



Manage ILM policies

StorageGRID 11.8

NetApp
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Manage ILM policies

ILM policies: Overview

An information lifecycle management (ILM) policy is an ordered set of ILM rules that determines how the StorageGRID system manages object data over time.



An ILM policy that has been incorrectly configured can result in unrecoverable data loss. Before activating an ILM policy, carefully review the ILM policy and its ILM rules, and then simulate the ILM policy. Always confirm that the ILM policy will work as intended.

Default ILM policy

When you install StorageGRID and add sites, a default ILM policy is automatically created, as follows:

- If your grid contains one site, the default policy contains a default rule that replicates two copies of each object at that site.
- If your grid contains more than one site, the default rule replicates one copy of each object at each site.

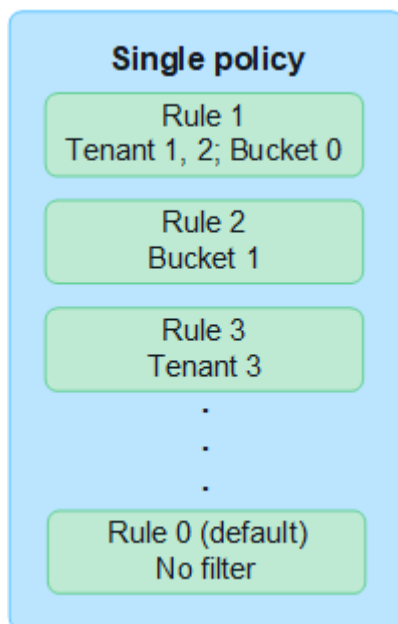
If the default policy does not meet your storage requirements, you can create your own rules and policy. See [Create an ILM rule](#) and [Create an ILM policy](#).

One or many active ILM policies?

You can have one or more active ILM policies at a time.

One policy

If your grid will use a simple data protection scheme with few tenant-specific and bucket-specific rules, use a single active ILM policy. The ILM rules can contain filters to manage different buckets or tenants.



When you have only one policy and a tenant's requirements change, you must create a new ILM policy or

clone the existing policy to apply changes, simulate, and then activate the new ILM policy. Changes to the ILM policy could result in object moves that could take many days and cause system latency.

Multiple policies

To provide different quality-of-service options to tenants, you can have more than one active policy at a time. Each policy can manage specific tenants, S3 buckets, and objects. When you apply or change one policy for a specific set of tenants or objects, the policies applied to other tenants and objects are not affected.

