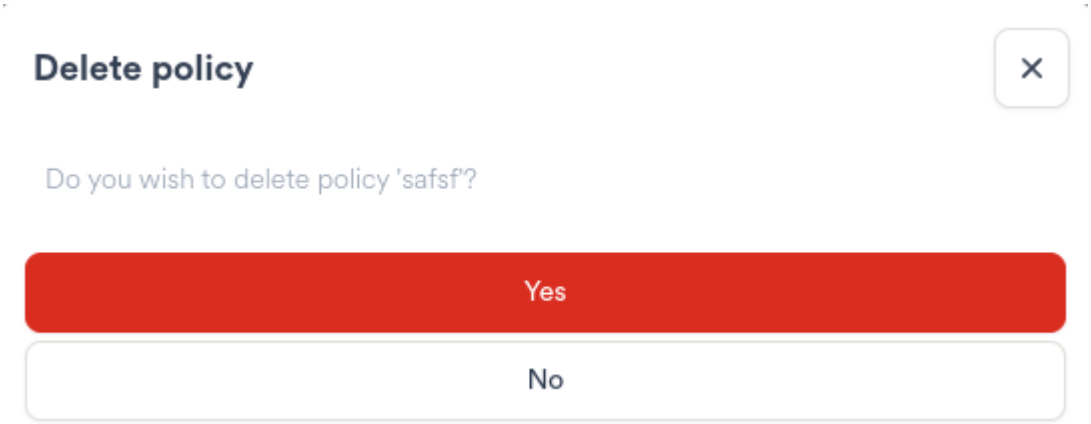
Important: This function can only be performed by a Hub Administrator.

Clicking the Schedules button in the main menu bar displays the list of Schedules:



Delete	Click the delete icon on the required Schedule row to delete the Policy

A confirmation dialog is raised:



- Click Yes to delete the Policy. This action is irreversable.
- Alternately click no, or close the confirmation dialog.

Running a Policy

Policies are run either on a Schedule, as specified in the Wizard on creation or in the Schedule settings.

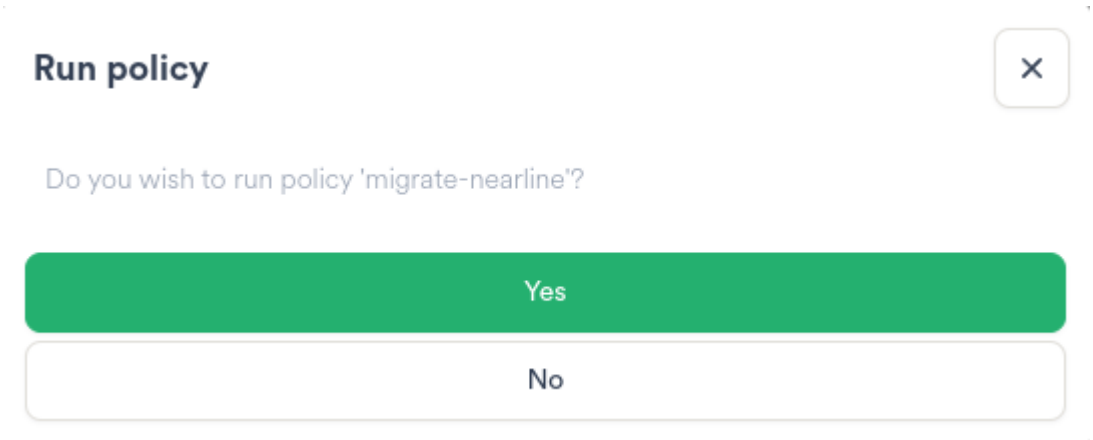
Alternatively, policies can be run on demand by clicking the Run button in the relevant row of the Action column on the Schedules page.

Important:

- Policies cannot be cancelled from the Hub UI once started
- Progress feedback is not visible in the UI
- Ensure the Policy is appropriate prior to running or scheduling

Run	Click the Run button to manually start the Policy run

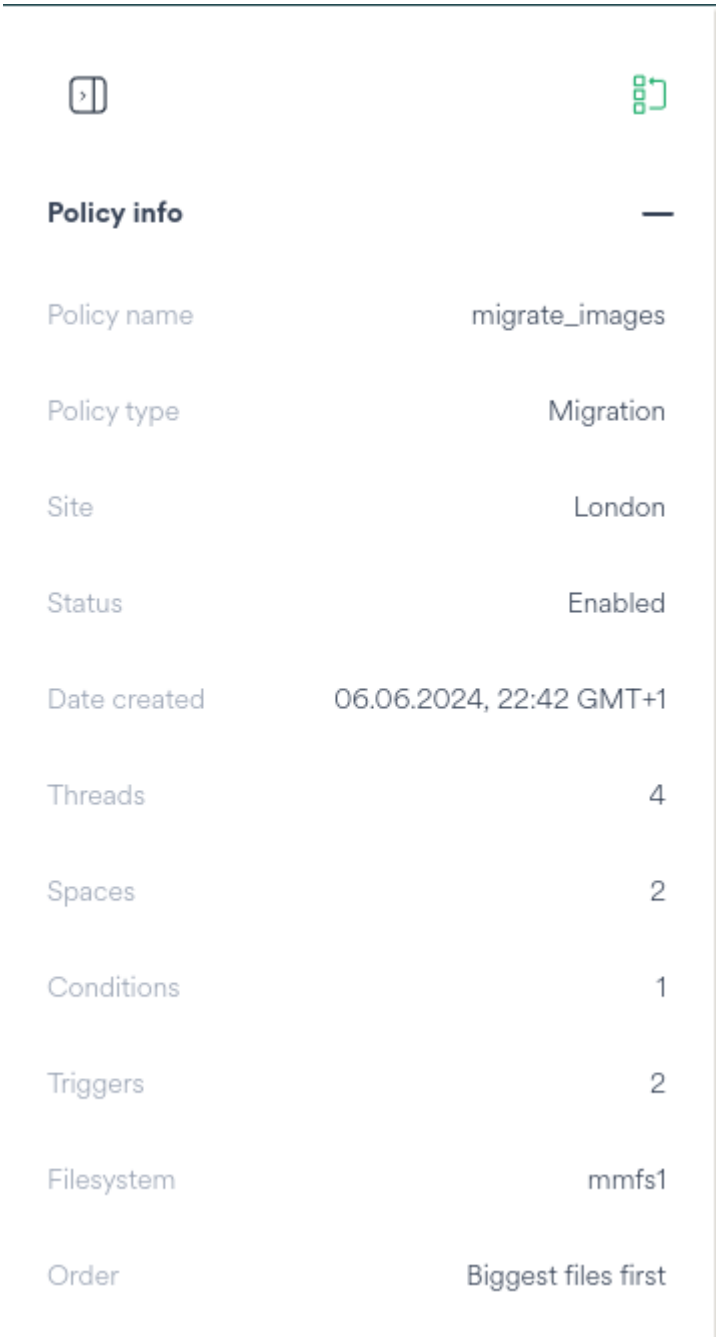
A confirmation dialog is raised:



- Click Yes to run the Policy.
- Alternately click no, or close the confirmation dialog.

Running Policies are shown on the Jobs page, subject to the above constraints. I.E. no controls are available for Polices on the Jobs page.

Policies provide specific Policy information when the Job is selected in the Jobs Page.



Refer to doc:*jobs* for further Jobs guidance.

Cancelling a Policy

Presently there is no capability to cancel a running Policy via the Hub UI.

Running policies can be terminated by issuing a `kill -9` to the `mmapplypolicy` process running on the relevant Ngenea node on the Site.

Upon terminating the running policy via the CLI, the Hub job will also terminate. The resultant Job state is (correctly) Failure - as the running policy was forcibly terminated.

Groups & Users

Hub provides management of Groups and Users internally.

Users may be authenticated by external directory services such as LDAP or Active Directory.

Two default groups are provided:

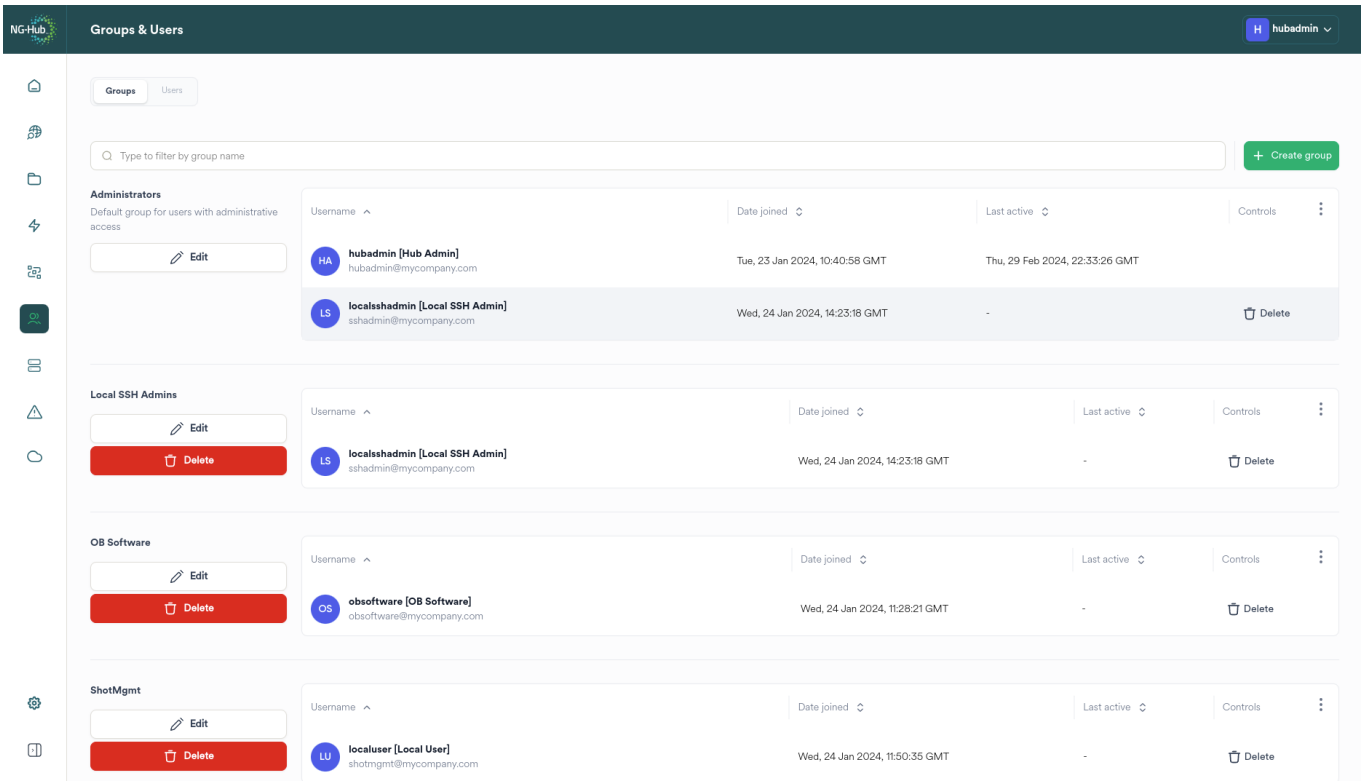
- Members of Administrators can configure and manage all Sites and Spaces
- Members of Users have read-only access to all Spaces

Additional groups can be deployed to provide restricted access for users to Sites and Spaces.

Viewing Groups

To view the available Groups managed in Hub, select the Group tab.

Important: Group management can only be performed by a Hub Administrator.

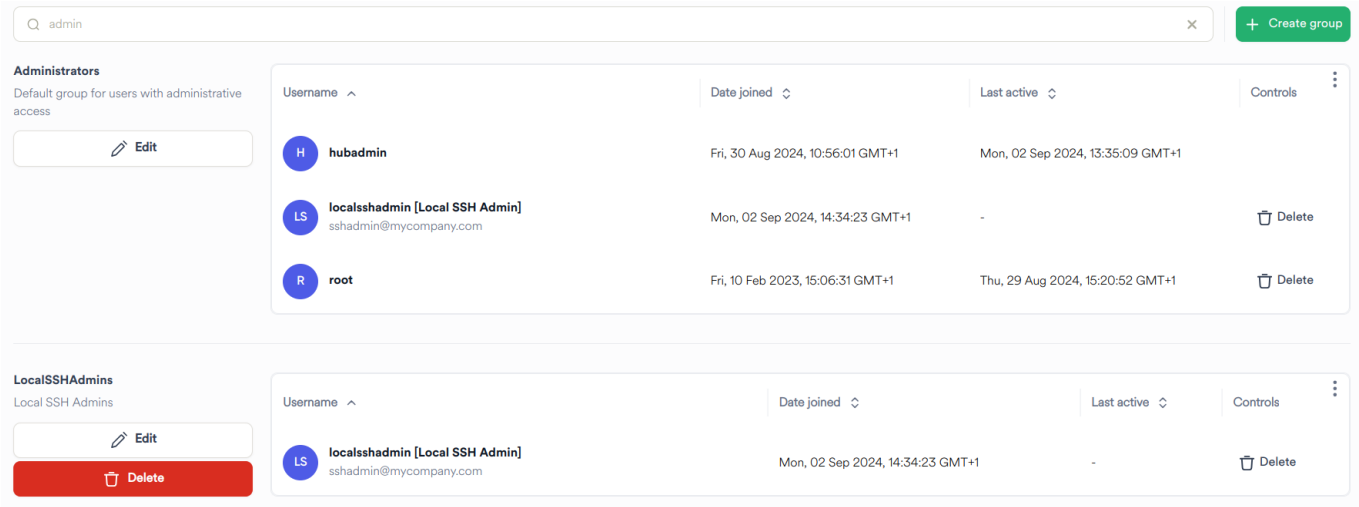


The Groups tab provides the following actions:

- Group creation
- Group deletion
- Group member management

Filtering the Groups View

To display Groups matching keywords, enter the keywords in the filter bar.



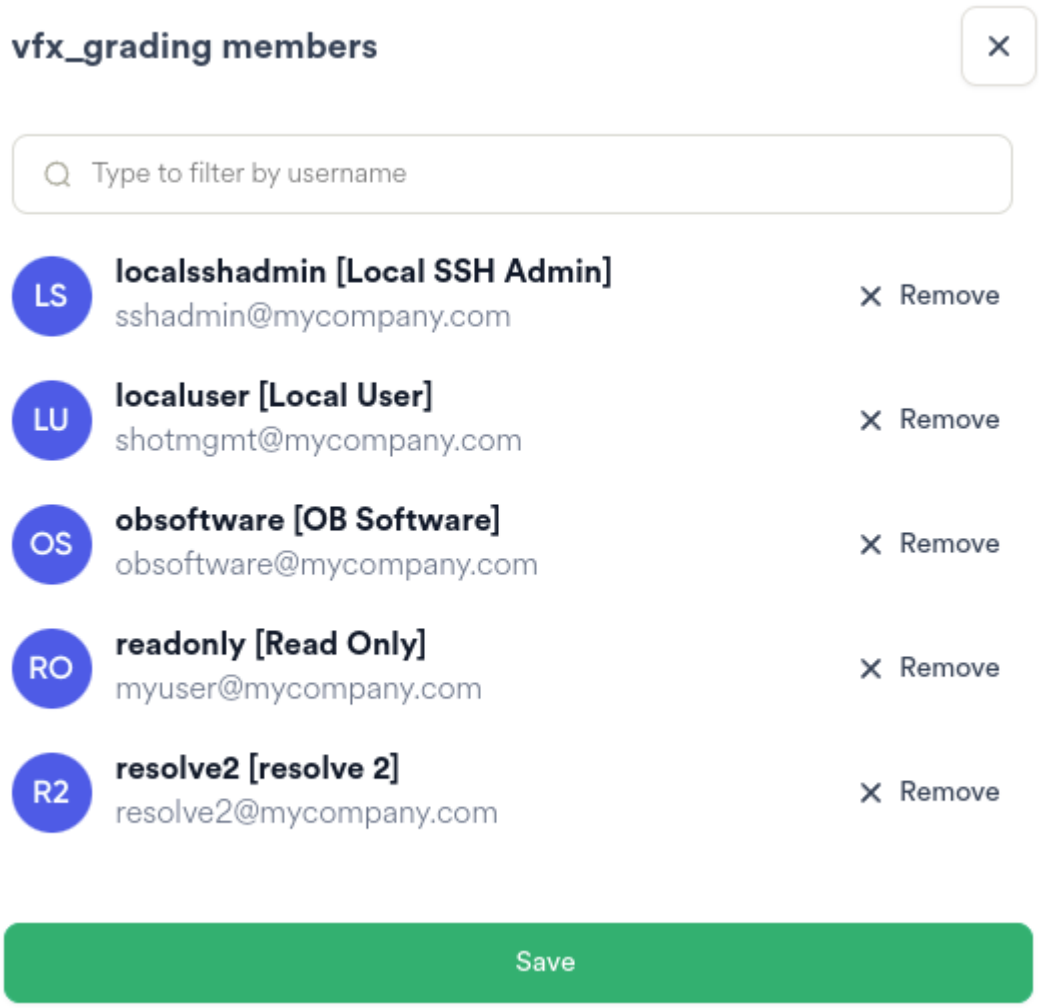
Group Members

The Groups View will only display up to four members per group.

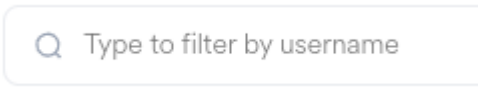
View all members

Click the View all members button to view all the members of the group

Clicking the View all members button raises the Group Membership dialog.



To filter for a User within the list of group members enter a keyword in the Filter for...



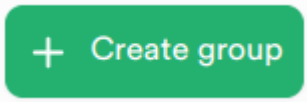
Click the Remove button to remove a User from the Group

Tip: If a User has been inadvertently removed, do not press the Save button, instead click off the Group members dialog to the main area of the screen.

Clicking the Save button at the bottom of the Group members dialog saves any changes made.

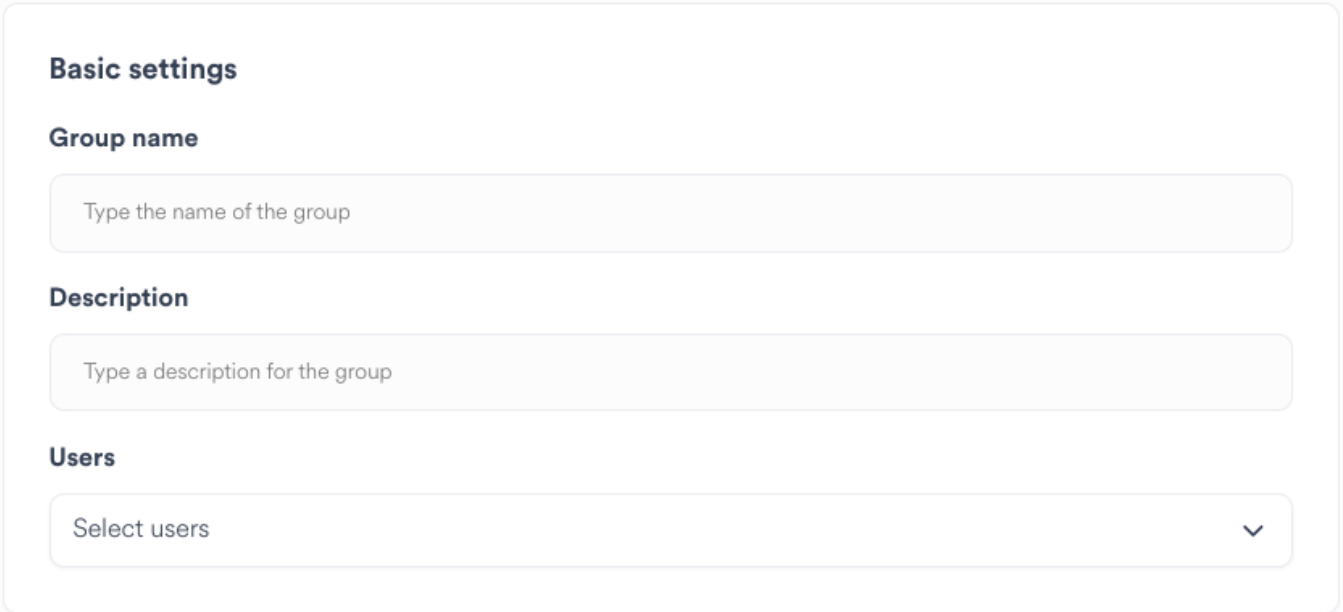
Creating Groups

Click the Create Group button to display a dialog to configure a new group.



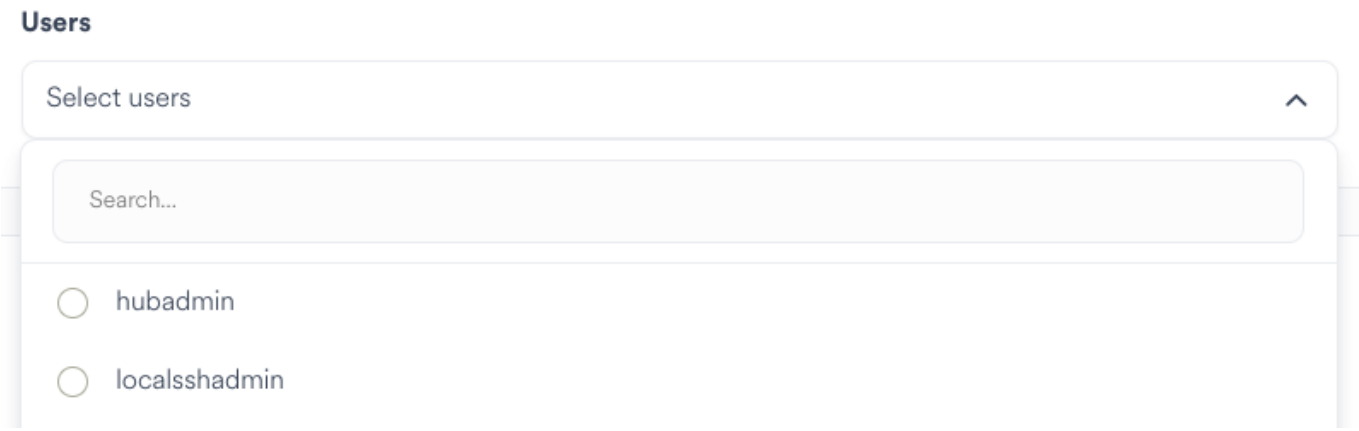
Important: This function can only be performed by a Hub Administrator

Basic Group Options



- Enter a name for the group. The name is case-sensitive and may not contain whitespace
- Enter a human-readable description for the group.

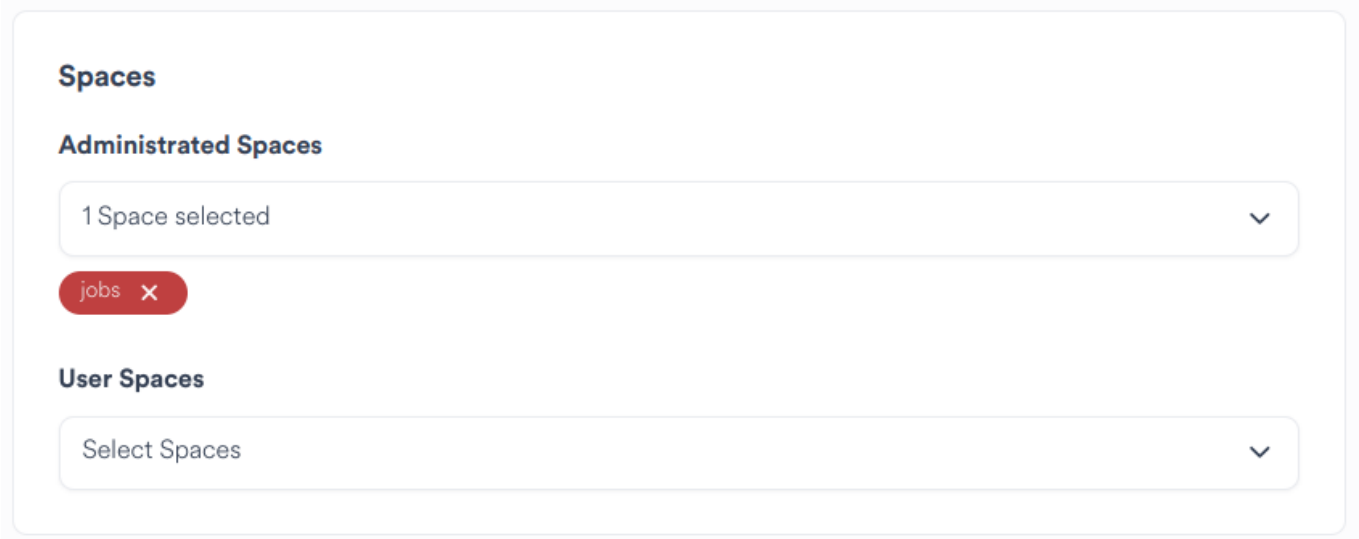
Select zero or more users to assign to the group



- Click a username to select it
- Click the username again to deselect it

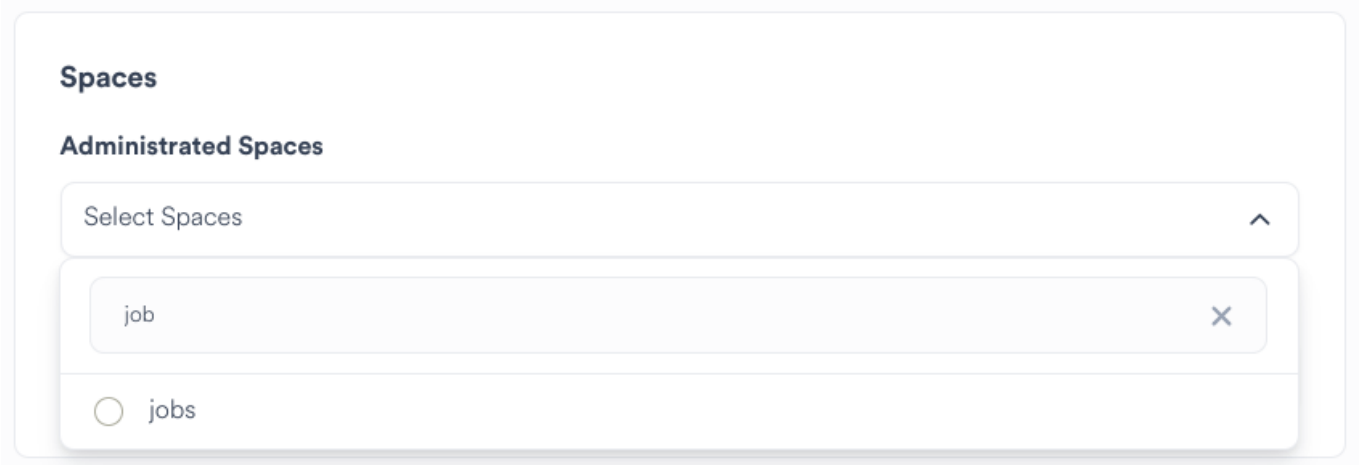
Group Space Options

Select which Spaces can be viewed and administered by users in this group.



- Administered Spaces can be viewed and browsed, and can have their settings changed
- User Spaces can be viewed and browsed, but cannot have their settings changed

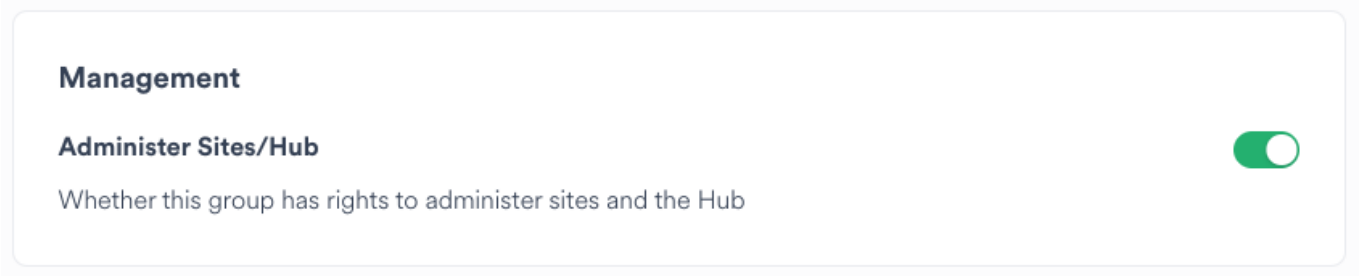
To filter for a Space within the list of spaces enter a keyword to filter for



Selected spaces are shown as chips. Clicking the ‘X’ on a chip deselects the space.

Management Settings

Select whether users in the group have the right to administer Ngenea Hub

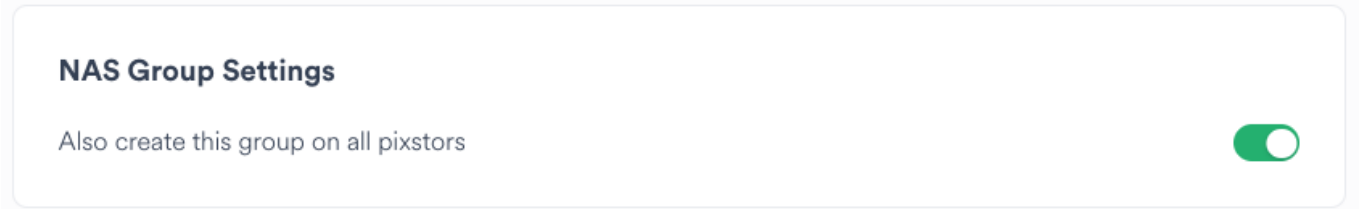


This includes the right to:

- Configure site settings
- Manage and run policies
- Manage Groups and Users
- View Alerts
- Manage, browse, and import from Targets
- Manage Global Settings

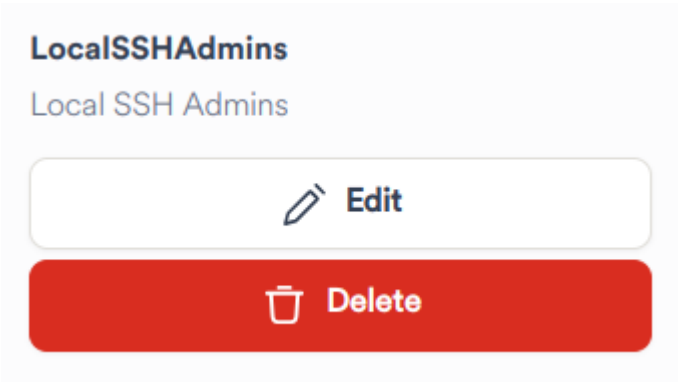
NAS Group Settings

Select whether the group should be created as a local NAS group.

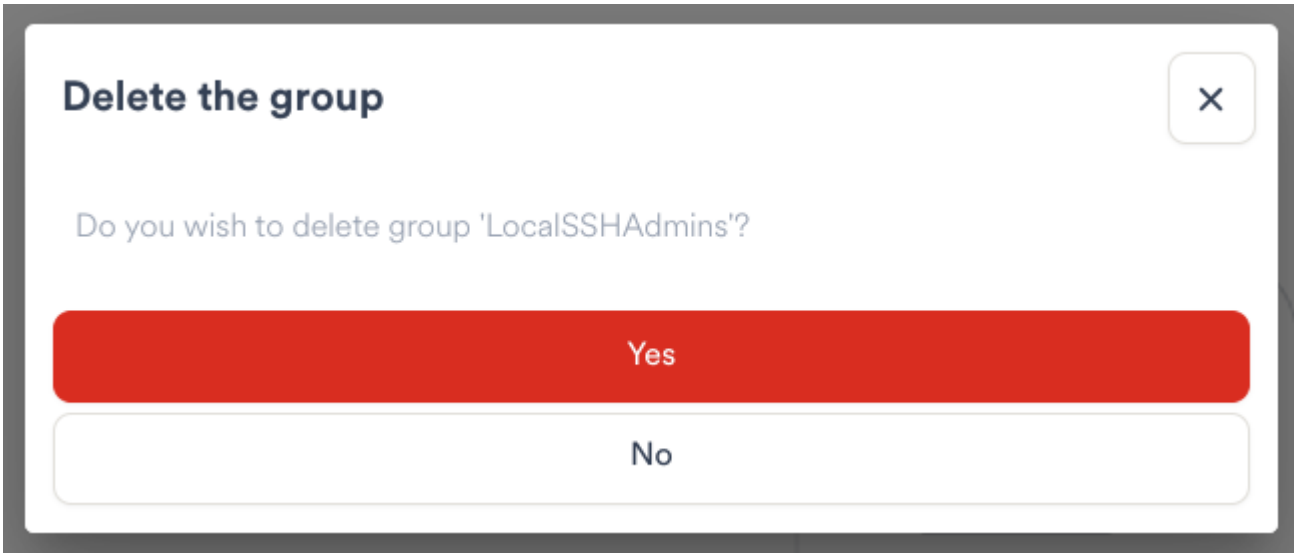


This will create a unix group on PixStor for all sites.

Deleting Groups



A confirmation dialog will be displayed



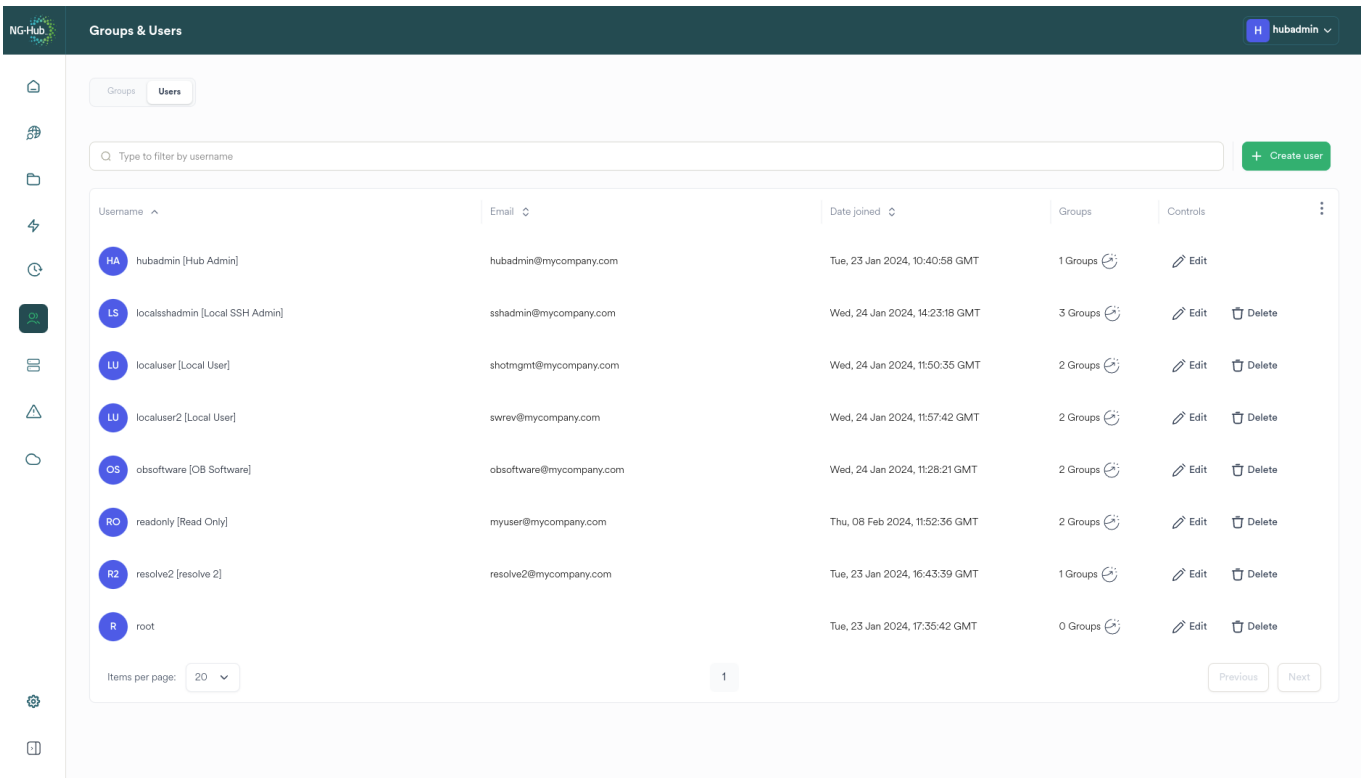
- Click “No” to close the confirmation dialog. The group will not be deleted.
- Click “Yes” to confirm and remove the group.

The default groups `Administrators` and `Users` cannot be deleted.

Viewing Users

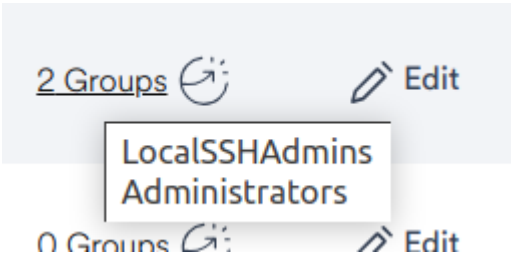
To view the available Users managed in Hub, select the Users tab.

Important: User management can only be performed by a Hub Administrator.



The Users tab provides the following actions:

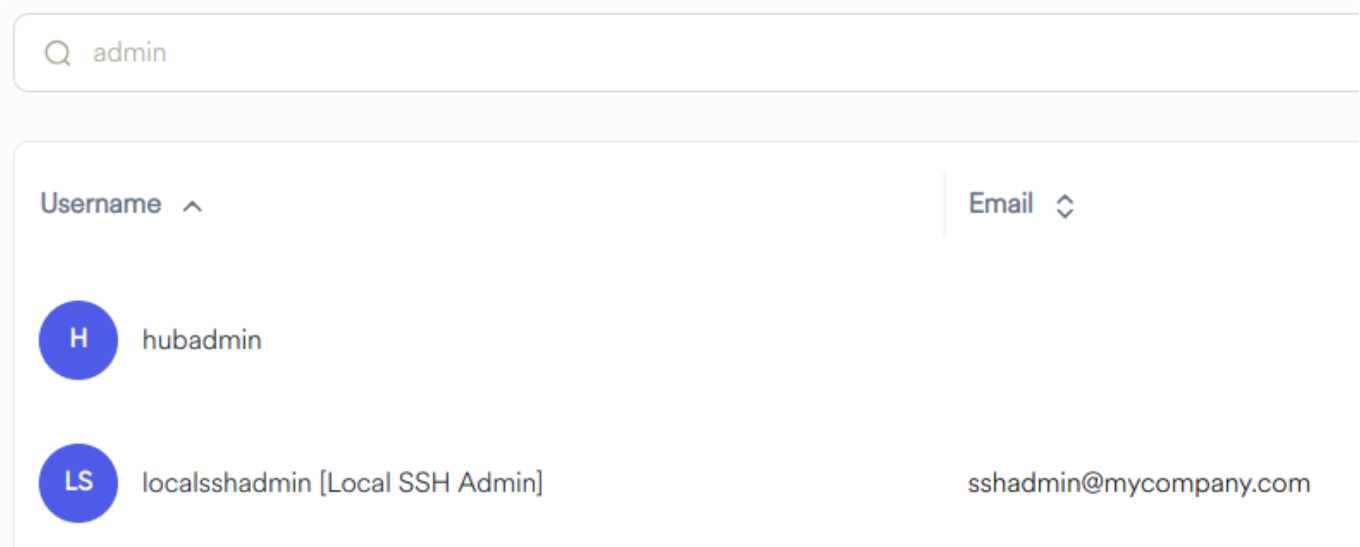
- User creation
- User deletion
- Group member management



Hover over the Groups column to see what groups a user belongs to

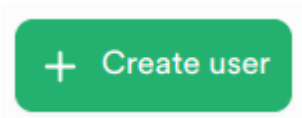
Filtering the Users View

To display Users matching keywords, enter the keywords in the filter bar.



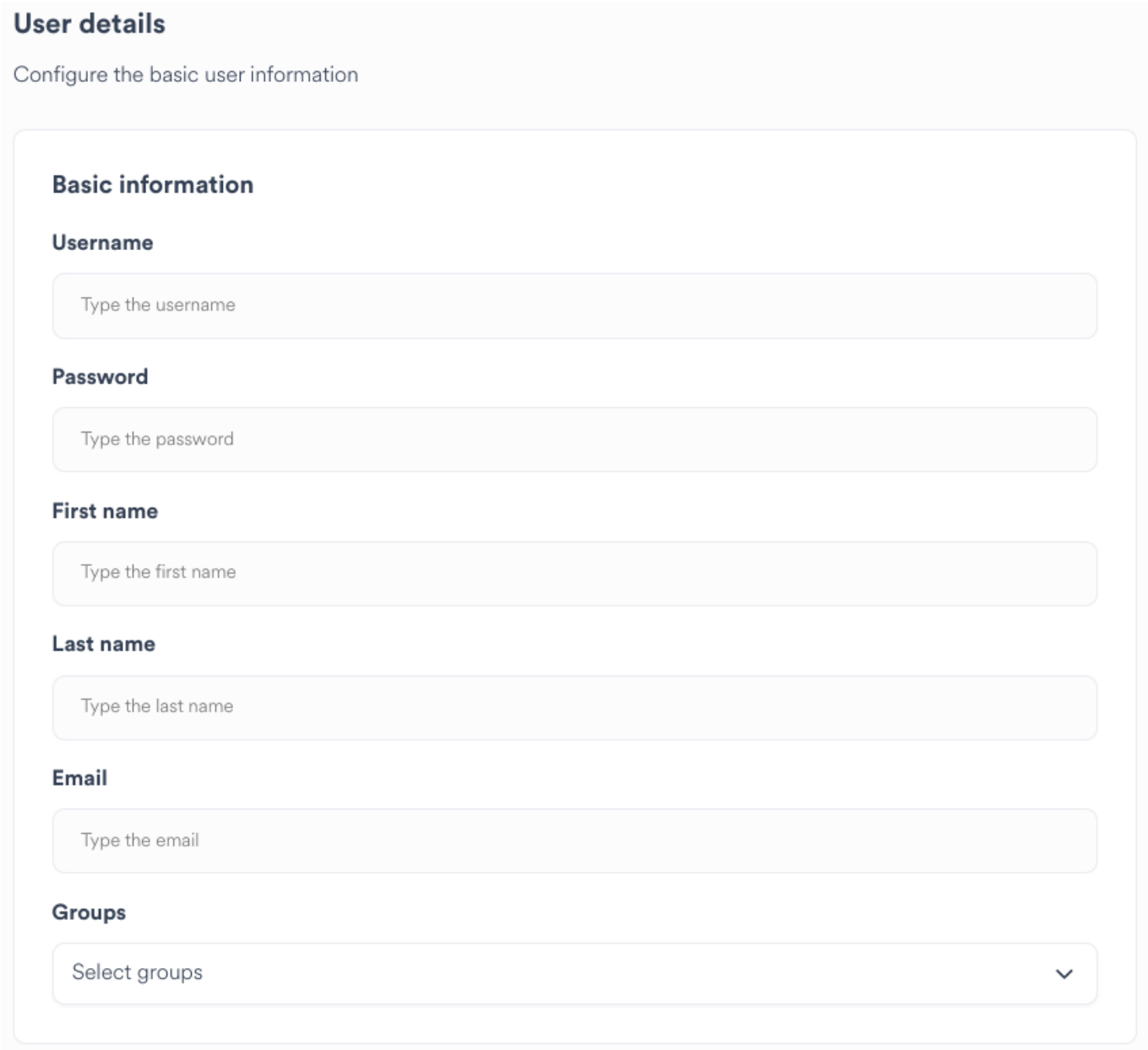
Creating Users

Click the Create User button to display a dialog to configure a new user.



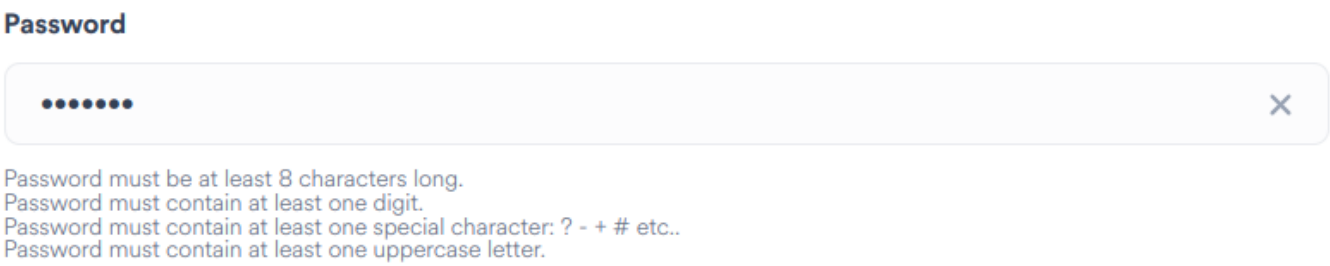
Important: This function can only be performed by a Hub Administrator

Basic User Options

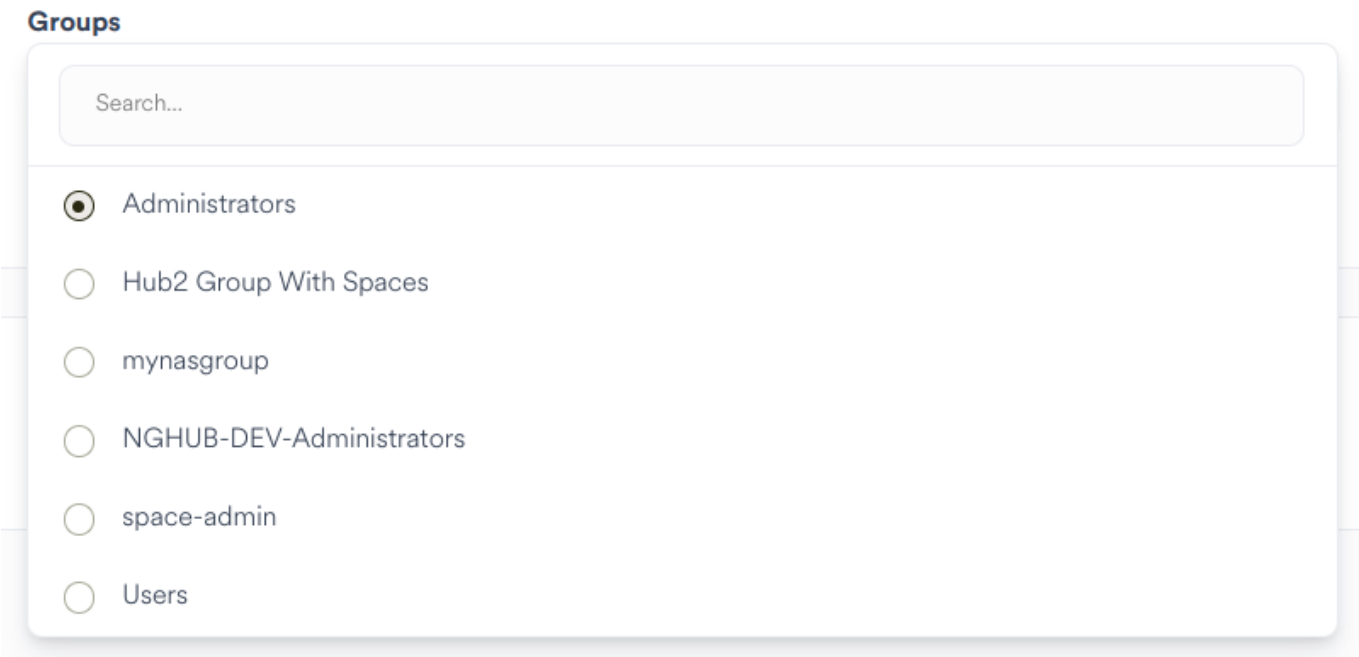


- Enter a name for the user. The name is case-sensitive and may not contain whitespace
- Enter a password
- Enter First and Last name for the user
- Enter an email address for the user

The password must meet all the requirements which are listed below the password box



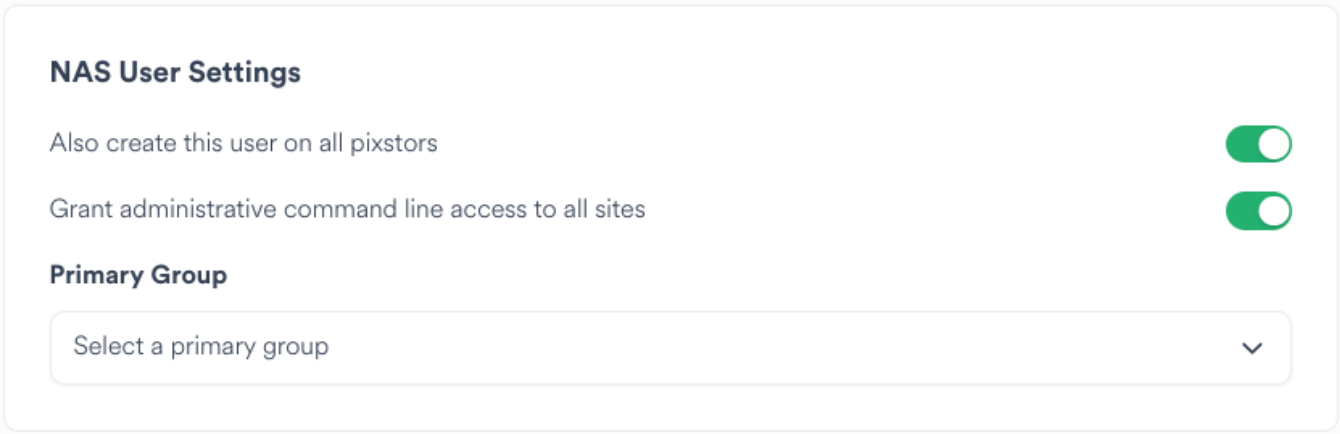
Select zero or more groups to assign the user to



- Click a group name to select it
- Click the group name again to deselect it

NAS User Settings

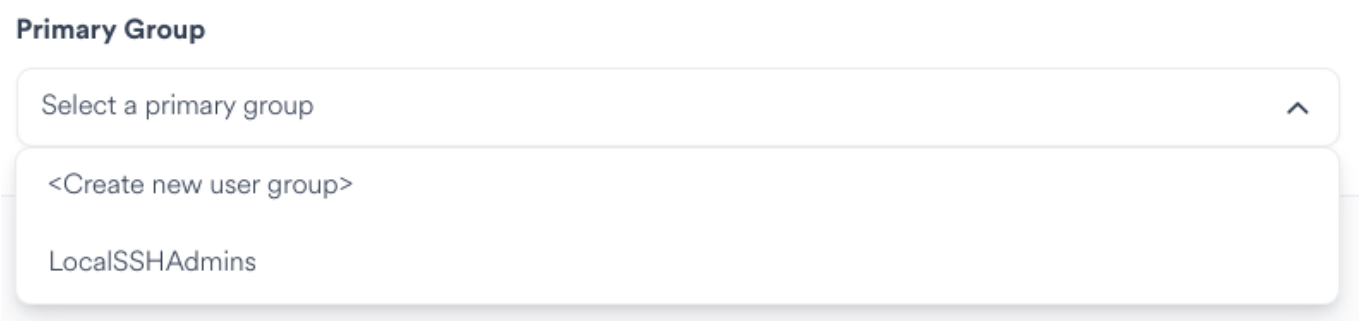
Select whether the user should be created as a local NAS user.



This will create a unix user on PixStor for all sites.

Select whether to grant command line access to the user. This means the user can connect to PixStor nodes via SSH.

Select the Primary Group for the user.



The dropdown will list any existing NAS groups. Alternatively, “Create a new user group” will create a new NAS-enabled Hub group with the same name as this user.

Deleting Users

To delete a user, click the delete “bin” icon in the row of that user.

A confirmation dialog will be displayed

- Click “No” to close the confirmation dialog. The user will not be deleted.
- Click “Yes” to confirm and remove the user.

You cannot delete the user you are currently logged in with.

Restricting Users from Spaces

All users in the group Users have read-only access to all Spaces.

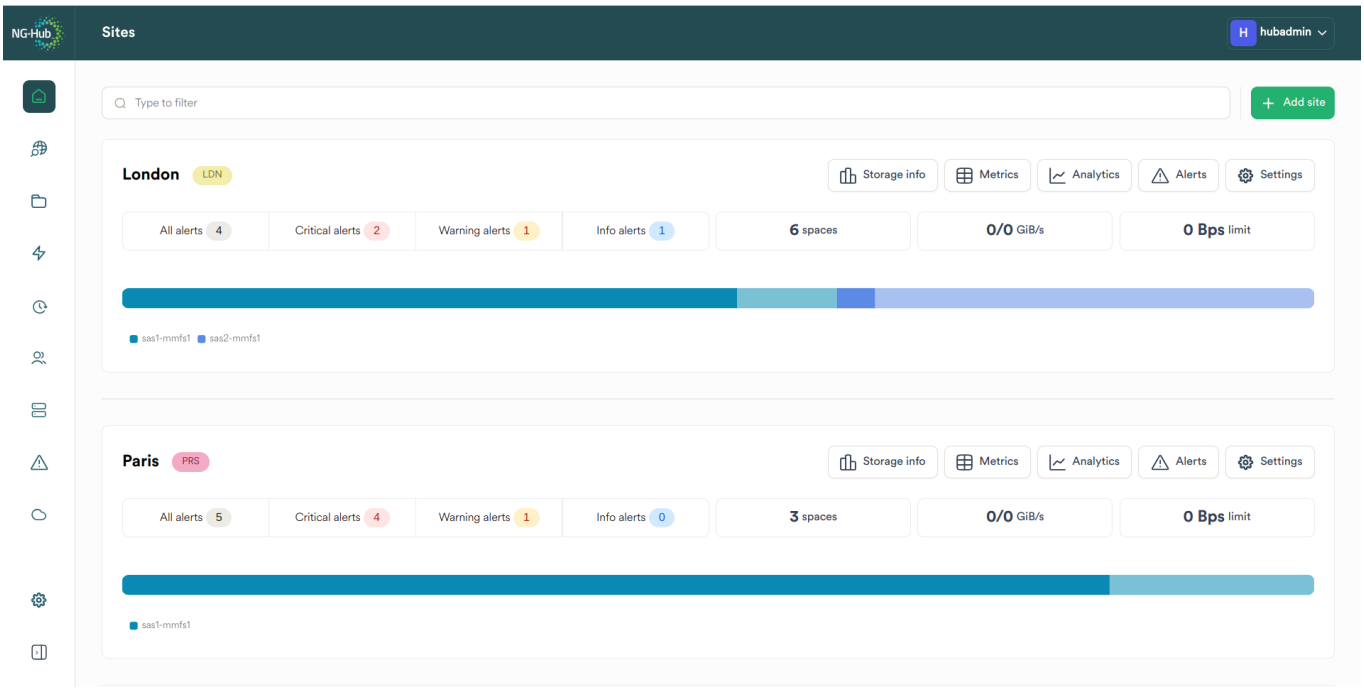
Should it be required to restrict a user from accessing specific spaces Spaces this can be achieved by:

1. Creating a new user group
2. Ensuring that only the specific spaces are assigned to the group
3. Add specific users to the group
4. Ensure the specific users are removed from the group Users

Caution: Adding a Space to a group’s Administered Spaces and Used spaces will allow assigned Users to change the settings for a Space. If administrative operations are not required, do not assign Spaces to Administered Spaces - create an additional group to allow specific users to administrate specific spaces.

Sites

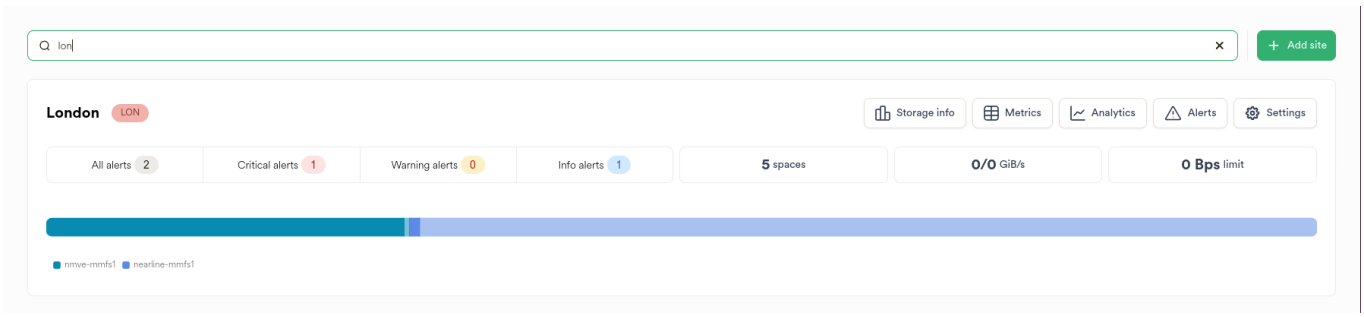
A site is a physical or cloud based pixstor server managed by Hub.



Filtering Sites

To filter for a site within the list of sites enter a keyword in the Search for...

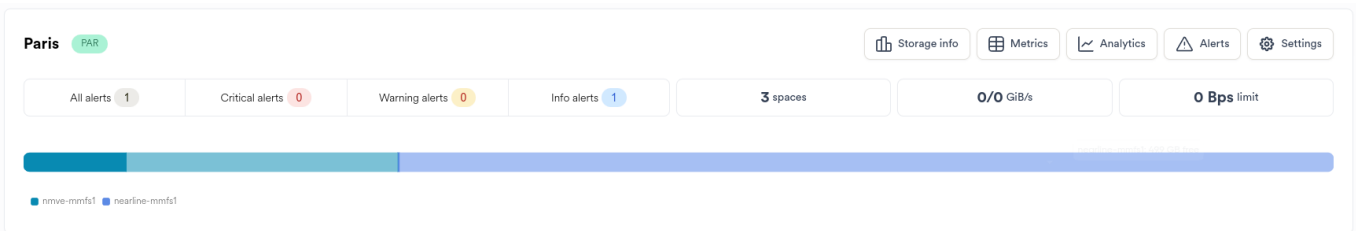
The displayed sites is limited to the sites which match the keyword(s).



The Site Card

Each site is displayed as a site card.

A Site is displayed as a card in the Sites view.



A Site Card comprises:

Site Name

London LON	Displays the designated friendly name of the site with the Ngenea site chip

Site Summary

The site summary displays high level totals for the number of files and folders present, the Ngenea hydrated and dehydrated states and the number of Spaces the site hosts.

Alert Types

Numbered filter buttons display the count of each type of Alert for the Site.

Select a button to open the Alerts for the Site, filtered for the specific Alert type.

All alerts 6	Click the All alerts button to view all alerts
Critical alerts 3	Click the Critical alerts button to filter for all Critical alerts
Warning alerts 0	Click the Warning alerts button to filter for all Warning alerts
Info alerts 3	Click the Info alerts button to filter for all Info alerts

Storage Info

Storage info	Click the Storage info button to open the Storage Info browser for the Site.

Site Metrics

Metrics	Click the Metrics button to open the pixstor nexus site metrics in a new browser tab.

Site Analytics

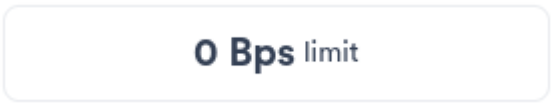
Analytics	Click the Analytics button to open the pixstor nexus site analytics in a new browser tab.

Site Alerts

Click the Alerts button to open the Alerts for the Site.

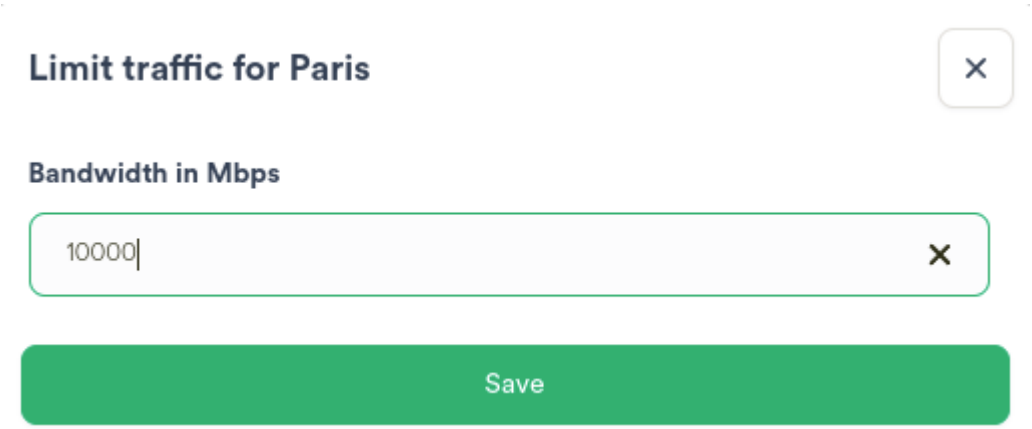
Bandwidth Control

The bandwidth of a site can be limited to a defined value via the UI. The current value is observed on the bandwidth limit button.



Click the bandwidth limit button to display the bandwidth control dialog.

The bandwidth control dialog allows limiting the bandwidth of a site to a defined value. Enter the limit in Megabits per second (Mbps) and press Save to apply the limit.

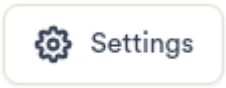


Hint: If the bandwith for a site has been inadvertently set do not press the Save button, instead click off the Bandwith limit dialog to the main area of the screen.

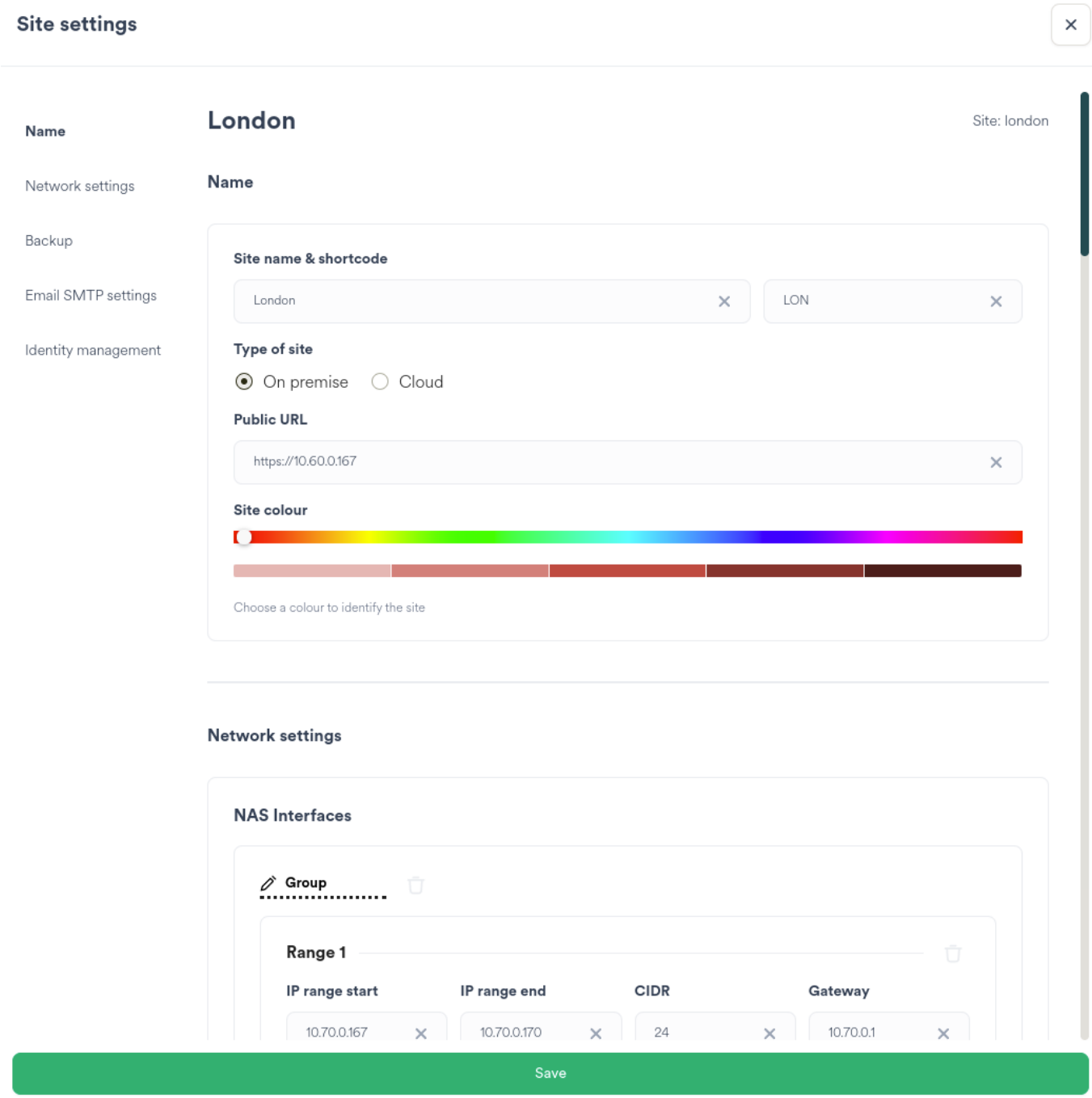
Important: This function can only be performed by a Hub Administrator.

Settings

Important: This function can only be performed by a Hub Administrator.



Click the site's Settings button to display a dialog to configure the selected site.



- Modify the *Site* settings as required. Refer to Adding a Site for settings guidance.

Pool Space

One or more pixstor storage pools which comprise the pixstor file system are represented.

Hovering over the pool percentage bar provides the remaining capacity for the pool.

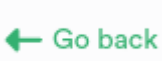
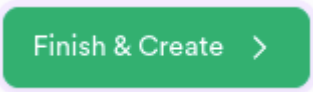
Adding a Site

Add Site Wizard

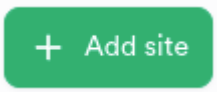
Hub allows remote configuration of all participating pixstor sites.

New sites are automatically joined to Hub awaiting optional configuration via the Site Wizard.

Navigating the Wizard

	Click the close button to exit the wizard. Changes are not saved.
	Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.
	Click the Go Back button to return to the previous wizard page.
	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

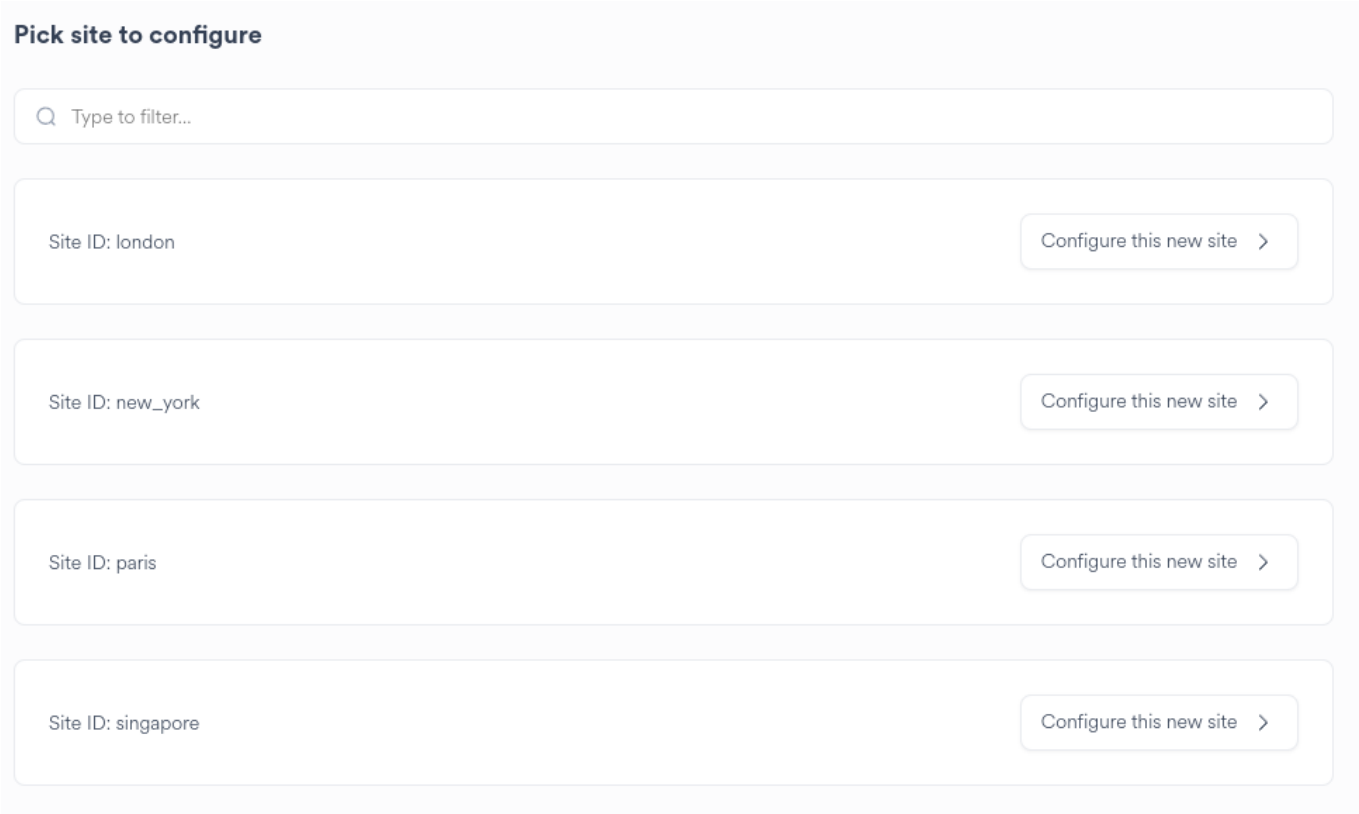
Add Site

	Click the Add site button to display a dialog to configure the selected site.

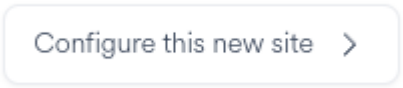
Important: This function can only be performed by a Hub Administrator.

Pick site to configure

Sites which have been automatically registered to Hub but not yet configured are shown:

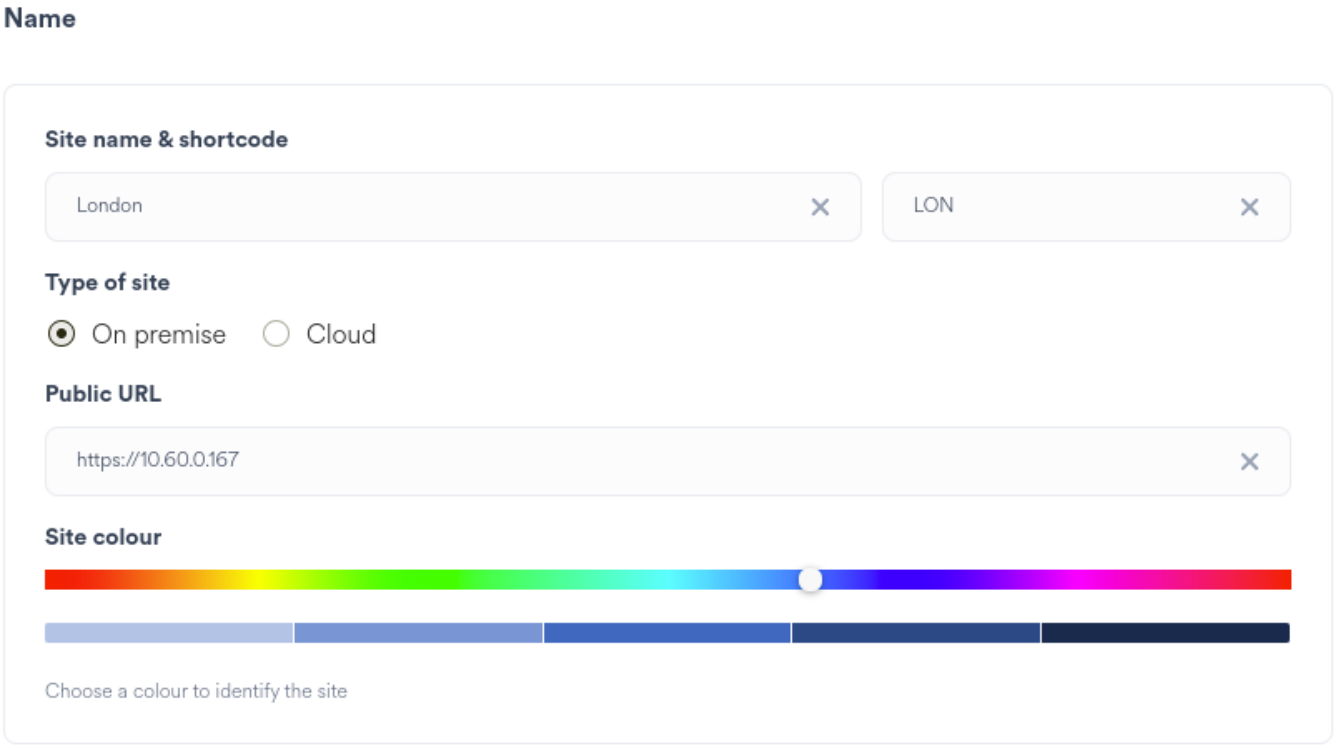


- Select a site to configure



Click the Configure this new site button to proceed

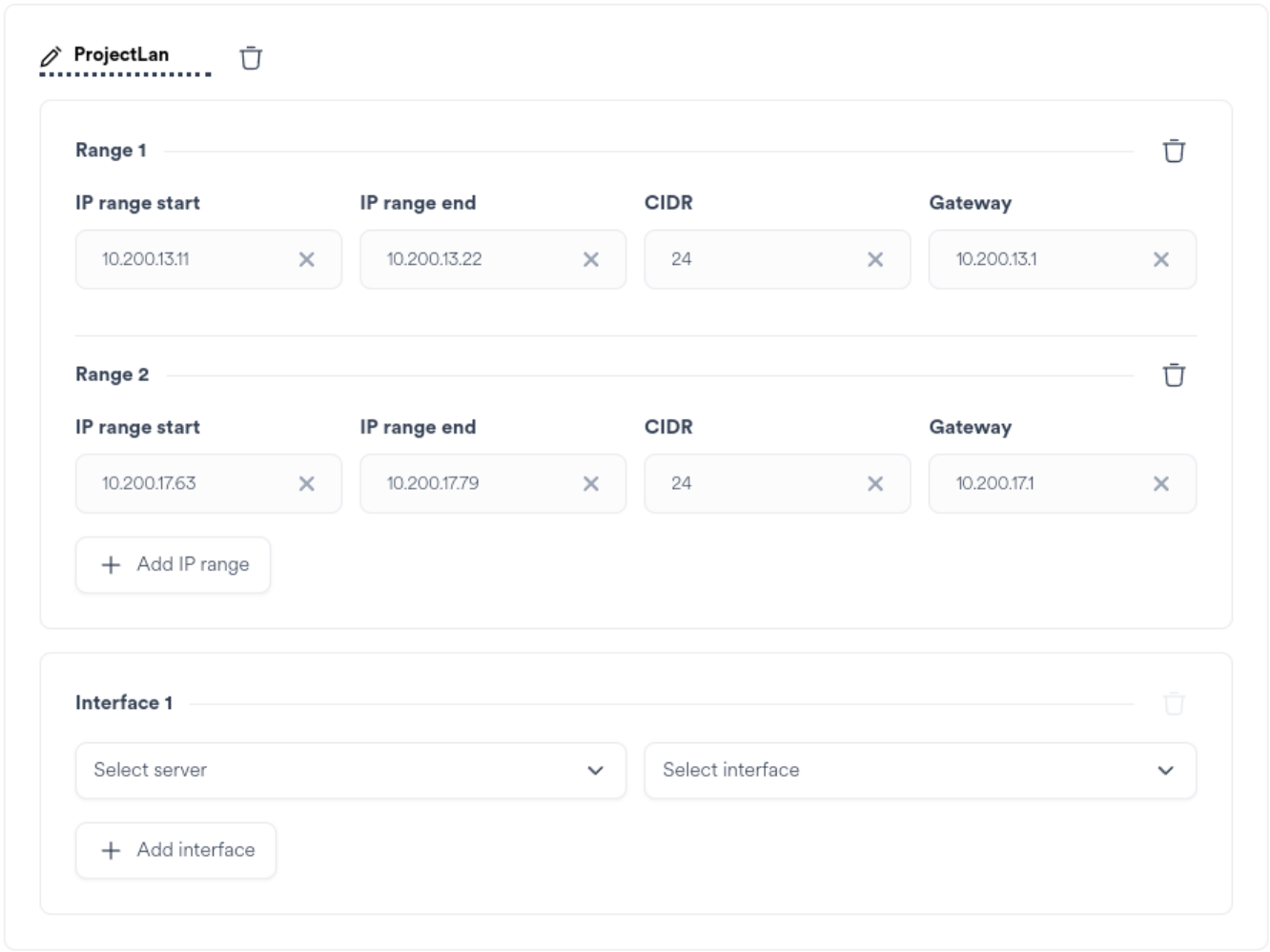
Site Name



- Provide a friendly name for the Site
- Provide a 3 character short code for the site. The shortcode is displayed as the label on the Site's chip. E.G. LDN for London

- Specify whether the site is on-premise or a pixstor cloud deployment. Each site type provides different Network Setting options.
- Provide the URL IP or FQDN which refers to the pixstor management node of the Site
- Select a colour for the Site chip

Network Settings (On premise)



- Add the required IP address or network range and specify a valid CIDR mask to apply the restriction
- Specify a gateway, if required
- Select the server(s) and interface(s) of the server where the IP range will be configured

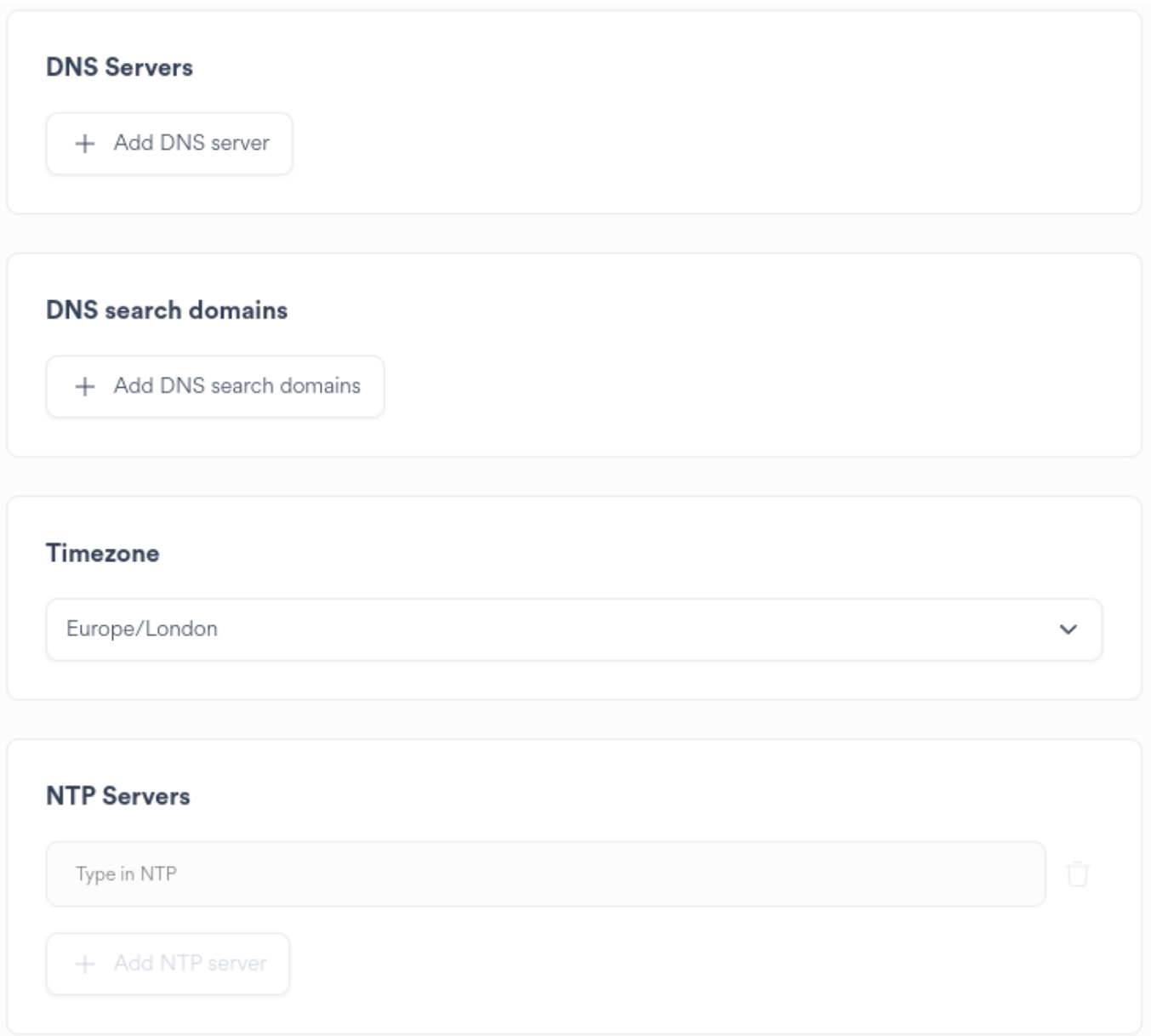
+ Add IP range	Click the Add IP range button to add additional restrictions
+ Create another group	Click Create another group to add additional IP range to interface mapping groups
	Click the delete button to remove an IP range or Interface group

Network Settings (Cloud & General)

pixstor cloud systems use predefined network architectures.

Unlike on-premise pixstor systems there is no requirement to create IP ranges or interface groups. IP addressing is externally managed by the cloud / virtual environment.

Both on-premise and cloud systems share common network configuration for DNS, Timezone and NTP.



- Specify the IP address or FQDN hostname of one or more DNS servers
- Specify one or more DNS search domains
- Specify the Timezone in which the server resides, or will participate in
- Specify the IP address or FQDN hostname of one or more DNS servers

Hint: If the pixstor site will be joined to an external Identify Mapping service such as Active Directory or LDAP, best practice is to ensure that the DNS and NTP servers match those of the service, or point at the service hosted DNS and NTP if it provides such capabilities. Should the pixstor become out of time sync with the Identify Mapping service login failures can occur.

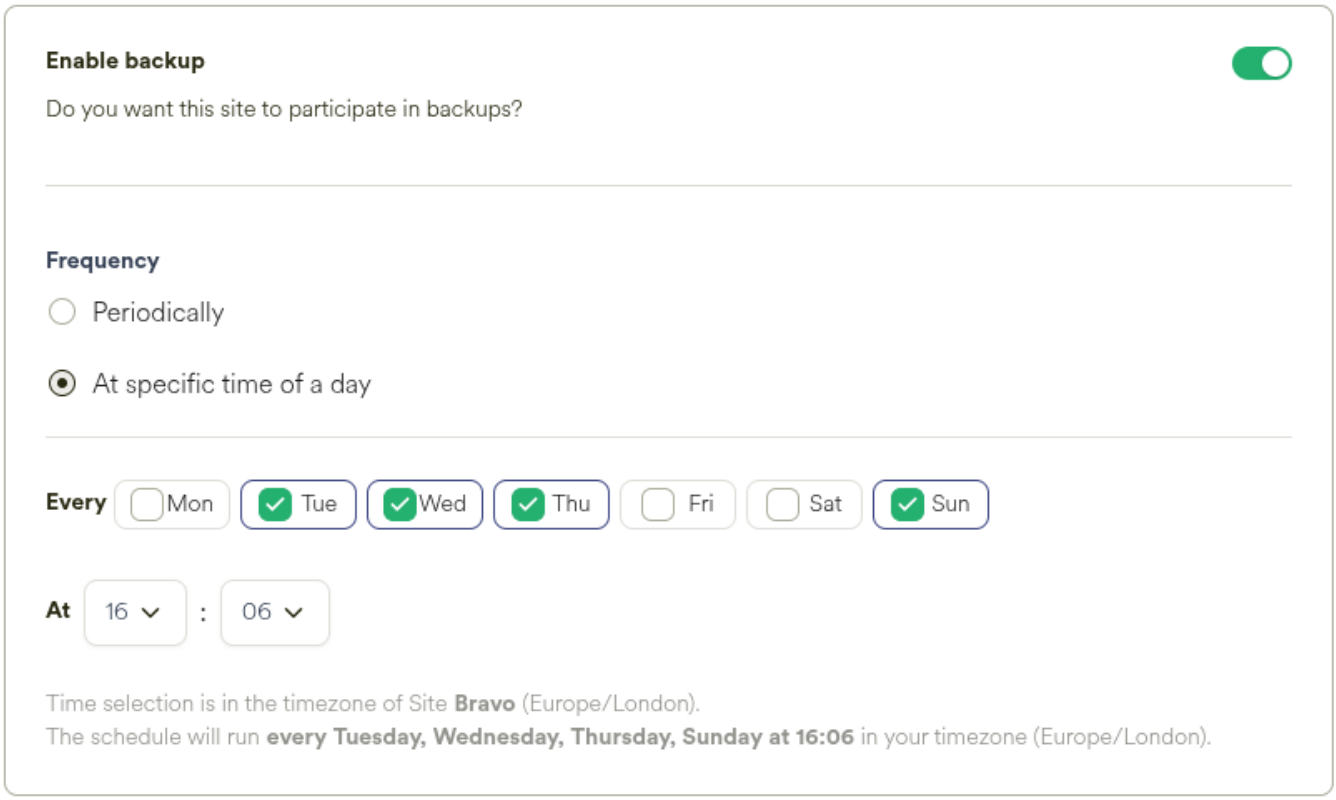
Backup

pixstor provides the capability to backup data within a Space on a per-Site basis to specific Ngenea Targets.

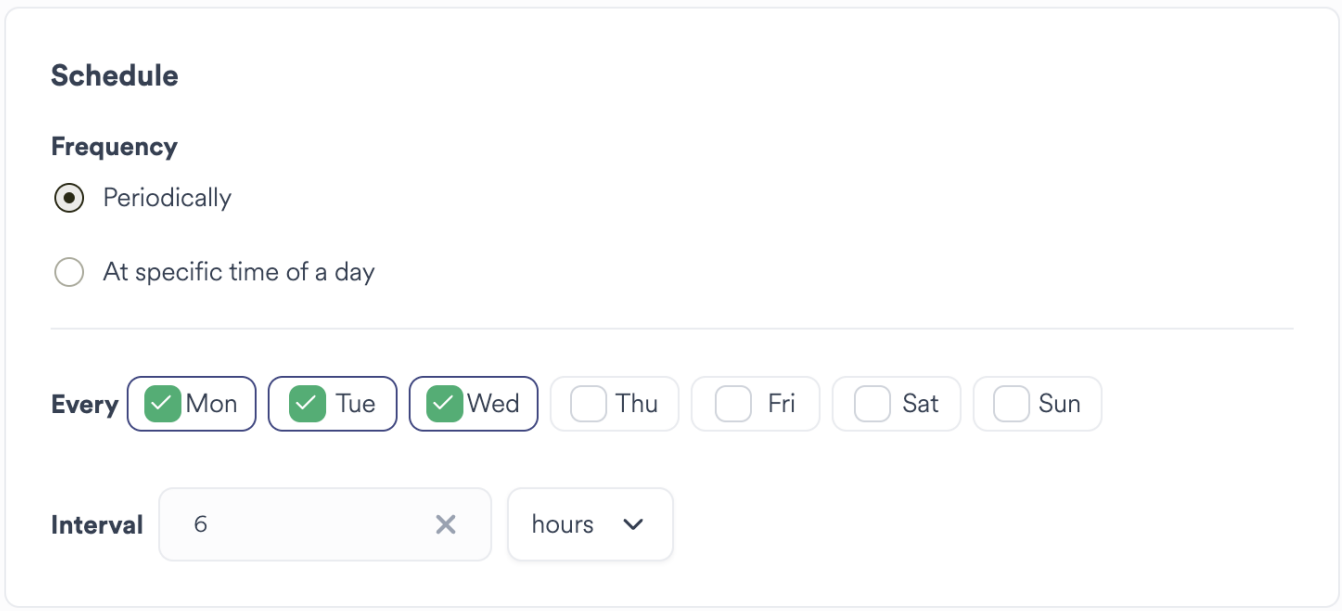
Hub enables configuration to be set for the Ngenea Backup service running on pixstor sites.

If the Site is enabled to participate in backups, each Space requires additional configuration to enable the per-Space backup.

For more information refer to Backups.



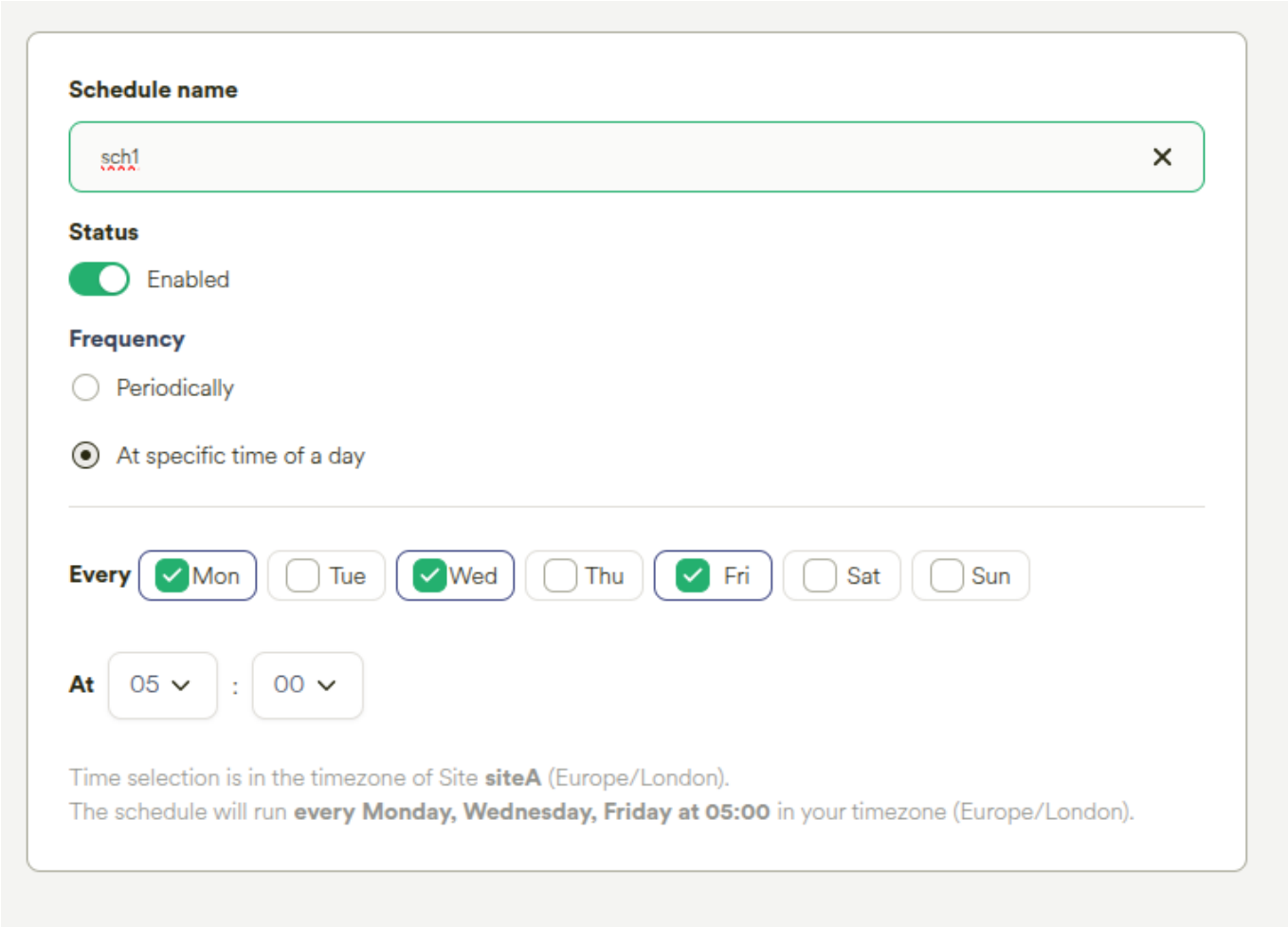
Determine the required frequency of the backup.



Choosing Periodically will ensure that the schedule will run on the next interval set.