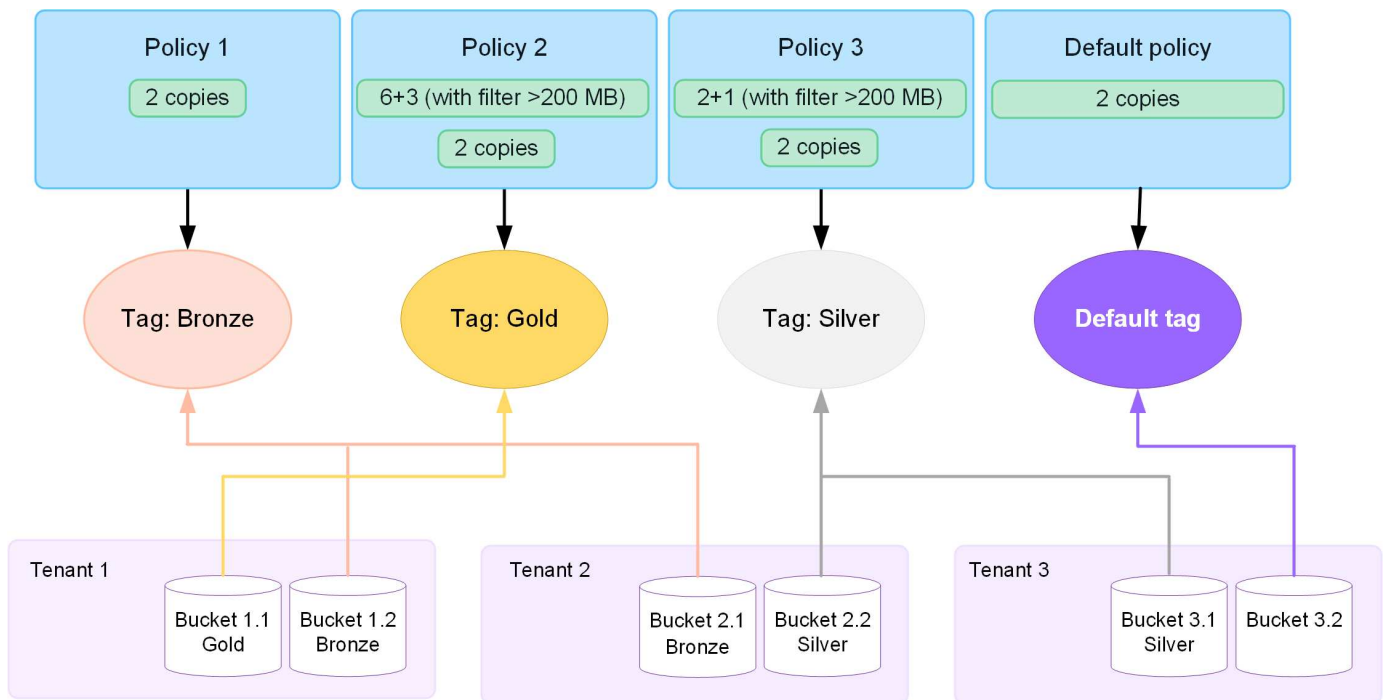
ILM policy tags

If you want to allow tenants to easily switch between multiple data protection policies on a per-bucket basis, use multiple ILM policies with *ILM policy tags*. You assign each ILM policy to a tag, then tenants tag a bucket to apply the policy to that bucket. You can set ILM policy tags on S3 buckets only.

For example, you might have three tags named Gold, Silver, and Bronze. You can assign an ILM policy to each tag, based on how long and where that policy stores objects. Tenants can choose which policy to use by tagging their buckets. A bucket tagged Gold is managed by the Gold policy and receives the Gold level of data protection and performance.

Default ILM policy tag

A default ILM policy tag is automatically created when you install StorageGRID. Every grid must have one active policy that is assigned to the Default tag. The default policy applies to all objects in Swift containers, and any untagged S3 buckets.



How does an ILM policy evaluate objects?

An active ILM policy controls the placement, duration, and data protection of objects.

When clients save objects to StorageGRID, the objects are evaluated against the ordered set of ILM rules in the policy, as follows:

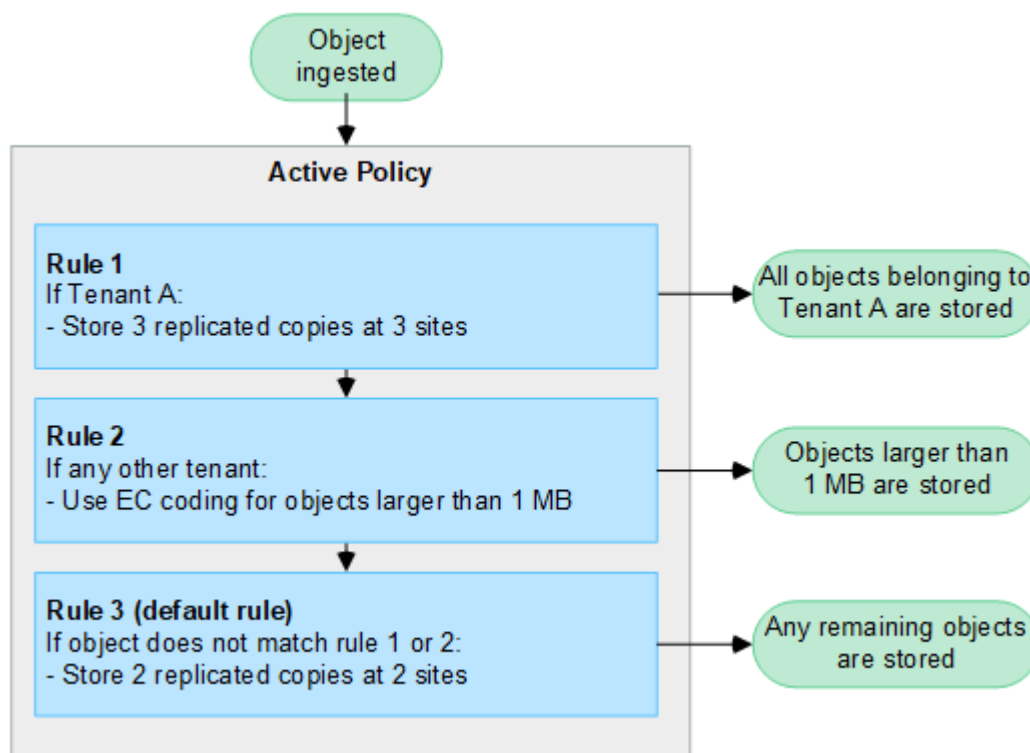
1. If the filters for the first rule in the policy match an object, the object is ingested according to that rule's ingest behavior and stored according to that rule's placement instructions.

2. If the filters for the first rule don't match the object, the object is evaluated against each subsequent rule in the policy until a match is made.
3. If no rules match an object, the ingest behavior and placement instructions for the default rule in the policy are applied. The default rule is the last rule in a policy. The default rule must apply to all tenants, all S3 buckets or Swift containers, and all object versions and can't use any advanced filters.

Example ILM policy

As an example, an ILM policy could contain three ILM rules that specify the following:

- **Rule 1: Replicated copies for Tenant A**
 - Match all objects belonging to Tenant A.
 - Store these objects as three replicated copies at three sites.
 - Objects belonging to other tenants aren't matched by Rule 1, so they are evaluated against Rule 2.
- **Rule 2: Erasure coding for objects greater than 1 MB**
 - Match all objects from other tenants, but only if they are greater than 1 MB. These larger objects are stored using 6+3 erasure coding at three sites.
 - Does not match objects 1 MB or smaller, so these objects are evaluated against Rule 3.
- **Rule 3: 2 copies 2 data centers** (default)
 - Is the last and default rule in the policy. Does not use filters.
 - Make two replicated copies of all objects not matched by Rule 1 or Rule 2 (objects not belonging to Tenant A that are 1 MB or smaller).



What are active and inactive policies?

Every StorageGRID system must have at least one active ILM policy. If you want to have more than one active ILM policy, you create ILM policy tags and assign a policy to each tag. Tenants then apply tags to S3 buckets.

The default policy is applied to all objects in buckets that do not have a policy tag assigned.

When you first create an ILM policy, you select one or more ILM rules and arrange them in a specific order. After you have simulated the policy to confirm its behavior, you activate it.

When you activate one ILM policy, StorageGRID uses that policy to manage all objects, including existing objects and newly ingested objects. Existing objects might be moved to new locations when the ILM rules in the new policy are implemented.

If you activate more than one ILM policy at a time, and tenants apply policy tags to S3 buckets, the objects in each bucket are managed according to the policy assigned to the tag.

A StorageGRID system tracks the history of policies that have been activated or deactivated.

Considerations for creating an ILM policy

- Only use the system-provided policy, Baseline 2 copies policy, in test systems. For StorageGRID 11.6 and earlier, the Make 2 Copies rule in this policy uses the All Storage Nodes storage pool, which contains all sites. If your StorageGRID system has more than one site, two copies of an object might be placed on the same site.



The All Storage Nodes storage pool is automatically created during the installation of StorageGRID 11.6 and earlier. If you upgrade to a later version of StorageGRID, the All Storage Nodes pool will still exist. If you install StorageGRID 11.7 or later as a new installation, the All Storage Nodes pool is not created.

- When designing a new policy, consider all of the different types of objects that might be ingested into your grid. Make sure the policy includes rules to match and place these objects as required.
- Keep the ILM policy as simple as possible. This avoids potentially dangerous situations where object data is not protected as intended when changes are made to the StorageGRID system over time.
- Make sure that the rules in the policy are in the correct order. When the policy is activated, new and existing objects are evaluated by the rules in the order listed, starting at the top. For example, if the first rule in a policy matches an object, that object will not be evaluated by any other rule.
- The last rule in every ILM policy is the default ILM rule, which can't use any filters. If an object has not been matched by another rule, the default rule controls where that object is placed and for how long it is retained.
- Before activating a new policy, review any changes that the policy is making to the placement of existing objects. Changing an existing object's location might result in temporary resource issues when the new placements are evaluated and implemented.

Create ILM policies

Create one or more ILM policies to meet your quality-of-service requirements.

Having one active ILM policy allows you to apply the same ILM rules to all tenants and buckets.

Having multiple active ILM policies allows you to apply the appropriate ILM rules to specific tenants and buckets to fulfill multiple quality-of-service requirements.

Create an ILM policy

About this task

Before creating your own policy, verify that the [default ILM policy](#) does not meet your storage requirements.