E.G:

- 1 hour: The backup will run on the next hour (12.00, 13.00)
- 15 mins: The backup will run on the next 15 minute interval past the hour (15, 30, 45, 00)

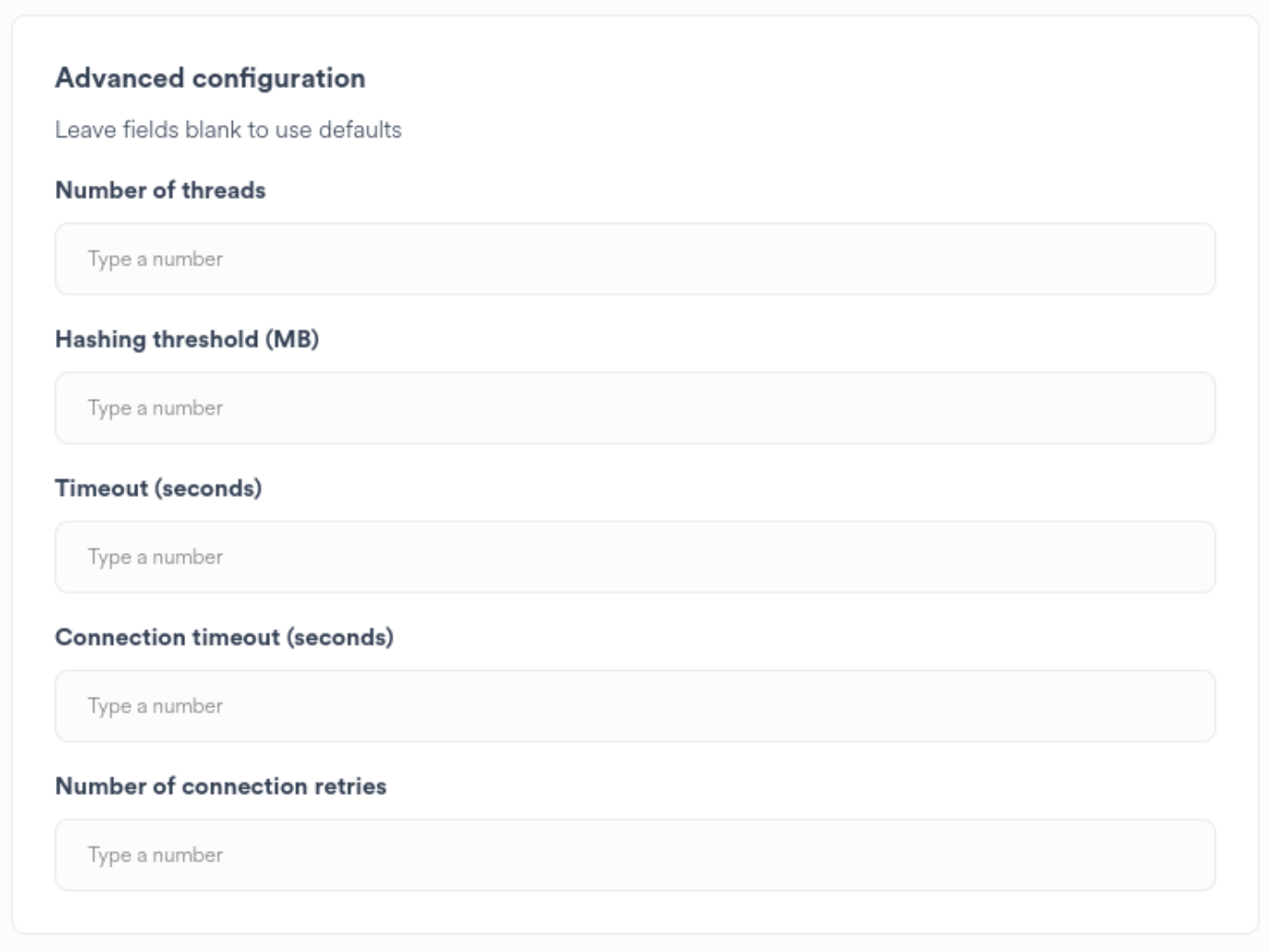


Choosing At Specific Time of A Day allows the Policy to be scheduled once per chosen day at a specific time of day.

Hint: The schedule time is set in the Site's local timezone, but will be stored in the UTC timezone.

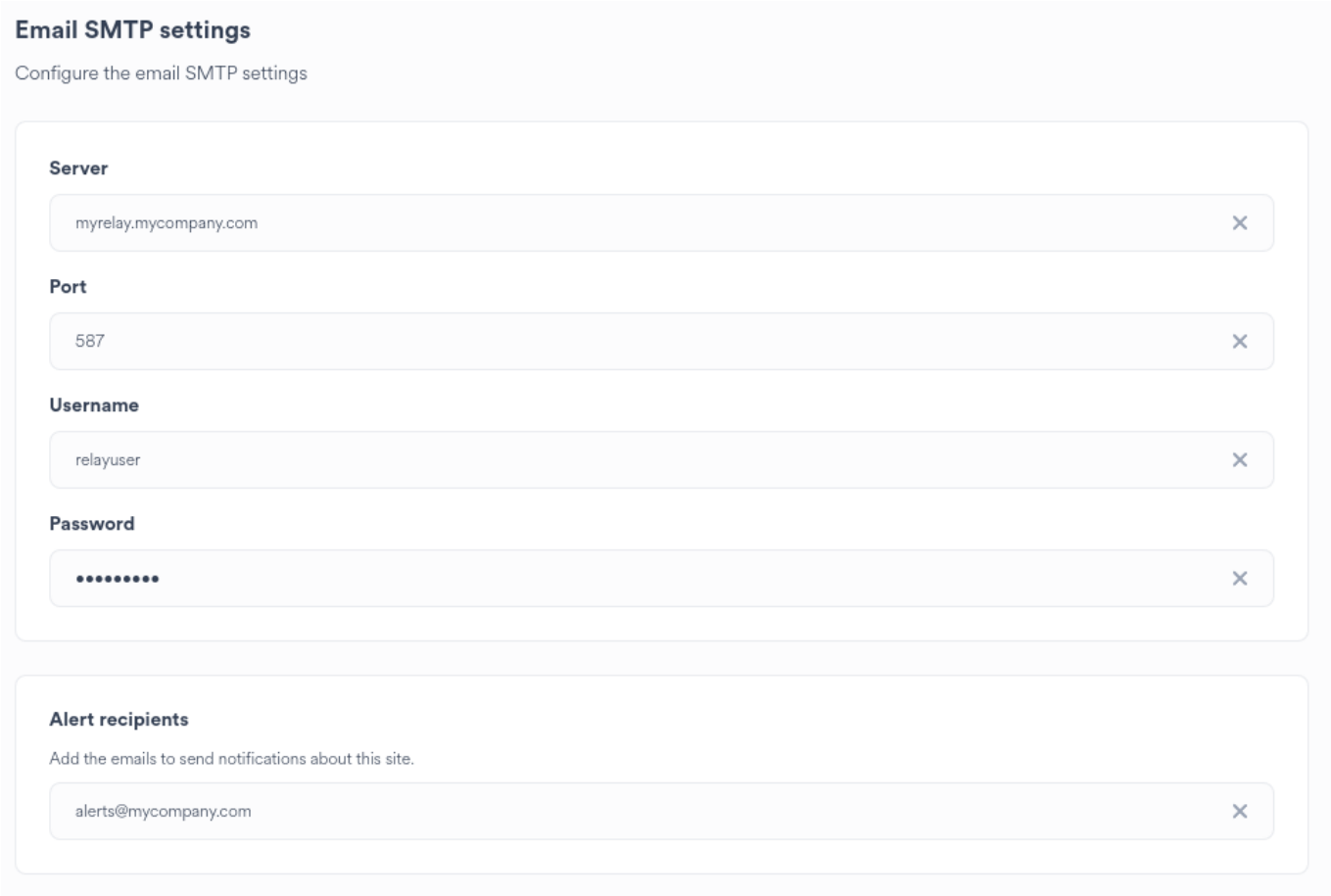
Optional tuning can be set for the backup operation in the Advanced Configuration.

Refer to the Ngenea Backup documention prior to applying any parameters.

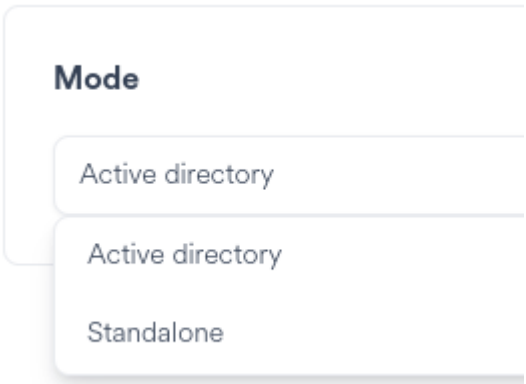


Email SMTP Settings

pixstor provides the capability to notify an inbox if service issues arise.



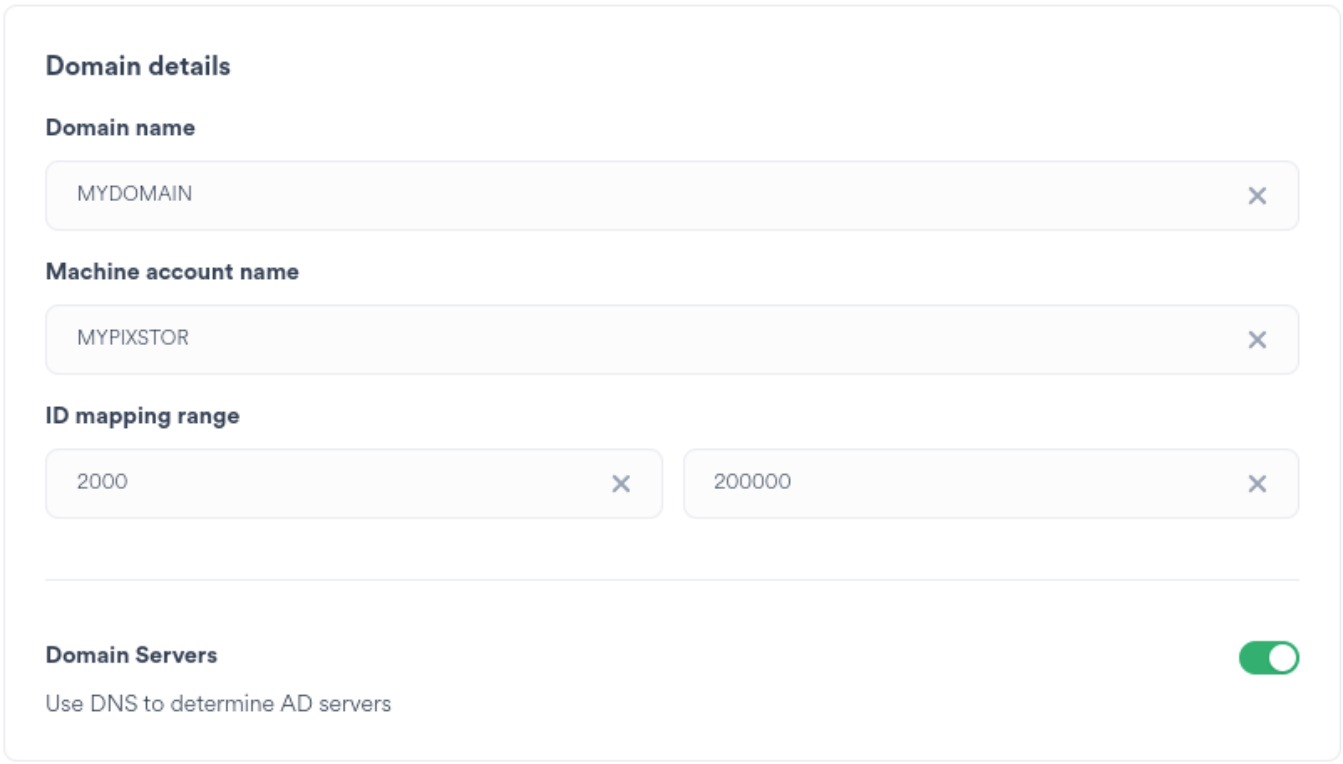
- Specify the SMTP configuration of an email server to which to send notification emails
- Specify one or more valid email addresses to receive the notification emails



Identity Management

- Specify the Identity Management mode as appropriate:

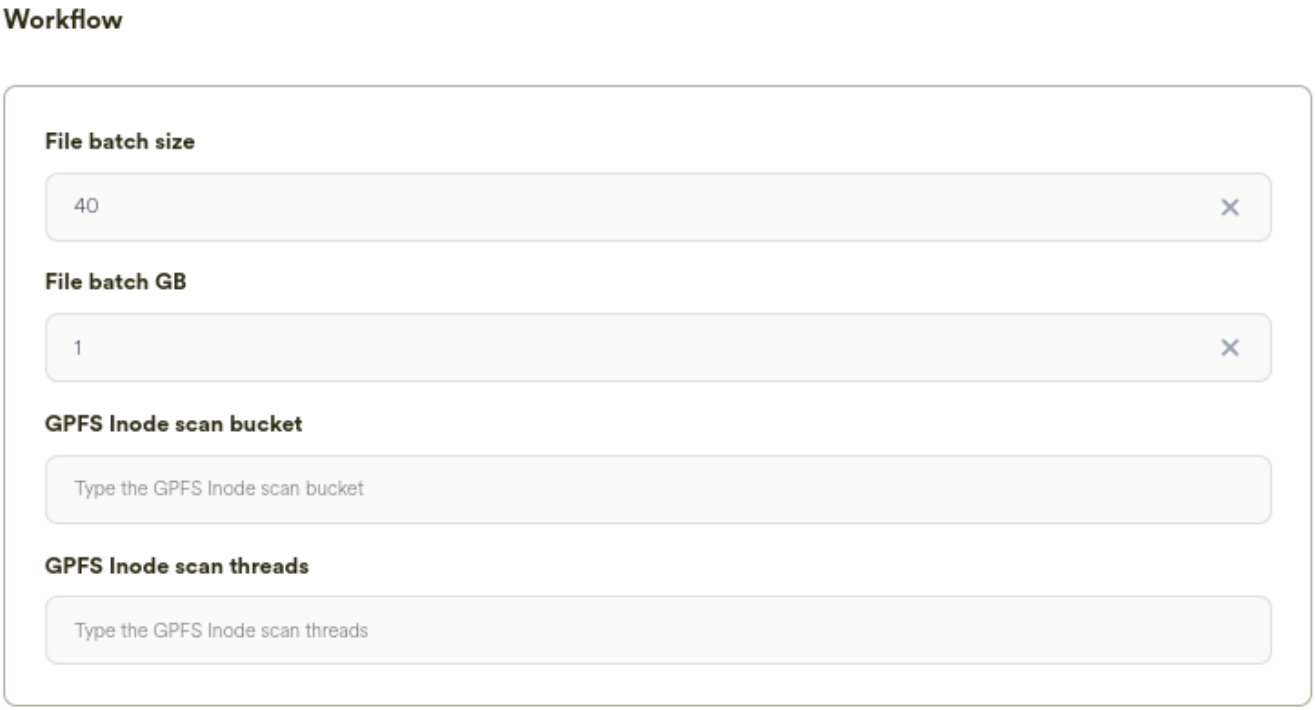
Mode	Description
Active Directory	pixstor uses RFC2307 compliant identity mapping with Active Directory
Standalone	pixstor generates local UIDs and GIDs mapped to Active Directory SIDs



- Specify the Domain to join
- Specify the Machine account name
- Specify the ID range to map to
- Specify whether to use DNS to locate an Active Directory Domain Controller or alternatively specify an IP address or hostname

- Specify a valid username and password with domain join capability

Workflow



File Batching

Whichever limit results in a smaller batch size applied. For examples given 100 files of 500MB each, a File batch GB of 1 and a File Batch Size of 10 will result in 50 batches of 2 files each (1GB total per batch), because 1GB (2 files) is smaller than 10 files (5GB).

File batch settings apply to all workflows run on a Site.

Alternatively enable Dynamic File Batching.

For more information refer to the Administration Guide.

- Specify the File batch size

Hint: Default = 40. Increasing this value reduces the number of tasks processed in a job. Reduction of tasks in a job, for the majority of workflows, reduces the total time for the job to run due to decreasing the total task processing overhead. It is extremely recommended to start with small values and increase based on observation of system load and resources and adding too many files to collate into a single task can cause the task payload to be rejected by Hub due to the size of the payload.

- Specify the File batch GB

Hint: Default = 1. Increasing this value causes more files to be added to a task upto the total file size specified, after which subsequent files are added to the next task, and so on.

GPFS Inode Scanning

- Specify the GPFS Inode Scan bucket

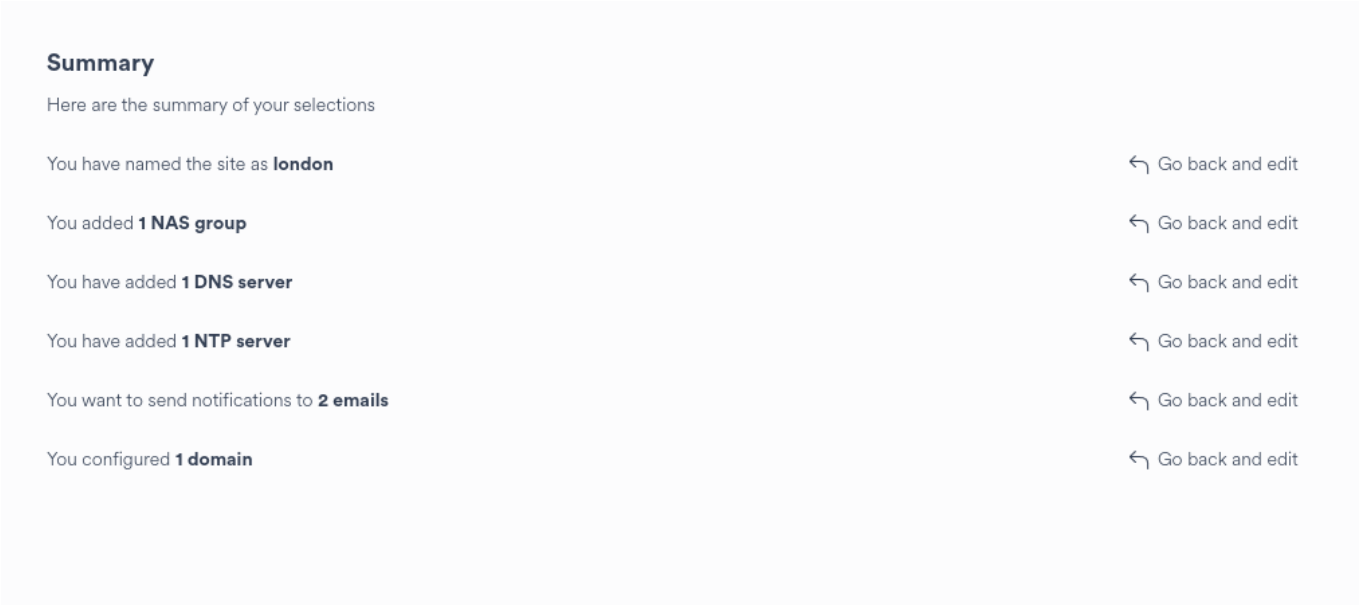
Hint: Default = auto-generated per scan. The number of bucketed groups of collated inodes to be processed by the parallel scanner. An optimal value is the total number of files to be scanned divided by one million so each bucketed inode group has approximately one million files.

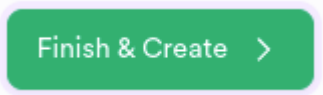
- Specify the GPFS Inode scan threads

Hint: Default = 2. The number of inode scan threads. Setting this value to the number of CPU cores can provide optimal performance with non-contending workloads. It is extremely recommended to start with small values and increase based on observation of system load and resources.

Summary

Upon completing the wizard steps a summary is presented:





Click the Finish & Create button to apply the changes displayed on the wizard summary page.

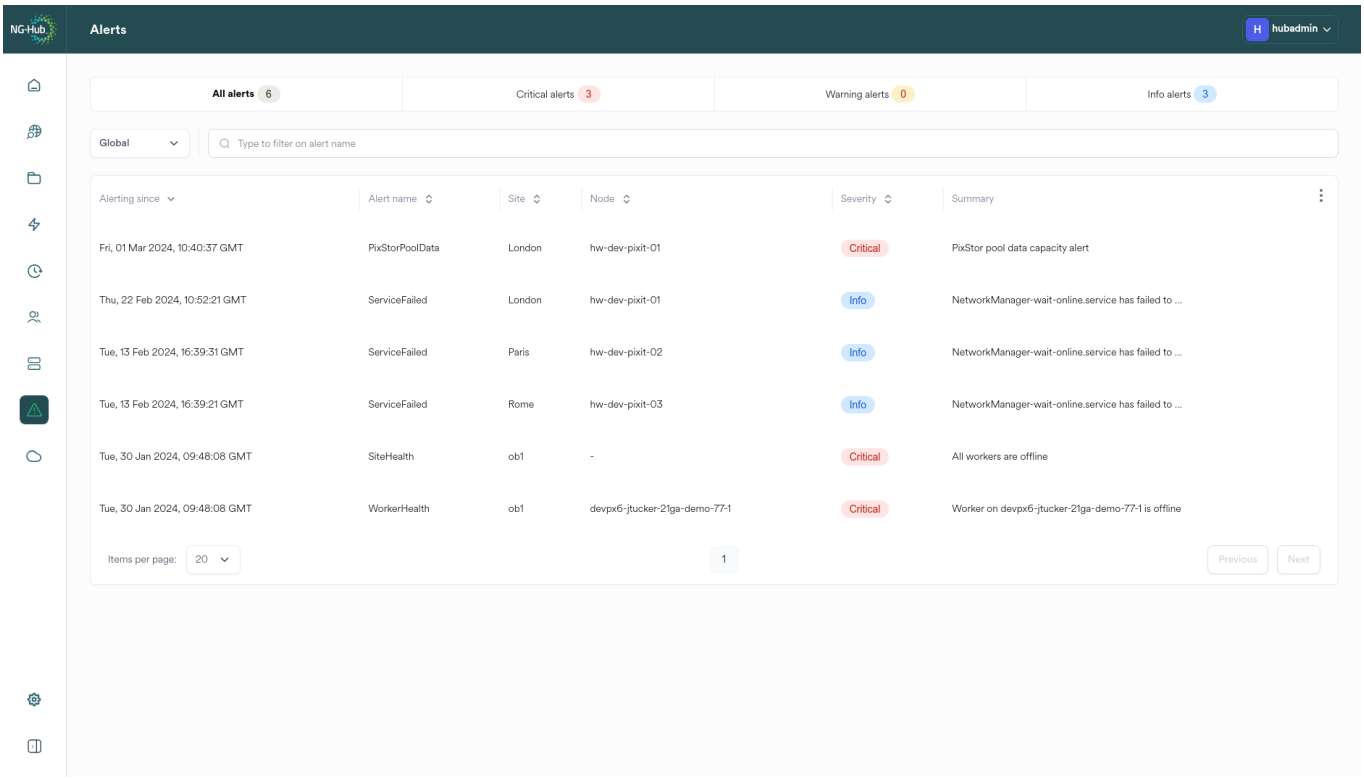
Alternatively `Go back` and change the proposed configuration as required or `close` the wizard to cancel the creation of the Ngenea target.

Alerts

Hub provides a view of alerts across all Sites.

- Only active alerts are displayed
- Muted alerts are not displayed

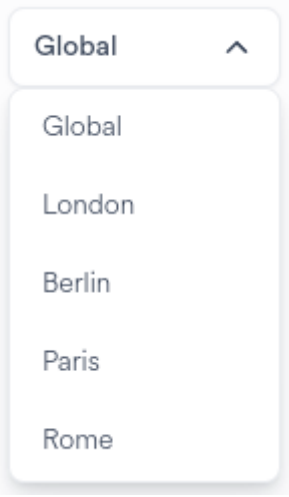
Click the alerts button to navigate to the Global Alerts screen



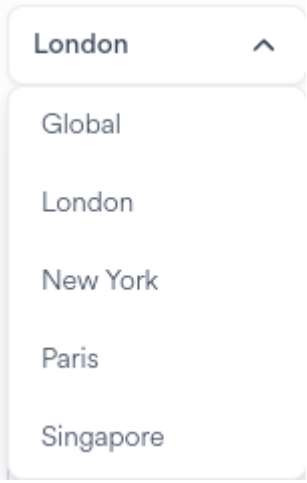
Hub provides two views of Alerts - Global and Local.

- Global displays all Alerts on all Sites
- Local displays the Alerts on a specific Site

The default view of Alerts is Global.

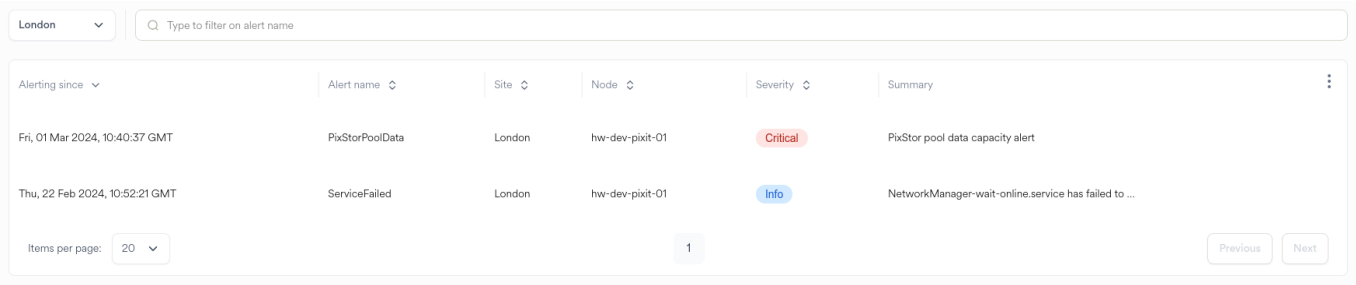


To switch to a site-centric view, select the specific site from the Alerts drop-down menu.



To switch to Global view, select Global from the Alerts drop-down menu.

Choosing a specific Site displays Alerts only from the chosen Site:



Alert Types

Above the Alert table, numbered filter buttons display the count of each type of Alert.

Select a button to filter for the specific Alert type.

All alerts 6	Click the All alerts button to view all alerts
Critical alerts 3	Click the Critical alerts button to filter for all Critical alerts
Warning alerts 0	Click the Warning alerts button to filter for all Warning alerts
Info alerts 3	Click the Info alerts button to filter for all Info alerts

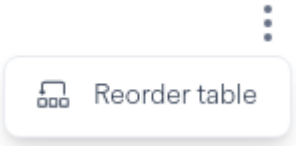
Categories

To filter for an Alert category, enter text into the filter bar.

Alerts are filtered where the Alert name matches the text in whole or part.

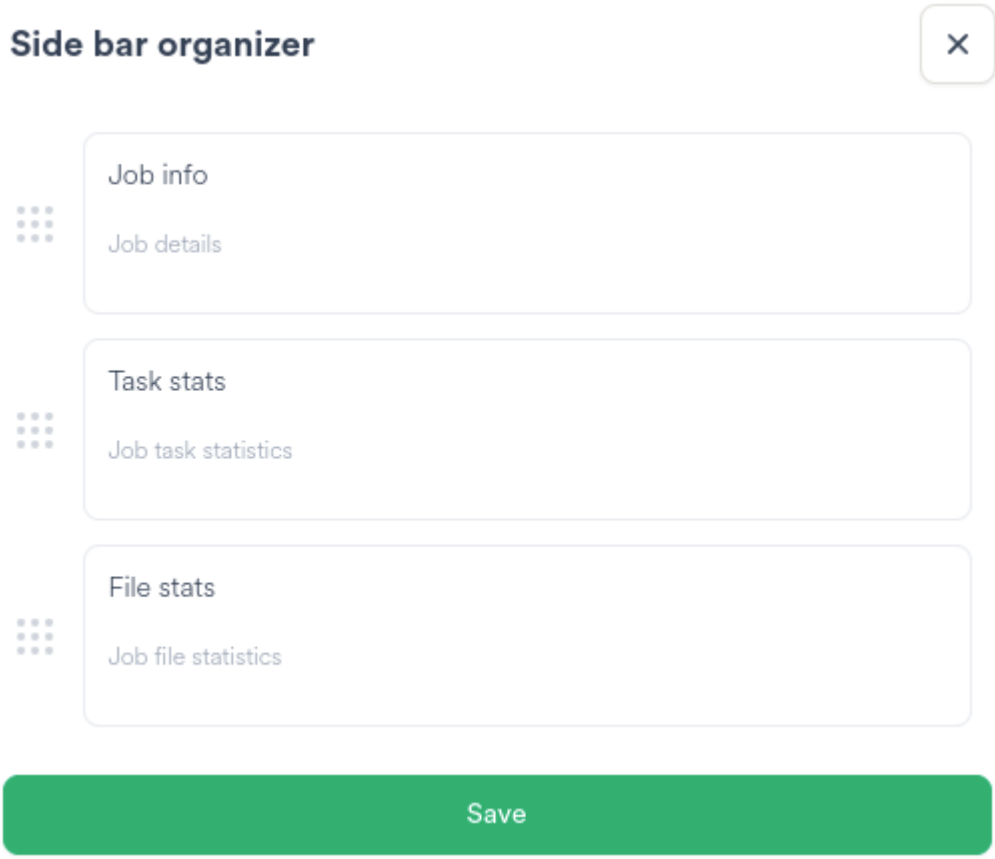
Reordering

The alerts table columns can be reorganised for user preference.



Click the vertical dots on the right hand side of the table and select the Reorder table button to open the table organizer

Re-arrange items in top to bottom order by dragging vertically up or down.



Ngenea

Ngenea 2.6+ introduces changes to how Ngenea Targets are managed. Buckets [new feature] and Targets work together to provide easy, granular mapping between Spaces and Buckets.

Ngenea provides the capability to off-site data, import data, or send data between pixstor sites.

Concepts

- A Bucket provides the storage for off-PixStor data. This may be an AWS S3, GCS, Azure Blob, POSIX or Blackpearl DS3 protocol. For versions prior to 2.6, these were previously the types of Ngenea Target.
- A Target is the mapping for how data is transferred to and from a Bucket for a Space. For versions prior to 2.6 this was available as part of the Ngenea Target setup.

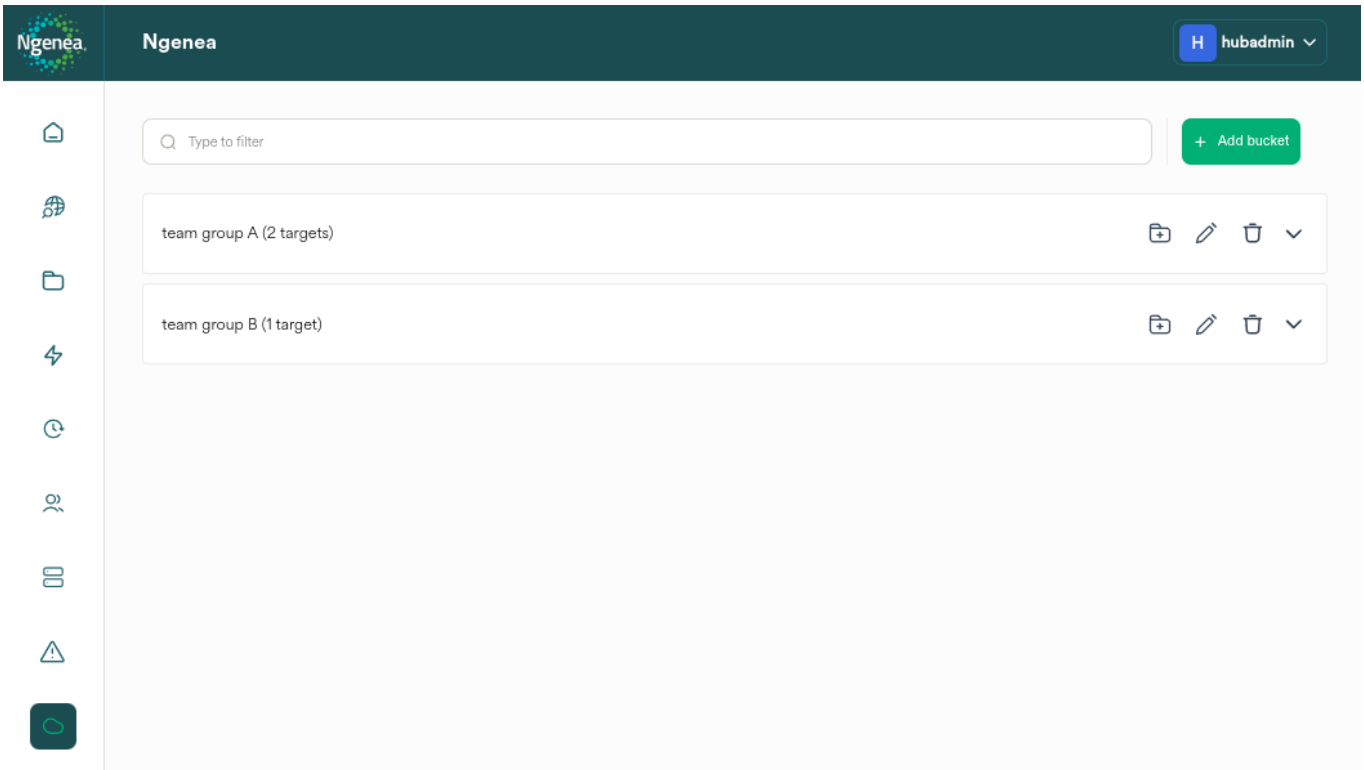
Viewing Buckets

A bucket is area of storage off-PixStor which comprises the following capabilities:

- Type
- location
- Credentials
- Bucket specific settings

Targets	Click the Ngenea button to navigate to the Ngenea screen

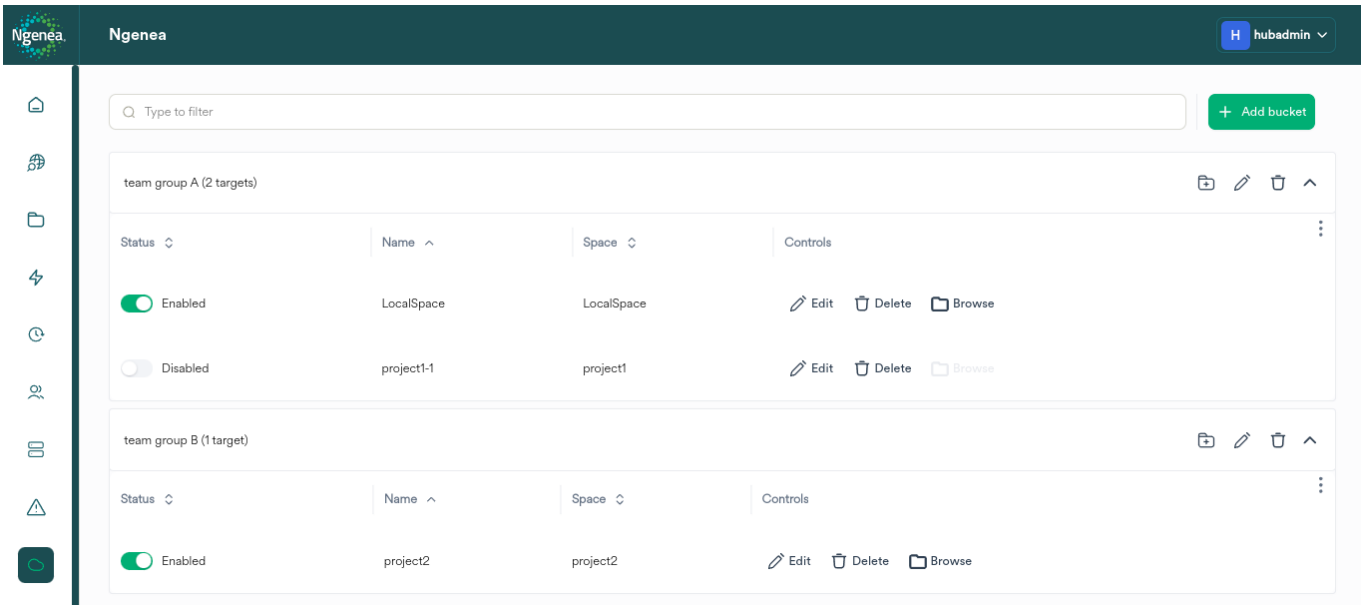
Clicking the Ngenea button in the main menu bar displays the list of Ngenea Buckets:



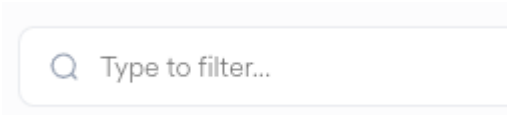
Viewing Targets

A Target is the mapping for how data is transferred to and from a Bucket for a Space.

Click the drop down button of a Bucket to view the associated Targets



Filtering Buckets

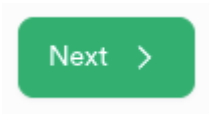


To filter the list of Ngenea Buckets, type the Bucket name or part of a Bucket name in the filter bar.

Bucket Wizard

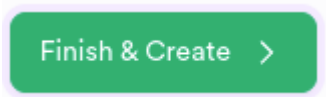
Navigating the Wizard

Click the close button to exit the wizard. Changes are not saved.



Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.

Click the Go Back button to return to the previous wizard page.



Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Adding a Bucket

Alternatively, a bucket for a Space can be created during the Space Creation Wizard. See Managing Spaces

Important: This function can only be performed by a Hub Administrator.

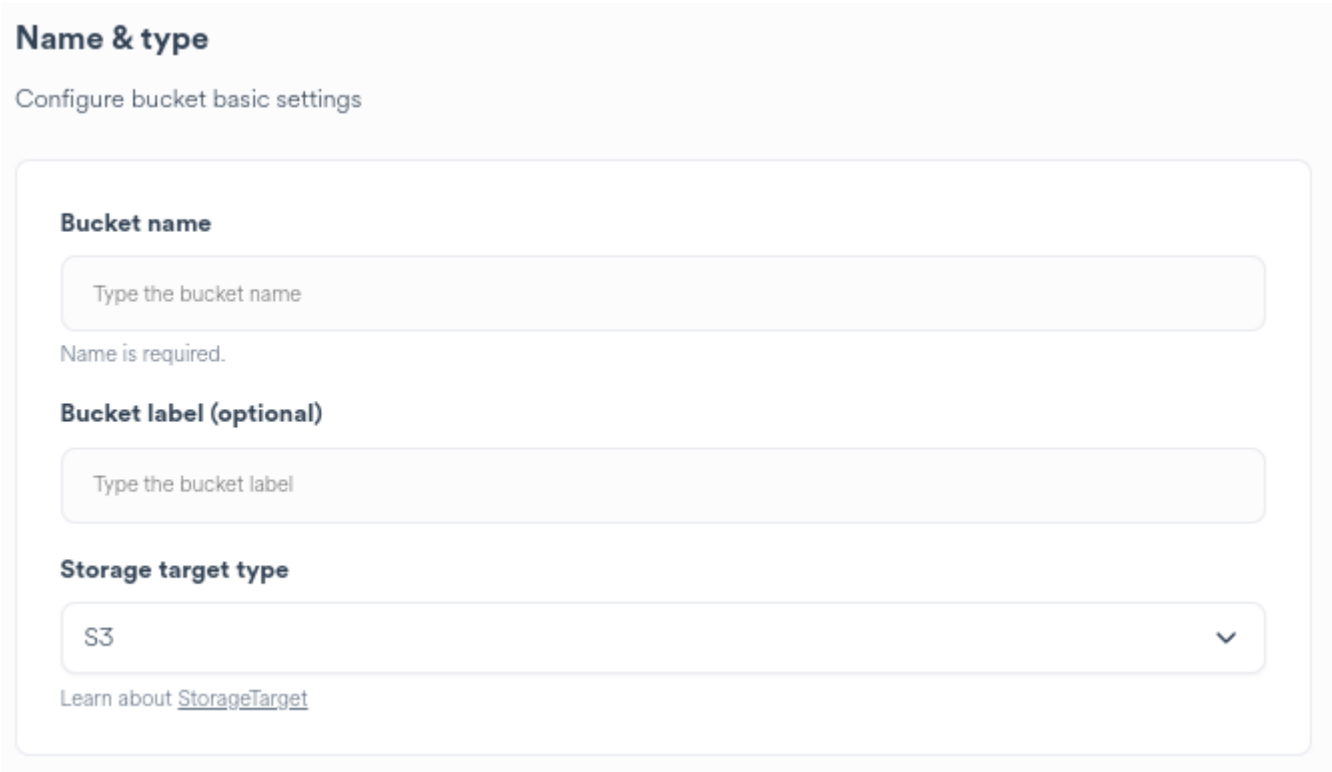
Click the Add Ngenea Bucket button to start the Ngenea Bucket Wizard

Type & reference

Ngenea supports the following storage target types:

Bucket Type	Description
S3	AWS S3 and S3 compatible buckets
Microsoft Azure	Azure Blob Storage
SpectraLogic BlackPearl	Spectralogic DS3 buckets
Google Object Storage	Google Cloud Storage
POSIX file system mount	Locally mounted targets, such as NFS

Select the required Bucket type from the drop down menu.



Enter the name of the Ngenea Bucket name.

E.G.:

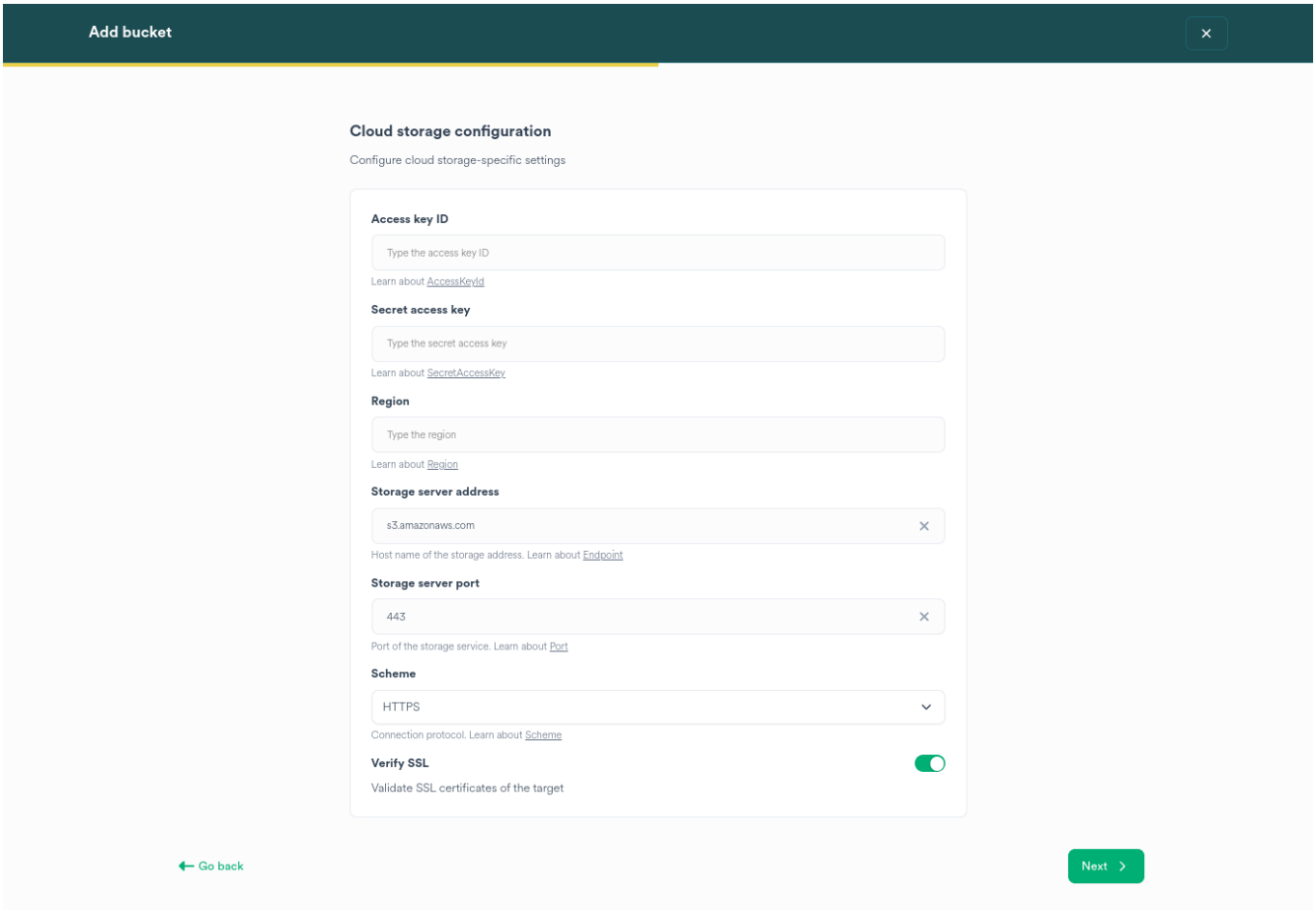
- mybucketname

Provide an optional friendly name as a Bucket label. If specified, users will see the Bucket label when referring to the Bucket in the Hub UI.

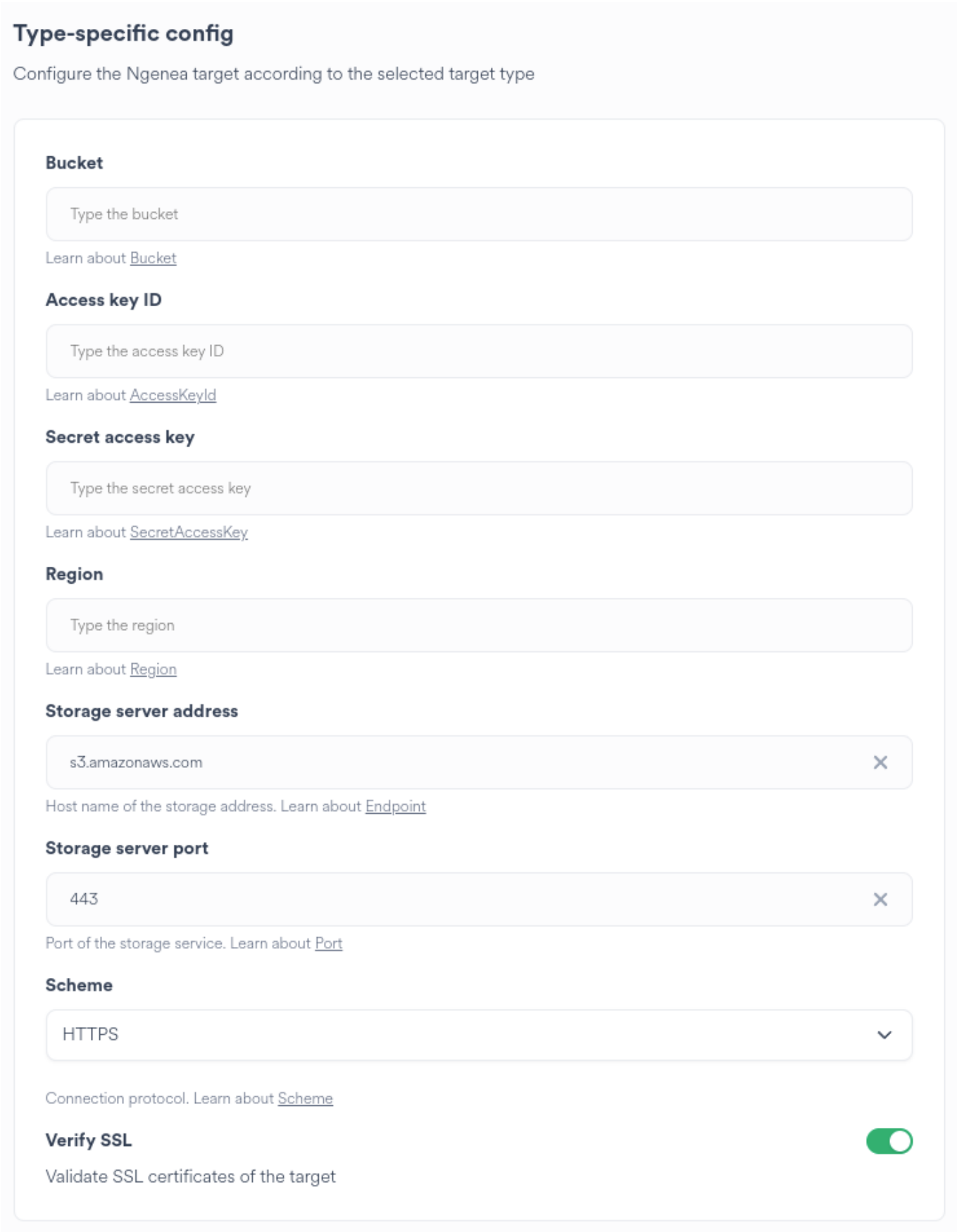
E.G.:

‘mybucketname data’

Depending on the Bucket type selected, a type-specific configuration page will be shown after selecting *Next*.


Add bucket
Cloud storage configuration
Configure cloud storage-specific settings
Access key ID
Type the access key ID
Learn about AccessKeyId
Secret access key
Type the secret access key
Learn about SecretAccessKey
Region
Type the region
Learn about Region
Storage server address
s3.amazonaws.com
Host name of the storage address. Learn about Endpoint
Storage server port
443
Port of the storage service. Learn about Port
Scheme
HTTPS
Connection protocol. Learn about Scheme
Verify SSL
Validate SSL certificates of the target
Go back
Next

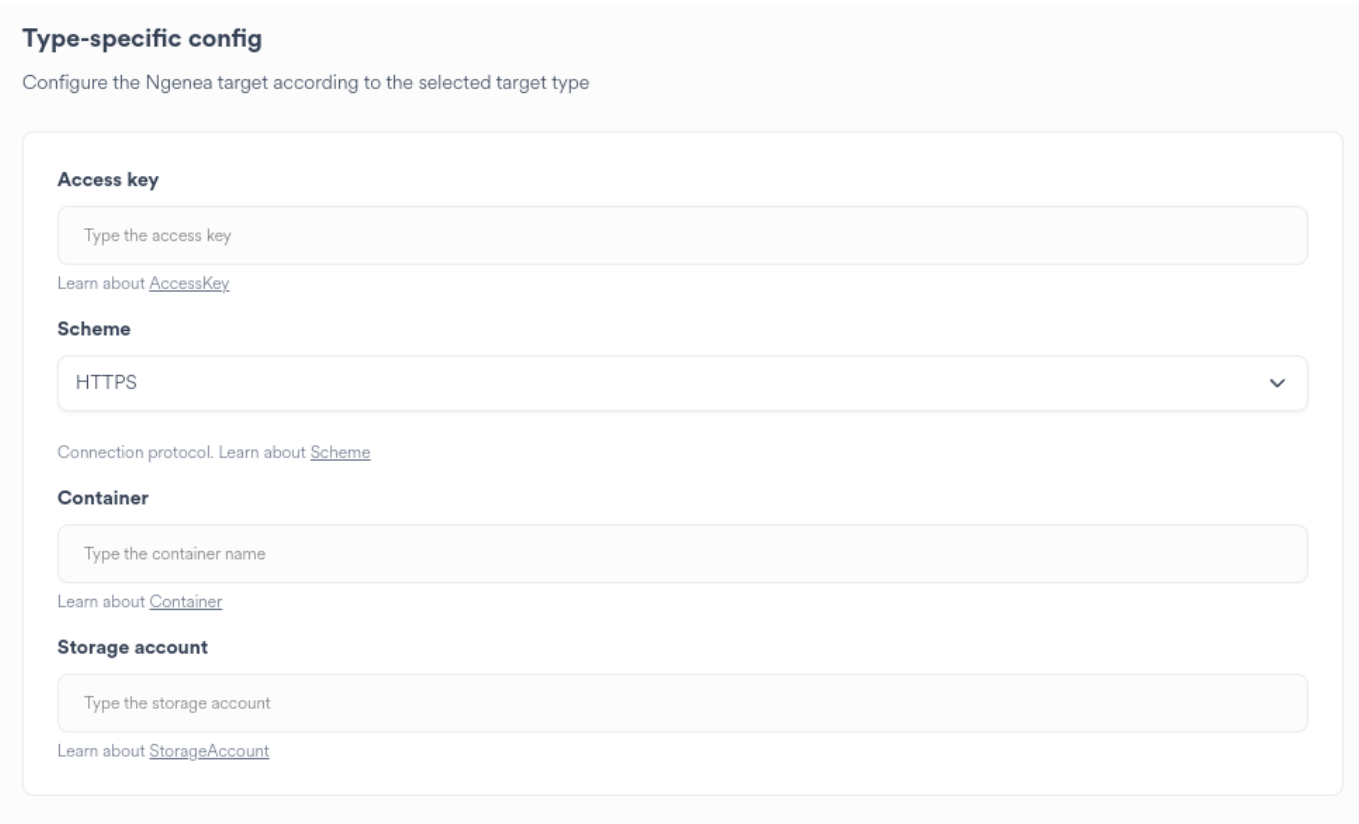
Type-specific config AWS S3 or compatible



Enter the settings as required, which must match those set in the S3 object storage provider:

Setting	Description
Bucket	The name of the storage bucket as specified at the object storage service.
Access key ID	The unique access key for the AWS user account performing data transfers. This will be stored encrypted.
Secret access key	The unique security key for the AWS user account performing data transfers. This will be stored encrypted.
Region	The AWS (or S3 compliant provider) region hosting the S3 Cloud Storage
Storage server address	Not used for Amazon S3 Cloud Storage. For services which reside at specific IPs, such as AWS Snowball, MinIO or LocalStack, specific the host or IP address to connect to.
Storage server port	The TCP/IP port used to communicate
Scheme	HTTP or HTTPS transfer. HTTPS is recommended. Data integrity cannot be guaranteed over HTTP transfer schemes.
Verify SSL	Whether to verify the SSL connection of the target. Disabling the SSL verification allows connections to storage targets which do not provide valid SSL certificates. Connecting to invalid SSL certificates is insecure.

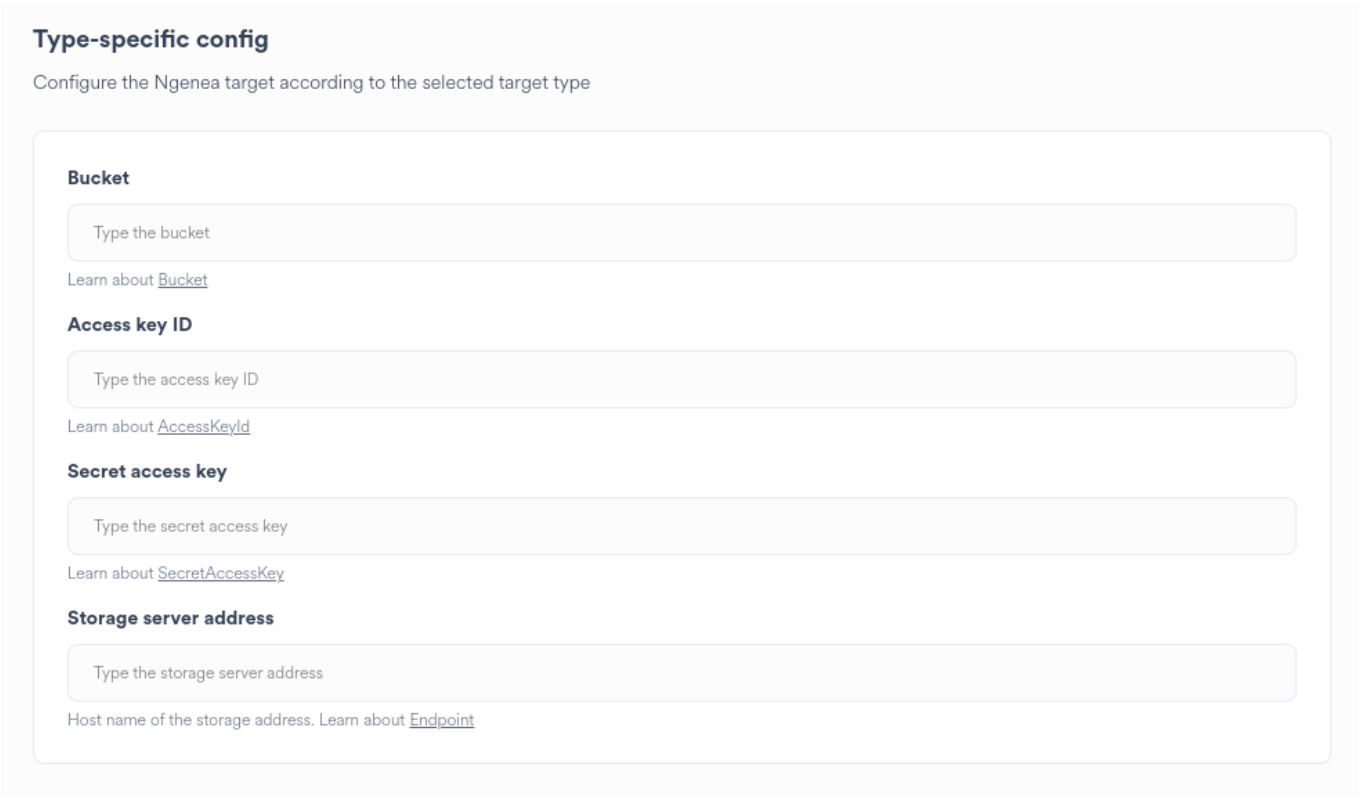
Type-specific config Microsoft Azure



Enter the settings as required, which must match those set in the Azure object storage provider:

Setting	Description
Access key ID	The unique access key for the Azure user account performing data transfers. This will be stored encrypted.
Scheme	HTTP or HTTPS transfer. HTTPS is recommended. Data integrity cannot be guaranteed over HTTP transfer schemes.
Container	The storage container for the blob data.
Storage account.	The Azure namespace containing the Container

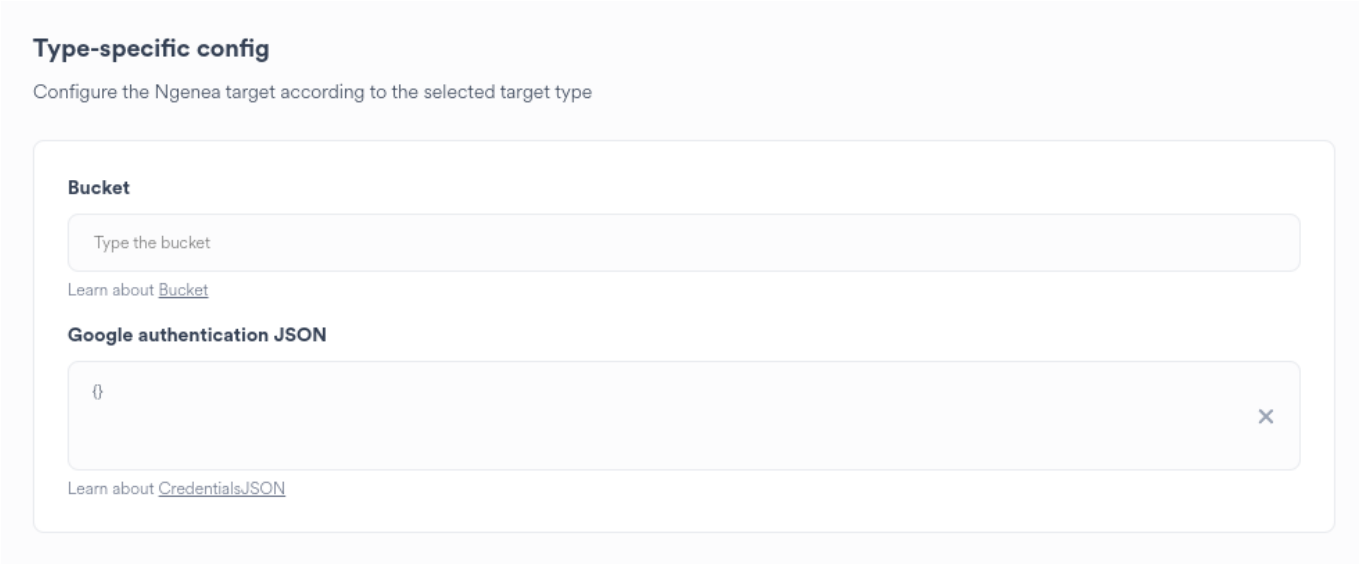
Type-specific config Spectra Logic BlackPearl



Enter the settings as required, which must match those set in the BlackPearl DS3 object storage provider:

Setting	Description
Bucket	The name of the storage bucket as specified at the object storage service.
Access key ID	The unique access key for the BlackPearl user account performing data transfers. This will be stored encrypted.
Secret access key	The unique security key for the BlackPearl user account performing data transfers. This will be stored encrypted.
Storage server address	The FQDN hostname of the BlackPearl.

Type-specific config Google Object Storage

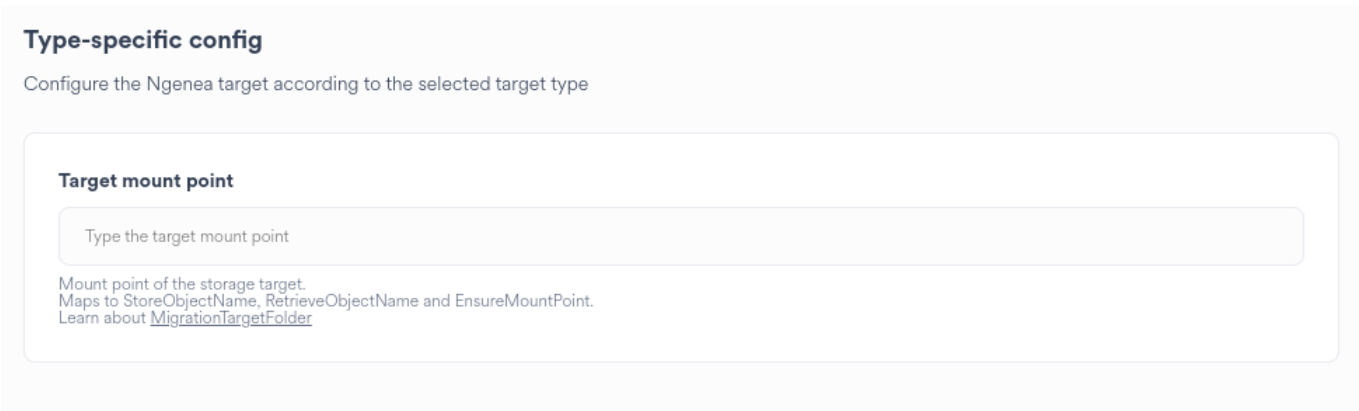


Enter the settings as required, which must match those set in the Google Cloud Storage object storage provider:

Setting	Description
Bucket	The name of the storage bucket as specified at the object storage service.
Google authentication JSON	Enter the contents of the JSON key for the user or service account granted permission to transfer data to Cloud Storage bucket. This will be stored encrypted. For more information refer to Google documentation

Important: If the Ngenea Bucket is to be used as a backup only bucket, *do not* define JSON information in the Google Authentication JSON. Instead define keyword `CredentialsFile` with the path to the file containing JSON credentials on pixstor. For more information refer to Backup-Only Targets.

Type-specific config Filesystem Mount

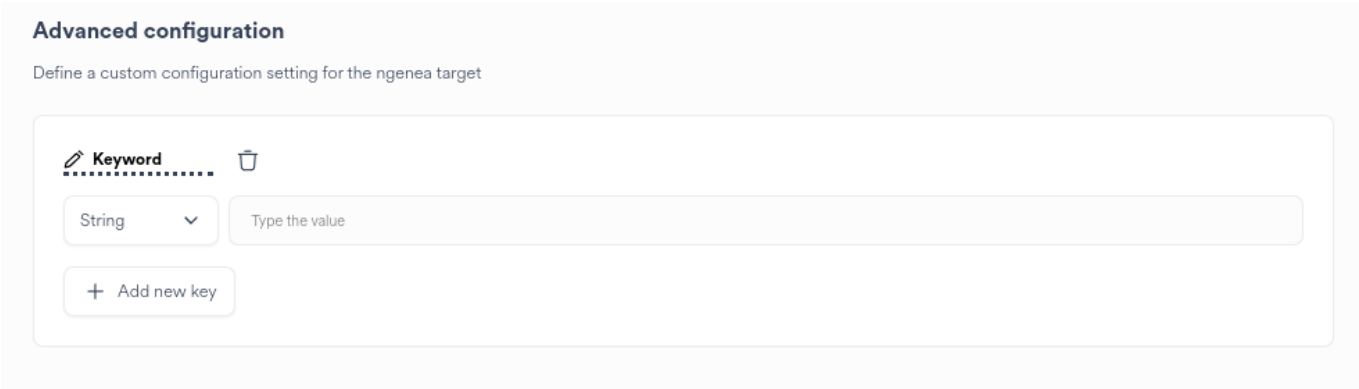


Enter the settings as required, which must match the location of the NAS mount point on the pixstor:

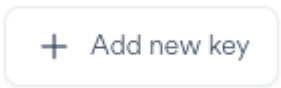
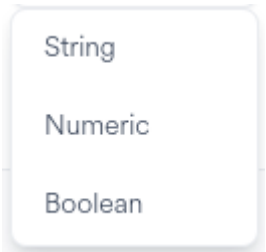
Important: Bucket mounts points are site-specific however Hub will create the target across sites associated with Space.

Setting	Description
Target mount point	The location of the POSIX compliant mounted storage. E.G. If the external POSIX storage is mounted on `/mmfs1/myexternalnas` enter `/mmfs1/myexternalnas`

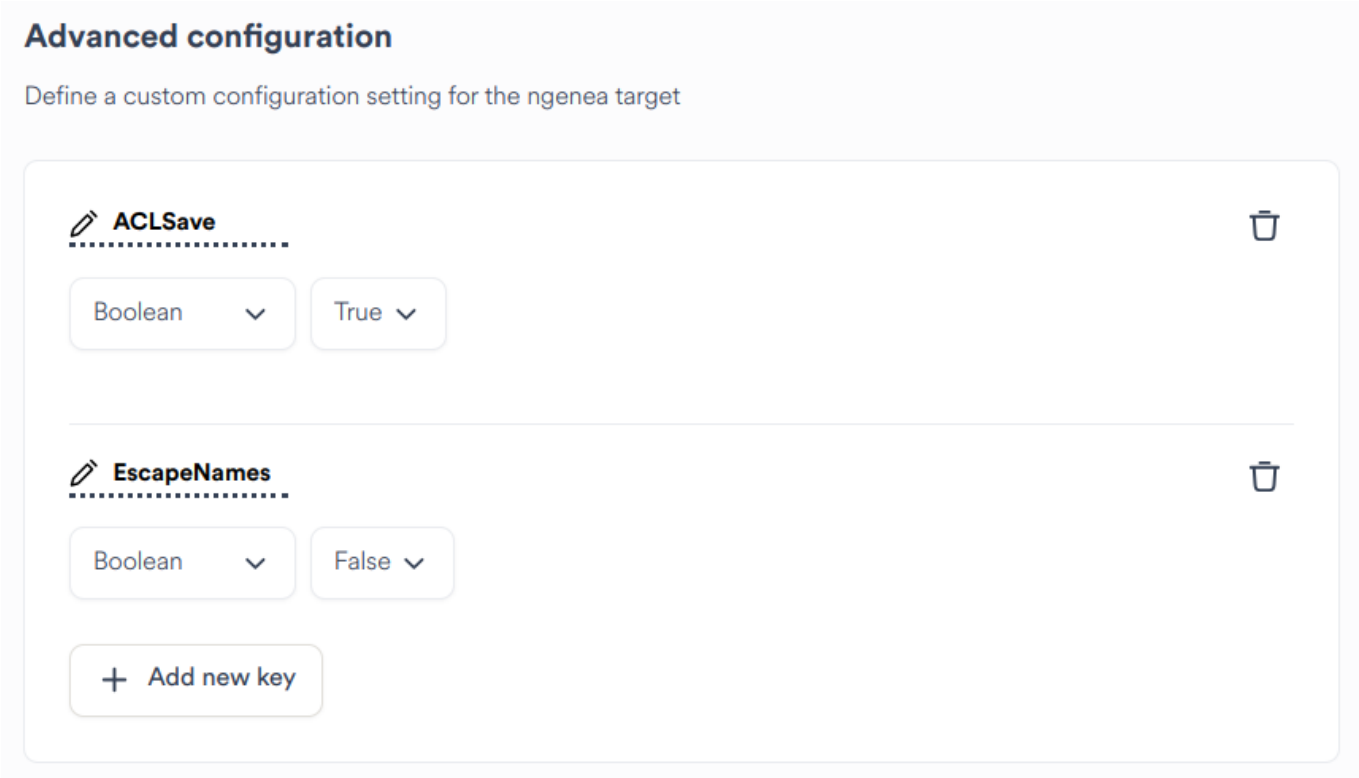
Advanced configuration



To add configuration settings to a target to control specific behaviour during Ngenea data operations.

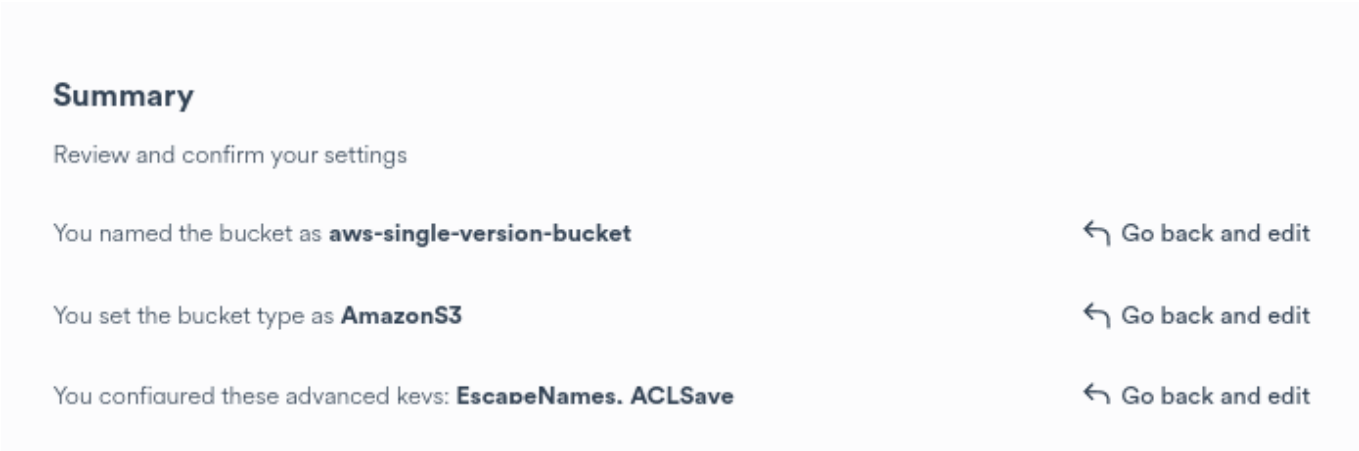
	Click the Add new key to define a new configuration setting
	Enter the name of the configuration setting in the Keyword field
	Select the type of configuration setting from the drop down menu. Choose or enter the value for the configuration setting.

Example of added Advanced configuration settings:



Summary

Upon completing the wizard steps a summary is presented:



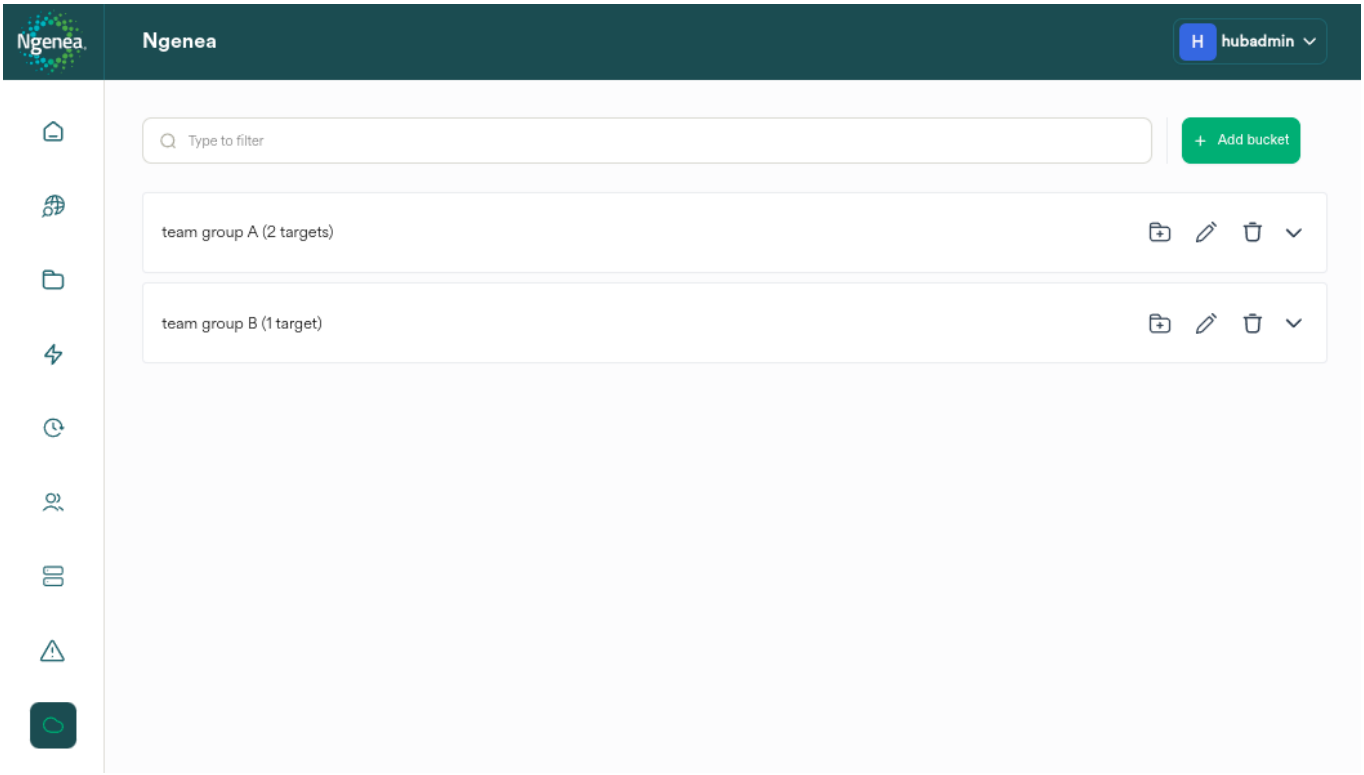
Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Alternatively `Go back` and change the proposed configuration as required or `close` the wizard to cancel the creation of the Ngenea target.

Editing a Bucket

Important: This function can only be performed by a Hub Administrator.

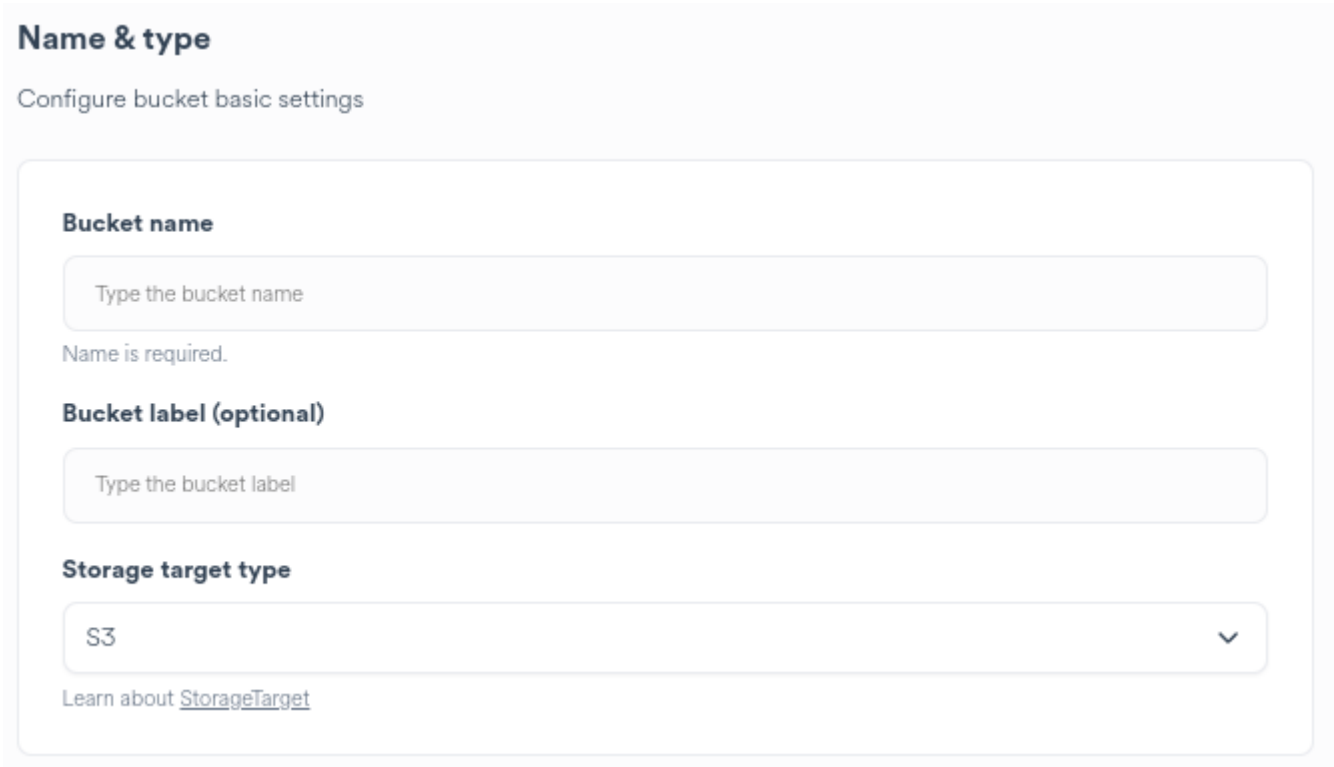
Clicking the Ngenea button in the main menu bar displays the list of Ngenea Buckets:



Edit

Click the edit icon on the required Ngenea Bucket row to edit the Ngenea Bucket

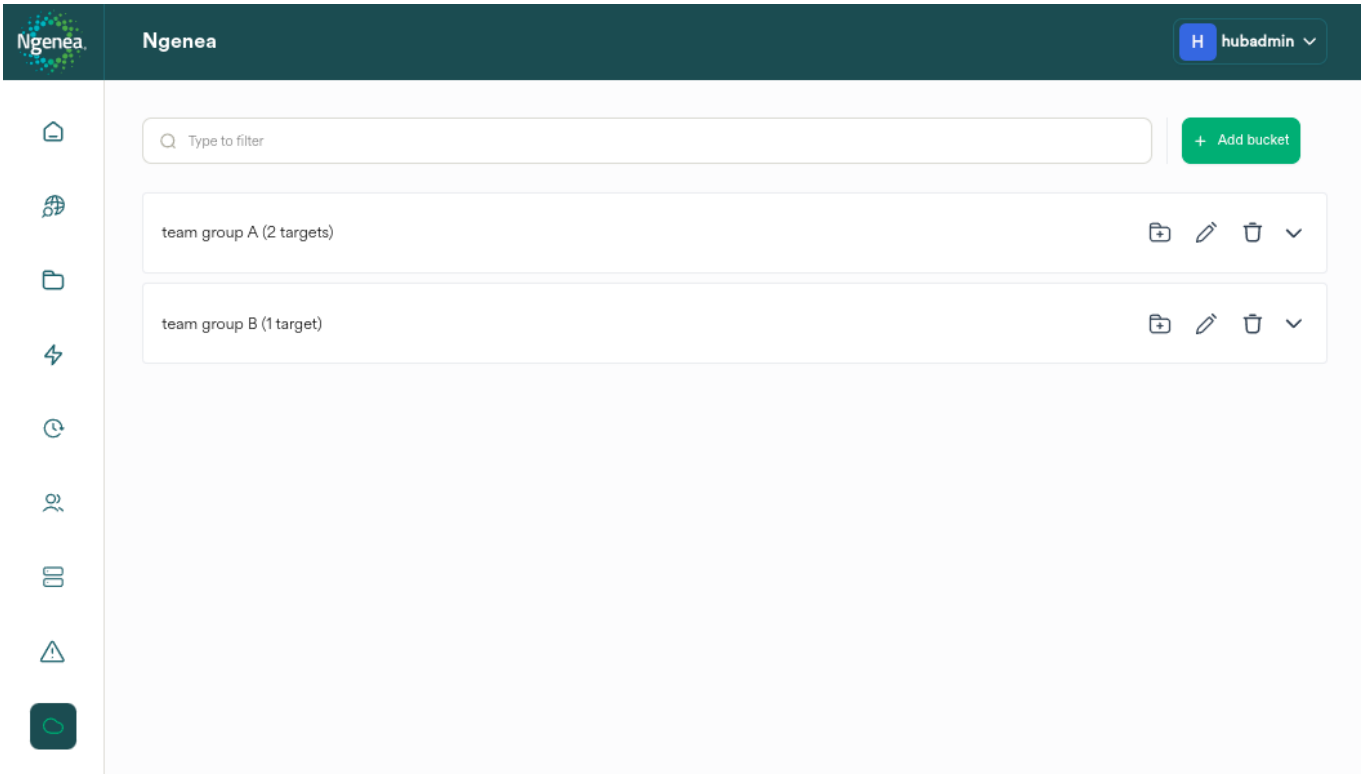
- Modify the Ngenea Bucket settings as required. Refer to Adding a Bucket for settings guidance.

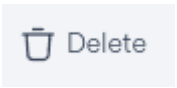


Deleting a Bucket

Important: This function can only be performed by a Hub Administrator.

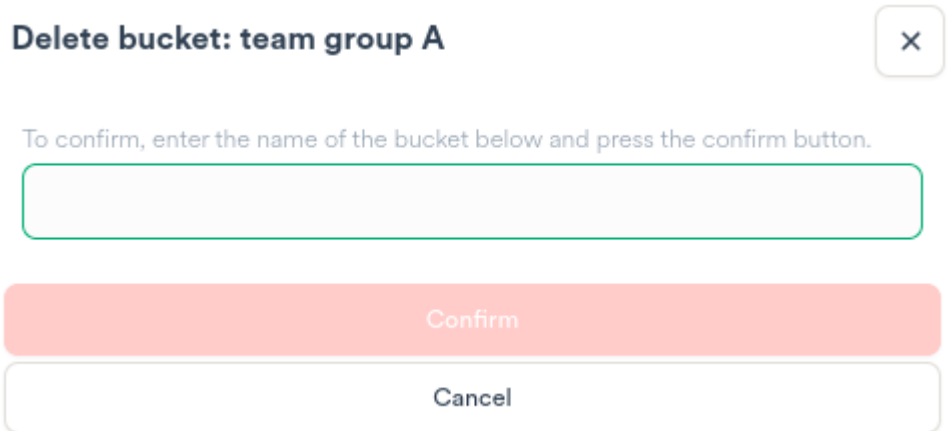
Clicking the Ngenea button in the main menu bar displays the list of Ngenea Buckets:





Click the delete icon on the required Ngenea bucket row to delete the Ngenea Bucket

A confirmation dialog is raised:



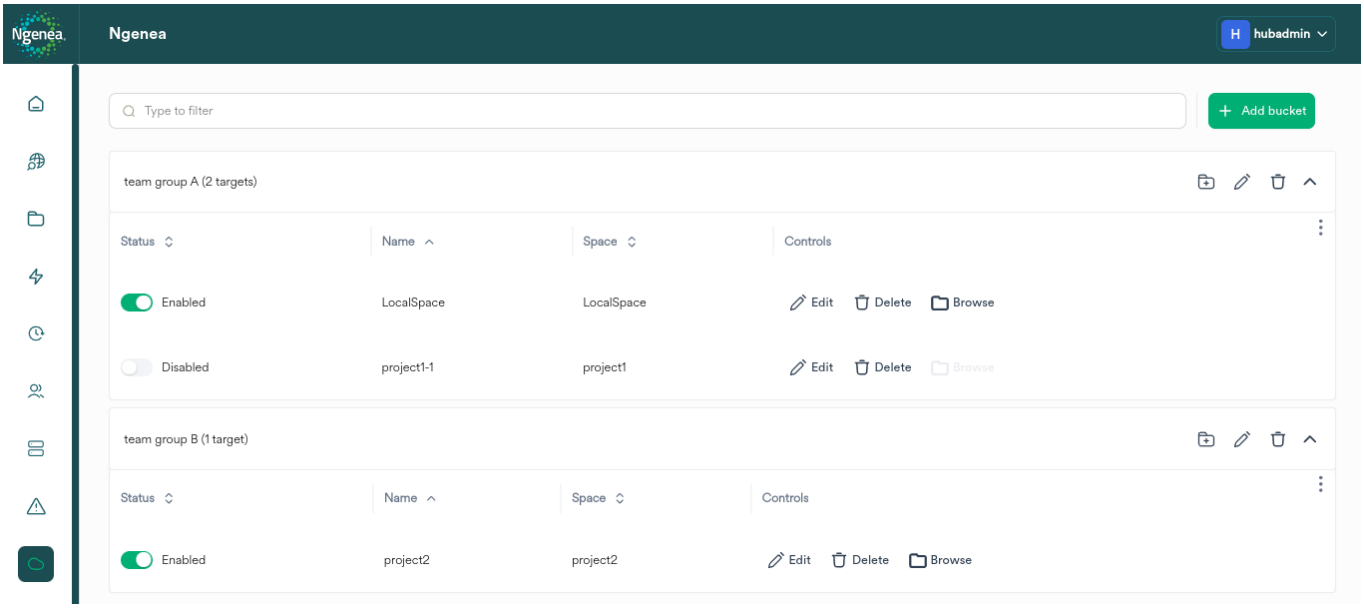
- Type the name of the Ngenea Bucket
- Click Yes to delete the Ngenea Bucket. This action is irreversable.
- Alternately click no, or close the confirmation dialog.

Important: Deleting a space automatically deletes associated targets. The parent bucket of the targets is not deleted, the bucket configuration still exists in pixstor and requires manual removal at the pixstor CLI.

Browsing a Target

Important: This function can only be performed by a Hub Administrator.

Clicking the Ngenea button in the main menu bar displays the list of Ngenea targets:



	Click the drop down button of a Bucket to view the associated Targets
Browse	Click the browse icon on the Ngenea target row to browse the Ngenea target

For more information on browsing and importing from an Ngenea target, see Target Import

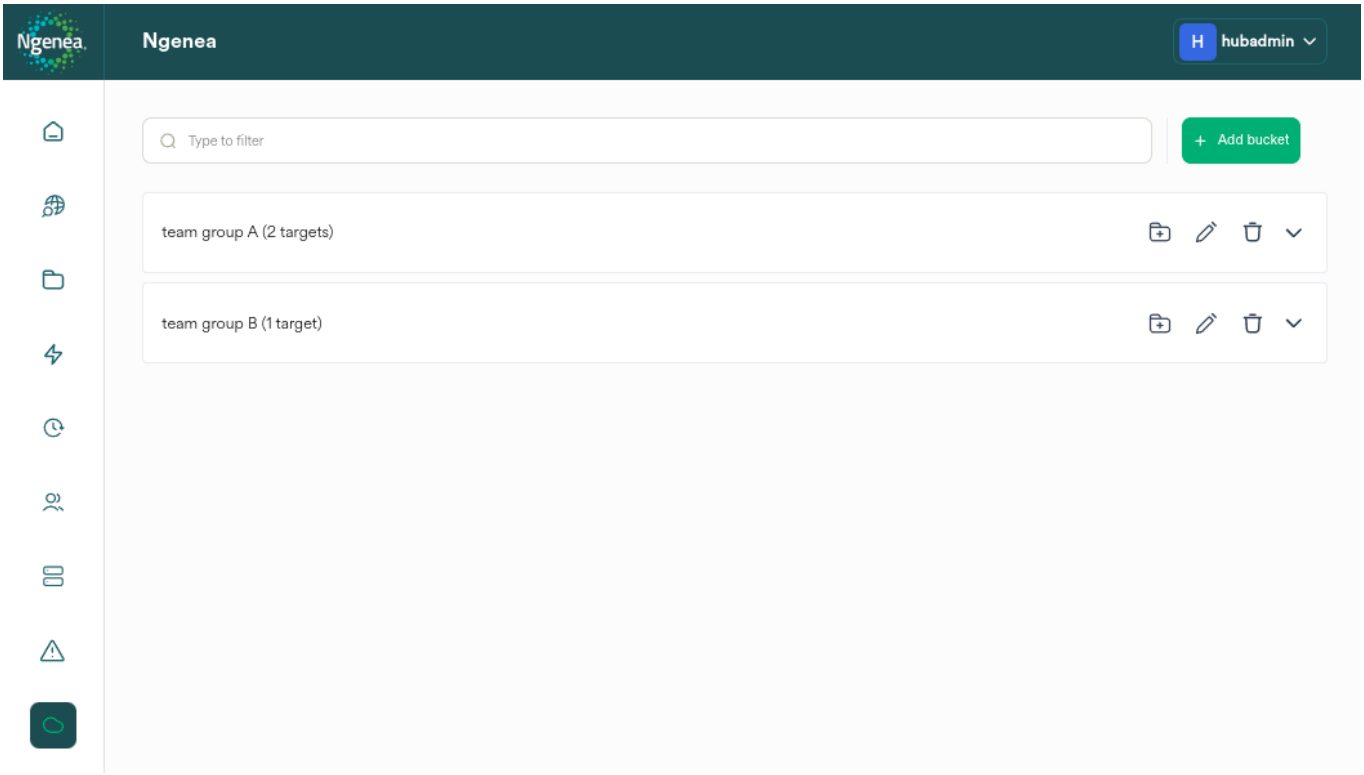
Adding a Target

A Target links a Space to a Bucket. A Target that is linked in this way must:

- have a Regex filter that matches the Space mountpoint which can also include subdirectories with the Space mountpoint.
- be linked to the same sites as the Space.

Targets	Click the Ngenea button to navigate to the Ngenea screen

Clicking the Ngenea button in the main menu bar displays the list of Ngenea Buckets:



	Click the Add Target button to start the External Target Wizard

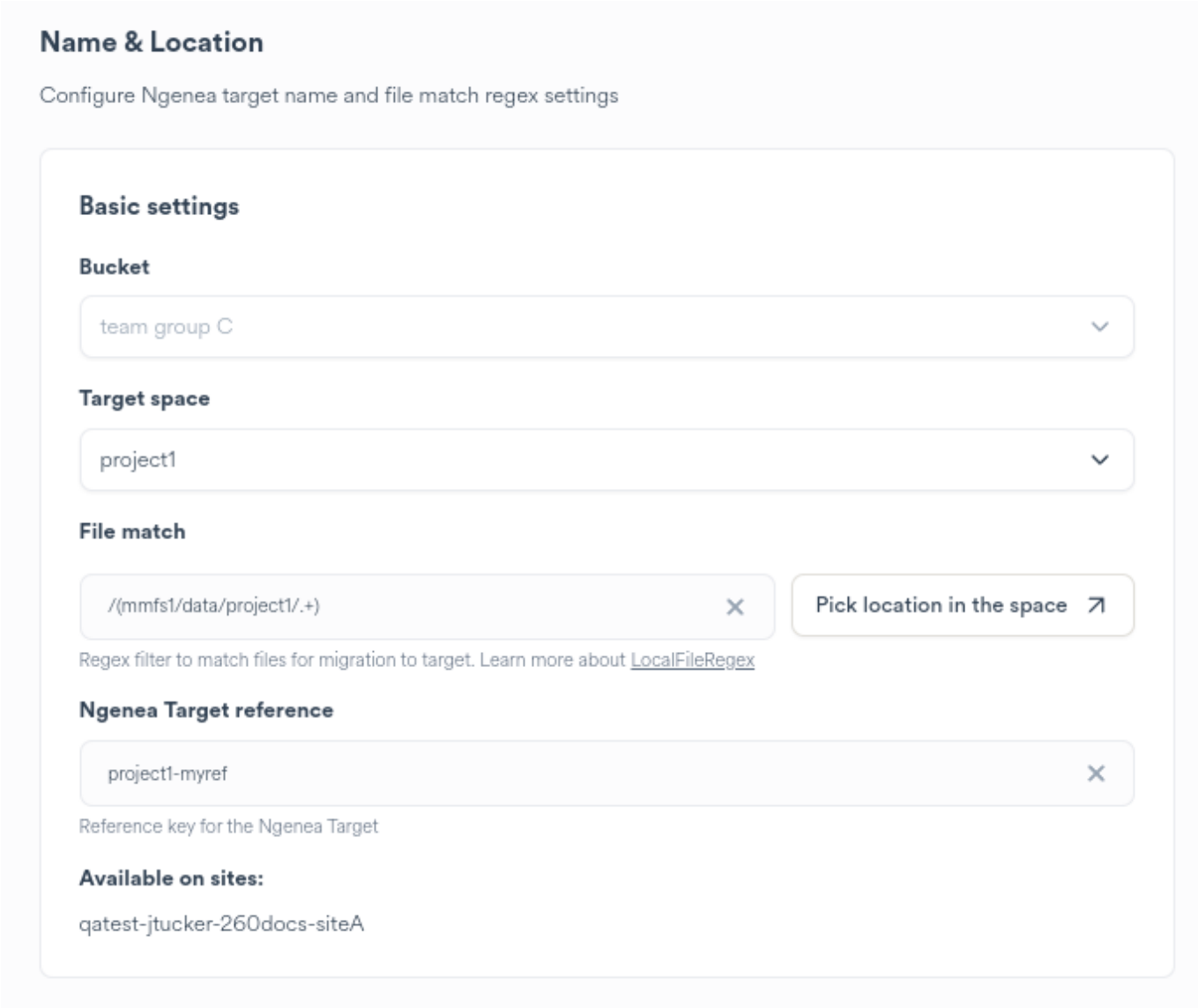
External Target Wizard

Navigating the Wizard

	Click the close button to exit the wizard. Changes are not saved.
Next	Click the Next button to advance to the next page of the wizard. The Next button is disabled until all required page elements are completed.
Go back	Click the Go Back button to return to the previous wizard page.
Finish & Create	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

Name & Location

Upon starting the External target wizard, the user is presented with the Name & Location page.



Configure the migration settings as required to handle data migration accordingly:

Setting	Description
Bucket	The name of the Bucket the Target will be associated with. The bucket name cannot be changed.
Target Space	The name of the Space the Target will be associated with. Selecting the Space generates a suggested File match entry. If no space is selected, you must manually select which sites it is available on.
File match	Refer to the RegEx Filters example table below
Ngenea Target reference	The metadata key to add to all files processed by Ngenea HSM.
Available on sites	The sites the Space is associated with and therefore the Target will be created are listed. The sites cannot be changed.

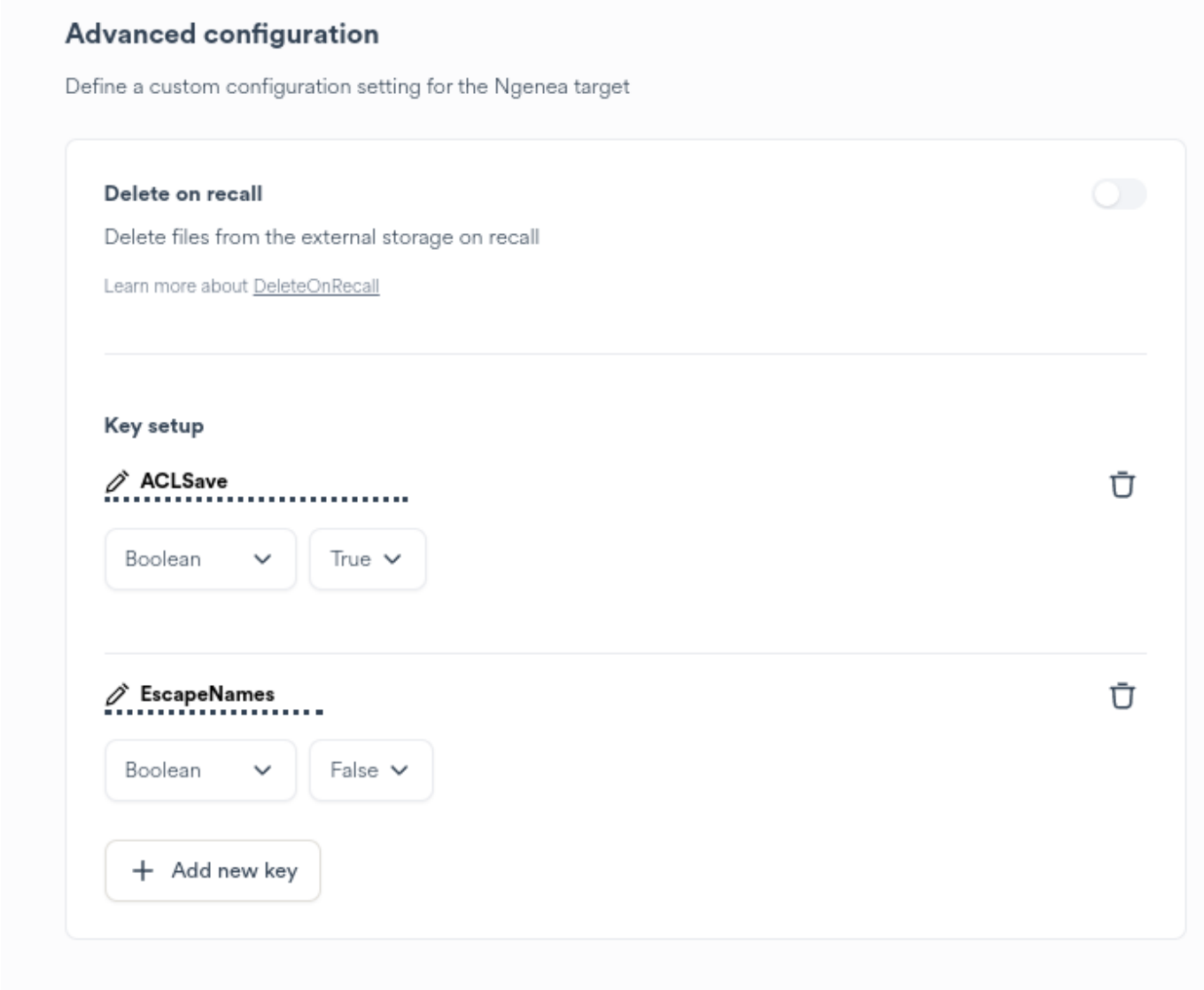
Note: When pre-creating a target not associated to a Space where the Target Space is set to 'No space is selected', Hub will not suggest automatic settings for the dialog. In this case it required to manually set and review the dialog setting so that the wizard can proceed further.

Example regex filters where a space named myspace is present on the pixstor filesystem at location `/mmfs1/data/myspace`:

RegEx Filter Examples	Outcome
`/mmfs1/data/myspace/(.*)`	Dehydrated files within the myspace folder are present at the root of the storage target.
`/mmfs1/data/(myspace/.*)`	The myspace folder is present at the root of the storage target.
`/mmfs1/data/myspace/subdirectory/(.*)`	Dehydrated files within the subdirectory of the myspace directory are present at the root of the storage target. The myspace directory is not present. Data immediately within the myspace directory (other than that within the subdirectory) is not eligible for Ngenea operations.
`/mmfs1/data/myspace/(subdirectory/.*)`	The subdirectory of the myspace directory is present at the root of the storage target. The myspace directory is not present. Data immediately within the myspace directory (other than that within the subdirectory) is not eligible for Ngenea operations.
`/mmfs1/data/(myspace/.+)`	This regex matches paths under /mmfs1/data/ that contain myspace/ followed by one or more characters. The myspace folder is present at the root of the storage target.
`/mmfs1/(data/myspace/.+)`	This regex matches paths containing data/myspace/ after /mmfs1/. The data folder is present at the root of the storage target.
`/(mmfs1/data/myspace/.+)`	This regex matches paths under mmfs1/data/myspace/.

RegEx Filter Examples	Outcome
`/mmfs1/data/((myspace1|myspace2|myspace3)/.+)`	This regex matches paths under /mmfs1/data/ where the space is one of myspace1, myspace2, or myspace3.
`/mmfs1/(data/(myspace1|myspace2|myspace3)/.+)`	This regex matches paths under /mmfs1/ where the path contains data/ followed by one of myspace1, myspace2, or myspace3, and then additional path segments.
`/(mmfs1/data/(myspace1|myspace2|myspace3)/.+)`	This regex is similar to the previous one but matches paths that start directly with mmfs1/data/ and then one of the three space names, followed by additional segments.

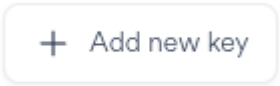
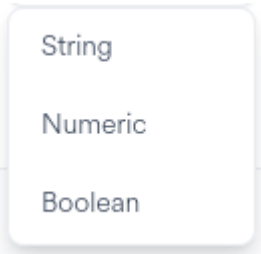
Advanced configuration



Configure the migration settings as required to handle data migration accordingly:

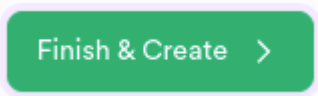
Setting	Description
Delete on recall	Determines whether to delete the recalled data from the Bucket after the data has been successfully recalled.
Key setup	Add configuration settings to a target to control specific behaviour during Ngenea data operations.

Important: Advanced Keys for a Target override those defined for the associated Bucket.

	Click the Add new key to define a new configuration setting
	Enter the name of the configuration setting in the Keyword field
	Select the type of configuration setting from the drop down menu. Choose or enter the value for the configuration setting.

Summary

Upon completing the wizard steps a summary is presented:

	Click the Finish & Create button to apply the changes displayed on the wizard summary page.

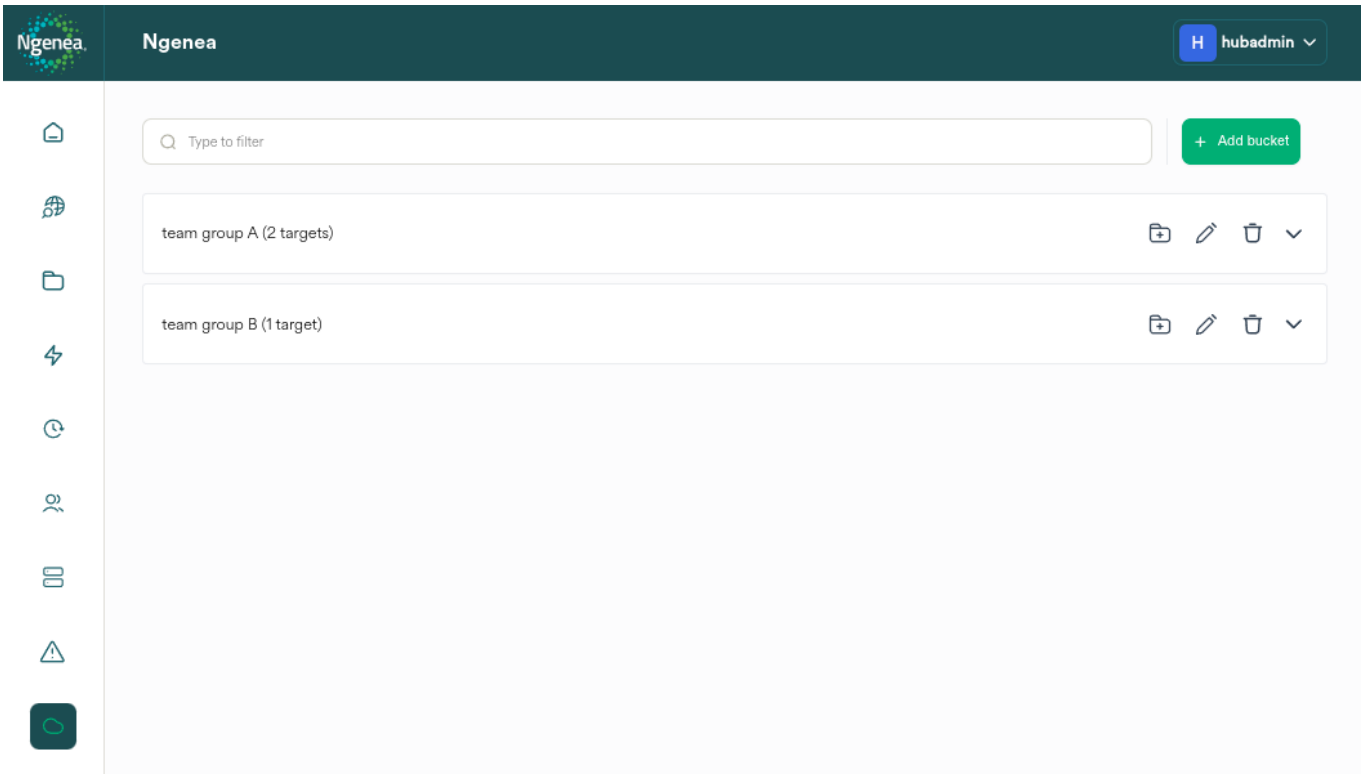
Alternatively `Go back` and change the proposed configuration as required or `close` the wizard to cancel the creation of the Ngenea target.

Target Import

An Ngenea target can be browsed, and files can be imported to the local PixStor file system.

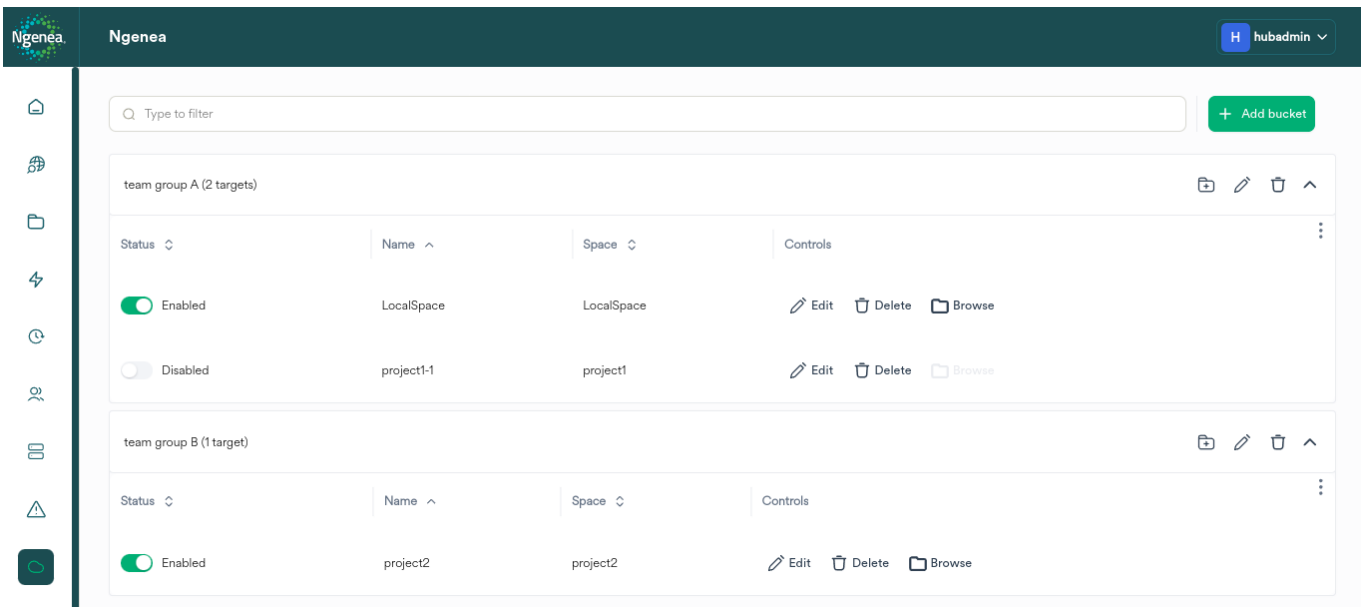
Important: This function can only be performed by a Hub Administrator.

Clicking the Targets button in the main menu bar displays the list of Ngenea buckets:



A Target is the mapping for how data is transferred to and from a Bucket for a Space.

Click the drop down button of a Bucket to view the associated Targets

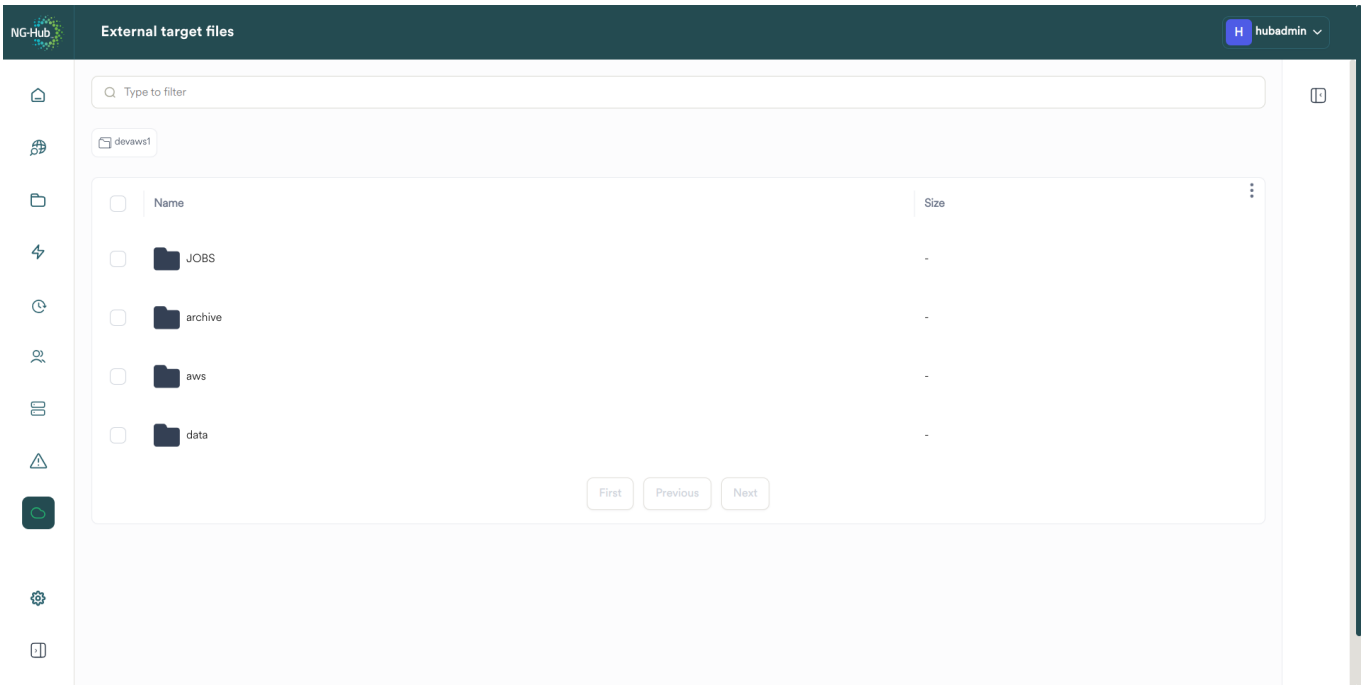


Browse	Click the browse icon on the Ngenea target row to browse the Ngenea target

Browsing a Target

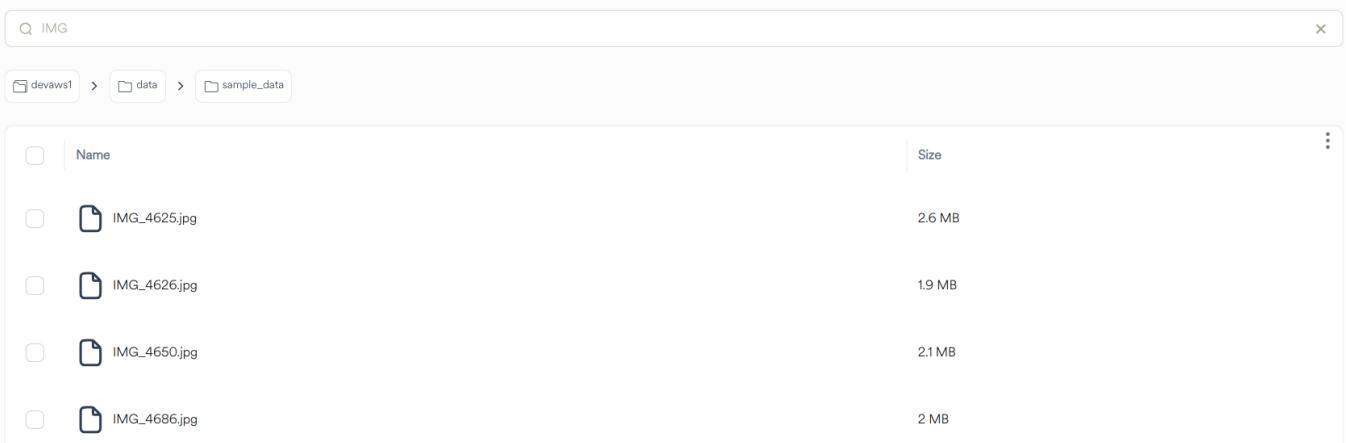
The target browser displays the file and folder contents of a target including additional contextual information such as size.

The target bowser screen is comprised of several areas.



Filtering the Target Browser

To display files or folders matching keywords, enter the keywords in the filter bar.



Target Browser File Attributes

The target browser displays information regarding the files and folders within the Target.

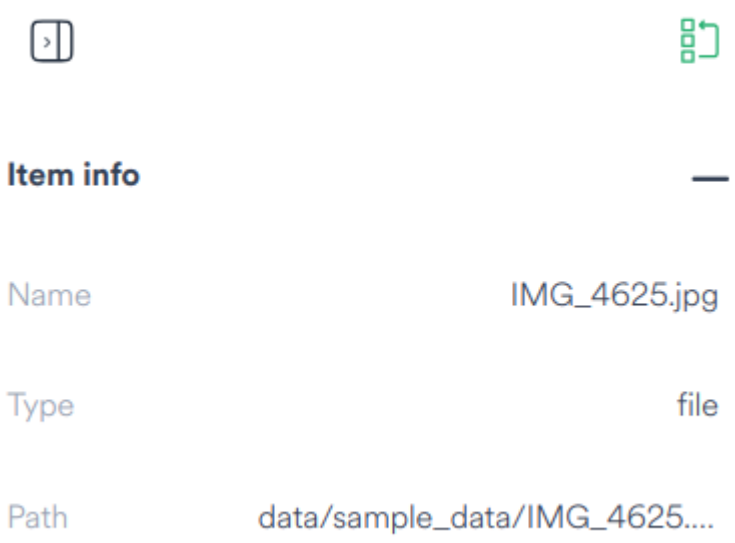
Available information may vary between target types.

Option	Description
Name	The file or directory name
Size	The size of the file on the target

Viewing File or Folder Metadata

Metadata Panel

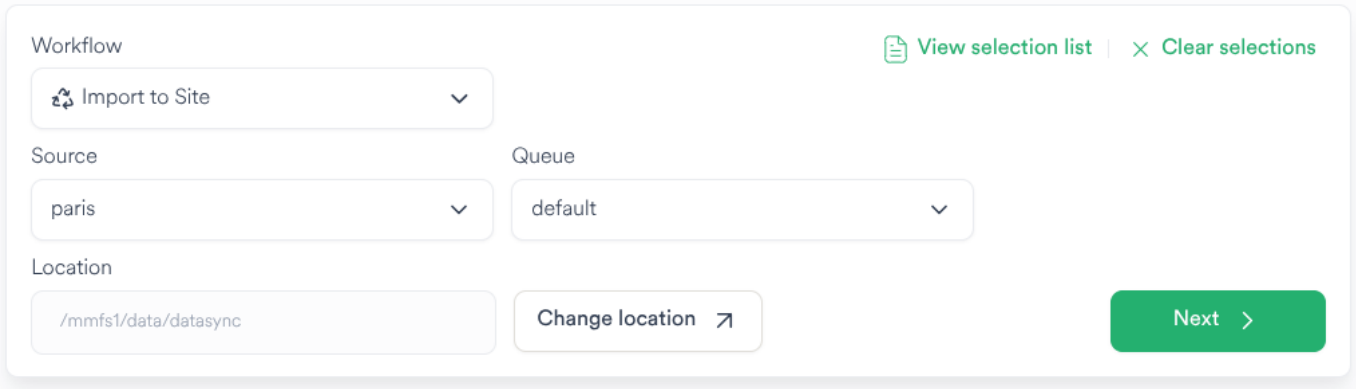
Click a file or directory name to view the associated metadata:



The metadata panel provides a summary of metadata.

Using the Job Creator Panel

Explain panel areas, buttons and operations

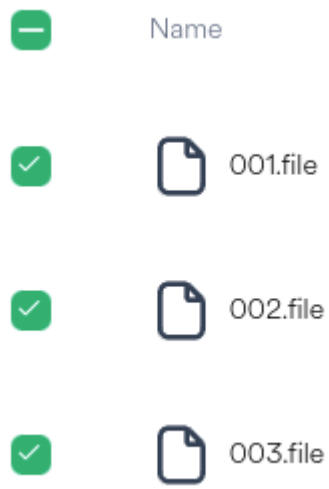


Selecting files and directories

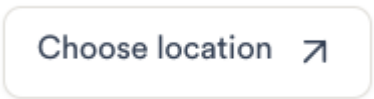
Selecting an individual file or directory populates the selection list with the item. Selecting a directory populates all items within the chosen directory tree.

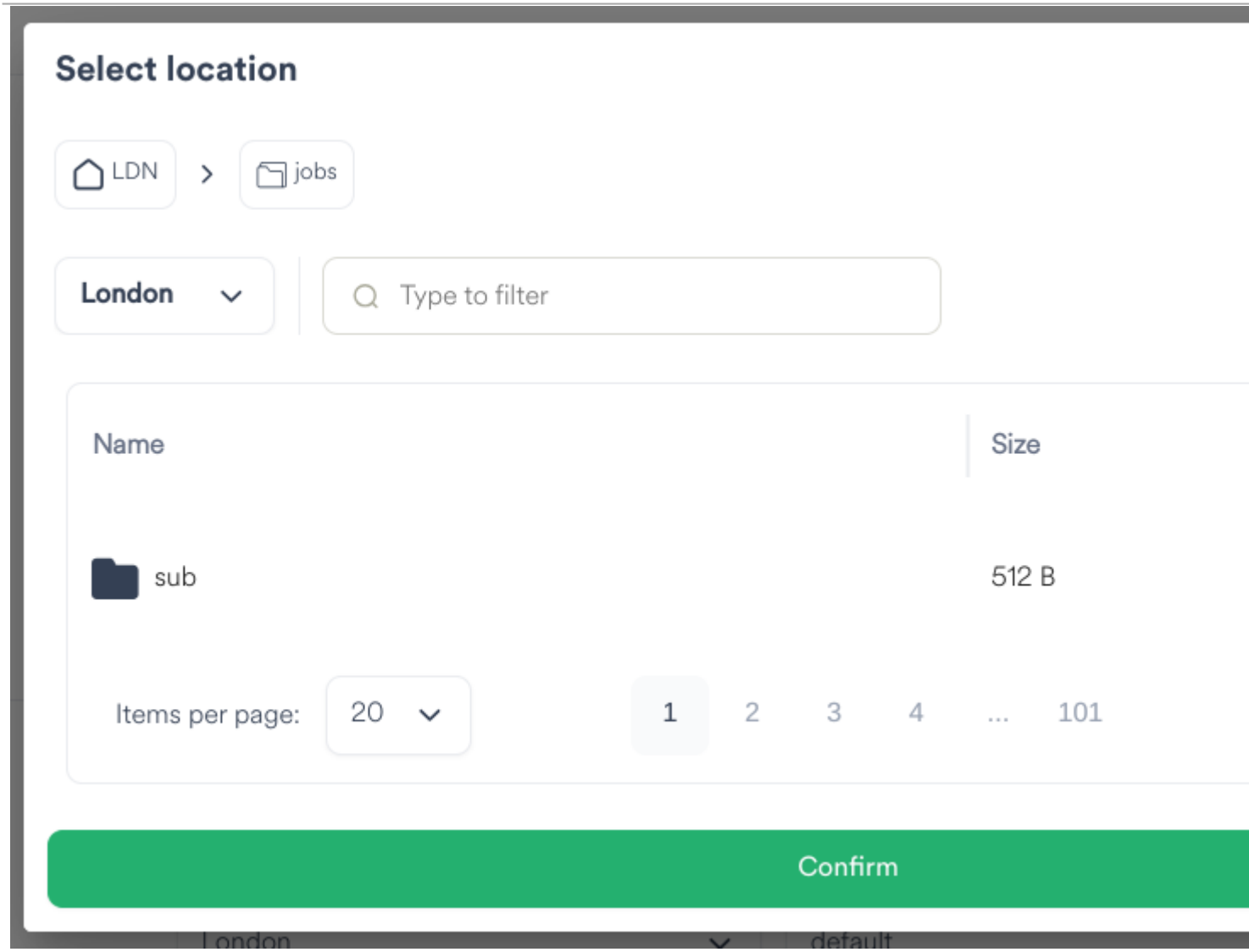
Selections of the entire Target or a directory are each counted as 1 item.

Select the ‘select all’ checkbox next to the Name field in order to select the entire Target.



View selection list	Click the View Selection List button to show the files and directories selected to be processed by the chosen workflow
× Clear selections	Click the Clear selections to remove all files and directories currently selected from the selection list





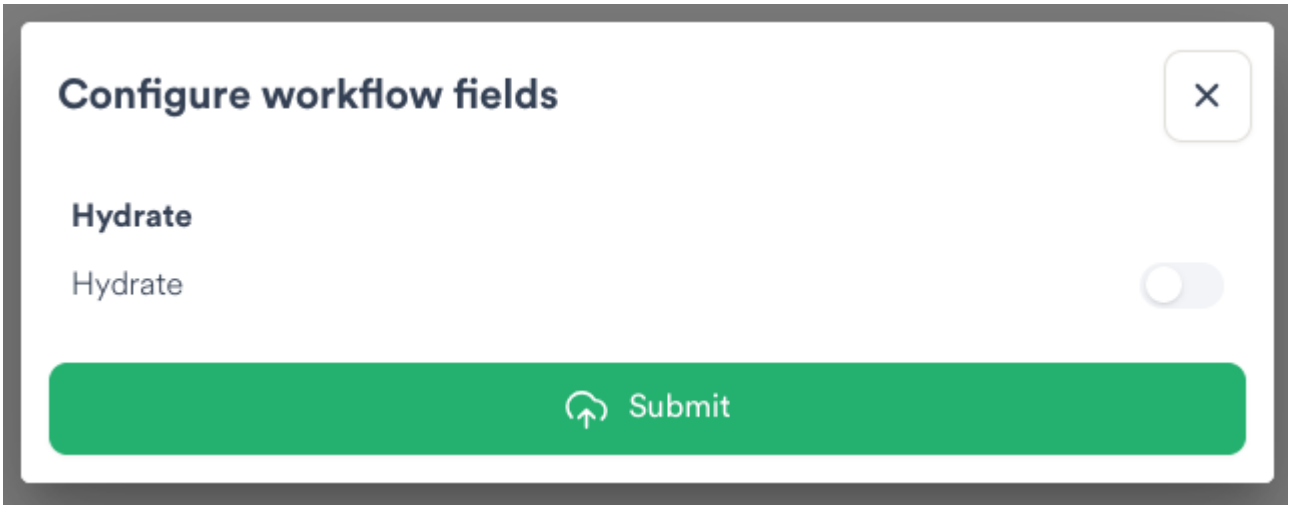
Note: Target files can only be imported to Locations in Spaces which match the target's "File match" pattern.

Note: Target files will be imported into the Space folder with their full remote path

For example, importing `path/in/cloud` to `/mmfs1/data/space/subpath` will result in `/mmfs1/data/space/subpath/path/in/cloud`

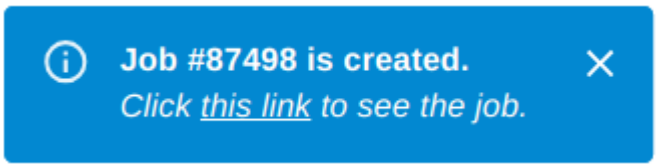
Next > Click the Next button to enact the Job

Jobs with Workflows which require additional user decisions prior to enacting the Job raise the Configure workflow fields dialog:



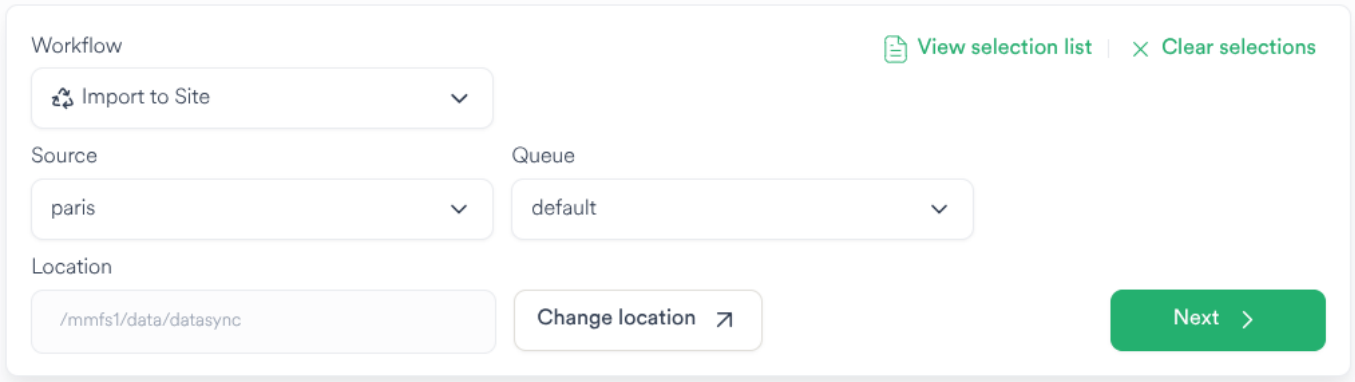
After entering the field information [if required], select the button at the bottom of the dialog to submit the Job.

Click the button at the bottom of the dialog to submit the Job.



Upon submitting the workflow, a notification indicates the job was created with a link to view details of that job

Job Types (Workflows)



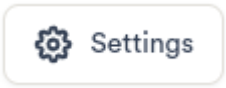
Default Workflows

Import to Site

The Import to Site workflow transfers the file metadata and data from the Ngenea target (E.G. an AWS cloud bucket). After successful transfer the metadata and data content of the file is present on the chosen site, within the chosen Location.

Global Settings

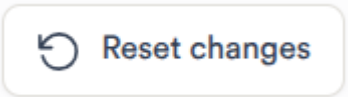
The global settings page controls settings which are applied across all pixstor sites participating in hub management.



Click the settings button to navigate to the Global Settings screen

Navigating the Settings page

After changing a setting, click the Save button to apply the changes



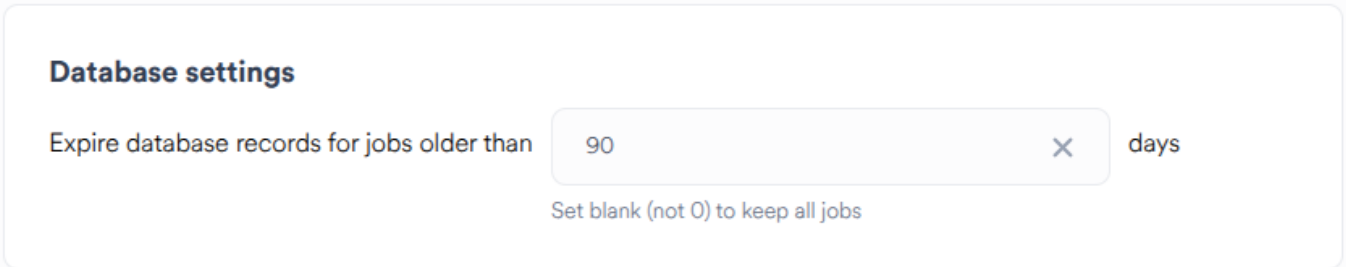
After changing a setting, click Reset Changes to reset any unsaved changes

Database

Old job data can be retained in the database for a specific number of days so that the hub database does not fill up the system.

Database expiry can be configured by setting `jobs_ttl` in Global Settings page in UI.

Clicking the Global Settings button displays a form for updating the `jobs_ttl` in days. The `Save` button will be enabled once the user changes the value in the field.

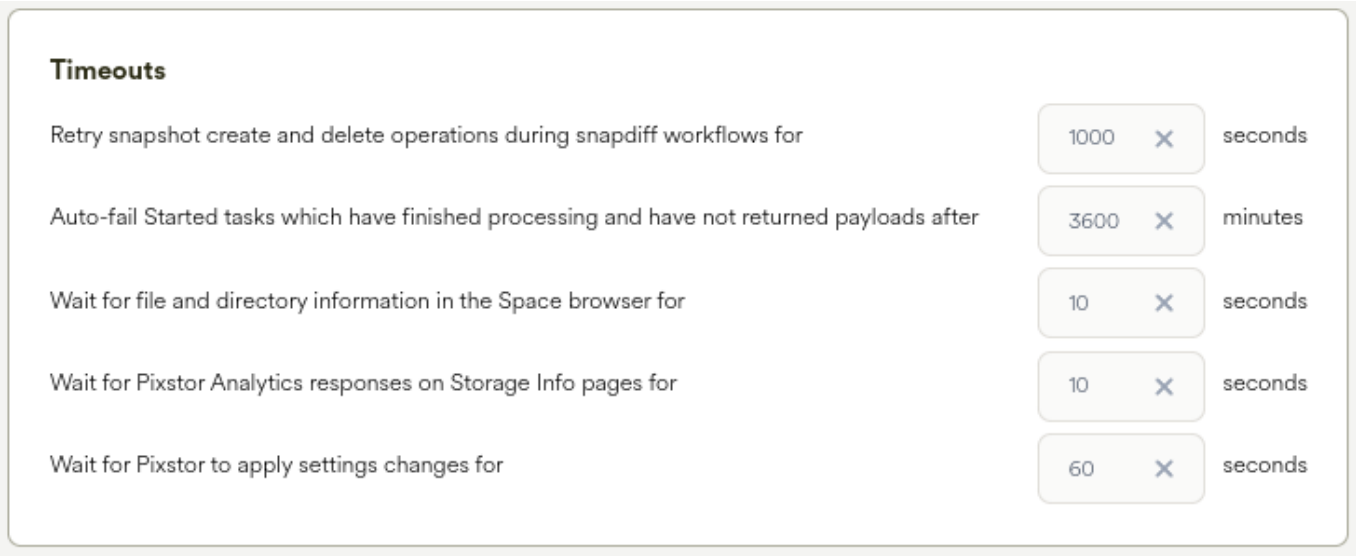


Timeouts

Hub manages many varied operations, at differing scale, across Sites which can be in different geo-locations.

As such, the time to complete operations may require tuning for the differing scenarios.

Additional timeout settings are available in the Administration Guide. See “Hub Configuration”.



Setting	Description	Default
Retry snapshot create and delete operations during snapdiff workflows for	Where snapshots operations are numerous or blocked by cluster behaviour, continue to retry snapshot creation and deletion within the timeout window	1000 seconds
Auto-fail Started tasks which have finished processing and have not returned payloads after	If a Job’s task has completed, but the results of the task have not been sent back to Hub (perhaps due to network, environmental or payload failure), set the task to state Failure after the timeout window has expired	3600 minutes
Wait for file and directory information in the Space browser for	During browsing of Spaces and similar file browser interfaces do not return disk usage and count information if no such information is received from the Pixstor Analytics after the timeout has expired	10 seconds

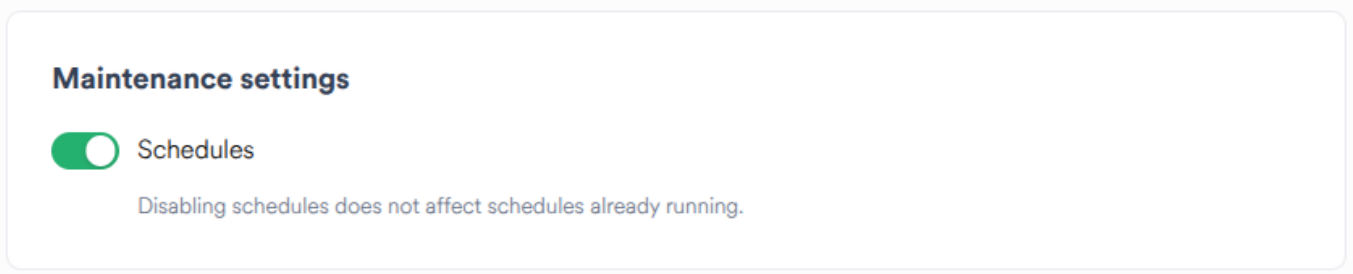
Setting	Description	Default
Wait for Pixstor Analytics responses on Storage Info pages for	During the browsing of Storage Info for a Site, do not return disk usage and count information if no such information is received from the Pixstor Analytics after the timeout has expired	10 seconds
Wait for Pixstor to apply settings changes for	When applying changes to Sites, wait the specified number of seconds for the Pixstor to respond to the action before failing the Settings task	60 seconds

Schedules

On the Schedules page, schedules can be enabled or disabled individually.

The Global Settings page provides the ability to disable all schedules at once.

Clicking the Global Settings button displays a “Schedules” toggle.



Set the toggle to disabled and click `Save` to disable all schedules.

No new scheduled jobs will start for as long as Schedules are disabled globally.

Any scheduled jobs which have already started when schedules are disabled will run to completion, but no new jobs for that schedule will start after that.

Set the toggle back to enabled and click `Save` to re-enable schedules globally. Any schedules which were disabled individually will remain disabled after Schedules are re-enabled globally.

Backups

PixStor provides the capability to backup data within a Space on a per-Site basis to specific Ngenea Targets.

Hub enables configuration to be set for the Ngenea Backup service running on pixstor sites.

Important: Best practice is to treat backup data separately from live data. Hub will only configure a backup to an Ngenea target set as a `backup-only` target type.

Configuring Backups

To perform a backup for a Space on a Site, the following actions must be undertaken:

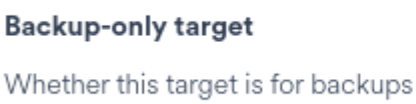
- An Ngenea Target is provisioned with `Backup-Only` enabled
- The Site from which to backup is enabled to participate in backups
- An appropriate backup schedule is set
- The Space is enabled for backup, selecting the Site and the Ngenea Target

Backup-Only Targets

An Ngenea Target can be utilised for backups of a Space.

Where a Space exists across multiple Sites, optionally, each site can perform its own backup of the Space.

Important: Multiple Sites are not permitted to backup to the same Ngenea Target.

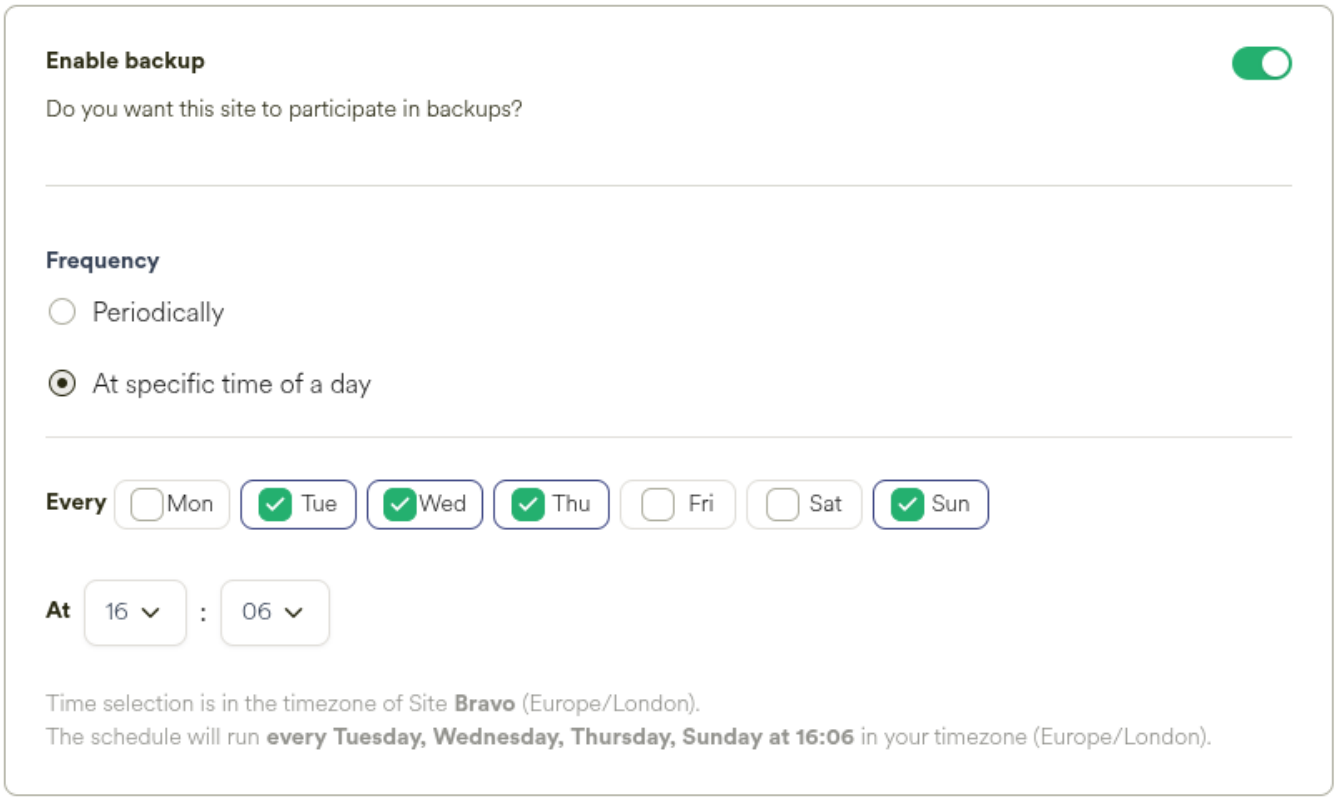


Enabling Site for Backup

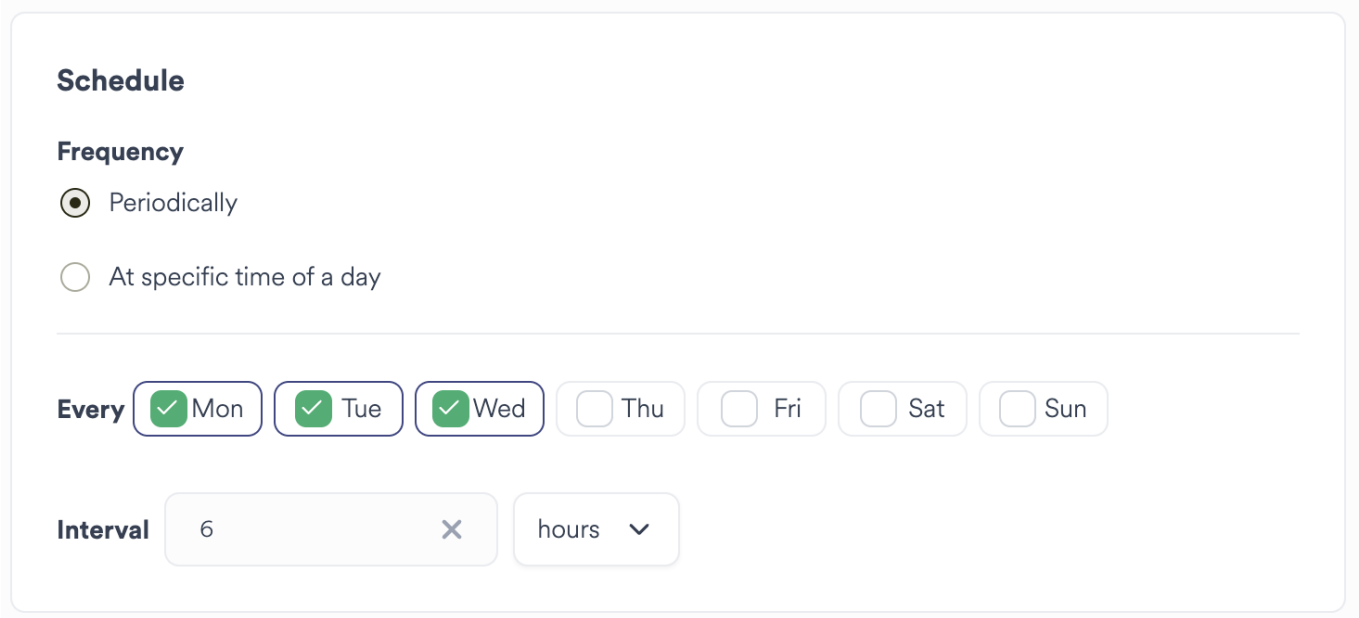
pixstor provides the capability to backup data within a Space on a per-Site basis to specific Ngenea Targets.

Hub enables configuration to be set for the Ngenea Backup service running on pixstor sites.

If the Site is enabled to participate in backups, each Space requires additional configuration to enable the per-Space backup.



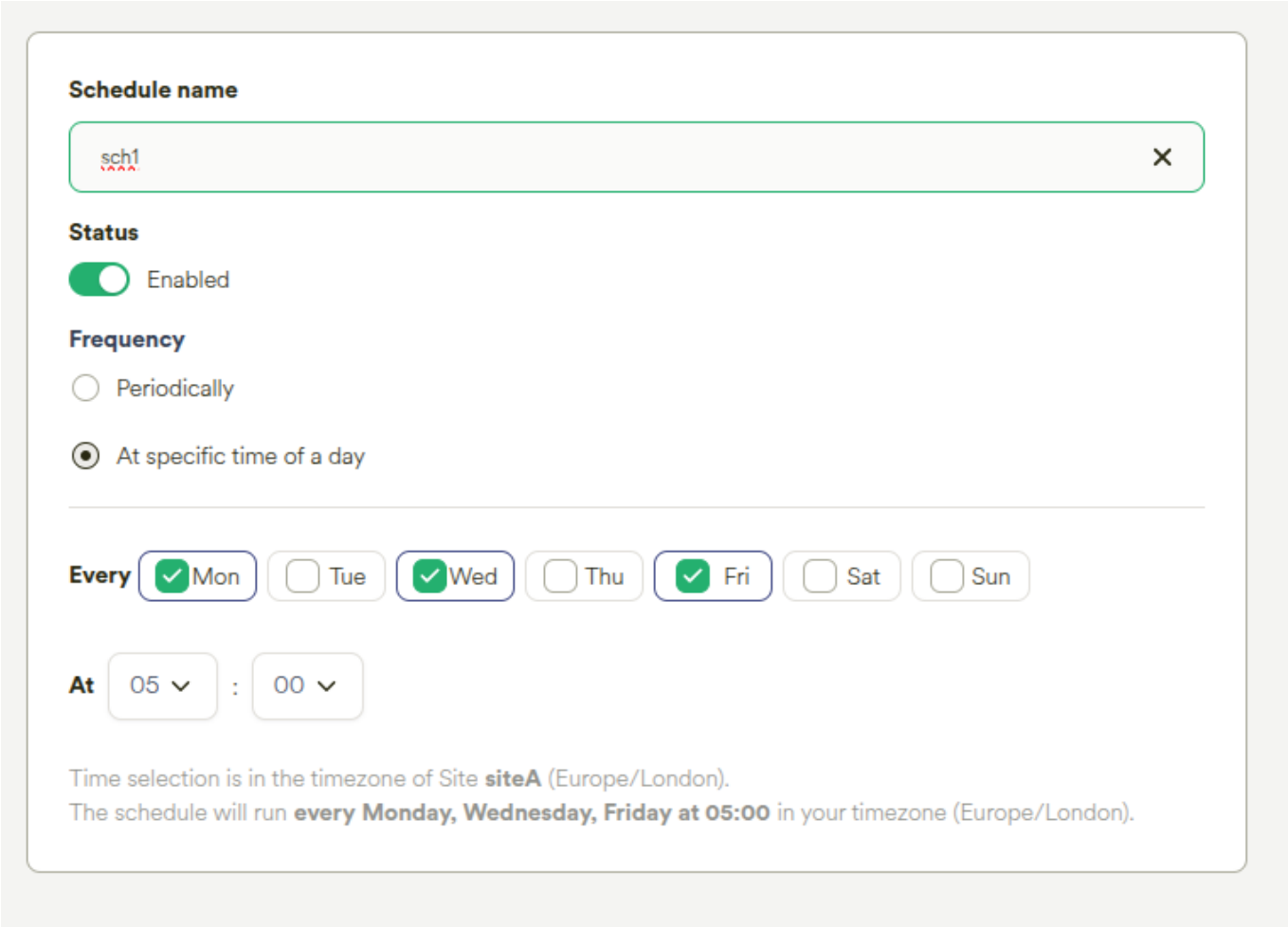
Determine the required frequency of the backup.



Choosing Periodically will ensure that the schedule will run on the next interval set.

E.G:

- 1 hour: The backup will run on the next hour (12.00, 13.00)
- 15 mins: The backup will run on the next 15 minute interval past the hour (15, 30, 45, 00)

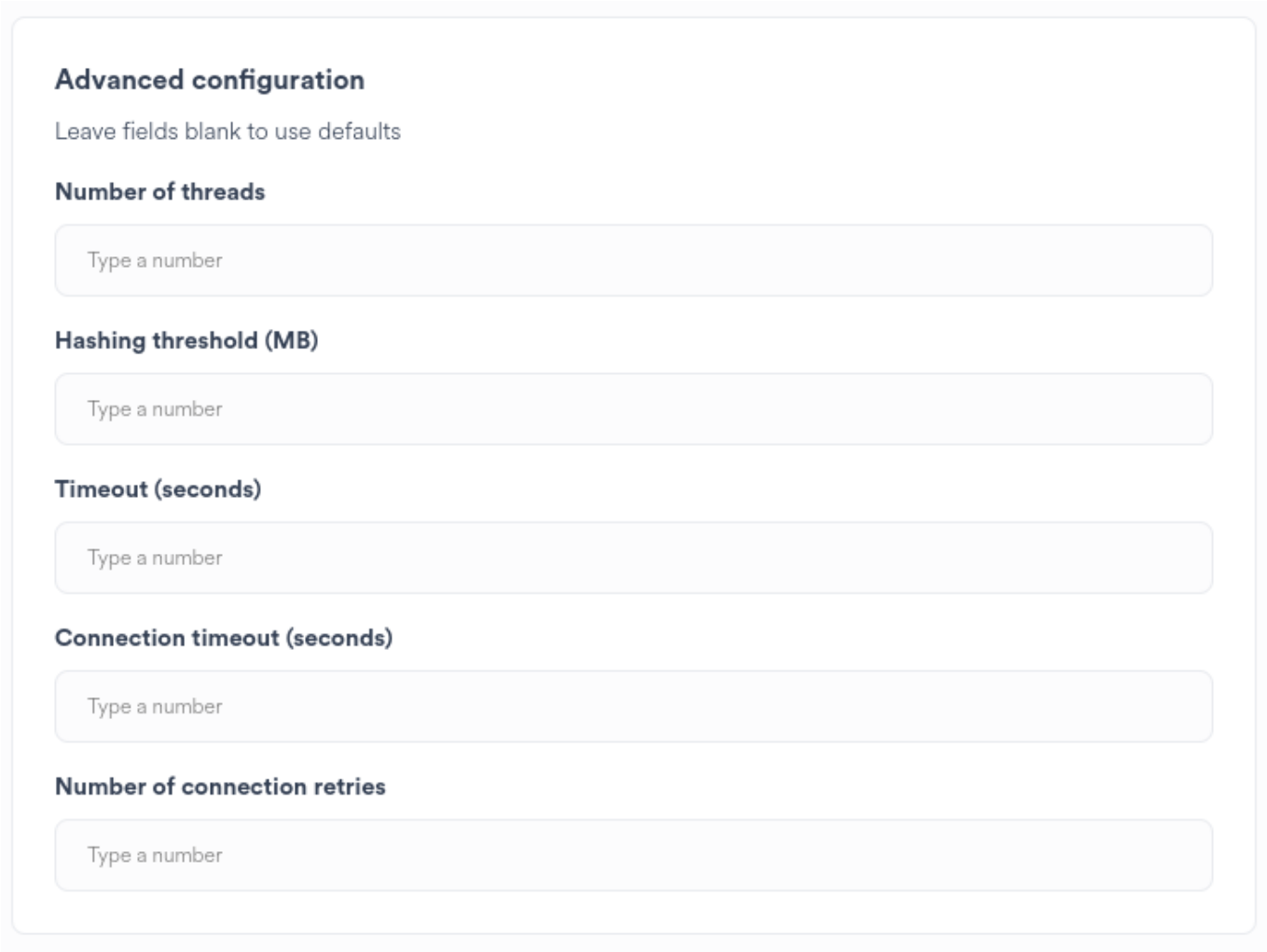


Choosing At Specific Time of A Day allows the Policy to be scheduled once per chosen day at a specific time of day.

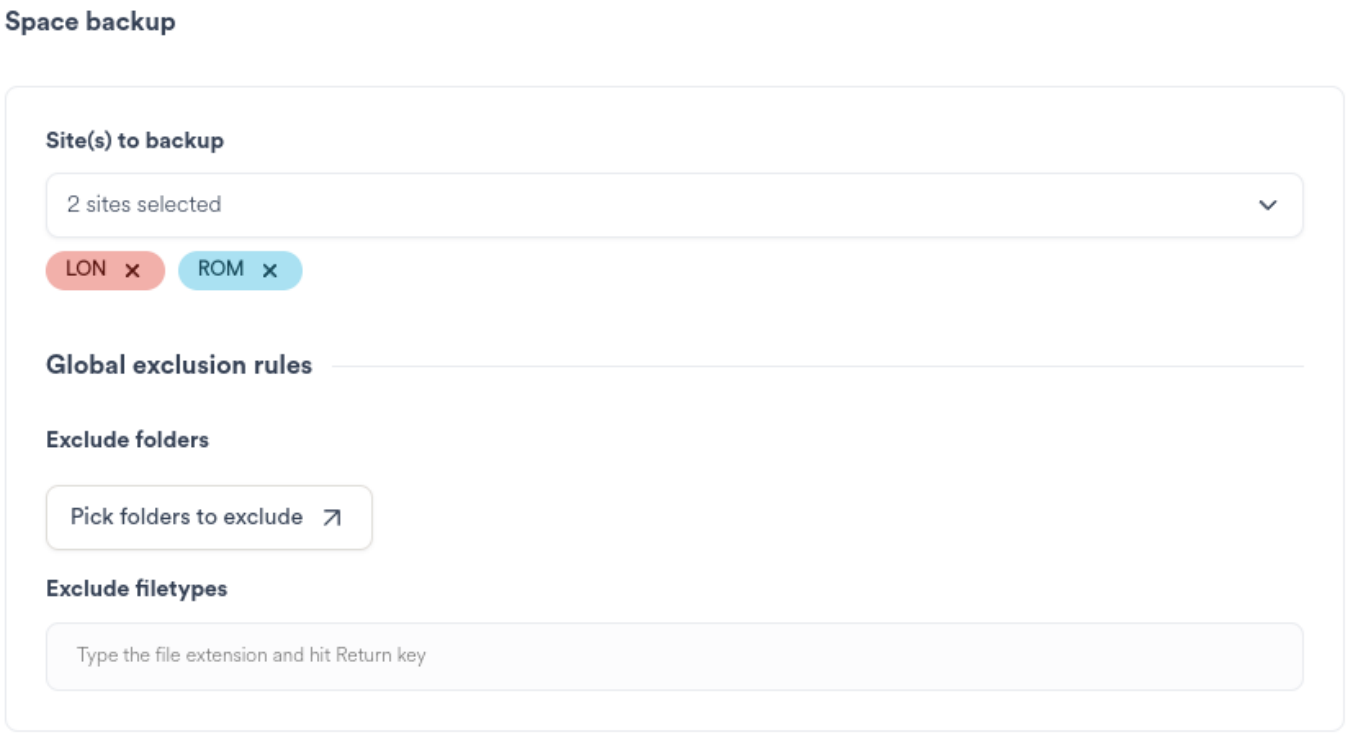
Hint: The schedule is run at the configured time in each site's timezone

Optional tuning can be set for the backup operation in the Advanced Configuration.

Refer to the Ngenea Backup documention prior to applying any parameters.



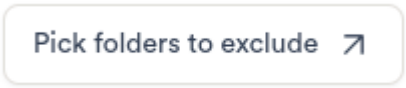
Enabling Space Backup



- Select the Sites which will perform backups for this space
- Define any Global Exclusions

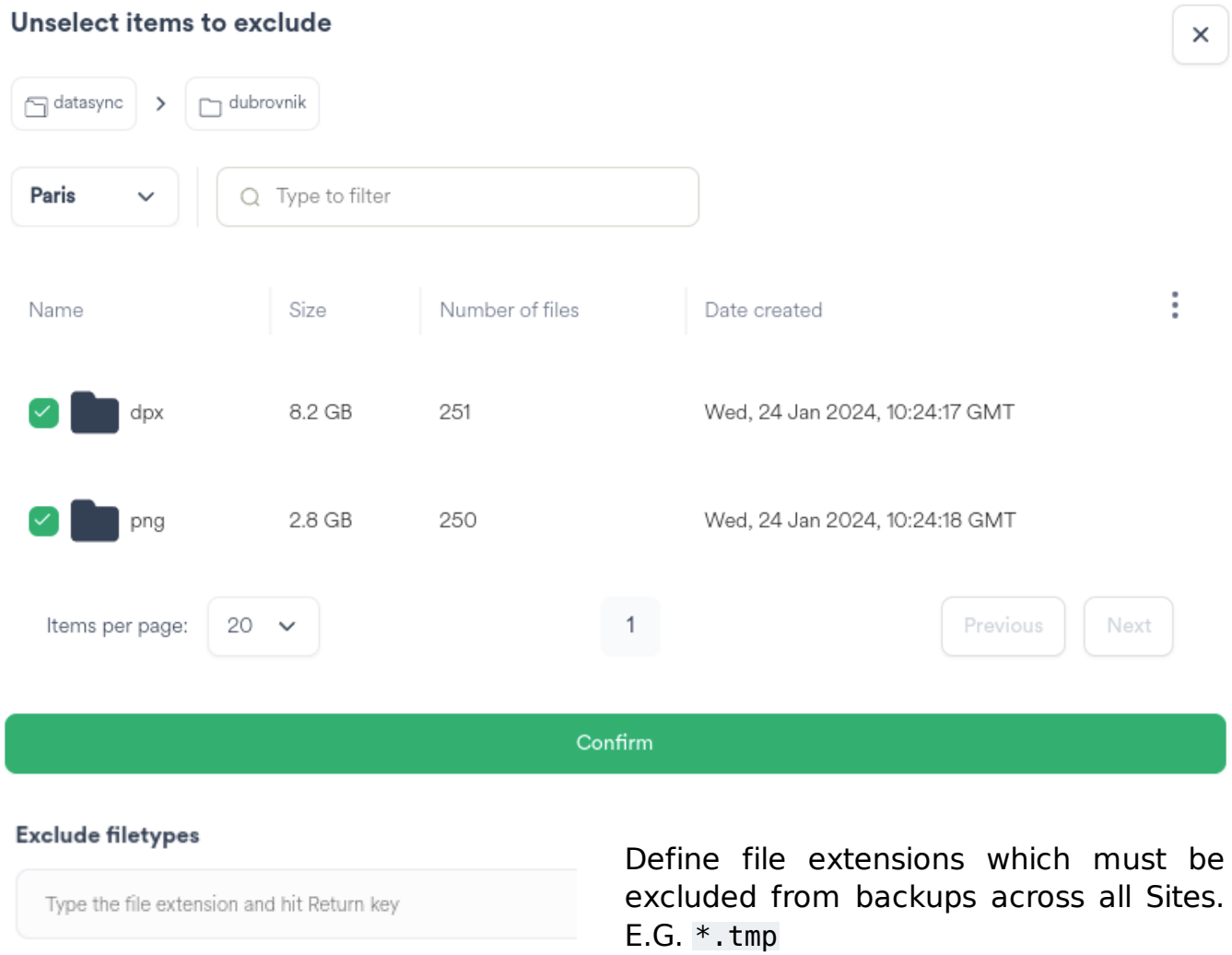
Global Exclusion Rules

Global exclusions apply to all Site backup configurations for the Space unless overridden on a per-Site basis.



Click the Unselect folders to exclude button to raise the folder browser dialog

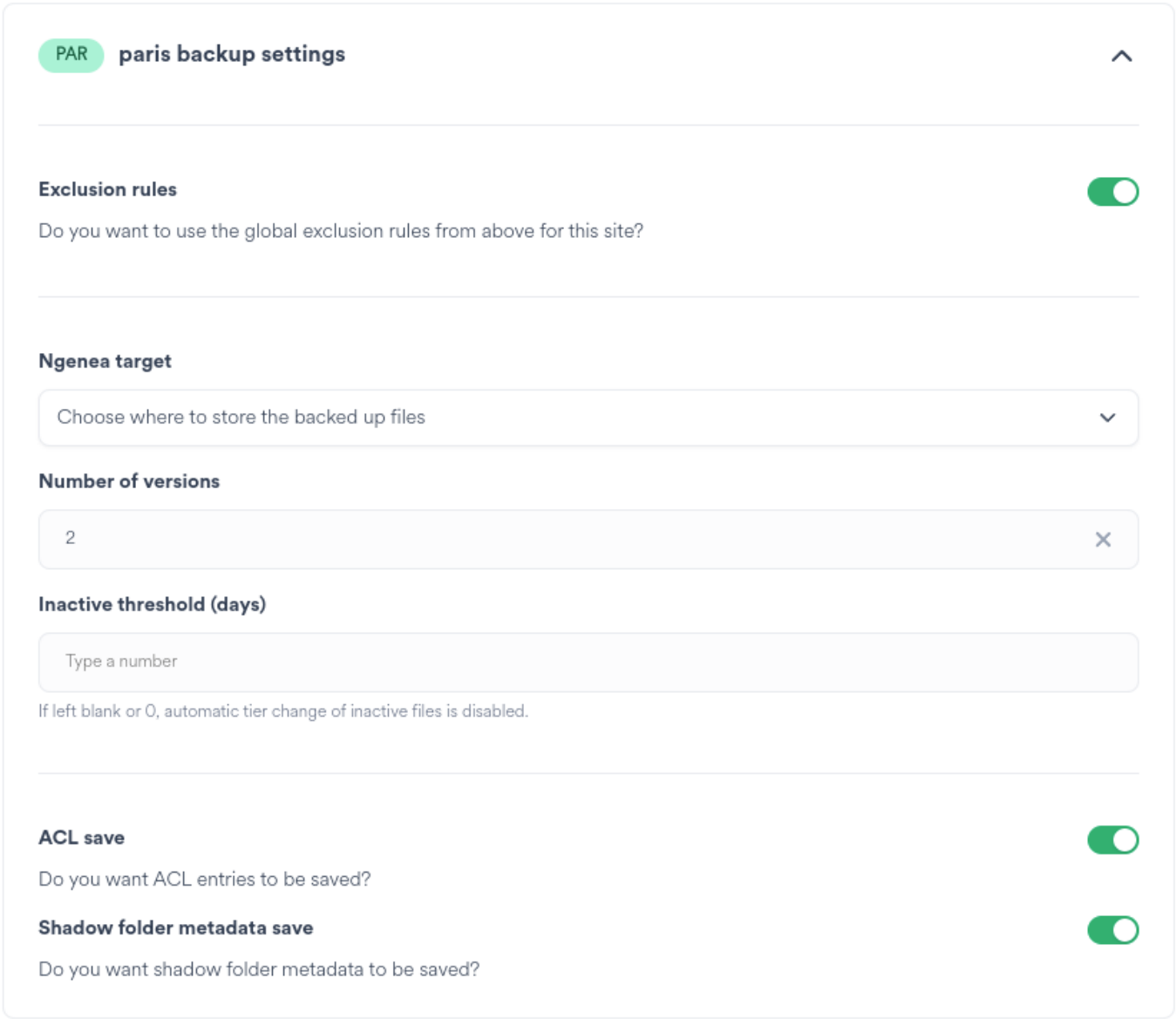
Use the folder browser to unselect items which will not be included (hence excluded) from backups.



Define file extensions which must be excluded from backups across all Sites. E.G. `*.tmp`

Hint: If multiple Sites are selected, backup configuration is presented per-Site. Optionally each site can specify its own settings.

For each Site participating in Space backup a configuration panel is displayed:



Review the backup settings for each site:

Setting	Description
Exclusion Rules	By default the Site inherits the Global exclusion rules. To override the rules, deselect the slider and define any exclusions using the same methods as described above.
Ngenea Target	Choose an available Ngenea Target. Only targets configured as *Backup-Only target* and not currently in use for other Sites are available for selection.
Number of versions	Defines the maximum number of all file versions within a remote storage location for the targeted Fileset before Ngenea Backup prunes excess versions. If the number of versions of a file has exceeds the defined threshold, the oldest version will be deleted.

Setting	Description
Inactive threshold(days)	Defines the threshold of days for a defined CRITERIA (E.G.: modification) after which each file within the monitored Independent Fileset is validated when INACTIVE_THRESHOLD is enabled. Those files where their defined CRITERIA exceeds this value will be re-copied from the local PixStor filesystem to storage container into an in-active tier. All instances of the file in typical standard storage classes are transitioned to older file versions.
ACL save	If enabled, all of the related NSFv4 ACL entries for an ingested file will be included in the remote object's metadata when a file is backed up. This allows Ngenea to apply those NSFv4 ACL entries when recalled or stubbed.
Shadow folder metdata save	If enabled, additional data objects will be created within the remote storage target as this data is stored as an object within the cloud provider. If enabled, all the directory modification, creation and deletion operations between subsequent backup runs will be stored in remote storage. This allows the restoration or ngrecall of directories with NFSv4 ACL and POSIX permission support. This data will also be version controlled similarly to files. This operation will occur if the permissions or ACL entries are edited on any directories meaning that each change to ACLs will be updated with regular runs of backup.

Administration Guide

Ngenea Hub harnesses the power of Ngenea to provide global workflows, enabling your data to be where you need it, when you need it.

Download

Ngenea Hub

Component	Link
Ngenea Hub	Not Found

Component	Link
Ngenea Hub Images	Not Found
Documentation (PDF)	ngenea-hub-v2.7.0

Ngenea Worker

Component	Link
Ngenea Worker (RPM)	Not Found

Ngenea Hub Client

Component	Link
Ngenea Hub Client (RPM)	Not Found
Ngenea Hub Client (whl)	ngclient-2.7.0.post1

Cloud Functions

Provider	Link
Google Cloud	Not Found
Amazon Web Services	Not Found

Installation Guide

This section provides a comprehensive guide for installing and configuring Ngenea Hub and Ngenea Worker on CentOS/RedHat systems.

Installing Ngenea Hub :

- **Pre-requisites**: Details the required version of Ngenea Hub, network configurations, software compatibility, and necessary steps for offline installation and **Docker authentication**.
- **Online Installation - CentOS/RedHat**: Outlines steps to install Ngenea Hub RPM, create configuration files, start the service, and verify its status.
- **Offline Installation - CentOS/RedHat**: Explains the installation procedure for systems without internet access using local RPM files for both Ngenea Hub and necessary Docker images.

Installing Ngenea Worker: Describes prerequisites, installation of Ngenea Worker RPM, and configuration for communication with Ngenea Hub.

Installing Ngenea Hub

Pre-requisites

Before proceeding with the installation of Ngenea Hub, ensure the following conditions are met:

Ngenea Hub Version: Ensure that you are installing the latest Ngenea Hub version.

> **Warning:** There is no direct upgrade path from Hub 1 to Hub 2.
>
> Please contact support for guidance on performing this upgrade.

Network Requirements: Ngenea Hub must be reachable from all Ngenea Workers on the following ports:

- 6379/tcp
- 5672/tcp
- 8000/tcp (for Ngenea Hub versions 1.18 and above)

Software Compatibility: The interoperability page discusses compatibility between Ngenea Hub and Ngenea HSM. You can check compatibility using the Product Interoperability Matrix provided in the software documentation.

> **Note:** For compatibility between Ngenea Hub and Ngenea Worker, the version numbers must match up to the minor version. Specifically, if the version format is major.minor.patch, both Hub and Worker must share the same major and minor versions (the patch version may differ).

Post-Installation Features: After installation, you may want to enable additional features like Search. Follow the instructions in the Feature Set-up guide for specific feature configurations.

CentOS / RedHat Systems: Ensure that the target system where you will install Ngenea Hub is running either CentOS or RedHat operating systems.

CentOS / RedHat - Offline Installation (if applicable): For offline installations, ensure that you have both the `ngenea-hub` and `ngenea-hub-images` RPM packages downloaded and available on the target system.

Docker Authentication (if applicable): If your setup requires Docker authentication (not necessary for Pixstor systems), configure it by running:

```
docker login eurepo.arcapix.com
```

Online Installation : CentOS / RedHat

1. **Transfer the Ngenea Hub RPM Package**: First, ensure that the `ngenea-hub-<version>.rpm` package is available on your target system. You can transfer the RPM file using various methods such as SCP, FTP, or other file transfer protocols.

2. **Install the Ngenea Hub Package**: Once the RPM file has been transferred, navigate to the directory where you stored the package and run the following command:

```
yum install ngenea-hub-<version>.rpm
```

Be sure to replace `<version>` with the actual version number of the Ngenea Hub RPM file.

Note: For offline installation, please refer to section Offline Installation: CentOS / RedHat.

1. **Create Initial Configuration File (Optional)**: To manually set up the initial configuration for Ngenea Hub, you can edit the file located at `/etc/sysconfig/ngeneahub`. This configuration file includes settings for external queue systems and other deployment parameters. If you'd like to create or adjust the configuration file yourself, run:

   ```
   ngeneahubctl createconfig
   ```

   If you choose not to create it, the file will be automatically generated the first time you start the Ngenea Hub service.

2. **Enable and Start the Ngenea Hub Service**: To ensure the Ngenea Hub service starts automatically on system boot and also starts immediately, execute the following command:

   ```
   systemctl enable --now ngeneahub
   ```

3. **Check the Status of the Services**: Verify that both the Ngenea Hub and frontend services are running correctly. Use these commands to check their status:

   For the Ngenea Hub service:

   ```
   ngeneahubctl status
   ```

   For the frontend service:

   ```
   systemctl status ngeneahub-frontend.path
   ```

   These commands will display the current status of the services, indicating whether they are active and running or if any issues need to be addressed.

Offline Installation : CentOS / RedHat

When installing the Ngenea Hub on systems without internet access (due to network restrictions or other reasons), the service typically attempts to pull the necessary Docker images directly from Ngenea's software repository. However, if this is not possible, you can perform the installation offline by using RPM packages.

Here’s how to proceed with the offline installation:

1. **Obtain the Required RPM Packages**: You need to download two RPM packages:
    - `ngenea-hub-<version>.rpm`: This RPM contains the main application for Ngenea Hub.
    - `ngenea-hub-images-<version>.rpm`: This additional RPM contains the Docker container images required for Ngenea Hub to operate, avoiding the need to pull them from the internet.

    Both of these RPMs should be available in the same location where you obtained the main Ngenea Hub software.

2. **Transfer RPMs to the Target System**: Copy or transfer the downloaded RPM files (`ngenea-hub-<version>.rpm` and `ngenea-hub-images-<version>.rpm`) to the system where you wish to install Ngenea Hub. This can be done using USB, external storage, or any other secure transfer method.

3. **Install the RPMs**: Once the RPM files are available on the target system, you can install them using the *rpm* command. Open a terminal on the target system and run the following command, replacing `<version>` with the appropriate version number of the files you downloaded:

```
yum install ngenea-hub-<version>.rpm ngenea-hub-images-
<version>.rpm
```

- `yum install` is the command used to install RPM packages.

1. **Verify Installation**: After the RPM installation is complete, you can verify that Ngenea Hub is properly installed by checking that the service is running and the required Docker containers are available locally.

Installing Ngenea Worker

This section provides a step-by-step process for installing and configuring the Ngenea Worker. Following these instructions will enable you to install the worker on a system and have it interact with the Ngenea Hub.

Pre-requisites

Ngenea Server Software

Ensure that the Ngenea Server software is installed and configured before proceeding with the worker installation.

File Systems Configuration with Auto-Inode-Limit

- The file systems on the nodes where you will install the ngenea-worker package must be configured with the auto-inode-limit.
- This setting is essential for the proper functioning of the worker.

- To configure auto-inode-limit on the file system, use the following command:

```
mmchfs <file_system_name> --auto-inode-limit
```

Replace `<file_system_name>` with the name of the file system.

Installing the Ngenea Worker Package

To install the ngenea-worker package, use the YUM package manager. This process assumes that your system is configured to use YUM repositories.

Run the following command to install the package:

```
yum install ngenea-worker
```

The `yum` command will download and install the ngenea-worker package along with its necessary dependencies. Wait for the installation to complete.

Worker Configuration

After the package installation, the next step involves configuring the worker so that it can communicate with the Ngenea Server.

Create or Edit the Worker Configuration File

The Ngenea Worker configuration is stored in a file located at: `/etc/ngenea/ngenea-worker.conf`.

If this file does not already exist, please create it. The configuration file utilizes the *.ini* format. You will need to include the following content within it:

```
[settings]
site = site1
api_host = localhost
api_port = 8000
api_secure = true
redis_port = 6379
gpfs_nodes = ["localhost"]
```

Here's how to adjust the example configuration based on your setup:

- **site**: Replace *site1* with the name of your specific site.
- **api_host**: Enter the hostname or IP address of your API server. If the API is hosted on the same machine as the worker, leave this as *localhost*.
- **api_port**: Enter the port on which your API server is running. The default value is *8000*.
- **redis_port**: This is the port Redis is running on. The default value is *6379*, and you should only change it if Redis is using a different port.
- **gpfs_nodes**: If you are using a General Parallel File System (GPFS), list your nodes here. If GPFS is installed on the same machine, *["localhost"]* is sufficient.

You can specify multiple nodes if needed, using a comma-separated list within the brackets.

Handling SSL Configuration

SSL (Secure Sockets Layer) ensures encrypted communication between the Ngenea Worker and the API. Here's how to handle the SSL settings:

- **If you have a valid SSL certificate**, set `api_secure=true`.
- When `api_secure=true`, the system requires a valid SSL certificate, and self-signed certificates are not allowed.
- Ensure that a valid SSL certificate is installed on the server if using SSL (`api_secure=true`). For assistance with obtaining or installing an SSL certificate, refer to the documentation on External SSL provisioning.
- **If you do not have a valid SSL certificate** and want to disable SSL, set `api_secure=false`. This will allow the system to communicate without using SSL.
- **If you do not specify the ``api_secure`` option** in the configuration file, the system will automatically default to `api_secure=true`. If you do not have SSL, you must explicitly set `api_secure=false` to avoid issues with the connection.

Worker Configuration Settings - Introduction

The Ngenea Worker configuration involves setting up and managing workers that process tasks for the Ngenea Hub.

It includes options for API connectivity, task concurrency, Redis integration, and advanced logging settings. The system allows customization through custom configurations, multiple site setups, and debug-level adjustments to ensure efficient task handling and monitoring.

Note: Click the **link** to learn more about Ngenea Worker settings and configurations!

Note: Please refer to the link to understand more about Hub Configuration: {ref} `Hub Configuration Documentation <hub_config>`.

Joining the Worker to the Hub

To establish secure communications and register the worker with the hub, you will need to run the join command with a valid hub admin username and password.

Use the following command:

```
ngenea-worker join --user <USERNAME>
```

Example: Let's assume the username for the hub admin is hubadmin. To run the join command:

```
ngenea-worker join --user hubadmin
```

The system will then prompt you to enter the password for the hubadmin user.

After providing the password, the worker will authenticate with the hub, and you should see output similar to this:

```
hubadmin's password:
Attempting to auth the hub using the provided credentials...
Authenticated as user onprem-worker.
Storing the client certificates for the worker...
Client certificate stored at /etc/pki/tls/certs/onprem.crt
Client private key stored at /etc/pki/tls/private/onprem.key
Storing the root CA for NgeneaHub...
Root CA stored at /etc/pki/tls/certs/ng-hub-ca.crt
```

Enabling and Starting the Ngenea Worker Service

```
The steps for authentication and certificate storage are
automatically performed as part of the `ngenea-worker join`
command.
```

Once the worker is authenticated and certificates are stored, the next step is to ensure that the Ngenea Worker service is enabled and running. You will use the systemd system and service manager for this.

Enable and start the Ngenea Worker service using this command:

```
systemctl enable --now ngenea-worker
```

Verification: You can verify the service status by running:

```
systemctl status ngenea-worker
```

If everything is configured correctly, you should see an active and running status.

Product Interoperability Matrix

Ngenea Hub requires specific versions of Ngenea.

- All Ngenea Hub managed sites must use the same version of Ngenea
- Mixed versions are unsupported

Ngenea

The following table defines the supported Ngenea versions for each version of Ngenea Hub.

Ngenea Hub version	Ngenea minimum version	Ngenea maximum version
2.7.0	1.31.0-1	1.31.0-1
2.6.0	1.31.0-1	1.31.0-1
2.5.5	1.30.1-1	1.30.1-1
2.5.4	1.30.1-1	1.30.1-1
2.5.3	1.30.1-1	1.30.1-1
2.5.2	1.30.1-1	1.30.1-1
2.5.1	1.30.1-1	1.30.1-1
2.5.0	1.30.1-1	1.30.1-1
2.4.3	1.30.1-1	1.30.1-1
2.4.2	1.30.1-1	1.30.1-1
2.4.1	1.30.1-1	1.30.1-1
2.4.0	1.30.1-1	1.30.1-1
2.3.2	1.29.0-2	1.29.0-2
2.3.1	1.29.0-2	1.29.0-2
2.3.0	1.29.0-2	1.29.0-2
2.2.5	1.28.0	1.28.0
2.2.4	1.28.0	1.28.0
2.2.3	1.28.0	1.28.0
2.2.2	1.28.0	1.28.0
2.2.1	1.28.0	1.28.0
2.2.0	1.28.0	1.28.0
2.1.0	1.27.0	1.27.0
2.0.2	1.25.0	1.25.0
1.30.0	1.27.0	1.27.0
1.29.0	1.27.0	1.27.0
1.28.0	1.26.1	1.26.1
1.27.0	1.25.0	1.25.0
1.26.0	1.24.1	1.24.1
1.25.0	1.24.1	1.24.1
1.24.0	1.21.0	1.22.0
1.23.0	1.21.0	1.22.0
1.22.0	1.21.0	1.22.0
1.21.0	1.21.0	1.21.0
1.20.0	1.21.0	1.21.0
1.19.0	1.21.0	1.21.0
1.17.3	1.20.1	1.20.1
1.17.0	1.19.0	1.19.0
1.13.0-1.16.0	1.16.0	1.19.0
1.10.0-1.12.0	1.15.0	1.16.0
1.9.0	1.14.0	1.14.0
1.8.0	1.13.0	1.14.0
1.7.0	1.12.0	1.12.0

Ngenea Hub version	Ngenea minimum version	Ngenea maximum version
1.6.0	1.12.0	1.12.0
1.5.0	1.12.0	1.12.0
<=0.6.0	1.9.0	1.11.0

Event Based Orchestration

The following table defines the supported Event Based Orchestration versions for each version of Ngenea Hub.

Ngenea Hub version	Event Based Orchestration version
1.30.0	1.0.0

Upgrade

Warning: There is no direct upgrade path from Hub 1 to Hub 2.

Please contact support for guidance on performing the upgrade.

Note: Hub versions 2.3.0+ have additional requirements.

Ensure to review the Product Interoperability Matrix and align software versions accordingly.

If an upgrade is being performed from a version < 2.3.0 please note changes in the Installation and Upgrade guides.

Before you start

Before upgrading, you must wait for any pending or active jobs to complete, otherwise they may be lost or present an incorrect future state.

Scheduled workflows must be temporarily disabled prior to upgrading to prevent new jobs being submitted during the upgrade process.

Backup Workflows

Ngenea Hub ships with some default workflows. New releases may make changes to these workflows, so any customisations to them may be lost during upgrade. For safety, workflows should be backed-up before upgrading.

The easiest way to backup workflows is using ngclient or by using Ngenea Hub backup management command Backing Up HUB Static Configurations

```
ngclient workflows list > workflows_backup.json
```

See NGCLIENT-WORKFLOWS for more information.

Stop Services

Note: Hub versions 2.1.0+ have additional requirements

When upgrading Hub 2.1.0+, the additional service ngenea-worker-frontend.path is required to be actioned

First, shutdown Ngenea Worker on all nodes

```
systemctl stop ngenea-worker
```

Note that any Ngenea Worker packages pre-1.12.0 will use the older syntax:

```
systemctl stop ngenea-worker@SITENAME
```

Then shutdown Ngenea Hub

```
systemctl stop ngeneahub
systemctl stop ngeneahub-frontend.path
```

Warning: Not stopping the workers before upgrading may result in jobs being stuck as `PENDING`. If this happens, restarting the workers using `systemctl restart ngenea-worker` will allow jobs to start running again.

Upgrade Packages

Download the latest RPMs from the Download page.

Upgrade Ngenea Hub

```
yum upgrade ngenea-hub-<version>.rpm
```

As with Installation Guide, for offline situations, the Ngenea Hub base and image rpms can be upgraded with

```
rpm -Uvh ngenea-hub-<version>.rpm ngenea-hub-images-<version>.rpm
```

Upgrade Ngenea Worker on all nodes

```
yum upgrade ngenea-worker-<version>.rpm
```

Upgrade Configurations

Warning: If upgrading from Ngenea Hub version 1.17 or older, you must convert worker configuration to 1.18+ format. Please refer to the *appropriate worker configuration* and *worker join* steps as described in Installing Ngenea Worker. Installation of the worker is not required as this has been achieved in the prior Upgrade Packages step.

Ngenea Hub versions 2.3+ have additional requirements. If an upgrade is being performed from a version < 2.3.0 please note changes in the Installation and Upgrade guides Prior LDAP connections require to be re-authenticated, or preferably via Kerberos. Ensure to review the LDAP / Active Directory Login LDAP and Kerberos sections applying the preferred setup accordingly.

Restart Services

First, startup Ngenea Hub

```
systemctl start ngeneahub
systemctl start ngeneahub-frontend.path
```

Then start Ngenea Worker on all nodes

```
systemctl start ngenea-worker
```

If any scheduled workflows were disabled, they can now safely be re-enabled.

Validation

Check the status of the Ngenea Hub service with:

```
ngeneahubctl status
systemctl status ngeneahub-frontend.path
```

Check the status of Ngenea Worker service with

```
systemctl status ngenea-worker
```

Restoring Workflows

Check the workflows post-update. If there are any issue or inconsistencies with the upgraded workflows, they can be restored from the backup created pre-upgrade. This is also done using `ngclient`.

Any workflow which is missing can be re-imported using

```
ngclient workflows import <workflow_file>
```

Any workflow which has changed can be restored using

```
ngclient workflows update <id> <workflow_file>
```

Note, `ngclient` only allows importing or updating single workflows at a time. The `workflow_file` passed to the above commands must only contain a single workflow definition.

Configuration

Hub Initial Configuration

Authenticate via TLS Communications

To secure communication, run the join command to ensure TLS (Transport Layer Security) is enabled.

During this step, you will need to provide the username and password of a registered hub admin user to authenticate successfully.

If you don’t have a hub admin user set up yet by following the steps:

- Open a terminal on the server where Ngenea Hub is installed. Run the following command to create a new admin user:

```
ngeneahubctl adduser
```

- You will be prompted to provide a username and password. These credentials will be used to log into the Ngenea Hub UI later.
- Replace `SITENAME` with the actual name of your site and run the following command:

```
ngeneahubctl addsite SITENAME
```

- Once you’ve created the admin user and registered the site, you can now log into the Ngenea Hub User Interface (UI).
- Open a web browser and navigate to : `http://server.address:8000`
- Replace `server.address` with the actual IP address or domain of your server.
- Enter the admin credentials you created earlier to log in.

Hub Configuration

Settings

Ngenea Hub requires some important settings to work properly. These settings tell the system how to connect to its database, process tasks, and secure data.

The main configuration file is located at:

`/etc/sysconfig/ngeneahub`

This file contains all the necessary information for Ngenea Hub to function. If you do not set these values, the system will use default settings.

Mandatory Settings

Here’s a simple explanation of each important setting:

Setting	Description
DJANGO_SECRET	A secret key that protects important system data, like user sessions. Think of it as a password used internally by the system.
POSTGRES_DB	The name of the database where Ngenea Hub stores its information.
POSTGRES_USER	The username that allows the system to connect to the database.
POSTGRES_PASSWORD	The password used to access the database securely.
WORKER_THREADS	Controls how many tasks can be handled at the same time. Default: **2**.
DAG_THREADS	Helps process multiple tasks at the same time. Default: **7**.
REFRESH_THREADS	Controls how many jobs can refresh at the same time. DefaultL **2**
CELERY_BROKER	Defines the task queue broker (**RabbitMQ** or **Redis**). Default: **Redis**.
RABBITMQ_USER	The username for RabbitMQ (if used). Default: **ngeneahub**.
RABBITMQ_PASSWORD	The password for RabbitMQ (if used). Default: **ngeneahub**.
RABBITMQ_VHOST	A virtual space inside RabbitMQ for organizing tasks. Default: **nghub**.
TASK_DAEMON_BATCH_SIZE	Number of tasks that update their status when a job starts. Default: **100**.
DAG_REFRESH_INTERVAL	Controls how often in seconds the job refresh daemon polls for new jobs to refresh. Default: **1**
DAG_REFRESH_MAX_AGE	Controls how long in seconds the job refresh daemon will wait for a refresh to complete before retrying it. Default: **600**
DAG_REFRESH_BATCH_SIZE	Controls the maximum number of job refreshes that will be queued per refresh interval. Default: **5**
JWT_PRIVATE_KEY	A key used to sign user authentication tokens. Generated on first startup.
JWT_PUBLIC_KEY	A key used to verify authentication tokens. Generated on first startup.
JWT_EXPOSED_JSON	Stores extra details related to authentication security.
GF_SECURITY_ADMIN_PASSWORD	Password for accessing **Grafana**, the system monitoring tool.

Setting	Description
HUB_PORT	The port where Ngenea Hub runs. Default: **8000**.
WEB_BIND_IP	The IP address used for connecting to the system. Default: **0.0.0.0**.
SHARED_SECRET	A secret key for secure communication within the system.
DJANGO_ENCRYPTED_FIELDS_KEY	Encryption key used to secure sensitive database information.
DJANGO_EJF_CRYPTER_KEY	Additional security key for encrypting Django responses.

Optional settings

Settings and Description

- **REDIS_HOST**: The address of the Redis queue results store. Defaults to the container service address.
- **WORKERS**: The number of workers for API requests. More workers allow the system to handle more requests simultaneously. Default: **8**. This is deprecated. Please use **GUNICORN_WORKERS** instead.
- **GUNICORN_THREADS**: The number of worker threads for handling requests. Typically, use 2–4 × CPU cores; adjust as needed for your workload. Default: **2**
- **GUNICORN_WORKERS**: The number of gunicorn workers for API requests. More gunicorn workers allow the system to handle more requests simultaneously. This setting will override any **WORKERS** settings provided. Default: **8**
- **API_TIMEOUT**: The timeout in seconds for API requests. Default: **600** seconds.
- **GATEWAY_TIMEOUT**: The timeout for requests passing through nginx. Should be greater than or equal to API_TIMEOUT. Default: **600** seconds.
- **CONSUMER_TIMEOUT**: The timeout for RabbitMQ consumer delivery acknowledgment in seconds. Default: **10800000** seconds (3 hours).
- **PUBLIC_URL**: Configurable base URL for the hub stack. Must not end in a trailing slash.
- **CELERY_THREADS**: The number of concurrency threads for handling multiple background tasks. More threads mean faster processing of tasks.
- **EVENT_THREADS**: The number of concurrency threads for handling event reporting tasks. More threads help report events faster.
- **RESULT_THREADS**: The number of concurrency threads for handling result reporting tasks. More threads mean quicker reporting of task results.
- **HEARTBEAT**: Enables or disables celery heartbeats to keep connections alive. Default: **True** (enabled).
- **GOSSIP**: Enables or disables celery gossip communication. Default: **False** (disabled).
- **MINGLE**: Enables or disables celery mingle for coordination. Default: **False** (disabled).
- **REDIS_HEALTH_CHECK_INTERVAL**: The interval in seconds between health checks for Redis backend. Default: **60** seconds.

- **REDIS_TCP_BACKLOG**: The number of pending requests to Redis. Higher values help avoid slow connections in high request environments. Default: **511**.
- **REDIS_SOCKET_TIMEOUT**: The timeout in seconds for resetting idle Redis backend connection sockets. Default: **60** seconds.
- **CELERY_SOCKET_TIMEOUT**: The timeout in seconds for resetting idle Celery broker connection sockets. Default: **60** seconds.
- **CELERY_CONNECTION_TIMEOUT**: The timeout in seconds for resetting idle connections via Redis broker. Default: **60** seconds.
- **EXPIRE_OLD_JOBS_INTERVAL**: Cron schedule for expiring old jobs. Default: `0 0 * * *` (daily).
- **REMOVE_OLD_SEARCH_RESULTS_INTERVAL**: Cron schedule for removing old search results. Default: `0 0 * * *` (daily).
- **INVALIDATE_CANCELLED_JOB_TASKS_INTERVAL**: Cron schedule for revoking cancelled job tasks. Default: `0 * * * *` (every hour).
- **CLEANUP_OLD_EVENTS_INTERVAL**: Cron schedule for cleaning up old snapdiff events. Default: `0 * * * *` (every hour).
- **INACTIVE_TASKS_INTERVAL**: Cron schedule for invalidating inactive tasks. Default: `0 * * * *` (every hour).
- **SYNC_SITE_SETTINGS_INTERVAL**: Cron schedule for syncing site settings in the database. Default: `0 * * * *` (every hour).
- **SYNC_GLOBAL_SETTINGS_INTERVAL**: Cron schedule for syncing global settings across all sites. Default: `0 * * * *` (every hour).
- **REFRESH_SITE_ANALYTICS_INTERVAL**: Cron schedule for refreshing site analytics. Default: `37 */12 * * *` (every 12 hours).
- **SYNC_STORAGE_POOLS_INTERVAL**: Cron schedule for syncing storage pools. Default: `*/30 * * * *` (every 30 minutes).
- **SYNC_REMOTE_SERVERS_INTERVAL**: Cron schedule for syncing remote servers. Default: `0 0 * * *` (once a day).
- **SYNC_SPACES_QUOTA_INTERVAL**: Cron schedule for syncing spaces' quotas. Default: `*/30 * * * *` (every 30 minutes).
- **SYNC_SPACES_INTERVAL**: Cron schedule for syncing spaces. Default: `0 * * * *` (every hour).
- **SYNC_ALERTS_INTERVAL**: Cron schedule for syncing alerts from all sites. Default: `* * * * *` (every minute).
- **EXPIRE_OLD_FSOBJECTS_INTERVAL**: Cron schedule for expiring old file system objects. Default: `0 0 * * *` (daily).
- **REMOVED_QUEUE_CLEANUP_INTERVAL**: Cron schedule for cleaning up removed queues. Default: `24 * 60` (every day).
- **CERTIFICATE_LIFE_TIME_DAYS**: Lifetime of SSL certificates in days. Default: **36500** (100 years).
- **QUEUE_ONLINE_CHECK_INTERVAL**: Interval in seconds to check if a queue is online. Default: **10** seconds.