Only use the system-provided policies, 2 copies Policy (for one-site grids) or 1 Copy per Site (for multi-site grids), in test systems. For StorageGRID 11.6 and earlier, the default rule in this policy uses the All Storage Nodes storage pool, which contains all sites. If your StorageGRID system has more than one site, two copies of an object might be placed on the same site.



If the [global S3 Object Lock setting has been enabled](#), you must ensure that the ILM policy is compliant with the requirements of buckets that have S3 Object Lock enabled. In this section, follow the instructions that mention having S3 Object Lock enabled.

Before you begin

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the [required access permissions](#).
- You have [created ILM rules](#) based on whether S3 Object Lock is enabled.

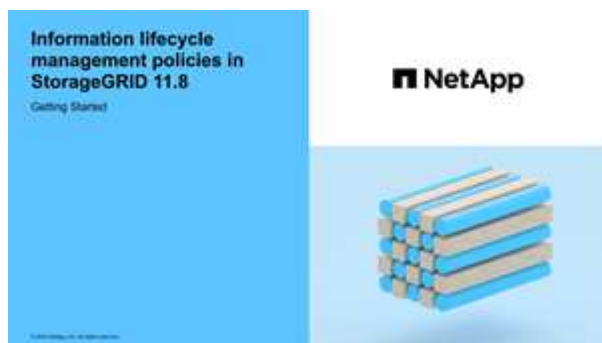
S3 Object Lock not enabled

- You have [created the ILM rules](#) you want to add to the policy. As required, you can save a policy, create additional rules, and then edit the policy to add the new rules.
- You have [created a default ILM rule](#) that does not contain any filters.

S3 Object Lock enabled

- The [global S3 Object Lock setting is already enabled](#) for the StorageGRID system.
- You have [created the compliant and non-compliant ILM rules](#) you want to add to the policy. As required, you can save a policy, create additional rules, and then edit the policy to add the new rules.
- You have [created a default ILM rule](#) for the policy that is compliant.

- Optionally, you have watched the video: [Video: Information lifecycle management policies in StorageGRID 11.8](#)



See also [Create an ILM policy: Overview](#).

Steps

1. Select **ILM > Policies**.

If the global S3 Object Lock setting is enabled, the ILM policies page indicates which ILM rules are compliant.

2. Determine how you want to create the ILM policy.

Create new policy

- a. Select **Create policy**.

Clone existing policy

- a. Select the checkbox for the policy you want to start with, then select **Clone**.

Edit existing policy

- a. If a policy is inactive, you can edit it. Select the checkbox for the inactive policy you want to start with, then select **Edit**.

3. In the **Policy name** field, enter a unique name for the policy.

4. Optionally, in the **Reason for change** field, enter the reason you are creating a new policy.

5. To add rules to the policy, select **Select rules**. Select a rule name to view the settings for that rule.

If you are cloning a policy:

- The rules used by the policy you are cloning are selected.
- If the policy you are cloning used any rules with no filters that were not the default rule, you are prompted to remove all but one of those rules.
- If the default rule used a filter, you are prompted to select a new default rule.
- If the default rule was not the last rule, you can move the rule to the end of the new policy.

S3 Object Lock not enabled

- a. Select one default rule for the policy. To create a new default rule, select **ILM rules page**.

The default rule applies to any objects that don't match another rule in the policy. The default rule can't use any filters and is always evaluated last.



Don't use the Make 2 Copies rule as the default rule for a policy. The Make 2 Copies rule uses a single storage pool, All Storage Nodes, which contains all sites. If your StorageGRID system has more than one site, two copies of an object might be placed on the same site.

S3 Object Lock enabled

- a. Select one default rule for the policy. To create a new default rule, select **ILM rules page**.

The list of rules contains only the rules that are compliant and don't use any filters.



Don't use the Make 2 Copies rule as the default rule for a policy. The Make 2 Copies rule uses a single storage pool, All Storage Nodes, which contains all sites. If you use this rule, multiple copies of an object might be placed on the same site.

- b. If you need a different "default" rule for objects in non-compliant S3 buckets, select **Include a rule without filters for non-compliant S3 buckets**, and select one non-compliant rule that does not use a filter.

For example, you might want to use a Cloud Storage Pool to store objects in buckets that don't have S3 Object Lock enabled.



You can only select one non-compliant rule that does not use a filter.

See also [Example 7: Compliant ILM policy for S3 Object Lock](#).

6. When you are done selecting the default rule, select **Continue**.
7. For the Other rules step, select any other rules you want to add to the policy. These rules use at least one filter (tenant account, bucket name, advanced filter, or the Noncurrent reference time). Then select **Select**.

The Create a policy window now lists the rules you selected. The default rule is at the end, with the other rules above it.

If S3 Object Lock is enabled and you also selected a non-compliant "default" rule, that rule is added as the second-to-last rule in the policy.



A warning appears if any rule does not retain objects forever. When you activate this policy, you must confirm that you want StorageGRID to delete objects when the placement instructions for the default rule elapse (unless a bucket lifecycle keeps the objects for a longer time period).

8. Drag the rows for the non-default rules to determine the order in which these rules will be evaluated.

You can't move the default rule. If S3 Object Lock is enabled, you also can't move the non-compliant

"default" rule if one was selected.



You must confirm that the ILM rules are in the correct order. When the policy is activated, new and existing objects are evaluated by the rules in the order listed, starting at the top.

9. As required, select **Select rules** to add or remove rules.
10. When you are done, select **Save**.
11. Repeat these steps to create additional ILM policies.
12. [Simulate an ILM policy](#). You should always simulate a policy before activating it to ensure it works as expected.

Simulate a policy

Simulate a policy on test objects before activating the policy and applying it to your production data.

Before you begin

- You know the S3 bucket/object-key or the Swift container/object-name for each object you want to test.


Steps

1. Using an S3 or Swift client or the [S3 Console](#), ingest the objects required to test each rule.
2. On the ILM policies page, select the checkbox for the policy, then select **Simulate**.
3. In the **Object** field, enter the S3 bucket/object-key or the Swift container/object-name for a test object. For example, `bucket-01/filename.png`.
4. If S3 versioning is enabled, optionally enter a version ID for the object in the **Version ID** field.
5. Select **Simulate**.
6. In the Simulation results section, confirm that each object was matched by the correct rule.
7. To determine which storage pool or erasure-coding profile is in effect, select the name of the matched rule to go to the rule details page.



Review any changes to the placement of existing replicated and erasure-coded objects. Changing an existing object's location might result in temporary resource issues when the new placements are evaluated and implemented.

Results

Any edits to the policy's rules will be reflected in the Simulation results and show the new match and previous match. The Simulate policy window retains the objects you tested until you select either **Clear all** or the remove icon  for each object in the Simulation results list.

Related information

[Example ILM policy simulations](#)

Activate a policy

When you activate a single new ILM policy, existing objects and newly ingested objects are managed by that policy. When you activate multiple policies, ILM policy tags assigned to buckets determine the objects to be managed.

Before you activate a new policy:

1. Simulate the policy to confirm that it behaves as you expect.
2. Review any changes to the placement of existing replicated and erasure-coded objects. Changing an existing object's location might result in temporary resource issues when the new placements are evaluated and implemented.



Errors in an ILM policy can cause unrecoverable data loss.

About this task

When you activate an ILM policy, the system distributes the new policy to all nodes. However, the new active policy might not actually take effect until all grid nodes are available to receive the new policy. In some cases, the system waits to implement a new active policy to ensure that grid objects aren't accidentally removed. Specifically:

- If you make policy changes that **increase data redundancy or durability**, those changes are implemented immediately. For example, if you activate a new policy that includes a three-copies rule instead of a two-copies rule, that policy will be implemented right away because it increases data redundancy.
- If you make policy changes that **could decrease data redundancy or durability**, those changes will not be implemented until all grid nodes are available. For example, if you activate a new policy that uses a two-copies rule instead of a three-copies rule, the new policy will appear in the Active policy tab but it will not take effect until all nodes are online and available.

Steps

Follow the steps for activating one policy or multiple policies:

Activate one policy

Follow these steps if you will have only one active policy. If you already have one or more active policies and you are activating additional policies, follow the steps for activating multiple policies.

1. When you are ready to activate a policy, select **ILM > Policies**.

Alternatively, you can activate a single policy from the **ILM > Policy tags** page.

2. On the Policies tab, select the checkbox for the policy you want to activate, then select **Activate**.
3. Follow the appropriate step:
 - If a warning message prompts you to confirm that you want to activate the policy, select **OK**.
 - If a warning message containing details about the policy appears:
 - a. Review the details to ensure the policy would manage data as expected.
 - b. If the default rule stores objects for a limited number of days, review the retention diagram and then type in that number of days into the text box.
 - c. If the default rule stores objects forever, but one or more other rules has limited retention, type **yes** in the text box.
 - d. Select **Activate policy**.