Enabling LDAP/Active Directory Authentication

This section of the guide explains how to integrate LDAP/Active Directory with Ngenea Hub for user authentication and group management. It covers required configuration settings, automatic user account creation, and group mirroring. It also explains how changes in AD (like adding or removing users from groups) are reflected in Hub after the next login.

For more details, refer to LDAP / Active Directory Login.

Broker Settings

The messaging queue configuration for Ngenea Hub is a crucial component in managing communication between workers and the Hub.

This system supports two main brokers: **Redis** and **RabbitMQ**, offering flexibility depending on your specific requirements and infrastructure. Configuring the messaging queue is handled through various settings in the `/etc/sysconfig/ngeneahub` file, along with specific configuration files for Redis and RabbitMQ.

In the sections that follow, we will delve into the details of selecting and configuring the messaging queue, including how to manage Redis and RabbitMQ settings, enable the RabbitMQ admin interface, and understand the limitations of these configurations within the Hub environment.

For more details, refer to Hub Messaging Queue Configuration.

Server Configurations

In **Ngenea Hub**, certain settings are stored in the Ngenea Hub database and can be easily viewed and modified via the **Ngenea Hub REST API** at the `/api/configurations/` endpoint.

The Ngenea Hub REST API allows you to manage configuration settings both globally and on a per-site basis. These configurations control various aspects of the system, such as job time-to-live (TTL), search backend setup, snapshot retries, task invalidation times, and more. By using simple API requests, you can optimize your system's performance and behavior.

For a comprehensive overview of available configurations, including how to view and change them through the API, as well as additional features like dynamic file batching, refer to the full documentation - Configuration.

Docker Compose Configuration

The `Docker Compose configuration` file for Ngenea Hub is located at `/usr/share/ngeneahub/docker/docker-compose.yml`.

If you need to make changes or add customizations, you can create an override file at `/usr/share/ngeneahub/docker/docker-compose.override.yml`. This override file allows you to extend or modify the default settings without changing the original configuration file. This setup makes it easier to customize your Docker Compose environment according to your specific needs.

Worker Configuration

Note: In the installation guide we have explained how to configure the Ngenea Worker, create or edit the `/etc/ngenea/ngenea-worker.conf` file with the required settings for your site, API server, Redis, and GPFS nodes. You can also configure SSL for secure communication with the API.

For more details, please refer to the link.

Settings

The following is a list of available settings:

Option	Type	Default	Required	Description
site	*string*		Yes	The name of the queue to listen to
api_host	*string*		Yes	The base url for Ngenea Hub, this will be the url without the https protocol or port.
api_port	*string*		Yes	The port that the Ngenea Hub is being hosted on, by default within Ngenea Hub it is 8000.
api_secure	*string*		No	If the API is behind a secure HTTPS connection, by default this is true. Refer to: External SSL for provisioning SSL certificates if `api_secure=true`.
api_secure_verify	*string*		No	If the API requests should verify certificates, by default this is true.
threads	*int*	*10*	No	The number of concurrent tasks that can be run.
heartbeat	*bool*	*true*	No	Key for Disabling/ Enabling celery heartbeats, by default Enabled.
gossip	*bool*	*false*	No	Key for Disabling/ Enabling celery gossip, by default Disabled.
mingle	*bool*	*false*	No	Key for Disabling/ Enabling celery mingle, by default Disabled.

Option	Type	Default	Required	Description
redis_health_check_interval	*int*	*60*	No	The Redis backend supports health checks. This value must be set as an integer whose value is the number of seconds between health checks.
redis_socket_timeout	*int*	*60*	No	The Redis results backend supports a socket connection timeout, this value must be set as an integer whose value is the number of seconds.
celery_socket_timeout	*int*	*60*	No	The Redis celery broker supports a socket timeout, this value must be set as an integer whose value is the number of seconds.
celery_connection_timeout	*int*	*60*	No	The Redis celery broker supports a socket connection timeout, this value must be set as an integer whose value is the number of seconds.
gpfs_nodes	*list*		No	A list of nodes to run the snapdiff policy scan on as a list of hostnames
enable_plugins	*bool*	*false*	No	Key for Disabling/ Enabling worker plugin behaviour (currently in alpha), by default Disabled.
loglevel	*str*	*INFO*	No	Key for setting the worker loglevel (more specific to worker main process). valid choices are INFO, DEBUG, WARNING, CRITICAL, ERROR (by default INFO).

Controlling Functions

Ngenea Worker uses internal function queues to process tasks. These queues can be adjusted based on your needs.

What Are Function Queues ?

Function queues are like task managers that organize and run specific tasks. You can turn these on or off and adjust their settings.

How to Configure Function Queues ?

- Open the configuration file (`/etc/ngenea/ngenea-worker.conf.`) for Ngenea Worker.
- Modify settings to enable or disable queues.
- Refer to the Workflow Steps documentation to see what each queue does.

Creating Custom Queues

If the default queues don't meet your needs, you can create custom job queues. These allow you to prioritize specific tasks or allocate more resources.

Example Configuration for a Custom Queue

Steps to Add a Custom Queue

1. Open the worker's configuration file (`/etc/ngenea/ngenea-worker.conf.`).
2. Add a new section with the name of the queue in brackets, like `[Queue highpriority]`.
3. Specify the number of threads for that queue. (Optional)
4. Save and reload the worker service to apply changes.

For detailed information, check Queues Documentation.

Using a Custom Configuration File

Configuration files are text files used to set options and preferences for a system or application. Sometimes, you may need to override the default configuration with a custom one. Here's how to set it up:

By default, the system uses the file located at:

```
/etc/ngenea/ngenea_config_arg.conf
```

How to Use a Custom Config File ?

- **Uncomment the CONFIG Line:** Open the file `/etc/ngenea/ngenea_config_arg.conf` and remove the # symbol in front of this line:

```
CONFIG=/etc/ngenea/ngenea-worker-custom.conf
```

- **Create a Custom Worker Config File:** Save a new file with a name like ngenea-worker-custom.conf. Use this file to define your settings.
- **Register Your Site:** Run these commands to register the custom site:

```
ngeneahubctl addsite <sitename>
ngenea-worker join --user <username> --site <sitename>
```

Running Ngenea Worker with Multiple Sites

Note: Running multiple sites on a node has several drawbacks, so using custom queues is preferred where possible.

To run services with two sites:

- Create new service file same as `/usr/lib/systemd/system/ngenea-worker.service` with different filename (Eg: ngenea-worker-site1.service).
- Create new custom config file same as `/etc/ngenea/ngenea_config_arg.conf` with different filename (Eg: ngenea_config_arg1.conf).
- Create new worker config file same as `/etc/ngenea/ngenea-worker.conf` with different filename and give the filename in ngenea_config_arg1.conf.
- In `ngenea-worker-site1.service`, change the value of `EnvironmentFile=...` to new custom config file created (Eg: EnvironmentFile=/etc/ngenea/ngenea_config_arg1.conf).
- Now run systemctl start `ngenea-worker.service` and `systemctl start ngenea-worker-site1.service`.

Setting Ngenea Worker Debug Level in systemd Service Script

Environment Directive: In a system, there are background tasks that run automatically (called services). The **`Environment` directive** in the service's setup tells it about certain settings it should use while running.

What Does `DYNAMO_DEBUG=true` Do?

`Environment=DYNAMO_DEBUG=true` sets a setting called **`DYNAMO_DEBUG`** to **`true`** for the service called **ngenea-worker**.

What Happens with This Setting?

- Normally, the **ngenea-worker** service only logs basic information about what it's doing (like regular updates).
- When you set **`DYNAMO_DEBUG=true`**, the service will log **extra, detailed information** about its activities.

Hub Messaging Queue Configuration

When setting up communication between various components of the Ngenea Hub, such as workers and the hub itself, a messaging queue plays a crucial role. These messaging queues act as intermediaries, efficiently managing and delivering messages between components.

The Ngenea Hub supports two messaging queue systems: **Redis** and **RabbitMQ**. Below is a step-by-step guide to understanding and configuring these systems.

Choosing the Messaging Queue

The Ngenea Hub provides two primary options for a messaging queue:

- **Redis**: Known for its speed and simplicity, Redis is an excellent choice for systems requiring high performance with straightforward configuration.
- **RabbitMQ** : RabbitMQ offers advanced features compared to Redis, including more sophisticated tools for managing queues, making it a better choice for complex messaging requirements.

The messaging between workers and Ngenea Hub is configurable between two different supported brokers. This is controlled with variables in `/etc/sysconfig/ngeneahub` along with additional configuration files.

The following are all broker related configuration values:

Setting	Default	Description
CELERY_BROKER	redis	This controls the messaging queue `redis|rabbitmq`
RABBITMQ_USER	ngeneahub	User for the rabbitmq user for use with Ngenea Hub
RABBITMQ_PASSWORD	Randomly generated password	Password used for the rabbitmq user for use with Ngenea Hub
RABBITMQ_VHOST	nghub	The virtual host used within the rabbitmq instance within Ngenea Hub
REDIS_HOST	redis	Address of the Redis queue results store. Defaults to the container service address.
REDIS_HEALTH_CHECK_INTERVAL	60	The Redis backend supports health checks. This value must be set as an integer whose value is the number of seconds between health checks.
REDIS_TCP_BACKLOG	511	In high requests-per-second environments you need a high backlog in order to avoid slow client connections issues to redis.
REDIS_SOCKET_TIMEOUT	60	When there are network issues redis backend connection sockets can become stale, this timeout setting will reset the socket connection after this value in seconds after becoming idle and resume operation.

For more details on general configuration see Hub Configuration for more details.

Redis Setting Files

When setting up Redis within Ngenea Hub, you're provided with a default configuration file located at: `/etc/ngenea/redis/redis.conf`, any edits made to this file will persist with software upgrades.

This file is pre-configured to help get you started with Redis, but it can be customized to better meet your specific needs. Common adjustments include tuning memory usage, adjusting data persistence settings, or optimizing performance based on the expected workload.

Customizing Redis

To make changes to the Redis configuration, follow these steps:

- **Open the Configuration File:** Use a text editor to open the redis.conf file: `sudo nano /etc/ngenea/redis/redis.conf`
- **Edit the File:** Make the necessary changes to the configuration. The file allows you to adjust various Redis settings, including memory limits, persistence options, and more. For a full list of configurable options, you can refer to Redis configuration.
- **Save the Changes:** After making the required changes, save the file and close the text editor.

Restarting Redis to Apply Changes

For your changes to take effect, Redis must be restarted. There are two ways to restart the Redis service:

Preferred Method: Restarting Ngenea Hub

The easiest and preferred method is to restart the entire Ngenea Hub system. This can be done with the following command:

```
sudo systemctl restart ngeneahub
```

This will restart all services, including Redis, and apply your changes without any risk of inadvertently disrupting the Redis container.

Alternative: Restarting Only the Redis Container

If you prefer to restart just the Redis container without affecting other services, you can restart it using Docker. **However, this method may have unintended consequences**, as it only restarts Redis and not the other dependent services in Ngenea Hub.

To restart the Redis container, use the following command:

```
docker restart ngeneahub_redis_1
```

While this can be useful for testing small changes, it's generally safer to restart the entire system to avoid potential issues with container dependencies.

RabbitMQ Setting Files

If Ngenea Hub is configured to use RabbitMQ, additional configuration files can be provided within the directory: `/etc/ngenea/rabbitmq/conf.d`

This directory can be populated with custom configuration files for broader RabbitMQ configuration.

Default Configuration Files: The provided default configuration files within the `/etc/ngenea/rabbitmq/conf.d` directory are defined and updated in: `/usr/share/ngeneahub/rabbitmq`.

These default configuration files will be replaced during software upgrades. Therefore, it is important to apply any changes within custom configuration files to preserve your customizations.

Customizing RabbitMQ: RabbitMQ allows extensive customization, such as setting limits on the number of messages processed concurrently.

Note: Be mindful that some default configuration files may be overwritten during software updates. To avoid losing customizations, save your configuration changes in separate files within the `/etc/ngenea/rabbitmq/conf.d` directory.

Applying Changes: After modifying the RabbitMQ configuration files, you must restart the RabbitMQ service to apply the changes. This can be done with the following command: `sudo systemctl restart rabbitmq-server`.

Using RabbitMQ's Admin Interface

Unlike Redis, RabbitMQ does not come with built-in command line tools to monitor or manage its operations directly.

However, a tool known as the "admin panel" is available for RabbitMQ. By default, it is not turned on, but it can be enabled by running the following command in the Ngenea Hub host's command line:

```
ngeneahubctl exec -c rabbitmq rabbitmq-plugins enable rabbitmq_ma
nagement
```

Once it is turned on, access can be gained by visiting the address (**port 15672**) on the Ngenea Hub.

```
http://<hub-host>:15672
```

To access this, a login is required using a username and password. These login details are stored in a specific file on the server, called `/etc/sysconfig/ngeneahub`, where two important pieces of information can be found:

- `RABBITMQ_USER` : The username to log in.
- `RABBITMQ_PASSWORD` : The password for the username.

Limitations

When using RabbitMQ, it's important to note that its data—such as queue metrics, worker statuses, and throughput—will not appear in the Ngenea Hub's built-in monitoring tool, Grafana, which is accessible via:

`/hubmetrics`

Instead, you must rely on the RabbitMQ admin panel to view and manage such metrics.

Feature Set-up

To use certain features in Ngenea Hub, additional set-up is required as described in this section.

Search

The search feature in Ngenea Hub allows you to easily find files and folders across different sites. Setting it up correctly will ensure that you can use this powerful tool to quickly locate files when needed.

Requirements

The search feature works with systems running on PixStor, which is the platform that powers Ngenea Hub. There are two search options available: **PixStor Search** and **PixStor Analytics**.

This guide assumes that one of these options has already been set up as part of your PixStor installation.

Configuration Steps

There are two main configurations you need to consider to set up search properly.

Choose Your Search Backend

Depending on the version of Ngenea Hub you're using, the system may utilize either the Analytics Backend or the PixStor Search Backend for handling search functionality. Both backends provide the same core features, but you might need to switch between them based on your system's specific configuration.

If you want to switch from the default Analytics Backend to the PixStor Search backend, it's simple to do, and no coding is required. You can change the setting by sending a request through a command. Here's how:

Option 1: Using curl

`curl` is a tool that allows you to interact with online services from the command line. To switch to the PixStor Search backend, use the following command:

```
curl -s -X PATCH 'http://example.com/api/configurations/' -H 'Acc
ept: application/json' -H "Authorization: Bearer
$JWT_ACCESS_TOKEN" -H 'Content-Type: application/json' -d '{"sear
ch_backend": "pixstor_search"}'
```

- Replace http://example.com with your system's actual address.
- $JWT_ACCESS_TOKEN should be replaced with your valid access token, which is required for authentication.

This command will update the configuration of your system to use PixStor Search instead of the default Analytics Backend.

Option 2: Using ngcurl

If you have `ngcurl` installed and configured on your system, you can use this simpler command:

```
ngcurl patch configurations '{"search_backend": "pixstor_search"}'
```

This will also switch the search backend to PixStor Search. Both options achieve the same result; you can choose the one that fits your setup.

Note: To understand in detail please refer to the Global Congiguration documentation.

Set the Elasticsearch URL

If you're using the Analytics backend and your system is running on PixStor 6, you'll need to adjust the Elasticsearch URL to ensure the system can find the right data. The new address will be `http://localhost:19200`.

If you're using PixStor 5, the default address `localhost:9200` will work fine, and you don't need to change anything.

Here's an example of how to update this setting for PixStor 6:

```
$ curl -s -X PATCH 'http://example.com/api/sites/1/' -H 'Accept:
application/json' -H "Authorization: Api-Key $APIKEY" -H 'Content-
Type: application/json' -d '{"elasticsearch_url": "localhost:
19200"}'
```

Note: To understand in detail please refer to the Site-specific Configurations documentation.

Using the Search Feature

Once everything is set up, you can begin using the search feature in Ngenea Hub.

Search via REST API:

The search functionality can be accessed through the Ngenea Hub's REST API. This is a great option if you're comfortable with using API tools. For details on how to use search via the REST API, refer to Search

Search via the Ngenea Hub User Interface (UI):

The Ngenea Hub interface provides a user-friendly way to search for files across sites directly from the global search page in UI.

Cloud Functions

Introduction

"Cloud to Hub" is a function that works in the cloud and reacts to changes in cloud storage, like when files are added or deleted. When something changes, it sends an update to Ngenea Hub, which then syncs the changes with other systems (like PixStor). This ensures that all the systems stay up-to-date and match the information in cloud storage.

It works with any supported platform and can handle any type of event (like creating or deleting files). To set it up for a new platform or event, you only need to change the settings in the `config.json` file.

Note: A function is a specific task or action that a system or program can perform. In this case, the Cloud to Hub function reacts to changes in cloud storage and triggers actions to keep other systems in sync.

Why Use Cloud Functions ?

Automation: Cloud Functions ensure that once something happens in the cloud (like a file upload), the correct action is taken automatically, without manual intervention.

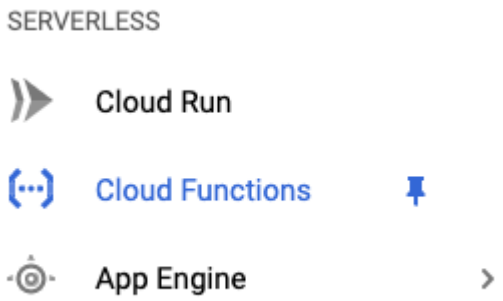
Synchronization: Cloud Functions help keep different systems in sync with each other, making sure all systems know when a file has changed.

Scalability: The cloud-based nature of the function means it can handle large amounts of data and automatically scale as needed.

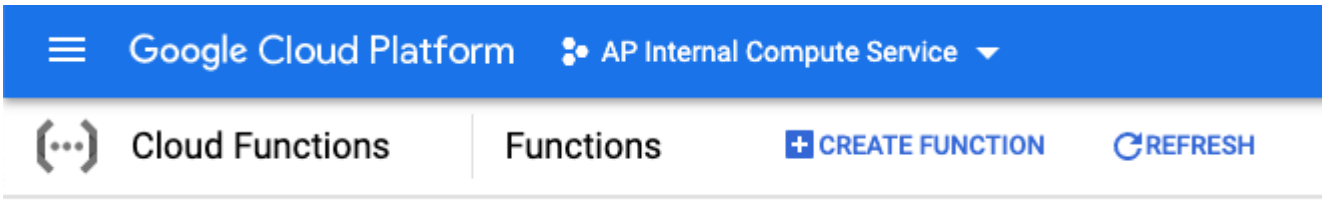
Supported Platforms:

GCP Cloud Function

In the GCP console menu under Serverless, select **Cloud Functions**



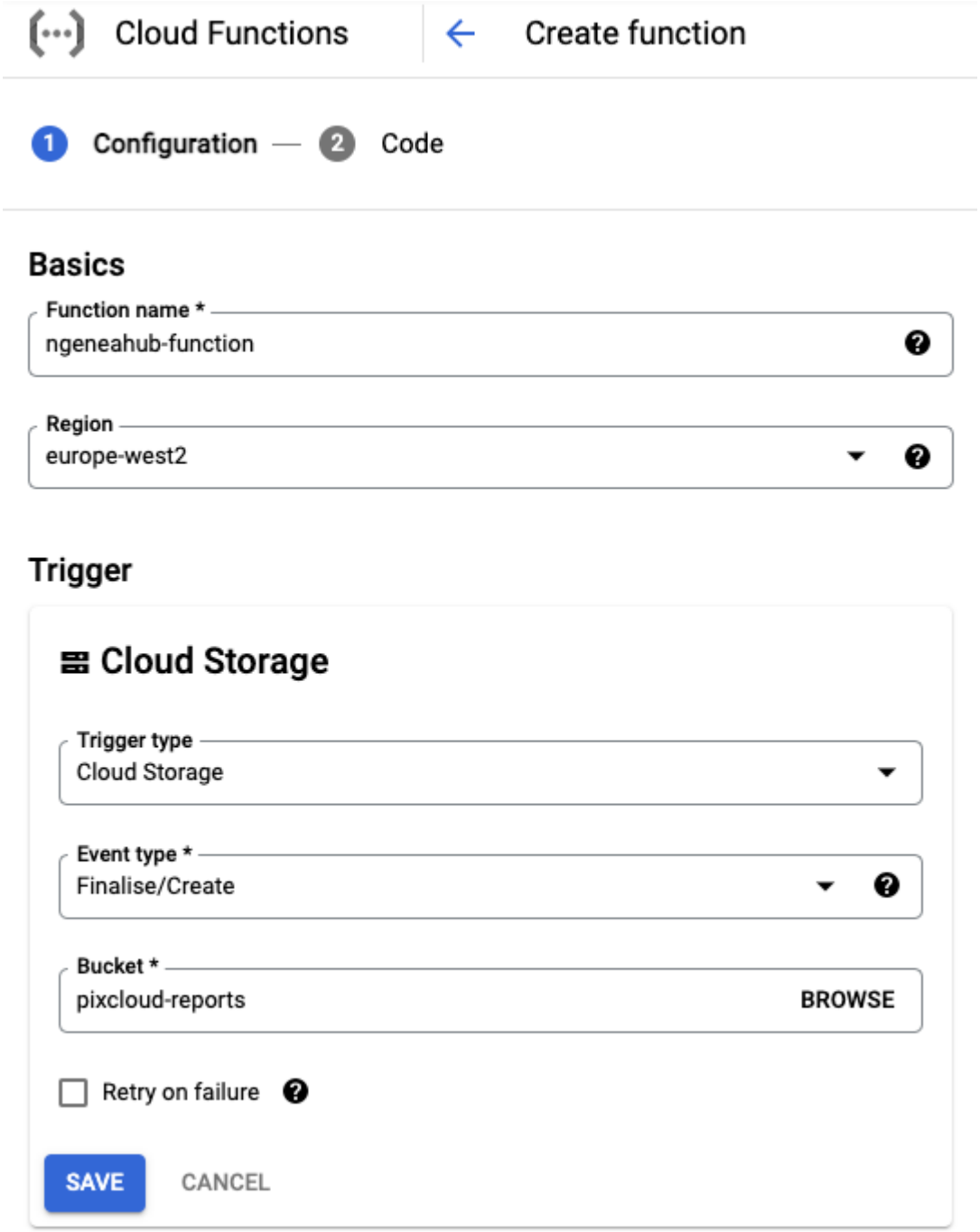
Choose **Create Function**



In the first Configuration page:

1. Give the function a name
2. Select a region to run from. Usually best to be in the same region as the bucket we'll be using
3. Under trigger select **Cloud Storage** type
4. And **Finalise/Create** for the event type
5. Select the bucket to monitor

Then press **Save**



If you wish to create a new service account for this function, use the following `gcloud` command to create a new service account and assign it the role `storage.objectViewer`

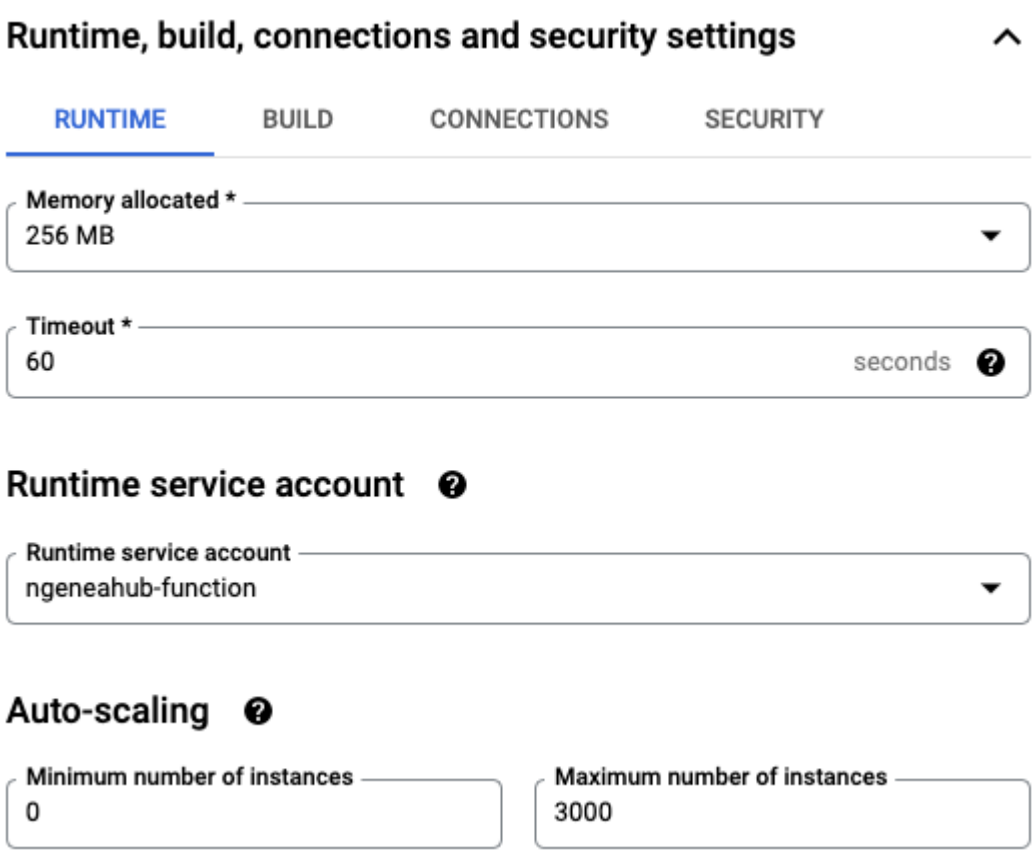
```
PROJECT_ID='GCP-PROJECT-1'
SERVICE_ACCOUNT_ID='ngeneahub-function'
ROLE_NAME='roles/storage.objectViewer'

gcloud iam service-accounts create $SERVICE_ACCOUNT_ID \
    --description='A service account to give the {{ brand_name }}
function read access to GCS buckets' \
    --display-name=$SERVICE_ACCOUNT_ID

gcloud projects add-iam-policy-binding $PROJECT_ID \
    --member="serviceAccount:$SERVICE_ACCOUNT_ID@$PROJECT_ID.iam.
gserviceaccount.com" \
    --role=$ROLE_NAME
```

Open up the **RUNTIME, BUILD AND CONNECTIONS SETTINGS** section

Under the **RUNTIME** tab at the bottom, select a **Runtime** service account that has the following permissions as a minimum (or the newly created service account from above):

- `storage.objectViewer`

Select **Next** to continue

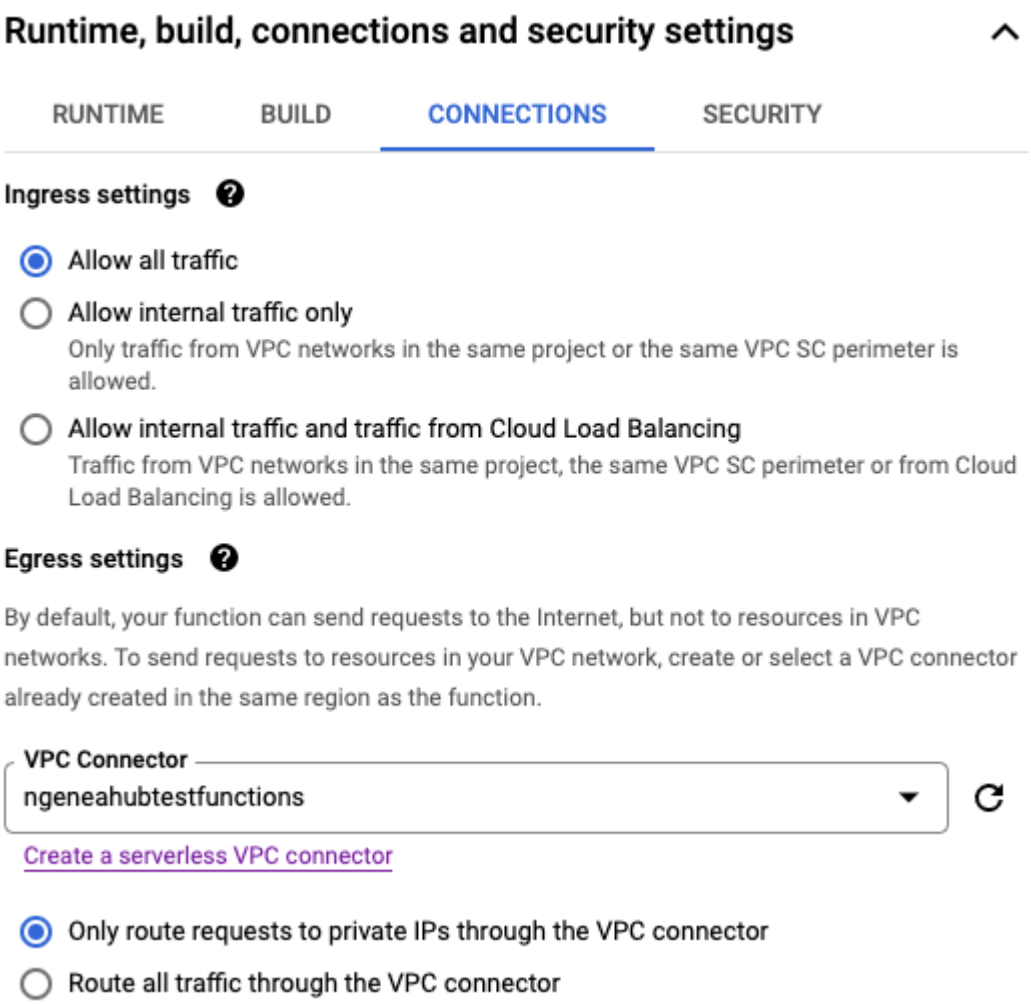


If the Ngenea Hub doesn't have an external IP to connect to, you'll need a **VPC Connector** for the function to be able to access the Ngenea Hub private IP.

The creation of the **VPC Connector** is out of scope of these docs.

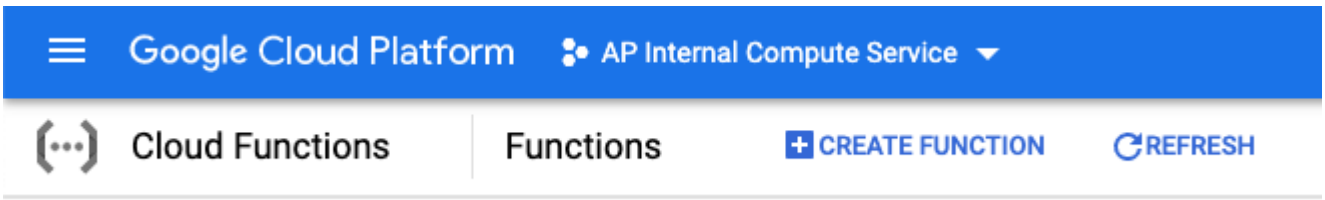
To select an existing **VPC Connector**, under the **RUNTIME, BUILD AND CONNECTIONS SETTINGS** section, select **Connections**.

From the VPC Connector drop down menu, select an existing connector and check the **Only route requests to private IPs through the VPC connector** radiobox.



In the Code config section

1. Change the **Runtime** to **Python 3.9**
2. The **Entry Point** is **main**
3. Select **ZIP upload** in the **Source code**
4. Choose the GCP zip previously downloaded from the Download page
5. Select a **Stage bucket** for use while deploying. You can use the bucket we'll be monitoring
6. Select **Next** to build the **Cloud Function**

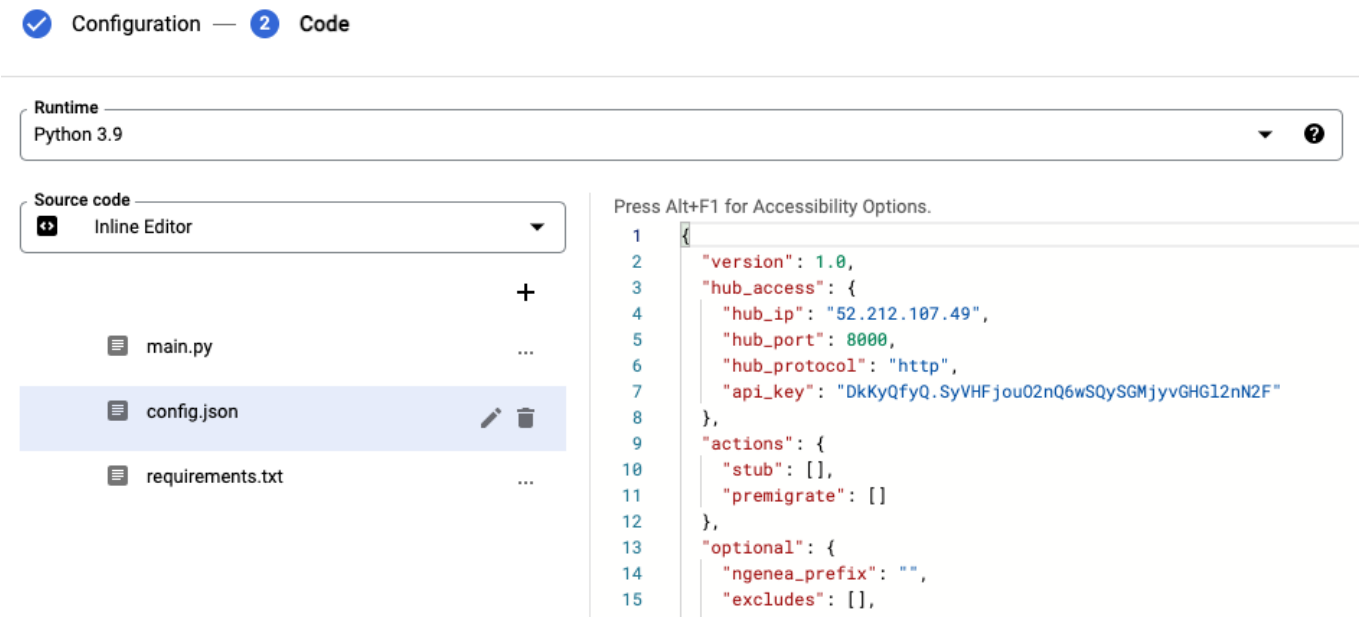


Once built you need to edit the default `config.json` file

Choose your new function and click **EDIT**

Select Next to get to the code edit section

Select the `config.json` file to edit



Edit the config file based on the docs from Cloud Functions

Select Deploy to save the changes. This can take 1-2 mins to update

AWS Lambda Function

What's AWS Lambda?

AWS Lambda is a service provided by Amazon Web Services (AWS) that allows you to run code without needing to manage servers. Imagine it as a machine that runs your code only when something specific happens, like a file being uploaded to an online storage system (like S3, which is AWS's storage service). You just upload your code, and AWS Lambda automatically handles the running of that code when it's needed.

What's IAM (Identity and Access Management)?

IAM is a service in AWS that helps you manage access to AWS resources. It allows you to define who can access what and what they can do with those resources. Think of IAM as a security guard that checks if someone has permission to use a certain resource or perform a certain action.

Create an IAM Policy and Role

IAM Policy: This is a set of permissions that define what a service (like Lambda) can or cannot do. For example, in this guide, the policy gives Lambda permission to:

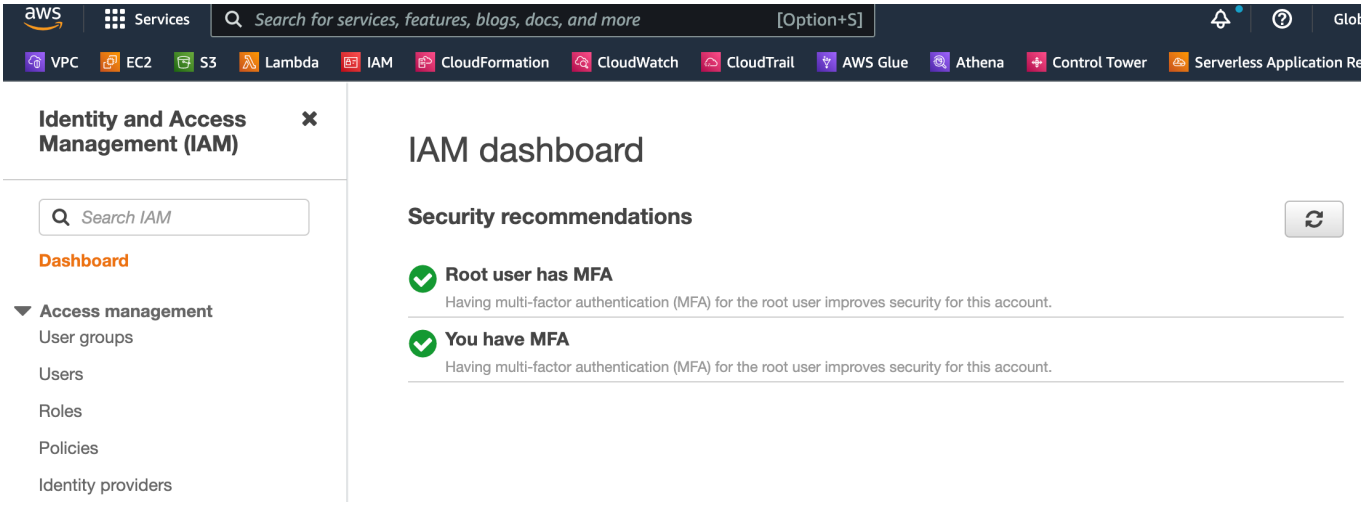
- Create log groups (where logs are stored).
- Write logs into CloudWatch (a service that monitors AWS resources).

- Get information about IAM users (a part of the AWS permissions system).

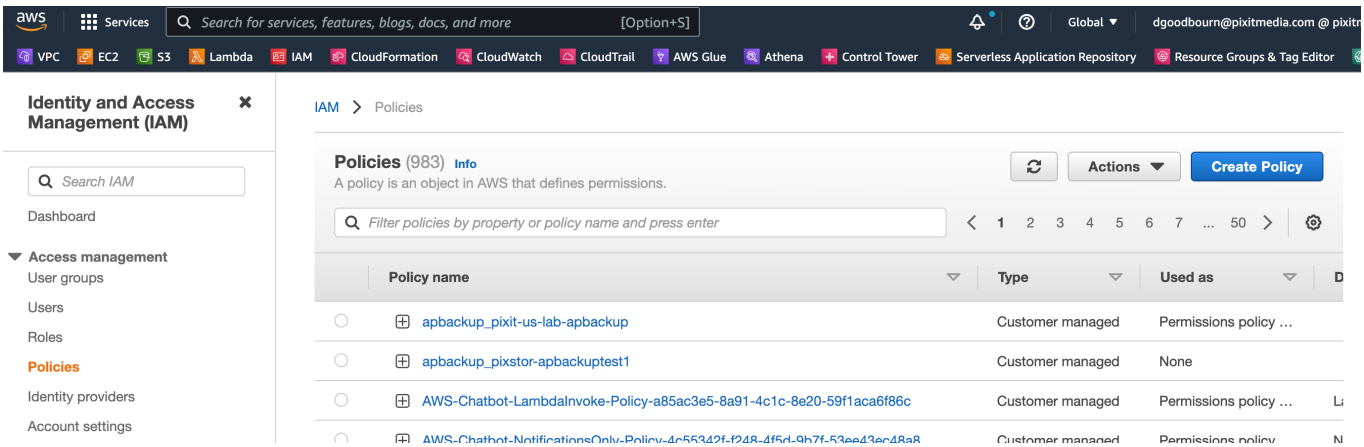
IAM Role: A role is like a `job` given to a service, like AWS Lambda, with specific permissions attached. The role lets Lambda use the permissions defined in the IAM policy you just created. It's like assigning a job to an employee (Lambda) and giving them a set of instructions (the policy) for what they're allowed to do.

To set up an IAM policy and role for AWS Lambda, follow these steps in the AWS console:

1. **Navigate to the IAM Service**: In the AWS Management Console, go to the **I AM** service. You can search for "IAM" in the search bar if it's hard to find.



1. **Create a New Policy:** In the left-hand menu, choose Policies and click the **Cr eate policy** button.



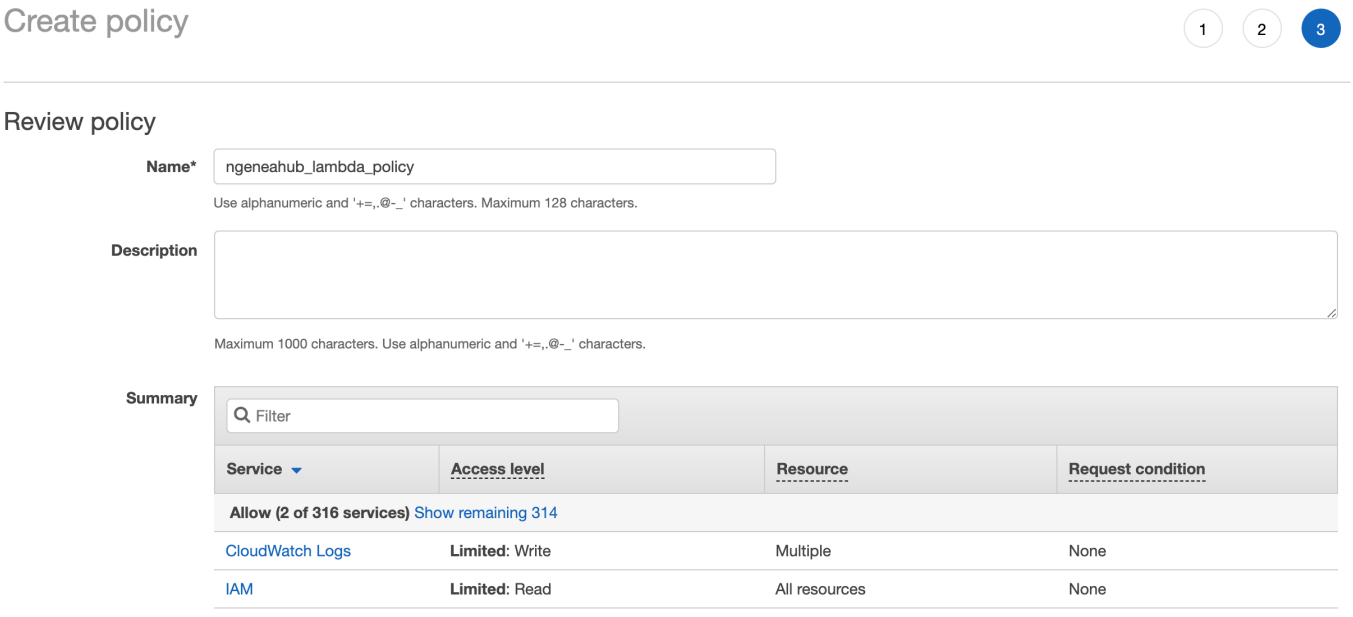
1. **Switch to the JSON Tab**: After clicking **Create policy**, you'll be taken to a page where you can define the policy. Select the JSON tab.
2. **Replace the Default Policy JSON**: Replace the existing text in the **JSON** editor with the following policy document:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "logs:CreateLogGroup",
```

```
            "Resource": "arn:aws:logs:*:<<AWS_ACCOUNT_ID>>:*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogStream",
                "logs:PutLogEvents"
            ],
            "Resource": [
                "arn:aws:logs:*:<<AWS_ACCOUNT_ID>>:log-group:/aws/
lambda/<<LAMBDA_NAME>>:*"
            ]
        },
        {
            "Effect": "Allow",
            "Action": "iam:GetUser",
            "Resource": "*"
        }
    ]
}
```

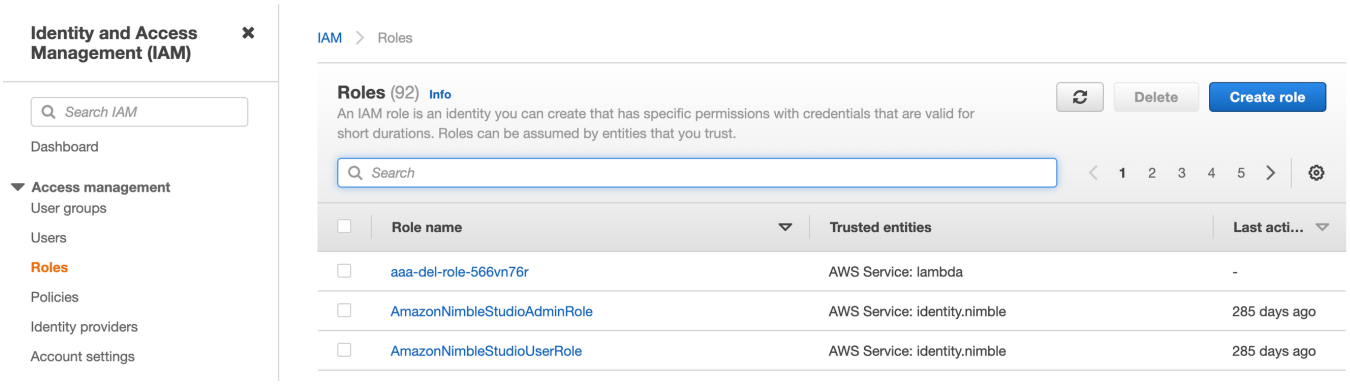
- Replace `<<AWS_ACCOUNT_ID>>`: Substitute `<<AWS_ACCOUNT_ID>>` with your actual AWS account ID. Your AWS account ID is a 12-digit number (e.g., `123456789012`) . **Do not include any hyphens**.
- Replace `<<LAMBDA_NAME>>`: Replace `<<LAMBDA_NAME>>` with the name of your Lambda function (e.g., my-lambda-function).

1. **Review and Create the Policy**:
    - After replacing the placeholders with the correct values, click **Next: Tags**.
        - If you need to add tags (optional), you can do so here, otherwise click **Next: Review**.
    - Give the policy a meaningful name, such as `ngeneahub_lambda_policy`.
    - Finally, click **Create Policy**.

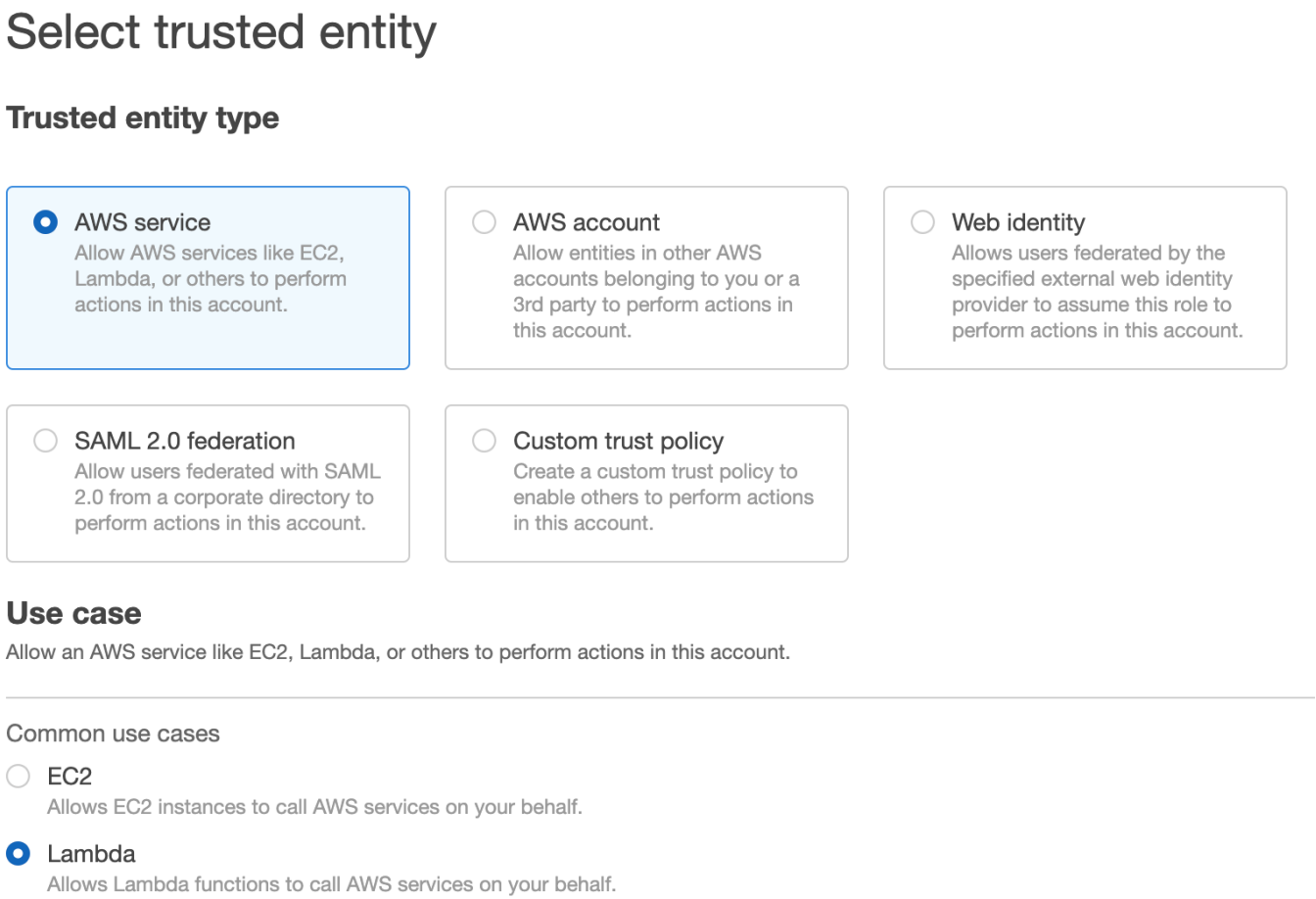


Create the IAM Role

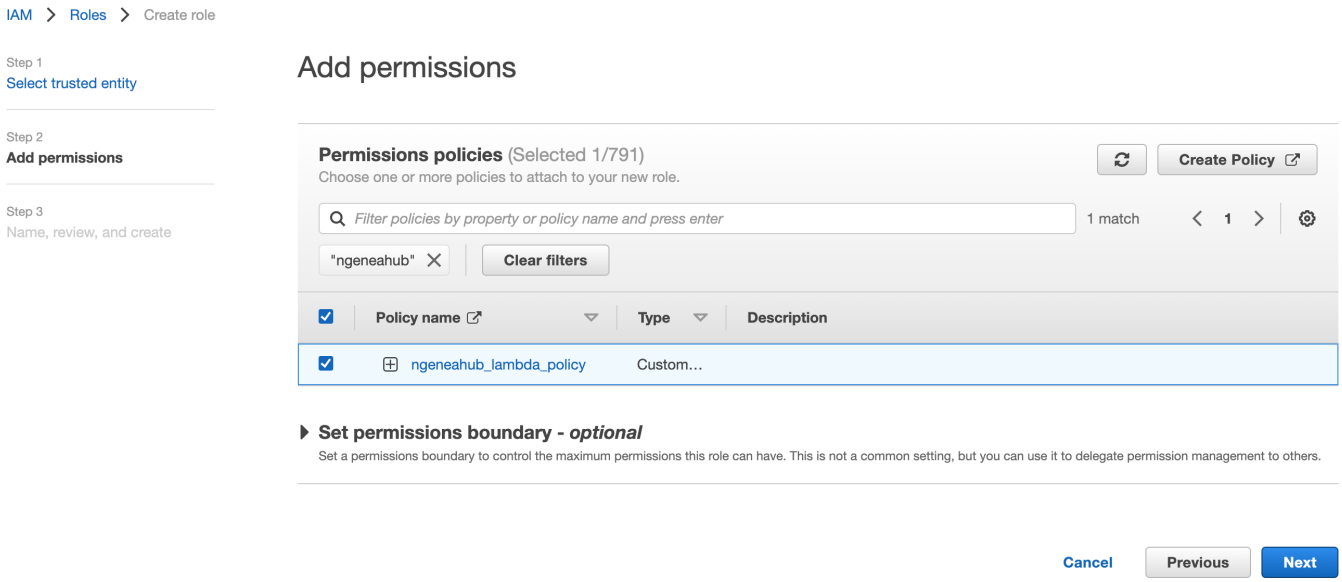
1. To **Create the IAM Role**, In the left-hand menu, select **Roles** and Click the **Create role** button.



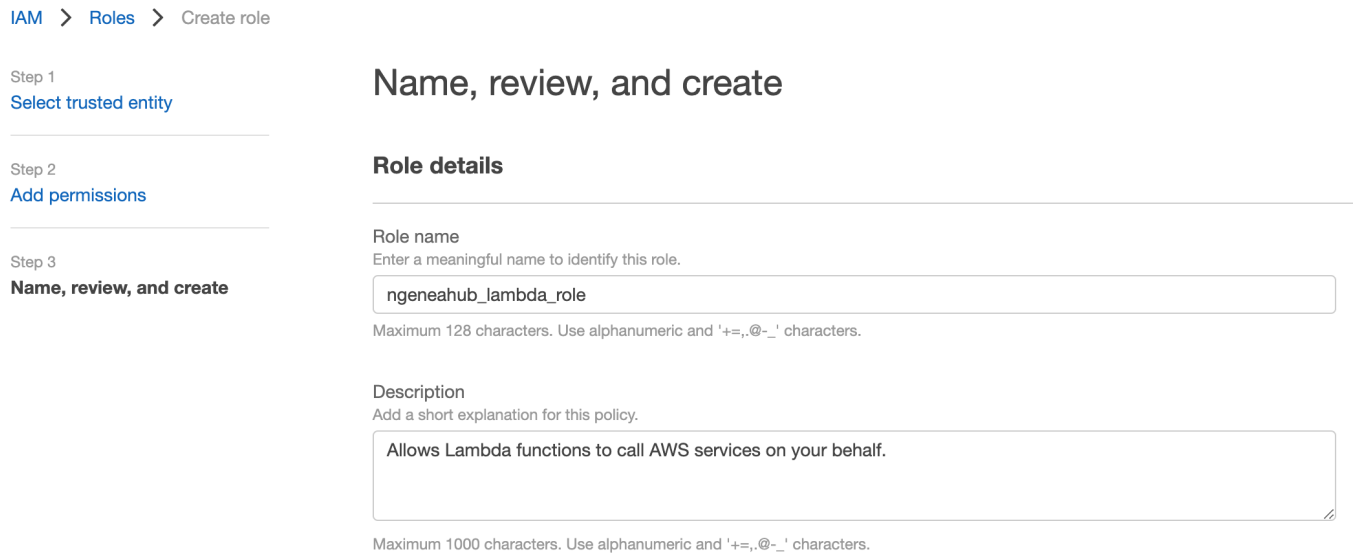
1. For the **trusted entity type**, choose **AWS service**. In the use case, select **Lambda**.



1. On the next screen, you'll be asked to attach permissions to the role. Search for the policy you just created, Select the policy, then click **Next: Tags**.
    - Again, if you need to add tags, you can do so here, otherwise click **Next: Review**.



1. Name the role `ngeneahub_lambda_role` to keep it descriptive and clear. Finally, click **Create Role**.



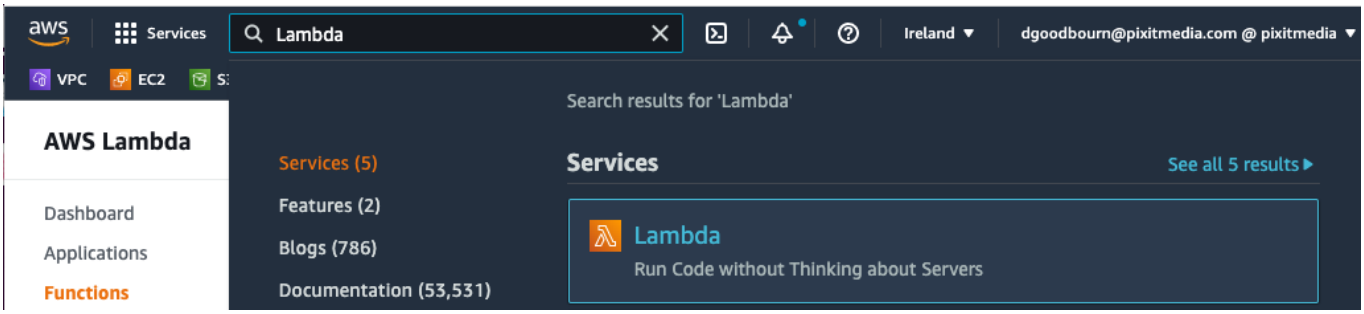
Create the Lambda function

A function in AWS Lambda is a small piece of code that does something specific when triggered. For example, you could write a Lambda function that resizes images whenever a new image is uploaded to S3. The Lambda function runs automatically when an event occurs, like uploading a file.

Creating the Function: To create a Lambda function, you start by selecting `Python 3.9` or above as the runtime and choosing the appropriate IAM role that defines the permissions for the function. If the function needs to connect to a private network, you configure the VPC, Subnet, and Security Group. You then upload the function code in a ZIP file, which contains the logic for Lambda to execute when triggered. Additionally, you provide a config.json file with necessary settings, such as API keys or database connections, for the function to operate correctly.

Follow the steps to create an AWS Lambda function.

1. Go to the AWS Management Console at Cloud Computing Services - Amazon Web Services (AWS) and log in with your account.
2. In the AWS Console, type “Lambda” in the search bar at the top and select Lambda from the dropdown list. This will take you to the Lambda service.

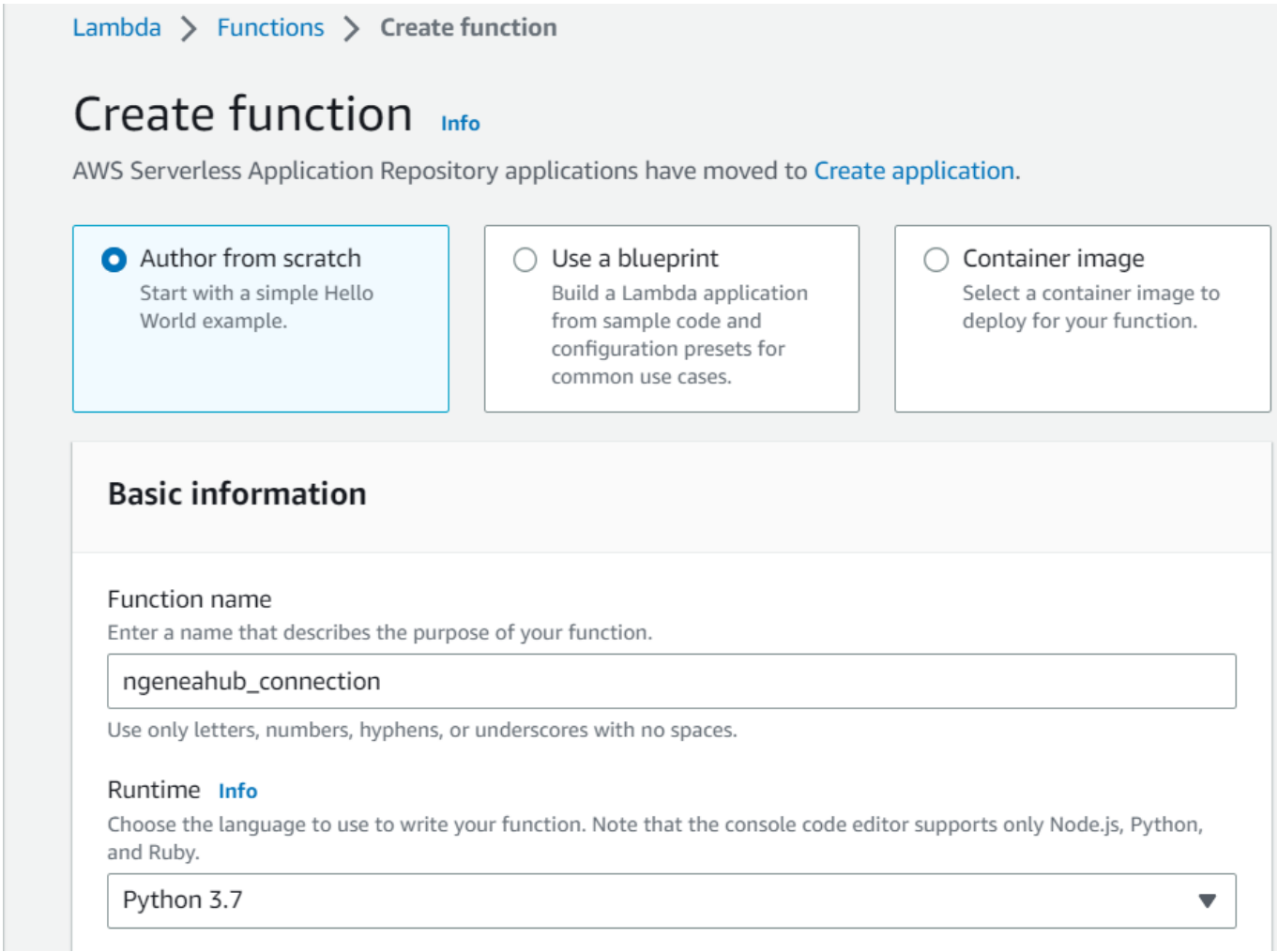


1. On the Lambda dashboard, you’ll see a button that says Create function. Click on it.
2. Select **“Author from scratch”**: This is the option that allows you to build a function from the ground up.
    - **Function name**: Enter a name for your Lambda function (e.g., “MyLambdaFunction”).
    - **Runtime**: From the Runtime dropdown, choose **Python 3.9+** (or another version of Python if required for your use case).

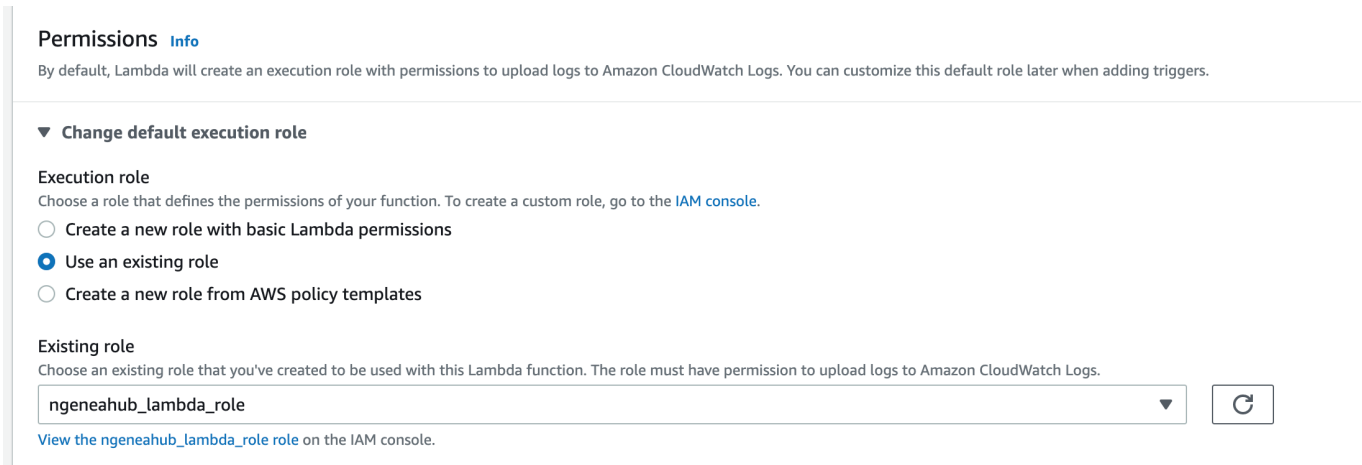
Note: Re-enabling the Requests Module in AWS Lambda (Python 3.9 Runtime)

Since AWS has removed Python 3.7 from the Lambda runtimes, it has also removed the **Requests module**. To continue using the Requests module in your Lambda functions running on Python 3.9, you will need to add it back by creating a custom Layer.

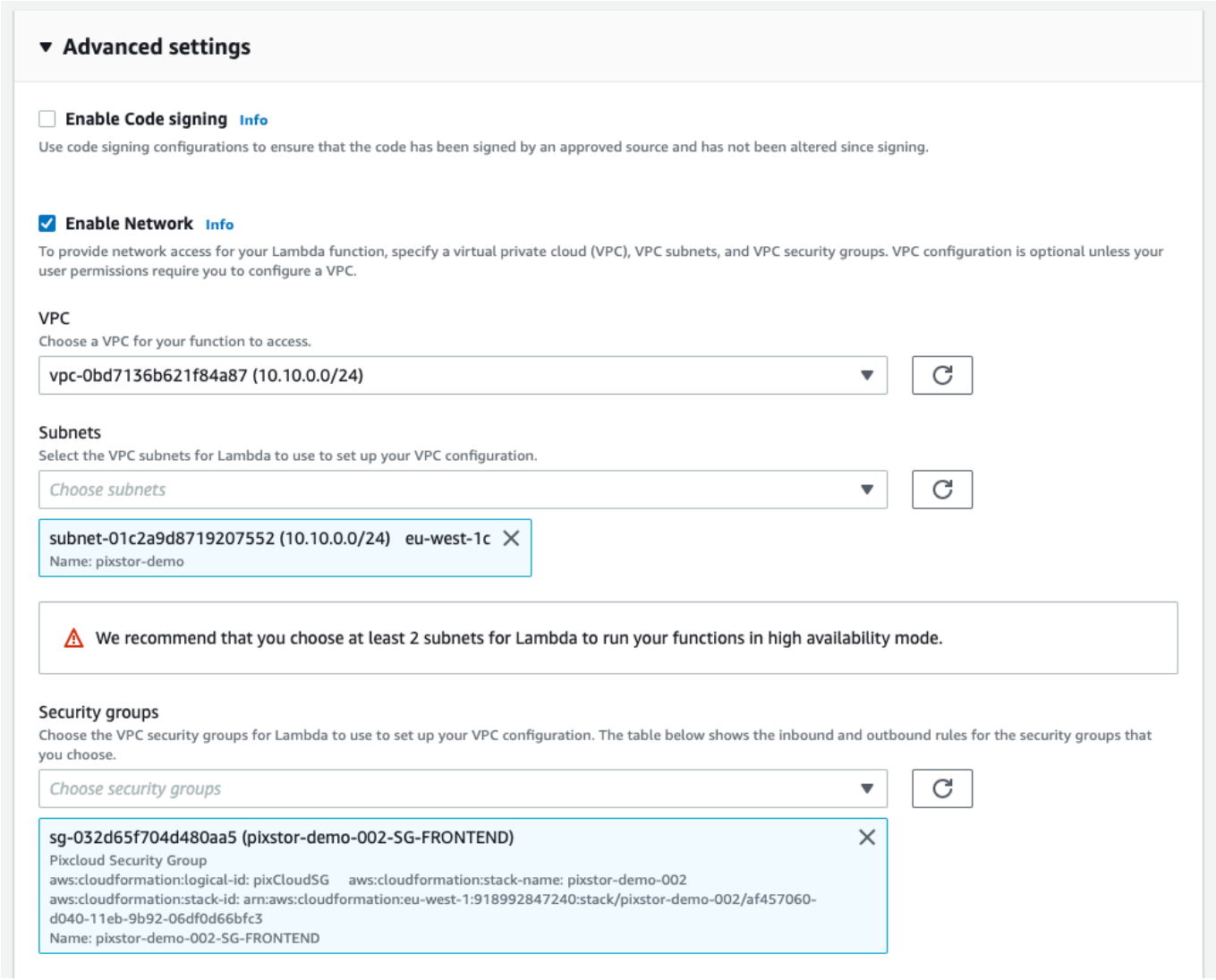
Follow the steps provided the in section: **5.2.2.5. AWS Lambda with Python 3.9: Adding Requests Module** to add a custom Layer to your Lambda function, which will include the Requests module for your code to utilize.



1. Under **Execution role**, choose Use an existing role. In the **Existing role** dropdown, select the IAM role that you have previously created for this function (the one that has the appropriate permissions for your Lambda).



1. **Configure VPC and Networking (If Necessary)**: If your Ngenea Hub doesn't have an external IP to connect to, follow these steps:
    - Scroll down to Advanced settings and select **Enable Network**.
    - From the dropdown, select the **VPC** where the Ngenea Hub is located.
    - Select the **Subnet** within the VPC where the Ngenea Hub resides.
    - Choose a **Security Group** that allows access to the Ngenea Hub over port 8000 (Only if hub is being served on port 8000).



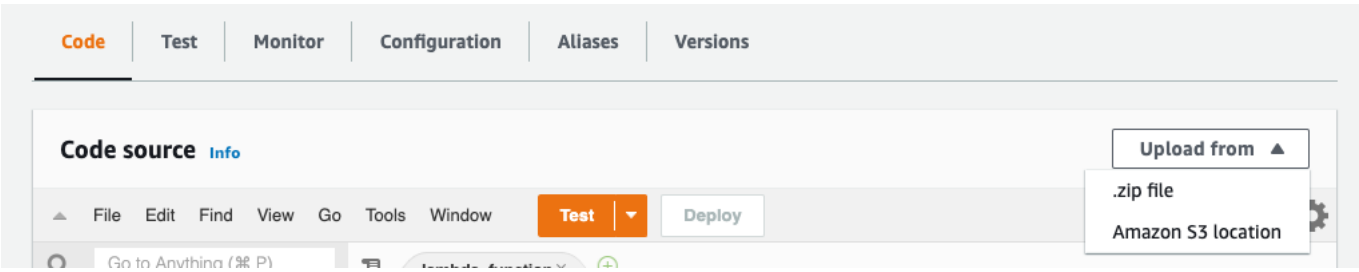
1. **Update the IAM Policy**: Your Lambda function will need permission to traverse the VPC's networking. Here's how to do it:
    - Go to the **IAM console** and find the policy you previously created. Add the following section to the policy:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "logs:CreateLogGroup",
            "Resource": "arn:aws:logs:*:<<AWS_ACCOUNT_ID>>:*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogStream",
                "logs:PutLogEvents"
            ],
            "Resource": [
                "arn:aws:logs:*:<<AWS_ACCOUNT_ID>>:log-group:/aws/lambda/<<LAMBDA_NAME>>:*"
            ]
        },
```

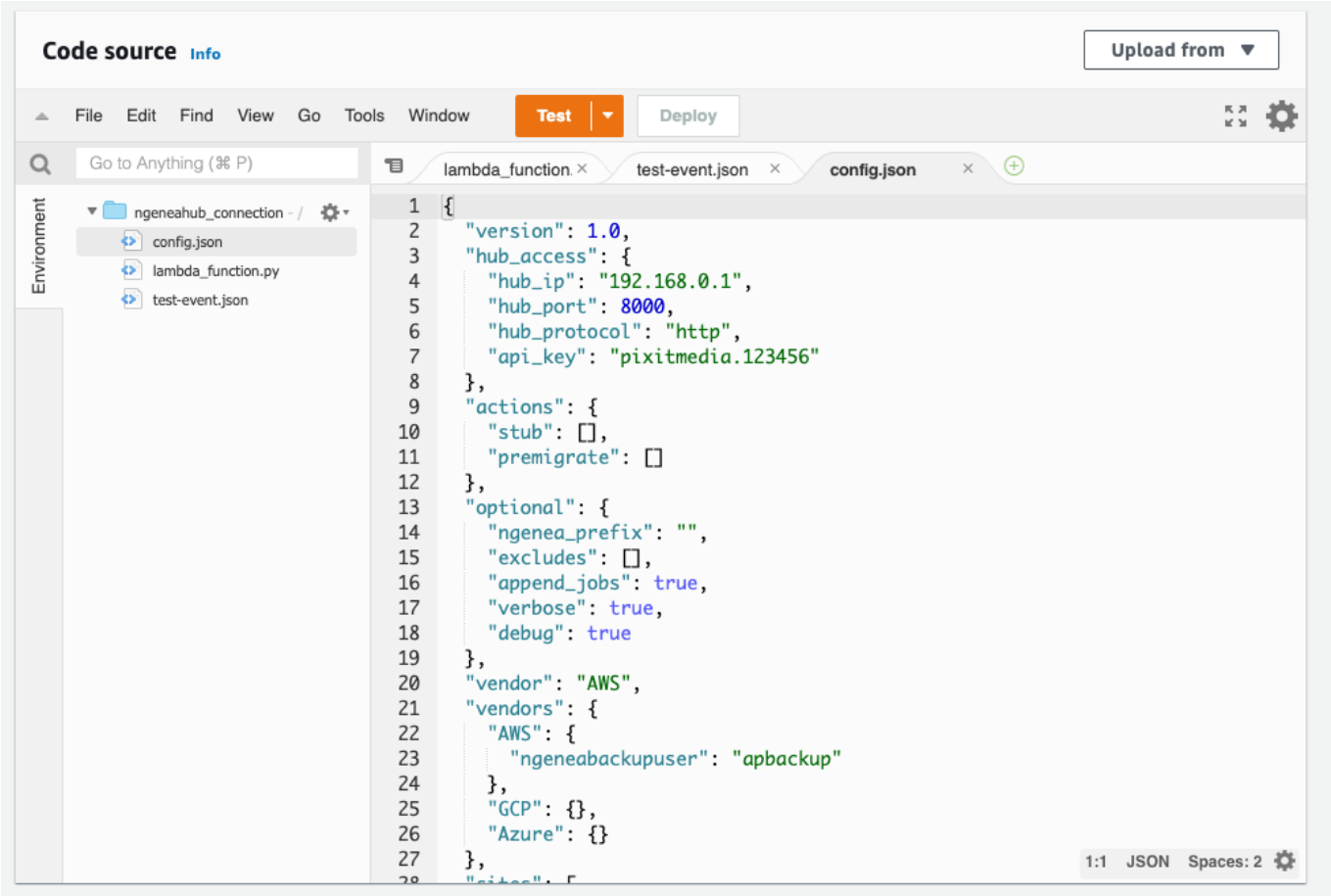
```
        {
            "Effect": "Allow",
            "Action": "iam:GetUser",
            "Resource": "*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "iam:GetUser",
                "ec2:DescribeNetworkInterfaces",
                "ec2:CreateNetworkInterface",
                "ec2:DeleteNetworkInterface"
            ],
            "Resource": "*"
        }
    ]
}
```

- Replace `<<AWS_ACCOUNT_ID>>` with your actual AWS account ID.
- Replace `<<LAMBDA_NAME>>` with the name of your Lambda function.
- Once you've updated the policy, **save** it.

1. **Create the Lambda Function**: With the role and network settings configured, click the **Create function** button. This will take a few minutes.
2. After your function is created, you will be redirected to the **function's configuration page**. Click on the **Code tab**.
3. Click on **Upload a .zip file**.
4. Click Upload, and then browse to select the **AWS zip file** you previously downloaded (from the ../../download page). Select the zip file and click **Save** to upload your code.



1. **Update the config.json File**: In the Code section, locate and edit the `config.json` file. You will need to update this file with all the relevant details based on the docs from Cloud Functions



1. Once you have updated the file, click **Deploy** to save your changes.

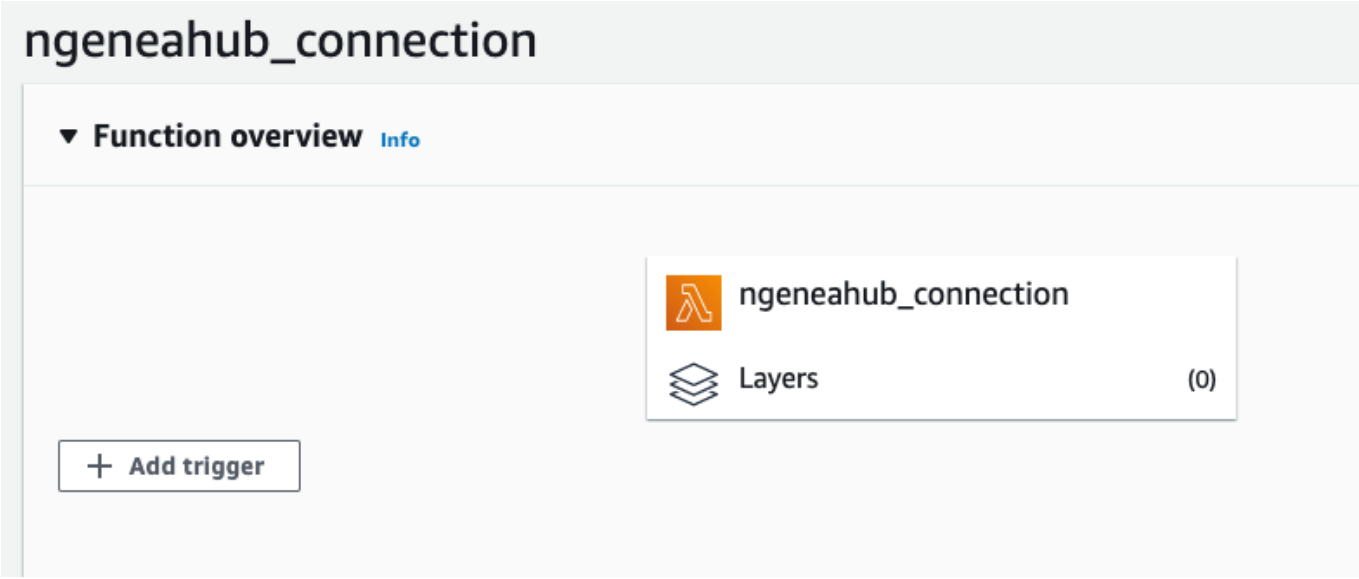
Set Up the Trigger (S3 Bucket Event)

Event Trigger: A trigger is an event that automatically activates a specific action, and in this case, you can set up an S3 trigger to invoke a Lambda function whenever a file is uploaded to an S3 bucket. By selecting the “All object create events” option, you ensure that Lambda responds to any new file uploaded to the bucket, regardless of the file type. This allows Lambda to automatically execute whenever a new file is created in the S3 bucket.

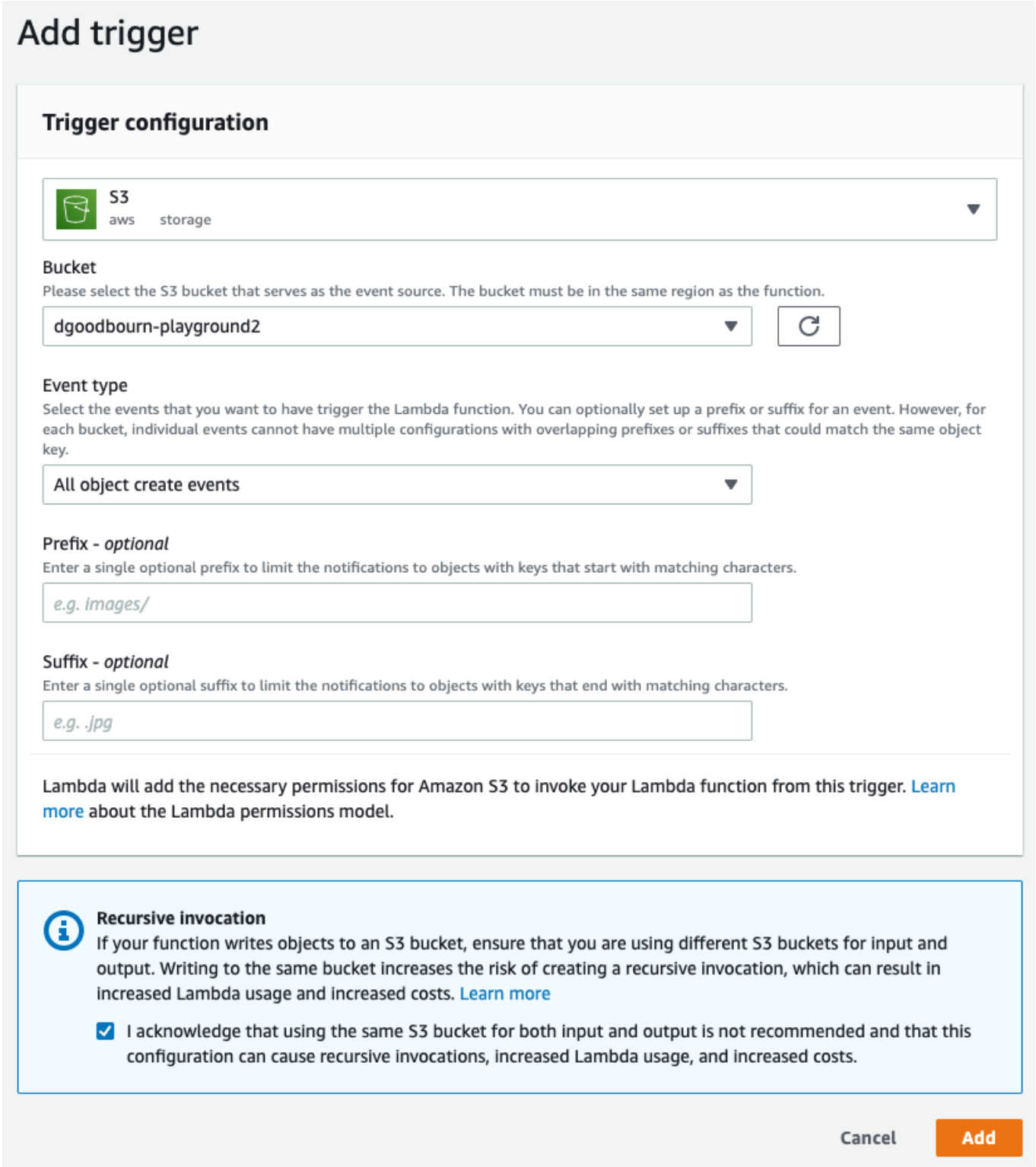
Recursive Invocation: This setting ensures that if Lambda’s own activities (like writing logs) somehow trigger the function again, it won’t end up running in an endless loop.

Assigning a trigger to your Lambda function using an S3 bucket event:

1. Open the **AWS Lambda Console**. Select the **Lambda function** you created earlier.
2. Under the **Function overview** section, click on **Add trigger**.



1. From the list of available triggers, choose **S3**.
2. In the **Bucket** dropdown, select the S3 bucket where you want the Lambda function to be triggered.
3. For **Event type**, select **All object create events**. This ensures that Lambda is triggered whenever any new object (file) is created in the S3 bucket.
4. Check the box labeled **Recursive Invocation checkbox warning**. This prevents Lambda from continuously triggering itself if it processes files within the bucket.
5. After selecting the options, click the **Add** button to assign the trigger to your Lambda function.



1. Your Lambda function is now configured with the S3 bucket event trigger, meaning it will automatically execute whenever a new file is uploaded to the selected bucket.

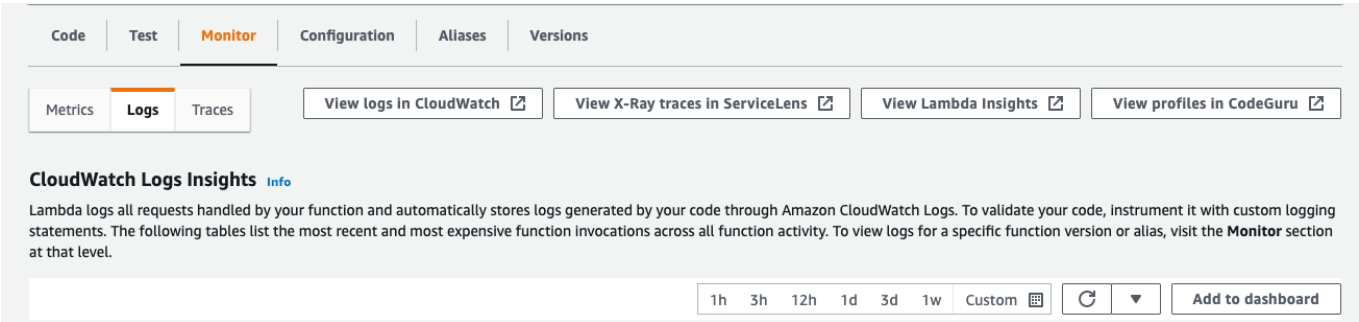
Monitoring Lambda Functions

CloudWatch: Amazon CloudWatch is an essential tool provided by AWS for monitoring various aspects of your AWS resources, including Lambda functions. It tracks vital metrics such as execution duration and logs that capture detailed information about the function's behavior.

By leveraging CloudWatch, you can determine if your Lambda function is performing correctly and identify any potential errors or issues.

Once a trigger is assigned to your Lambda function, you can monitor its performance in the **Monitor tab**. This tab provides a variety of monitoring options, giving you a comprehensive view of your function's performance.

For a more in-depth analysis, you can use View **Logs in CloudWatch**. This is the best place to access detailed logs and troubleshoot any issues your Lambda function might be facing.

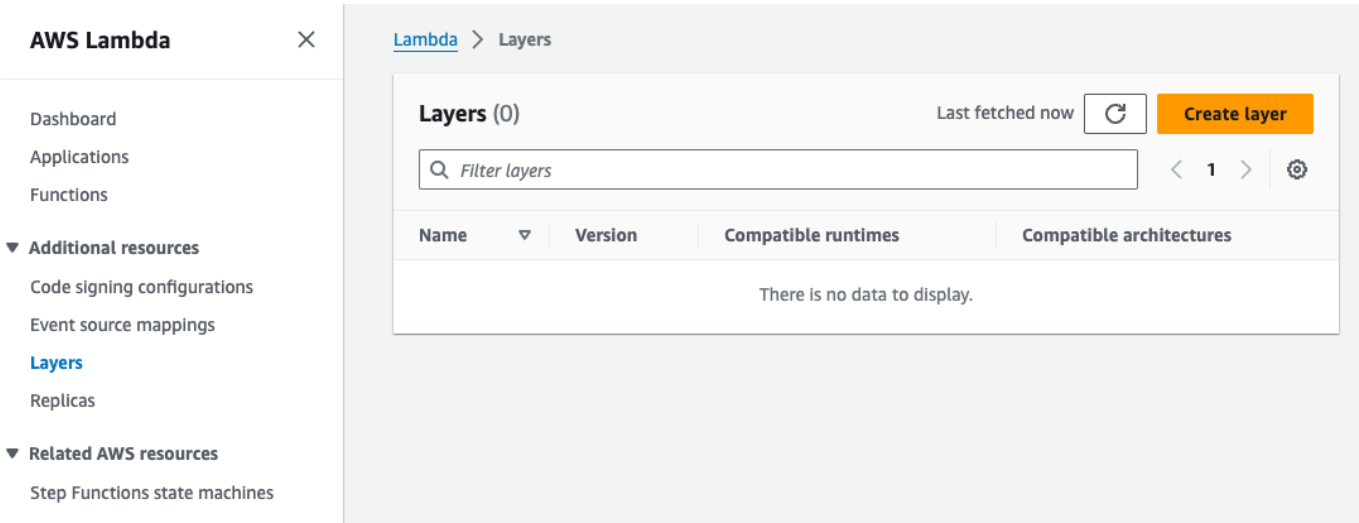


AWS Lambda with Python 3.9: Adding Requests Module

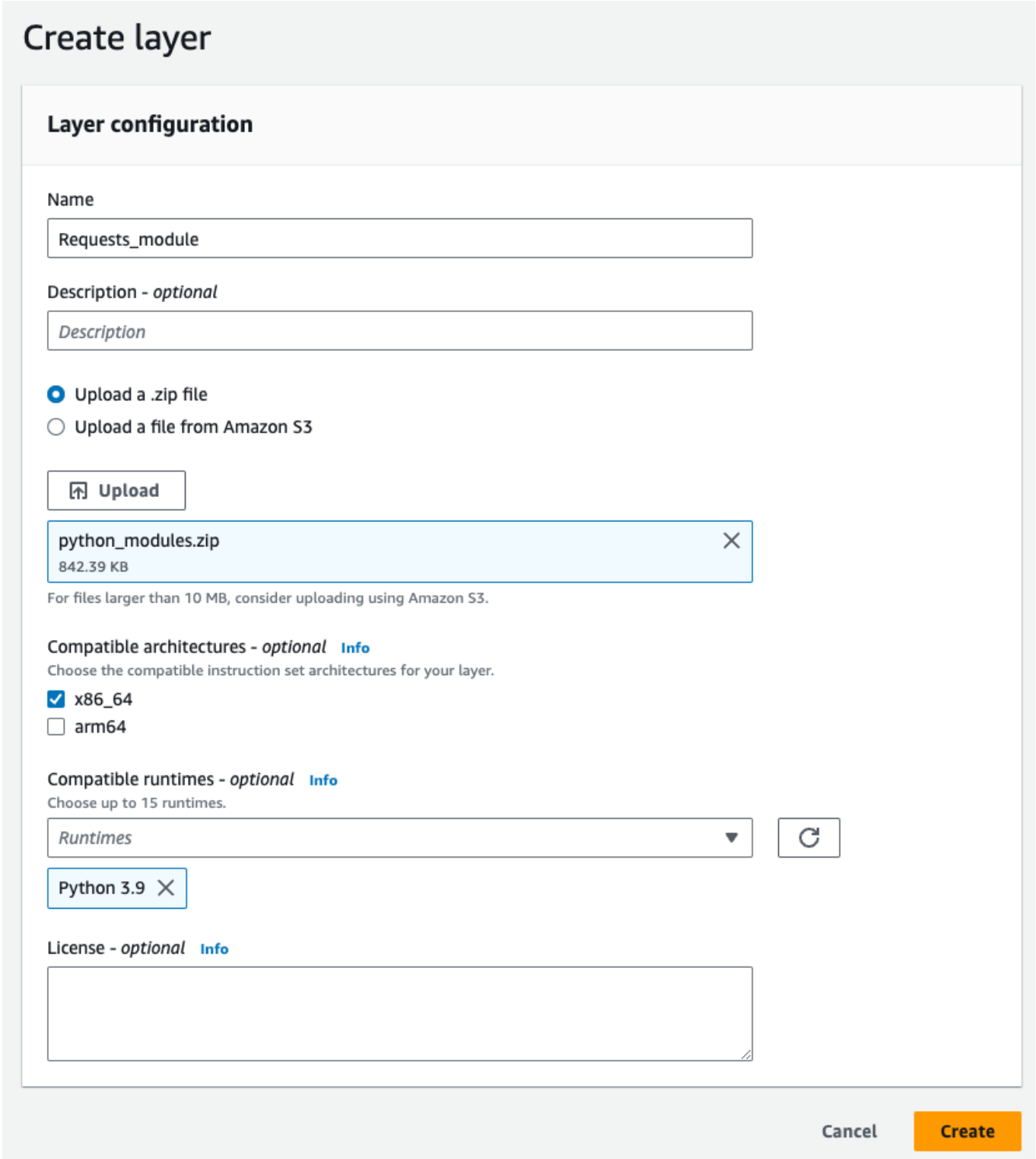
AWS has removed Python 3.7 from its Lambda runtimes, which also means the requests module is no longer included. Until we update the cloud bucket events code, we need to manually add the requests module. To do this, we'll create a Layer and attach it to the Lambda function.

> In AWS Lambda, a Layer is a way to package and share additional code, such as libraries, dependencies, or even custom runtime components, that your Lambda function can use. In this case, you can create a Lambda Layer that includes the Requests library and attach it to your function.