Activate multiple policies

To activate multiple policies, you must create tags and assign a policy to each tag.



When multiple tags are in use, if tenants frequently reassign policy tags to buckets, grid performance might be impacted. If you have untrusted tenants, consider using only the Default tag.

1. Select **ILM > Policy tags**.
2. Select **Create**.
3. In the Create policy tag dialog box, type a tag name and, optionally, a description for the tag.



Tag names and descriptions are visible to tenants. Choose values that will help tenants make an informed decision when selecting policy tags to assign to their buckets. For example, if the assigned policy will delete objects after a period of time, you could communicate that in the description. Do not include sensitive information in these fields.

4. Select **Create tag**.
5. In the ILM policy tags table, use the pull-down to select a policy to assign to the tag.
6. If warnings appear in the Policy limitations column, select **View policy details** to review the policy.
7. Ensure each policy would manage data as expected.
8. Select **Activate assigned policies**. Or, select **Clear changes** to remove the policy assignment.
9. In the Activate policies with new tags dialog box, review the descriptions of how each tag, policy, and rule will manage objects. Make changes as needed to ensure the policies will manage objects as expected.
10. When you are sure you want to activate the policies, type **yes** in the text box, then select **Activate**

policies.

Related information

[Example 6: Changing an ILM policy](#)

Example ILM policy simulations

The examples of ILM policy simulations provide guidelines for structuring and modifying simulations for your environment.

Example 1: Verify rules when simulating an ILM policy

This example describes how to verify rules when simulating a policy.


In this example, the **Example ILM policy** is being simulated against the ingested objects in two buckets. The policy includes three rules, as follows:










- The first rule, **Two copies, two years for bucket-a**, applies only to objects in bucket-a.
- The second rule, **EC objects > 1 MB**, applies to all buckets but filters on objects greater than 1 MB.
- The third rule, **Two copies, two data centers**, is the default rule. It does not include any filters and does not use the Noncurrent reference time.

After simulating the policy, confirm that each object was matched by the correct rule.

Simulation results

Use this table to confirm the results of applying this policy to the selected objects.



| Object  | Version ID  | Rule matched   | Previous match   | Actions |
|--|--|--|--|---|
| bucket-a/bucket-a object.pdf | — | Two copies, two years for bucket-a | — |  |
| bucket-b/test object greater than 1 MB.pdf | — | EC objects > 1 MB | — |  |
| bucket-b/test object less than 1 MB.pdf | — | Two copies, two data centers | — |  |

In this example:

- `bucket-a/bucket-a object.pdf` correctly matched the first rule, which filters on objects in `bucket-a`.
- `bucket-b/test object greater than 1 MB.pdf` is in `bucket-b`, so it did not match the first rule. Instead, it was correctly matched by the second rule, which filters on objects greater than 1 MB.
- `bucket-b/test object less than 1 MB.pdf` did not match the filters in the first two rules, so it will be placed by the default rule, which includes no filters.

Example 2: Reorder rules when simulating an ILM policy

This example shows how you can reorder rules to change the results when simulating a policy.

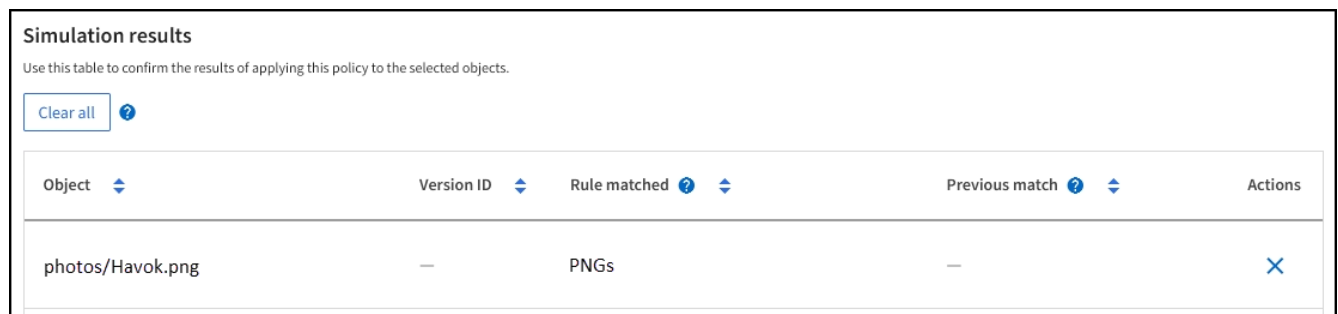
In this example, the **Demo** policy is being simulated. This policy, which is intended to find objects that have `series=x-men` user metadata, includes three rules, as follows:

- The first rule, **PNGs**, filters for key names that end in `.png`.
- The second rule, **X-men**, applies only to objects for Tenant A and filters for `series=x-men` user metadata.
- The last rule, **Two copies two data centers**, is the default rule, which matches any objects that don't match the first two rules.

Steps

1. After adding the rules and saving the policy, select **Simulate**.
2. In the **Object** field, enter the S3 bucket/object-key or the Swift container/object-name for a test object, and select **Simulate**.

The Simulation results appear, showing that the `Havok.png` object was matched by the **PNGs** rule.



The screenshot shows a table titled "Simulation results" with the following content:

| Object | Version ID | Rule matched | Previous match | Actions |
|------------------|------------|--------------|----------------|---------|
| photos/Havok.png | — | PNGs | — | X |

However, `Havok.png` was meant to test the **X-men** rule.

3. To resolve the issue, reorder the rules.
 - a. Select **Finish** to close the Simulate ILM Policy window.
 - b. Select **Edit** to edit the policy.
 - c. Drag the **X-men** rule to the top of the list.
 - d. Select **Save**.
4. Select **Simulate**.

The objects you previously tested are re-evaluated against the updated policy, and the new simulation results are shown. In the example, the Rule matched column shows that the `Havok.png` object now matches the X-men metadata rule, as expected. The Previous match column shows that the PNGs rule matched the object in the previous simulation.

Simulation results
Use this table to confirm the results of applying this policy to the selected objects.

Clear all ?

| Object | Version ID | Rule matched | Previous match | Actions |
|------------------|------------|--------------|----------------|---------|
| photos/Havok.png | — | X-men | PNGs | X |

Example 3: Correct a rule when simulating an ILM policy

This example shows how to simulate a policy, correct a rule in the policy, and continue the simulation.

In this example, the **Demo** policy is being simulated. This policy is intended to find objects that have `series=x-men` user metadata. However, unexpected results occurred when simulating this policy against the `Beast.jpg` object. Instead of matching the X-men metadata rule, the object matched the default rule, Two copies two data centers.

Simulation results
Use this table to confirm the results of applying this policy to the selected objects.

Clear all ?

| Object | Version ID | Rule matched | Previous match | Actions |
|------------------|------------|-----------------------------|----------------|---------|
| photos/Beast.jpg | — | Two copies two data centers | — | X |

When a test object is not matched by the expected rule in the policy, you must examine each rule in the policy and correct any errors.

Steps

1. Select **Finish** to close the Simulate policy dialog. On the details page for the policy, select **Retention diagram**. Then select **Expand all** or **View details** for each rule as needed.
2. Review the rule's tenant account, reference time, and filtering criteria.

As an example, suppose the metadata for the X-men rule was entered as "x-men01" instead of "x-men."

3. To resolve the error, correct the rule as follows:
 - If the rule is part of the policy, you can either clone the rule or remove the rule from the policy and then edit it.
 - If the rule is part of the active policy, you must clone the rule. You can't edit or remove a rule from the active policy.
4. Perform the simulation again.

In this example, the corrected X-men rule now matches the `Beast.jpg` object based on the `series=x-men` user metadata, as expected.

Simulation results
Use this table to confirm the results of applying this policy to the selected objects.

Clear all ?

| Object | Version ID | Rule matched | Previous match | Actions |
|------------------|------------|--------------|----------------|---------|
| photos/Beast.jpg | — | X-men | — | X |

Manage ILM policy tags

You can view ILM policy tag details, edit a tag, or remove a tag.

Before you begin

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the [required access permissions](#).

View ILM policy tag details

To view the details for a tag:

1. Select **ILM > Policy tags**.
2. Select the name of the policy from the table. The details page for the tag appears.
3. On the details page, view the previous history of assigned policies.
4. View a policy by selecting it.

Edit ILM policy tag



Tag names and descriptions are visible to tenants. Choose values that will help tenants make an informed decision when selecting policy tags to assign to their buckets. For example, if the assigned policy will delete objects after a period of time, you could communicate that in the description. Do not include sensitive information in these fields.