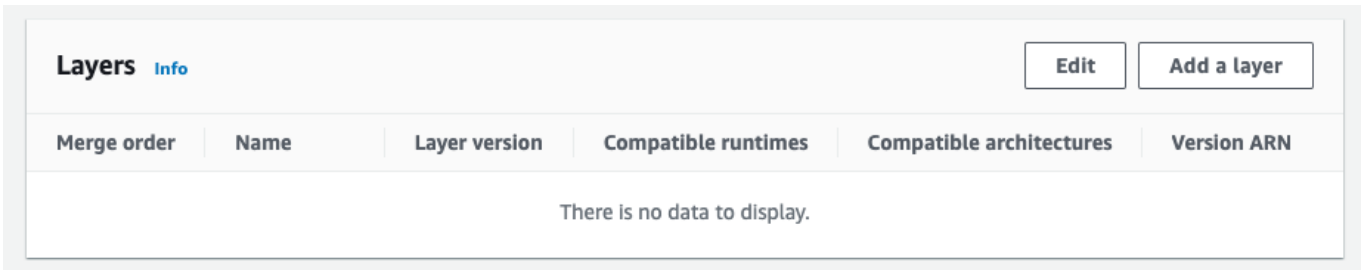
1. **To create a new Lambda Layer**, In the AWS Console, go to **Lambda** and click **Layers** in the left menu. Click **Create Layer** to continue.



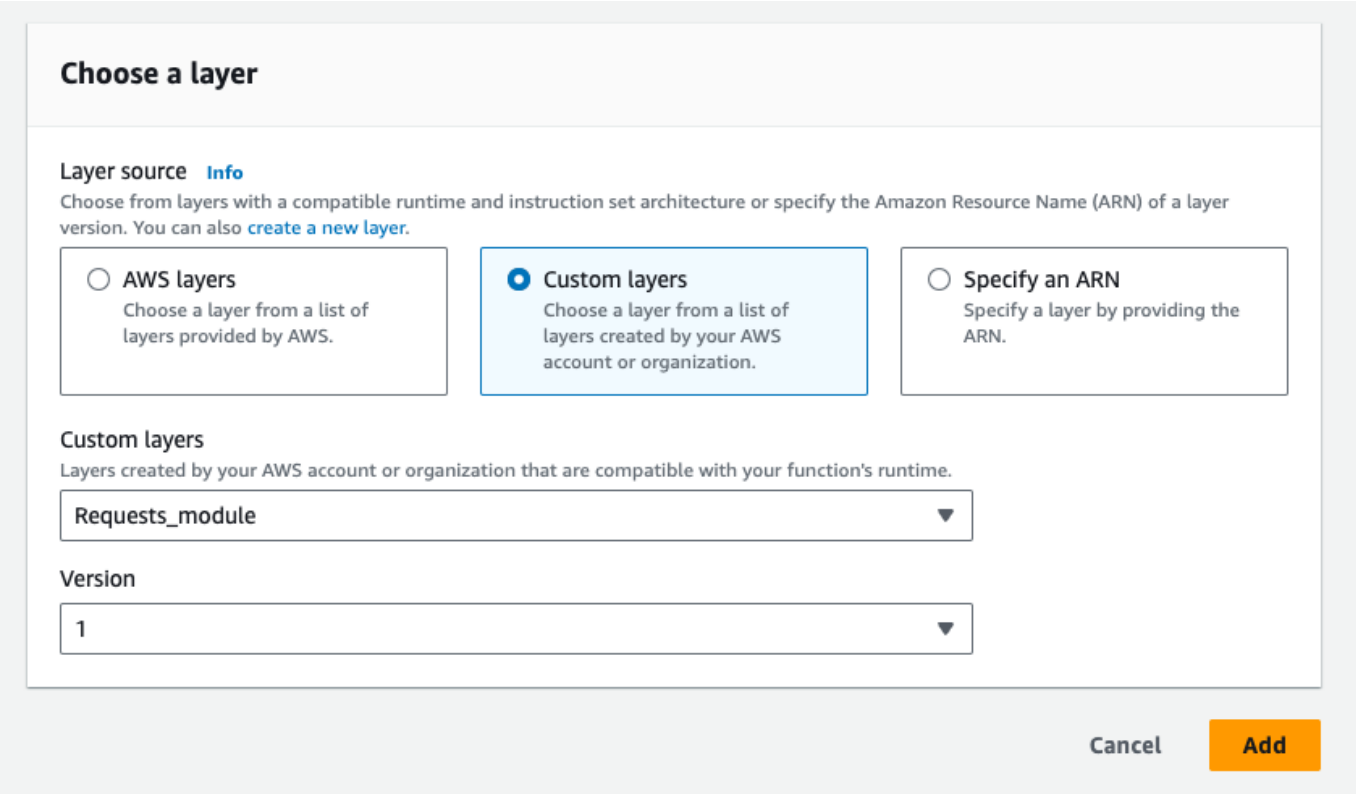
1. Enter a name for your layer (e.g., `RequestsLayer`).
2. Upload the `python_modules.zip` zip file.
3. Select `x86_64` architecture and `Python 3.9` runtime. Click **Create** to save.



1. In your Lambda function, scroll down to the **Layers** section and click the **Add a Layer** button.



1. Select the **Custom layers** option, then choose the layer you created from the **Custom layers dropdown** and pick the **Version**.



1. Your Lambda function should now work, as the `Requests` module is successfully loaded.

Configuration

The configuration file `config.json` is the key to setting up Cloud Functions and defining how they should behave. This file is written in JSON, and it tells the system what actions to take when certain events occur. You will configure the settings to ensure everything works correctly.

Here are the most important sections of the configuration file:

version

The version field specifies the version of the configuration format. Currently, the only supported version is `1.0`.

hub_access

To integrate and interact with Ngenea Hub, you need to configure a set of settings to establish communication with its `REST API`. These settings ensure that your system or application can properly authenticate, submit files, and trigger workflows for processing. Below is an explanation of each configuration setting, along with example values.

- **hub_ip** : The IP address of the Ngenea Hub REST API. This identifies the location of the Ngenea Hub server within your network or on the internet. Example: `hub_ip = "192.168.1.100"`

- **hub_port** : The port number used by the Ngenea Hub REST API. By default, the Ngenea Hub API may be set to use port 8000, but this can vary depending on your specific setup. Example: `hub_port = 8000`
- **hub_protocol** : The protocol used for communicating with the Ngenea Hub API. You can choose between http (insecure) and https (secure). Example: `hub_protocol = "https"`
- **api_key**: An API key used for authentication with the Ngenea Hub. This key ensures that your system has the necessary permissions to interact with the Hub. Example: `api_key = "your-api-key-here"`
- **workflow**: The name of the workflow you wish to submit for processing an event file. Workflows define a set of tasks or steps that Ngenea Hub follows to process data.
  - **reverse_stub**: Typically used for new files, reversing or processing them in a specific way. Example: `workflow = "reverse_stub"`
  - **recall**: Another default workflow for recalling or processing files.
- **workflow_flags**: A mapping of additional settings you can pass to customize the behavior of the selected workflow. These flags allow you to fine-tune the process by specifying certain options.Example: `workflow_flags = {"hydrate": true}`
- **Custom Workflows**: By default, Ngenea Hub does not have a delete workflow. If you need to delete files, you must create a custom workflow to handle file deletion. As shown below, you might create a workflow named `delete_file` for this purpose:

```
{
  "name": "delete_file",
  "label": "delete_file",
  "icon_classes": [
    "fa fa-cloud fa-stack-2x text-success",
    "fa fa-angle-up fa-stack-2x text-light"
  ],
  "discovery": null,
  "enabled": true,
  "visible": true,
  "fields": [],
  "filter_rules": [
    {
      "type": "all",
      "state": "all",
      "action": [
        {
          "name": "dynamo.tasks.delete_paths_from_gpfs",
          "recursive": false
        }
      ],
      "description": "Delete the file at a given path"
    }
  ]
}
```

Sites

In systems like Ngenea Hub, events (such as file updates or deletions) need to be reflected across multiple sites to maintain consistency.

- **Site Name** : Each site in the Ngenea Hub system is identified by a **name**. This name is crucial for tracking and managing events on a particular site.
- **Default Mode for 'Recall' Workflows**: When an event occurs, the system needs to decide how to recall or reflect that event across sites. If the event path does not match a specific action, the **default mode** is used.
- The two available default modes are:
  - **Stub**: A placeholder or temporary record used when the system doesn't have detailed information.
  - **Premigrate**: This mode prepares the system for future migration or change before the event is fully applied.
- **Skip from Ngenea**:
  - If the system is syncing files between multiple sites, there may be situations where certain files should not be reflected or recalled on sites. This is where the **skip_from_ngenea** setting comes into play.
  - When **skip_from_ngenea** is set to **True**, files created or transferred via Ngenea Hub will be skipped for recall. This is useful because files transferred through Ngenea Hub are already in sync between sites, so recalling them again is unnecessary.
  - However, if a file is uploaded directly to the cloud (outside of Ngenea Hub), it still needs to be reflected or recalled across the sites to ensure consistency.
- **Handling Delete Events**:
  - Deleting a file or event can sometimes be tricky, especially when using cloud platforms like GCP (Google Cloud Platform). In these cases, it may be unclear where the file was deleted from, which can complicate the process of reflecting that delete action.
  - As a result, when a **delete event** occurs and the system cannot determine its origin, the system will reflect the delete on **all sites** to ensure that no inconsistent or outdated data remains across the sites.

By configuring these settings carefully, you can ensure that the right events are reflected accurately across all your sites, while avoiding unnecessary updates or recalls for already-synced data.

Actions

Mapping of actions – `stub` or `premigrate` – to path prefixes.

This section explains how actions such as "stub" or "premigrate" are mapped to specific path prefixes. These mappings determine whether a file should be included in a "recall" workflow, where the file is downloaded and prepared for use.

If a path matches multiple actions, the longest matching prefix will take priority. For example, consider the following configuration:

```
{
    "stub": ["data"],
    "premigrate": ["data/cats"]
}
```

In this case:

- The path `data/cats/cat-01.jpg` will undergo **premigrate**, meaning this action prepares a file for migration to a different storage location, typically involving downloading and preparing the file for a transition or backup.
- The path `data/cats-02.jpg` will be **stubbed**, meaning it will remain as a placeholder without being fully downloaded.

If no specific action is defined for a given path, the default action for the site (as mentioned earlier) will be applied.

However, if the default action is not set, or if `hydrate` is explicitly specified in the `workflow_flags`, that setting will take priority and override the default behavior. If no configuration is provided at all, the default action is to stub the file.

This system allows for more flexibility and precise control over how files are handled during the migration and recall processes.

optional

Optional settings are additional settings that can be configured in the `config.json` file to customize the behavior of the system. While their use is not mandatory, they offer increased flexibility for those seeking to refine and optimize the system's functionality. Below is a detailed overview:

- **ngenea_prefix** : Allows you to map a cloud path to a local storage path. For example, if you have a file in the cloud at `data/cats-01.jpg`, but want it to appear in a specific folder on your local system, like `/mmfs1/data/cats-01.jpg`, this setting adds a prefix to the cloud file path. This ensures it matches your local storage path. By **default**, the setting is empty `('')`, meaning no mapping occurs unless you specify one.
- **excludes** : Allows you to exclude specific paths or files from being processed. For example, if you want to ignore files in the `logs/` folder, you can add `logs` to the `excludes` list. By **default**, this setting is an empty list `([])`, meaning no exclusions are applied unless explicitly specified.
- **append_jobs** : The `append_jobs` setting controls whether multiple tasks should be grouped under the same job ID. If set to `true`, it groups tasks that occur within the same hour under one job ID. If set to `false`, each task will be assigned its own unique job ID. By **default**, this setting is `false`, meaning tasks are handled separately unless modified.
- **verbose** : The `verbose` refers to the level of detail included in the output, especially in logs or messages. If set to `true`, it displays general `info level` logs, which provide information on the system's activities. If set to `false`, only `minimal log` information will be shown. The **default** value is `false`, meaning only basic logs are shown unless specified otherwise.

- **debug** : The `debug` setting provides detailed logs for troubleshooting. When set to `true`, it displays 'debug level`logs, which contain in-depth technical information for resolving issues. If set to`false, it does not show detailed debug information. The **default** value is` false`, meaning fewer details are shown unless enabled.
    - **Note** : If both verbose and debug are enabled, the debug logs will take priority and provide more detailed information.

vendor

This setting tells the system which cloud service is being used. Right now, there are two options:

- **AWS** (Amazon Web Services)
- **GCP** (Google Cloud Platform)

So, if you're using AWS or GCP for your system, you would set this option to either "AWS" or "GCP" to let the system know which cloud platform it should work with.

vendors

This section contains settings that are specific to a particular cloud platform (vendor), such as AWS. **Currently, these settings are only used for AWS.**

- **AWS-specific setting - ngeneabackupuser**:
    - The `ngeneabackupuser` is the name of the user account that Ngenea uses within AWS. It's used to identify whether a file came from the Ngenea system when processing files.
    - This identification is helpful for situations where you might want to skip files that were already uploaded or created by Ngenea, especially when the `skip_from_ngenea` setting is **enabled**.
    - Essentially, this ensures that files associated with Ngenea are handled appropriately, preventing redundant actions or unnecessary processing.

Complete Example

```
{
    "version": 1.0,
    "hub_access": {
        "hub_ip": "192.168.0.1",
        "hub_port": 8000,
        "hub_protocol": "http",
        "api_key": "pixitmedia.123456",
        "workflow": "reverse_stub",
        "workflow_flags": {
            "hydrate": false,
            "overwrite": true
        }
    },
    "sites": [
        {
```

```
            "site": "uk",
            "default": "stub"
        }
    ],
    "actions": {
        "stub": [],
        "premigrate": []
    },
    "optional": {
        "ngenea_prefix": "",
        "excludes": [],
        "append_jobs": true,
        "verbose": true,
        "debug": true
    },
    "vendor": "AWS",
    "vendors": {
        "AWS": {
            "ngeneabackupuser": ""
        },
        "GCP": {},
        "Azure": {}
    }
}
```

Ngenea Worker Plugins

Warning: This feature is currently in alpha

When constructing workflows to run on Ngenea Hub, there may not be a task that covers the behaviour required for a given workflow. To alleviate this, there is now support for custom plugin tasks to be added to any instance of Ngenea Worker that can cover that missing behaviour.

These are defined as custom tasks for the celery https://docs.celeryq.dev/en/stable/ task distribution framework.

Creating your plugin

Warning: This feature is currently in alpha.

A plugin for the hub is a python module that contains one or multiple celery tasks that can be discovered by the Ngenea Worker, these tasks can then be used in workflows in Ngenea Hub.

Example plugin creation

Using the Ngenea Hub CLI a template plugin can be created in the plugin directory at `/var/lib/ngenea-worker/plugins`. All plugins will persist in this location and will need to be in this directory to be correctly installed.

For the following example, we will be creating a plugin named `echo_args` that will return the expected key word arguments provided to the task itself.

To begin, create a plugin template for the example `echo_args` using:

```
ngenea-worker plugins create echo_args
```

This will create the template plugin project at `/var/lib/ngenea-worker/plugins/echo_args`. To implement custom logic, navigate to `/var/lib/ngenea-worker/plugins/echo_args` in which contains the python module file `echo_args/echo_args.py`. Within this file there is the basic example task `example_task`:

```
from arcapix.dynamo.server.status import FileActionStatus
from arcapix.dynamo.server.queue import get_current_task_queue_na
me

@shared_task(bind=True, name="dynamo.custom.example_task")
def example_task(self, *args, paths: List = None, jobid: int = No
ne, **kwargs):
    print(paths)
    print(jobid)
    status = FileActionStatus(self.name, paths, jobid, get_curren
t_task_queue_name())
    for path in paths:
        status.add("processed", path["path"])
    return status.dump()
```

Warning: The task return must adhere to the format exampled above otherwise the job will result in an indefinite `Pending` state in the UI/API and the Ngenea Hub logs will present a traceback in the task call back. Refer to section: `Custom Tasks/Return Payload` for the specific return format of task results.

For more information on the supported file states, please refer to the section `supported file states` in the `Custom Tasks` page.

The logic within this task can be replaced along with the name of the function to our echo task:

Note: The name provided to `shared_task` will be the task name that is used to call the task within a workflow.

```
from arcapix.dynamo.server.status import FileActionStatus
from arcapix.dynamo.server.queue import get_current_task_queue_na
```

```
me

@shared_task(bind=True, name="dynamo.custom.echo_args")
def echo_args(self, *args, paths: List = None, jobid: int = None,
**kwargs):
    status = FileActionStatus(self.name, paths, jobid, get_curren
t_task_queue_name())
    for path in paths:
        status.add("processed", path["path"])
    return status.dump()
```

With the new task in place, the entry point for the plugin will have to be adjusted in `setup.py`.

> **Note:** Ensure that all custom task entry points are defined under `worker_plugin`

Initial `setup.py` entry points:

```
...
    "worker_plugin": [
        "echo_args=echo_args.echo_args:example_task",
    ]
...
```

In this case, the changes are as follows:

```
...
    "worker_plugin": [
        "echo_args=echo_args.echo_args:echo_args",
    ]
...
```

External Dependencies

If the logic in the plugin requires an external dependency, it can be installed into the worker using the `setup.py` within the template plugin generated via `ngenea-worker plugins create`. To add additional dependencies, they can be added to the `install_requires` section:

> **Note:** Ensure that the celery package and version is un-edited within the plugin requirements, otherwise it may have unexpected effects on the functionality of Ngenea Worker.

```
install_requires=[
    "celery<=5.4",
    "example-module==0.1.0"
]
```

Installing custom plugins

To install the newly created plugin refer to the plugin installation page.

Managing plugins

Warning: This feature is currently in alpha.

Enabling your plugin

To enable worker plugin behaviour, the `enable_plugins` setting needs to be set to `true` in the `/etc/ngenea/ngenea-worker.conf` file

```
enable_plugins=true
```

By default, this setting will be `false`

After plugins have been created, they can be managed using the following scripts.

Installing your plugin

All the plugins that have been created within `/var/lib/ngenea-worker/plugins` can be installed through running:

```
ngenea-worker plugins install
```

This will install all of the plugin packages within the plugins directory. These packages will not update within the Ngenea Worker unless it has had a version number increase in the `setup.py`.

Single plugins can also be installed by providing the name of the package explicitly:

```
ngenea-worker plugins install PACKAGE_NAME
```

After installing the desired plugins, the Ngenea Worker service will need to be restarted:

```
systemctl restart ngenea-worker
```

Uninstalling your plugin

Uninstalling any of the plugins can be done through the uninstall script:

Warning: This can remove any modules within the environment that Ngenea Worker runs within, use caution when uninstalling any modules that aren't directly within `/var/lib/ngenea-worker/plugins` as it could cause Ngenea Worker to not function correctly.

```
ngenea-worker plugins uninstall <PACKAGE_NAME>
```

To uninstall all of the modules in the plugin directory it can be done through:

```
pushd /var/lib/ngenea-worker/plugins/
ngenea-worker plugins uninstall * -y
popd
```

Listing your plugin

Listing your plugin involves two distinct sections:

- **Listing Installed Plugins**: Displays only the plugins that are currently installed with versions.
- **Listing All Plugins**: Displays all plugins available in the plugins directory with versions, located at `/var/lib/ngenea-worker/plugins` regardless of whether they are installed or not.

To list plugins, use the following command:

```
ngenea-worker plugins list
```

Custom Tasks

> **Warning:** This feature is currently in alpha

In addition to the predefined tasks, Ngenea Worker plugins allow custom tasks to be defined.

Once created, custom tasks can be included in Custom Workflows.

Custom tasks must accept the same standard arguments, and return a payload in the same format, as predefined tasks do.

The Structure of a Task

Arguments

Tasks must accept the following keyword arguments:

name	description	example	default
`jobid`	ID of the job the task is associated with.	`100`	`None`

name	description	example	default
`paths`	List of paths (may be files, folders or symlinks) to be processed. Each path is given as a dict with a "path" key, and can also have other keys such as "size" and "message".	`[{"path": "/mmfs1/data/my-fileset/file1", "size": 264321}, {"path": "/mmfs1/data/my-fileset/file2", "size": 15}]`	`None`

To pass specific keyword arguments to a task, include these in the workflow definition as hardcoded values or Runtime fields.

In addition, tasks should accept arbitrary other keyword arguments via a `**kwargs` parameter, but do not need to process them.

Here is an example function signature, from the definition of the predefined task `dynamo.tasks.migrate`:

```
def migrate(self, *args, jobid=None, paths=None, skip_modified_du
ring_migrate=False, **kwargs)
```

Return Payload

Ngenea Hub expects task results to be returned in a specific format.

There is a class `FileActionStatus` that the worker code uses as a convenience for constructing the return payload. This may be used as an alternative to constructing the return payload from scratch.

Using the FileActionStatus class

The class is imported like this:

```
from arcapix.dynamo.server.status import FileActionStatus
```

A status object is instantiated like this:

```
status = FileActionStatus(taskname, input_paths, jobid,
queue_name)
```

- `taskname` is the name of the current task
- `input_paths` is the list of path objects as passed to the task in the `paths` parameter
- `jobid` is the job's numerical id. This is provided as an input to the task.

- `queue_name` is the queue the task is currently running on. This can be retrieved with `get_current_task_queue_name()` from `arcapix.dynamo.server.queue`

For each path operated on by the task, call the `.add(key, path)` method on the status object, where `key` is the state of the file:

```
status.add("processed", "/mmfs1/data/my-fileset/file1")
```

The status object keeps track of files as they are added. At the completion of the task, return the results like this:

```
return status.dump()
```

Constructing a return payload from scratch

Tasks return a dict containing at least these 3 keys:

```
{
    "jobid": <job_id>,
    "paths": <list of path objects that were processed or
skipped>,
    "status": {
        "task": <task_name>,
        "input_paths": <list of path objects input to the task>,
        "input_total": <number of paths input to the task>,
        "summary": <dict giving number of files keyed by state>,
        "details": <dict giving list of file objects keyed by sta
te>,
        "started": <timezone-aware datetime for when the task sta
rted>
    }
}
```

The `paths` key lists the paths to be passed to the next task in the workflow.

Here is an example payload:

```
{
    "jobid": 100,
    "paths": [{"path": "/mmfs1/data/my-fileset/file1"}],
    "status": {
        "task": "my-plugin",
        "input_paths": [{"path": "/mmfs1/data/my-fileset/file1"},
{"path": "/mmfs1/data/my-fileset/file2"}],
        "input_total": 2,
        "summary": {
            "failures": 1,
            "processed": 1,
            "skipped": 0
        },
        "details": {
            "failures": [{"path": "/mmfs1/data/my-fileset/file2",
"message": ["Reason xyz for the failure"]}],
```

```
            "processed": [{"path": "/mmfs1/data/my-fileset/file1"}
],
            "skipped": []
        },
        "started": "2023-04-25T14:56:31.253043",
    }
}
```

Supported file states

These are the supported file states for tasks that perform operations on files:

- “processed”: file was successfully processed
- “skipped”: file was not processed because they were already in the desired state
- “aborted”: file was not processed and should not be processed by subsequent tasks in the workflow
- “failures”: file could not be processed because of an error
- “inprogress”: file is still being processed (this state is rarely used)

Generally, the files that should be passed to the next task are those that were processed or skipped.

Streaming task results

This applies to delete and move handlers in a snapdiff workflow.

Rather than returning, results for delete and move handler in snapdiff workflows must be streamed back to Ngenea Hub

In this case Ngenea Hub will pass keyword argument `stream_results=True` to the task to indicate that it expects streamed results

Important: If your task will be used as a move or delete handler in a snapdiff workflow, it must accept `stream_results` either as an explicit parameter or via `**kwargs`

A `StreamTaskResults` class is provided to facilitate this.

```
from arcapix.dynamo.server.streamstatus import StreamTaskResults
```

The class behaves the same as a `FileActionStatus`

```
if stream_results:
    status = StreamTaskResults(taskname, input_paths, jobid, queu
e_name, taskid)
else:
    status = FileActionStatus(taskname, input_paths, jobid, queue_
name)
```

The parameters are the same as `FileActionStatus`, described above, with the addition on `taskid`. The task must be defined with `bind=True`. The `taskid` can then be retrieved with `self.request.id`

For each path operated on by the task, call the `.add(key, path)` method on the status object, where `key` is the state of the file:

```
status.add("processed", "/mmfs1/data/my-fileset/file1")
```

The status object keeps track of files as they are added, and in the background sends them to Ngenea Hub in batches.

At the completion of the task, return the results like this:

```
return status.dump()
```

Calling `status.dump()` also flushes any outstanding files to Ngenea Hub.

Support for Streaming Paths from API

This applies to delete and move handlers in a snapdiff workflow.

To fetch the streaming paths, the function `expand_paths` from the module `arcapix.dynamo.server.utils.inputs` has to be used like below.

```
from arcapix.dynamo.server.utils.inputs import expand_paths
```

Warning: `expand_paths` provides a generator function fetching pages of paths on demand. Developers must ensure that memory starvation of Hub is negated by following the principles of generator functions thereby avoiding storing large number of values in memory concurrently.

Queues

There are various functions available to get information about the celery queue a custom task is running on

Note: The way queues are handled, and the way celery queue names are formatted, has changed in Ngenea Hub 2.4.0

For more information on Ngenea Hub queues see Queues

```
from arcapix.dynamo.server.queue import ...
```

- `get_current_task_queue_name()` - returns the name of the celery queue the current task is running on
- `get_current_site()` - returns the name of the site the current task is running on

- `get_formatted_queue_name(site, queue, function)` - returns the celery queue name for a given `site`, `queue`, and `function`
- `ParsedQueueName` - a class representing a celery queue name, parsed into `site`, `queue`, and `function`

```
parsed_queue = ParsedQueueName.current_task_queue()

print(parsed_queue.site)  # london
print(parsed_queue.queue)  # highpriority
print(parsed_queue.function)  # custom

print(str(parsed_queue))  # london.highpriority#custom
```

Important: The format of celery queue names is subject to change. You should always use the above functions, rather than manually parsing and formatting queue names.

Example Plugins

Warning: This feature is currently in alpha

Here are a couple examples of functionality that can be added to the hub, these can be dropped into any template project.

Email notification task

The intent of this plugin is to email a list of staff members at the end of a workflow to ensure that they are informed of its completion, it has extra key word arguments that allow the editing of the subject:

```
import sys

from email.mime.multipart import MIMEMultipart
from email.mime.text import MIMEText
from email.utils import formatdate
from smtplib import SMTP
from typing import List

from celery import shared_task
from arcapix.dynamo.server.status import FileActionStatus
from arcapix.dynamo.server.queue import get_current_task_queue_na
me


def send_email(email_to: List[str], email_from: str, subject: str,
message: str, server: str = "localhost"):
    """
    Sends an email through an already configured SMTP server

    :param email_to: List of email recipients
```

```
    :param email_from: Address that email derives from
    :param subject: Email subject
    :param message: Message to send
    :param server: Target SMTP server address
    :return: None
    """
    smtp_message = MIMEMultipart()
    smtp_message['From'] = email_from
    smtp_message['To'] = ', '.join(email_to)
    smtp_message['Date'] = formatdate(localtime=True)
    smtp_message['Subject'] = subject

    smtp_message.attach(MIMEText(message))

    try:
        smtp = SMTP(server)
        smtp.sendmail(email_from, email_to,
smtp_message.as_string())
        smtp.close()
    except OSError as error:
        # All SMTP errors are derived from OSError and catching
all SMTP errors from the base exception is not allowed
        print('Error sending notification email: %s', error)


@shared_task(bind=True, name="dynamo.custom.email_staff")
def email_staff(
    self,
    *args,
    paths: List = None,
    jobid: int = None,
    staff_members: List = None,
    message: str = None,
    subject: str = None,
    server: str = None,
    from_address: str = None,
    **kwargs
):
    if not message:
        message = f"Job {jobid} has completed successfully
processing {len(paths)} paths"

    if not from_address:
        from_address = "ngenea-worker@pixitmedia.com"

    if not subject:
        subject = "Ngenea Worker Job completed successfully"

    if not server:
        server = "localhost"

    status = FileActionStatus(self.name, paths, jobid, get_curren
t_task_queue_name())
```

```
    send_email(email_to=staff_members, email_from=from_address, s
ubject=subject, message=message, server=server)

    return status.dump()


if __name__ == "__main__":
    sys.exit(0)  # pragma: no cover
```

The `setup.py` will need editing to make the entry point the name of the function `email_staff` in the module that had been created for this example plugin.

To make use of this new task in the hub, here is an example workflow that will email staff members after all the data has been migrated with a custom subject and receiving email address:

```
{
    "name": "migrate_notif",
    "label": "Migrate with notif",
    "icon_classes": [
        "fa fa-cloud fa-stack-2x text-primary",
        "fa fa-refresh fa-stack-1x text-light"
    ],
    "discovery": null,
    "enabled": true,
    "visible": true,
    "fields": [],
    "filter_rules": [
        {
            "type": "all",
            "state": "all",
            "action": [
                {
                    "name": "dynamo.tasks.migrate"
                },
                {
                    "name": "dynamo.custom.email_staff",
                    "staff_members": [
                        "johnsmith@organisation.com",
                        "admin@organisation.com"
                    ],
                    "subject": "Project number 7 job complete",
                    "from_address": "notifications@organisation.c
om"
                }
            ]
        }
    ]
}
```

Running additional script

After running a set of tasks, you may need to execute a script on the host machine of the Ngenea Worker instance. The following plugin allows the execution of an arbitrary script located at `/opt/cloud_script.sh`:

> **Note:** Any script run through this plugin will be run with root access

```
import sys

from subprocess import run as run_script
from subprocess import TimeoutExpired, SubprocessError, PIPE, STD
OUT

from typing import List

from celery import shared_task

from arcapix.dynamo.server.status import FileActionStatus
from arcapix.dynamo.server.queue import get_current_task_queue_na
me

DEFAULT_SCRIPT = "/opt/cloud_script.sh"


@shared_task(bind=True, name="dynamo.custom.run_cloud_script")
def run_cloud_script(
    self,
    *args,
    paths: List = None,
    jobid: int = None,
    script_location: str = None,
    timeout: int = 600,
    additional_args: List = None,
    use_paths: bool = False,
    **kwargs
):
    status = FileActionStatus(self.name, paths, jobid, get_curren
t_task_queue_name())

    try:
        args = [script_location if script_location else DEFAULT_S
CRIPT]
        if additional_args:
            args = args + additional_args

        if use_paths:
            # Appends the paths to the arguments
            args = args + [path["path"] for path in paths]

        result = run_script(
            args,
            stdout=PIPE,
```

```
            stderr=STDOUT,
            check=True,
            timeout=timeout,
        )

        status.add_log(str(result.stdout))

        if result.returncode == 0:
            for path in paths:
                status.add("processed", path["path"])

    except TimeoutExpired:
        status.add_log("Called script timed out")
    except SubprocessError as sp_err:
        status.add_log(str(sp_err))

    return status.dump()


if __name__ == "__main__":
    sys.exit(0)  # pragma: no cover
```

The `setup.py` will need editing to make the entry point the name of the function `run_cloud_script` in the module that had been created for this example plugin.

To make use of this new task in the hub, here is an example workflow that will run the default cloud script after all of the data has been migrated:

```
{
    "name": "migrate_cloud_script",
    "label": "Migrate with notif",
    "icon_classes": [
        "fa fa-cloud fa-stack-2x text-primary",
        "fa fa-refresh fa-stack-1x text-light"
    ],
    "discovery": null,
    "enabled": true,
    "visible": true,
    "fields": [],
    "filter_rules": [
        {
            "type": "all",
            "state": "all",
            "action": [
                {
                    "name": "dynamo.tasks.migrate"
                },
                {
                    "name": "dynamo.custom.run_cloud_script"
                }
            ]
        }
```

```
    ]
}
```

SubDAG Helpers

Warning: This feature is currently in alpha

Typically, workflows have a fixed definition. However, certain use cases require modifying the workflow at runtime. For instance, a task might need to dynamically batch paths for child tasks to ensure load balancing, or submit different child tasks based on the results of the current task.

Sub-DAGs enable the dynamic definition of workflows. A sub-DAG can consist of a single task or a chain/graph of multiple tasks. Once submitted, the sub-DAG is automatically integrated into the parent job for reporting and job control.

The worker repository provides a helper function called `task_template` which allows for defining a single task DAG graph for use with dynamic DAGs.

The function is defined in `arcapix.dynamo.server.dags.util` module. An example for defining a task using the DAG helper module is shown below:

```
from arcapix.dynamo.server.dags.util import task_template, submit_
subdag

def submit_stub_task(self, paths, source_site, dest_site,
**kwargs):
    stub_template = task_template(
        "dynamo.tasks.reverse_stub",
        kwargs={
            "hydrate": False,
            "overwrite": True,
        },
        site=dest_site,
    )

    submit_subdag(
        paths=paths,
        task_id=self.request.id,
        "dynamocore.tasks.dag.run_subdag",
        subgraph_template=stub_template
    )
```

For complex sub-DAGs, the worker repository provides a helper module in `arcapix.dynamo.server.dag.helper`. This module allows for defining a chain of tasks using the helper functions like `add_task` and `map` for use with dynamic DAGs.

An example for defining a chain of tasks using the DAG helper module is shown below:

```
from arcapix.dynamo.server.dags.helper import Graph, add_task
from arcapix.dynamo.server.dags.util import submit_subdag

def submit_chain_of_dag_tasks(self, paths, source_site, dest_site,
**kwargs):
    graph = Graph()

    xattr = graph.add_task(
        "dynamo.tasks.remove_location_xattrs_for_moved",
        kwargs={"jobid": jobid},
        site=source_site,
    )

    recall = graph.add_task(
        "dynamo.tasks.reverse_stub",
        parents=[xattr.id],
        kwargs={
            "jobid": jobid,
            "site": dest_site,
            "endpoint": endpoint,
            "hydrate": True,
            "overwrite": True,
            "skip_hash": True,
            "extra_flags": ["--skip-check-uuid"],
            "batch_size": REVERSE_STUB_BATCH_SIZE,
        },
        site=dest_site,
    )

    submit_subdag(
        paths=[{"path": i} for i in paths],
        task_id=self.request.id,
        "dynamocore.tasks.dag.run_subdag",
        subgraph_template=graph.to_dict()
    )
```

This example demonstrates how to use the `Graph` and `add_task` helpers to create a chain of tasks and submit them as a sub-DAG. The `submit_subdag` function is used to submit the sub-DAG with the specified paths and task ID, using the dynamically generated task graph template.

Disaster Recovery / Cold Failover

It’s possible to configure Ngenea Hub to be able to cold-failover to another node if it’s running on a PixStor.

Setup

Configure datastore

Configure Ngenea Hub to store it's persistent data on the GPFS filesystem so it can be read by multiple nodes. This is done by settings the following setting in `/etc/sysconfig/ngeneahub`

```
DATA_DIR=/mmfs1/.arcapix/ngeneahub/data
```

Configure Networking

It's strongly recommended to configure a floating IP that can be used for the Ngenea Worker to connect to. This will allow cold failover without having to reconfigure workers.

This can be done by setting the following settings in `/etc/sysconfig/ngeneahub`:

- `SERVICE_CIDR`. Set this to the IP and netmask of the IP you want to be managed by ngeneahub. e.g. `192.168.2.3/24` for the IP `192.168.2.3` on a network with a netmask of `255.255.255.0`
- `SERVICE_INTERFACE`. Set this to the name of the interface the IP address should be added to. e.g. `man0`

Configure the workers to use this IP by editing `/etc/ngenea/ngenea-worker.conf` on each worker node and modifying `broker_url` and `result_backend`

Install Ngenea Hub

Install Ngenea Hub on multiple nodes as usual. Make sure `/etc/sysconfig/ngeneahub` are in sync across these nodes. Enable and start the service on one node only. Leave the service disabled and stopped on the other nodes.

Performing failover

In the case of a node failure, after confirming the services are no longer running on the other node, the following steps can be performed to bring the service up on another node:

important You must be certain the service is not running anywhere else before continuing, otherwise data loss can occur.

- Remove the lock file from `${DATA_DIR}/.lock`.
- Start the Ngenea Hub service

Migration from local datastore

After setting `DATA_DIR` in `/etc/sysconfig/ngeneahub` and restarting the service, data will automatically be migrated. This is a one-way operation.

External SSL

This document provides information on

- NGINX Installation on vanilla centos 7
- Configuration for SSL Termination and Reverse proxies to ngeneahub

Installing NGINX

Adding the EPEL Software Repository

```
sudo yum install epel-release
```

Installing NGINX

```
sudo yum install nginx
```

Starting Nginx service

```
sudo systemctl start nginx
```

Check Nginx service Status

```
sudo systemctl status nginx
```

Nginx status output should look like this

```
Output
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service;
disabled; vendor preset: disabled)
   Active: active (running) since Mon 2022-01-24 20:14:24 UTC; 5s
ago
  Process: 1898 ExecStart=/usr/sbin/nginx (code=exited, status=0/
SUCCESS)
  Process: 1896 ExecStartPre=/usr/sbin/nginx -t (code=exited,
status=0/SUCCESS)
  Process: 1895 ExecStartPre=/usr/bin/rm -f /run/nginx.pid
(code=exited, status=0/SUCCESS)
 Main PID: 1900 (nginx)
   CGroup: /system.slice/nginx.service
           ├─1900 nginx: master process /usr/sbin/nginx
           └─1901 nginx: worker process

Jan 24 20:14:24 centos-updates systemd[1]: Starting The nginx HTTP
and reverse proxy server...
Jan 24 20:14:24 centos-updates nginx[1896]: nginx: the
configuration file /etc/nginx/nginx.conf syntax is ok
Jan 24 20:14:24 centos-updates nginx[1896]: nginx: configuration
file /etc/nginx/nginx.conf test is successful
```

```
Jan 24 20:14:24 centos-updates systemd[1]: Started The nginx HTTP
and reverse proxy server.
```

The service should be `active`

To stop the Nginx service

```
sudo systemctl stop nginx
```

To disable the Nginx service

```
sudo systemctl disable nginx
```

To Enable the Nginx service

```
sudo systemctl enable nginx
```

Configuration for SSL Termination and Reverse Proxy using OpenSSL

Create Self-Signed Certificates for Nginx

Create the Certificate Configuration file named `localhost.conf`

```
[req]
default_bits       = 2048
default_keyfile    = localhost.key
distinguished_name = req_distinguished_name
req_extensions     = req_ext
x509_extensions    = v3_ca

[req_distinguished_name]
countryName                 = Country Name (2 letter code)
countryName_default         = US
stateOrProvinceName         = State or Province Name (full name)
stateOrProvinceName_default = New York
localityName                = Locality Name (eg, city)
localityName_default        = Rochester
organizationName            = Organization Name (eg, company)
organizationName_default    = localhost
organizationalUnitName      = organizationalunit
organizationalUnitName_default = Development
commonName                  = Common Name (e.g. server FQDN or YO
UR name)
commonName_default          = localhost
commonName_max              = 64

[req_ext]
subjectAltName = @alt_names

[v3_ca]
subjectAltName = @alt_names
```

```
[alt_names]
DNS.1   = example.com
DNS.2   = 127.0.0.1
```

Create the Certificate using OpenSSL using below command

```
sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout l
ocalhost.key -out localhost.crt -config localhost.conf
```

Copy the Certificate Key Pair to the Certificates folder `/etc/ssl/certs`

```
sudo cp localhost.crt /etc/ssl/certs/localhost.crt
sudo cp localhost.key /etc/ssl/private/localhost.key
```

Creating configuration file for Nginx

Create a configuration file in `/etc/nginx/conf.d/proxy.conf` and Update the Nginx Configuration File to Load the Certificate Key Pair

```
    server {

        listen 80;
        listen 443 ssl http2;
        listen [::]:443 ssl http2; #for IPv6

        server_name example.com;

        #specify the certificate files to use
        ssl_certificate /etc/ssl/certs/localhost.crt;
        ssl_certificate_key /etc/ssl/private/localhost.key;

        ssl_protocols TLSv1.2 TLSv1.1 TLSv1;

        root /usr/share/nginx/html;

        #Serving index.html file when requesting /
        index index.html;

        #Reverse proxy for requests
        location / {
                proxy_set_header        Host $host:8000;
                proxy_set_header        X-Real-IP $remote_addr;
                proxy_set_header        X-Forwarded-For
$proxy_add_x_forwarded_for;
                proxy_set_header        X-Forwarded-Proto $scheme;

                proxy_pass http://localhost:8000/;#if running
outside docker you can use 127.0.0.1 or localhost instead of
host.docker.internal, or with docker with network_mode: "host"
                proxy_redirect off;
                }
```

```
        }
}
```

Reload the Nginx service after you have made some configuration changes

```
sudo systemctl reload nginx
```

Configuration for SSL Termination and Reverse Proxy using Certbot and LetsEncrypt (Another method)

Add trusted SSL Certificates from Letsencrypt

We need to redirect all unencrypted HTTP connections to HTTPS. This is done with certbot and letsencrypt certificates. The certbot will obtain free certificates and also handle the renewal process automatically. To do that we will install certbot and also a plugin for our NGINX server.

```
sudo yum install certbot python3-certbot-nginx
```

Once we have installed those packages, we can obtain our certificates.

```
sudo certbot --nginx -d example.com
```

It will ask you if you want to redirect all traffic from HTTP to HTTPS. Select yes (2). This automatically makes some changes to our NGINX default configuration.

```
server {

  server_name example.com;

  location / {
    proxy_pass http://127.0.0.1:8000;
  }

    listen [::]:443 ssl ipv6only=on; # managed by Certbot
    listen 443 ssl; # managed by Certbot
    ssl_certificate /etc/letsencrypt/live/example.com/
fullchain.pem; # managed by Certbot
    ssl_certificate_key /etc/letsencrypt/live/example.com/
privkey.pem; # managed by Certbot
    include /etc/letsencrypt/options-ssl-nginx.conf; # managed by
Certbot
    ssl_dhparam /etc/letsencrypt/ssl-dhparams.pem; # managed by
Certbot

}
server {
    if ($host = example.com) {
        return 301 https://$host$request_uri;
    } # managed by Certbot
```

```
  listen 80 default_server;
  listen [::]:80 default_server;

  server_name example.com;
    return 404; # managed by Certbot
}
```

HTTPS Configuration for NgeneaHub

To configure NgeneaHub for HTTPS, a configuration file named ‘nghub.conf’ should be created under etc/nginx/conf.d/pixstor/ folder. It should contain the configuration below:

```
location /ngeneahub/ {
     proxy_pass http://localhost:8000;
     proxy_http_version 1.1;
     proxy_set_header Host $host;
     proxy_set_header X-Forwarded-Proto $scheme;
     proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;

}
location /ngeneahub/ws {
     proxy_pass http://localhost:8000;
     proxy_http_version 1.1;
     proxy_set_header Host $host;
     proxy_set_header Upgrade $http_upgrade;
     proxy_set_header Connection "Upgrade";
     proxy_set_header X-Forwarded-Proto $scheme;
     proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
}
```

Reload the Nginx service after you have made some configuration changes

```
sudo systemctl reload nginx
```

To auto-renew the certificates, Run

```
certbot renew
```

LDAP / Active Directory Login

This section describes the LDAP / Active Directory integration for Ngenea Hub.

A user can log in to Ngenea Hub using their username and password stored in the LDAP / Active Directory server rather than a manually created account in Ngenea Hub.

LDAP services are required to implement RFC2307 or RFC2307bis for provisioning of the LDAP schema.

As such, the username corresponds to the identity store user's `sAMAccountName`, etc.

Upon successful login, a Ngenea Hub user account will be automatically created for that user.

Where `LDAP_MIRROR_GROUPS` is configured, new groups are created in Ngenea Hub if not existing when the first user login is a member of the groups.

Administrators can assign Hub groups and permissions prior to subsequent logins for ease of use. Refer to `LDAP_MIRROR_GROUPS` in Managing users and groups from AD in HUB

If `LDAP_USER_SEARCH` and/or `LDAP_GROUP_SEARCH` is not set, all LDAP / Active Directory users can authenticate via the setting of `LDAP_DOMAIN`.

When LDAP is enabled, internal Ngenea Hub users can still be created and internally authenticated.

Configuration

The following settings control LDAP configuration.

The following are set in the main configuration file for Ngenea Hub at `/etc/sysconfig/ngeneahub`. Any setting which doesn't specify a default is required when `LDAP_ENABLED` is true.

After changing settings in `/etc/sysconfig/ngeneahub` a Hub restart is required to reflect the changes applied.

Setting	Description
LDAP_ENABLED	Setting to enable or disable LDAP-based authentic
LDAP_HOSTNAME	The URI of the LDAP server.
LDAP_USER_SEARCH	Domain to search for users who may authenticate
LDAP_GROUP_SEARCH	Domain to search for groups to populate when mi
LDAP_MIRROR_GROUPS	If True, LDAP groups will be auto-populated (see b
LDAP_ALWAYS_UPDATE_USER	If True, the fields of the user object will be updat True
LDAP_AUTHORIZE_ALL_USERS	If True, LDAPBackend will furnish permissions for a
LDAP_BIND_AS_AUTHENTICATING_USER	If True, authentication will leave the LDAP connect
LDAP_REFRESH_DN_ON_BIND	If True, it refreshes the DN attribute of the user. de
LDAP_CACHE_TIMEOUT	The amount of time, in seconds, a user's group m
LDAP_CONNECTION_OPTIONS	A dictionary of options to pass to each connectio {}
LDAP_DENY_GROUP	The distinguished name of a group, authenticatio None
LDAP_FIND_GROUP_PERMS	If True, LDAPBackend looks up Django Groups ma default: False

Setting	Description
LDAP_GLOBAL_OPTIONS	A comma-separated list of pairs in the format “KE name in the ‘ldap’ module `LDAP_GLOBAL_OPTIONS=OPT_X_TLS_REQUIRE_CERT:O` would parse into which is a dictionary of `ldap.OPT_X_TLS_REQUIRE_CERT: ldap.O ldap.OPT_X_TLS_ALLOW }` default: {}
LDAP_MIRROR_GROUPS_EXCEPT	It must be a list or other collection of group name
LDAP_PERMIT_EMPTY_PASSWORD	If True, authentication will be allowed with empty
LDAP_REQUIRE_GROUP	The distinguished name of a group, authentication
LDAP_NO_NEW_USERS	Prevent the creation of new users during authenti
LDAP_START_TLS	If True, each connection to the LDAP server will e False
LDAP_USER_QUERY_FIELD	when set, it is used to query the authenticating us None
LDAP_USER_ATTRLIST	A list of operational attributes to load for the auth
LDAP_USER_DN_TEMPLATE	A string template that describes any user’s disting
LDAP_USER_FLAGS_BY_GROUP	A mapping from boolean User field names to disti

Example Configurations

No whitespace must be present in the below configurations.

LDAP

```
LDAP_ENABLED=True
LDAP_DOMAIN=ldap.example.com
LDAP_HOSTNAME=ldap://ldap.example.com:389
```

LDAP enumerating specific User and Group membership

```
LDAP_ENABLED=True
LDAP_DOMAIN=my.ldap.example.com
LDAP_HOSTNAME=ldap://ldap.example.com:389
LDAP_USER_SEARCH=cn=Users,dc=hubusers,dc=example,dc=com
LDAP_GROUP_SEARCH=cn=Groups,dc=hubgroup,dc=example,dc=com
```

LDAPS

```
LDAP_ENABLED=True
LDAP_DOMAIN=ldap.example.com
LDAP_HOSTNAME=ldaps://ldap.example.com:636
LDAP_GLOBAL_OPTIONS=OPT_X_TLS_REQUIRE_CERT:OPT_X_TLS_ALLOW
```

LDAP + STARTTLS

```
LDAP_ENABLED=True
LDAP_DOMAIN=ldap.example.com
LDAP_HOSTNAME=ldap://ldap.example.com:389
```

```
LDAP_START_TLS=true
LDAP_GLOBAL_OPTIONS=OPT_X_TLS_REQUIRE_CERT:OPT_X_TLS_ALLOW
```

Managing users and groups from AD in HUB

The user account which is generated for an AD user behaves the same as any other Ngenea Hub user. This means it can be assigned to Ngenea Hub groups, and will gain the permissions from those groups.

By default, a new AD user will not belong to any groups, and therefore will not have any permissions. A privileged user will need to assign the user to any appropriate Ngenea Hub groups.

If `LDAP_MIRROR_GROUPS` is enabled, then when a user logs in to Ngenea Hub, groups will be automatically be created for any AD groups the user belongs to (if the group doesn't already exist), and the user will be assigned to those groups.

Only groups belonging to the `LDAP_GROUP_SEARCH` domain will be populated. If `LDAP_USER_SEARCH` is not set, we use `LDAP_DOMAIN` to work it out, then all AD groups that authenticated users belong to would be created. This is usually not what you want. Example of explicit search terms:

`LDAP_USER_SEARCH=cn=Users,dc=hubusers,dc=example,dc=com`

`LDAP_GROUP_SEARCH=cn=Groups,dc=hubgroup,dc=example,dc=com`

> NOTE: When either `LDAP_USER_SEARCH` or `LDAP_GROUP_SEARCH` is not set, the search is constructed from domain e.g. `LDAP_DOMAIN=ldap.example.com` the search string will be `dc=ldap,dc=example,dc=com`.

Mirrored AD groups behave the same as any other Ngenea Hub group, meaning permissions can be assigned to them to apply role-based access controls (RBAC). By default, mirrored AD groups will have no permissions assigned.

Any user can be assigned to a Hub mirrored AD group. Assigning a user to a Hub mirrored group does not change group membership in AD.

How can I manage my Hub users and groups using AD?

1. *What settings are required?*

   `LDAP_MIRROR_GROUPS=True`

   This will create an AD group in Hub for every group the user is a member of.

2. *If a user is added or removed from a group in AD, when is this reflected in Hub?*

   AD changes are not immediately reflected in Hub.

   If a user is added to an AD group, the group membership for the individual user is updated on next authentication (API or UI login).

If a user is removed from an AD group, the group membership for the individual user is updated on next authentication (API or UI login).

Example:

- If user1 has been added to a group in AD, the Hub state will not reflect the AD changes viewed by user2 until user1 logs in and user2 refreshes their view of users and groups.
- If user1 has been removed from a group in AD, the Hub state will not reflect the AD changes viewed by user2 until user1 logs in and user2 refreshes their view of users and groups.

3. *How can I limit the groups created in Hub when* `LDAP_MIRROR_GROUPS=True`

   Create a Hub specific OU in AD.

   Create groups to mirror to Hub in the OU.

   Add the required users in the `ou=Hub/<groups>`

   Only the groups in the `ou=Hub` will be mirrored to Hub on login.

4. *How do I set up the groups in readiness for future user logins?*

   Create an AD user.

   Log the user in.

   Initially the AD user will not be granted permissions.

   As the Hub admin, set the permissions on the groups.

   Log out the user AD user and on next login they will be assigned to the groups and pick up the set permissions.

   When future users log in, they will be assigned to the groups and pick up the set permissions on login.

5. *If a user or group is deleted from AD how is this reflected in Hub?*

   Users deleted from AD are not automatically deleted from Hub.

   The correlating Hub user account is unable to authenticate with Hub.

   Groups deleted from AD are not automatically deleted from Hub.

   Users who are currently logged in will retain security permissions until the group is deleted from Hub.

   Systems administrators must ensure to delete users and groups from Hub after their removal from AD.

6. *Does changing the password for a user affect the user hub?*

   Hub does not store credentials for AD users.

AD users who log in to Hub are authenticated against AD prior to allowing the user to login.

If Hub cannot contact AD to authenticate the user, the user is not allowed to login.

7. *Does user and group management in Hub affect AD?*

   No, Hub 'mirrors' the group membership on login, but the mirror is only from AD to Hub.

   There are no updates pushed from Hub to AD.

Queues

Custom job queues can be created with dedicated settings, and jobs can be assigned to run on those queues.

For example:

- a `highpriority` queue with a high number of threads, allowing for faster task processing
- a `lowpriority` queue with a low number of threads for jobs which do not need to complete promptly
- a dedicated queue for transparent recall jobs, so that those jobs are never blocked by other workflows

In addition to custom queues, there is a `default` queue which always exists for all workers. The default queue is used when a job is submitted without specifying a target queue.

Configuration

Queues are configured in the worker configuration file located at `/etc/ngenea/ngenea-worker.conf`

A queue is defined by adding a new `Queue` section to the config file. The following creates a queue named `highpriority` with 20 threads.

```
[Queue highpriority]
threads = 20
```

Queue names may contain letters, numbers, underscores, and hyphens. Queue names may not contain whitespace.

Queues support the following settings:

- `threads`: how many tasks can run in parallel on the queue

If no settings are provided under the queue section, the queue will inherit the global settings.

If no `threads` count is set in the global settings section, then a default of 10 is used.

For example, in the following

```
[settings]
...
threads = 4

[Queue transparent_recall]

[Queue highpriority]
threads = 10
```

The `highpriority` explicitly sets the number of threads to 10.

The `transparent_recall` queue does not explicitly set a number of threads, so it inherits `threads = 4` from global settings.

Functions

Custom job queues have three functions

- `worker` where core workflow tasks run
- `discovery` where discovery tasks (recursive, snapdiff) run
- `custom` where custom plugin tasks run

The `default` queue, which always exists, has those same three function plus two additional functions

- `interactive` where internal tasks such as file browsing are run
- `settings` where settings tasks, such as space creation and policies, are run

These two additional functions are not available on custom queues.

By default, each function gets the same number of threads. The number of threads can be configured per function

```
[Queue highpriority]
threads = 20
custom = {"threads": 10}
```

In this example, the `worker` and `discovery` functions will get 20 threads, but the `custom` function will only get 10 threads.

Per-function settings under the main `[settings]` section will only apply to functions of the `default` queue; they are not inherited.

Disabling Functions

Functions can be disabled for a queue by setting the function to `false`

For example, to disable the `custom` function, meaning custom plugin tasks cannot run on that queue

```
[Queue no-custom]
custom = false
```

In the same way, `default` queue functions can be disabled.

For example, in a cluster, you may set the management node to only run settings tasks

```
# management node
[settings]
discovery = false
worker = false
custom = false
```

And, you set ngenea nodes to only run workflow tasks, and not run settings tasks

```
# ngenea node
[settings]
settings = false
```

Warning: Each default queue function must be enabled on at least one node within a cluster, or else Hub will not function correctly.

Queue discovery

When a new queue is added to the worker config file, the change will be detected and the new queue will start up automatically. When a queue is removed from the worker config, the change will be detected and the queue will be shutdown automatically.

If this does not occur, or does not occur fast enough, a reload can be forced with

```
systemctl reload ngenea-worker
```

This will reload the worker config and start up/shutdown queues according to the worker config, without interrupting any queues which already exist and have not been changed.

Ngenea Hub uses worker heartbeats to automatically discover and register newly started queues. New queues will be visible and ready for use in Ngenea Hub workflows shortly after being added to the worker config.

Queue removal

When a queue is removed from the worker configuration file and the worker is reloaded, the queue will be shutdown.

However, the removed queue will *not* be automatically de-registered from Ngenea Hub.

> **Warning:** If you submit a job to a queue which has been shutdown and not de-registered, the job will not be processed unless the queue is configured and started up again.

Removed queues **must** be manually de-registered using the following command

```
ngeneahubctl manage remove_queue <site> <queue>
```

If the queue is brought back online, or if a new queue is created with the same name, it **will not** be recreated in Ngenea Hub until the queue has expired.

Removed queues expire when no heartbeats have been received for some interval after being removed. The expiry interval is configured using the `REMOVED_QUEUE_CLEANUP_INTERVAL` setting, which defaults to 1 day.

To immediately re-use the same queue name of a previously removed queue, the `--offline-only` flag can be used. This must be preceded by a complete worker restart

```
systemctl restart ngenea-worker
```

`--offline-only` will remove the queue only if the queue is offline. If the queue is still online, or comes back online, it will be automatically recreated.

Memory considerations

Queues use roughly 40MB of RAM per thread when no tasks are running.

Since each queue has three functions, if all three functions in a given queue are configured with the same number of threads, then the memory requirement is roughly `threads * 125MB`.

For example, creating a high priority queue with 20 threads per function (60 threads total) will use ~2.5GB of memory when no tasks are running.

Similarly, creating a low priority queue with 5 threads per function (15 threads total) will use ~625MB of memory when no tasks are running.

Task execution will consume additional memory on top of this baseline memory usage. Since more threads mean more tasks can run at the same time, a queue with a large number of threads can lead to significant memory usage at peak.

Workflows

A queue can be passed when submitting a workflow. If no queue is passed, the `default` queue will be used.

If a workflow contains tasks which run on multiple sites, such as send or sync workflows, the same queue will be used for both sites. If the named queue doesn't exist on one of the sites, the `default` queue will be used instead.

A different queue can be specified for each task in a workflow by providing the queue as a parameter in the task steps, for example

```
{
    "name": "dynamo.tasks.migrate",
    "queue": "highpriority"
}
```

Workflow 'fields' can be used to allow selecting per-task queues at runtime.

For example, the built-in `send` workflow provides a `destinationqueue` field, which can be passed at runtime in a similar way to `destinationsite`

```
{
    "paths": [
        "/mmfs1/data/project_one",
    ],
    "site": "london",
    "queue": "highpriority",
    "workflow": "send_to_site",
    "fields": {
        "destinationsite": "dublin",
        "destinationqueue": "lowpriority"
    }
}
```

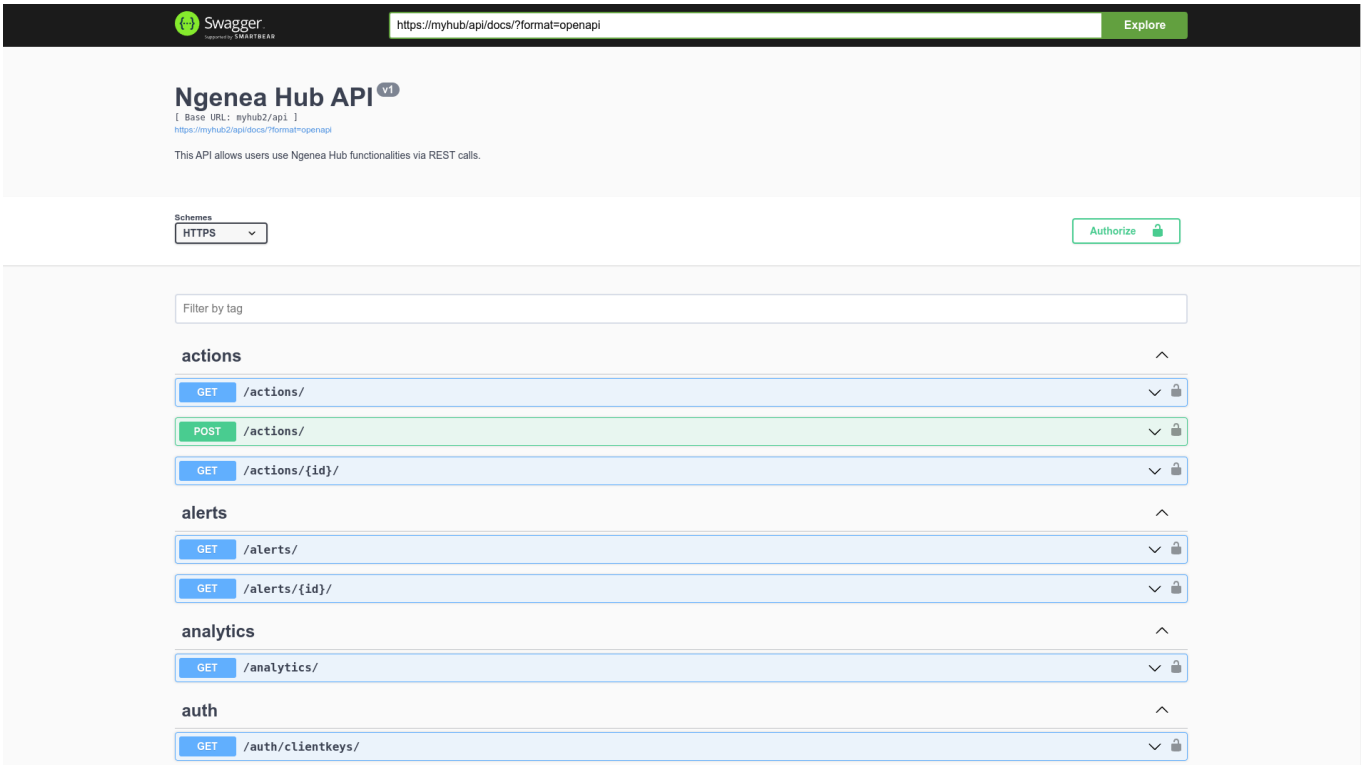
For more information on constructing and running workflows, see Custom Workflows

Usage

API

Reference

The API reference can be found at your Ngenea Hub install at `http(s)://myhub/api/docs/`. This section does not attempt to duplicate the reference, but instead provide some usage examples.



Authentication

Authentication to the API can be performed in 2 ways

- JWT Authentication
- Client Keys

The first one is for interacting with the API interactively and is therefore most likely not suitable for building automated workflows. On the other hand, client keys are valid until they are revoked and are more suitable for automation.

JWT Authentication

To use the API directly, authentication tokens should be generated to prevent sending the username and password repeatedly. You need to generate these tokens by sending your username-password pair to the login endpoint: `/auth/token/`

```
curl -s -X POST 'http://localhost:8000/api/auth/token/'  -H 'Accept: application/json'  -H 'Content-Type: application/json' -d '{"username": "dfoster",  "password": "******"}' | jq -r
{
  "access": <access_token>,
  "refresh": <refresh_token>,
}
```

There are 2 types of authentication tokens:

- Access token
- Refresh token

Access tokens are used for doing API requests. You need to include the token in the Authorization header to use any other endpoint:

```
curl -s -X GET 'http://localhost:8000/api/jobs/'  -H 'Accept:
application/json'  -H 'Content-Type: application/json'  -H "Autho
rization: Bearer $JWT_ACCESS_TOKEN" | jq
{
    "count": 1,
    "next": null,
    "previous": null,
    "results": [
        {
            "url": "http://10.201.2.158:8000/api/jobs/1/",
            "id": 1,
            "workflow": "migrate",
            "fields": {
                "lock_level": "implicit"
            },
            "created": "2025-05-07T14:58:46.442659Z",
            "started": "2025-05-07T14:58:46.491711Z",
            "completed": "2025-05-07T14:58:47.325761Z",
            "runtime": 0.870274,
            "state": "SUCCESS",
            "site": "site1",
            "queue": "default",
            "owner": {
                "type": "user",
                "id": 1,
                "name": "pixadmin"
            },
            "discovery": "recursive",
            "dir_walk_complete": true,
            "is_settings_job": false,
            "friendly_name":
"Dehydrate of '/mmfs1/pixitmedia.png' on 'site1'",
            "progress": null
        },
    ]
}
```

On the other hand, refresh tokens are used for refreshing the access token. For security purposes, access tokens expire in 1 hour and refresh tokens expire in 1 day. When an expired token is used, one of `HTTP 401 Unauthorized` and `HTTP 403 Forbidden` errors is received. In that case, you need to refresh the access token with `/api/token/refresh/` endpoint:

```
curl -s -X POST 'http://localhost:8000/api/auth/token/refresh/'  -
H 'Accept: application/json'  -H 'Content-Type: application/json'
-d '{"refresh": "<refresh_token>"}' | jq -r
{
  "access": <new_access_token>,
}
```

Refresh tokens can also be expired too. In that case, you need to send your credentials (username and password) again to obtain new token pair.

Client Keys

Creating Client Keys

> **Note:** The UI does not currently support creating client keys and therefore have to be done via the API directly

Before we can authenticate using the client key, we need to temporarily authenticate using JWT to be able to create a client key.

To get a valid JWT access token using curl and `jq`:

```
export JWT_TOKEN=$(curl -s -X POST 'http://localhost:8000/api/
auth/token/'  -H 'Accept: application/json'  -H 'Content-Type:
application/json' -d '{"username": "dfoster",  "password":
"******"}' | jq -r .access)
echo $JWT_TOKEN
<token>
```

This can now be used to create a client key:

```
curl -s -X POST 'http://localhost:8000/api/auth/clientkeys/'  -H '
Accept: application/json'  -H 'Content-Type: application/json'  -H
"Authorization: Bearer $JWT_TOKEN" -d '{"name":
"my_automation_key"}' | jq '.'
{
  "url": "http://localhost:8000/api/auth/clientkeys/1/",
  "id": 1,
  "name": "my_automation_key",
  "api_key": "YOUR_API_KEY"
}
```

```
{warning} This is the only time the client key will be visible, m
ake sure it is recorded.
```

Using Client Keys

The key created in the previous section can now be used by setting the header `Authorization: Api-Key YOUR_API_KEY` against an API endpoint. For example:

```
export API_KEY=YOUR_API_KEY

curl -s -X GET 'http://localhost:8000/api/jobs/'  -H 'Accept:
application/json'  -H 'Content-Type: application/json'  -H "Autho
rization: Api-Key $API_KEY" | jq
{
  "count": 0,
  "next": null,
  "previous": null,
```

```
  "results": [],
  "stats": {
    "type": {
      "migrate": 0,
      "premigrate": 0,
      "recall": 0
    },
    "state": {
      "SUCCESS": 0,
      "FAILURE": 0,
      "STARTED": 0,
      "PENDING": 0,
      "ERROR": 0
    },
    "created": {},
    "site": {}
  }
}
```


Submitting Workflow

To submit a workflow, the following parameters are required:

name	description
`workflow`	The name of the workflow to submit
`paths`	A list of paths to execute the workflow on
`site`	The name of the site where the workflow should be started from. Steps within a workflow may run on different sites.

In addition, the following optional parameters may be provided:

name	description
`discovery`	Name of the file discovery technique to use. Currently the only supported discovery is `recursive`. If no discovery is specified, `recursive` will be used as the default. If explicitly set to `null`, no discovery will be performed and the provided paths will be used ‘as is’.
`fields`	Additional parameter for the workflow, typically used by custom workflows.

Migrate

Using a Client Key stored in a environment variable `TOKEN`, the following is an example of migrating a file using curl.

```
curl -s -X POST 'http://example.com/api/file/workflow/'  -H 'Accept: application/json'  -H 'Content-Type: application/json'  -H "Authorization: Api-Key $TOKEN"  -d '{"paths": ["/mmfs1/data/sample_data.tgz"], "site": "dfoster1", "workflow": "migrate", "discovery": null}'
```

Note: Since we're only migrating a single file, we don't need recursive discovery, so discovery has been set to `null` to disable it.

Trailing Slashes

In general, the endpoint used with `POST` requests must have a trailing slash.

For example, a `POST` request made to `http://example.com/api/file/workflow` would error, but if made to `http://example.com/api/file/workflow/` it would work.

Monitoring and Management

systemd service

Ngenea Hub is controlled via the `ngeneahub` systemd service

ngeneahubctl cli tool

The `ngeneahubctl` tool can be used to manually stop/start the services, outside of systemd, for debugging

Docker containers

Ngenea Hub uses a collection of docker containers, which can be managed by standard Docker monitoring/management tools and processes:

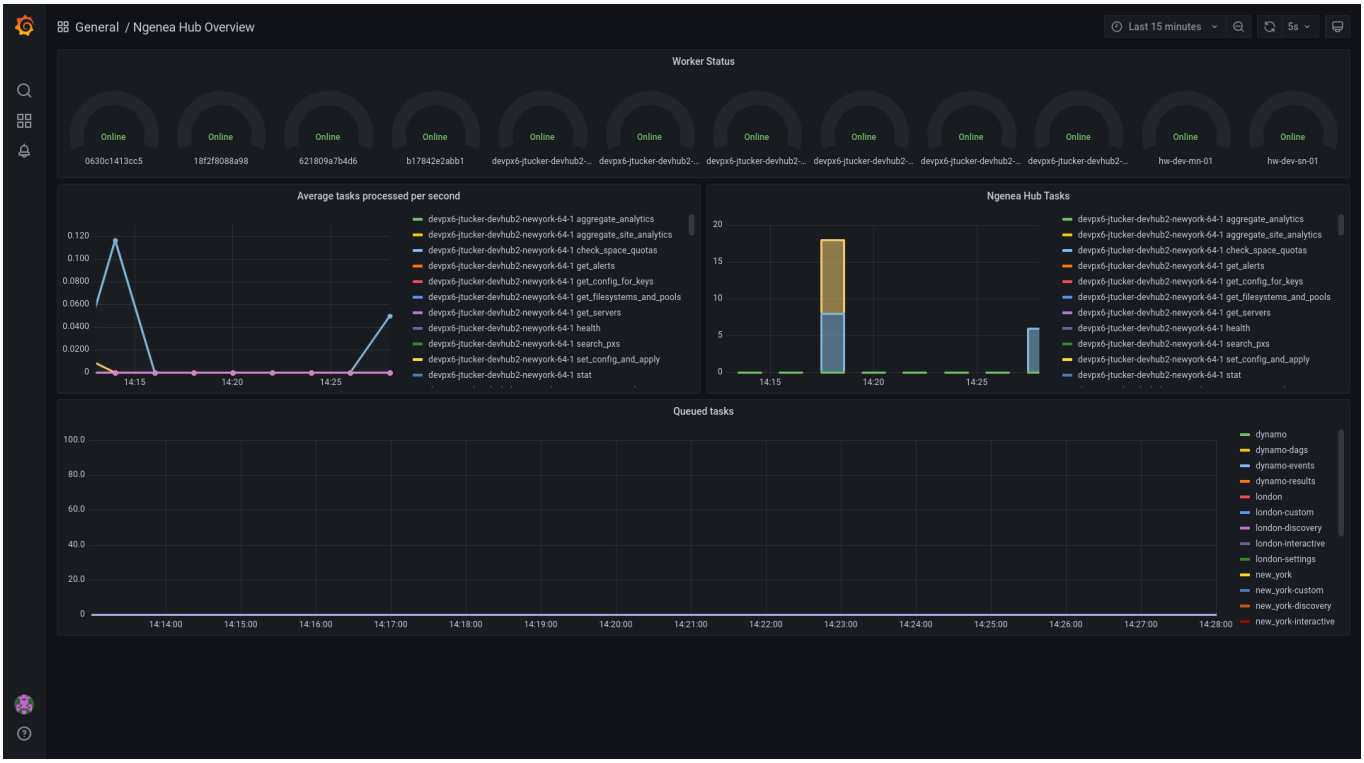
Container Name	Description
`ngeneahub_app_1`	Web application
`ngeneahub_jobrefresh_1`	Maintenance task controller
`ngeneahub_db_1`	Application database (Postgres)
`ngeneahub_redis_1`	Task results backend and celery broker

Hub Task Metrics

Hub provides a Grafana panel of the Tasks in the Hub queue and the status of the Workers.

To view the Metrics open the URL as follows, substituting the location of your hub. *http(s)://myhub/hubmetrics*

It is required to be authenticated to Hub in order to view the metrics.



Health endpoints

To view the state of all sites and related nodes within known to Ngenea Hub, a GET request can be performed to `/api/health` to view all of the sites, nodes and the hub service itself. The states are currently based on how many nodes are online for each site using the following states:

State	Description
`ok`	All nodes are functional
`warning`	Some nodes are offline within a site
`critical`	One or more sites are completely offline

An example output of the health endpoint can be seen below:

```
{
    "overall_health": "ok",
    "hub_status": {
        "health": "ok"
    },
    "site_status": [
        {
            "site": "site1",
            "health": "ok",
            "nodes": [
                {
                    "name": "pixstor-east-ng-test",
                    "health": "ok",
                    "online": true
                }
            ]
        },
        {
```

```
            "site": "site2",
            "health": "ok",
            "nodes": [
                {
                    "name": "pixstor-west-ng-test",
                    "health": "ok",
                    "online": true
                }
            ]
        }
    ]
}
```


A request can also be performed to specific sites using `/api/sites/ID/health/` to view the site specific health status:


```
{
    "site": "site1",
    "health": "ok",
    "nodes": [
        {
            "name": "pixstor-east-ng-test",
            "health": "ok",
            "online": true
        }
    ]
}
```


Custom Workflows

Defining workflows

It's possible to define custom workflows which use pre-defined rules as building blocks to create your workflow.

> **Note:** Custom workflows are not currently exposed via the UI. Use the API `/api/workflows/` endpoint to create custom workflows

A workflow definition requires the following parameters:

Name	Description
`name`	The unique name for this workflow. For easy of submission again the API, this should not contain spaces.
`label`	The human readable name for this workflow, can contain spaces.
`icon_classes`	List of icon classes to represent the workflow in the UI. Font Awesome is useful here.

Name	Description
`filter_rules`	A list of rules to apply to provided files that match defined states. Described in more detail below.
`fields`	A list of runtime fields. Described in more detail below.

Additionally, you can optionally provide:

Name	Description
`discovery`	Which discovery task the workflow should be used by default, this can be either recursive or snapdiff.
`discovery_options`	A json containing any additional options to pass to the workflow default discovery. Described in more detail below.

Filter Rules

Filter rules are defined in JSON. They are a list of individual rules in a mapping format that will be performed on each matching file result when a discovery task is complete. If called through the API with no discovery task provided, rules will be applied to any states provided in the workflow input.

Steps are defined in JSON. Steps is a list of individual steps that will be performed serially. Each rule must contain the following:

Name	Description	Required
`state`	The state of a result provided by the discovery task with any given path, an example of that could be “processed” or “modified” more details about this are in the discovery section.	Yes
`type`	The type of result the rule will apply to, the only valid types are: `file|directory|symlink|all`	Yes
`action`	A list of tasks to perform on files that match the state and type	Yes
`include`	A list of globs to apply to provided files to limit actions to just them.	No
`exclude`	A list of globs to apply to provided files. Described in more detail below.	No
`ignore_site_includes`	Whether to ignore any global includes defined on the site the workflow will run on	No

Name	Description	Required
`ignore_site_excludes`	Whether to ignore any global excludes defined on the site the workflow will run on	No

These rules control which actions will be performed on certain files based on their given state that they have been given following specific discovery tasks such as `snapdiff` or provided in the initial input of a workflow. These states can allow direct control of workflows performed on files provided, allowing multiple workflow paths within the same job by utilizing multiple rules controlling specific states with additional control with include and exclude path rules.

Alongside rules bound to a state, there are two special states that rules can be used, these being `default` and `all`. Rule sets cannot have both `default` and `all` rules within them, but it is possible to have multiple of one type with different sets of exclude and include rules to allow for more granular control.

Rules defined with `default` as their `state` and `type` will perform their action on paths that have not been captured by all other rules within a given rule set. This means that if there are specific file states that need to be actioned differently, paths that do not match any other rules actioned against without ignoring those non-matching paths.

The other special rule type is rules with the `state` and `type` of `all`. This rule will perform its action on all paths regardless of their provided type and state. This is an additional operation so if another rule has an explicit rule provided it will perform multiple actions on the same path, for each matching rule in rule set. Simple workflows are typically composed of a single rule with the state and type of `all` as this will simply process all paths provided to it.

Within each rule, there must be a list of actions to perform on the resulting file provided within the `action` key. These actions will be performed serially. Each action must be a mapping that contain the following in each entry:

Name	Description	Required
`name`	The name of the task to run, e.g. `dynamo.tasks.migrate`	Yes
`site`	The name of the site to run against, if this is not provided it will use the site provided within the workflow call.	No

Name	Description	Required
`queue`	The name of the queue the task should run on. The queue must exist on the site the task will run against. If not provided it will use the queue provided in the workflow call, or the `default` queue if one is not provided	No

If steps have optional arguments, these can be passed as additional key:value pairs in these step definition mapping to pass those optional arguments.

As an example we can define a generic rule that captures every type of file and state and sends it to a second site, this would be useful for a bulk move using the `recursive` discovery task to cover all types of files in directories provided to the task:

Example 1 - Send to london

```
{
    "state": "all",
    "type": "all",
    "action": [
        {
            "name": "dynamo.tasks.migrate",
            "queue": "highpriority"
        },
        {
            "name": "dynamo.tasks.reverse_stub",
            "site": "london"
        }
    ]
}
```

Runtime fields

A workflow needs to be able to accept parameters as it submitted. Taking example #1 above, “london” doesn’t want to be hardcoded as the destination site, as that would mean a new workflow would need to be defined for each possible destination.

Instead, fields can be defined, that in turn will need to be provided at workflow submission time. Fields are defined as a mapping with the following keys:

Name	Description	Required
`name`	The name of the field.	Yes

Name	Description	Required
`label`	The friendly name for this field, used for presenting in the UI	Yes
`type`	The type of the field, valid options are: • `string` - a free text field • `int` - a free text field that will be validated a integer • `bool` - a checkbox • `choices` - A dropdown box representing a list of choices, populated from choices list of objects. • `enum[enum_type]` - A dropdown box representing a choice of option, populated from enum_type. `enum_type` can be one of the following ◦ `site` - A list of all the sites Ngenea Hub has defined ◦ `queue` - A list of all queues available on the selected site • `list` - a list of values of any scalar type	Yes
`default`	The default value for runtime fields	optional

The following is an example of a custom field definition for providing a site to an action step:

Example 2 - Custom field definition

```
[
    {
        "name": "target_site",
        "label": "Site to migrate to",
        "type": "enum[site]"
    }
]
```

Custom field defintion with default value

```
[
    {
        "name": "target_site",
        "label": "site to migrate to",
        "type": "enum[site]",
        "default": "london"
    }
]
```

If default value is specified in runtime fields, it will take the default value for fields while running workflow if the user input is not given otherwise it will always use the user input.

Back in the definition of an action step, any value that is prefixed with a `*` will be used as a field name and the value replaced instead of a literal string.

The following example, modifies example #1 to use the custom field as defined in example #3:

Example 3 - Updated rule now using custom fields

```
{
    "state": "all",
    "type": "all",
    "action": [
        {
            "name": "dynamo.tasks.migrate"
        },
        {
            "name": "dynamo.tasks.reverse_stub",
            "site": "*target_site"
        }
    ]
}
```

So, a complete request to create a workflow that will process all file and state types with a dynamic “site” field will look like:

Example 4 - Full workflow request

```
{
    "name": "send_file",
    "label": "Send files from one site to another",
    "icon_classes": ["fa fa-cloud fa-stack-2x text-primary", "fa
fa-refresh fa-stack-1x text-light"],
    "filter_rules": [
        {
            "state": "all",
            "type": "all",
            "action": [
                {
                    "name": "dynamo.tasks.migrate"
                },
```

```
                {
                    "name": "dynamo.tasks.reverse_stub",
                    "site": "*target_site"
                }
            ]
        }
    ],
    "fields": [
        {
            "name": "target_site",
            "label": "Site to migrate to",
            "type": "enum[site]"
        }
    ]
}
```

The following is an example of a custom field definition for providing a choices to an action step:

Example 5 - Custom field definition

```
[
    {
        "name": "sync_policy",
        "label": "sync_policy",
        "type": "choices",
        "choices": [
            {
               "label": "Newest",
               "value": "newest"
            },
            {
               "label": "Sourcesite",
               "value": "sourcesite"
            }
        ]
    }
]
```

choices support both string and integer type values.

Back in the definition of an action step, any value that is prefixed with a `*` will be used as a field name and the value replaced instead of a literal string.

The following example, uses the custom field in action:

Example 6 - Updated rule now using custom fields

```
{
    "state": "all",
    "type": "all",
    "action": [
        {
            "name": "dynamo.tasks.migrate"
        },
```

```
        {
            "name": "dynamo.tasks.reverse_stub",
            "sync_policy": "*sync_policy"
        }
    ]
}
```

So, a complete request to create a workflow that will process all file and state types with a static choices field will look like:

Example 7 - Full workflow request

```
{
    "name": "send_file",
    "label": "Send files from one site to another",
    "icon": "<span class='fa-stack'><i class='fa fa-cloud fa-
stack-2x text-primary'></i><i class='fa fa-angle-right fa-stack-2x
text-light'></i></span>"
    "filter_rules": [
        {
            "state": "all",
            "type": "all",
            "action": [
                {
                    "name": "dynamo.tasks.migrate"
                },
                {
                    "name": "dynamo.tasks.reverse_stub",
                    "sync_policy": "*sync_policy"
                }
            ]
        }
    ],
    "fields": [
        {
            "name": "sync_policy",
            "label": "sync_policy",
            "type": "choices",
            "choices": [
               {
                  "label": "Newest",
                  "value": "newest"
               },
               {
                  "label": "Sourcesite",
                  "value": "sourcesite"
               }
            ]
        }
    ]
}
```

Running Workflows

Once a workflow has been defined, it can be performed through the file browser by selecting files and directories and clicking the actions button. It is then possible to select the workflow you wish to call, this workflow call will not use a discovery task unless a directory is selected, in that case it will make use of the `recursive` discovery step.

This can also be performed via a POST request to `/api/file/workflow`. When called through the API, you have the option to provide a discovery step, these steps can expand the initial paths provided to them to either recursively perform actions or perform something like a file difference scan.

Name	Description	Type	Required
`paths`	A list of paths to perform the workflows against, these can be just strings of file absolute file paths or can be JSON with the keys of “path” and “state”, detailed example in example 7	JSON List	Yes
`site`	The site to perform the workflow against	String	Yes
`queue`	The queue to run workflow tasks on. The `default` queue will be used if not provided.	String	None
`fields`	The runtime fields for a workflow	String	Yes
`discovery`	The discovery phase to use for this workflow run, this will override any defaults	String	No
`job`	The ID of a job that this workflow should be run within	Integer	No

Following the example workflow defined above, you can call the workflow to recursively send all files within any paths provided using the following POST to `/api/file/workflow`:

Example 8 - Calling example workflow

```
{
    "paths": [
        "/mmfs1/data/project_one",
        "/mmfs1/data/project_two"
    ],
    "site": "london",
    "queue": "highpriority",
    "workflow": "send_file",
    "discovery": "recursive",
    "fields": {
        "target_site": "dublin",
    }
}
```

This will now migrate all files within `/mmfs1/data/project_one` and `/mmfs1/data/project_two` and then recall them at the site defined as `dublin`.

If there is a more complex workflow that have been defined that includes rules for specific states, the input paths can include this state information. This behaviour can be only be used when no discovery state is provided, an example of a custom rule set using could be:

Example 9 - Calling workflow with state data

```
{
    "name": "migrate_state",
    "label": "Stateful file migration",
    "filter_rules": [
        {
            "type": "all",
            "state": "modified",
            "action": {
                "name": "dynamo.tasks.migrate"
            }
        {
            "type": "all",
            "state": "moved",
            "action": {
                "name": "dynamo.tasks.delete_paths_from_gpfs"
            }
        }
    ],
    "discovery": null,
    "fields": []
}
```

Here is a simple rule set that will migrate all paths provided with the state `modified` and will delete all paths provided with the state `moved`. With this example workflow provided you can perform a POST to `/api/file/workflow` with the following JSON:

Example 10 - Calling workflow with state data

```
{
    "paths": [
```

```
        {
            "path": "/mmfs1/data/project_one",
            "state": "modified"
        {
            "path": "/mmfs1/data/project_two",
            "state": "moved"
        }
    ],
    "site": "london",
    "workflow": "migrate_state",
    "discovery": null,
    "fields": {}
}
```

Using multiple state based rules with different include and exclude path filters, you could achieve more complex behaviour in workflow calls for more finite control.

Discovery Steps

Discovery steps can make complex large bulk operations much more manageable to call, allowing you to provide a single path that expands to cover all the contents of a path, or to see time based differences for a given path.

Note: If a workflow is submitted without a discovery task explicitly provided, it will default to using the discovery task defined as the default during the workflow's creation, visible via the workflow's "discovery" attribute. To avoid this, it is possible to explicIty pass `null` as the discovery task via the API to skip any discovery phase and additional processing on the paths provided and instead process the actions specified using the rules, without any additional checks.

Name	Description	Supported states
`recursive`	Performs a recursive expansion of the initial provided paths. This allows paths to be expanded to cover all sub file and directories, it will then perform the defined action for all the generic rules in a workflow against all resulting files.	`all`

Name	Description	Supported states
`snapdiff`	Performs a time based file scan on an independant fileset between the last time a scan was performed. It will retrieve all file differences between those moments in time and the state of that file.	`created|updated|moved|deleted|all`

For more complex discovery steps such as `snapdiff`, there are defined states that files, directories and links can be in once it has completed its scan. This allows more explicit control of file and state control within a single call to a workflow. If for example you want all results with the type of `file` that have the state `created` to be sent to another site without any temporary files, a rule to cover that could be:

Example 11 - Custom rule for filtering snapdiff discovery results

```
{
    "state": "created",
    "type": "file",
    "exclude": ["*.temp"],
    "action": [
        {
            "name": "dynamo.tasks.migrate"
        },
        {
            "name": "dynamo.tasks.reverse_stub",
            "site": "*target_site"
        }
    ]
}
```

Discovery Options

Additional options can be passed to the discovery task by setting `discovery_options` on the workflow. The supported options are those described in Discovery Steps.

Example 12 - Passing options to the discovery

```
{
    "discovery": "recursive",
    "discovery_options": {
        "skip_missing": false
    }
}
```

Discovery options will be used with the workflow default discovery only. If a different discovery is set at runtime, the discovery options will be ignored. Discovery options cannot currently be overwritten at runtime.

Includes and Excludes

Includes and excludes can be used to select paths that individual filter rules should apply to, or generally limit which paths should be handled during a workflow run.

Include/exclude patterns behave like unix shell pattern matching ('globbing'). The 'wildcard' asterisk character `*` will match any characters within a string. Patterns must match whole paths; partial matches are *not* supported, except through the use of wildcards.

Includes and excludes are combined as "a path matching any includes and not any excludes". For example `{"include": ["/mmfs1/data/*"], "exclude": ["*.tmp"]}` would match only files in `/mmfs1/data`, but not files in that directory with the `.tmp` extension. If no includes are defined, then all files are considered included (unless explicitly excluded).

There are three places where path include and exclude patterns can be defined:

- on a site
- within a filter rule
- at runtime, when a workflow is submitted

Site patterns can be used to apply includes and excludes globally, to all workflows and workflow steps. If defined, these will be *appended* to any patterns defined within a filter rule or at runtime.

For example, if a rule defines `{"exclude": ["*.tmp"]}` and the site defines `{"exclude": ["*.cache"]}`, then the combined excludes for that rule would be `{"exclude": ["*.tmp", "*.cache"]}`

If not desired, this behaviour can be overridden by specifying `ignore_site_includes` / `ignore_site_excludes` either on a per-rule basis, or for all rules by passing those parameters when submitting a workflow run.

For workflows involving multiple sites, such as send and sync, only the primary (source) site patterns will be considered.

If includes and excludes are passed when submitting a workflow, they will be applied to all filter rules within the workflow, replacing any patterns already defined within the workflow rules. Any site patterns will be appended to the runtime patterns, unless 'ignore' is specified.

Jobs

Housekeeping

Job details are kept for a time after job completion. During this time, they can be viewed in the UI.

But older jobs are periodically culled from the database, to keep it to a manageable size. The housekeeping process runs once a day, and removes results for any job

that completed more than 90 days ago (by default). A different 'time-to-live' (TTL) can be set using the `jobs_ttl` configuration - see Configuration for more information.

Site Sync

Ngenea Hub provides the facility for syncing data from one site to another.

Site Sync applies changes in one direction. See also Bidirectional Site Sync for applying changes in both directions.

Synchronisation is achieved by utilising a scheduled workflow which periodically discovers file and directory changes within an Independent Fileset on a source site and applying those changes to a target site. Changes are applied by sending newly created or recently modified files and directories, including deleting or moving files or directories in place on the target site as necessary to match the source site.

The REST API can also be utilised to achieve the same setup.

Troubleshooting

If you encounter issues with sync, refer to the sync troubleshooting guide page for guidance.

Bidirectional Site Sync

Ngenea Hub provides the facility for syncing data between sites.

Bidirectional Site Sync is similar to Site Sync, but applies changes in both directions. If a Bidirectional Site Sync runs between sites A and B, changes on site A will be applied on site B, followed by changes on site B being applied on site A.

Synchronisation is achieved by utilising a scheduled workflow which periodically discovers file and directory changes within an Independent Fileset on each of the sites and applies those changes to the other site. Changes are applied by sending newly created or recently modified files and directories, including deleting or moving files or directories in place on the target site as necessary to match the other site.

A prerequisite for a working Bidirectional Site Sync is that the Independent Fileset has been created on both sites.

The principles of setting up Bidirectional Site Sync are similar (but with some differences explained below) to setting up a Site Sync, so please refer to the walkthrough on the Site Sync page for detailed instructions. It can be done using the Ngenea Hub UI or the REST API.

Schedule

Discovery

Create a new schedule. Unlike with Site Sync, for Bidirectional Site Sync set the schedule's `Discovery` to `bidirectional_snapdiff`.

This discovery type operates identically to the `snapdiff` discovery type, with snapshots used to track changes over time within an Independent Fileset.

A separation is enforced between `bidirectional_snapdiff` schedules and schedules with other discovery types. Whereas the `Discovery` of other schedules may be changed, a change from or to the `bidirectional_snapdiff` discovery type is not allowed. This is to ensure consistency of the specific workflow rules that apply to Bidirectional Site Sync.

Time criteria

Unlike with Site Sync, a Bidirectional Site Sync will not be triggered if the previous sync is still running. This means that some syncs will be skipped if scheduled closer together than the time it takes to complete a sync.

Workflow

Subscribing a workflow

Select the `Bi-directional Site Sync` workflow.

This is the only workflow that may be subscribed to a `bidirectional_snapdiff` schedule, and it cannot be subscribed to other types of schedule.

A `bidirectional_snapdiff` schedule may have at most one subscribed workflow.

Outcome

When executing the scheduled workflow, only one job is created and appears within the schedule details page. This job includes the tasks for both the snapdiff discoveries (one on each site), as well as the tasks that enact the sync in each direction.

Troubleshooting

If you encounter issues with sync, refer to the sync troubleshooting guide page for guidance.

Search

The search endpoint provides the ability to search for files across multiple sites, and aggregate the results.

Search is performed in two steps - submitting a query, and retrieving the results.

Submitting a query

Search performs a query by submitting asynchronous tasks to each requested site. The sites then perform the actual search and return results as available.

A search is initiated by `POST`ing a query to the search endpoint

```
curl -s -X POST 'http://example.com/api/search/'  -H 'Accept: application/json'  -H 'Content-Type: application/json'  -H "Authorization: Api-Key $TOKEN"  -d '{"path": "/mmfs1/data", "sites": ["site1"], "recursive": true, "filters": {"hsm.status": "migrated"}}'
```

The search request payload is made of

name	description
`path`	Directory to query
`sites`	List of one or more sites to search. Default: all sites
`recursive`	Whether to search the `path` recursively. Default: false, only immediate children of `path` will be returned.
`filters`	A collection of filters against arbitrary metadata, see below. Default: None
`metadata_fields`	A list of metadata fields to include in search results. This can include specific field names (e.g. `hsm.status`), or namespace wildcards (e.g. `core.*`) to select all fields in a given namespace. Default: all available fields.
`merge`	If the same file exists on multiple site, this will cause them to be merged in the results (see below). Default: false

Upon successful submission, the request will return status `201 (Created)`, and a response body which includes the url for retrieving search results (see below)

```
{"id":1,"url":"http://example.com/api/search/1/"}
```

Filters

Filters are a collection of filters to apply to arbitrary file metadata.

The specific metadata available to be filtered on depends on the search backend being used. The fields in the following examples may not be available for all backends.

At a minimum, one can expect to be able to filter on `core.filename`, the file basename. For example to filter only jpeg files, `{"core.filename": "*.jpg"}`

Possible filter types are

type	description	example
exact match	match a value exactly	`{"core.filename": "cats-01.jpg"}, {"core.size": 0}`
match list	match any of the values in the list (value1 OR value2 OR ...)	`{"core.group.name": ["editor", "admin"]}`
wildcard	any string value containing an asterisk (`*`) is treated as a wildcard	`{"core.filename", "*.jpg"}`
range	numerical or date range, using any combination of less-than (`lt`), less-than-equal (`lte`), greater-than (`gt`), greater-than-equal (`gte`)	`{"core.modificationtime": {"gte": "2021-01-01", "lt": "2021-02-01"}}, {"core.size": {"gt": 1000000000}}`
negation	exclude anything matching a given filter	`{"not": {"core.filename": ".DS_Store"}}`

Filters are combined as AND, e.g. `{"core.extension": ".jpg", "hsm.status": "migrated"}` matches `.jpg` files which are HSM migrated.