To edit the description for an existing tag:

1. Select **ILM > Policy tags**.
2. Select the checkbox for the tag, then select **Edit**.

Alternatively, select the name of the tag. The details page for the tag appears, and you can select **Edit** on that page.

3. Change the tag description as needed
4. Select **Save**.

Remove ILM policy tag

When you remove a policy tag, any buckets that are assigned that tag will have the Default policy applied.

To remove a tag:

1. Select **ILM > Policy tags**.
2. Select the checkbox for the tag, then select **Remove**. A confirmation dialog box appears.

Alternatively, select the name of the tag. The details page for the tag appears, and you can select **Remove** on that page.

3. Select **Yes** to delete the tag.

Verify an ILM policy with object metadata lookup

After you have activated an ILM policy, you should ingest representative test objects into the StorageGRID system. You should then perform an object metadata lookup to confirm that copies are being made as intended and placed in the correct locations.

Before you begin

- You have an object identifier, which can be one of:
 - **UUID**: The object's Universally Unique Identifier. Enter the UUID in all uppercase.
 - **CBID**: The object's unique identifier within StorageGRID. You can obtain an object's CBID from the audit log. Enter the CBID in all uppercase.
 - **S3 bucket and object key**: When an object is ingested through the S3 interface, the client application uses a bucket and object key combination to store and identify the object. If the S3 bucket is versioned and you want to look up a specific version of an S3 object using the bucket and object key, you have the **version ID**.
 - **Swift container and object name**: When an object is ingested through the Swift interface, the client application uses a container and object name combination to store and identify the object.

Steps

1. Ingest the object.
2. Select **ILM > Object metadata lookup**.
3. Type the object's identifier in the **Identifier** field. You can enter a UUID, CBID, S3 bucket/object-key, or Swift container/object-name.
4. Optionally, enter a version ID for the object (S3 only).
5. Select **Look Up**.

The object metadata lookup results appear. This page lists the following types of information:

- System metadata, including:
 - object ID (UUID)
 - object name
 - name of the container
 - result type (object, delete marker, S3 bucket or Swift container)
 - tenant account name or ID
 - logical size of the object

- date and time the object was first created
- date and time the object was last modified
- Any custom user metadata key-value pairs associated with the object.
- For S3 objects, any object tag key-value pairs associated with the object.
- For replicated object copies, the current storage location of each copy.
- For erasure-coded object copies, the current storage location of each fragment.
- For object copies in a Cloud Storage Pool, the location of the object, including the name of the external bucket and the object's unique identifier.
- For segmented objects and multipart objects, a list of object segments including segment identifiers and data sizes. For objects with more than 100 segments, only the first 100 segments are shown.
- All object metadata in the unprocessed, internal storage format. This raw metadata includes internal system metadata that is not guaranteed to persist from release to release.

The following example shows the object metadata lookup results for an S3 test object that is stored as two replicated copies.



The following screenshot is an example. Your results will vary depending on your StorageGRID version.

System Metadata

| | |
|---------------|--------------------------------------|
| Object ID | A12E96FF-B13F-4905-9E9E-45373F6E7DA8 |
| Name | testobject |
| Container | source |
| Account | t-1582139188 |
| Size | 5.24 MB |
| Creation Time | 2020-02-19 12:15:59 PST |
| Modified Time | 2020-02-19 12:15:59 PST |

Replicated Copies

| Node | Disk Path |
|-------|--|
| 99-97 | /var/local/rangedb/2/p/06/0B/00nM8H\$ TFbnQQ} CV2E |
| 99-99 | /var/local/rangedb/1/p/12/0A/00nM8H\$ TFboW28 CXG% |

Raw Metadata

```
{
  "TYPE": "CNT",
  "CHND": "A12E96FF-B13F-4905-9E9E-45373F6E7DA8",
  "NAME": "testobject",
  "CBID": "0x8823DE7EC7C10416",
  "PHND": "FEA0AE51-534A-11EA-9FCD-31FF00C36056",
  "PPTH": "source",
  "META": {
    "BASE": {
      "PAWS": "2",

```

6. Confirm that the object is stored in the correct location or locations and that it is the correct type of copy.



If the Audit option is enabled, you can also monitor the audit log for the ORLM Object Rules Met message. The ORLM audit message can provide you with more information about the status of the ILM evaluation process, but it can't give you information about the correctness of the object data's placement or the completeness of the ILM policy. You must evaluate this yourself. For details, see [Review audit logs](#).

Related information

- [Use S3 REST API](#)
- [Use Swift REST API](#)

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