Retrieving results

When search results are read, they can be retrieved using the url returned when the query was submitted.

```
$ curl 'http://example.com/api/search/1/' -H "Authorization: Api-Key $TOKEN"
{
  "count": 1,
  "next": null,
  "previous": null,
  "items": [
    {
      "href": "http://example.com/api/file/?path=%2Fmmfs1%2Fdata%2Fhello.txt&site=site1",
      "site": "site1",
      "path": "/mmfs1/data",
      "name": "hello.txt",
      "metadata": {
          "core.accesstime": "2021-10-12T16:27:28",
          "core.changetime" : "2021-10-12T16:28:45",
          "core.directory" : "/mmfs1/data",
          "core.extension" : ".txt",
          "core.filename" : "hello.txt",
          "core.group.id" : 0,
```

```
            "core.group.name" : "root",
            "core.hash.sha512": "db3974a97...94d2434a593",
            "core.modificationtime" : "2021-10-12T16:28:45",
            "core.pathname": "/mmfs1/data/hello.txt",
            "core.size" : 12,
            "core.user.id" : 0,
            "core.user.name" : "root",
            "gpfs.filesetname" : "root",
            "gpfs.filesystem" : "mmfs1",
            "gpfs.kballocated" : 0,
            "gpfs.poolname" : "sas1",
            "hsm.status" : "migrated"
            "ngenea.pathname" : "data/hello.txt",
            "ngenea.size" : 12,
            "ngenea.target" : "awss3",
            "ngenea.uuid": "acf1a307-5b6a-43b0-8fb2-d2b366e88008",
        },
        "proxies": {
            "_thumbnail": "/media/123/456/789/123456789012345.png"
        }
    }
  ],
  "metadata_fields": ["core.accesstime", ...],
  "complete": true,
  "errors": {"site2": "Search backend is offline"}
}
```

Results from different sites may not arrive at the same time. The `complete` field indicates whether all sites what returned their results. This includes when a site returns with an error.

Results from different sites are ‘concatenated’, meaning if the same file exists on multiple sites, there will be separate result items for the file for each site.

The `metadata` field on each item contains arbitrary file metadata. The specific metadata will vary depending on the search backend being used. In the case of the PixStor Search backend, the available fields will vary depending on file type, and which plugins were used when the files were ingested.

If `metadata_fields` was specified when the query was submitted, the `metadata_fields` entry in the response will match, with any wildcards expanded to list the avilable fields which match those wildcards. Otherwise, the `metadata_fields` entry will list all the available metadata fields which could be returned from the search backend. Individual files may not have all the listed fields.

All search backends format results to be namespaced, similar to PixStor Search, for consistency.

If an error occurs while performing the search on any of the sites, the `errors` entries will provide a mapping of site names and error messages.

Proxies

The `proxies` field on each item contains links to proxies of the file, such as thumbnails and previews.

These will only be available if the backend is `pixstor_search`, and PixStor Search itself has been configured and ingested in 'search plus' mode.

The links are relative urls, which must be combined with the `public_url` from the corresponding `/sites` endpoint to fetch the actual proxy files, e.g. `https://pixstor-site1/media/...`.

Typical proxies may include:

- `_thumbnail` - a 150x150 px thumbnail image
- `image.preview` - a 400x300 px preview image
- `video.preview` - a 400x300 px, lower resolution version of a video
- `audio.preview` - a downscaled version of an audio file

Proxies may not be available for all file types, depending on which search plugins have been enabled and ingested.

Parameters

Search results are paginated. The following parameters can be used to control what results are returned

name	description
`page`	Numbered page of results to fetch. Default: 1
`page_size`	Maximum number of results to return per page. Default: 20
`sort`	One or more fields to sort results on, separated by commas, e.g. `?sort=name,site`. Field names can be prefixed with `-` to reverse order. For fields in `metadata`, the field name is specified as is, e.g. `?sort=-core.accesstime`. Default: arbitrary order.
`group_by_name`	When this url parameter is 'true' results are merged based on matching name, e.g. `?group_by_name=true`

Merged results

When a search is submitted with `"merge": true`, the search results will be 'merged'.

This means that entries for matching files from different sites will be combine. An entry is considered to be matching if it has the same full path.

```
$ curl 'http://example.com/api/search/2/' -H "Authorization: Api-
Key $TOKEN"
{
  "count": 1,
  "next": null,
  "previous": null,
  "items": [
    {
      "path": "/mmfs1/data",
      "name": "hello.txt",
      "metadata": {
          "core.accesstime": "2021-10-12T16:27:28",
          "core.changetime" : "2021-10-12T16:28:45",
          "core.directory" : "/mmfs1/data",
          "core.extension" : ".txt",
          "core.filename" : "hello.txt",
          "core.group.id" : 0,
          "core.group.name" : "root",
          "core.hash.sha512": "db3974a97...94d2434a593",
          "core.modificationtime" : "2021-10-12T16:28:45",
          "core.pathname": "/mmfs1/data/hello.txt",
          "core.size" : 12,
          "core.user.id" : 0,
          "core.user.name" : "root",
          "gpfs.filesetname" : "root",
          "gpfs.filesystem" : "mmfs1",
          "gpfs.kballocated" : 0,
          "gpfs.poolname" : "sas1",
          "hsm.status" : "migrated"
          "ngenea.pathname" : "data/hello.txt",
          "ngenea.size" : 12,
          "ngenea.target" : "awss3",
          "ngenea.uuid": "acf1a307-5b6a-43b0-8fb2-d2b366e88008",
      },
      "status": {
         "site1": true,
         "site2": false
      }
    }
  ],
  "metadata_fields": ["core.accesstime", ...],
  "complete": true
}
```

Merged results no longer have the `site` and `href` fields. In their place is a `status` field, which maps sites to whether the file is ‘resident’ on that site.

A file is considered resident if the file is not migrated, or is premigrated (‘hydrated’). A file is considered not resident if the file is migrated (stubbed), or not present at all.

Results grouped by name

To group search results by name, add the url parameter `group_by_name=true`.

This will return results from any of the requested sites. Results within a group may belong to different directories.

```
$ curl 'http://example.com/api/search/1/?group_by_name=true' -H "
Authorization: Api-Key $TOKEN"
{
  "count": 60,
  "next": "http://testserver/api/search/1/?
group_by_name=true&page=2",
  "previous": "http://testserver/api/search/1/?
group_by_name=true",
  "more_results": false,
  "items": [
    {"test-10": [
      {
        "site": "testsite",
        "path": "/mmfs1/data",
        "metadata": {...}
      },
      {
        "site": "anothersite",
        "metadata": {...}
      }
    ]
    },
    {"test-11": [
      {
        "site": "testsite",
        "path": "/mmfs1/data",
        "metadata": {...}
      },
      {
        "site": "anothersite",
        "path": "/mmfs1/archive",
        "metadata": {...}
      }
    ]
    },
    {"test-19": [
      {
        "site": "testsite",
        "path": "/mmfs1/data",
        "metadata": {...}
      },
      {
        "site": "anothersite",
        "path": "/mmfs1/data",
        "metadata": {...}
      },
      ...
    ]
    }
  ],
  "complete": true,
```

```
  "metadata_fields": null,
  "errors": {}
}
```

Max Results

There is a hard limit on the number of results returned, per site. By default, each site will return, at most, 200 results.

Fetching a lot of results makes queries slower and, since results are stored in the DB, storing more results uses more space. One the other hand, the limiting may lead to some matches not being returned.

The maximum number of results per site is controlled by the `search_max_results` configuration - see Configuration for more info.

Result limiting is applied when the search query is submitted, not when results are retrieved. If you change `search_max_results`, you will need to resubmit your query to fetch any additional matches.

Note, some backends have a hard limit of 10,000 results.

Housekeeping

The results from a query are stored, so they can be retrieved multiple times without performing a new query.

However, over time, the files on each site will change, and the stored results may no longer accurately reflect the active file system.

Therefore, old results are periodically culled. The housekeeping process runs once a day, and removes results for any search which was submitted more than a week ago (by default). A different 'time-to-live' (TTL) can be set using the `search_result_ttl` configuration - see Configuration for more information.

Results can also be manually removed by performing a `DELETE` request against the given search result endpoint

```
curl -X DELETE 'http://example.com/api/search/1/' -H "Authorizati
on: Api-Key $TOKEN"
```

Controlling Bandwidth Usage

Ngenea Hub can control the amount of traffic speed for each node within each site that processes files through Ngenea. This will limit both outgoing and incoming traffic with defined cloud services.

Bandwidth configuration in the UI

The bandwidth setting can be updated both via the REST API and directly through the UI. Any changes to the `bandwidth` attribute on a `Site` instance will take effect immediately.

The UI on the Site details page now includes a field for setting the bandwidth limit, displayed in Mb/s

Checking Node status

Each site within Ngenea Hub is the collection of all nodes running an instance of Ngenea Worker using the name of a given site. These are nodes within a cluster that are collectively listening to the same queue for a given site. Each time any worker comes online on a new node or a known node, this is tracked within Ngenea Hub using `Node` objects. These are automatically created when first starting up a worker, after creation their online status can be monitored.

You can view the nodes for each site within `/api/nodes/` this will be a complete list of all nodes known to Ngenea Hub.

For bandwidth control, there will need to be existing nodes known to Ngenea Hub, otherwise the bandwidth rules cannot be applied. If your worker coming online was not tracked due to timing issues, you can manually scan for existing nodes using one of the Actions.

Registering Datastores

In order to control the bandwidth for all nodes under a site, the site will need to have the Ngenea policy targets defined as `Datastore` instances within Ngenea Hub.

The following example is for defining an AWS S3 target for Ngenea within Ngenea Hub:

```
{
    "name": "site1_amazon",
    "type": "S3",
    "bucket": "bucket01",
    "secretaccesskey": "secret-key",
    "accesskey": "access-key"
}
```

With this established datastore, all that is left to do is link the created datastore to a site so that when a change in bandwidth is applied, the site knows what service to limit the traffic to.

Cloud IPAddresses

Each datastore that points to a cloud target will have access to a list of all known IP addresses that are associated with that specific service. This will be used to limit all traffic between those IP ranges and the nodes currently running a worker instance when a bandwidth limit is applied.

These IP ranges are updated internally once a day in a scheduled task.

Using manual IP addresses

Manual IP addresses can be used to override the list of cloud related IPs, this can be useful to control bandwidth to custom endpoint targets such as services like minio making use of POST `api/ipaddresses/`. Using the following example to add an address to the list of IPAddresses:

> **Note:** This will disable the use of all cloud addresses for a datastore and will instead only use the custom IP addresses.

```
{
    "ipaddr": "208.65.153.237",
    "datastore": 1
}
```

This will ensure that all traffic between those nodes and the defined IP addresses will be limited to the max bandwidth limit

Linking a Datastore to a Site

With our example site `site1` creating a `SiteLink` between `site1` and the datastore `site1_amazon` allows the bandwidth to be applied to all S3 targets on all nodes that are running the Ngenea Worker service.

For this example all local data for this Ngenea is located in `/mmfs1/data/aws_data` with data being placing data in the bucket `bucket01` under `aws_data/`.

The following `SiteLink` can be used to represent this:

```
{
    "site": "site1",
    "datastore": "site1_amazon",
    "site_path": "/mmfs1/data/aws_data/",
    "datastore_path": "aws_data/"
}
```

This will ensure that each `Node` under `site1` will limit its traffic to all related addresses.

Applying the bandwidth

> **Note:** This will effect all traffic on each node running a worker to the cloud services defined with the sites linked datastores.

With the SiteLink in place, changing the bandwidth attribute to the Mb/s desire on the site instance via the API route PATCH `/api/site/{id}`:

```
{
  "bandwidth": 1000
}
```

Using this or the UI, this will cause the hub to signal the worker to limit traffic using the IP ranges defined for the datastores.

This total bandwidth will be divided between all nodes for any given site, so if a site has a bandwidth of 1Gb/s then both nodes will be limited to 500mb/s.

Configuration

Global Configurations

Some configurations are stored in the Ngenea Hub configuration file, as described in Hub Configuration. These are generally static, or sensitive settings. Changes to these settings require a service restart.

In addition, there are configurations which can be changed on-the-fly, typically to change Ngenea Hub behaviour. These settings can be viewed and changed via the REST API, as described below.

Available Settings

Name	Description	Default
jobs_ttl	How long job details should be stored after job completion, in days.	90
search_backend	Backend to use when performing searches. Currently supported backends: `analytics`, `pixstor_search`.	`pixstor_sea`
search_result_ttl	How long search results should be stored, in days.	7

Name	Description	Default
search_max_results	Maximum number of search results to fetch from the search backend, per site. Fetching more results will make queries slower and will require more storage space. Fetching fewer results may lead to some files being missing. Note, some backends have a hard limit of 10,000 results.	200
analytics_timeout	How long to wait for results from search results when configured to use analytics, in seconds.	10
snapshot_create_delete_retry_timeout	Time in seconds after which workers will give up retrying snapshot create and delete operations. These occur in the `dynamo.tasks.snapdiff` and `dynamo.tasks.rotate_snapshot` tasks. The default 1000s will give 4 or more retries. Set to 0 to disable retries.	1000
stat_timeout	How long to wait for results from the `/api/file/` endpoint, in seconds.	10
stat_refresh_period	How long a files details will be retained as a cache within the file browser, in seconds.	10
task_invalidation_timeout	How long in minutes for a task in the STARTED state will wait before being invalidated.	360
snapdiff_stream_timeout	Idle timeout when waiting for delete and move tasks to complete during snapdiff workflows, in minutes.	10
force_local_managed_users	Allow local NAS users to be managed on AD joined sites.	False
custom_statistics_tasks	A list containing the names of custom tasks that add their number of reported files to the job total, it will do so regardless of when these tasks are executed within a workflow.	[“dynamo.cu “dynamo.cu
maximum_external_results	Maximum number of items to retrieve per page from an external target scan.	100
node_health_last_heartbeat_interval	The maximum allowed time (in seconds) between the last recorded heartbeat and the current time for a node to be considered online. If the node’s last heartbeat occurred more than this interval ago, the node will be marked as offline.	120

Name	Description	Default
initial_uid	Minimum uid value for the nas user that can be configured	100000
initial_gid	Minimum gid value for the nas group that can be configured	100000
schedules_enabled	Allow the processing of automated tasks (Policies and Scheduled Workflows).	True
health_timeout	Maximum wait time in seconds for a health check to determine available sites.	1
salt_task_timeout	How long to wait for settings tasks to return their results, in seconds.	60
default_space_location	Path of a directory, relative to the file system root, to use as the default location for space creation	data

Note: If the file details are not returned for large fileset, increase the default value of `stat_refresh_period` in the configuration tab of hub admin page http://:/admin or do a patch on configuration API.

REST API

Configurations can be listed and set via the Ngenea Hub REST API.

Note: The configurations endpoint does not support client key authentication. You must use JWT Authentication.

To list the current configuration settings,

```
$ curl -s 'http://example.com/api/configurations/' -H 'Accept:
application/json' -H "Authorization: Bearer $JWT_ACCESS_TOKEN"
{
    "search_backend": "analytics",
    "search_max_results": 200,
    "search_result_ttl": 7,
    ...
}
```

To change one or more configuration settings, make a `PATCH` request the same endpoint

```
$ curl -s -X PATCH 'http://example.com/api/configurations/' -H 'A
ccept: application/json' -H "Authorization: Bearer $JWT_ACCESS_TO
KEN" -H 'Content-Type: application/json' -d '{"search_max_results"
: 500}'
{
    "search_max_results": 500,
```

```
    ...
}
```

Settings Migration

In versions 1.9.0 and earlier, some of the above settings were configured via the Ngenea Hub config file (Hub Configuration).

Upon updating to version 1.10.0 or above, any values currently set in that config file will be captured. Thereafter, any changes to those settings within the config file will be ignored.

Site-specific Configurations

Some configuration options can be set on a per-site level, and may differ between sites.

These can be viewed and changed via the REST API, as described below. They can also be viewed and changed in the Ngenea Hub UI, from the 'Sites' tab on the Administration page.

Available Settings

Name	Description	Default
bandwidth	Limit the bandwidth for the site (In MB/s). In the UI, it is hidden behind the `bandwidth_controls` feature flag (see Feature Flags)	*not set* (unlimited)
elasticsearch_url	URL used to interact with Elasticsearch when `search_backend` is set to `analytics` (see **Global Configurations** above). The URL is evaluated on the node(s) on which the site worker is running.	`localhost:9200`
pixstor_search_url	URL used to interact with PixStor Search when `search_backend` is set to `pixstor_search` (see **Global Configurations** above). The URL is evaluated on the node(s) on which the site worker is running.	`https://localhost/`

Name	Description	Default
public_url	Public URL that can be used to reach this site. Typically this will be the hostname or external IP address of the site management node.	*not set*
file_batch_gb	Limit the total size of file data in a batch, in gigabytes. See **File Batching** below	1
file_batch_size	Limit the total number of files in a batch. See **File Batching** below	40
enable_auto_file_batch_sizing	If Dynamic file batching should be enabled for this site. See **Dynamic File Batching** below	`True`
soft_lock_threshold	The `snapdiff` discovery uses locking to prevent multiple snapdiff running against the same fileset at once. To prevent stale locks, lock are considered 'expired' after the `lock_threshold`, given in seconds.	86400 (one day)
include	A list of include glob patterns which will apply to all workflows run against this site	*not set*
exclude	A list of exclude glob patterns which will apply to all workflows run against this site	*not set*
iscanThreads	Defines the number of threads that can be used during snapdiff operations.	*not set*
iscanBuckets	Defines the number of buckets that can be used during snapdiff operations.	*not set*

File Batching

The file list generated by discovery tasks may be broken into smaller batches before passing them to workflow steps.

This makes the overall job execution more granular. Individual tasks will be smaller and faster. This also makes it easier to cancel a job, given that only PENDING tasks can be cancelled.

On the other hand, if the batching is too small, the large number of tasks generated may saturate the job queue, blocking out tasks from other jobs.

File batching is based on both `file_batch_gb` and `file_batch_size`. Whichever limit results in a smaller batch is the one which is used. For example, given 100 files of 500MB each, a `file_batch_gb` of 1 and `file_batch_size` of 10 will result in 50 batches of 2 files each (1GB total per batch), because 1GB (2 files) is smaller than 10 files (5GB).

Dynamic File Batching

The Dynamic File Batching feature is designed to improve the processing of tasks with large sets of files by adjusting batch size based on the total number of files being processed from using a predefined set of ranges.

By enabling the auto file batch sizing configuration option, the system automatically adjusts file batch sizes to optimize resource utilization and enhance performance.

REST API

Configurations can be listed and set via the Ngenea Hub REST API.

The sites endpoint supports client key authentication

To list the current site configuration settings,

```
$ curl -s 'http://example.com/api/sites/1/' -H 'Accept:
application/json' -H "Authorization: Api-Key $APIKEY"
{
    "name": "site1",
    "elasticsearch_url": "localhost:19200",
    "file_batch_size": 100,
    ...
}
```

Note - configurations are only included when fetching a specific site, not when listing all sites.

To change one or more configuration settings, make a `PATCH` request the same endpoint

```
$ curl -s -X PATCH 'http://example.com/api/sites/1/' -H 'Accept:
application/json' -H "Authorization: Api-Key $APIKEY" -H 'Content-
Type: application/json' -d '{"file_batch_gb": 5}'
{
    "file_batch_gb": 5,
    ...
}
```

Certificate Lifetime

The certificate lifetime refers to the duration for which a certificate is valid. You can view and modify this duration through the `/api/pki/lifetime/1/` endpoint.

Viewing the Certificate Lifetime

To view the current certificate lifetime, you can send a `GET` request to the `/api/pki/lifetime/1/` endpoint. This will return a JSON response with the current lifetime in days.

```
{
  "days": 2147483647,
  "updated_at": "2024-04-12T09:19:43.732Z",
  "updated_by": 0
}
```

Modifying the Certificate Lifetime

To modify the certificate lifetime, you can send a `PATCH` request to the `/api/pki/lifetime/1/` endpoint. The request body should be a JSON object with a `days` field specifying the new lifetime in days.

Please note that only administrators and users with the `filebrowser.change_certificatelifetime` permission can modify the certificate lifetime.

Example:

```
curl -X PATCH -H "Content-Type: application/json" -d '{"days":
365}' https://your-domain.com/api/pki/lifetime/1/
```

In this example, we are setting the certificate lifetime to 365 days.

Remember to replace the `days` value with the desired lifetime in days.

Summary

The `/api/pki/lifetime/1/` endpoint allows you to view and modify the certificate lifetime. Remember that to use the changed lifetime in the certificates, then Ngenea Hub needs to be restarted.

Feature Flags

Feature flags control whether selected pre-release features are enabled.

Certain features may be included in a release which aren’t yet fully implemented, or fully tested. By default, these features are disabled and ‘hidden’, so should not affect normal functionality.

However, these features may be enabled on a ‘preview’ basis, on the understanding that they may be incomplete or unstable.

Warning: **Do not** enable preview features unless you are willing to accept the potential risks.

Once a feature is finalised and stable, it will be released officially, and the corresponding feature flag will be removed.

Note: There is currently no feature flagged functionality.

REST API

Features can be listed, enabled, or disabled via the Ngenea Hub REST API.

To list the available features, and whether they're currently enabled

```
$ curl -s 'http://example.com/api/features/'  -H 'Accept:
application/json'  -H "Authorization: Api-Key $TOKEN"
{
    "count": 1,
    "next": null,
    "results": [
        {
            "name": "searchui",
            "description": "Enable search features in the Ngenea
Hub UI",
            "enabled": false
        },
        {
            "name": "bandwidth_controls",
            "description": "Enable bandwidth controls in the
Ngenea Hub UI",
            "enabled": false,
        }
    ]
}
```

Individual features are keyed by their name, e.g. `http://example.com/api/features/searchui/`

To enable a feature, make a `PATCH` request against the desired feature

```
$ curl -s -X PATCH 'http://example.com/api/features/searchui/'  -
H 'Accept: application/json'  -H "Authorization: Api-Key $TOKEN" -
H 'Content-Type: application/json' -d '{"enabled": true}'
[
    {
        "name": "searchui",
        "description": "Enable search features in the Ngenea Hub
UI",
        "enabled": true
    },
```

```
    ...
]
```

And similarly, to disable a feature

```
curl -s -X PATCH 'http://example.com/api/features/searchui/'  -H '
Accept: application/json'  -H "Authorization: Api-Key $TOKEN" -H '
Content-Type: application/json' -d '{"enabled": false}'
```

Note: It may be necessary to restart the Ngenea Hub service for a feature change to take effect.

ngclient

Alternatively, feature flags can be interacted with using ngclient.

To list available features and whether they're currently enabled

```
$ ngclient features list
 [X]  searchui              Enable search features in the UI
 [ ]  bandwidth_controls    Enable bandwidth controls in the UI
```

To enable a feature

```
ngclient features enable bandwidth_controls
```

And to disable a feature

```
ngclient features disable bandwidth_controls
```

See ngclient features for more information.

Actions

Actions allow administrative users to perform certain operations, as described below.

Available Actions

`discover_nodes`

Ngenea Hub monitors for when new nodes come online.

The `discover_nodes` action can be used to manually scan for nodes. This may be necessary if a node was previously manually removed from Ngenea Hub

This action takes no arguments.

REST API

Actions are submitted via the `/api/actions/` endpoint, and typically execute asynchronously. The state of the action can be viewed via the same endpoint.

> **Note:** The actions endpoint does not support client key authentication. You must use JWT Authentication.

To submit an action, make a `POST` request against the `/api/actions/` endpoint

```
$ curl -s -X POST 'http://example.com/api/actions/' -H 'Accept:
application/json' -H "Authorization: Bearer $JWT_ACCESS_TOKEN" -H
'Content-Type: application/json' -d '{"action": "discover_nodes"}'
{
    "id": 12345,
    ...
}
```

This returns a unique id, which can be used to check the status and results of the action

```
$ curl -s 'http://example.com/api/actions/12345/' -H 'Accept:
application/json' -H "Authorization: Bearer $JWT_ACCESS_TOKEN"
{
    "action": "discover_nodes",
    "user": "myuser",
    "state": "SUCCESS"
    "results": {...}
}
```

Limitations

Site Sync

Site Sync must only be used in one direction

The intent of `site_sync` is for one source site to synchronise all required changes to any amount of destination sites and not consider the state of the destination site(s). Site Sync must only be utilised when data is required to be synchronised without concern for any active changes on destination site(s).

Site Sync only considers changes within an applicable time window for synchronisation

Synchronisation is not ‘event driven’. Changes are collated within a window of time (defined by the associated schedule), and sent as a group.

The order in which certain events occurred cannot be determined. For example; delete determination; where no data point exists to determine the ‘change time’ [ctime] of a file or directory due to deletion prior to the sync time window.

During bidirectional synchronisation, when conflicting create/modify and delete events occur for files, the create/modify event takes precedence over the delete event to prevent data loss. In such scenarios, a newer version of the file which was prior deleted will be present after synchronisation. Directory behaviour is not affected.

Site Sync supports Independent Filesets

Site Sync methodology is incompatible with any requirement to synchronise an entire file system, nor is use of Dependent Filesets, or arbitrary directory trees supported.

Destination site Independent Filesets must exist prior to synchronisation

Site Sync does not create Independent Filesets on destination site(s) prior to synchronisation. Destination Independent Fileset creation is an administrative function and must be undertaken prior to configuration and operation of a Site Sync methodology to the destination site.

Directory deletion is not supported

Site sync does not support directory deletion. Deletion of a large file tree structure on a source site will delete files within the directory structure, resulting in an empty directory tree on the destination site.

Bidirectional Site Sync

Bidirectional Site Sync implements eventual consistency

Site Sync adheres to the principle of eventual consistency whereby one or more subsequent Site Sync jobs or tasks are required to be enacted for source and destination sites to be in sync . Prior to all required Site Sync jobs enacting the synchronisation status is viewed as partially synchronised. Each subsequent job increases the totality of synchronisation.

Data which has failed to be synchronised in prior synchronisations is placed into subsequent synchronisation runs, leading to eventual consistency.

Bidirectional Site Sync is only supported via schedules

Ref: Schedules

A bidirectional Site Sync is created via defining a schedule using the `bidirectional_snapdiff` discovery and subscribing the `bidirectional_sync` workflow to the schedule.

A path may only be managed by one schedule per site, and at most one workflow may be subscribed to a `bidirectional_snapdiff` schedule.

Hub does not support multiple bidirectional synchronisation with the same source site for the same Independent Fileset (E.G. between site1 and site2, and between site1 and site3).

The `bidirectional_snapdiff` discovery causes all iterative Independent Fileset changes to be tracked. Identified changes are compared to across iterative runs. When both sets of changes have been evaluated, only appropriately valid changes are synchronised to the destination site.

Bidirectional synchronisation is sequential

When setting up a bidirectional site sync ‘site1’ is the site which is configured when creating the schedule, and ‘site2’ is the site configured as the `destinationsite` when subscribing the workflow to the schedule.

A bidirectional site sync will first synchronise changes from site1 to site2, and then from site2 to site1.

A failure while synchronising site1 to site2 will not block the reverse direction sync from enacting.

The sequential nature of synchronisation ensures conflict situations where the synchronisation from site2 to site1 wins by virtue of the last write [most recent write at any site] of a file taking precedence.

Swapping files / Last write wins

Synchronisation of a set of file moves whereby the actions include synchronisation determination of the paths of two files being swapped is complex and can result in conflicts. Where identical file paths exist at the destination site, file moves will fail rather than overwriting the existing files.

Manual intervention is required before a synchronisation will again succeed. N.B.: the replaying of the swap of the files on the destination site is not sufficient to resolve the conflict.

Renaming or deleting files and directories causes re-sending of data

Where a file is moved on site1 and the same file is deleted on site2 during an active synchronisation, the moved file from site1 will be resent to site2. This behaviour will be observed even if the delete event occurred later chronologically.

Renaming or files and directories on both bidirectional Site Sync sites causes duplication of data

This behaviour is observed when a file or directory is moved on both sites to different locations during an active synchronisation. E.G.:

- `/mmfs1/data/path1` is moved to `/mmfs1/data/path2` on `site1`
- `/mmfs1/data/path1` is moved to `/mmfs1/data/path3` on `site2`

This scenario results in duplicate data at both sites in both `/mmfs1/data/path2` and `/mmfs1/data/path3`.

Creation or deletion of empty directories on site 1 does not synchronise to site 2

Site Sync does not perform deletions of empty directories on a destination site and does not create empty directories on a destination site.

Troubleshooting

This section outlines steps for troubleshooting issues with Ngenea Hub

Service Status

To check the status of Ngenea Hub and its individual services

```
ngeneahubctl status
```

To check the status of Ngenea Worker

```
systemctl status ngenea-worker
```

Service Logs

The full logs for Ngenea Hub can be viewed with

```
journalctl -u ngeneahub
```

To view Ngenea Worker logs

```
journalctl -u ngenea-worker
```

Specific Features

Site Sync

Site sync - both one-way and bidirectional - may fail due to conflicts which cannot be automatically resolved. This page outlines options for intervening to resolve such conflicts.

Snapshot Rotation

By default, snapdiff snapshots will always rotate, even if an error occurs during sync.

Traditionally, snapshots are rolled-back on error. However, this can lead to changes being replayed inappropriately, leading to further errors and conflicts. Because of this, the default behaviour was changed to always rotate.

The downside to this approach is that some changes may be missed by sync. For example, if an network issues prevent a file from being synced, that file will not be re-synced unless or until it changes again. Note, however, there are retries within a sync run to mitigate such temporary issues.

If a sync job does fail, it will be necessary to determine the source of the error and manually resolve any issues. The job details will report on which paths failed overall. Looking at the individual task details will give more information on where and why a specific path failed.

To disable this behaviour, so that snapshots will rollback on error, set the runtime field `snapdiff_rotate_on_error` to False

> **Note:** If the sync is run within a schedule, it will use the first subscribed workflow's snapdiff_rotate_on_error value. This does not apply to bidirectional_sync as it can only have one subscribed workflow.

Manual Resolution

In some cases it is possible to resolve conflicts by manually applying changes.

For example, if a file is moved on site A and deleted on site B, sync will fail because there is no file to move (or delete, depending on the sync direction) on the target site. In this case, maunally deleting the file on site A, or re-sending the file (in its new location) onto site B will resolve the conflict. Thereafter, sync will be able to run without issue.

Re-sync all

Another option is to re-sync everything from scratch. This is the safest option, as it ensures that no file changes are lost.

Note that sync will skip any files which are already in the correct state, so a re-sync won't take as long as syncing to a brand new target.

Snapdiff-based sync uses filesystem snapshots to track file changes over time. The snapdiff discovery uses a 'last snap' file to record the last snapshot which was successfully synced.

This last snap file is located at `/mmfs1/.rotate/ngenea-worker.lastsnap.name.<fileset_name>.id.<fileset_id>`

By removing the last snap file, the next sync run will behave as if it has not been run before, and so will sync everything. Once sync has run successfully, you can safely delete the snapshot which was previously recorded in the last snap file (before that file was deleted).

Force rotate

The riskiest option is to force a snapshot rotation. This effectively says that you don't care about the current failure and just want the sync to move on.

As discussed above, this is the default behaviour. Note that this may result in some file changes not being synced. For a safer option, see **Re-sync all** above.

The following steps can be used as a one-off when the default rotate-on-error function has been disabled.

To force a rotate, you should first temporarily disable sync. This can be done by setting the sync schedule to disabled in the Ngenea Hub UI.

Next, create a new snapshot of the fileset. The name is expected to be of the form `ngenea-worker.snapdiff.<timestamp>`.

Update the 'last snap' file (described above), replacing the currently recorded snapshot name with the name of the new snapshot you just created.

This last snap file is located at `/mmfs1/.rotate/ngenea-worker.lastsnap.name.<fileset_name>.id.<fileset_id>`

Finally, re-enable sync. Sync will now pick up new file changes starting from the point at which the new snapshot was created.

Once sync has run successfully, you can safely delete the snapshot which was previously recorded in the last snap file (before that file was updated).

Locking Errors

Lock files are used to ensure that a sync for a given fileset will not run if one is already running.

In this case, any new sync job will fail, and under the snapdiff task details, you will see an error like

```
SnapdiffLockError: Could not perform snapdiff as one is currently
running for provided fileset
```

Under rare circumstances, a lock may not be correctly cleaned up, preventing syncs from running, even though there are none currently active.

In that case, the lock file can be removed manually. First, ensure there there aren't any syncs running. For extra safety, temporarily disable any scheduled syncs.

The lock file is located at `/mmfs1/.rotate/snapdiff.name.<fileset_name>.id.<fileset_id>.lock`

Any snapdiff lock file will automatically expire after 24 hours by default. The lifetime can be changed using the `lock_threshold` site setting

Reference

Default Workflows

This section documents all the workflows which come installed in Ngenea Hub by default. See Custom Workflows for guidance on how to create your own workflows.

migrate

Migrate one or more files from a site.

discovery: `recursive`

steps:

- dynamo.tasks.migrate

fields:

- `lock_level` (choice): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`partial`

premigrate

Premigrate one or more files from a site.

discovery: `recursive`

steps:

- dynamo.tasks.migrate
  - `premigrate`: True

fields:

- `lock_level` (choice): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`implicit`

recall

Recall one or more files on to a site.

discovery: `recursive`

steps:

- dynamo.tasks.recall

fields:

- `lock_level` (choice): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`implicit`

send

Send files from one site to another via cloud storage.

discovery: `recursive`

steps:

- dynamo.tasks.remove_location_xattrs_for_moved
- dynamo.tasks.migrate
  - `premigrate`: True
- dynamo.tasks.reverse_stub

fields:

- `destinationsite` (string): site to send files to
- `destinationqueue` (string): queue on the destination site to run the task on
- `hydrate` (bool): hydrate files on the destination site

unmanage

Removes a correspondence between files and storage endpoints.

discovery: `recursive`

steps:

- dynamo.tasks.unmanage

fields:

- `no_flock` (optional): Disable using lock files. Sets lock level to `implicit` if it is not set. Conflicts with `partial` lock level.
- `lock_level` (choice): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`implicit`
- `storage_key` (pattern): Removes the link between files and storage endpoints, optionally filtering by keys that match a specified extended glob pattern (multiple patterns can be separated by `|`). By default, it removes all keys.

site_sync

Sync a fileset from one site to another via cloud storage.

The `snapdiff` discovery looks for changes within the fileset on the source site since the last time the workflow was invoked. These changes are then synced to the destination site.

The workflow should be invoked with a single path which is the link point of the independent fileset to be synced.

discovery: `snapdiff`

fields:

- `destinationsite` (string): site to sync changes to
- `destinationqueue` (string): queue on the destination site to run the task on
- `sync_preference` (string): determines how conflicts should be resolved on the remote site. One of: newest, local, ignore

created

Files with state `created` are sent to the destination site, subject to `sync_preference`

steps:

- dynamo.tasks.remove_location_xattrs_for_moved
- dynamo.tasks.migrate
  - `premigrate`: True
  - `overwrite`: True
  - `abort_missing`: True
- dynamo.tasks.reverse_stub
  - `overwrite`: True

updated

Files with state `updated` are sent to the destination site, subject to `sync_preference`

steps:

- dynamo.tasks.check_sync_state
- dynamo.tasks.remove_location_xattrs_for_moved
- dynamo.tasks.migrate
  - `premigrate`: True
  - `overwrite`: True
  - `abort_missing`: True
- dynamo.tasks.reverse_stub
  - `overwrite`: True

moved

Files with state `moved` are moved ‘in-place’ on the destination site

steps:

- dynamo.tasks.move_paths_on_gpfs

deleted

Files with state `deleted` are removed on the destination site

steps:

- dynamo.tasks.delete_paths_from_gpfs

import_to_site_hydrated

This workflow is designed to import fully hydrated remote objects from external ngenea targets to the local filesystem.

discovery: `null`

steps:

- dynamo.tasks.import_files_from_external_target
  - `hydrate`: True

fields:

- `endpoint` (string): Name of the ngenea target configuration
- `location` (string): An absolute path for where to place the file/folder in the local filesystem, this can be a different path than the remote location. Defaults to `None`
- `lock_level` (string): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`implicit`

import_to_site_dehydrated

This workflow is designed to import stubbed remote objects from external ngenea targets to the local filesystem.

discovery: `null`

steps:

- dynamo.tasks.import_files_from_external_target
  - `hydrate`: False

fields:

- `endpoint` (string): Name of the ngenea target configuration
- `location` (string): An absolute path for where to place the file/folder in the local filesystem, this can be a different path than the remote location. Defaults to `None`
- `lock_level` (string): Filesystem locking level for ngenea operations. One of: `partial`, `implicit`, `none`. Default=`implicit`

Hidden Workflows

This section documents all the workflows which come installed in Ngenea Hub by default that are not provided in the UI. Some of these are intended for advanced users making use of the API, and some are used for GPFS policy automation.

transparent_recall

This is the workflow that will be performed on dehydrated files on the system when accessed, if the policy is configured to make use of Ngenea Hub within its Transparent Recall policy.

Typically, all of these Transparent Recalls are placed into a single job within Ngenea Hub.

steps:

- dynamo.tasks.recall
  - `lock_level`: “partial”

reverse_stub

This workflow is designed to create stubs files or fully hydrated files using remote content on a given site without the need for an existing file on the site for a given path. Due to this requiring the data to be within the cloud and not present on the filesystem, it requires the paths to target cloud targets through the API.

steps:

- dynamo.tasks.reverse_stub

fields:

- `hydrate` (bool): If the file should be fully hydrated during the recall operation
- `overwrite` (bool): If the operation should overwrite a local file that already exists

delete_file

This workflow deletes one or more file/folder paths from the filesystem.

steps:

- dynamo.tasks.delete_paths_from_gpfs

fields:

- `recursive` (bool): If non-empty directories should be deleted. if recursive is `false` additional jobs will be needed to delete empty directories. Defaults to `false`

Discovery Steps

This section documents all the currently supported discovery steps in Ngenea Hub. See Custom Workflows for guidance on how to use these in your own workflows.

dynamo.tasks.recursive_navigate - recursive - Function: discovery

Navigates down any folder tree provided using the initial paths as the base of this navigation. It will process every discovered item and can have its behaviour defined using type rules using `file|link|folder` or action on all items with `all` as its type and state.

Upon discovering non-empty directories, it will create another instance of this task to navigate down that directory while still processing the current directory. Once a batch of items has been found it will action the appropriate rule on them.

Argument	Type	Default	Description
`skip_missing`	`bool`	`False`	Allows the processing of any files directly provided to the discovery step regardless of it being on the filesystem.

dynamo.tasks.recursive_action - recursive(deprecated) - Function: discovery

Navigates down any folder tree provided to it and actions any rule defined with `all` as its type and state on all found files.

Argument	Type	Default	Description
`skip_missing`	`bool`	`False`	Allows the processing of any files directly provided to the discovery step regardless of it being on the filesystem.

dynamo.tasks.snapdiff - snapdiff - Function: discovery

For use only with a GPFS Independent Fileset, it will create a GPFS snapshot and it will then process the list of differences between the time of the initial run and subsequent runs. On the first run of this, it will ingest all the files within that Fileset.

Argument	Type	Default	Description
`skip_old_ctimes`	`bool`	`False`	Skips any files within the snapdiff difference list if the ctime of the file is older than the oldest snapshot.
`condense_moves`	`bool`	`True`	If a directory is moved, this will condense all the move operations into a single operation for move based tasks, otherwise it will action against every effected file.

Workflow Steps

The following are all the currently supported steps in Ngenea Hub. All of these steps are ran on the Ngenea Worker provided site on its respective function queue when running a workflow. See Custom Workflows for guidance on how to use these steps in your own workflows.

Each task alongside its name has its function queue detailed, these functions can be controlled through the Ngenea Worker configuration

`dynamo.tasks.migrate` - Function: Worker

Migrates a list of files to a pre-defined remote target using Ngenea.

Argument	Type	Default	Description
`premigrate`	`bool`	`False`	retain the content of every migrated file and do not set the OFFLINE flag for the file.migrating.
`stub_size`	`int`	`0`	retain a segment of every migrated file starting from its beginning and having a specified approximate length in bytes.
`overwrite`	`bool`	`False`	overwrite remote objects if they already exist–do not create remote object instances with various UUID suffixes
`fail_on_mismatch`	`bool`	`False`	fail a file migration if a remote object exists but has different hash or metadata. In that case, the task errors
`lock_level`	`string`	`implicit`	Defined the locking mode that ngenea will use when performing the migrate
`endpoint`	`string`		specify the endpoint to migrate
`abort_missing`	`bool`	`False`	allow the migrate task to make any missing files end up in the “aborted” state instead of “failed”
`migrate_offline_files`	`bool`	`False`	If set to True, the migrate task will process offline files in the same manner as regular online files. If set to False, the migrate task will process the offline files using `--sync-metadata`
`sub_batch`	`int`	`optional`	The number of paths to process in each sequential chunk. When set, the task will be split and executed in smaller batches of this size. By default, `sub_batch=None` processes all paths in a single batch

`dynamo.tasks.recall` - Function: Worker

Recalls a list of files to a pre-defined remote target using Ngenea.

Argument	Type	Default	Description
skip_hash	bool	False	If the recall should skip checking the hash of the file
endpoint	string		specify which endpoint(site) to recall from
lock_level	string	partial	Defines the locking level ngenea will use during the recall
default_uid	string		When a file is recalled, it uses this UID if one is not set on the remote object
default_gid	string		When a file is recalled, it uses this GID if one is not set on the remote object
update_atime	bool	false	When a files is recalled, update its access time (atime) to 'now'
update_mtime	bool	false	When a files is recalled, update its modification time (mtime) to 'now'
delete_remote	bool	false	If set, when a file is recalled, it deletes the file in the remote location
sub_batch	int	optional	The number of paths to process in each sequential chunk. When set, the task will be split and executed in smaller batches of this size. By default, sub_batch=None processes all paths in a single batch

dynamo.tasks.reverse_stub - Function: Worker

Recalls a list of files to a pre-defined remote target using Ngenea.

Argument	Type	Default	Description
hydrate	bool	False	If the file should be premigrated instead of a regular stub
stub_size	int	0	The max file size before files will be stubbed for this task
skip_hash	bool	False	If the recall should skip checking the hash of the file
overwrite	bool	False	Overwrite local files if they already exist, except files with only metadata changes.
endpoint	string		specify which endpoint(site) to recall from.
retry_stale	string	None	Controls if the worker should attempt to retry file failures due to stale file handles. This string can be either stub for only removing reverse stubbed files or all.
lock_level	string	implicit	Defines the locking level ngenea will use during the recall
default_uid	string		When a file is recalled, it uses this UID if one is not set on the remote object

Argument	Type	Default	Description
`default_gid`	`string`		When a file is recalled, it uses this GID if one is not set on the remote object
`update_atime`	`bool`	`false`	When a files is recalled, update its access time (atime) to ‘now’
`update_mtime`	`bool`	`false`	When a files is recalled, update its modification time (mtime) to ‘now’
`conflict_preference`	`string`	`None`	Dictates what state the local file should be to pass the check. Options are “newest” which passes if the local file is the latest version of the file on either site, “local” which accepts the local file version regardless of the check and “ignore” which always uses the other sites file version.
`sub_batch`	`int`	`optional`	The number of paths to process in each sequential chunk. When set, the task will be split and executed in smaller batches of this size. By default, `sub_batch=None` processes all paths in a single batch

`dynamo.tasks.ngenea_sync_metadata` - Function: Worker

Sync the local ngenea metadata on a file with the remote target using Ngenea.

Argument	Type	Default	Description
`skip_hash`	`bool`	`False`	If the sync should skip checking the hash of the file
`endpoint`	`string`		Specify which endpoint(site) to recall from
`default_uid`	`string`		When a file is synced, it uses this UID if one is not set on the remote object
`default_gid`	`string`		When a file is synced, it uses this GID if one is not set on the remote object

`dynamo.tasks.delete_paths_from_gpfs` - Function: Worker

Removes a list of files from a GPFS filesystem.

Argument	Type	Default	Description
`recursive`	`bool`	`False`	If any directory path is provided and this is set, it will remove the entire file tree, otherwise it will only remove empty directories. It is important to note that the recursive behaviour of removing the entire directory tree will not apply to filesets or if the target directory contains files or directories that are restricted from being deleted such as `snapshots`, in such cases the task will silently ignore those files or directories and report the task as successful.

`dynamo.tasks.check_sync_state` - Function: Worker

Checks a provided site against the calling sites to ensure that the local file is in a specified state compared to another site. Using this task will also perform `dynamo.tasks.stat_paths` on the provided site before execution.

Argument	Type	Default	Description
`sync_preference`	`string`	`ignore`	Dictates what state the local file should be to pass the check. Options are “newest” which passes if the local file is the latest version of the file on either site, “local” which accepts the local file version regardless of the check and “ignore” which always uses the other sites file version.
`site`	`string`		The target site to compare
`abort_outdated`	`bool`	`False`	If this bool is set files that do not need to be executed will be marked as aborted as opposed to skipped
`hash_includes_acl`	`bool`	`False`	If this bool is set the metadata comparison for directories will also compare Access Control Lists

`dynamo.tasks.move_paths_on_gpfs` - Function: Worker

Moves files on the filesystem using provided paths with a `source` key.

This task moves files in two steps (via an intermediate temporary location), to avoid move conflicts (for example, this task correctly handles cases where files are ‘swapped’: `fileA` moved to `fileB`, and `fileB` moved to `fileA`).

Argument	Type	Default	Description
`delete_remote_xattrs`	`bool`	`False`	If set, after a file has been moved all remote location xattrs will be removed

Argument	Type	Default	Description
`source_missing_signature`	`json`	`null`	A signature to send any paths to where the source is missing. If this isn't set, a missing source is treated as a failure.
`target_max_age`	`int`	`null`	If the target file exists, it is overwritten by default. If this optional parameter is set, the target has to have a ctime <= this timestamp for the move to proceed. Otherwise, the source file is removed. Given in seconds since epoch. Primarily used for sync workflows.

`dynamo.tasks.one_step_move_paths_on_gpfs` - Function: Worker

Moves files on the filesystem using provided paths with a `source` key.

This task is not used in the default Ngenea Hub workflows. It is less robust than `dynamo.tasks.move_paths_on_gpfs`, because it moves files directly from source to their new location (in one step). So for example, trying to 'swap' files (`fileA` moved to `fileB`, and `fileB` moved to `fileA`) with this task will effectively result in one of these files being deleted on the target site.

However, this task is for cases where doing moves in two steps is not an acceptable option.

Argument	Type	Default	Description
`delete_remote_xattrs`	`bool`	`False`	If set, after a file has been moved all remote location xattrs will be removed
`source_missing_signature`	`json`	`null`	A signature to send any paths to where the source is missing. If this isn't set, a missing source is treated as a failure.
`target_max_age`	`int`	`null`	If the target file exists, it is overwritten by default. If this optional parameter is set, the target has to have a ctime <= this timestamp for the move to proceed. Otherwise, the source file is removed. Given in seconds since epoch. Primarily used for sync workflows.

`dynamo.tasks.remove_location_xattrs_for_moved` - Function: Worker

This task removes all remote location xattrs on all provided paths.

This step takes no additional arguments.

`dynamo.tasks.move_in_cloud` - Function: Worker

Moves a file on the filesystem's related cloud storage platform using provided paths with a `source` key.

This step takes no additional arguments.

`dynamo.tasks.remove_from_cloud` - Function: Worker

Deletes a file on the filesystem's related cloud storage platform using provided paths.

This step takes no additional arguments.

`dynamo.tasks.ensure_cloud_file_exists` - Function: Worker

Ensures all files provided to the task exist on the filesystem's related cloud storage platform. If some do not, it will attempt to retry this check an additional two more times before failing.

This step takes no additional arguments.

`dynamo.tasks.import_files_from_external_target` - Function: Worker

Recalls a list of files from an external target to a predefined local object using Ngenea. The input files must be a list of remote object paths not local file paths. (eg, `projects/`)

Argument	Type	Default	Description
`endpoint`	`string`		Specify which endpoint(ngenea target name) to recall from
`lock_level`	`string`	`implicit`	Defines the locking level ngenea will use during the recall
`location`	`string`	`null`	Specify an absolute path for where to place the file/folder in the local filesystem
`hydrate`	`bool`	`false`	If the remote object should be premigrated instead of a regular stub
`extra_flags`	`list`		List of extra arguments that can be passed to recall command
`skip_hash`	`bool`	`false`	If the recall should skip checking the hash of the file
`default_uid`	`string`		When a file is recalled, it uses this UID if one is not set on the remote object
`default_gid`	`string`		When a file is recalled, it uses this GID if one is not set on the remote object
`update_atime`	`bool`	`false`	When a files is recalled, update its access time (atime) to 'now'

Argument	Type	Default	Description
update_mtime	bool	false	When a files is recalled, update its modification time (mtime) to 'now'

dynamo.tasks.copy_files_from_external_target

Copies a list of files from an external target to a predefined local location using Ngenea. The input files should be provided as a list of remote object paths, not local file paths (e.g., projects/). Once copied, these files are no longer associated with the target.

Argument	Type	Default	Description
endpoint	string		Specify which endpoint(ngenea target name) to recall from
lock_level	string	implicit	Defines the locking level ngenea will use during the recall
location	string	null	Specify an absolute path for where to place the file/folder in the local filesystem
default_uid	string	requires ignore_metadata to be: True, else ignored	When a file is recalled, it uses this UID if one is not set on the remote object
default_gid	string	requires ignore_metadata to be: True, else ignored	When a file is recalled, it uses this GID if one is not set on the remote object
extra_flags	list		List of extra arguments that can be passed to recall command
ignore_metadata	bool	false	Do not read user, group and timestamps etc, from data to be copied

dynamo.tasks.import_bytes - Function: Worker

Recalls specific byte ranges of files from an external target to a predefined local location using Ngenea. The input files should be provided as a list of remote object paths (e.g., projects/), and the recall operation will be based on the byte-level data of these files, rather than entire files.

Argument	Type	Default	Description
endpoint	string		Specify which endpoint(ngenea target name) to recall from
lock_level	string	implicit	Defines the locking level ngenea will use during the recall

Argument	Type	Default	Description
`location`	`string`	`null`	Specify an absolute path for where to place the file/folder in the local filesystem
`remote_offset_start`	`int`	`0`	Beginning offset of a segment of a remote object to download
`remote_offset_end`	`int`	`remote object size`	Ending offset of a segment of a remote object to download
`default_uid`	`string`		When a file is recalled, it uses this UID if one is not set on the remote object
`default_gid`	`string`		When a file is recalled, it uses this GID if one is not set on the remote object
`default_mode_file`	`int`		Specify mode bits (in octal format) to set for stubbed/premigrated files if there are no mode bits associated with remote objects
`default_mode_dir`	`int`		Specify mode bits (in octal format) to set for directories created locally if there are no mode bits associated with remote objects

Warning: This task is incompatible with recursive discovery.

`dynamo.tasks.recall_bytes` - Function: Worker

Recalls specific byte ranges of files from local stubbed paths to a predefined local location using Ngenea. The input should be a list of local stubbed file paths, and the recall will only retrieve the byte-level data of those files, rather than entire files.

Argument	Type	Default	Description
`lock_level`	`string`	`implicit`	Defines the locking level ngenea will use during the recall
`location`	`string`	`null`	Specify an absolute path for where to place the file/folder in the local filesystem
`remote_offset_start`	`int`	`0`	Beginning offset of a segment of a remote object to download
`remote_offset_end`	`int`	`remote object size`	Ending offset of a segment of a remote object to download
`default_uid`	`string`		When a file is recalled, it uses this UID if one is not set on the remote object
`default_gid`	`string`		When a file is recalled, it uses this GID if one is not set on the remote object

Argument	Type	Default	Description
`default_mode_file`	`int`		Specify mode bits (in octal format) to set for stubbed/premigrated files if there are no mode bits associated with remote objects
`default_mode_dir`	`int`		Specify mode bits (in octal format) to set for directories created locally if there are no mode bits associated with remote objects

Warning: This task is incompatible with recursive discovery.

Automated Tasks

All detailed tasks below are run on automated schedules defined by the hub itself, some of these can have their schedules adjusted and thresholds adjusted.

Every minute

`alerts.tasks.fetch_alerts`

Submits the task `dynamo.tasks.get_alerts` to retrieve and sync the alerts on all sites with the Ngenea Hub's internal database. This is run on the `discovery` function of the Ngenea Worker. The returning task that stores the alerts in the database runs within the internal `celery` queue within Ngenea Hub.

The schedule of this task can be controlled by using the SYNC_ALERTS_INTERVAL config setting, any provided value must comply with cron syntax.

Every 30 minutes

`dynamocore.tasks.admin.load_storagepools`

Fetches the GPFS storage pools from all active sites registered within Ngenea Hub and stores them within the database. Additionally, it will also create the default filesystem root spaces if they don't exist for a site.

The schedule of this task can be controlled by using the REFRESH_SITE_ANALYTICS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.space_site.send_check_space_site_quota`

Sends a task to the Ngenea Hub's internal `celery` queue to collect all spaces within every site named `dynamocore.tasks.space_site.send_check_space_site_quota` which will then queue the worker task `dynamo.tasks.check_space_quotas` on every site's `worker` function queue. It will then send a task back to the hub `celery` queue to store the quotas in the database.

The schedule of this task can be controlled by using the SYNC_SPACES_QUOTA_INTERVAL config setting, any provided value must comply with cron syntax.

Hourly

`dynamocore.tasks.jobs.update_state_as_failed_for_inactive_tasks`

This task will assess all tasks currently that have been started in Ngenea Hub and will ensure that they are not lost due to a communication error.

Any tasks found to not be actively running within any of the defined queues will be marked as invalid after the configurable time threshold `task_invalidation_timeout` in the configuration API.

The schedule of this task can be controlled by using the INACTIVE_TASKS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.jobs.invalidate_cancelled_job_tasks`

After jobs are cancelled within the Ngenea Hub some tasks can be left in an un-cancelled state if the service un-expectedly exits leaving tasks in a non-cancelled state indefinitely. This task will automatically clean up these tasks that are in incorrect states.

The schedule of this task can be controlled by using the INVALIDATE_CANCELLED_JOB_TASKS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.network.ensure_consistent_tc_rules`

With bandwidth controls enabled for any sites this task ensures that these rules are enacted on each site. Sites that are already compliant with their networking rules will not see any effect.

`dynamocore.tasks.events.cleanup_old_events`

This task automatically removes bidirectional sync events within the database. It will clear all objects for all but the latest 2 jobs along with any jobs that have been cancelled and failed

The schedule of this task can be controlled by using the CLEANUP_OLD_EVENTS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.browsing.browsing_task_clear`

Removes all cached task results for API requests for file details for the file browser in the UI. It will remove all entries that are older than an hour along with any that received errors when retrieving results.

dynamocore.tasks.system_settings.create_or_update_site_settings_auto

This task starts up a task in the main `celery` queue within Ngenea Hub for updating or creating outstanding settings across all active sites within the management of Ngenea Hub. This starts by executing `dynamocore.tasks.site.active_sites` followed immediately by `dynamocore.tasks.system_settings.create_or_update_site_settings_for_sites`. This will cause Ngenea Hub to retrieve the settings for every site using `dynamo.tasks.get_config_for_keys` and update the hub database accordingly using an additional task on the main `celery` queue within Ngenea Hub.

This call uses the main `worker` function queue with the Ngenea Worker, more details on queue functions are available in the function configuration.

The schedule of this task can be controlled by using the SYNC_SITE_SETTINGS_INTERVAL config setting, any provided value must comply with cron syntax.

dynamocore.tasks.system_settings.sync_global_settings_auto

Starts up a task in the main `celery` within Ngenea Hub that creates a collection of tasks to retrieve the global settings and external Ngenea targets within the hub database and apply them to every Ngenea Worker. It achieves this with the Ngenea Worker task `dynamo.tasks.set_config_and_apply` this is run on the main `worker` function.

The schedule of this task can be controlled by using the SYNC_GLOBAL_SETTINGS_INTERVAL config setting, any provided value must comply with cron syntax.

dynamocore.tasks.spaces.sync_spaces

When a space is created or updated and the job fails, this automated task schedules a retry attempt on making the space. If this is already being processed, it will not update the space within this interval.

The schedule of this task can be controlled by using the SYNC_SPACES_INTERVAL config setting, any provided value must comply with cron syntax.

Every 12 Hours

dynamocore.tasks.site.fetch_site_analytics

.. note:: This has an offset of 37 minutes to prevent overlapping system tasks.

Retrieves the site-wide analytics from all sites and then stores them within the Ngenea Hub database. The timeout for this operation is controlled via the `analytics_timeout` in the configuration API. This analytics task is run on the `discovery` function within the Ngenea Hub.

The schedule of this task can be controlled by using the REFRESH_SITE_ANALYTICS_INTERVAL config setting, any provided value must comply with cron syntax.

Daily

dynamocore.tasks.search.remove_old_search_results

This automated task removes all the old search result caches for searches submitted by the UI. The time period for this lifetime is controlled by the `search_result_ttl` in the configuration API, the default for this threshold is 7 days.

The schedule of this task can be controlled by using the REMOVE_OLD_SEARCH_RESULTS_INTERVAL config setting, any provided value must comply with cron syntax.

dynamocore.tasks.jobs.expire_old_jobs

This automated task removes all the old jobs (settings, workflows, scheduled) that have been submitted and processed within Ngenea Hub.

The threshold for this can be controlled by the `jobs_ttl` in the configuration API, the default for this is 30 days.

The schedule of this task can be controlled by using the EXPIRE_OLD_JOBS_INTERVAL config setting, any provided value must comply with cron syntax.

dynamocore.tasks.network.update_cloud_ips_for_s3

Once per day, Ngenea Hub collects the IP addresses published by Amazon for their S3 service for uses in controlling the bandwidth of any S3 related operations going through Ngenea Worker.

If there are any changes in the address listings, this will be reported to the Ngenea Worker which will adjust any network interface it may be managing.

If bandwidth controls are not enabled, the changes will have no effect on any existing Ngenea Worker instances.

dynamocore.tasks.network.update_cloud_ips_for_azure

Once per day, Ngenea Hub collects the IP addresses published by Microsoft for their Azure Blob service for uses in controlling the bandwidth of any Azure related operations going through Ngenea Worker.

If there are any changes in the address listings, this will be reported to the Ngenea Worker which will adjust any network interface it may be managing.

If bandwidth controls are not enabled, the changes will have no effect on any existing Ngenea Worker instances.

dynamocore.tasks.network.update_cloud_ips_for_google

Once per day, Ngenea Hub collects the IP addresses published by Google for their GCS service for uses in controlling the bandwidth of any GCS related operations going through Ngenea Worker.

If there are any changes in the address listings, this will be reported to the Ngenea Worker which will adjust any network interface it may be managing.

If bandwidth controls are not enabled, the changes will have no effect on any existing Ngenea Worker instances.

`dynamocore.tasks.server.get_remote_servers`

Once per day Ngenea Hub has to retrieve the currently configured CTDB servers on each Ngenea Worker. It achieves this through the Ngenea Worker task `dynamo.tasks.get_servers` on the `worker` function of each site. This is then stored through the main Ngenea Hub `celery` queue through the `dynamocore.tasks.server.store_server_callback` task.

The schedule of this task can be controlled by using the SYNC_REMOTE_SERVERS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.jobs.expire_old_fsobjects`

Removes the stored long term file browser caching entries in the database and will expire any entries that have not been accessed within 7 days.

The schedule of this task can be controlled by using the EXPIRE_OLD_FSOBJECTS_INTERVAL config setting, any provided value must comply with cron syntax.

`dynamocore.tasks.refresh.delete_removed_queues`

Once queues are marked for deletion after being removed from a sites config file and the queue removal tool has been run, it will collect these queues and remove them along with and alerts linked to them.

The schedule of this task can be controlled by using the REMOVED_QUEUE_CLEANUP_INTERVAL config setting, any provided value must comply with cron syntax.

Job States

When jobs are created on the call of a workflow, they can end up in specific state that

State	Description
`Pending`	The job is being populated with tasks through its discovery task and will begin when paths have been collected
`Started`	Some tasks within the job have started to be processed
`Success`	All tasks in a job have completed successfully
`Failure`	There was an error or failure when attempting a task within a job, meaning the job could not complete
`Pausing`	The job has been manually paused via request and is waiting for on-going tasks to complete

State	Description
`Paused`	The job has been manually paused via request and can be resumed or cancelled manually
`Cancelling`	The job has been manually cancelled via request and is in the process of cancelling any future tasks
`Cancelled`	The job has been manually closed via request and all remaining task have been cancelled

Task States

When jobs create tasks, after performing their action on the provided files they can end up in specific state as seen below

State	Description
`Pending`	This task is has been created but has not yet been picked up by a site
`Started`	This task is now running on site
`Success`	This task has completed successfully
`Failure`	There was a unexpected error when attempting a task within a job, meaning the job could not complete and could not provide structured output
`Error`	There was a captured error when attempting a task within a job, meaning the job will not have processed all paths but has structured output of what has been completed. Any paths which were successfully processed will be handled by subsequent tasks in a task chain.
`Skipped`	This task has will have no work to perform so it has been automatically skipped by another task
`Cancelled`	Either a previous task has failed or the job has been manually cancelled, causing this task to no longer run

Note: Job and task states are updated asynchronously. There may be, for example, a short delay between a job/task completing and its state being reported as such.

File States

As a file is processed by a workflow, each task reports whether the state of the file following the task. The containing job reports the state of the file after all workflow steps have completed.

A file can have any of the following states

Processed

The file was successfully processed by the workflow step without issues

Skipped

The files was not processed because it was already in the expected state, e.g. a delete was skipped because the file wasn't found, a migration was skipped because the file was already offline.

Because it is in the expected state, skipped files can be processed by subsequent tasks in the workflow.

Failed

An error occurred meaning the file couldn't be processed. Because of this error, the file will not be processed by later tasks in the workflow.

The overall job will be marked as failed if it contains any failed files. Workflows which use the `snapdiff` discovery will be 'rolled back' in this case.

Failed files typically indicate an issue that needs to be manually resolved, such as network issues.

Aborted

An error occurred meaning the file couldn't be processed. Because the file was aborted, it will not be processed by later tasks in the workflow.

The overall job is **not** marked as failed if it contains aborted files. Workflows which use the `snapdiff` discovery will 'rotate' in this case.

The intended use case for this state is in scheduled (recurring) jobs, where the any aborted files are expected to be successfully processed in a later run.

For example, if a file changes while it is being sent, the send will be aborted to prevent data corruption. But because the file was modified, it will be identified as modified in the next snapdiff scan and processed again; effectively retried.

API

`GET /actions/`

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)

- **next** (*string*) –
- **previous** (*string*) –
- **results[].action** (*string*) – (required)
- **results[].id** (*integer*) – (read only)
- **results[].state** (*string*) –

POST /actions/

Request JSON Object:

- **action** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **action** (*string*) – (required)

GET /actions/{id}/

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **action** (*string*) – (required)
- **id** (*integer*) – (read only)
- **results** (*string*) – (read only)
- **state** (*string*) –
- **user** (*integer*) –

GET /alerts/

Query Parameters:

- **name** (*string*) – name
- **node** (*string*) – node
- **site** (*string*) – site
- **severity** (*string*) – severity
- **summary** (*string*) – summary
- **timestamp** (*string*) – timestamp
- **suppressed** (*string*) – suppressed

Status Codes:

- 200 OK –

Response JSON Object:

- **[].created** (*string*) – Time that the alert was recorded in Hub
- **[].id** (*integer*) – (read only)
- **[].name** (*string*) – Name of of the alert (required)
- **[].node** (*string*) – Hostname of the node the alert originated from
- **[].queue** (*string*) – Name of the queue that the alert relates to
- **[].severity** (*string*) – (required)
- **[].site** (*string*) – (read only)
- **[].summary** (*string*) – Summary description of the alert
- **[].suppressed** (*boolean*) – Whether the alert is suppressed
- **[].timestamp** (*string*) – Time when the alert was triggered (required)

GET /alerts/{id}/

Parameters:

- **id** (*integer*) – A unique integer value identifying this alert.

Status Codes:

- 200 OK –

Response JSON Object:

- **created** (*string*) – Time that the alert was recorded in Hub
- **id** (*integer*) – (read only)
- **name** (*string*) – Name of of the alert (required)
- **node** (*string*) – Hostname of the node the alert originated from
- **queue** (*string*) – Name of the queue that the alert relates to
- **severity** (*string*) – (required)
- **site** (*string*) – (read only)
- **summary** (*string*) – Summary description of the alert
- **suppressed** (*boolean*) – Whether the alert is suppressed
- **timestamp** (*string*) – Time when the alert was triggered (required)

`GET /analytics/`

Retrieves list of files under given path for given site.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **path** (*string*) – Target directory path
- **site** (*string*) – Site name
- **children** (*boolean*) – Include children directories
- **cache_ttl** (*integer*) – How long the cache will last for the target path
- **custom_timeout** (*integer*) – Timeout for fetching analytics
- **download** (*string*) – Download details as file e.g. CSV `?download=csv`.

Status Codes:

- 200 OK –

`GET /auth/clientkeys/`

API endpoint for managing client keys

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].name** (*string*) – Name of the client key (required)
- **results[].url** (*string*) – (read only)
- **results[].user** (*string*) – (required)

`POST /auth/clientkeys/`

API endpoint for managing client keys

Request JSON Object:

- **api_key** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **name** (*string*) – Name of the client key (required)
- **url** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **api_key** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **name** (*string*) – Name of the client key (required)
- **url** (*string*) – (read only)

`GET /auth/clientkeys/{id}/`

API endpoint for managing client keys

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **id** (*integer*) – (read only)
- **name** (*string*) – Name of the client key (required)
- **url** (*string*) – (read only)
- **user** (*string*) – (required)

`PATCH /auth/clientkeys/{id}/`

API endpoint for managing client keys

Parameters:

- **id** (*string*) –

Request JSON Object:

- **id** (*integer*) – (read only)
- **name** (*string*) – Name of the client key (required)
- **url** (*string*) – (read only)
- **user** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **id** (*integer*) – (read only)
- **name** (*string*) – Name of the client key (required)
- **url** (*string*) – (read only)
- **user** (*string*) – (read only)

`DELETE /auth/clientkeys/{id}/`

API endpoint for managing client keys

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`POST /auth/token/`

Request JSON Object:

- **password** (*string*) – (required)
- **username** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **password** (*string*) – (required)
- **username** (*string*) – (required)

`GET /auth/token/publickey/`

API endpoint for retrieving public key that is used for token verification.

Status Codes:

- 200 OK –

`POST /auth/token/refresh/`

Takes a refresh type JSON web token and returns an access type JSON web token if the refresh token is valid.

Request JSON Object:

- **access** (*string*) – (read only)
- **refresh** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **access** (*string*) – (read only)
- **refresh** (*string*) – (required)

`POST /auth/token/verify/`

Verifies that the token is not expired AND the token owner exists in the database AND the token owner is an active user.

Request JSON Object:

- **token** (*string*) – (required)
- **type** (*string*) – Token type e.g: *access* or *refresh* (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **token** (*string*) – (required)
- **type** (*string*) – Token type e.g: *access* or *refresh* (required)

`GET /automatedschedules/`

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].day_of_month** (*string*) – (required)
- **results[].day_of_week** (*string*) – (required)
- **results[].discovery_id** (*integer*) – (read only)
- **results[].discovery_managed_paths** (*string*) – (read only)
- **results[].discovery_name** (*string*) – (read only)
- **results[].discovery_workflow** (*string*) – (read only)
- **results[].enabled** (*boolean*) – (required)
- **results[].hour** (*string*) – (required)
- **results[].minute** (*string*) – (required)
- **results[].month_of_year** (*string*) – (required)
- **results[].name** (*string*) – (required)
- **results[].policy_id** (*integer*) – (read only)
- **results[].policy_name** (*string*) – (read only)
- **results[].schedule_type** (*string*) – (required)
- **results[].site_name** (*string*) – (read only)
- **results[].spaces** (*string*) – (read only)

`GET /buckets/`

Model View Set for the Bucket model.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].access_key** (*string*) – (read only)
- **results[].access_key_id** (*string*) – (read only)
- **results[].advanced_settings** (*object*) – Advanced settings for the target
- **results[].container** (*string*) – Azure storage container
- **results[].credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **results[].credentials_json** (*string*) – (read only)
- **results[].endpoint** (*string*) – Hostname of the target storage service
- **results[].external_targets[]** (*integer*) –
- **results[].id** (*integer*) – (read only)
- **results[].label** (*string*) – Bucket label
- **results[].migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **results[].name** (*string*) – Bucket name (required)
- **results[].port** (*integer*) – Port of the target storage service
- **results[].region** (*string*) – Region where the bucket is located
- **results[].scheme** (*string*) – Connection protocol
- **results[].secret_access_key** (*string*) – (read only)
- **results[].soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **results[].ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **results[].storage_account** (*string*) – Azure storage account name
- **results[].storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

`POST /buckets/`

Model View Set for the Bucket model.

Request JSON Object:

- **access_key** (*string*) – Azure-specific access key
- **access_key_id** (*string*) – Access key ID for the storage service
- **advanced_settings** (*object*) – Advanced settings for the target
- **container** (*string*) – Azure storage container
- **credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **credentials_json** (*object*) – JSON blob containing Google Cloud credentials
- **endpoint** (*string*) – Hostname of the target storage service
- **id** (*integer*) – (read only)
- **label** (*string*) – Bucket label
- **migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **name** (*string*) – Bucket name (required)
- **port** (*integer*) – Port of the target storage service
- **region** (*string*) – Region where the bucket is located
- **scheme** (*string*) – Connection protocol

- **secret_access_key** (*string*) – Secret access key for the storage service
- **ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **storage_account** (*string*) – Azure storage account name
- **storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **access_key** (*string*) – Azure-specific access key
- **access_key_id** (*string*) – Access key ID for the storage service
- **advanced_settings** (*object*) – Advanced settings for the target
- **container** (*string*) – Azure storage container
- **credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **credentials_json** (*object*) – JSON blob containing Google Cloud credentials
- **endpoint** (*string*) – Hostname of the target storage service
- **id** (*integer*) – (read only)
- **label** (*string*) – Bucket label
- **migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **name** (*string*) – Bucket name (required)
- **port** (*integer*) – Port of the target storage service
- **region** (*string*) – Region where the bucket is located
- **scheme** (*string*) – Connection protocol
- **secret_access_key** (*string*) – Secret access key for the storage service
- **ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **storage_account** (*string*) – Azure storage account name
- **storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

`GET /buckets/{id}/`

Model View Set for the Bucket model.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **access_key** (*string*) – (read only)
- **access_key_id** (*string*) – (read only)
- **advanced_settings** (*object*) – Advanced settings for the target
- **container** (*string*) – Azure storage container
- **credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **credentials_json** (*string*) – (read only)
- **endpoint** (*string*) – Hostname of the target storage service
- **external_targets[]** (*integer*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Bucket label
- **migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **name** (*string*) – Bucket name (required)

- **port** (*integer*) – Port of the target storage service
- **region** (*string*) – Region where the bucket is located
- **scheme** (*string*) – Connection protocol
- **secret_access_key** (*string*) – (read only)
- **soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **storage_account** (*string*) – Azure storage account name
- **storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

`PATCH /buckets/{id}/`

Model View Set for the Bucket model.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **access_key** (*string*) – Azure-specific access key
- **access_key_id** (*string*) – Access key ID for the storage service
- **advanced_settings** (*object*) – Advanced settings for the target
- **container** (*string*) – Azure storage container
- **credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **credentials_json** (*object*) – JSON blob containing Google Cloud credentials
- **endpoint** (*string*) – Hostname of the target storage service
- **id** (*integer*) – (read only)
- **label** (*string*) – Bucket label
- **migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **name** (*string*) – Bucket name (required)
- **port** (*integer*) – Port of the target storage service
- **region** (*string*) – Region where the bucket is located
- **scheme** (*string*) – Connection protocol
- **secret_access_key** (*string*) – Secret access key for the storage service
- **ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **storage_account** (*string*) – Azure storage account name
- **storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

Status Codes:

- 200 OK –

Response JSON Object:

- **access_key** (*string*) – Azure-specific access key
- **access_key_id** (*string*) – Access key ID for the storage service
- **advanced_settings** (*object*) – Advanced settings for the target
- **container** (*string*) – Azure storage container
- **credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **credentials_json** (*object*) – JSON blob containing Google Cloud credentials
- **endpoint** (*string*) – Hostname of the target storage service
- **id** (*integer*) – (read only)
- **label** (*string*) – Bucket label

- **migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **name** (*string*) – Bucket name (required)
- **port** (*integer*) – Port of the target storage service
- **region** (*string*) – Region where the bucket is located
- **scheme** (*string*) – Connection protocol
- **secret_access_key** (*string*) – Secret access key for the storage service
- **ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **storage_account** (*string*) – Azure storage account name
- **storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)

`DELETE /buckets/{id}/`

Delete the bucket and apply the settings to delete them on external targets on all sites that they are available.

Parameters:

- **request** –
- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /configurations/`

API endpoint for viewing and setting configurations.

Status Codes:

- 200 OK –

Response JSON Object:

- **analytics_timeout** (*integer*) – Maximum time to wait for results from analytics in seconds
- **custom_statistics_tasks** (*object*) – A list of custom tasks to be considered discovery tasks
- **default_space_location** (*string*) – Default location for space
- **force_local_managed_users** (*boolean*) – Allow NAS users to be managed on AD joined sites
- **health_timeout** (*integer*) – Maximum time to wait health check to see what sites are available in seconds
- **initial_gid** (*integer*) – Minimum GID to be configured
- **initial_uid** (*integer*) – Minimum UID to be configured
- **jobs_ttl** (*integer*) – Time to store job details after the job completes, in days
- **maximum_external_results** (*integer*) – Maximum number of items to retrieve per page from an external target scan
- **node_health_last_heartbeat_interval** (*integer*) – The time since the last health heartbeat was recorded in seconds
- **salt_task_timeout** (*number*) – Salt timeout in seconds
- **schedules_enabled** (*boolean*) – Allow processing of automated schedules
- **search_backend** (*string*) – Search backend
- **search_max_results** (*integer*) – Maximum search results
- **search_result_ttl** (*integer*) – Maximum time to store search results in days

- **snapdiff_stream_timeout** (*integer*) – Maximum amount of minutes to wait for task results
- **snapshot_create_delete_retry_timeout** (*integer*) – Maximum time for workers to retry snapshot create and delete operations, in seconds
- **stat_refresh_period** (*integer*) – Maximum time to wait for results from stat in seconds
- **stat_timeout** (*integer*) – Maximum time to wait for results from stat in seconds
- **task_invalidation_timeout** (*integer*) – Maximum amount of minutes before a task in the STARTED state is considered invalid

`PATCH /configurations/`

API endpoint for viewing and setting configurations.

Request JSON Object:

- **analytics_timeout** (*integer*) – Maximum time to wait for results from analytics in seconds
- **custom_statistics_tasks** (*object*) – A list of custom tasks to be considered discovery tasks
- **default_space_location** (*string*) – Default location for space
- **force_local_managed_users** (*boolean*) – Allow NAS users to be managed on AD joined sites
- **health_timeout** (*integer*) – Maximum time to wait health check to see what sites are available in seconds
- **initial_gid** (*integer*) – Minimum GID to be configured
- **initial_uid** (*integer*) – Minimum UID to be configured
- **jobs_ttl** (*integer*) – Time to store job details after the job completes, in days
- **maximum_external_results** (*integer*) – Maximum number of items to retrieve per page from an external target scan
- **node_health_last_heartbeat_interval** (*integer*) – The time since the last health heartbeat was recorded in seconds
- **salt_task_timeout** (*number*) – Salt timeout in seconds
- **schedules_enabled** (*boolean*) – Allow processing of automated schedules
- **search_backend** (*string*) – Search backend
- **search_max_results** (*integer*) – Maximum search results
- **search_result_ttl** (*integer*) – Maximum time to store search results in days
- **snapdiff_stream_timeout** (*integer*) – Maximum amount of minutes to wait for task results
- **snapshot_create_delete_retry_timeout** (*integer*) – Maximum time for workers to retry snapshot create and delete operations, in seconds
- **stat_refresh_period** (*integer*) – Maximum time to wait for results from stat in seconds
- **stat_timeout** (*integer*) – Maximum time to wait for results from stat in seconds
- **task_invalidation_timeout** (*integer*) – Maximum amount of minutes before a task in the STARTED state is considered invalid

Status Codes:

- 200 OK –

Response JSON Object:

- **analytics_timeout** (*integer*) – Maximum time to wait for results from analytics in seconds
- **custom_statistics_tasks** (*object*) – A list of custom tasks to be considered discovery tasks
- **default_space_location** (*string*) – Default location for space
- **force_local_managed_users** (*boolean*) – Allow NAS users to be managed on AD joined sites
- **health_timeout** (*integer*) – Maximum time to wait health check to see what sites are available in seconds
- **initial_gid** (*integer*) – Minimum GID to be configured
- **initial_uid** (*integer*) – Minimum UID to be configured
- **jobs_ttl** (*integer*) – Time to store job details after the job completes, in days
- **maximum_external_results** (*integer*) – Maximum number of items to retrieve per page from an external target scan
- **node_health_last_heartbeat_interval** (*integer*) – The time since the last health heartbeat was recorded in seconds
- **salt_task_timeout** (*number*) – Salt timeout in seconds
- **schedules_enabled** (*boolean*) – Allow processing of automated schedules
- **search_backend** (*string*) – Search backend
- **search_max_results** (*integer*) – Maximum search results
- **search_result_ttl** (*integer*) – Maximum time to store search results in days
- **snapdiff_stream_timeout** (*integer*) – Maximum amount of minutes to wait for task results
- **snapshot_create_delete_retry_timeout** (*integer*) – Maximum time for workers to retry snapshot create and delete operations, in seconds
- **stat_refresh_period** (*integer*) – Maximum time to wait for results from stat in seconds
- **stat_timeout** (*integer*) – Maximum time to wait for results from stat in seconds
- **task_invalidation_timeout** (*integer*) – Maximum amount of minutes before a task in the STARTED state is considered invalid

`GET /datastores/`

API endpoint for managing DataStores.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –

- **results[].accesskey** (*string*) –
- **results[].accesskeyid** (*string*) –
- **results[].bucket** (*string*) –
- **results[].container** (*string*) –
- **results[].credentialsfile** (*string*) –
- **results[].endpoint** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].name** (*string*) – DataStore Name (required)
- **results[].region** (*string*) –
- **results[].secretaccesskey** (*string*) –
- **results[].storageaccount** (*string*) –
- **results[].type** (*string*) – Site Type (required)
- **results[].url** (*string*) – (read only)

`POST /datastores/`

API endpoint for managing DataStores.

Request JSON Object:

- **accesskey** (*string*) –
- **accesskeyid** (*string*) –
- **bucket** (*string*) –
- **container** (*string*) –
- **credentialsfile** (*string*) –
- **endpoint** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – DataStore Name (required)
- **region** (*string*) –
- **secretaccesskey** (*string*) –
- **storageaccount** (*string*) –
- **type** (*string*) – Site Type (required)
- **url** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **accesskey** (*string*) –
- **accesskeyid** (*string*) –
- **bucket** (*string*) –
- **container** (*string*) –
- **credentialsfile** (*string*) –
- **endpoint** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – DataStore Name (required)
- **region** (*string*) –
- **secretaccesskey** (*string*) –
- **storageaccount** (*string*) –
- **type** (*string*) – Site Type (required)
- **url** (*string*) – (read only)

`GET /datastores/{id}/`

API endpoint for managing DataStores.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **accesskey** (*string*) –
- **accesskeyid** (*string*) –
- **bucket** (*string*) –
- **container** (*string*) –
- **credentialsfile** (*string*) –
- **endpoint** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – DataStore Name (required)
- **region** (*string*) –
- **secretaccesskey** (*string*) –
- **storageaccount** (*string*) –
- **type** (*string*) – Site Type (required)
- **url** (*string*) – (read only)

`PATCH /datastores/{id}/`

API endpoint for managing DataStores.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **accesskey** (*string*) –
- **accesskeyid** (*string*) –
- **bucket** (*string*) –
- **container** (*string*) –
- **credentialsfile** (*string*) –
- **endpoint** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – DataStore Name (required)
- **region** (*string*) –
- **secretaccesskey** (*string*) –
- **storageaccount** (*string*) –
- **type** (*string*) – Site Type (required)
- **url** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **accesskey** (*string*) –
- **accesskeyid** (*string*) –
- **bucket** (*string*) –
- **container** (*string*) –
- **credentialsfile** (*string*) –
- **endpoint** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – DataStore Name (required)
- **region** (*string*) –

- **secretaccesskey** (*string*) –
- **storageaccount** (*string*) –
- **type** (*string*) – Site Type (required)
- **url** (*string*) – (read only)

`DELETE /datastores/{id}/`

API endpoint for managing DataStores.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /external_targets/`

Model View Set for filebrowser's ExternalTarget model.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **bucket** (*string*) – External target bucket name

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].advanced_settings** (*object*) – Advanced settings for the target
- **results[].available_on_sites[]** (*integer*) – Sites where this target is available
- **results[].backup_only** (*boolean*) – Mark this target as backup only
- **results[].backup_site** (*integer*) – Site which claimed this target for backup
- **results[].bucket.access_key** (*string*) – (read only)
- **results[].bucket.access_key_id** (*string*) – (read only)
- **results[].bucket.advanced_settings** (*object*) – Advanced settings for the target
- **results[].bucket.container** (*string*) – Azure storage container
- **results[].bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **results[].bucket.credentials_json** (*string*) – (read only)
- **results[].bucket.endpoint** (*string*) – Hostname of the target storage service
- **results[].bucket.external_targets[]** (*integer*) –
- **results[].bucket.id** (*integer*) – (read only)
- **results[].bucket.label** (*string*) – Bucket label
- **results[].bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **results[].bucket.name** (*string*) – Bucket name (required)

- **results[].bucket.port** (*integer*) – Port of the target storage service
- **results[].bucket.region** (*string*) – Region where the bucket is located
- **results[].bucket.scheme** (*string*) – Connection protocol
- **results[].bucket.secret_access_key** (*string*) – (read only)
- **results[].bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **results[].bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **results[].bucket.storage_account** (*string*) – Azure storage account name
- **results[].bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **results[].bucket_instance** (*integer*) – Associated bucket
- **results[].delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **results[].enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **results[].endpoint_name** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].is_ready** (*string*) – (read only)
- **results[].local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)
- **results[].name** (*string*) – Ngenea target name (required)
- **results[].space.mountpoint** (*string*) – Mount point (required)
- **results[].space.name** (*string*) – Space Name (required)
- **results[].space.sites[]** (*integer*) –

`POST /external_targets/`

Model View Set for filebrowser's ExternalTarget model.

Request JSON Object:

- **advanced_settings** (*object*) – Advanced settings for the target
- **available_on_sites[]** (*integer*) – Sites where this target is available
- **backup_only** (*boolean*) – Mark this target as backup only
- **backup_site** (*integer*) – Site which claimed this target for backup
- **bucket.access_key** (*string*) – (read only)
- **bucket.access_key_id** (*string*) – (read only)
- **bucket.advanced_settings** (*object*) – Advanced settings for the target
- **bucket.container** (*string*) – Azure storage container
- **bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **bucket.credentials_json** (*string*) – (read only)
- **bucket.endpoint** (*string*) – Hostname of the target storage service
- **bucket.external_targets[]** (*integer*) –
- **bucket.id** (*integer*) – (read only)
- **bucket.label** (*string*) – Bucket label
- **bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **bucket.name** (*string*) – Bucket name (required)
- **bucket.port** (*integer*) – Port of the target storage service
- **bucket.region** (*string*) – Region where the bucket is located

- **bucket.scheme** (*string*) – Connection protocol
- **bucket.secret_access_key** (*string*) – (read only)
- **bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **bucket.storage_account** (*string*) – Azure storage account name
- **bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **bucket_instance** (*integer*) – Associated bucket
- **delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **endpoint_name** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_ready** (*string*) – (read only)
- **local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)
- **name** (*string*) – Ngenea target name (required)
- **space.mountpoint** (*string*) – Mount point (required)
- **space.name** (*string*) – Space Name (required)
- **space.sites[]** (*integer*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **advanced_settings** (*object*) – Advanced settings for the target
- **available_on_sites[]** (*integer*) – Sites where this target is available
- **backup_only** (*boolean*) – Mark this target as backup only
- **backup_site** (*integer*) – Site which claimed this target for backup
- **bucket.access_key** (*string*) – (read only)
- **bucket.access_key_id** (*string*) – (read only)
- **bucket.advanced_settings** (*object*) – Advanced settings for the target
- **bucket.container** (*string*) – Azure storage container
- **bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **bucket.credentials_json** (*string*) – (read only)
- **bucket.endpoint** (*string*) – Hostname of the target storage service
- **bucket.external_targets[]** (*integer*) –
- **bucket.id** (*integer*) – (read only)
- **bucket.label** (*string*) – Bucket label
- **bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **bucket.name** (*string*) – Bucket name (required)
- **bucket.port** (*integer*) – Port of the target storage service
- **bucket.region** (*string*) – Region where the bucket is located
- **bucket.scheme** (*string*) – Connection protocol
- **bucket.secret_access_key** (*string*) – (read only)
- **bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **bucket.storage_account** (*string*) – Azure storage account name

- **bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **bucket_instance** (*integer*) – Associated bucket
- **delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **endpoint_name** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_ready** (*string*) – (read only)
- **local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)
- **name** (*string*) – Ngenea target name (required)
- **space.mountpoint** (*string*) – Mount point (required)
- **space.name** (*string*) – Space Name (required)
- **space.sites[]** (*integer*) –

`GET /external_targets/{id}/`

Model View Set for filebrowser's ExternalTarget model.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **advanced_settings** (*object*) – Advanced settings for the target
- **available_on_sites[]** (*integer*) – Sites where this target is available
- **backup_only** (*boolean*) – Mark this target as backup only
- **backup_site** (*integer*) – Site which claimed this target for backup
- **bucket.access_key** (*string*) – (read only)
- **bucket.access_key_id** (*string*) – (read only)
- **bucket.advanced_settings** (*object*) – Advanced settings for the target
- **bucket.container** (*string*) – Azure storage container
- **bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **bucket.credentials_json** (*string*) – (read only)
- **bucket.endpoint** (*string*) – Hostname of the target storage service
- **bucket.external_targets[]** (*integer*) –
- **bucket.id** (*integer*) – (read only)
- **bucket.label** (*string*) – Bucket label
- **bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **bucket.name** (*string*) – Bucket name (required)
- **bucket.port** (*integer*) – Port of the target storage service
- **bucket.region** (*string*) – Region where the bucket is located
- **bucket.scheme** (*string*) – Connection protocol
- **bucket.secret_access_key** (*string*) – (read only)
- **bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **bucket.storage_account** (*string*) – Azure storage account name

- **bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **bucket_instance** (*integer*) – Associated bucket
- **delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **endpoint_name** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_ready** (*string*) – (read only)
- **local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)
- **name** (*string*) – Ngenea target name (required)
- **space.mountpoint** (*string*) – Mount point (required)
- **space.name** (*string*) – Space Name (required)
- **space.sites[]** (*integer*) –

`PATCH /external_targets/{id}/`

Model View Set for filebrowser's ExternalTarget model.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **advanced_settings** (*object*) – Advanced settings for the target
- **available_on_sites[]** (*integer*) – Sites where this target is available
- **backup_only** (*boolean*) – Mark this target as backup only
- **backup_site** (*integer*) – Site which claimed this target for backup
- **bucket.access_key** (*string*) – (read only)
- **bucket.access_key_id** (*string*) – (read only)
- **bucket.advanced_settings** (*object*) – Advanced settings for the target
- **bucket.container** (*string*) – Azure storage container
- **bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **bucket.credentials_json** (*string*) – (read only)
- **bucket.endpoint** (*string*) – Hostname of the target storage service
- **bucket.external_targets[]** (*integer*) –
- **bucket.id** (*integer*) – (read only)
- **bucket.label** (*string*) – Bucket label
- **bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **bucket.name** (*string*) – Bucket name (required)
- **bucket.port** (*integer*) – Port of the target storage service
- **bucket.region** (*string*) – Region where the bucket is located
- **bucket.scheme** (*string*) – Connection protocol
- **bucket.secret_access_key** (*string*) – (read only)
- **bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **bucket.storage_account** (*string*) – Azure storage account name
- **bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **bucket_instance** (*integer*) – Associated bucket

- **delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **endpoint_name** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_ready** (*string*) – (read only)
- **local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)
- **name** (*string*) – Ngenea target name (required)
- **space.mountpoint** (*string*) – Mount point (required)
- **space.name** (*string*) – Space Name (required)
- **space.sites[]** (*integer*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **advanced_settings** (*object*) – Advanced settings for the target
- **available_on_sites[]** (*integer*) – Sites where this target is available
- **backup_only** (*boolean*) – Mark this target as backup only
- **backup_site** (*integer*) – Site which claimed this target for backup
- **bucket.access_key** (*string*) – (read only)
- **bucket.access_key_id** (*string*) – (read only)
- **bucket.advanced_settings** (*object*) – Advanced settings for the target
- **bucket.container** (*string*) – Azure storage container
- **bucket.credentials_file** (*string*) – JSON file containing Google Cloud credentials
- **bucket.credentials_json** (*string*) – (read only)
- **bucket.endpoint** (*string*) – Hostname of the target storage service
- **bucket.external_targets[]** (*integer*) –
- **bucket.id** (*integer*) – (read only)
- **bucket.label** (*string*) – Bucket label
- **bucket.migration_target_folder** (*string*) – Filepath of migration target for FS storage type
- **bucket.name** (*string*) – Bucket name (required)
- **bucket.port** (*integer*) – Port of the target storage service
- **bucket.region** (*string*) – Region where the bucket is located
- **bucket.scheme** (*string*) – Connection protocol
- **bucket.secret_access_key** (*string*) – (read only)
- **bucket.soft_deleting** (*boolean*) – The bucket is soft-deleting. Remote tasks are still running.
- **bucket.ssl_verify** (*boolean*) – Verify SSL certificate when connecting
- **bucket.storage_account** (*string*) – Azure storage account name
- **bucket.storage_type** (*string*) – Type of external storage (e.g., Amazon S3, Azure, etc.) (required)
- **bucket_instance** (*integer*) – Associated bucket
- **delete_on_recall** (*boolean*) – Delete files from the external storage on recall
- **enabled** (*boolean*) – Whether this ngenea target is enabled. Default is true
- **endpoint_name** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_ready** (*string*) – (read only)
- **local_file_regex** (*string*) – Regex filter to match files for migration to this target (required)

- **name** (*string*) – Ngenea target name (required)
- **space.mountpoint** (*string*) – Mount point (required)
- **space.name** (*string*) – Space Name (required)
- **space.sites[]** (*integer*) –

`DELETE /external_targets/{id}/`

Model View Set for filebrowser's ExternalTarget model.

Parameters:
- **id** (*string*) –

Status Codes:
- 204 No Content –

`GET /external_targets/{id}/files/`

Model View Set for filebrowser's ExternalTarget model.

Parameters:
- **id** (*string*) –

Query Parameters:
- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **path** (*string*) – Target remote path, value can be a glob eg 'aws/cats*.jpg'. NOTE: For globs the scan is'nt recursive
- **max_items** (*integer*) – Maximum number of items to retrieve per page
- **marker** (*string*) – Last pagination response marker

Status Codes:
- 200 OK –

Response JSON Object:
- **directories[].name** (*string*) – (read only)
- **directories[].path** (*string*) – (required)
- **directories[].size** (*string*) – (read only)
- **directories[].type** (*string*) – (required)
- **files[].name** (*string*) – (read only)
- **files[].path** (*string*) – (required)
- **files[].size** (*string*) – (read only)
- **files[].type** (*string*) – (required)
- **marker** (*string*) – (required)
- **next_marker** (*string*) – (required)
- **path** (*string*) – (required)
- **summary** (*object*) – (required)

`GET /features/`

API endpoint for managing feature flags.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].description** (*string*) – Description of what the feature does (read only)
- **results[].enabled** (*boolean*) – Whether the feature has been enabled
- **results[].name** (*string*) – Name of the feature (read only)

`GET /features/{name}/`

API endpoint for managing feature flags.

Parameters:

- **name** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **description** (*string*) – Description of what the feature does (read only)
- **enabled** (*boolean*) – Whether the feature has been enabled
- **name** (*string*) – Name of the feature (read only)

`PATCH /features/{name}/`

API endpoint for managing feature flags.

Parameters:

- **name** (*string*) –

Request JSON Object:

- **description** (*string*) – Description of what the feature does (read only)
- **enabled** (*boolean*) – Whether the feature has been enabled
- **name** (*string*) – Name of the feature (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **description** (*string*) – Description of what the feature does (read only)
- **enabled** (*boolean*) – Whether the feature has been enabled
- **name** (*string*) – Name of the feature (read only)

`GET /file/`

Retrieves list of files under given path for given site.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **path** (*string*) – Target directory path
- **site** (*string*) – Site name
- **details** (*boolean*) – Show details of children objects
- **restricted** (*boolean*) – Include restricted objects
- **cache_ttl** (*integer*) – How long the cache will last for the target path
- **type** (*string*) – item type

Status Codes:

- 200 OK –

`POST /file/workflow/`

Performs a workflow on a list of files

Request JSON Object:

- **discovery** (*string*) – Discovery name
- **exclude[]** (*string*) –
- **fields** (*object*) –
- **ignore_site_excludes** (*boolean*) –
- **ignore_site_includes** (*boolean*) –
- **include[]** (*string*) –
- **job** (*integer*) – Job ID
- **paths[]** (*object*) –
- **queue** (*string*) – Queue name
- **site** (*string*) – Site name (required)
- **workflow** (*string*) – Workflow name (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **discovery** (*string*) – Discovery name
- **exclude[]** (*string*) –
- **fields** (*object*) –
- **ignore_site_excludes** (*boolean*) –
- **ignore_site_includes** (*boolean*) –
- **include[]** (*string*) –
- **job** (*integer*) – Job ID
- **paths[]** (*object*) –
- **queue** (*string*) – Queue name
- **site** (*string*) – Site name (required)
- **workflow** (*string*) – Workflow name (required)

`GET /filesets/`

Retrieve list of filesets on a given site.

Query Parameters:

- **site** (*string*) – Site name

Status Codes:

- 200 OK –

`GET /filestatustypes/`

API endpoint for managing file status types.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].background_color** (*string*) – (required)
- **results[].key** (*string*) – (required)
- **results[].label** (*string*) – (required)
- **results[].text_color** (*string*) – (required)
- **results[].url** (*string*) – (read only)

`GET /filestatustypes/{key}/`

API endpoint for managing file status types.

Parameters:

- **key** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **background_color** (*string*) – (required)
- **key** (*string*) – (required)
- **label** (*string*) – (required)
- **text_color** (*string*) – (required)
- **url** (*string*) – (read only)

`PATCH /filestatustypes/{key}/`

API endpoint for managing file status types.

Parameters:

- **key** (*string*) –

Request JSON Object:

- **background_color** (*string*) – (required)
- **label** (*string*) – (required)
- **text_color** (*string*) – (required)

Status Codes:

- 200 OK –

Response JSON Object:

- **background_color** (*string*) – (required)
- **label** (*string*) – (required)
- **text_color** (*string*) – (required)

`GET /filesystems/`

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].mountpoint** (*string*) – Filesystem mount point (required)
- **results[].name** (*string*) – Name of the filesystem (required)
- **results[].site** (*string*) – Site the filesystem belongs to (required)

`GET /filesystems/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **mountpoint** (*string*) – Filesystem mount point (required)
- **name** (*string*) – Name of the filesystem (required)
- **site** (*string*) – Site the filesystem belongs to (required)

`GET /groups/`

API endpoint for managing groups.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].description** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].name** (*string*) – (required)
- **results[].nas_group.gid** (*integer*) – GID number for the user. This is automatically generated and cannot be changed. (read only)
- **results[].object_permissions[].model** (*string*) – (required)
- **results[].object_permissions[].object_pk** (*string*) – (required)
- **results[].object_permissions[].permission** (*integer*) – (required)
- **results[].permissions[]** (*integer*) –
- **results[].users[].date_joined** (*string*) –
- **results[].users[].email** (*string*) –
- **results[].users[].first_name** (*string*) –
- **results[].users[].last_login** (*string*) –
- **results[].users[].last_name** (*string*) –
- **results[].users[].username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`POST /groups/`

API endpoint for managing groups.

Request JSON Object:

- **description** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group** (*boolean*) –
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[]** (*string*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **description** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group** (*boolean*) –
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[]** (*string*) –

`POST /groups/sync/`

API to sync nas groups on each site

Status Codes:

- 201 Created –

Response JSON Object:

- **description** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group.gid** (*integer*) – GID number for the user. This is automatically generated and cannot be changed. (read only)
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[].date_joined** (*string*) –
- **users[].email** (*string*) –
- **users[].first_name** (*string*) –
- **users[].last_login** (*string*) –
- **users[].last_name** (*string*) –
- **users[].username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`GET /groups/{id}/`

API endpoint for managing groups.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **description** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group.gid** (*integer*) – GID number for the user. This is automatically generated and cannot be changed. (read only)
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[].date_joined** (*string*) –
- **users[].email** (*string*) –
- **users[].first_name** (*string*) –
- **users[].last_login** (*string*) –
- **users[].last_name** (*string*) –
- **users[].username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`PATCH /groups/{id}/`

API endpoint for managing groups.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **description** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group** (*boolean*) –
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[]** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **description** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **nas_group** (*boolean*) –
- **object_permissions[].model** (*string*) – (required)
- **object_permissions[].object_pk** (*string*) – (required)
- **object_permissions[].permission** (*integer*) – (required)
- **permissions[]** (*integer*) –
- **users[]** (*string*) –

`DELETE /groups/{id}/`

API endpoint for managing groups.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /health/`

Status Codes:

- 200 OK –

`GET /ipaddresses/`

API endpoint for managing IP addresses.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **datastore_id** (*integer*) – Data store ID that the IP is assigned to

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)

- **next** (*string*) –
- **previous** (*string*) –
- **results[].datastore.id** (*integer*) – (read only)
- **results[].datastore.name** (*string*) – DataStore Name (required)
- **results[].datastore.url** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].ipaddr** (*string*) – IP Address (IPv4) (required)
- **results[].url** (*string*) – (read only)

`POST /ipaddresses/`

API endpoint for managing IP addresses.

Request JSON Object:

- **datastore** (*integer*) – (required)
- **id** (*integer*) – (read only)
- **ipaddr** (*string*) – (required)
- **url** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **datastore** (*integer*) – (required)
- **id** (*integer*) – (read only)
- **ipaddr** (*string*) – (required)
- **url** (*string*) – (read only)

`GET /ipaddresses/{id}/`

API endpoint for managing IP addresses.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **datastore.id** (*integer*) – (read only)
- **datastore.name** (*string*) – DataStore Name (required)
- **datastore.url** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **ipaddr** (*string*) – IP Address (IPv4) (required)
- **url** (*string*) – (read only)

`PATCH /ipaddresses/{id}/`

API endpoint for managing IP addresses.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **datastore** (*integer*) – (required)
- **id** (*integer*) – (read only)
- **ipaddr** (*string*) – (required)
- **url** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **datastore** (*integer*) – (required)
- **id** (*integer*) – (read only)
- **ipaddr** (*string*) – (required)
- **url** (*string*) – (read only)

`DELETE /ipaddresses/{id}/`

API endpoint for managing IP addresses.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /jobs/`

API endpoint for managing jobs.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **created** (*string*) – Time period string for filtering jobs by time. Leave `null` for displaying jobs in all times.
- **created_time_from** (*string*) – Start time for filtering jobs by creation time in UTC. Discarded when `created` parameter is given.
- **created_time_to** (*string*) – End time for filtering jobs by creation time in UTC. Discarded when `created` parameter is given.
- **completed_time_from** (*string*) – Start time for filtering jobs by completion time in UTC.
- **completed_time_to** (*string*) – End time for filtering jobs by completion time in UTC.
- **workflow** (*string*) – Job workflow type
- **state** (*array*) – Job states
- **owner_ids** (*array*) – Job owner user IDs. Send `-1` for the `Unknown` owner. Send `-2` for the `System` jobs.
- **clientkey_ids** (*array*) – Job clientkey IDs
- **schedule_ids** (*array*) – Job schedule IDs
- **site** (*string*) – Job site name
- **site_id** (*integer*) – Job site ID
- **input_paths_prefix** (*string*) – Path prefix for the job paths
- **search_keyword** (*string*) – Keyword to filter by
- **hide_noop** (*boolean*) – Hide successful jobs with no processed files
- **queue** (*string*) – Job queue name
- **queue_id** (*integer*) – Job queue ID

Status Codes:

- 200 OK –

POST /jobs/

API endpoint for managing jobs.

Status Codes:

- 201 Created –

GET /jobs/jobtype_choices/

Get all custom jobtypes.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

GET /jobs/recent/

Retrieves last N jobs as recent jobs. N = 5 by default (defined in dynamohub/settings/base.py).

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

GET /jobs/stats/

API endpoint for managing jobs.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **created** (*string*) – Time period string for filtering jobs by time. Leave `null` for displaying jobs in all times.

- **created_time_from** (*string*) – Start time for filtering jobs by creation time in UTC. Discarded when `created` parameter is given.
- **created_time_to** (*string*) – End time for filtering jobs by creation time in UTC. Discarded when `created` parameter is given.
- **completed_time_from** (*string*) – Start time for filtering jobs by completion time in UTC.
- **completed_time_to** (*string*) – End time for filtering jobs by completion time in UTC.
- **workflow** (*string*) – Job workflow type
- **state** (*array*) – Job states
- **owner_ids** (*array*) – Job owner user IDs. Send `-1` for the `Unknown` owner. Send `-2` for the `System` jobs.
- **clientkey_ids** (*array*) – Job clientkey IDs
- **schedule_ids** (*array*) – Job schedule IDs
- **site** (*string*) – Job site name
- **site_id** (*integer*) – Job site ID
- **input_paths_prefix** (*string*) – Path prefix for the job paths
- **search_keyword** (*string*) – Keyword to filter by
- **hide_noop** (*boolean*) – Hide successful jobs with no processed files
- **queue** (*string*) – Job queue name
- **queue_id** (*integer*) – Job queue ID

Status Codes:

- 200 OK –

`GET /jobs/{id}/`

API endpoint for managing jobs.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

`PATCH /jobs/{id}/`

API endpoint for managing jobs.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

`DELETE /jobs/{id}/`

API endpoint for managing jobs.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`POST /jobs/{id}/cancel/`

Cancels the pending and started tasks currently on the MQ for the given ID’s job.

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

`GET /jobs/{id}/files/`

Retrieves the files related with a job, with their execution status.

Parameters:

- **id** (*string*) –

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **category** (*string*) –

Status Codes:

- 200 OK –

`POST /jobs/{id}/pause/`

API endpoint to pause the active dag job

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

`GET /jobs/{id}/progress/`

Returns the job completion percentage for the given job id

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

`POST /jobs/{id}/resubmit/`

Resubmits the job with given id. If the job is not finished yet, this action will not have an effect.

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

`POST /jobs/{id}/resume/`

API endpoint to resume the paused dag job

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

`GET /jobs/{id}/statistics/`

Returns the statistics of all files for the given job id

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

`GET /jobstats/`

API endpoint for managing jobstat.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **state** (*array*) – Job states
- **job** (*integer*) – Job ID
- **path** (*string*) – Target path
- **history** (*boolean*) – Returns the task history along with job stat

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].code** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].job** (*integer*) – Related job id (required)
- **results[].message** (*string*) –
- **results[].path** (*string*) – Path to object on filesystem
- **results[].state** (*string*) –
- **results[].task** (*integer*) – Latest related dag task (required)
- **results[].url** (*string*) – (read only)

`GET /jobstats/{id}/`

API endpoint for managing jobstat.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **code** (*string*) –
- **id** (*integer*) – (read only)
- **job** (*integer*) – Related job id (required)
- **message** (*string*) –
- **path** (*string*) – Path to object on filesystem
- **state** (*string*) –
- **task** (*integer*) – Latest related dag task (required)

`GET /jobstats/{id}/history/`

Returns the task history for the job stat ID

Parameters:

- **id** (*string*) –

Query Parameters:

- **state** (*array*) – Job states
- **job** (*integer*) – Job ID
- **path** (*string*) – Target path
- **history** (*boolean*) – Returns the task history along with job stat

Status Codes:

- 200 OK –

Response JSON Object:

- **code** (*string*) –
- **id** (*integer*) – (read only)
- **job** (*integer*) – Related job id (required)
- **message** (*string*) –
- **path** (*string*) – Path to object on filesystem
- **state** (*string*) –
- **task** (*integer*) – Latest related dag task (required)

`GET /my-permissions/`

API endpoint for viewing the requesting user permissions.

Status Codes:

- 200 OK –

Response JSON Object:

- **[].group_object_permissions.app_label** (*string*) – (required)
- **[].group_object_permissions.codename** (*string*) – (required)
- **[].group_object_permissions.id** (*integer*) – (required)
- **[].group_object_permissions.model** (*string*) – (required)
- **[].group_object_permissions.name** (*string*) – (required)
- **[].group_object_permissions.object_pk** (*string*) – (required)
- **[].group_permissions.app_label** (*string*) – (required)
- **[].group_permissions.codename** (*string*) – (required)
- **[].group_permissions.id** (*integer*) – (read only)
- **[].group_permissions.model** (*string*) – (required)
- **[].group_permissions.name** (*string*) – (required)
- **[].user_object_permissions.app_label** (*string*) – (required)
- **[].user_object_permissions.codename** (*string*) – (required)
- **[].user_object_permissions.id** (*integer*) – (required)

- **[].user_object_permissions.model** (*string*) – (required)
- **[].user_object_permissions.name** (*string*) – (required)
- **[].user_object_permissions.object_pk** (*string*) – (required)
- **[].user_permissions.app_label** (*string*) – (required)
- **[].user_permissions.codename** (*string*) – (required)
- **[].user_permissions.id** (*integer*) – (read only)
- **[].user_permissions.model** (*string*) – (required)
- **[].user_permissions.name** (*string*) – (required)

GET /nodes/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].has_default_queue** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].last_heartbeat** (*string*) – Time the node sent its last heartbeat event
- **results[].name** (*string*) – Hostname for a given worker node (required)
- **results[].online** (*string*) – (read only)
- **results[].site** (*string*) – (required)
- **results[].url** (*string*) – (read only)

GET /nodes/{id}/

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **has_default_queue** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **last_heartbeat** (*string*) – Time the node sent its last heartbeat event
- **name** (*string*) – Hostname for a given worker node (required)
- **online** (*string*) – (read only)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)

PATCH /nodes/{id}/

Parameters:

- **id** (*string*) –

Request JSON Object:

- **has_default_queue** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **last_heartbeat** (*string*) – Time the node sent its last heartbeat event
- **name** (*string*) – Hostname for a given worker node (required)
- **online** (*string*) – (read only)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **has_default_queue** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **last_heartbeat** (*string*) – Time the node sent its last heartbeat event
- **name** (*string*) – Hostname for a given worker node (required)
- **online** (*string*) – (read only)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)

`DELETE /nodes/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /permissions/`

API endpoint for viewing permissions.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].app_label** (*string*) – (required)
- **results[].codename** (*string*) – (required)
- **results[].id** (*integer*) – (read only)
- **results[].model** (*string*) – (required)
- **results[].name** (*string*) – (required)

`GET /permissions/{id}/`

API endpoint for viewing permissions.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **app_label** (*string*) – (required)
- **codename** (*string*) – (required)
- **id** (*integer*) – (read only)
- **model** (*string*) – (required)
- **name** (*string*) – (required)

`GET /pki/ca/pub/`

Status Codes:

- 200 OK –

`GET /pki/lifetime/`

Status Codes:

- 200 OK –

Response JSON Object:

- **[].days** (*integer*) – The number of days the certificate is valid for.
- **[].updated_at** (*string*) – (read only)
- **[].updated_by** (*integer*) – (read only)

`GET /pki/lifetime/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this certificate lifetime.

Status Codes:

- 200 OK –

Response JSON Object:

- **days** (*integer*) – The number of days the certificate is valid for.
- **updated_at** (*string*) – (read only)
- **updated_by** (*integer*) – (read only)

`PATCH /pki/lifetime/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this certificate lifetime.

Request JSON Object:

- **days** (*integer*) – The number of days the certificate is valid for.
- **updated_at** (*string*) – (read only)
- **updated_by** (*integer*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **days** (*integer*) – The number of days the certificate is valid for.
- **updated_at** (*string*) – (read only)
- **updated_by** (*integer*) – (read only)

`GET /pki/service/private/`

Status Codes:

- 200 OK –

GET /pki/service/pub/

Status Codes:

- 200 OK –

POST /pki/site/

Status Codes:

- 201 Created –

GET /policies/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].condition_groups[].date_conditions[].age** (*string*) –
- **results[].condition_groups[].date_conditions[].condition_group** (*integer*) – (required)
- **results[].condition_groups[].date_conditions[].date_field** (*string*) –
- **results[].condition_groups[].date_conditions[].id** (*integer*) – (read only)
- **results[].condition_groups[].date_conditions[].include** (*boolean*) –
- **results[].condition_groups[].date_conditions[].older_or_newer** (*string*) –
- **results[].condition_groups[].filesize_conditions[].condition_group** (*integer*) – (required)
- **results[].condition_groups[].filesize_conditions[].greater_or_less** (*string*) – (required)
- **results[].condition_groups[].filesize_conditions[].id** (*integer*) – (read only)
- **results[].condition_groups[].filesize_conditions[].include** (*boolean*) –
- **results[].condition_groups[].filesize_conditions[].size** (*integer*) – (required)
- **results[].condition_groups[].filetype_conditions[].condition_group** (*integer*) – (required)
- **results[].condition_groups[].filetype_conditions[].filetypes[]** (*string*) –
- **results[].condition_groups[].filetype_conditions[].id** (*integer*) – (read only)
- **results[].condition_groups[].filetype_conditions[].include** (*boolean*) –
- **results[].condition_groups[].id** (*integer*) – (read only)
- **results[].condition_groups[].name** (*string*) – (required)
- **results[].condition_groups[].policy** (*integer*) – (required)
- **results[].created** (*string*) – (read only)

- **results[].enabled** (*boolean*) –
- **results[].filesystem** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].name** (*string*) – (required)
- **results[].order.by** (*string*) –
- **results[].order.id** (*integer*) – (read only)
- **results[].order.reverse** (*boolean*) –
- **results[].policy_type** (*string*) –
- **results[].schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **results[].schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **results[].schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.
- **results[].schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **results[].schedule.id** (*integer*) – (read only)
- **results[].schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **results[].schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **results[].schedule.start_date_time** (*string*) – Start date time based on the time provided, timezone and if self.first_occur is true.
- **results[].schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **results[].schedule.timezone** (*string*) – (required)
- **results[].site** (*integer*) –
- **results[].spaces[]** (*integer*) –
- **results[].threads** (*integer*) – Number of threads to run policy on
- **results[].triggers** (*string*) – (read only)

POST /policies/

Request JSON Object:

- **created** (*string*) – (read only)
- **enabled** (*boolean*) –
- **filesystem** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **order.by** (*string*) –
- **order.id** (*integer*) – (read only)
- **order.reverse** (*boolean*) –
- **policy_type** (*string*) –
- **run_immediately** (*boolean*) –
- **schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.

- **schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **schedule.id** (*integer*) – (read only)
- **schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **site** (*integer*) –
- **spaces[]** (*integer*) –
- **threads** (*integer*) – Number of threads to run policy on
- **triggers[].is_cloud** (*boolean*) –
- **triggers[].lower_threshold** (*number*) –
- **triggers[].max_utilisation** (*number*) –
- **triggers[].pool_name** (*string*) – (required)
- **triggers[].premigrate_threshold** (*number*) –
- **triggers[].upper_threshold** (*number*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **created** (*string*) – (read only)
- **enabled** (*boolean*) –
- **filesystem** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **order** (*integer*) –
- **policy_type** (*string*) –
- **run_immediately** (*boolean*) –
- **schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.
- **schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **schedule.id** (*integer*) – (read only)
- **schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **site** (*integer*) –
- **spaces[]** (*integer*) –
- **threads** (*integer*) – Number of threads to run policy on
- **triggers[].id** (*integer*) – (read only)

- **triggers[].is_cloud** (*boolean*) –
- **triggers[].lower_threshold** (*number*) –
- **triggers[].max_utilisation** (*number*) –
- **triggers[].pool_name** (*string*) – (required)
- **triggers[].premigrate_threshold** (*number*) –
- **triggers[].upper_threshold** (*number*) –

GET /policies/{id}/

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **condition_groups[].date_conditions[].age** (*string*) –
- **condition_groups[].date_conditions[].condition_group** (*integer*) – (required)
- **condition_groups[].date_conditions[].date_field** (*string*) –
- **condition_groups[].date_conditions[].id** (*integer*) – (read only)
- **condition_groups[].date_conditions[].include** (*boolean*) –
- **condition_groups[].date_conditions[].older_or_newer** (*string*) –
- **condition_groups[].filesize_conditions[].condition_group** (*integer*) – (required)
- **condition_groups[].filesize_conditions[].greater_or_less** (*string*) – (required)
- **condition_groups[].filesize_conditions[].id** (*integer*) – (read only)
- **condition_groups[].filesize_conditions[].include** (*boolean*) –
- **condition_groups[].filesize_conditions[].size** (*integer*) – (required)
- **condition_groups[].filetype_conditions[].condition_group** (*integer*) – (required)
- **condition_groups[].filetype_conditions[].filetypes[]** (*string*) –
- **condition_groups[].filetype_conditions[].id** (*integer*) – (read only)
- **condition_groups[].filetype_conditions[].include** (*boolean*) –
- **condition_groups[].id** (*integer*) – (read only)
- **condition_groups[].name** (*string*) – (required)
- **condition_groups[].policy** (*integer*) – (required)
- **created** (*string*) – (read only)
- **enabled** (*boolean*) –
- **filesystem** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **order.by** (*string*) –
- **order.id** (*integer*) – (read only)
- **order.reverse** (*boolean*) –
- **policy_type** (*string*) –
- **schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.

- **schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **schedule.id** (*integer*) – (read only)
- **schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **schedule.start_date_time** (*string*) – Start date time based on the time provided, timezone and if self.first_occur is true.
- **schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **schedule.timezone** (*string*) – (required)
- **site** (*integer*) –
- **spaces[]** (*integer*) –
- **threads** (*integer*) – Number of threads to run policy on
- **triggers** (*string*) – (read only)

`PATCH /policies/{id}/`

Parameters:

- **id** (*string*) –

Request JSON Object:

- **created** (*string*) – (read only)
- **enabled** (*boolean*) –
- **filesystem** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **order.by** (*string*) –
- **order.id** (*integer*) – (read only)
- **order.reverse** (*boolean*) –
- **policy_type** (*string*) –
- **schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.
- **schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **schedule.id** (*integer*) – (read only)
- **schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **site** (*integer*) –
- **spaces[]** (*integer*) –
- **threads** (*integer*) – Number of threads to run policy on

- **triggers[].is_cloud** (*boolean*) –
- **triggers[].lower_threshold** (*number*) –
- **triggers[].max_utilisation** (*number*) –
- **triggers[].pool_name** (*string*) – (required)
- **triggers[].premigrate_threshold** (*number*) –
- **triggers[].upper_threshold** (*number*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **created** (*string*) – (read only)
- **enabled** (*boolean*) –
- **filesystem** (*string*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – (required)
- **order** (*integer*) –
- **policy_type** (*string*) –
- **run_immediately** (*boolean*) –
- **schedule.day_of_month** (*string*) – Cron Days Of The Month to Run. Use “*” for “all”. (Example: “1,15”)
- **schedule.day_of_week** (*string*) – Cron Days Of The Week to Run. Use “*” for “all”. (Example: “0,5”)
- **schedule.first_occur** (*boolean*) – Whether the first occurrence will be at the stipulated time.
- **schedule.hour** (*string*) – Cron Hours to Run. Use “*” for “all”. (Example: “8,20”)
- **schedule.id** (*integer*) – (read only)
- **schedule.minute** (*string*) – Cron Minutes to Run. Use “*” for “all”. (Example: “0,30”)
- **schedule.month_of_year** (*string*) – Cron Months Of The Year to Run. Use “*” for “all”. (Example: “0,6”)
- **schedule.time** (*string*) – Time to start running on the policy’s SITE. REMEMBER: The Ngenea hub and the site may be running in different timezones
- **site** (*integer*) –
- **spaces[]** (*integer*) –
- **threads** (*integer*) – Number of threads to run policy on
- **triggers[].id** (*integer*) – (read only)
- **triggers[].is_cloud** (*boolean*) –
- **triggers[].lower_threshold** (*number*) –
- **triggers[].max_utilisation** (*number*) –
- **triggers[].pool_name** (*string*) – (required)
- **triggers[].premigrate_threshold** (*number*) –
- **triggers[].upper_threshold** (*number*) –

`DELETE /policies/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

POST /policies/{id}/run/

Parameters:

- **id** (*string*) –

Status Codes:

- 202 Accepted – Task id of the task fired for the associated request.

GET /queues/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].label** (*string*) – UI facing label for the queue
- **results[].last_heartbeat** (*string*) –
- **results[].name** (*string*) – Queue name. Must match [a-zA-Z0-9-_]+ (required)
- **results[].nodes** (*string*) – (read only)
- **results[].site** (*string*) – (read only)

GET /queues/{id}/

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **id** (*integer*) – (read only)
- **label** (*string*) – UI facing label for the queue
- **last_heartbeat** (*string*) –
- **name** (*string*) – Queue name. Must match [a-zA-Z0-9-_]+ (required)
- **nodes** (*string*) – (read only)
- **site** (*string*) – (read only)

GET /schedules/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is

empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

- **site_id** (*integer*) – Site ID
- **space_id** (*integer*) – Space ID

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].day_of_month** (*string*) – The day setting for the cron schedule
- **results[].day_of_week** (*string*) – The week setting for the cron schedule
- **results[].discovery** (*string*) –
- **results[].discovery_options** (*object*) –
- **results[].enabled** (*boolean*) – If the schedule should be enabled
- **results[].hour** (*string*) – The hour setting for the cron schedule
- **results[].id** (*integer*) – (read only)
- **results[].managed_paths** (*object*) – Path of managed filesystem elements
- **results[].minute** (*string*) – The minute setting for the cron schedule
- **results[].month_of_year** (*string*) – The month setting for the cron schedule
- **results[].name** (*string*) – Schedule Name (required)
- **results[].site** (*string*) – (required)
- **results[].space** (*string*) – (required)
- **results[].url** (*string*) – (read only)

`POST /schedules/`

Request JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule
- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) –
- **url** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule

- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) –
- **url** (*string*) – (read only)

`GET /schedules/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule
- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) – (required)
- **url** (*string*) – (read only)

`PATCH /schedules/{id}/`

Parameters:

- **id** (*string*) –

Request JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule
- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule
- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) –

`DELETE /schedules/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`POST /schedules/{id}/run/`

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **day_of_month** (*string*) – The day setting for the cron schedule
- **day_of_week** (*string*) – The week setting for the cron schedule
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – If the schedule should be enabled
- **hour** (*string*) – The hour setting for the cron schedule
- **id** (*integer*) – (read only)
- **managed_paths** (*object*) – Path of managed filesystem elements
- **minute** (*string*) – The minute setting for the cron schedule
- **month_of_year** (*string*) – The month setting for the cron schedule
- **name** (*string*) – Schedule Name (required)
- **site** (*string*) – (required)
- **space** (*string*) – (required)
- **url** (*string*) – (read only)

`GET /schedules/{parent_lookup_schedule}/workflows/`

Parameters:

- **parent_lookup_schedule** (*string*) –

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination

and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].fields** (*object*) – Mapping of path to operation for task usage
- **results[].id** (*integer*) – (read only)
- **results[].queue** (*string*) – (required)
- **results[].site** (*string*) – (required)
- **results[].url** (*string*) – (read only)
- **results[].workflow** (*string*) – (required)

`POST /schedules/{parent_lookup_schedule}/workflows/`

Parameters:

- **parent_lookup_schedule** (*string*) –

Request JSON Object:

- **fields** (*object*) – Mapping of path to operation for task usage
- **id** (*integer*) – (read only)
- **queue** (*string*) – Queue name
- **site** (*string*) – (required)
- **workflow** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **fields** (*object*) – Mapping of path to operation for task usage
- **id** (*integer*) – (read only)
- **queue** (*string*) – Queue name
- **site** (*string*) – (required)
- **workflow** (*string*) – (required)

`GET /schedules/{parent_lookup_schedule}/workflows/{id}/`

Parameters:

- **parent_lookup_schedule** (*string*) –
- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **fields** (*object*) – Mapping of path to operation for task usage
- **id** (*integer*) – (read only)
- **queue** (*string*) – (required)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)
- **workflow** (*string*) – (required)

`PATCH /schedules/{parent_lookup_schedule}/workflows/{id}/`

Parameters:
- **parent_lookup_schedule** (*string*) –
- **id** (*string*) –

Request JSON Object:
- **fields** (*object*) – Mapping of path to operation for task usage
- **id** (*integer*) – (read only)
- **queue** (*string*) – (required)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)
- **workflow** (*string*) – (required)

Status Codes:
- 200 OK –

Response JSON Object:
- **fields** (*object*) – Mapping of path to operation for task usage
- **id** (*integer*) – (read only)
- **queue** (*string*) – (required)
- **site** (*string*) – (required)
- **url** (*string*) – (read only)
- **workflow** (*string*) – (required)

`DELETE /schedules/{parent_lookup_schedule}/workflows/{id}/`

Parameters:
- **parent_lookup_schedule** (*string*) –
- **id** (*string*) –

Status Codes:
- 204 No Content –

`POST /search/`

API endpoint for file search

Request JSON Object:
- **filters** (*object*) – Metadata filters to apply to search
- **merge** (*boolean*) – Whether matching files should be merged
- **metadata_fields** (*object*) – Available metadata fields from this search
- **path** (*string*) – Directory to search (required)
- **recursive** (*boolean*) – Search the target path recursively
- **sites[]** (*string*) –

Status Codes:
- 201 Created –

Response JSON Object:
- **filters** (*object*) – Metadata filters to apply to search
- **merge** (*boolean*) – Whether matching files should be merged
- **metadata_fields** (*object*) – Available metadata fields from this search
- **path** (*string*) – Directory to search (required)
- **recursive** (*boolean*) – Search the target path recursively
- **sites[]** (*string*) –

`PATCH /search/metadata/`

API endpoint for file search

Request JSON Object:

- **id** (*integer*) – (read only)
- **url** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **id** (*integer*) – (read only)
- **url** (*string*) – (read only)

`GET /search/metadata_fields/`

API endpoint for file search

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].url** (*string*) – (read only)

`GET /search/{id}/`

Get paginated results for a given search id.

Parameters:

- **id** (*string*) –

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **sort** (*string*) – One or more fields to sort results by
- **group_by_name** (*boolean*) –
  When this url parameter is 'True' results are merged based on matching file name. e.g.

```
[
  {
    data: [
      {site: site1, path: /mmfs1, ...},
```

```
      {site: site2, path: /mmfs1, ...}
    ]
  },
  {
    foo: [
      {site: site1, path: /mmfs1/data, ...}
      # not present on site2
    ]
  }
}
```

Status Codes:

- 200 OK –

Response JSON Object:

- **href** (*string*) – (read only)
- **metadata** (*object*) – File metadata
- **name** (*string*) – Directory or file name (required)
- **path** (*string*) – Directory or file path (required)
- **proxies** (*object*) – File proxies (thumbnails, etc.)
- **site** (*string*) – Site Name

DELETE /search/{id}/

API endpoint for file search

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

GET /servers/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].list_of_interfaces** (*object*) – List of interfaces of this server
- **results[].name** (*string*) – Server name (required)
- **results[].site** (*integer*) – Site correlated with this server (required)

GET /servers/{id}/

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **list_of_interfaces** (*object*) – List of interfaces of this server
- **name** (*string*) – Server name (required)
- **site** (*integer*) – Site correlated with this server (required)

`GET /settings/`

API to get a list of global settings.

Status Codes:

- 200 OK –

Response JSON Object:

- **[].desc** (*string*) – (read only)
- **[].id** (*integer*) – (read only)
- **[].key** (*string*) – (required)
- **[].value** (*object*) –

`PATCH /settings/`

API to set a setting or a group of global settings. A group of settings should be sent in key-value schema. Requested data will be stored in the database, and then sent to each site. Terminology Setting - An individual setting e.g. ngenea:realm

Notes on use:

- Non-global settings cannot be set on this endpoint either alone or with global settings
- Setting a key to None will delete it from the database and set null on all active sites

  e.g. {“values”: [{“key”: “ngeneahsm_targets:devaws:Storage”, “value”: None}]}

Request JSON Object:

- **values[].desc** (*string*) – (read only)
- **values[].id** (*integer*) – (read only)
- **values[].key** (*string*) – (required)
- **values[].value** (*object*) –

Status Codes:

- 202 Accepted – Task id of the task fired for the associated request per site.

`POST /settings/sync/`

API to sync global settings on each site Stored data will be sent to the given site or to each site if not given.

Query Parameters:

- **site** (*string*) – Site to run the sync operation on if provided, otherwise all sites

Status Codes:

- 202 Accepted – Task id of the task fired for the associated request per site.

`GET /settingstasks/`

API endpoint for viewing tasks.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **tasktype** (*string*) – Task type
- **state** (*array*) – Task states
- **job_id** (*integer*) – Job ID

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].id** (*integer*) – (read only)
- **results[].job** (*integer*) –
- **results[].site** (*string*) – (required)
- **results[].started** (*string*) – Time that the task started running
- **results[].state** (*string*) –
- **results[].task_id** (*string*) – (read only)
- **results[].tasktype** (*string*) – (read only)
- **results[].url** (*string*) – (read only)

`GET /settingstasks/{id}/`

API endpoint for viewing tasks.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **completed** (*string*) – Time of the task completion
- **friendly_name** (*string*) – Text to be used to describe what this task is doing.
- **id** (*integer*) – (read only)
- **job** (*integer*) –
- **request** (*string*) – (read only)
- **results** (*string*) – (read only)
- **runtime** (*string*) – (read only)
- **site** (*string*) – (required)
- **started** (*string*) – Time that the task started running
- **state** (*string*) –
- **task_id** (*string*) – (read only)
- **tasktype** (*string*) – (read only)
- **url** (*string*) – (read only)

`GET /shares/nfs/`

Status Codes:

- 200 OK –

Response JSON Object:

- **[].clients[].advanced_settings** (*object*) –
- **[].clients[].anonymous_group_id** (*integer*) –
- **[].clients[].anonymous_user_id** (*integer*) –
- **[].clients[].asynchronous** (*boolean*) –
- **[].clients[].force_all_user_id** (*boolean*) –
- **[].clients[].force_root_user_id** (*boolean*) –
- **[].clients[].hosts** (*string*) – (required)
- **[].clients[].id** (*integer*) – (read only)
- **[].clients[].insecure_ports** (*boolean*) –
- **[].clients[].nfs_share** (*integer*) – (required)
- **[].clients[].read_only** (*boolean*) –
- **[].clients[].subtree_check** (*boolean*) –
- **[].clients[].uuid** (*string*) – (read only)
- **[].clients[].write_delay** (*boolean*) –
- **[].fsid** (*integer*) –
- **[].id** (*integer*) – (read only)
- **[].name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **[].path** (*string*) –
- **[].space** (*integer*) – (required)
- **[].uuid** (*string*) – (read only)

`POST /shares/nfs/`

Request JSON Object:

- **clients[].advanced_settings** (*object*) –
- **clients[].anonymous_group_id** (*integer*) –
- **clients[].anonymous_user_id** (*integer*) –
- **clients[].asynchronous** (*boolean*) –
- **clients[].force_all_user_id** (*boolean*) –
- **clients[].force_root_user_id** (*boolean*) –
- **clients[].hosts** (*string*) – (required)
- **clients[].id** (*integer*) – (read only)
- **clients[].insecure_ports** (*boolean*) –
- **clients[].nfs_share** (*integer*) – (required)
- **clients[].read_only** (*boolean*) –
- **clients[].subtree_check** (*boolean*) –
- **clients[].uuid** (*string*) – (read only)
- **clients[].write_delay** (*boolean*) –
- **fsid** (*integer*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **path** (*string*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **clients[].advanced_settings** (*object*) –
- **clients[].anonymous_group_id** (*integer*) –
- **clients[].anonymous_user_id** (*integer*) –
- **clients[].asynchronous** (*boolean*) –
- **clients[].force_all_user_id** (*boolean*) –
- **clients[].force_root_user_id** (*boolean*) –
- **clients[].hosts** (*string*) – (required)
- **clients[].id** (*integer*) – (read only)
- **clients[].insecure_ports** (*boolean*) –
- **clients[].nfs_share** (*integer*) – (required)
- **clients[].read_only** (*boolean*) –
- **clients[].subtree_check** (*boolean*) –
- **clients[].uuid** (*string*) – (read only)
- **clients[].write_delay** (*boolean*) –
- **fsid** (*integer*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **path** (*string*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)

`GET /shares/nfs/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this nfs share.

Status Codes:

- 200 OK –

Response JSON Object:

- **clients[].advanced_settings** (*object*) –
- **clients[].anonymous_group_id** (*integer*) –
- **clients[].anonymous_user_id** (*integer*) –
- **clients[].asynchronous** (*boolean*) –
- **clients[].force_all_user_id** (*boolean*) –
- **clients[].force_root_user_id** (*boolean*) –
- **clients[].hosts** (*string*) – (required)
- **clients[].id** (*integer*) – (read only)
- **clients[].insecure_ports** (*boolean*) –
- **clients[].nfs_share** (*integer*) – (required)
- **clients[].read_only** (*boolean*) –
- **clients[].subtree_check** (*boolean*) –
- **clients[].uuid** (*string*) – (read only)
- **clients[].write_delay** (*boolean*) –
- **fsid** (*integer*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **path** (*string*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)

`PATCH /shares/nfs/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this nfs share.

Request JSON Object:

- **clients[].advanced_settings** (*object*) –
- **clients[].anonymous_group_id** (*integer*) –
- **clients[].anonymous_user_id** (*integer*) –
- **clients[].asynchronous** (*boolean*) –
- **clients[].force_all_user_id** (*boolean*) –
- **clients[].force_root_user_id** (*boolean*) –
- **clients[].hosts** (*string*) – (required)
- **clients[].id** (*integer*) – (read only)
- **clients[].insecure_ports** (*boolean*) –
- **clients[].nfs_share** (*integer*) – (required)
- **clients[].read_only** (*boolean*) –
- **clients[].subtree_check** (*boolean*) –
- **clients[].uuid** (*string*) – (read only)
- **clients[].write_delay** (*boolean*) –
- **fsid** (*integer*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **path** (*string*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **clients[].advanced_settings** (*object*) –
- **clients[].anonymous_group_id** (*integer*) –
- **clients[].anonymous_user_id** (*integer*) –
- **clients[].asynchronous** (*boolean*) –
- **clients[].force_all_user_id** (*boolean*) –
- **clients[].force_root_user_id** (*boolean*) –
- **clients[].hosts** (*string*) – (required)
- **clients[].id** (*integer*) – (read only)
- **clients[].insecure_ports** (*boolean*) –
- **clients[].nfs_share** (*integer*) – (required)
- **clients[].read_only** (*boolean*) –
- **clients[].subtree_check** (*boolean*) –
- **clients[].uuid** (*string*) – (read only)
- **clients[].write_delay** (*boolean*) –
- **fsid** (*integer*) –
- **id** (*integer*) – (read only)
- **name** (*string*) – Note: This name is for identification only. NFSClients don't have names in remote representations
- **path** (*string*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)

DELETE /shares/nfs/{id}/

Parameters:

- **id** (*integer*) – A unique integer value identifying this nfs share.

Status Codes:

- 204 No Content –

GET /shares/samba/

Status Codes:

- 200 OK –

Response JSON Object:

- **[].admin_users** (*object*) –
- **[].advanced_settings** (*object*) –
- **[].allowed_users** (*object*) –
- **[].create_mask** (*string*) –
- **[].directory_mask** (*string*) –
- **[].force_create_mode** (*string*) –
- **[].force_directory_mode** (*string*) –
- **[].guest_ok** (*boolean*) –
- **[].hosts_allow** (*object*) –
- **[].hosts_deny** (*object*) –
- **[].hsm_support** (*boolean*) –
- **[].id** (*integer*) – (read only)
- **[].multi_thread_reads** (*boolean*) –
- **[].multi_thread_writes** (*boolean*) –
- **[].name** (*string*) – (required)
- **[].on_sites** (*object*) –
- **[].path** (*string*) –
- **[].read_only** (*boolean*) – (required)
- **[].root_share_locking** (*boolean*) –
- **[].space** (*integer*) – (required)
- **[].uuid** (*string*) – (read only)
- **[].visible** (*boolean*) – (required)

POST /shares/samba/

Request JSON Object:

- **admin_users** (*object*) –
- **advanced_settings** (*object*) –
- **allowed_users** (*object*) –
- **create_mask** (*string*) –
- **directory_mask** (*string*) –
- **force_create_mode** (*string*) –
- **force_directory_mode** (*string*) –
- **guest_ok** (*boolean*) –
- **hosts_allow** (*object*) –
- **hosts_deny** (*object*) –
- **hsm_support** (*boolean*) –
- **id** (*integer*) – (read only)
- **multi_thread_reads** (*boolean*) –
- **multi_thread_writes** (*boolean*) –
- **name** (*string*) – (required)

- **on_sites** (*object*) –
- **path** (*string*) –
- **read_only** (*boolean*) – (required)
- **root_share_locking** (*boolean*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)
- **visible** (*boolean*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **admin_users** (*object*) –
- **advanced_settings** (*object*) –
- **allowed_users** (*object*) –
- **create_mask** (*string*) –
- **directory_mask** (*string*) –
- **force_create_mode** (*string*) –
- **force_directory_mode** (*string*) –
- **guest_ok** (*boolean*) –
- **hosts_allow** (*object*) –
- **hosts_deny** (*object*) –
- **hsm_support** (*boolean*) –
- **id** (*integer*) – (read only)
- **multi_thread_reads** (*boolean*) –
- **multi_thread_writes** (*boolean*) –
- **name** (*string*) – (required)
- **on_sites** (*object*) –
- **path** (*string*) –
- **read_only** (*boolean*) – (required)
- **root_share_locking** (*boolean*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)
- **visible** (*boolean*) – (required)

`GET /shares/samba/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this samba share.

Status Codes:

- 200 OK –

Response JSON Object:

- **admin_users** (*object*) –
- **advanced_settings** (*object*) –
- **allowed_users** (*object*) –
- **create_mask** (*string*) –
- **directory_mask** (*string*) –
- **force_create_mode** (*string*) –
- **force_directory_mode** (*string*) –
- **guest_ok** (*boolean*) –
- **hosts_allow** (*object*) –
- **hosts_deny** (*object*) –
- **hsm_support** (*boolean*) –

- **id** (*integer*) – (read only)
- **multi_thread_reads** (*boolean*) –
- **multi_thread_writes** (*boolean*) –
- **name** (*string*) – (required)
- **on_sites** (*object*) –
- **path** (*string*) –
- **read_only** (*boolean*) – (required)
- **root_share_locking** (*boolean*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)
- **visible** (*boolean*) – (required)

`PATCH /shares/samba/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this samba share.

Request JSON Object:

- **admin_users** (*object*) –
- **advanced_settings** (*object*) –
- **allowed_users** (*object*) –
- **create_mask** (*string*) –
- **directory_mask** (*string*) –
- **force_create_mode** (*string*) –
- **force_directory_mode** (*string*) –
- **guest_ok** (*boolean*) –
- **hosts_allow** (*object*) –
- **hosts_deny** (*object*) –
- **hsm_support** (*boolean*) –
- **id** (*integer*) – (read only)
- **multi_thread_reads** (*boolean*) –
- **multi_thread_writes** (*boolean*) –
- **name** (*string*) – (required)
- **on_sites** (*object*) –
- **path** (*string*) –
- **read_only** (*boolean*) – (required)
- **root_share_locking** (*boolean*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)
- **visible** (*boolean*) – (required)

Status Codes:

- 200 OK –

Response JSON Object:

- **admin_users** (*object*) –
- **advanced_settings** (*object*) –
- **allowed_users** (*object*) –
- **create_mask** (*string*) –
- **directory_mask** (*string*) –
- **force_create_mode** (*string*) –
- **force_directory_mode** (*string*) –
- **guest_ok** (*boolean*) –
- **hosts_allow** (*object*) –

- **hosts_deny** (*object*) –
- **hsm_support** (*boolean*) –
- **id** (*integer*) – (read only)
- **multi_thread_reads** (*boolean*) –
- **multi_thread_writes** (*boolean*) –
- **name** (*string*) – (required)
- **on_sites** (*object*) –
- **path** (*string*) –
- **read_only** (*boolean*) – (required)
- **root_share_locking** (*boolean*) –
- **space** (*integer*) – (required)
- **uuid** (*string*) – (read only)
- **visible** (*boolean*) – (required)

`DELETE /shares/samba/{id}/`

Parameters:

- **id** (*integer*) – A unique integer value identifying this samba share.

Status Codes:

- 204 No Content –

`GET /sitelinks/`

API endpoint for managing sitelinks.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **site_id** (*integer*) – Site ID
- **datastore_id** (*integer*) – Data store ID

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].datastore** (*string*) – (required)
- **results[].datastore_path** (*string*) – (required)
- **results[].id** (*integer*) – (read only)
- **results[].site** (*string*) – (required)
- **results[].site_path** (*string*) – (required)
- **results[].url** (*string*) – (read only)

`POST /sitelinks/`

API endpoint for managing sitelinks.

Request JSON Object:

- **datastore** (*string*) – (required)

- **datastore_path** (*string*) – (required)
- **id** (*integer*) – (read only)
- **site** (*string*) – (required)
- **site_path** (*string*) – (required)
- **url** (*string*) – (read only)

Status Codes:

- 201 Created –

Response JSON Object:

- **datastore** (*string*) – (required)
- **datastore_path** (*string*) – (required)
- **id** (*integer*) – (read only)
- **site** (*string*) – (required)
- **site_path** (*string*) – (required)
- **url** (*string*) – (read only)

`GET /sitelinks/{id}/`

API endpoint for managing sitelinks.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **datastore** (*string*) – (required)
- **datastore_path** (*string*) – (required)
- **id** (*integer*) – (read only)
- **site** (*string*) – (required)
- **site_path** (*string*) – (required)
- **url** (*string*) – (read only)

`PATCH /sitelinks/{id}/`

API endpoint for managing sitelinks.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **datastore** (*string*) – (required)
- **datastore_path** (*string*) – (required)
- **id** (*integer*) – (read only)
- **site** (*string*) – (required)
- **site_path** (*string*) – (required)
- **url** (*string*) – (read only)

Status Codes:

- 200 OK –

Response JSON Object:

- **datastore** (*string*) – (required)
- **datastore_path** (*string*) – (required)
- **id** (*integer*) – (read only)
- **site** (*string*) – (required)
- **site_path** (*string*) – (required)

- **url** (*string*) – (read only)

`DELETE /sitelinks/{id}/`

API endpoint for managing sitelinks.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /sites/`

API endpoint for managing sites.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **results[].bandwidth** (*integer*) – speed for site (in Mb/s)
- **results[].color[]** (*integer*) –
- **results[].directories_count** (*integer*) – How many directories this site has
- **results[].editable** (*string*) – (read only)
- **results[].files_count** (*integer*) – How many files this site has
- **results[].files_hydrated_count** (*integer*) – How many files hydrated this site has
- **results[].files_stubbed_count** (*integer*) – How many files stubbed this site has
- **results[].id** (*integer*) – (read only)
- **results[].label** (*string*) – Human readable name for this site
- **results[].name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **results[].public_url** (*string*) – The base URL by which this site can be reached
- **results[].ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **results[].shortcode** (*string*) – Shortcode
- **results[].spaces[]** (*string*) –
- **results[].timezone** (*string*) –
- **results[].type** (*string*) – Type indicating where the site (pixstor) is deployed
- **results[].url** (*string*) – (read only)

POST /sites/

API endpoint for managing sites.

Request JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **elasticsearch_url** (*string*) – URL of the Elasticsearch server to use for the Analytics search backend on this site
- **enable_auto_file_batch_sizing** (*boolean*) – If optimal batch size should be determined at runtime.
- **exclude** (*object*) – Global workflow excludes for this site
- **file_batch_gb** (*integer*) – File batch GB
- **file_batch_size** (*integer*) – File batch size
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **gpfs_iscan_buckets** (*integer*) – Number of buckets to use for the gpfs snapdiff policy
- **gpfs_iscan_threads** (*integer*) – Number of threads to use for the gpfs snapdiff policy
- **id** (*integer*) – (read only)
- **include** (*object*) – Global workflow includes for this site
- **label** (*string*) – Human readable name for this site
- **lock_threshold** (*integer*) – Threshold for soft locking snapshot rotations
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **pixstor_search_url** (*string*) – The base URL for querying the PixStor API
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode (required)
- **spaces[]** (*string*) –
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed

Status Codes:

- 201 Created –

Response JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **editable** (*string*) – (read only)
- **elasticsearch_url** (*string*) – URL of the Elasticsearch server to use for the Analytics search backend on this site
- **enable_auto_file_batch_sizing** (*boolean*) – If optimal batch size should be determined at runtime.
- **exclude** (*object*) – Global workflow excludes for this site
- **file_batch_gb** (*integer*) – File batch GB

- **file_batch_size** (*integer*) – File batch size
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **gpfs_iscan_buckets** (*integer*) – Number of buckets to use for the gpfs snapdiff policy
- **gpfs_iscan_threads** (*integer*) – Number of threads to use for the gpfs snapdiff policy
- **id** (*integer*) – (read only)
- **include** (*object*) – Global workflow includes for this site
- **label** (*string*) – Human readable name for this site
- **lock_threshold** (*integer*) – Threshold for soft locking snapshot rotations
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **pixstor_search_url** (*string*) – The base URL for querying the PixStor API
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[].id** (*integer*) – (read only)
- **spaces[].name** (*string*) – Space Name (required)
- **spaces[].url** (*string*) – (read only)
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed
- **url** (*string*) – (read only)

`GET /sites/{id}/`

API endpoint for managing sites.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **editable** (*string*) – (read only)
- **elasticsearch_url** (*string*) – URL of the Elasticsearch server to use for the Analytics search backend on this site
- **enable_auto_file_batch_sizing** (*boolean*) – If optimal batch size should be determined at runtime.
- **exclude** (*object*) – Global workflow excludes for this site
- **file_batch_gb** (*integer*) – File batch GB
- **file_batch_size** (*integer*) – File batch size
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **gpfs_iscan_buckets** (*integer*) – Number of buckets to use for the gpfs snapdiff policy

- **gpfs_iscan_threads** (*integer*) – Number of threads to use for the gpfs snapdiff policy
- **id** (*integer*) – (read only)
- **include** (*object*) – Global workflow includes for this site
- **label** (*string*) – Human readable name for this site
- **lock_threshold** (*integer*) – Threshold for soft locking snapshot rotations
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **pixstor_search_url** (*string*) – The base URL for querying the PixStor API
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[].id** (*integer*) – (read only)
- **spaces[].name** (*string*) – Space Name (required)
- **spaces[].url** (*string*) – (read only)
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed
- **url** (*string*) – (read only)

`PATCH /sites/{id}/`

API endpoint for managing sites.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **elasticsearch_url** (*string*) – URL of the Elasticsearch server to use for the Analytics search backend on this site
- **enable_auto_file_batch_sizing** (*boolean*) – If optimal batch size should be determined at runtime.
- **exclude** (*object*) – Global workflow excludes for this site
- **file_batch_gb** (*integer*) – File batch GB
- **file_batch_size** (*integer*) – File batch size
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **gpfs_iscan_buckets** (*integer*) – Number of buckets to use for the gpfs snapdiff policy
- **gpfs_iscan_threads** (*integer*) – Number of threads to use for the gpfs snapdiff policy
- **id** (*integer*) – (read only)
- **include** (*object*) – Global workflow includes for this site
- **label** (*string*) – Human readable name for this site
- **lock_threshold** (*integer*) – Threshold for soft locking snapshot rotations
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+
- **pixstor_search_url** (*string*) – The base URL for querying the PixStor API
- **public_url** (*string*) – The base URL by which this site can be reached

- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[]** (*string*) –
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed

Status Codes:

- 200 OK –

Response JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **editable** (*string*) – (read only)
- **elasticsearch_url** (*string*) – URL of the Elasticsearch server to use for the Analytics search backend on this site
- **enable_auto_file_batch_sizing** (*boolean*) – If optimal batch size should be determined at runtime.
- **exclude** (*object*) – Global workflow excludes for this site
- **file_batch_gb** (*integer*) – File batch GB
- **file_batch_size** (*integer*) – File batch size
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **gpfs_iscan_buckets** (*integer*) – Number of buckets to use for the gpfs snapdiff policy
- **gpfs_iscan_threads** (*integer*) – Number of threads to use for the gpfs snapdiff policy
- **id** (*integer*) – (read only)
- **include** (*object*) – Global workflow includes for this site
- **label** (*string*) – Human readable name for this site
- **lock_threshold** (*integer*) – Threshold for soft locking snapshot rotations
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **pixstor_search_url** (*string*) – The base URL for querying the PixStor API
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[].id** (*integer*) – (read only)
- **spaces[].name** (*string*) – Space Name (required)
- **spaces[].url** (*string*) – (read only)
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed
- **url** (*string*) – (read only)

`DELETE /sites/{id}/`

API endpoint for managing sites.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /sites/{id}/health/`

API endpoint for managing sites.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **editable** (*string*) – (read only)
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **id** (*integer*) – (read only)
- **label** (*string*) – Human readable name for this site
- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[]** (*string*) –
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed
- **url** (*string*) – (read only)

`POST /sites/{id}/refresh/`

API endpoint for managing sites.

Parameters:

- **id** (*string*) –

Status Codes:

- 201 Created –

Response JSON Object:

- **am_i_configured** (*boolean*) – Boolean field determining if UI has been configured for the site
- **bandwidth** (*integer*) – speed for site (in Mb/s)
- **color[]** (*integer*) –
- **directories_count** (*integer*) – How many directories this site has
- **editable** (*string*) – (read only)
- **files_count** (*integer*) – How many files this site has
- **files_hydrated_count** (*integer*) – How many files hydrated this site has
- **files_stubbed_count** (*integer*) – How many files stubbed this site has
- **id** (*integer*) – (read only)
- **label** (*string*) – Human readable name for this site

- **name** (*string*) – Site Name. Must match [a-zA-Z0-9-_]+ (required)
- **public_url** (*string*) – The base URL by which this site can be reached
- **ready_to_configure** (*boolean*) – Boolean to check if site is ready to configure
- **shortcode** (*string*) – Shortcode
- **spaces[]** (*string*) –
- **timezone** (*string*) –
- **type** (*string*) – Type indicating where the site (pixstor) is deployed
- **url** (*string*) – (read only)

`GET /sites/{id}/settings/`

API endpoint for managing sites.

Parameters:
- **id** (*string*) –

Query Parameters:
- **flat** (*boolean*) – Return flat dict

Status Codes:
- 200 OK –

Response JSON Object:
- **[].desc** (*string*) – (read only)
- **[].id** (*integer*) – (read only)
- **[].key** (*string*) – (required)
- **[].value** (*object*) –

`PATCH /sites/{id}/settings/`

API to set a setting or a group of settings associated with a site. A group of settings should be sent in key-value schema. Terminology Setting - An individual setting e.g. sambda:realm

Parameters:
- **id** (*string*) –

Request JSON Object:
- **values[].desc** (*string*) – (read only)
- **values[].id** (*integer*) – (read only)
- **values[].key** (*string*) – (required)
- **values[].value** (*object*) –

Status Codes:
- 202 Accepted – Task id of the task fired for the associated request.

`POST /sites/{id}/settings/refresh/`

Refresh settings for a given site under management. This API will also create settings in the hub for this site if they don't already exist.

Parameters:
- **id** (*string*) –

Status Codes:
- 202 Accepted – Task id of the task fired for the associated request.

`GET /spaces/`

Model View Set for filebrowser's Space model.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **site_id** (*integer*) – Site ID
- **search_keyword** (*string*) – Keyword to filter by

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].color[]** (*integer*) –
- **results[].created** (*string*) – Time of the job creation (read only)
- **results[].editable** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].immutable** (*boolean*) – Space that once created cannot be deleted or updated. Usually the default space.
- **results[].is_ready** (*string*) – (read only)
- **results[].mountpoint** (*string*) – Mount point (required)
- **results[].name** (*string*) – Space Name (required)
- **results[].nested_shares** (*string*) – (read only)
- **results[].on_sites** (*object*) –
- **results[].permission_mode** (*string*) – Ability to set the permission mode on a space
- **results[].relationships** (*string*) – (read only)
- **results[].sites[].id** (*string*) – (read only)
- **results[].sites[].label** (*string*) – (required)
- **results[].sites[].name** (*string*) – (required)
- **results[].sites[].pool** (*string*) – (read only)
- **results[].sites[].usage[]** (*integer*) –
- **results[].size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **results[].snapshot_schedule.duration** (*string*) – (required)
- **results[].snapshot_schedule.frequency** (*string*) – (required)
- **results[].snapshot_schedule.id** (*integer*) – (read only)
- **results[].snapshot_schedule.space** (*integer*) –
- **results[].snapshot_schedule.time** (*string*) – (required)
- **results[].url** (*string*) – (read only)
- **results[].uuid** (*string*) – (read only)

POST /spaces/

Model View Set for filebrowser's Space model.

Request JSON Object:

- **color[]** (*integer*) –

- **created** (*string*) – Time of the job creation (read only)
- **mountpoint** (*string*) – (required)
- **name** (*string*) – (required)
- **permission_mode** (*string*) – Ability to set the permission mode on a space
- **sites[].id** (*string*) – (read only)
- **sites[].label** (*string*) – (required)
- **sites[].name** (*string*) – (required)
- **sites[].pool** (*string*) – (read only)
- **sites[].usage[]** (*integer*) –
- **size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **snapshot_schedule.duration** (*string*) – (required)
- **snapshot_schedule.frequency** (*string*) – (required)
- **snapshot_schedule.id** (*integer*) – (read only)
- **snapshot_schedule.space** (*integer*) –
- **snapshot_schedule.time** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **color[]** (*integer*) –
- **created** (*string*) – Time of the job creation (read only)
- **editable** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **immutable** (*boolean*) – Space that once created cannot be deleted or updated. Usually the default space.
- **is_ready** (*string*) – (read only)
- **mountpoint** (*string*) – Mount point (required)
- **name** (*string*) – Space Name (required)
- **nested_shares** (*string*) – (read only)
- **on_sites** (*object*) –
- **permission_mode** (*string*) – Ability to set the permission mode on a space
- **relationships** (*string*) – (read only)
- **sites[].id** (*string*) – (read only)
- **sites[].label** (*string*) – (required)
- **sites[].name** (*string*) – (required)
- **sites[].pool** (*string*) – (read only)
- **sites[].usage[]** (*integer*) –
- **size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **snapshot_schedule.duration** (*string*) – (required)
- **snapshot_schedule.frequency** (*string*) – (required)
- **snapshot_schedule.id** (*integer*) – (read only)
- **snapshot_schedule.space** (*integer*) –
- **snapshot_schedule.time** (*string*) – (required)
- **url** (*string*) – (read only)
- **uuid** (*string*) – (read only)

`GET /spaces/{id}/`

Model View Set for filebrowser's Space model.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **color[]** (*integer*) –
- **created** (*string*) – Time of the job creation (read only)
- **editable** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **immutable** (*boolean*) – Space that once created cannot be deleted or updated. Usually the default space.
- **is_ready** (*string*) – (read only)
- **mountpoint** (*string*) – Mount point (required)
- **name** (*string*) – Space Name (required)
- **nested_shares** (*string*) – (read only)
- **on_sites** (*object*) –
- **permission_mode** (*string*) – Ability to set the permission mode on a space
- **relationships** (*string*) – (read only)
- **sites[].id** (*string*) – (read only)
- **sites[].label** (*string*) – (required)
- **sites[].name** (*string*) – (required)
- **sites[].pool** (*string*) – (read only)
- **sites[].usage[]** (*integer*) –
- **size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **snapshot_schedule.duration** (*string*) – (required)
- **snapshot_schedule.frequency** (*string*) – (required)
- **snapshot_schedule.id** (*integer*) – (read only)
- **snapshot_schedule.space** (*integer*) –
- **snapshot_schedule.time** (*string*) – (required)
- **url** (*string*) – (read only)
- **uuid** (*string*) – (read only)

`PATCH /spaces/{id}/`

Model View Set for filebrowser’s Space model.

Parameters:

- **id** (*string*) –

Request JSON Object:

- **color[]** (*integer*) –
- **created** (*string*) – Time of the job creation (read only)
- **mountpoint** (*string*) – Mount point (read only)
- **name** (*string*) –
- **permission_mode** (*string*) – Ability to set the permission mode on a space
- **sites[].id** (*string*) – (read only)
- **sites[].label** (*string*) – (required)
- **sites[].name** (*string*) – (required)
- **sites[].pool** (*string*) – (read only)
- **sites[].usage[]** (*integer*) –

- **size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **snapshot_schedule.duration** (*string*) – (required)
- **snapshot_schedule.frequency** (*string*) – (required)
- **snapshot_schedule.id** (*integer*) – (read only)
- **snapshot_schedule.space** (*integer*) –
- **snapshot_schedule.time** (*string*) – (required)

Status Codes:

- 200 OK –

Response JSON Object:

- **color[]** (*integer*) –
- **created** (*string*) – Time of the job creation (read only)
- **editable** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **immutable** (*boolean*) – Space that once created cannot be deleted or updated. Usually the default space.
- **is_ready** (*string*) – (read only)
- **mountpoint** (*string*) – Mount point (required)
- **name** (*string*) – Space Name (required)
- **nested_shares** (*string*) – (read only)
- **on_sites** (*object*) –
- **permission_mode** (*string*) – Ability to set the permission mode on a space
- **relationships** (*string*) – (read only)
- **sites[].id** (*string*) – (read only)
- **sites[].label** (*string*) – (required)
- **sites[].name** (*string*) – (required)
- **sites[].pool** (*string*) – (read only)
- **sites[].usage[]** (*integer*) –
- **size** (*integer*) – Space size quota in bytes. No value specified, means as large as your system allows.
- **snapshot_schedule.duration** (*string*) – (required)
- **snapshot_schedule.frequency** (*string*) – (required)
- **snapshot_schedule.id** (*integer*) – (read only)
- **snapshot_schedule.space** (*integer*) –
- **snapshot_schedule.time** (*string*) – (required)
- **url** (*string*) – (read only)
- **uuid** (*string*) – (read only)

`DELETE /spaces/{id}/`

Model View Set for filebrowser's Space model.

Parameters:

- **id** (*string*) –

Status Codes:

- 204 No Content –

`GET /spaces/{id}/files/`

Model View Set for filebrowser's Space model.

Parameters:

- **id** (*string*) –

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **site** (*string*) – Site to run the stat operation on if provided, otherwise all space's sites
- **path** (*string*) – Path to retrieve stat
- **details** (*boolean*) – Retrieve all the details of the children files
- **restricted** (*boolean*) – Include restricted objects
- **check_available_sites** (*boolean*) – Check only available sites
- **custom_refresh_period** (*integer*) – Custom time in seconds to invalidate the DB cache
- **custom_timeout** (*integer*) – Custom time in seconds to invalidate the task
- **raise_exception** (*boolean*) – Raise exception if timeout
- **type** (*string*) – item type

Status Codes:

- 200 OK –

Response JSON Object:

- **atime** (*string*) –
- **children** (*string*) – (read only)
- **ctime** (*string*) –
- **data_size** (*integer*) –
- **deleted** (*boolean*) –
- **disk_usage** (*integer*) –
- **error** (*string*) – Failed to fetch file data error
- **image_preview** (*string*) – Relative URL of an image preview
- **metadata** (*object*) –
- **mtime** (*string*) –
- **name** (*string*) – Name of of the fs object
- **path** (*string*) – Path of the object (required)
- **path_depth** (*integer*) –
- **remote_locations** (*object*) –
- **restricted** (*boolean*) –
- **site** (*string*) – (read only)
- **size** (*integer*) –
- **status** (*string*) – Migration status
- **thumbnail** (*string*) – Relative URL of an object thumbnail
- **time_refreshed** (*string*) –
- **total_files** (*integer*) – Only applies to directories
- **type** (*string*) –
- **url** (*string*) – (read only)
- **video_preview** (*string*) – Relative URL of a video preview

GET /storagepools/

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].capacity** (*integer*) – Capacity of storage pool (required)
- **results[].filesystem** (*string*) – Storage pool filesystem (required)
- **results[].free_space** (*integer*) – Free space of storage pool (required)
- **results[].is_default** (*boolean*) – Check if default pool
- **results[].name** (*string*) – Name storage pool (required)
- **results[].site** (*integer*) – Site correlated with storage object (required)
- **results[].used_space** (*integer*) – Used space of storage pool (required)

`GET /storagepools/{id}/`

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **capacity** (*integer*) – Capacity of storage pool (required)
- **filesystem** (*string*) – Storage pool filesystem (required)
- **free_space** (*integer*) – Free space of storage pool (required)
- **is_default** (*boolean*) – Check if default pool
- **name** (*string*) – Name storage pool (required)
- **site** (*integer*) – Site correlated with storage object (required)
- **used_space** (*integer*) – Used space of storage pool (required)

`GET /tags/`

API endpoint for search tags

Query Parameters:

- **filter** (*string*) – substring that returned tags must contain

Status Codes:

- 200 OK –

Response JSON Object:

- **[].name** (*string*) – (required)

`GET /tasks/`

API endpoint for viewing tasks.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **tasktype** (*string*) – Task type
- **task_id** (*string*) – Task Id
- **state** (*array*) – Task states
- **job_id** (*integer*) – Job ID
- **internal** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].dynamic_parents[]** (*integer*) –
- **results[].id** (*integer*) – (read only)
- **results[].job** (*integer*) – (required)
- **results[].parents** (*string*) – (read only)
- **results[].site** (*string*) – (required)
- **results[].started** (*string*) – Time that the task started running
- **results[].state** (*string*) –
- **results[].task_id** (*string*) – Celery task ID
- **results[].tasktype** (*string*) – (required)
- **results[].url** (*string*) – (read only)

`GET /tasks/{id}/`

API endpoint for viewing tasks.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **completed** (*string*) – Time of the task completion
- **dynamic_parents[]** (*integer*) –
- **friendly_name** (*string*) – Text to be used to describe what this task is doing.
- **id** (*integer*) – (read only)
- **job** (*integer*) – (required)
- **parents** (*string*) – (read only)
- **paths** (*string*) – (read only)
- **result** (*object*) –
- **runtime** (*string*) – (read only)
- **site** (*string*) – (required)
- **started** (*string*) – Time that the task started running
- **state** (*string*) –

- **task_id** (*string*) – Celery task ID
- **tasktype** (*string*) – (required)
- **url** (*string*) – (read only)

`GET /tasks/{id}/files/`

API endpoint for viewing tasks.

Parameters:
- **id** (*string*) –

Query Parameters:
- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.
- **state** (*string*) –
- **type** (*string*) –
- **site** (*string*) –

Status Codes:
- 200 OK –

Response JSON Object:
- **completed** (*string*) – Time of the task completion
- **dynamic_parents[]** (*integer*) –
- **friendly_name** (*string*) – Text to be used to describe what this task is doing.
- **id** (*integer*) – (read only)
- **job** (*integer*) – (required)
- **parents** (*string*) – (read only)
- **paths** (*string*) – (read only)
- **result** (*object*) –
- **runtime** (*string*) – (read only)
- **site** (*string*) – (required)
- **started** (*string*) – Time that the task started running
- **state** (*string*) –
- **task_id** (*string*) – Celery task ID
- **tasktype** (*string*) – (required)
- **url** (*string*) – (read only)

`GET /users/`

API endpoint for managing users.

Query Parameters:
- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].date_joined** (*string*) –
- **results[].email** (*string*) –
- **results[].first_name** (*string*) –
- **results[].groups[].id** (*integer*) – (read only)
- **results[].groups[].name** (*string*) – (required)
- **results[].groups[].url** (*string*) – (read only)
- **results[].id** (*integer*) – (read only)
- **results[].is_active** (*boolean*) – Designates whether this user should be treated as active. Unselect this instead of deleting accounts.
- **results[].last_login** (*string*) –
- **results[].last_name** (*string*) –
- **results[].nas_user.allow_ssh** (*boolean*) –
- **results[].nas_user.primary_group** (*string*) – (required)
- **results[].nas_user.uid** (*integer*) – UID number for the user. This is automatically generated. And cannot be changed (read only)
- **results[].profile.country** (*string*) – User's country
- **results[].profile.default_site** (*integer*) –
- **results[].profile.department** (*string*) – Name of the department user is working in
- **results[].profile.home_site** (*integer*) –
- **results[].profile.line_manager** (*string*) – Name of the line manager of the user
- **results[].profile.phone** (*string*) – User's phone number
- **results[].profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'
- **results[].url** (*string*) – (read only)
- **results[].username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`POST /users/`

API endpoint for managing users.

Request JSON Object:

- **email** (*string*) –
- **first_name** (*string*) –
- **groups[]** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **password** (*string*) – (required)
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –

- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'
- **username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **email** (*string*) –
- **first_name** (*string*) –
- **groups[]** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **password** (*string*) – (required)
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –
- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'
- **username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`POST /users/change_password/`

API endpoint for managing users.

Request JSON Object:

- **new_password** (*string*) – (required)
- **old_password** (*string*) – (required)

Status Codes:

- 201 Created –

Response JSON Object:

- **new_password** (*string*) – (required)
- **old_password** (*string*) – (required)

`POST /users/sync/`

API to sync nas users on each site

Status Codes:

- 201 Created –

Response JSON Object:

- **date_joined** (*string*) –
- **email** (*string*) –
- **first_name** (*string*) –
- **groups[].id** (*integer*) – (read only)
- **groups[].name** (*string*) – (required)
- **groups[].url** (*string*) – (read only)
- **id** (*integer*) – (read only)

- **is_active** (*boolean*) – Designates whether this user should be treated as active. Unselect this instead of deleting accounts.
- **last_login** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **nas_user.uid** (*integer*) – UID number for the user. This is automatically generated. And cannot be changed (read only)
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –
- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'
- **url** (*string*) – (read only)
- **username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`GET /users/{username}/`

API endpoint for managing users.

Parameters:

- **username** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **date_joined** (*string*) –
- **email** (*string*) –
- **first_name** (*string*) –
- **groups[].id** (*integer*) – (read only)
- **groups[].name** (*string*) – (required)
- **groups[].url** (*string*) – (read only)
- **id** (*integer*) – (read only)
- **is_active** (*boolean*) – Designates whether this user should be treated as active. Unselect this instead of deleting accounts.
- **last_login** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **nas_user.uid** (*integer*) – UID number for the user. This is automatically generated. And cannot be changed (read only)
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –
- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'
- **url** (*string*) – (read only)

- **username** (*string*) – Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only. (required)

`PATCH /users/{username}/`

API endpoint for managing users.

Parameters:
- **username** (*string*) –

Request JSON Object:
- **email** (*string*) –
- **first_name** (*string*) –
- **groups[]** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **password** (*string*) –
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –
- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'

Status Codes:
- 200 OK –

Response JSON Object:
- **email** (*string*) –
- **first_name** (*string*) –
- **groups[]** (*string*) –
- **last_name** (*string*) –
- **nas_user.allow_ssh** (*boolean*) –
- **nas_user.primary_group** (*string*) – (required)
- **password** (*string*) –
- **profile.country** (*string*) – User's country
- **profile.default_site** (*integer*) –
- **profile.department** (*string*) – Name of the department user is working in
- **profile.home_site** (*integer*) –
- **profile.line_manager** (*string*) – Name of the line manager of the user
- **profile.phone** (*string*) – User's phone number
- **profile.timezone** (*string*) – Timezone in a string format e.g. 'Europe/London'

`DELETE /users/{username}/`

API endpoint for managing users.

Parameters:
- **username** (*string*) –

Status Codes:
- 204 No Content –

`POST /users/{username}/activate/`

Activates user account with given username.

Parameters:

- **username** (*string*) –

Status Codes:

- 201 Created –

`POST /users/{username}/deactivate/`

Deactivates user account with given username.

Parameters:

- **username** (*string*) –

Status Codes:

- 201 Created –

`GET /workflows/`

API endpoint for viewing workflows.

Query Parameters:

- **page** (*integer*) – A page number within the paginated result set. When not given, first page is retrieved by default.
- **page_size** (*integer*) – Number of results to return per page. Page size parameter can be a number between `20` and `100`. For disabling pagination and retrieving all results, `0` should be given. When page size parameter is empty or `<20`, `20` results are returned by default. When page size parameter `>100`, `100` results are returned by default.

Status Codes:

- 200 OK –

Response JSON Object:

- **count** (*integer*) – (required)
- **next** (*string*) –
- **previous** (*string*) –
- **results[].discovery** (*string*) –
- **results[].discovery_options** (*object*) –
- **results[].enabled** (*boolean*) – Is the workflow available for use?
- **results[].external_only** (*boolean*) – Signifies that the workflow is only allowed to operate on external targets
- **results[].fields** (*object*) –
- **results[].filter_rules** (*object*) –
- **results[].icon_classes** (*object*) –
- **results[].id** (*integer*) – (read only)
- **results[].label** (*string*) – Friendly name of the workflow (required)
- **results[].name** (*string*) – Name of Workflow (required)
- **results[].preferred_queue** (*string*) – Preferred queue for this workflow
- **results[].schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **results[].visible** (*boolean*) – Is the workflow visible on the UI?

`POST /workflows/`

API endpoint for viewing workflows.

Request JSON Object:

- **discovery** (*string*) –

- **discovery_options** (*object*) –
- **enabled** (*boolean*) – Is the workflow available for use?
- **external_only** (*boolean*) – Signifies that the workflow is only allowed to operate on external targets
- **fields** (*object*) –
- **filter_rules** (*object*) –
- **icon_classes** (*object*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Friendly name of the workflow (required)
- **name** (*string*) – Name of Workflow (required)
- **preferred_queue** (*string*) – Preferred queue for this workflow
- **schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **visible** (*boolean*) – Is the workflow visible on the UI?

Status Codes:

- 201 Created –

Response JSON Object:

- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – Is the workflow available for use?
- **external_only** (*boolean*) – Signifies that the workflow is only allowed to operate on external targets
- **fields** (*object*) –
- **filter_rules** (*object*) –
- **icon_classes** (*object*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Friendly name of the workflow (required)
- **name** (*string*) – Name of Workflow (required)
- **preferred_queue** (*string*) – Preferred queue for this workflow
- **schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **visible** (*boolean*) – Is the workflow visible on the UI?

`GET /workflows/{id}/`

API endpoint for viewing workflows.

Parameters:

- **id** (*string*) –

Status Codes:

- 200 OK –

Response JSON Object:

- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – Is the workflow available for use?
- **external_only** (*boolean*) – Signifies that the workflow is only allowed to operate on external targets
- **fields** (*object*) –
- **filter_rules** (*object*) –
- **icon_classes** (*object*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Friendly name of the workflow (required)
- **name** (*string*) – Name of Workflow (required)

- **preferred_queue** (*string*) – Preferred queue for this workflow
- **schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **visible** (*boolean*) – Is the workflow visible on the UI?

PATCH /workflows/{id}/

API endpoint for viewing workflows.

Parameters:
- **id** (*string*) –

Request JSON Object:
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – Is the workflow available for use?
- **fields** (*object*) –
- **filter_rules** (*object*) –
- **icon_classes** (*object*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Friendly name of the workflow (required)
- **name** (*string*) – Name of Workflow (required)
- **preferred_queue** (*string*) – Preferred queue for this workflow
- **schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **visible** (*boolean*) – Is the workflow visible on the UI?

Status Codes:
- 200 OK –

Response JSON Object:
- **discovery** (*string*) –
- **discovery_options** (*object*) –
- **enabled** (*boolean*) – Is the workflow available for use?
- **fields** (*object*) –
- **filter_rules** (*object*) –
- **icon_classes** (*object*) –
- **id** (*integer*) – (read only)
- **label** (*string*) – Friendly name of the workflow (required)
- **name** (*string*) – Name of Workflow (required)
- **preferred_queue** (*string*) – Preferred queue for this workflow
- **schedule_only** (*boolean*) – Workflow only callable inside of a schedule
- **visible** (*boolean*) – Is the workflow visible on the UI?

DELETE /workflows/{id}/

API endpoint for viewing workflows.

Parameters:
- **id** (*string*) –

Status Codes:
- 204 No Content –

Tools

The following sections document add-on tools for Ngenea Hub

ngclient

NGCLIENT

SYNOPSIS

ngclient authenticate (-u USERNAME [-p PASSWORD] | -T TOKEN) [-k NAME]

ngclient migrate *path...* [-s *site*] [-r] [-p] [options...]

ngclient recall *path...* [-s *site*] [-r] [options...]

ngclient send *path...* [-s *source*] -t *target* [options...]

ngclient workflows *COMMAND*

ngclient features *COMMAND*

DESCRIPTION

ngclient is a CLI wrapper for the default Ngenea Hub workflows - migrate, recall, and send. It also provides a mechanism for generating authentication tokens.

ngclient settings can be read from a config file, rather than being passed on the command line. See **ngenea-client.conf(5)** for more information on the configuration format. CLI flags take precedence over config file settings.

The *authenticate* command can be used to generate a client key from a username or access token. The generated client key will be printed to stdout. That client key can then be used with the workflow sub-commands, either via the *–client-key* flag, or by saving it to the **ngenea-client.conf(5)** configuration file.

The *workflows* command group contains sub-commands for interacting with workflows, such as listing workflows and importing new one. See **ngclient-workflows(1)** for more details.

The *features* command group contains sub-commands for listing, enabling, or disabling feature flags. See **ngclient-features(1)** for more details.

OPTION SUMMARY

```
      path...                          One paths to call the workflow
on

-T, --access-token TOKEN               Access token to authenticate
with
-u, --username USERNAME                Username to authenticate with
-p, --password PASSWORD                Password for the authentication
username
-k, --key-name NAME                    Unique name for the client key
```

```
    --base-url                      Base URL of the
{{ brand_name }} API

-c, --config CONFIG                 Alternative configuration file
path
    --client-key KEY                Client API key to authenticate
with
-D, --no-verify                     Disable TLS verification

-s, --site SITE                     Site to perform the workflow on
-t, --target TARGET                 Site to send files to

-q, --queue QUEUE                   Queue to perform the workflow
on
-Q, --target-queue TARGETQUEUE      Queue to send files to

-d, --no-wait                       Exit after job is submitted,
don't wait for it to complete
    --timeout SECONDS               wait for completion timeout. If
not set, wait indefinitely

-r, --recursive                     Perform task recursively.
-p, --premigrate                    Premigrate files from site
-H, --hydrate                       Hydrate files on the send
target site

-h, --help                          Print help message and exit
```

OPTIONS

- **-T**, **–access-token**

  An access token to generate a client key with.

- **-u**, **–username**

  Username to generate a client key with.

- **-p**, **–password**

  Password to use in combination with *–username*

  If *–username* is specified and *–password* isn’t, you will be prompted to enter a password interactively. This may be preferrable so that the password doesn’t appear in shell history.

- **-k**, **–key-name**

  A *unique* name to assign when generating a client key.

  This will be displayed in the Ngenea Hub UI

  If not specified, a random uuid will be generated for the key name.

- **–base-url**

Base URL of the Ngenea Hub API, which operations will be performed against.

This can be used to perform Ngenea Hub operations on a remote server.

If not specified, the default is *http://localhost:8000/api*

- **-c**, **–config**

  The path to an alternative configuration file.

  If not specified, the default configuration paths will be used. The default paths are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

  See **ngenea-client.conf(5)** for more information on the configuration format.

  Command line options take precedence over any corresponding config file settings.

- **-D**, **–no-verify**

  Disables TLS Verification

  By default, **ngclient** will verify TLS certificate at the remote end.

  With this flag, requests made by **ngclient** will accept any TLS certificate presented by the server, and will ignore hostname mismatches and/or expired certificates.

- **–client-key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **-s**, **–site**

  Site to use for workflows.

  For *migrate* and *recall*, this is the site where the workflows execute. For *send*, this is the source site, from which files are sent.

  Site does not have to match the node where **ngclient** is being called. This can be used to migrate/recall/send files from a remote site.

  Note - shell-globbing will be evaluated on the local node. For a remote site, the files that the glob would match may differ.

- **-t**, **–target**

  Target site for the *send* workflow

- **-q**, **–queue**

Queue to use for workflows. By default, source queue is set as *default*

For *migrate* and *recall*, this is the queue where the workflows execute. For *send*, this is the source queue, from which files are sent.

- **-Q**, **–target-queue**

  Target queue for the *send* workflow

  If the target queue is not provided, it will use the source queue. If the source queue is also not provided, the queue will be set to *default*.

- **-d**, **–no-wait**

  Don’t wait for workflows to complete.

  By default, **ngclient** will wait for the workflow to complete, subject to *–timeout*.

  With this flag, **ngclient** will exit immediately. The workflow will continue to execute independently. In that case, the workflow can be monitored in the Ngenea Hub UI

- **–timeout**

  How long to wait for workflows to complete, in seconds.

  If not specified, **ngclient** will wait indefinitely.

  If the workflow doesn’t complete within the timeout, the client will exit with an error. The workflow itself may continue to execute.

- **-r**, **–recursive**

  Migrate or recall files and directories recursively.

- **-p**, **–premigrate**

  Premigrate files

  Premigrated files are migrated, but the data is kept resident.

- **-H**, **–hydrate**

  Controls whether the *send* workflow ‘hydrates’ files on the target.

  If false, files are only reverse stubbed on the target.

- **-h**, **–help**

  Prints the help message.

EXAMPLES

GENERATE A CLIENT KEY

```
$ ngclient authenticate --username pixadmin -k ngclient-pixadmin
pixadmin's password:

jDBh2cRk6.LswQfylT2BtGiqtYUWhMB1iipJmQNgr
```

NOTE: The `authenticate` command doesn't read config values from the config file, so the *–no-verify* and *–base-url* arguments should be passed as cmd arguments if default values aren't required

RECALL A FILE

```
ngclient recall /mmfs1/data/hello.txt -s site1 --client-key jDBh2
cRk6.LswQfylT2BtGiqtYUWhMB1iipJmQNgr
```

For brevity, the *site* and *client-key* can be saved to the config file

PREMIGRATE A DIRECTORY RECURSIVELY

Assuming the site and client key has been saved to the config file

```
ngclient migrate /mmfs1/data/sample_data/cats -p -r
```

SEND A FILE TO A REMOTE SITE

```
ngclient send /mmfs1/data/hello.txt -s site1 -t site2 --hydrate
```

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

The *ngclient* wheel can be installed and run on any operating system.

Note - transparent_recall(1) is packaged along with ngclient, but transparent_recall will only work on Unix-based operating systems.

SEE ALSO

ngenea-client.conf(5), ngclient-workflows(1), ngclient-features(1), transparent_recall(1), ngmigrate(1), ngrecall(1)

LICENSE

NGCLIENT-WORKFLOWS

SYNOPSIS

ngclient workflows list *[workflow-id]* [options...]

ngclient workflows import *workflow-file* [options...]

ngclient workflows update *workflow-id workflow-file* [options...]

ngclient workflows delete *workflow-id* [options...]

DESCRIPTION

The *list* command is used to list one or more existing workflows from Ngenea Hub. By default, workflows are output in json format, one per line. The *–yaml* flag can be used to output as yaml.

The *import* command can be used to import a new, custom workflow from a json or yaml formatted file.

Currently it is not possible to invoke these custom workflows from **ngclient**, once created. They can be invoked from the Ngenea Hub UI or via the REST API.

The *update* command can be used to update an existing workflow from a json or yaml formatted file. The file can contain only the fields you want to change to perform a partial update, or a whole workflow definition for a full replacement.

NOTE - it’s not possible to make partial changes to the *fields* or *filter_rules* blocks. They can only be replaced as a whole.

The *delete* command can be used to delete an existing workflow, by id.

Base URL and API key settings can be read from a config file, rather than being passed on the command line. See **ngenea-client.conf(5)** for more information on the configuration format. CLI flags take precedence over config file settings.

Interacting with workflows requires Ngenea Hub authentication. The **ngclient(1)** *authenticate* command can be used to generate a client key from a username or access token.

OPTION SUMMARY

```
      workflow-id          Unique workflow identifier
      workflow-file        File containing a custom workflow defi
nition

    --yaml                 List workflows in yaml format
```

```
    --base-url              Base URL of the {{ brand_name }} API

-c, --config CONFIG         Alternative configuration file path
    --client-key KEY        Client API key to authenticate with

-h, --help                  Print help message and exit
```

OPTIONS

- **workflow-file**

  Path to a json or yaml formatted file, containing a workflow definition.

  If '-' is used, the workflow definition will be read from stdin.

  The workflow format is described in the main documentation, section *'4.4. Custom Workflows'*

- **–yaml**

  List workflows in yaml format.

  By default, workflows are output in json format, one per line (jsonl).

  The *–yaml* flag will output the workflows in structured yaml format. If multiple workflows are being listed, each one will be separated by a blank line.

- **–base-url**

  Base URL of the Ngenea Hub API, which operations will be performed against.

  This can be used to perform Ngenea Hub operations on a remote server.

  If not specified, the default is *http://localhost:8000/api*

- **-c**, **–config**

  The path to an alternative configuration file.

  If not specified, the default configuration paths will be used. The default paths are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

  See **ngenea-client.conf(5)** for more information on the configuration format.

  Command line options take precedence over any corresponding config file settings.

- **–client-key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **-h**, **–help**

  Prints the help message.

EXAMPLES

GENERATE A CLIENT KEY

```
$ ngclient authenticate --username pixadmin -k ngclient-pixadmin
pixadmin's password:

jDBh2cRk6.LswQfylT2BtGiqtYUWhMB1iipJmQNgr
```

The following examples assume that the client key has been saved in the default config file.

GET AN EXISTING WORKFLOW

```
$ ngclient workflows list 1
{"id": 1, "name": "migrate", "label": "Migrate", "icon_classes":
["fa fa-cloud fa-stack-2x text-success", "fa fa-angle-up fa-
stack-2x text-light"], "discovery": "recursive", "enabled": true,
"visible": true, "fields": [], "filter_rules": [{"type": "all", "
state": "all", "action": [{"name": "dynamo.tasks.migrate"}], "des
cription": "Migrates a file off from a given path"}]}
```

LIST ALL EXISTING WORKFLOWS IN YAML FORMAT

```
$ ngclient workflows list --yaml
id: 1
name: migrate
label: Migrate
discovery: recursive
...
enabled: true
visible: true

id: 2
name: premigrate
label: Premigrate
discovery: recursive
...
enabled: true
visible: true

...
```

(the above example output has been truncated)

IMPORT A CUSTOM WORKFLOW

Using the following workflow definition in json format

```
$ cat overwrite_workflow.json
{"name": "recall_overwrite", "label": "Overwrite On Recall", "ico
n_classes": ["fa fa-cloud fa-stack-2x text-primary", "fa fa-caret-
down fa-stack-2x text-light"], "filter_rules": [{"type": "all", "
state": "all", "action": [{"name": "dynamo.tasks.reverse_stub", "
site": "*destinationsite", "overwrite": true}]}], "fields": [{"na
me": "destinationsite", "type": "enum[site]", "label": "Destinati
on Site", "value": "site"}]}
```

Import the workflow as follows

```
ngclient workflows import overwrite_workflow.json
```

RENAME A WORKFLOW

With the change in yaml format, using '-' to read from stdin

```
echo "name: overwrite_on_recall" | ngclient workflows update 6 -
```

DELETE A WORKFLOW

```
ngclient workflows delete 6
```

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

The *ngclient* wheel can be installed and run on any operating system.

SEE ALSO

ngclient(1), ngenea-client.conf(5)

LICENSE

ngclient-features

NGCLIENT-FEATURES

SYNOPSIS

ngclient features list [options...]

ngclient features enable *name* [options...]

ngclient features disable *name* [options...]

DESCRIPTION

The *list* command is used to list available feature flags for Ngenea Hub.

The *enable* and *disable* commands can be used to enable a named feature in Ngenea Hub.

Base URL and API key settings can be read from a config file, rather than being passed on the command line. See **ngenea-client.conf(5)** for more information on the configuration format. CLI flags take precedence over config file settings.

Interacting with features requires Ngenea Hub authentication. The **ngclient(1)** *auth enticate* command can be used to generate a client key from a username or access token.

OPTION SUMMARY

```
      name                  Name of the feature to enable or disab
le

    --json                  List features in json format

    --base-url              Base URL of the {{ brand_name }} API

-c, --config CONFIG         Alternative configuration file path
    --client-key KEY        Client API key to authenticate with

-h, --help                  Print help message and exit
```

OPTIONS

- **–json**

  List features in json format.

  By default, the *list* command will report features in a table-based format. The *–json* flag will report features in json format instead, one per line.

- **–base-url**

  Base URL of the Ngenea Hub API, which operations will be performed against.

  This can be used to perform Ngenea Hub operations on a remote server.

  If not specified, the default is *http://localhost:8000/api*

- **-c**, **–config**

  The path to an alternative configuration file.

If not specified, the default configuration paths will be used. The default paths are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

See **ngenea-client.conf(5)** for more information on the configuration format.

Command line options take precedence over any corresponding config file settings.

- **–client-key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **-h**, **–help**

  Prints the help message.

EXAMPLES

The following examples assume that the client key has been saved in the default config file.

LIST AVAILABLE FEATURES

```
$ ngclient features list
 [X]  searchui              Enable search features in the UI
 [ ]  bandwidth_controls    Enable bandwidth controls in the UI
 [ ]  rbac                  Enable role-based access controls
```

(The above are just examples and may not reflect actual feature flags)

ENABLE A FEATURE

```
ngclient features enable rbac
```

DISABLE A FEATURE

```
ngclient features disable searchui
```

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

The *ngclient* wheel can be installed and run on any operating system.

SEE ALSO

ngclient(1), ngenea-client.conf(5)

LICENSE

ngclient-settings

NGCLIENT-SETTINGS

SYNOPSIS

ngclient settings refresh [options...]

DESCRIPTION

The *settings refresh* command is used to trigger a refresh of site settings in Ngenea Hub.

This means loading the latest settings from PixStor on one or all sites into Ngenea Hub. This may be useful if a setting has been manually changed on a site, or if the settings displayed in Ngenea Hub are otherwise wrong or out-of-date.

Base URL and API key settings can be read from a config file, rather than being passed on the command line. See **ngenea-client.conf(5)** for more information on the configuration format. CLI flags take precedence over config file settings.

Interacting with features requires Ngenea Hub authentication. The **ngclient(1)** *auth enticate* command can be used to generate a client key from a username or access token.

OPTION SUMMARY

```
    --site                  Name of a specific site to refresh set
tings from

    --base-url              Base URL of the {{ brand_name }} API

-c, --config CONFIG         Alternative configuration file path
    --client-key KEY        Client API key to authenticate with

-h, --help                  Print help message and exit
```

OPTIONS

- **–site**

  Name of a specific site to refresh settings on.

If this flag isn't specified, settings will be refreshed for all sites registered in Ngenea Hub

- **–base-url**

  Base URL of the Ngenea Hub API, which operations will be performed against.

  This can be used to perform Ngenea Hub operations on a remote server.

  If not specified, the default is *http://localhost:8000/api*

- **-c**, **–config**

  The path to an alternative configuration file.

  If not specified, the default configuration paths will be used. The default paths are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

  See **ngenea-client.conf(5)** for more information on the configuration format.

  Command line options take precedence over any corresponding config file settings.

- **–client-key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **-h**, **–help**

  Prints the help message.

EXAMPLES

The following examples assume that the client key has been saved in the default config file.

REFRESH SETTINGS ON ONE SITE

```
$ ngclient settings refresh --site london
```

REFRESH SETTINGS ON ALL SITES

```
ngclient settings refresh
```

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

The *ngclient* wheel can be installed and run on any operating system.

SEE ALSO

ngclient(1), ngenea-client.conf(5)

LICENSE

ngclient-sites

NGCLIENT-SITES

SYNOPSIS

ngclient sites refresh [options...]

DESCRIPTION

The *sites refresh* command is used to trigger a refresh of site-specific metadata in Ngenea Hub.

Site metadata includes things like storage pools, filesystems, analytics, etc. This metadata is typically refreshed periodically, but if the data currently returned from Ngenea Hub seems wrong or out of date, this command can be used to force a refresh.

Base URL and API key settings can be read from a config file, rather than being passed on the command line. See **ngenea-client.conf(5)** for more information on the configuration format. CLI flags take precedence over config file settings.

Interacting with features requires Ngenea Hub authentication. The **ngclient(1)** *auth enticate* command can be used to generate a client key from a username or access token.

OPTION SUMMARY

```
    --site                  Name of a specific site to refresh set
tings from

    --base-url              Base URL of the {{ brand_name }} API

-c, --config CONFIG         Alternative configuration file path
    --client-key KEY        Client API key to authenticate with

-h, --help                  Print help message and exit
```

OPTIONS

- **–site**

  Name of a specific site to refresh metadata on.

  If this flag isn’t specified, metadata will be refreshed for all sites registered in Ngenea Hub

- **–base-url**

  Base URL of the Ngenea Hub API, which operations will be performed against.

  This can be used to perform Ngenea Hub operations on a remote server.

  If not specified, the default is *http://localhost:8000/api*

- **-c**, **–config**

  The path to an alternative configuration file.

  If not specified, the default configuration paths will be used. The default paths are in the user’s HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

  See **ngenea-client.conf(5)** for more information on the configuration format.

  Command line options take precedence over any corresponding config file settings.

- **–client-key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **-h**, **–help**

  Prints the help message.

EXAMPLES

The following examples assume that the client key has been saved in the default config file.

REFRESH METADATA ON ONE SITE

```
$ ngclient sites refresh --site london
```

REFRESH METADATA ON ALL SITES

```
ngclient sites refresh
```

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

The *ngclient* wheel can be installed and run on any operating system.

SEE ALSO

ngclient(1), ngenea-client.conf(5)

LICENSE

ngenea-client.conf

NGENEACLIENTCONF

SYNOPSIS

The Ngenea Hub client configuration files is used to configure **ngclient(1)** and **transparent_recall(1)**

The default config file locations are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, with a global config at */etc/ngenea/ngenea-client.conf*.

If both configuration files exist, the user config will take precedence, with the global config used for any values not specified in the user config.

For example

```
# global config
[settings]
base_url = http://10.172.0.23:8000
site = default

# user config
[settings]
site = mysite
```

would result in *base_url = http://10.172.0.23:8000/api*, since it's not specified in the user config, and *site = mysite* since the value from the user config takes precedence.

NOTE - unless explicitly specified with the *–config* flag, both ngclient(1) and transparent_recall(1) will use this same default config files.

If a config file is explicitly specified with *–config*, the default configs will not be considered at all.

Command line options take precedence over any corresponding config file settings.

FILE FORMAT

ngenea-client.conf(5) uses an ini-style format.

It is made up of *key = value* lines under the *[settings]* section header.

```
[settings]
client_key = mykey
```

Boolean type values can be either *true*, *false*, *yes*, or *no* (case-insensitive)

Additional sections, or unrecognised keys are ignored.

PARAMETERS

- **base_url**

  Base URL of the Ngenea Hub API, which operations will be performed against.

  This can be used to perform Ngenea Hub operations on a remote server.

  If not specified, the default is *http://localhost:8000/api*

- **client_key**

  Ngenea Hub authentication client key.

  This can be generated via the Ngenea Hub REST API, or using **ngclient(1)** *aut henticate*

- **site**

  The default site to use for workflows.

  For *migrate* and *recall*, this is the site where the workflows execute. For *send*, this is the source site, from which files are sent.

- **queue**

  The default queue to use for workflows.By default, source queue is set as *defa ult*

  For *migrate* and *recall*, this is the queue where the workflows execute. For *send*, this is the source queue, from which files are sent.

- **wait**

Whether to wait for workflows to complete.

If true (default), tools will wait for the workflow to complete, subject to *timeout*.

If false, tools will exit immediately. The workflow will continue to execute independently. In that case, the workflow can be monitored in the Ngenea Hub UI

- **timeout**

  How long to wait for workflows to complete, in seconds.

  If not set, tools will wait indefinitely.

  If the workflow doesn't complete within the timeout, the client will exit with an error. The workflow itself may continue to execute.

- **hydrate**

  For **ngclient(1)** *send*, controls whether sent files are hydrated on the target.

  If false, files are only reverse stubbed on the target.

- **api_secure_verify**

  Whether to enable/disable TLS Verification when communicating with Ngenea Hub REST API.

  This is particularly useful when Ngenea Hub REST API is behind a self-signed certificate.

  If false, TLS verification will be disabled.

  If not specified, the default is *true*.

EXAMPLE

```
[settings]
base_url = http://mypixserver:8000
client_key = ...
site = mysite
queue = standard
wait = true
timeout = 180
hydrate = true
api_secure_verify = true
```

SEE ALSO

ngclient(1), transparent_recall(1)

LICENSE

2021 ArcaPix Limited

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

transparent_recall

TRANSPARENT_RECALL

SYNOPSIS

transparent_recall file [–config CONF]

DESCRIPTION

transparent_recall is a tool for recalling individual files via Ngenea Hub

Performing recalls via Ngenea Hub allows for monitoring progress via the Ngenea Hub UI. Individual recall tasks performed on demand, but for reporting are grouped together into one job per hour.

transparent_recall can be called directly to recall files, but typically would be installed as a filesystem policy rule. See **TRANSPARENT RECALL POLICY** for more info.

OPTION SUMMARY

```
      file           One or more directory to export events from

    --config CONF    Alternative configuration file location
-h, --help           Print help message and exit
```

OPTIONS

- **–config**

  The path to an alternative configuration file.

  If not specified, the default configuration paths will be used. The default paths are in the user's HOME directory *$HOME/.config/ngenea/ngenea-client.conf*, and the global configuration at */etc/ngenea/ngenea-client.conf*

  See the **CONFIGURATION** section below and *ngenea-client.conf(5)* for more information.

  Command line options take precedence over any corresponding config file settings.

- **-queue**

  Queue to perform the transparent recall on.

- **-h**, **-help**

  Prints the help message.

CONFIGURATION

transparent_recall requires authentication to be able to perform recalls via Ngenea Hub. To authenticate, a valid *client_key* must be placed in the configuration file.

A client key can be generated via the Ngenea Hub REST API, or using the **ngclient(1)** *authenticate* command.

Minimally, the configuration must include this *client_key*, as well as the *site* where recalls are performed.

```
[settings]
client_key = ...
site = thissite
```

The *site* must match the the node where the recall was triggered.

The *queue* can be specified in the configuration; otherwise, it will be set to the default option, *default*.

transparent_recall will respect any **ngclient(1)** *recall* configuration options, except for *recursive*. This includes *timeout*; by default it will wait indefinitely for the recall to complete.

See **ngenea-client.conf(5)** for more information on the configuration format and additional options.

TRANSPARENT RECALL POLICY

Transparent recall, by definition, is intended to be triggered automatically when an offline file is opened for reading or writing.

To enable transparent recall functionality using **transparent_recall**, the following rules can be added to the filesystem placement policy.

```
/* BEGIN: NGENEA TRANSPARENT RECALL POLICY */

define(xattr_stbsz,[INTEGER(XATTR('dmapi.APXstbsz'))])

RULE FileOpen EVENT 'OPEN'
     ACTION(SetDataEvent(0, OP_READ, CASE WHEN xattr_stbsz IS NULL
THEN 0 ELSE xattr_stbsz END) AND
            SetDataEvent(1, OP_WRITE+OP_TRUNC, 0))
     WHERE LENGTH(XATTR('dmapi.APXguuid'))>0 AND
```

```
CountSubstr(MISC_ATTRIBUTES,'V')>0

RULE FileOpen_else EVENT 'OPEN' DIRECTORIES_PLUS

RULE FileData EVENT 'DATA'
    ACTION( system_lw('/usr/bin/python3 /usr/bin/
transparent_recall :' ||
        VARCHAR(FS_ID) || ':' ||VARCHAR(INODE) || ':' ||
VARCHAR(GENERATION) ||
        ' ' || getDetail('path_name') )=0)
    WHERE getDetail('open_flags')!='0' AND
LENGTH(XATTR('dmapi.APXguuid'))>0 AND
CountSubstr(MISC_ATTRIBUTES,'V')>0

RULE FileData_else EVENT 'DATA' DIRECTORIES_PLUS

/* END: NGENEA TRANSPARENT RECALL POLICY */
```

If transparent recall (*EVENT*) rules are already installed for ngenea (native), these rules should replace those equivalent rules.

Don’t replace any rules besides the ngenea *EVENT* rules, e.g. don’t replace any *SET POOL* rules.

See **mmchpolicy(1)** for how to change the filesystem placement policy

Adjusting the transparent recall queue

If an alternative queue has been established, for example `transparent-recall` it can be used for all transparent recall operations by using this policy alternative:

```
RULE FileData EVENT 'DATA'
    ACTION( system_lw('/usr/bin/python3 /usr/bin/
transparent_recall --queue transparent-recall :' ||
        VARCHAR(FS_ID) || ':' ||VARCHAR(INODE) || ':' ||
VARCHAR(GENERATION) ||
        ' ' || getDetail('path_name') )=0)
    WHERE getDetail('open_flags')!='0' AND
LENGTH(XATTR('dmapi.APXguuid'))>0 AND
CountSubstr(MISC_ATTRIBUTES,'V')>0
```

This substitutes the main `ACTION` to allow for all transparent recall operations to go through the custom queue exclusively. This means transparent recalls will not be effected by any other operations happening on the main

For more details on how to create and enable these custom queues, refer to the configuration section of the ngeneahub documentation.

TROUBLESHOOTING

When attempting to read an offline file, if the read process reports *“Operation not permitted”*, and it’s not due to permissions, the most likely cause is that the recall failed.

Logs for the **transparent_recall** command invocation can be found at */var/adm/ras/mmfs.log.latest*

Logs for the transparent recall job can be viewed via Ngenea Hub.

WARNING - if reading a file triggers a recall, the read request will block until recall exits; it can't be interrupted (Ctrl+C) or killed (kill -9). If the recall job is 'stuck' and no timeout is set, the only way to make the read process exit is to kill the recall job via Ngenea Hub.

AVAILABILITY

Distributed as part of the *ngenea-hub-client* rpm, or the *ngclient* wheel (Python) for non-Red Hat based systems.

Note - **transparent_recall** makes use of flock(2), so can only be used on Unix-base operating systems.

SEE ALSO

ngclient(1), ngenea-client.conf(5), ngrecall(1), mmchpolicy(1)

LICENSE

Backup

Backing Up HUB Static Configurations

Warning: The backup process only includes static configurations and selected database tables. Job and task-related data are **not included** in the backup.

Ngenea Hub provides a set of commands to efficiently **backup** and **restore** its critical static configurations and selected database tables, ensuring quick recovery and minimal downtime during system upgrades or failures.

These commands allow administrators to safeguard important configuration data, such as **schedules**, **users**, **workflows**, **external targets**, and **spaces**, while excluding transient job and task data, which helps streamline the process and reduce the overall backup size.

```
ngeneahubctl backup --help
```

```
Usage: ngeneahubctl backup [OPTIONS] COMMAND [ARGS]...

  Backup and restore ngeneahub static configurations

Options:
  --help  Show this message and exit.

Commands:
  export   Export ngeneahub static configurations to a file
  restore  Restore ngeneahub static configurations from a file
```

Backup

The backup process captures key Ngenea Hub configurations and selected database tables, providing a snapshot of the system's critical static configurations.

To perform a backup Ngenea Hub's database container **ngeneahub_db_1** must be running or Ngenea Hub fully operational.

To start the Ngenea Hub database container separately run;

```
docker start ngeneahub_db_1
```

Command:

```
ngeneahubctl backup export --help

Usage: ngeneahubctl backup export [OPTIONS]

  Export ngeneahub static configurations to a file

Options:
  -o, --output DIRECTORY  Location to store generated archive. De
fault
                          '$(PWD)'
  --help                  Show this message and exit.
```

This command performs the following:

- **Database dump**: Exports selected tables related to schedules, users, workflows, external targets, global configurations,spaces etc into a SQL file.
- **Configuration backup**: Copies static configuration files from key directories:
  - `/etc/ngenea/postgres` (PostgreSQL settings)
  - `/etc/ngenea/redis` (Redis configurations)
  - `/etc/ngenea/rabbitmq` (RabbitMQ configurations)
  - `/etc/ngenea/ngenea-client.conf` (Hub client configuration)
  - `/etc/sysconfig/ngeneahub` (Hub configuration)
- **Archive creation**: Packs the SQL dump and configuration files into a compressed archive (`ngeneahub_backup_<timestamp>.tar.gz`) which will be written to the current working directory or a directory as specified by *-o, –output* command line option.

Restore

> **Note:** Depending on the scenario a wipe *maybe* required before restoring a backup.

The restore process reinstates the backed-up database tables and configuration files, returning the Hub to its operational state following a failure or upgrade.

To perform a restoration Ngenea Hub should be fully operational.

> **Note:** After performing a restoration all services needs to be restarted

Command:

```
ngeneahubctl backup restore <backup-file>
```

```
ngeneahubctl backup restore --help

Usage: ngeneahubctl backup restore [OPTIONS] PATH

  Restore ngeneahub static configurations from a file

Options:
  --help  Show this message and exit.
```

This command performs the following:

- **Unpack the backup archive**: Extracts the contents of the backup file.
- **Restore configurations**: Copies the saved configuration files back into their respective directories, re-establishing the static system setup.
- **Truncate and reset tables**: Clears the selected database tables, resetting them to ensure no conflicts with the incoming data.
- **Import the SQL dump**: Inserts the backed-up data into the database, restoring schedules, users, workflows, targets, and spaces.

Glossary

C

Celery

An open-source tool that helps applications perform tasks in the background without slowing down the main program. It assigns tasks, like processing files or maintaining systems, to separate workers that operate independently. Celery keeps track of which tasks are waiting, in progress, or done, and it can schedule tasks for specific times or retry them if there’s an issue.

Celery Beats

A scheduling tool is software that plans and runs tasks automatically at specific times. It’s like setting an alarm for a task you want done regularly, such as backing up data every day or syncing files between locations every hour.

Celery Beat is one of these tools; it manages these recurring tasks in the system, ensuring they happen on schedule without needing someone to start them manually.

Celery Monitor

Celery Monitor is a tool that tracks the health and status of Celery workers, which are background processes that handle tasks. It listens for regular “heartbeats” from these workers, which are signals that confirm each worker is still active and functioning. **Celery Worker**

A Celery Worker is a process that runs in the background, ready to take on tasks sent by a central Hub server. These tasks might include organizing files, processing data, or adjusting settings. Each worker is connected to a specific list of tasks, called a queue, which it monitors constantly. When a new task appears in its queue, the worker completes it and then reports back to the Hub server. This setup allows tasks to be distributed across multiple workers, making task handling more efficient.

D

Data Mover

A Data Mover is a tool or service that helps transfer data from a company’s internal storage system to external locations, like cloud storage. It is designed to handle large amounts of data without slowing down the primary system. By using methods like data compression and parallel processing, a Data Mover makes the transfer process faster and more efficient, ensuring the system remains responsive.

Django

Django is a set of tools (web development framework) that helps developers create the backend of a website, like the Hub’s user interface. It manages software requests, such as retrieving data from a database or initiating tasks, and ensures fast responses.

Django also helps different parts of the system, like databases (where onfiguration and Hub stateful data is stored) and external services (APIs that provide additional functionality), communicate with each other, allowing everything to work together smoothly.

E

External Target

An external target is any storage type that is not part of your main system. This includes things like cloud storage services (like AWS or Google Cloud) or shared network drives (like NFS). These systems help you move and store your data away from your main setup, allowing you to back up information, save it for the long term, or share it with others easily.

Another key benefit of using an external target is that by offloading data to it, you free up space on your PixStor system, enabling you to perform more tasks and improve overall efficiency.

Filesystem

A filesystem is like a digital storage organizer where all files are kept and managed. It provides a way to arrange and control how data is stored and accessed on storage devices, such as hard drives, solid-state drives, or cloud storage.

A cluster is a group of interconnected systems that work together as one. Each system in the cluster is called a node (a separate computer or device that contributes to the cluster’s tasks).

In a clustered environment, the filesystem is usually shared across all (but not necessarily all) of the nodes, allowing any of them to access and change files as needed. Effective filesystem management ensures that data is organized efficiently, makes it easy to retrieve information, and helps maintain overall system performance.

G

GPFS (General Parallel File System)

Note: Definition not approved !!!

GPFS, or General Parallel File System, is a high-performance storage solution designed for clustered environments (groups of interconnected systems that work together to perform tasks).

Unlike a standard file system, which typically allows only one user or process to access a file at a time, GPFS enables multiple nodes to read from and write to the same set of files simultaneously. This parallel access significantly boosts efficiency, especially in scenarios where large datasets are involved.

GPFS is optimized for concurrent file operations, ensuring that users experience minimal delays and can manage large amounts of data effectively without performance degradation. This makes it particularly well-suited for tasks that require fast and reliable data sharing among many users or processes.

Grafana

Grafana is an open-source analytics and monitoring platform that provides dynamic visualizations of system performance metrics. It enables users to create and customize dashboards with various data representations, such as graphs, charts, and alerts.

Grafana collects real-time data on key performance indicators (KPIs) (metrics used to measure the success or performance of a system), including task completion rates, queue lengths, and system latency (the time delay between a request and its response). This allows for effective monitoring and troubleshooting of system operations.

Gateway Node (gw)

A Gateway Node is responsible for providing connectivity to users and applications. It typically runs protocol services such as SMB3, NFSv3, and NFSv4 to enable access to the cluster's data.

Note: Protocol services are methods that define how data is transferred between devices or applications. They ensure different devices or programs can communicate with each other and share information in a standardized way. Examples include SMB3 (used for file sharing) and NFS (used for accessing files over a network).

H

Hub Server

The Hub Server serves as the central management component of the system. It coordinates tasks and workflows while facilitating communication between various services, including a database, a REST API for handling user requests, a web-based interface for automated interaction, and a task scheduler for automated operations.

M

Management Node (mn)

The main node responsible for overseeing the entire cluster. It typically runs critical functions like the Hub server, search functionality, and analytics tools. The management node coordinates tasks and manages other nodes in the cluster.

Ngenea Node (ng)

A specialized node within the cluster that is responsible for transferring data between the cluster and external storage locations, such as cloud services (e.g., AWS, Google Cloud). The Ngenea Node manages data migration and backup processes without affecting the performance of other nodes in the cluster, including gateway nodes.

Ngenea Worker

A worker is a software component that runs on designated nodes within a network. Its main role is to perform tasks assigned to it by a central server known as the Hub. These tasks often include:

- Managing Files: Primarily involves pushing data to the cloud and retrieving it, as well as organizing, moving, or deleting files as needed.

- Processing Data: Analyzing or transforming data to extract useful information.
- Changing System Settings: Modifying configurations to improve performance or functionality.

Once the worker finishes its tasks, it sends the results to Redis, from which the Hub retrieves them to coordinate overall operations and monitor the status of each worker.

Nginx

Nginx is software that serves as both a web server and a load balancer. It manages incoming user requests and directs them to the right internal service within the Hub system. For example, when a user accesses the Hub's web interface, Nginx ensures that their request is sent to the correct part of the system to get the needed response. This helps improve performance and ensures that requests are handled efficiently.

Node

A node is an individual unit within a cluster. Each node has specific roles, such as storing data, managing the system, or allowing user access. Nodes work together in the cluster to ensure that data is processed and stored efficiently, helping the entire system function smoothly.

NVMe Node

An NVMe Node is a type of storage node that uses NVMe (Non-Volatile Memory Express), a fast data transfer technology, for quicker access to data. Instead of traditional storage connections like SAS cables, it connects using high-speed Ethernet, allowing for much faster data services.

P

PixStor Cluster

A PixStor Cluster consists of multiple interconnected nodes that function together to manage and store data efficiently. Each node within the cluster has distinct responsibilities, such as data management, storage, or facilitating access for users and applications.

Prometheus

Prometheus is a monitoring tool that collects and stores data about the performance of a system, such as CPU usage, memory consumption, and task processing times. It gathers this information over time and allows administrators to analyze it to track the health and performance of the system. Prometheus also makes this data available for visualization tools like Grafana, which helps users create dashboards to easily see how the system is performing.

R

RabbitMQ

RabbitMQ is a messaging tool (broker) that helps different parts of an application communicate. It allows the Hub server to send tasks to workers by organizing those tasks into a “queue.” Workers pick up tasks from the queue, process them, and then send a message back to RabbitMQ when they are done. This ensures tasks are handled efficiently, even if there are many tasks or workers operating at the same time.

Redis

Redis is a fast, in-memory database that stores data in a key-value format. It is commonly used for temporary data, like caching results or tracking tasks within a system. In addition to storing data, Redis facilitates communication between different parts of the system, such as the Hub server and workers, ensuring tasks are completed and results are shared quickly and efficiently.

For example, task queues are pushed through a Redis queue by default, demonstrating its role in managing task distribution and communication within the system.

S

Salt

Salt, also known as SaltStack, is a versatile tool used for managing and automating the configuration of multiple computers (or “nodes”) in a network. It ensures that all the nodes in a cluster have the same settings, software, and updates by applying changes across the entire system.

For example, if you need to install software or update configurations on all nodes, Salt allows you to do this centrally and efficiently, without having to manually update each node one by one. This helps keep all systems in sync and simplifies management tasks.

Search Backend

The part of the system that allows users to search for files and metadata (information about files) within the cluster. The search backend indexes certain files in the system so that users can quickly locate what they are looking for.

Note: “Search Backend” is a generic term that could refer to either PixStor Search or PixStor Analytics, depending on how the Hub is configured.

Site

A Site is a collection of one or more nodes (which are individual units that can process and store data) working together within a single PixStor cluster (a system that combines multiple nodes to manage large amounts of information).

Each Site has specific responsibilities, such as managing tasks, processing data, and transferring data to and from external sources. In simpler terms, a Site is a team of nodes that collaborates to handle and organize data efficiently within the PixStor system.

Snapdiff Discovery

Snapdiff Discovery is a method for finding changes in files or folders by using saved point-in-time images (snapshots) of them. Instead of checking every single file each time, it compares these snapshots to see what has changed. This makes the process more reliable and traceable, especially when there's a lot of data to look through. In simple terms, it helps identify differences without having to search everything all over again.

Storage Node (sn)

A storage node is a part of a cluster that connects directly to storage devices like hard drives. Its main job is to manage how data is saved and accessed. In simple terms, it makes sure that information can be stored and retrieved quickly and easily within a larger group of connected devices.

W

Web UI

A web UI, or web user interface, is the part of a web application or online system that you see and interact with. It allows you to manage tasks, check the status of your files, and use various tools—all through your web browser.

Changelog

```
2.7.0: 2025-06-24
==================

Improvement
-----------
HUB2-620 -  API: Policies can now be run immediately after being
created
HUB2-948 -  Policies are no longer restricted to mmfs1 named file
systems
HUB2-2183 - API: The default location of Spaces can be configured
for all Sites
HUB2-2316 - The global settings is synced after an 'apply
settings' job has been run
HUB2-2337 - The visual contrast for grouping boxes and dividers
has been improved
HUB2-2338 - Spaces can now be viewed in table layout
HUB2-2339 - Job tables can now be sorted for job creator, site,
queue, workflow, queue
HUB2-2340 - Workflow batch and item GB size are now available as
Site options
```

HUB2-2342 - Timeout settings have been added to the Global Settings page
HUB2-2672 - All automated schedule times are now shown in local time, not UTC
HUB2-2677 - Ngenea Targets now have validation on their advanced key options
HUB2-2794 - File browser timeouts can now be configured in the Global Settings page
HUB2-2812 - The path when you pick a location in a space space now starts at the space mountpoint
HUB2-2829 - Policy based workflows renamed from 'Tiering' to 'Policy-based Tiering'
HUB2-2877 - Added GUNICORN_WORKERS as a synonym for WORKERS configuration key, the WORKERS configuration is now deprecated
HUB2-2878 - New GUNICORN_THREADS setting to increase API performance
HUB2-2890 - RabbitMQ container is now migrated to the configured destination when DATA_DIR is set

Bug

HUB2-1520 - Newly added sites now pick up NAS users and groups
HUB2-1699 - Hub metrics no longer fails to load due to an authentication error
HUB2-2733 - Hubmetrics dashboard no longer fails to load
HUB2-2746 - Site snapshot times no longer contain timezones
HUB2-2751 - When renaming a Site, the original name is autofilled
HUB2-2764 - Ngenea target name validation now does not allow names containing "."
HUB2-2787 - Rotate snapshot completion time is now set correctly
HUB2-2796 - Rotate tasks no longer errors when attempting to store its results
HUB2-2818 - Transparent recall no longer throws a traceback despite sucessful recall of files
HUB2-2827 - Snapdiff workflows no longer assume old queue name format for custom plugins
HUB2-2830 - Updating an NFS share in the UI no longer causes share deletion on Pixstor
HUB2-2835 - Job engine now correctly waits for the parent task in high speed workflows
HUB2-2836 - Workflow discovery option can now be patched to be null
HUB2-2845 - Creation of a discovery schedule no longer fails to create due to an existing schedule sharing the same scheduled time
HUB2-2848 - A deleted schedule no longer remains on the dashboard when a schedule is deleted
HUB2-2849 - day_of_month is no longer edited within the schedule picker
HUB2-2884 - Fix "key error" for create NAS user and update NAS group members jobs
HUB2-2915 - Added safety measures to prevent deadlock failures in snapdiff jobs
HUB2-2917 - Ensure Next button is not disabled in Network settings

Page when configuring a newly added Site
HUB2-2924 - Added safety measure for looking up task_id during DAG callback
HUB2-2927 - Jobs are no longer left indefinitely pending when workflows and site include or excludes are used

2.6.0-2: 2025-05-27
===================

Documentation updates

2.6.0: 2025-04-30
=================

Feature

HUB2-1651 - Simplified Ngenea Targets for Spaces
    * Targets and buckets can now be created during Space creation
    * Targets and buckets are now separately defined and can be re-used
HUB2-1975 - Schedule Management Interface
    * There is now a dedicated page for Schedule Management
    * This controls both workflow schedules and Policies
    * There is now an additional single endpoint for serving a read only listing of schedules and policies
HUB2-2126 - Added workflow for ngenea download only mode

Improvement

HUB2-628 - Salt related tasks timeout is now configurable
HUB2-1699 - Hub metrics no longer requires an additional login
HUB2-2303 - Policy file condition selection now prepends dot automatically
HUB2-2304 - Space endpoint can now be filtered via site_id
HUB2-2372 - Targets are not longer required to be backup_only
HUB2-2487 - The same path is now allowed to be used by multiple non-snapdiff schedules
HUB2-2489 - The space endpoint now returns 'is_ready'
HUB2-2329 - ngenea-worker plugins list now provides the version of all installed plugins
HUB2-2531 - LDAP TLS Certificate support
HUB2-2646 - Global settings now has a quick link when attempting to edit a schedule when all are disabled
HUB2-2689 - Non snapdiff job task responses have improved performance
HUB2-2701 - Job details page now loads statistics separately making page loading much faster

Bug

HUB2-1932 - Schedules from other Spaces are no longer visible under a Space

HUB2-1990 - When searching space specific RBAC no longer returns no results
HUB2-2087 - Spaces can now correctly be re-added to be backed up
HUB2-2229 - AD groups now support whitespaces in names
HUB2-2243 - A settings job is no longer created when changing the site short code
HUB2-2252 - Jobs can no longer prematurely report as done
HUB2-2315 - Transparent recall through Hub no longer fails with path containing certain characters
HUB2-2327 - Not submitting group name no longer returns a 500 error
HUB2-2404 - When immediately disabling the sync schedule on a newly created space, it now correctly disables
HUB2-2415 - ngenea-worker plugins uninstall can now remove multiple plugins at once
HUB2-2418 - ngenea-worker plugins install now correctly installs only the specified plugins
HUB2-2438 - Policy exclude conditions are no longer treated the same as includes
HUB2-2432 - Removing the task filter now works as expected in the task table
HUB2-2456 - dynamo.tasks.rotate_snapshot no longer always shows as NULL
HUB2-2534 - Send to site no longer shows files both as "processed" and "pending" upon job completion
HUB2-2540 - Trailing slash in site settings no longer causes 404
HUB2-2662 - File browser in schedule wizard now shows restricted items
HUB2-2539 - Changing the pool from the default now correctly refreshes
HUB2-2656 - Fixed issue with 'sssd' not applying when applying domain settings in shares
HUB2-2658 - Deleting a target via "delete bucket" now fully clear salt pillar
HUB2-2669 - Non admin users can now update their profile
HUB2-2711 - Transparent recall error on job id expiry check
HUB2-2712 - GCS targets can now switch between credentials_json and credentials_file in a single PATCH request
HUB2-2718 - Space cards sizes are now consistent
HUB2-2719 - Ensured that shares cannot allow all_squash and no_root_sqaush
HUB2-2767 - Fixed issue with navigating Buckets using Azure based targets
HUB2-2769 - Snapdiff cache files are now consistent between multiple nodes

2.5.5: 2025-03-04
=================

Feature

HUB2-2344 - Workflows to enable partial recall and importing bytes

```
2.5.4: 2025-02-28
==================

Improvement
-----------

HUB2-2547 - Allow users to specify preferred queue for a workflow
via API using "preferred_queue"

Bug
---
HUB2-2520 - Automated queue cleanup task no longer throws an
exception on startup
HUB2-2541 - Space creation location picker now returns correct
folders when not browsed prior in the file browser


2.5.3: 2025-02-19
==================

Bug
---
HUB2-2611 - Ensured shares defined before version 2.5.3 could be
removed from the salt pillar
HUB2-2545 - Renaming an NFS share no longer creates a new match-
all share
HUB2-2588 - Creating a Samba share no longer results in endless
looping jobs
HUB2-2600 - Existing NFS clients are no longer updated when new
NFS client is added
HUB2-2601 - Editing an existing NFS share no longer has the
potential to create new match-all shares


2.5.2: 2025-02-10
==================

Improvement
-----------
HUB2-2531 - Hub login support for LDAPs and STARTTLS


Bug
---
HUB2-2545 - Renaming NFS shares no longer creates a new wildcard
share


2.5.1-1: 2025-01-13
====================

Bug
---
```

HUB2-2455 - Fixed tasks unexpectedly exiting while attempting to log job statistics

2.5.0-2: 2024-12-13
==========
Updated Ngenea HSM dependency to 1.30.1-1

2.5.0: 2024-11-13
==========

Feature

HUB2-1965 - Support for setting a Spaces permission mode
HUB2-2198 - ngeneahubctl now supports database export
HUB2-2199 - ngeneahubctl now supports database import
HUB2-2280 - Provide DownloadOnly workflow in file browser

Improvement

HUB2-1333 - Started tasks no stuck after a sudden worker exit
HUB2-1519 - Improve scanning performance for policies against single spaces
HUB2-1643 - ngclient now accepts relative paths
HUB2-2037 - Ngenea targets can be unlinked from all sites
HUB2-2068 - Added additional safety guards to ngeneahubctl wipe
HUB2-2099 - The Site management page now displays when sites are configured on their respective nodes
HUB2-2119 - ngclient now identifes authentication issues
HUB2-2240 - Stopping/restarting a worker causes tasks to get killed and lost
HUB2-2286 - Suppport ConfigFile, LocalFileRegex, LocalSymlinkTargets, RemoteLocationXAttrRegex, StorageKey in ngenea target advanced keys
HUB2-2294 - NFS share now display with multiple non-CIDR clients in the UI
HUB2-2300 - Ensure the email entry is omitted on the users table if not set
HUB2-2301 - Star character is no longer displayed when Search query is submitted
HUB2-2305 - Ensure Kerberos connections are bound as authenticated user
HUB2-2306 - The "Minimize" tooltip for left bar is no longer incorrectly sized
HUB2-2324 - Workflows that select a secondary site now default to the "default" queue if not provided
HUB2-2333 - Google cloud storage targets can now use CredentialsFile as the only credentials provider
HUB2-2335 - When rabbitmq is not the target broker the container no longer spawns
HUB2-2353 - Either credentials_json or credentials_files can be used when defining a target with Google Cloud Storage

```
Bug
---
HUB2-1288 - Fix page scrollbar sizing in Job list page
HUB2-1424 - Ensure Hub cannot overwrite existing users and groups
from pixdjango
HUB2-1460 - Provide values for usage and capacity in Policy UI
when no quota is in place on a space
HUB2-1584 - Resolve issue with per-process lock aquisition in
transparent recall
HUB2-1806 - Ensure migrations to ngenea are limited to one source
pool
HUB2-1937 - The automated job to expire old jobs has been
optimised
HUB2-1955 - Resolve 500 error when deleting a schedules workflow
HUB2-1983 - NFS shares are now correctly configured with multiple
clients
HUB2-1984 - Resolve traceback observed: AttributeError: 'QuerySet'
object has no attribute 'objects' when using check_sync_state
HUB2-1986 - Ensured every client for the same NFS share have the
same fsid
HUB2-1999 - Resolve GCS bucket creation failure due to mangled
json auth
HUB2-2002 - Recursive navigate now reports failed paths
HUB2-2084 - Remove redis connection log error under normal
operation
HUB2-2174 - Job descriptions are now case sensitive
HUB2-2216 - Non-existing ngenea target now correctly raises a 404
HUB2-2220 - Ensure Space mountpoint is not presented with double
forward slash in the space wizard
HUB2-2224 - reverse_stub task no longer lists "--overwrite-local".
HUB2-2277 - Thread counts can now be explicitly for each default
queue function
HUB2-2279 - Browsing external targets now correctly parse errors
from listing cloud files
HUB2-2283 - Fix inability to change Space card colour
HUB2-2284 - Remote folder not matched of top level folder
selection no longer causes import from site jobs to fail
HUB2-2307 - Shares can now be browsed when Samba allowed_hosts is
null
HUB2-2317 - Target name too long error not correctly reported to
user in UI
HUB2-2318 - Targets now correctly supports StorageKey numerical
strings
HUB2-2322 - The 'invalid character' error message when browsing a
space no longer appears when there are no files to browse

2.4.4: 2025-02-07
=================

Feature
-------
HUB2-2479 - Improved snapdiff based workflows performance
providing snapdiff includes and excludes on the worker
```

```
2.4.3: 2024-10-16
==================

Improvement
-----------
HUB2-2245 - Snapdiff based workflow moves now support same named
queues

2.4.2: 2024-10-14
==================

Improvement
-----------
HUB2-2214 - Transparent recall now supports alternative queues

Bug
---
HUB2-2170 - Resolves LDAP plaintext authentication failure
HUB2-2193 - GPFS Policies scans now run across multiple nodes
HUB2-2209 - Scheduled jobs without a second site now correctly run
HUB2-2225 - All ngenea target keywords are now supported

2.4.1: 2024-10-07
==================

Bug
---
HUB2-2209 - Workflows without a destination site now correct run
from a schedule

2.4.0: 2024-10-04
==================

Feature
-------
Multiple Job Queues
RabbitMQ as an optional broker

Improvement
-----------
HUB2-908 - Limit ngenea target creation to specific sites via API
HUB2-1544 - Move ngenea target settings to dedicated /
external_targets endpoint
HUB2-1640 - Attempt to premigrate files from snapshot even if live
copy doesn't exist
HUB2-1776 - Summary page update for Ngenea bucket configuration
HUB2-1898 - Improve performance of Job no-op filter
HUB2-1970 - Make the job link middle- & right- clickable on "job
is created" popup
HUB2-1989 - API-Keys no longer require an email for creation
HUB2-2005 - Unify order of statuses in Job specific page
HUB2-2117 - Make node heartbeat check interval configurable
```

```
Bug
---
HUB2-599 - Workflow schedules will now wait until space creation
completes on all sites to start
HUB2-1382 - The search_keyword argument correctly filters jobs via
ID
HUB2-1641 - Snapdiff tasks no longer skip files not on the live
filesystem
HUB2-1799 - Search filter chips no longer disappear after a search
completes
HUB2-1802 - Policy related jobs are no longers always stuck in
pending
HUB2-1973 - Disable rpm build-id debug files
HUB2-1994 - Login page now has correct page title

Documentation
-------------

HUB2-1820 - Update existing Plugin docs for new DAG capabilities
HUB2-1866 - Existing worker task options have been updated


2.3.2: 2024-08-23
=================

Bug
---

HUB2-1893: Reverted; due to causing Bidirectional sync to fail
intermittently


2.3.1: 2024-08-09
=================

Improvement
-----------
HUB2-1685: Added documented new engine functionality to the worker
HUB2-1016: Double clicking thumbnails within search now opens a
full screen preview
HUB2-1457: Fileset snapshots retention period language is improved
for international users
HUB2-1895: Snapdiff workflows now support root filesets

Bug
---
HUB2-1672: Fix engine deadlock issue when running a non null
discovery job
HUB2-1704: Shares deleted on the UI are now always deleted on the
target system
HUB2-1707: Snapshot schedule update task is submitted when editing
shares
HUB2-1762: Settings jobs can now be cancelled
HUB2-1859: Resolve rare race condition when storing task results
```

HUB2-1865: Ganesha exports now stored with numerical value for allowing persistence on shares reload
HUB2-1893: Snapdiff rotate task now correctly runs after processing task is revoked
HUB2-1916: Resolved flickering on second page of tasks in a job
HUB2-1944: When creating a space, the scheduled job now waits for the space to be completed before starting
HUB2-1957: Resolved race condition in site settings task
HUB2-1985: Deleting a client from an NFS export now removes the share from the site
HUB2-1798: UI automatic file browser refresh no longer display some restricted folders

2.3.0: 2024-07-05
=================

Feature

Job Reporting improvements
LDAP and Kerberos integration
Space deletion via the UI
Dynamic job batching
Database size reduction with tunable settings

Improvement

HUB2-1190: Default locking method options are now applied to all default workflows
HUB2-1804: Custom plugin docs have been updated to support new engine functionality
HUB2-1891: Job details page now renders regardless of statistics being loaded
HUB2-1892: API_TIMEOUT and GATEWAY_TIMEOUT now default 10 minutes
HUB2-1356: Various database size reduction optimisations
HUB2-1644: Recursive jobs now use less calls to mmlsfileset
HUB2-1644: Recursive jobs now no longer navigate into excluded directories
HUB2-1691: Removed search is halted message when interrupting a search
HUB2-1700: SMB shares now supports definitions in the hosts to allow/deny
HUB2-1719: Ngenea worker analytics requests can now have their timeouts configured
HUB2-1281: Error and failed jobs can now be re-submitted
HUB2-1610: Job descriptions have been added to all non-settings jobs
HUB2-1621: Users can now to filter paths across all pages when searching for a related job
HUB2-1462: Installed internal SSL certificates can now be displayed on the command line
HUB2-1613: Plugins and internal tasks now use jobid consistently
HUB2-1664: Transparent recall is now using the new task engine

Bug

HUB2-1895: Snapdiff workflows now support root fileset snapshots
HUB2-1414: Circular symbolic links no longer cause analytics errors
HUB2-1491: Shares now correctly cannot contain white spaces
HUB2-1683: Users and groups are no longer allowed to contain white spaces
HUB2-1693: Alerts are now shown immediately
HUB2-1821: Site options are now pre-populated in bidirectional sync setup
HUB2-1839: Analytics caches are correctly removed on an analytics error
HUB2-1861: Downloading a file list now provides the correct output
HUB2-1550: Fixed the runtime for paused jobs
HUB2-1614: Default spaces are created correctly for filesystems not mounted at the standard default
HUB2-1694: Cancelling a snapdiff with specific timings no longer causes the job to remain in an unknown state
HUB2-1701: Permissions are now correctly applied to the alerts on the the site page
HUB2-1706: Storage metric graphs now correctly display on lower resolutions
HUB2-1737: Site labels now default to their names if not set
HUB2-1464: Custom snapdiff jobs now correctly track progress correctly in job list page
HUB2-810: Space creation no longer fails due to unrelated salt state errors
HUB2-847: Site network settings now allow CIDR values as 0-32 , with 0 included
HUB2-1055: Only one job is now created when spaces are deleted
HUB2-1187: Un-necessary SSL warnings have been removed in worker logs
HUB2-1299: Ensure text in UI tooltips no longer go off the screen
HUB2-1396: Site colour picker shows multiple shades of a colour selected
HUB2-1466: None snapdiff job runtimes are now consistent between summary and detail views
HUB2-1478: Job ids can now be longer than 22 characters
HUB2-1480: Client certificate expiry is now set correctly internally
HUB2-1484: Clicking “x” for site filter chip now behaves consistently
HUB2-1492: Long space names now display correctly in the "location" section of space creation as well as summary screen
HUB2-1493: UI now correctly states the correct maximum name size for spaces
HUB2-1535: Job progress bar in the job listing page now correct reflect progress
HUB2-1540: Job progress bar in the job listing page now shows progress without manual refresh
HUB2-1551: Task details modal tooltip no longer blinks
HUB2-1566: Job "id" field is now correctly set for settings tasks

HUB2-1574: Ordering of jobs in the job listing page when sorting by state is now consistent
HUB2-1587: Internal task non_discovery_rule_filter now shows date started
HUB2-1589: ngclient authenticate now correctly uses the api_secure_verify from config file
HUB2-1603: Schedules for recreated filesets now correctly run
HUB2-1608: The rightbar no longer flickers in the job details page when scrolled down
HUB2-1609: Pending item stats have been removed snapdiff jobs as they do not use them
HUB2-1620: Non UTC datetime in custom DAG tasks now correctly refresh
HUB2-1628: Ensured that on custom plugin install that the internal packages do not change version
HUB2-1629: Populate settings job no longer get stuck in the "NEW" state with an "Unknown" owner
HUB2-1631: Delete space task now runs even if create space hasn't completed yet
HUB2-1635: Transparent recall no longer fails if existing transparent recall job does not exist
HUB2-1666: The filter bar now always displays correctly in the file browser
HUB2-1669: The current view is now retaining on jobs detail page refresh

2.2.5: 2024-06-21
==========

Improvement

HUB2-1852 - Ensured that storage analytics can have its request timeout configured

Fix

HUB2-1852 - Pass API_TIMEOUT from the hub sysconfig file to the API container

2.2.4: 2024-05-31
==========

Improvement

HUB2-1644 - Recursive navigate tasks no longer call mmlsfileset more than once

Bug

HUB2-1680 - Task failures no longer stop downstream tasks to stay in PENDING

```
2.2.3: 2024-05-21
==================

Improvement
-----------
HUB2-1625 - The API wide timeout can now be configured

Bug
---
HUB2-1626 - The job details UI now waits for job results
regardless of request duration
HUB2-1667 - The job list UI now waits for results regardless of
request duration
HUB2-1682 - Job related web socket connections now waits for
connection regardless of duration
HUB2-1619 - Jobs with the state "Failing" no longer disappear from
jobs list page


2.2.2: 2024-05-06
==================

Bug
---

HUB2-1630 - Fixed issue with bidirectional sync re-submission


2.2.1: 2024-04-29
==================

Bug
---

HUB2-1630 - Transparent recall functionality now correctly submits
with new engine


2.2.0: 2024-03-28
==================

Feature
-------
UI Colours
Search Tags
Custom Attributes for SMB
New DAG Job Engine

Improvement
-----------
HUB2-291 - Better wrap long space names
HUB2-365 - Different colors for task table chips instead of "gray"
ones
```

HUB2-368 - Fix scrolling arrows showing up by default on rightbar
HUB2-652 - Utility for translating schedule object to user
HUB2-770 - Automatically name policy condition group titles
HUB2-863 - Task stats should apply the filter on job details page
HUB2-895 - Provide API support for editing search tags
HUB2-990 - Provide the ability to filter site alerts by severity
HUB2-1032 - Search: Support extensions starting with dot for core.extension filter
HUB2-1035 - Enforce unique space mount point (API)
HUB2-1072 - Ensure group titles wrap better
HUB2-1084 - Swap files above tasks in job details
HUB2-1089 - Provide the ability to set the number of executed policy threads in the UI
HUB2-1103 - Add buttons for pausing and resuming a job
HUB2-1104 - API response for job Owner is different
HUB2-1105 - Adjust Job details UI labels to new DAG statistics
HUB2-1107 - Adjust websocket responses to conform with new serializers
HUB2-1112 - Ensure NAS components are not visible if all sites in AD mode
HUB2-1162 - Site filtering for policies
HUB2-1213 - Ensure apbackup chip colours are consistent and correct site colour when input is changed
HUB2-1218 - Make top bar green
HUB2-1219 - Implement yellow progress bar across wizards
HUB2-1220 - Provide the ability to set the colour of the Site Chip in the Create Site wizard
HUB2-1222 - Updated colourful left bar menu buttons
HUB2-1223 - Updated login page presentation
HUB2-1224 - Cyclic colours for space cards
HUB2-1225 - Provide the ability to set the colour of the Space Card in the Space Wizard
HUB2-1226 - General CSS changes for button/checkbox/slider etc. elements
HUB2-1227 - Add SMB Custom Options Panel to Create Space Wizard
HUB2-1228 - Add SMB Customs Options Panel to Update Space Modal
HUB2-1230 - Modify multiselect dropdown component for search of a tag
HUB2-1237 - Remove feature flags for stable features
HUB2-1256 - Provide API support for Site chip colours
HUB2-1259 - Increase intervals for site refreshes
HUB2-1261 - Provide alphabetical ordering for managed keys
HUB2-1263 - Add tag selector filter to Search filters (in main search filter list)
HUB2-1264 - Add tag editor to search side panel for asset
HUB2-1282 - Grant metadata update permission to worker service user
HUB2-1291 - Switch site chips to double colour chips
HUB2-1294 - Don't display muted alerts in the GUI
HUB2-1310 - Update Hub favicon
HUB2-1311 - Add danger notification
HUB2-1312 - Make rightbar stay at the same place on scroll for global search page
HUB2-1316 - Hide resubmit button for settings tasks

HUB2-1328 - Better render "Date started" for cancelled tasks
HUB2-1334 - Ensure backup UI components are only displayed if the site has nodes configured with the apbackup role
HUB2-1346 - Implement database expiry page in global settings page
HUB2-1358 - Make sticked sidebar on default for all elements
HUB2-1376 - Re-expose grafana dashboard
HUB2-1377 - Provide role lookup for apbackup feature
HUB2-1378 - Add filter by job creator inside jobs
HUB2-1389 - RPM of public facing html docs
HUB2-1399 - Change text inside of tags multi-select
HUB2-1401 - Remove Default Location toggle from space create wizard
HUB2-1402 - Where a site only has one pool, auto-select it in the space creation drop-down
HUB2-1411 - Document swagger URL
HUB2-1417 - Add a base class to all non system worker tasks that check if it can run
HUB2-1418 - Adjust the cancel process to use redis and change the cancelling states
HUB2-1436 - Add the enable_plugin setting to the plugin docs
HUB2-1438 - Type filter updates on Jobs page for DAG jobs
HUB2-1442 - Job details show job status as Pausing when the job is in state Pausing
HUB2-1446 - Remove settings task types from workflow filter list in the UI
HUB2-1447 - Support for filtering on CANCELLING and PAUSING states in the UI
HUB2-1450 - Document the /hubmetrics endpoint
HUB2-1469 - Task stats should include PENDING task counts
HUB2-1496 - Provide clarification that File Stats processes more than Files
HUB2-1498 - Rename the "In-Progress" file stats label to "Pending"
HUB2-1530 - Rename Job Type to Workflow in job creator

Bug

HUB2-395 - Prevent setting space mount point to existing path
HUB2-473 - Deleting any of the site config fields and submitting does not delete the fields
HUB2-581 - Resolve an issue whereby a resubmitted job displays Job Creator unknown
HUB2-703 - Client key name max length error
HUB2-807 - Invalid date message on filebrowser table
HUB2-812 - Resolve an issue whereby full screen for task logs does not display in full screen
HUB2-892 - Resolve an issue whereby a space cannot be deleted using the python shell without deleting snapshot_schedule first
HUB2-928 - Fix timeout message in search page
HUB2-946 - Small Browser Window Stylesheet Issue
HUB2-997 - Task type filter options are not loaded for some of the system jobs
HUB2-1006 - Ensure that site creation summaries are accurate
HUB2-1061 - Provide job not found page
HUB2-1079 - Resolve an issue whereby full screen video preview

does not fullscreen
HUB2-1083 - Resolve an issue whereby joined sites have no job site labels
HUB2-1086 - Resolve an issue whereby key names can be obscured
HUB2-1136 - Very long file name takes all the width in file browser table
HUB2-1144 - Resolve an issue whereby a invalid nginx config can cause frontend service interruption
HUB2-1146 - Error handling error response from search
HUB2-1184 - Cursor jumps to end of line as you type in the space name textbox
HUB2-1185 - Job gets stuck in processing if permissions on ngmigrate do not allow execution
HUB2-1189 - Remove unneeded warnings in the worker logs
HUB2-1232 - Cannot add API key via UI if profile fields aren't set
HUB2-1242 - Resolve an issue whereby all NAS interfaces cannot be removed
HUB2-1245 - Resolve an issue whereby the Username is truncated in the top right
HUB2-1260 - Resolve an issue whereby the Sites page shifts off screen when the left bar is expanded
HUB2-1262 - Resolve an issue whereby flickering is observed when loading pages
HUB2-1279 - 500 Server error when trying to verify an auth token
HUB2-1284 - Resolve an issue whereby SAMBA configuration entries are duplicated on update or deletion
HUB2-1285 - Unable to save NAS settings
HUB2-1289 - Fix duplicate job detection preventing Samba keys from being updated more than once
HUB2-1290 - Resolve an issue whereby a basic auth login prompt is presented
HUB2-1293 - Pre-set public url is not populated on create site wizard
HUB2-1301 - Setting a schedule to 1 hour causes it to run every minute
HUB2-1307 - Unable to create NAS users after deleting NAS user
HUB2-1314 - Create and update Space wizard error if no ngenea targets have been defined
HUB2-1319 - Fix validation email for create user wizard & update user modal
HUB2-1322 - Migration policy with three pools skips the second pool
HUB2-1323 - Cannot create a policy with a schedule
HUB2-1324 - Site settings - existing extra domain can not be deleted & validation needed for extra domain without name
HUB2-1326 - public_url = None crashes UI for unconfigured site
HUB2-1339 - Fix "get() returned more than one Server" issue
HUB2-1359 - Fix height of the multi-select dropdowns to have valid minimum height
HUB2-1360 - Selecting a tag for an item, assign it for all items with exact path, which is not unique
HUB2-1362 - Job status appears as Ongoing for job in state UNKNOWN_FAILURE
HUB2-1366 - Resolve an issue whereby ngenea target secrets are

visible in log files
HUB2-1367 - Spaces can suddenly become unlinked where multiple "sites" are defined for a given PixStor cluster
HUB2-1379 - Filter input inside jobs is not working
HUB2-1380 - transparent_recall does not honour api_secure_verify
HUB2-1384 - Cannot change snapshot schedule on a space
HUB2-1394 - SettingsTask deduplication logic prevents legitimate jobs from running
HUB2-1400 - Redis will consume all available ram on a system over time
HUB2-1403 - Fix settings refresh
HUB2-1404 - Timestamp rules for policy weighting are incorrect
HUB2-1412 - Space settings loads a blank screen if site label is not set
HUB2-1413 - Job submitter does not show anything if site label is missing
HUB2-1415 - Make sure the UI does not break when workflows are visible=False
HUB2-1416 - Link to space path lost on login
HUB2-1420 - Job submitter does not allow running workflow
HUB2-1423 - DAGs submit custom tasks to the wrong queue
HUB2-1425 - Tasks filter not applying to live updates
HUB2-1426 - Unable to disable site apbackup
HUB2-1434 - Tasks go into state "STARTED" even though they are still "PENDING"
HUB2-1441 - Ngenea worker service cannot start up when no filesystem exists
HUB2-1448 - Possible to cancel PAUSING jobs via the jobs overview
HUB2-1455 - Job details rightbar shows ongoing when the job is in cancelling state
HUB2-1467 - Job stats are not updated correctly when a DAG job is cancelled
HUB2-1477 - Docker images manifest file is missing from rpms
HUB2-1494 - UI is redirected to /undefined
HUB2-1495 - Only in progress File stats are updating
HUB2-1497 - Clicking the files stats number retrieves no content into the pop up JSON modal
HUB2-1499 - job task list IDs are not being sorted correctly
HUB2-1500 - API request should call refresh token once expired, rather than logging the user out
HUB2-1509 - Long job descriptions break the UI on job table
HUB2-1517 - Cancelling a recursive job can cause tasks to be stuck in PAUSED
HUB2-1518 - Cancelling a job while "recursive_navigate" task is in started, causes objects to be stuck "In-progress"
HUB2-1521 - Error in return status of ngmigrate task
HUB2-1549 - Completed time not set for cancelled job with failed tasks
HUB2-1559 - UI does not allow having empty emails on user update modal

2.1.1: 2024-02-08
==========

```
Bug
---
HUB2-1367 - Spaces can become unlinked where multiple "sites" are
defined on the same PixStor cluster


2.1.0: 2023-12-22
=================

Feature
-------
Ability to configure Ngenea Backup
Ability to manage NAS users and groups
Ability to view disk metrics
New storage info page
New Alerts UI


2.0.2: 2023-11-17
=================

Feature
-------
New Search page, integrating PixStor Search into Hub
New Policies page, to configure and run data migration policies
from the Hub UI

HUB2-27 - Prevent access to UI components according to user
permissions
HUB2-660 - Display all GPFS filesystems in Site Dashboard
HUB2-691 - Ability to give space shares custom names
HUB2-692 - Ability to create multiple shares per space at
different paths
HUB2-754 - API to fetch settings tasks list for a job
HUB2-791 - Global view of Jobs in the UI
HUB2-792 - Support for submitting custom workflows in the UI
HUB2-823 - Support for setting analytics and metrics URL from UI
HUB2-828 - Ability to specify target path for Space creation
HUB2-831 - Filesystems API endpoint
HUB2-1003 - System folders are hidden in the UI
HUB2-1014 - Ability to bookmark and link locations in the file
browser
HUB2-1043 - Ability to view job file lists in job details page
rightbar
HUB2-1071 - Added DNS search domains to Site settings
HUB2-1075 - Support for editing job Schedules in the UI

Improvement
-----------
HUB2-370 - Improved progress bars proportion in job details page
HUB2-527 - Sensitive settings such as ngenea secret keys are
hidden from the UI and API
HUB2-785 - Include share path in file list for share jobs
```

HUB2-795 - Jobs page view persists when refreshing the page
HUB2-825 - All members of the group can be viewed via the "view all members" button
HUB2-833 - Improved UI for settings Job details
HUB2-834 - Adds user-friendly job descriptions
HUB2-835 - Snapshot time can only be set when the frequency is greater than 1 day
HUB2-861 - Ability to search for a job by ID on jobs page
HUB2-905 - Updated storage target type naming in ngenea wizard
HUB2-915 - "view task" modal is now full width in the jobs page
HUB2-927 - Users list is sorted alphabetically in the groups tab
HUB2-951 - Server address is now optional when creating S3 ngenea targets
HUB2-1025 - Tooltip for long values in the details sidebar
HUB2-1030 - Validation notice for Samba shares in the Space wizard
HUB2-1070 - Don't allow setting server names longer than NETBIOS allowed limit
HUB2-1124 - Updated labels and icons for default workflows

Bug

HUB2-595 - Create space parent directory if it doesn't already exist
HUB2-783 - Set owner for automated settings tasks to 'system'
HUB2-796 - Exclude certain interface types from site NAS settings
HUB2-805 - Filters not working on Users or Groups pages
HUB2-816 - Workflow file list selected whole space instead of individual files
HUB2-832 - Validation for space placement pools
HUB2-854 - Folder metadata not loading in the file browser
HUB2-856 - Fix settings page link for when a custom base URL is configured
HUB2-931 - None values being written to samba shares
HUB2-932 - Multiple delete jobs being triggered for the same share
HUB2-933 - Don't force changing site shortcode on create site wizard
HUB2-935 - Broken spaces page when only one site is configured
HUB2-949 - Go back button for "advanced configuration" breaks UI on ngenea target wizard summary
HUB2-953 - Add api_secure_verify support to ngclient
HUB2-1028 - Site settings weren't updated in the UI after applying a change

2.0.1: 2023-09-19
=================

Bug

HUB2-931: Don't write None values to samba shares

Documentation

HUB2-673: Updated user docs for Ngenea Hub 2.0

```
2.0.0: 2023-08-11
==================

Feature
-------

Initial Release:

- Hub 2.0 UI
- Provide the ability to view pixstor sites and storage
- Provide the ability to configure pixstor sites from the Hub UI
- Provide the ability to create Spaces
- Provide the ability to view files globally across all Space
associated sites
- Provide the ability to perform data workflows
- Provide the ability to monitor jobs and tasks
- Provide the ability to manage Hub users and groups
- Support for Active Directory/LDAP logon
- Worker support of Hub 2.0 functions
  - Analytics data
  - Get and Set pixstor settings for a site
  - Autojoin to Hub
```

License

Ngenea Hub is licensed under the DataCore EULA:

```
DataCoreTM Software Corporation End User License Agreement
1610407359.4 Rev. May 1, 2025

THIS IS A BINDING CONTRACT (“AGREEMENT”) BETWEEN DATACORE SOFTWARE
CORPORATION
(“DATACORE”, “WE”, “US”, “OUR”) AND THE COMPANY OR OTHER LEGAL
ENTITY WISHING TO USE OR
USING OUR SOFTWARE (“YOU”, “YOUR”, “LICENSEE”). THE SECTION BELOW
HEADED “INDIVIDUAL
USERS” IS ALSO BINDING ON EACH INDIVIDUAL USER OF OUR SOFTWARE. BY
CLICKING ACCEPT OR
AGREE, OR BY ACCESSING, OPENING, DOWNLOADING, INSTALLING, COPYING
OR OTHERWISE USING
ANY OF THE SOFTWARE (INCLUDING BY AUTHORIZING, ARRANGING FOR AND/
OR PERMITTING ANY
EMPLOYEE OR OTHER MEMBER OF LICENSEE PERSONNEL TO DO ANY OF THE
SAME), YOU ACCEPT
AND AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT (“AGREEMENT
EFFECTIVE DATE”). IN
THIS AGREEMENT, THE TERM “SOFTWARE” MEANS: (A) THE SOFTWARE IN
RESPECT OF WHICH THIS
AGREEMENT HAS BEEN PROVIDED TO YOU, INCLUDING BUT NOT LIMITED TO,
ALL DATACORE BRANDED
```

SOFTWARE, PERIFERY BRANDED SOFTWARE,SANSYMPHONY BRANDED SOFTWARE, PULS8 BRANDED
SOFTWARE, SWARM BRANDED SOFTWARE, FILEFLY BRANDED SOFTWARED, AI+ BRANDED SOFTWARE,
OBJECT MATRIX BRANDED SOFTWARE, PIXIT MEDIA BRANDED SOFTWARE, ARCASTREAM BRANDED
SOFTWARE, ARCAPIX BRANDED SOFTWARE, OR SOFTWARE THAT MAY BE PRE-INSTALLED ON
APPLIANCES (“HARDWARE”) UNDER ANY DATACORE, SANSYMPHONY, OBJECT MATRIX, PERIFERY,
PULS8, PIXIT MEDIA, ARCASTREAM BRAND OR ARCAPIX BRAND; SOFTWARE UNDER THE CARINGO OR
DATACORE FILEFLY OR SWARM BRANDS; AI+ BRANDED SOFTWARE; (B) ANY AND ALL REMOTELY
ACCESSED CLOUD AND/OR WEB SERVICES PROVIDED OR MADE AVAILABLE TO YOU UNDER THE
DATACORE BRAND AND/OR ANY OF THE SANSYMPHONY, PERIFERY, PULS8, OBJECT MATRIX, PIXIT
MEDIA, ARCASTREAM, ARCAPIX, CARINGO, FILEFLY, SWARM AND AI+ BRANDS; AND (C) ANY AND ALL
OTHER SOFTWARE (INCLUDING ANY APPLICATION PROGRAMMING INTERFACE (API)) AND CLOUD AND
WEB SERVICES PROVIDED OR MADE AVAILABLE TO YOU BY DATACORE. YOU ACKNOWLEDGE AND
AGREE THAT: (A) IF DATACORE PROVIDES YOU WITH ANY OTHER LICENSE IN RESPECT OF SUCH
SOFTWARE IN ADDITION TO THIS AGREEMENT, UNLES SUCH LICENSE EXPRESSLY PROVIDES
OTHERWISE, IT SHALL SUPPLEMENT AND NOT SUPERSEDE OR REPLACE THIS AGREEMENT AND, IN
THE EVENT OF CONFLICT BETWEEN SUCH LICENSE AND THIS AGREEMENT, THE PROVISIONS OF THIS
AGREEMENT SHALL PREVAIL); AND (B) THE SOFTWARE AND ITS ACCOMPANYING DOCUMENTATION
ARE PROVIDED SOLELY UNDER LICENSE AND NOT SOLD TO YOU. YOU DO NOT ACQUIRE ANY
OWNERSHIP INTEREST IN THE SOFTWARE OR DOCUMENTATION UNDER THIS AGREEMENT.

DATACORE IS WILLING TO LICENSE THE SOFTWARE TO YOU ONLY IF YOU ACCEPT ALL OF THE TERMS
IN THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THESE TERMS, YOU MAY NOT ACCESS, OPEN,
DOWNLOAD, INSTALL, COPY OR OTHERWISE USE ANY SOFTWARE, AND YOU MUST PROMPTLY
DESTROY ALL DOWNLOADED SOFTWARE IN YOUR POSSESSION OR CONTROL, INCLUDING ANY BACK-
UP COPY, AND RETURN ALL OTHER SOFTWARE TO THE VENDOR FROM WHOM IT WAS ACQUIRED IN
ACCORDANCE WITH THE VENDOR’S RETURN POLICY FOR THE SOFTWARE.

THE TERMS OF THIS AGREEMENT MAY BE UPDATED FROM TIME TO TIME AT DATACORE’S SOLE
DISCRETION, WITH OR WITHOUT NOTICE TO YOU. IT IS YOUR

RESPONSIBILITY TO REVIEW AND
COMPLY WITH THE CURRENT VERSION OF THIS AGREEMENT, WHICH CAN BE FOUND AT:
https://www.datacoreassets.com/resources/legal/DataCore-EULA.pdf.

CERTAIN DATACORE SOFTWARE REQUIRES ACTIVATION. IF THE SOFTWARE REQUIRES ACTIVATION,
YOU WILL BE PROMPTED TO ACTIVATE THE SOFTWARE IN ACCORDANCE WITH THE INSTRUCTIONS
PROVIDED. IF THE SOFTWARE REQUIRES ACTIVATION AND IS NOT ACTIVATED WITHIN THIRTY (30) DAYS
AFTER SOFTWARE INITIALIZATION, IT WILL CEASE FULL OPERATION UNTIL THE SOFTWARE IS
ACTIVATED. SOME EVALUATION VERSIONS OF THE SOFTWARE MAY NOT BE ELIGIBLE FOR ACTIVATION.
NOTICE TO DATACORE HARDWARE USERS: DATACORE HARDWARE MAY CONTAIN, BUT MAY NOT BE
LIMITED TO, SOFTWARE FROM VMWARE, RED HAT, PROXMOX, UBUNTU, ELASTICSEARCH, AND/OR
MICROSOFT (TOGETHER, “OTHER SOFTWARE”). NOTHING IN THIS AGREEMENT WILL BE CONSTRUED
AS GRANTING ANY RIGHTS TO YOU, BY LICENSE OR OTHERWISE, IN OR TO SUCH OTHER SOFTWARE.
YOU ARE RESPONSIBLE FOR OBTAINING THE APPROPRIATE LICENSE RIGHTS FOR ITS USE FROM
THEM DIRECTLY. NONE OF THE TERMS AND CONDITIONS OF THIS AGREEMENT EXTEND TO OR
GOVERN THE OTHER SOFWARE AND DATACORE HAS NO LIABILITY OR OBLIGATION WITH RESPECT
TO ANY SUCH OTHER SOFTWARE.

NOTICE TO EVALUATION USERS: UNTIL YOU HAVE CONVERTED TO A PAID PRODUCTION USE
LICENSE, THIS LICENSE IS SOLELY FOR THE PURPOSE OF YOUR EVALUATION OF THE SOFTWARE.
YOU ARE NOT PERMITTED TO USE THE SOFTWARE IN A PRODUCTION ENVIRONMENT OR TO PROVIDE
SERVICES. IF YOU CHOOSE NOT TO CONVERT TO A PAID PRODUCTION USE LICENSE, THE SOFTWARE
WILL CEASE OPERATING IN THIRTY (30) DAYS, OR SUCH OTHER DATE AS DATACORE MAY SPECIFY
(THE “EVALUATION PERIOD”). FOR THE PURPOSES OF THIS AGREEMENT, “EVALUATION” SHALL MEAN
ANY FREE, TRIAL, PILOT OR DEMONSTRATION USE; EVEN IF EXTENDED BEYOND THIRTY DAYS BY
WRITTEN PERMISSION OF DATACORE FOR SUCH LIMITED USE.

Individual Users. As stated above, in all other parts of this Agreement, references to “You” or “Your” are to
Licensee. In this paragraph only, references to “You” or “Your” are to the specific individual employee or other
authorized user of Licensee using our Software. You hereby warrant and represent that either: (i) Licensee has
previously entered into and is bound by this Agreement and You are

authorized by Licensee to use the Software on its behalf, or, if Licensee is not already bound by this Agreement, (ii) You are authorized to enter into, and have entered into, this Agreement on behalf of Licensee and bind Licensee to comply with this Agreement and You are authorized by Licensee to use the Software on its behalf. You further confirm and agree that: You will not use the Software or act (or omit to act) in any way that would put Licensee in breach of this Agreement [and, if applicable, that You will use the Software at all times only in accordance with and subject to the Terms of Use that may apply to the Software.

You acknowledge and agree that the Software may contain a time-sensitive disablement feature (“Time-Bomb”) that will automatically deactivate the Software upon the expiration of any Term License (as defined below) for the Software. You agree not to tamper with, disable, or attempt to bypass the Time-Bomb feature. You acknowledge that the Time-Bomb feature is integral to the enforcement of the applicable term of the license for the Software and agree that DataCore shall not be liable for any loss or damage that may arise from the disablement of the Software as a result of the Time-Bomb feature. Upon the deactivation of the Software by the Time-Bomb feature, You must cease all use of the Software and undertake to delete or destroy all copies of the Software in Your possession or control within a (sixty) 60-day grace period.

Evaluation License Grant. If Your quote, agreement, proposal and/or order form (“Order”) is for an evaluation of the Software, subject to the terms and conditions in this Agreement, and solely during the Evaluation Period, DataCore hereby grants to You a revocable, nontransferable, non-exclusive, non-sublicensable, limited license to download, install and use an on-premises version, or access and use on a third party cloud infrastructure (as specified on the Order), one copy of the binary code version of the Software and its accompanying documentation for Your internal use only and subject to all the following: such use must be (i) solely for purposes of Your internal evaluation and testing of the operation of the Software in a nonproduction environment; (ii) during the term of the Evaluation Period only; and (iii) limited to the parameters and optional features (if any), specified on the Order. Limited parameters may include, but not be limited to, number of computing devices (including virtual machines running in Your own environment or on a third party cloud infrastructure authorized by DataCore), storage capacity, time period, and number of users. You will not use or cause or permit any use of the Software in a production environment. You will adhere to the license restrictions (and all applicable provisions) of this Agreement. You may not publish or disclose to third parties any

evaluation of the Software without DataCore's prior written consent.

Production Use License Grant. If Your Order is for commercial use of the Software on a non-evaluation basis, subject to the terms and conditions in this Agreement, DataCore hereby grants to You a non-transferable, non-exclusive, non-sublicensable, limited to the paid term (as applicable), license to download, install and use an on-premises version, or access and use on a third party cloud infrastructure authorized by DataCore (as specified on the Order), the binary code version of the Software for Your internal use, subject to the parameter limits and optional features (if any), of Your license as may be stated on Your DataCore Order. License parameter limits may include, but not be limited to, number of computing devices (including virtual machines running in Your own environment or on a third party cloud infrastructure), storage capacity (total, used, and managed; as explained below), number of users, time period, and other limitations specified by DataCore. Storage capacity means Your entire storage capacity accessible to DataCore, less any capacity occupied by data protection algorithms, which may include more than one DataCore software application or instance. For the avoidance of doubt, storage capacity is the sum total of all storage space accessible to DataCore software applications, even if not (yet) used or managed at a given time; used capacity is storage space taken up by data, metadata and system information managed by DataCore and managed capacity is storage space under the control of a DataCore software application and available for consumption even though not in use. Storage capacity will be used and monitored to determine storage-based license fees. If You want to increase Your license parameters and/or features beyond that for which You have paid, You must purchase and pay DataCore for such increased parameters and/or features at DataCore's then applicable rates. Unless otherwise specified on Your Order, such rates will be the most recent rates published by DataCore at the relevant time. DataCore may share Your data and information with third party service providers, which may include but not be limited to, OpenAI and Amazon, in order to provide the Software. In some cases, at DataCore's sole discretion, a Letter of Credit or other financial arrangement may be required by DataCore before accepting Your Order.

DCSPP Participants. Pursuant to Your valid DataCore Cloud Service Provider Program ("DCSPP") Agreement, You may only use the Software to provide Hosted IT Services. "Hosted IT Services" means an internet-based subscription service operated by a service provider entity that consists of providing multiple end service users (as defined below) access to: (i) the storage resources of systems

operated by the service provider entity (such as utility or grid computing), or (ii) various software applications that are installed and operated on the systems of the service provider entity. For purposes of this Agreement, “end service users” may be: (i) independent third-parties with which the service provider has a commercial relationship; or (ii) departments, divisions or workgroups served by a subscribing central hosting service provider. Your authorized users, (employees or others), may access the Software remotely through a wide area network or VPN, or other secure remote access method, provided that You comply with the parameter limitations of the Software and subscription plan for which You have been expressly authorized by DataCore. All DCSPP participants (authorized Cloud Service Providers (“CSPs”)), must have accepted and be subject to a current and valid DataCore Cloud Service Provider Agreement, as well as a current and valid CSP/Aggregator Agreement that includes, but is not limited to: (i) complete terms of use for the DCSPP, (ii) Software usage requirements and limitations, and (iii) DataCore’s liability limits, in accordance with this Agreement. For the purposes of this Agreement, a DataCore Aggregator (“Aggregator”) shall mean a Software Distributor that has a current and valid contract with DataCore, which authorizes them to sell and distribute the Software for the DCSPP.
If applicable, You may make one backup copy of the Software, provided the copy must contain all of the original Software’s copyright, trademark and other proprietary notices.

Object Matrix Users. Object Matrix users shall comply with this Agreement along with any additional terms and conditions provided to You by DataCore. Object Matrix perpetual software licenses are not transferrable between devices. For the avoidance of doubt, Object Matrix perpetual software licenses are tied solely to the device(s) upon which they are initially installed. For Legacy (as defined below) Object Matrix users, specific terms and conditions of Your use of Object Matrix products and services (“OM Terms”) may be found at: https://www.datacore.com/legal/, under the Legacy Object Matrix section. “Legacy” means Object Matrix users that meet all conditions stated at the Legacy Object Matrix section. Rights granted to You apply only to the specific products to which You have subscribed as set out in Your Object Matrix Order (as the case may be) (the “Order”) relate. For Legacy Object Matrix users, in the event of a conflict arising between this Agreement and OM Terms, then the OM Terms shall prevail.
Pixit Media and ArcaStream Users. Pixit Media, ArcaStream and Arcapix users (“PMA Users”) shall comply with this Agreement along with any additional terms and conditions provided to You by DataCore. Certain license parameters and reissuance procedures may apply to Pixit Media licenses. For Legacy PMA Users (as defined below), specific terms and conditions of Your use of Pixit Media and/or

ArcaStream products and services (“Legacy PMA Terms”) may be found at: https://www.datacore.com/legal/, under the Legacy Pixit Media and ArcaStream section.
“Legacy PMA Users” means Pixit Media and/or ArcaStream users that meet all conditions stated at the Legacy Pixit Media and ArcaStream section. Rights granted to You apply only to the specific products to which You have subscribed as set out in Your associated Order (as the case may be) (the “PMA Order”) relate. For Legacy PMA Users, in the event of a conflict arising between this Agreement and Legacy PMA Terms, then the Legacy PMA Terms shall prevail.

License Restrictions. Your employees may access the Software remotely through a wide area network or VPN, or other secure remote access method, provided that, if applicable, You may in no event exceed the number of permitted concurrent uses or users of the Software for which You have been expressly authorized by DataCore.
In the absence of any express written authorization by DataCore to the contrary, the number of concurrent uses or users of the Software, the number of computing devices (including virtual machines) on which the Software may be used, and the number of copies of the Software You may make, shall be one. You may also make one back-up copy of the Software, provided the copy must contain all of the original Software’s copyright, trademark and other proprietary notices. Any copy remains the exclusive property of DataCore or its licensors. You will not cause or permit: (i) use or copying of the Software or documentation, except as expressly provided in this Agreement; (ii) modification, adaption, assignment, distribution, rental, sub-license, lease, lending or transfer of the Software; (iii) reverse engineering, disassembly, translation, decoding or decompilation of the Software, except to the extent expressly permitted by law notwithstanding this prohibition; (iv) creation of any derivative works based on the Software; (v) removal, deletion, circumvention or alteration of any trademarks, copyright or other intellectual property rights notices provided with the Software; (vi) removal, disablement or circumvention of any security or copy protection features; (vii) use of the Software to violate or circumvent any law, regulation or rule, or for any purpose other than its intended use in accordance with the documentation; (viii) except as DataCore may otherwise agree in writing, use of the Software in connection with a service bureau or other use or configuration whereby the Software is used by, for the benefit of, or to provide a service on the computer equipment of, a third party. Notwithstanding the foregoing, if You have express written authorization from DataCore that grants You leasing, factoring, or other alternative servicing rights to the Software, such rights may be exercised subject to full compliance with such Agreement. The

Software requires integration with an Amazon Web Services (AWS) account and an OpenAI account. You are responsible for obtaining and maintaining the AWS and OpenAI accounts that are integrated with the Software and complying with any terms and conditions of Your AWS and OpenAI accounts. Failure to do so will not relieve Your obligations under this Agreement, including Your obligation to make payments for the Software that are due to DataCore.

Ownership. The Software (including any copies) is licensed, not sold. DataCore and its licensors retain all right, title and interest in the Software and documentation, and in all copies, improvements, updates, revisions, enhancements, modifications and derivative works thereof, including, without limitation, all patent, copyright, trade secret, trademark and database rights. The terms of this Agreement are intended to benefit any third party licensors, who may directly enforce applicable terms of this Agreement to protect their interest in any of the Software. DataCore and its licensors reserve all rights not expressly granted to You herein, and no other licenses, whether express, implied or otherwise, are granted to You.

Maintenance, Support and Updates. DataCore has no obligation to provide any maintenance, support, updates, or fixes for any Software that You use during an Evaluation Period. For Software licensed to You on a term basis or as a subscription service, DataCore, from time to time, may update, fix, and maintain the Software as DataCore, in its sole discretion, deems necessary, or as DataCore may otherwise expressly agree in writing. For perpetual Software licenses, except as provided under the limited warranty set forth below, and except as DataCore may otherwise expressly agree in writing, DataCore is under no obligation to maintain, support or update the Software in any way, or to provide updates or error corrections, however, such services may be separately purchased under a support contract. To receive technical support entitlements for Software, all licenses currently activated for the Software residing on or utilized by Your system must be under a current support contract with DataCore (either as included in the purchase of a Term License or as a separately purchased support contract for a perpetual license). Systems running any active licenses that are not covered by a current support contract shall be deemed ineligible for technical support. Support contracts are tied to specific licenses and are not interchangeable with other licenses. For all licenses (term, subscription or perpetual), if DataCore provides You with a bug fix, maintenance release or update to the Software, it is provided to You as is and shall be considered Software subject to the terms of this Agreement, unless You receive a separate license from DataCore for that release or update that expressly

supersedes and replaces this Agreement. In addition, the Software may contain support and/or data collection functions that provide DataCore with certain system telemetry information that DataCore may use to provide support, analysis, and reporting to You, as well as to update or enhance the Software. By using the Software, You consent to DataCore's access and use of such information for such purposes. Subject to satisfaction of any eligibility conditions stated therein, the terms of the DataCore Support Services Terms and Conditions, as available through the following link: https://www.datacoreassets.com/resources/support/DataCore-Software-Support-Services-Terms-and-Conditions.pdf, shall apply and hereby be incorporated into this Agreement by this reference. Certain support and maintenance terms applicable to Hardware, may be found under the Legacy Object Matrix section at: https://www.datacore.com/legal/.

System Data Rights. You agree that DataCore will collect and track technical and related information about You and Your use of the Software, which may include, but not be limited to, Your internet protocol address, hardware identifying information, operating system, application software, storage capacity, peripheral hardware, and Software usage statistics (together "System Data"), to assist with the operation and function of the Software, the provision of updates, support, invoicing, marketing by DataCore or its agents, benchmarking and research and development. A current summary of information collected by DataCore (the "DataCore Collection Manifest") is available through the following link:https://docs.datacore.com/intelligenceservice/intelligenceservice/collection-manifest.htm, and hereby incorporated into this Agreement by this reference. The terms of the DataCore Data Processing Agreement ("DPA") as available through the following link: https://www.datacoreassets.com/resources/legal/DataCore-Data-Protection-Provisions-Addendum.pdf shall also apply and hereby be incorporated into this Agreement by this reference.

Automated Data Collection. You agree that DataCore may utilize automated data collection tools ("ADC") for automated collection, processing and monitoring of Your Software usage data for DataCore's reporting, billing and associated purposes. Furthermore, You will cooperate with DataCore to enable ADC, as necessary.

(Examples of ADC may include, but not be limited to, DataCore Insight Services ("DIS"), Phone Home or any other telemetry service tool utilized by DataCore). In the event You disable, turn off, circumvent or otherwise prevent ADC from functioning correctly during the term of this EULA, You acknowledge and agree that You may

be billed (and will be required to pay) at a usage rate of two times (“2x”) the peak monthly amount billed in any prior month in which ADC was functioning.

Confidentiality. The Software contains confidential and proprietary information of DataCore and/or its licensors (“Confidential Information”). You agree not to use Confidential Information except as necessary to perform this Agreement and shall not disclose Confidential Information to any third party. You agree to take all reasonable and adequate measures, and no less than measures You take to secure Your own confidential and proprietary information, to protect and secure the Confidential Information and Software from unauthorized disclosure or use.

Payment. If a non-recurring installation, setup or onboarding charge (“Installation Charge”) is specified on an Order, DataCore will invoice You for such Installation Charge upon the effective date of the Order. If a recurring charge (“Recurring Charge”) (e.g., Monthly Charge, Quarterly Charge, Annual Charge, etc.) is specified on an Order, DataCore will invoice You for the Recurring Charge in advance for each period. If applicable, DataCore will invoice You and You will pay such invoices for any additional charges for products and services described on an Order. You will pay all invoices within thirty (30) days from the date of such invoice.

All invoices must be paid in accordance with their terms without setoff or deduction, and late payments will accrue interest on the unpaid sum as of the date of the invoice at the lesser of (i) the highest legal rate of interest permitted by applicable law or (ii) one and one-half percent (1.5%) per month. DataCore may apply any payments received by DataCore to any one of Your then outstanding charges.

Taxes. All amounts payable by You to DataCore hereunder are exclusive of any sales, use and other taxes or duties (collectively, “Taxes”). You are solely responsible for payment of any Taxes, except for those taxes based on the income of DataCore. You will not withhold any Taxes from any amounts due to DataCore.

Limited Warranty. During the Evaluation Period the Software is provided and You accept the Software “AS-IS” and “WITH ALL FAULTS.” Upon commencement of the production use license, DataCore warrants for a period of ninety (90) days thereafter that the Software will substantially conform under normal use to DataCore’s specifications contained in the user guides and operating manuals provided by DataCore with or in respect of the Software. DataCore will, at its sole discretion, either promptly replace any Software that fails to comply with this warranty at its cost or refund the amount paid for the Software and attributable to the remainder of the production license period. Any claims submitted under this section must be submitted in writing to DataCore within the

specified warranty period. This limited warranty is void if failure of the Software results from accident, abuse, misapplication, abnormal use or a virus. Any replacement for the Software, and any bug fix, maintenance release or update to the Software, will be warranted under this limited warranty for the remainder of the original warranty period applicable to the Software or thirty (30) days from its delivery, whichever is longer. THIS SECTION STATES YOUR SOLE AND EXCLUSIVE REMEDY, AND DATACORE'S AND ITS SUPPLIERS' SOLE AND EXCLUSIVE LIABILITY, IN CONNECTION WITH THE SOFTWARE, INCLUDING FOR ANY BREACH OF THE WARRANTY RELATING TO THE SOFTWARE. THIS LIMITED WARRANTY SET FORTH IN THIS SECTION GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE ADDITIONAL RIGHTS, WHICH VARY FROM JURISDICTION TO JURISDICTION.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND CONDITIONS, WHETHER EXPRESS OR IMPLIED, AND DATACORE AND ITS SUPPLIERS EXPRESSLY DISCLAIM ALL OTHER WARRANTIES AND CONDITIONS, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, SATISFACTORY QUALITY, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, AND AGAINST HIDDEN DEFECTS TO THE FULLEST EXTENT PERMITTED BY LAW. NO ADVICE OR INFORMATION, WHETHER ORAL OR WRITTEN, OBTAINED FROM DATACORE OR ELSEWHERE WILL CREATE ANY WARRANTY OR CONDITION NOT EXPRESSLY STATED IN THIS AGREEMENT. DATACORE DOES NOT WARRANT THAT THE SOFTWARE WILL MEET YOUR REQUIREMENTS OR THAT USE OF THE SOFTWARE WILL BE UNINTERRUPTED, ERROR FREE, OR FREE OF VARIATIONS FROM THE DOCUMENTATION. DATACORE IS NOT RESPONSIBLE FOR ANY INTERFERENCE WITH OR INABILITY TO USE THE SOFTWARE RESULTING FROM ADDITIONAL SOFTWARE OR SERVICES PROVIDED BY THE CLOUD INFRASTRUCTURE SUPPLIER, IF ANY, THROUGH WHICH YOU ACCESS THE SOFTWARE.

Evaluation License Termination. The Evaluation license granted under this Agreement shall terminate automatically upon the expiration of the Evaluation Period. In addition, the Evaluation license shall terminate prior to the expiration of the Evaluation Period upon the occurrence of any of the following: (i) either You or DataCore at any time give the other written notice of termination (with or without cause); (ii) You breach any provision in this Agreement; or (iii) if applicable, Your access to the Software is terminated by Your cloud infrastructure provider. The Software will cease to function or become inaccessible in whole or in part upon

termination of the evaluation license.
Production Use License Termination. The production use license granted to You under this Agreement will terminate immediately and automatically without notice upon the occurrence of any of the following: (i) if You have licensed the Software on a term basis (a “Term License”) or on a subscription basis (“Subscription Term”), upon the expiration of Your pre-paid Term License or Subscription Term; (ii) You breach any provision in this Agreement; (iii) DataCore does not receive payment in full for Your license; (iv) if You entered into an Exchange Agreement with DataCore in which Your perpetual license(s) are terminated in exchange for Term License(s), Subscription Term, a different edition of perpetual licenses, or license key exchange for equivalent license or capacity (TB); or (vi) if applicable, Your access to the Software is terminated by the cloud infrastructure provider through which You acquired the production use license. Upon termination of the Term License or Subscription Term, as applicable, You will discontinue use of the Software and remove any and all copies of the Software and any part of the Software from any and all computing devices, including any back-up copy, and destroy the Software. At DataCore’s request, You will certify in writing to the foregoing.

With regard to Term Licenses and Subscription Terms, at the termination or expiration date of Your Term License or Subscription Term, as applicable, and without notice from DataCore, You will be provided a (sixty) 60-day grace period to collect Your exportable data. In the event Your Term License or Subscription Term is renewed within the (sixty) 60-day grace period (requiring the payment of all fees due), Your use of the Software and access to Your data may be resumed, provided that You have properly backed-up Your configuration information and it can be restored. If DataCore does not receive and acknowledge Your Term License or Subscription Term renewal within the (sixty) 60-day grace period, DataCore may delete or destroy Your configuration and historic information associated with the Software. After the (sixty) 60-day grace period, Your previous Term License or Subscription Term may (at DataCore’s sole discretion; conditions and fees may apply) no longer be renewed and any Term License or Subscription Term added may be treated as a new Term License or Subscription Term, as applicable, and unrelated to the terminated Term License or Subscription Term. DataCore has no obligation to restore access to any previous Term License or Subscription Term configuration information, history or data. In no event shall DataCore be liable to You for loss or accuracy of Your configuration information or data. The provisions of this Agreement, except for the license grant and warranty, will survive termination.
Term. This Agreement comes into force on the Agreement Effective

Date and shall continue in effect until terminated in accordance with its terms.

Early Termination. Except for early termination due to a material breach of this Agreement by DataCore, You may not terminate Your Term License, Subscription Term or Support Agreement without prior payment of all fees due for the entire period for which Your Order applies. For multi-year license or support terms, all future payments must be received by DataCore prior to DataCore's acceptance of early termination, which acceptance shall be made at DataCore's sole discretion. In the event of early termination due to a material breach of this Agreement by DataCore, you must first pay all fees due and unpaid in respect of the entire period for which Your Order applies up to the date of such breach. In no event shall any of Your prepaid fees be returned to You by DataCore for early termination.

Effect of Termination. Termination or expiration of this Agreement shall not: (i) affect any of the rights, obligations or liabilities accruing to You or DataCore prior to the date of termination or expiration, or (ii) release You from any obligations, including the payment of all fees due, or liabilities you may have under any other agreement with any DataCore distributor, reseller or aggregator. Notwithstanding termination or expiration of this Agreement, all provisions of this Agreement which are expressly stated to survive termination or expiration of this Agreement or which by their nature are intended to survive termination or expiration shall survive and remain in effect in accordance with their terms.

Audit Rights. During the term of this Agreement and for a period of two (2) years from the date of its termination[,cancellation] or expiration: (i) You shall maintain complete, clear, and accurate records that demonstrate compliance with the terms and conditions of this Agreement and any other agreement(s) in force between You and DataCore, and (ii) upon thirty (30) days written notice, DataCore (or DataCore's representative) will be entitled to audit Your books, records and use of the Software and any other DataCore materials provided to You, to verify compliance with the terms of this Agreement and any other agreement(s) in force between You and DataCore, the functioning of ADC, and all applicable DataCore policies. You shall promptly pay to DataCore or the relevant DataCore distributor, reseller or aggregator, as may be applicable, any underpayments owed to such party as revealed by any such audit, plus any applicable late payment fees. Any such audit will be performed at DataCore's expense during normal business hours, in a manner so as to try not to upset Your normal business operations and procedures, provided that You shall cooperate fully

with DataCore and shall promptly reimburse DataCore in full for the cost of such audit if such audit reveals: (a) an underpayment by You of more than five percent (5%) of the amounts payable by You in respect of the period audited (b) any evidence that You have violated any laws, DCSPP rules (if applicable to You) or DataCore policies, (c) You have disabled, turned off, circumvented or otherwise prevented ADC from functioning correctly, or (d) any other material breach of this Agreement.

Indemnification. You agree to indemnify and hold DataCore, its suppliers, subcontractors and other partners, and their respective officers, agents, partners and employees, harmless from any fee, loss, awards, damages, liability, claim, or demand, including, but not limited to, reasonable attorneys' fees, made by any third-party due to or arising out of or in connection with Your use of the Software, Your violation of any proprietary rights of another by Your data or information provided to the Software.
Limited Liability. UNDER NO CIRCUMSTANCES WILL DATACORE OR ITS SUPPLIERS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, LOSS OF SAVINGS OR ANTICIPATED SAVINGS, LOSS OF BUSINESS, BUSINESS OPPORTUNITY, BUSINESS INTERUPTION, GOODWILL, REPUTATION OR DATA, COST OF COVER, RELIANCE DAMAGES OR ANY OTHER SIMILAR DAMAGES OR LOSS, EVEN IF DATACORE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND REGARDLESS OF WHETHER ARISING UNDER CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE. EXCEPT AS LIMITED BY APPLICABLE LAW, DATACORE'S AND ITS SUPPLIERS' TOTAL LIABILITY UNDER THIS AGREEMENT OR OTHERWISE SHALL IN NO EVENT EXCEED THE GREATER OF $500 OR THE LICENSE FEE PAID BY YOU FOR THE SOFTWARE IN THE 12 MONTHS PRECEDING THE EVENT GIVING RISE TO THE LIABILITY. THE LIABILITY LIMITATIONS SET FORTH IN THIS AGREEMENT SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED IN THIS AGREEMENT OR THE INVALIDITY OF ANY OTHER PROVISION.

U.S. Government Rights. The Software and its documentation are "commercial computer software" and "commercial computer software documentation," respectively as such terms are used in FAR 12.212 and other relevant government procurement regulations. Any use, duplication, or disclosure of the Software or its documentation by or on behalf of the U.S. government is subject to restrictions as set forth in this Agreement.

Export Law Assurances. The Software, including its documentation and related technical data, is subject to the export control laws and regulations of the United States (“Export Laws”). You agree not to export or re-export (directly or indirectly) the Software (including its documentation and related technical data) or any direct product thereof without fully complying with the Export Laws.
License Compliance Assurances. DataCore reserves the right to run periodic license compliance tests to determine and enforce the parameters of Your license(s). Without interruption to users, license compliance data may be reviewed and/or collected on demand, whether by automatic or manual means. Parameters associated with such compliance tests may include, but not be limited to, system memory, number of CPU cores, storage capacity, users, time, and configuration.

Governing Law. This Agreement will be governed by and construed in accordance with the laws of the State of Florida U.S.A., excluding the United Nations Convention on Contracts for the International Sale of Goods, and without regard to principles of conflicts of law. Each party consents to the jurisdiction and exclusive venue of the state and federal courts of Broward County, Florida U.S.A. provided that DataCore shall at all times have the right to commence proceedings in any other court of its choice of appropriate jurisdiction to obtain an injunction, specific performance or other equitable relief for protection of intellectual property rights.
Transfers/Assignment. This Agreement will bind and inure to the benefit of each party’s permitted successors and assigns. You may not transfer, novate, assign or otherwise part with (each, a “transfer” of) this Agreement or any of Your rights or obligations under it, in whole or in part, without DataCore’s prior written consent. You agree to notify DataCore of any transfer in writing and provide all proposed transferee information requested by DataCore. Consent to any requested transfer shall not be guaranteed and shall be made at DataCore’s sole discretion. Any attempt to assign this Agreement without such notice and consent will be null and void. You agree that DataCore may transfer this Agreement or any of its rights or obligations under it to a third party without the requirement for further consent from you in the event of the sale of all or substantially all of the business of DataCore, in the context of a solvent reorganization or any other analogous procedure or otherwise on (thirty) 30 days prior written notice to you.

Third-Party Code. The Software may contain or be provided with third-party components subject to terms and conditions of such third-party licenses (“Third-Party Software”). Third-Party Software may include Open Source Software, as defined below. Third Party Software shall be deemed

to be incorporated within the Software for the purposes of this Agreement (except where expressly provided to the contrary) and use of the Third Party Software shall be subject to (and You shall comply with) such additional terms as relate to such Third Party Software from time to time ("Third Party Additional Terms"), and such Third Party Additional terms shall take precedence over this Agreement in relation to such Third Party Software. You shall indemnify and hold DataCore harmless against any loss or damage which DataCore may suffer or incur as a result of Your breach of any Third Party Additional Terms howsoever arising, and DataCore may treat Your breach of any Third Party Additional Terms as a material breach of this Agreement. Third Party Software is provided "AS-IS" and the performance of and any issues caused by or arising from any Third Party Software shall be considered an event outside of DataCore control. The Software may contain or be provided with components subject to the terms and conditions of "open source" software licenses ("Open Source Software"). Open Source Software may be identified in the user guides and operating manuals provided by DataCore with the Software, or DataCore may provide a list of the Open Source Software for a particular version of the Software upon written request. To the extent required by the license that accompanies the Open Source Software, the terms of such license will apply in lieu of the terms of this Agreement with respect to such Open Source Software, including, without limitation, any provisions governing access to source code, enhancement, modification or reverse engineering. Conflicts. In the event of a conflict or inconsistency arising between the subject matter of this Agreement and the DPA then the terms of the DPA shall prevail.

General Provisions. If any provision hereof shall be held illegal, invalid, or unenforceable, in whole or in part, such provision shall be modified to the minimum extent necessary to make it legal, valid and enforceable, and the legality, validity and enforceability of all other provisions of this Agreement shall not be affected thereby. No delay or failure by either party to exercise or enforce at any time any right or provision hereof shall be considered a waiver thereof or of such party's right thereafter to exercise or enforce each and every right and provision of this Agreement. You shall immediately notify DataCore if You become aware of any misuse of the Software or any infringement of DataCore's intellectual property rights in the Software and fully cooperate with DataCore in any legal action taken to enforce DataCore's intellectual property rights. This Agreement, including any Order accepted by DataCore, is the complete and exclusive statement between You and DataCore relating to the subject matter hereof and supersedes all prior oral and written and all contemporaneous oral negotiations, commitments, and understandings of the parties,

```
if any, including but not limited to any prior license for the
Software. In the case of any conflict between the terms of
this Agreement and the provisions of any Order for the Software,
the terms of this Agreement shall control. The
parties confirm that it is their wish that this Agreement, as well
as all other documents relating hereto, have been and
shall be drawn up in the English language only. The English
language version of this Agreement will control in all
respects, and all other versions are for convenience only and are
not binding.
```

Contact

Ngenea Hub is provided and supported by:

- Pixit Media Contact