Get started

NetApp Ransomware Resilience

NetApp
February 07, 2026

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Get started

Learn about NetApp Ransomware Resilience

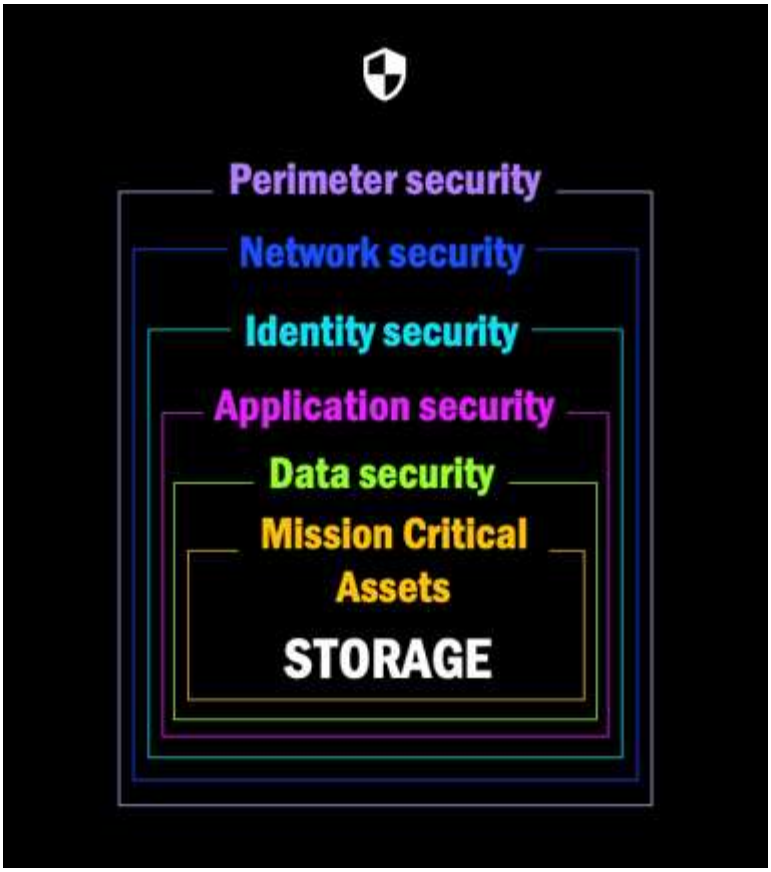
Ransomware attacks can block access to your data and attackers can ask for ransom in exchange for the release of data or decryption. According to the IDC, it is not uncommon for victims of ransomware to experience multiple ransomware attacks. The attack can disrupt access to your data for anywhere from one day to several weeks.

NetApp Ransomware Resilience protects your data from ransomware attacks. In Ransomware Resilience, protection is available for application-based workloads of Oracle, VM datastores, and file shares on on-premises NAS storage (using the NFS and CIFS protocols) and SAN storage (FC, iSCSI, and NVMe) as well as Cloud Volumes ONTAP for Amazon Web Services, Cloud Volumes ONTAP for Google Cloud, Cloud Volumes ONTAP for Microsoft Azure, and Amazon FSx for NetApp ONTAP across the NetApp Console. You can back up data to Amazon Web Services, Google Cloud, Microsoft Azure cloud storage, and NetApp StorageGRID.

Ransomware Resilience at the data layer

Your security posture typically encompasses multiple layers of defense to protect against a range of cyber threats.

- **Outermost layer**: This is your first line of defense using firewalls, intrusion detection systems, and virtual private networks to safeguard network boundaries.
- **Network security**: This layer builds upon the foundation with network segmentation, traffic monitoring, and encryption.
- **Identity security**: Uses authentication methods, access controls, and identity management to ensure only authorized users can access sensitive resources.
- **Application security**: Protects software applications using secure coding practices, security testing, and runtime application self-protection.
- **Data security**: Safeguards your data with data protection, backups, and recovery strategies. Ransomware Resilience operates on this layer.



What you can do with Ransomware Resilience

Ransomware Resilience provides full use of several NetApp technologies so that your storage administrator, data security administrator, or security operations engineer can accomplish the following goals:

- **Identify** all application-based, file share, or VMware-managed workloads in NetApp on-premises NAS (NFS or CIFS) and SAN (FC, iSCSI, and NVMe) systems across the NetApp Console, projects, and Console agents. Ransomwware Resilience categorizes the data priority and provides recommendations to you for ransomware resilience improvements.
- **Protect** your workloads by enabling backups, snapshot copies, and ransomware protection strategies on your data.
- **Detect** anomalies that might be ransomware attacks. [1]
- **Respond** to potential ransomware attacks by automatically initiating a point-in-time snapshot that is locked so that the copy can't be deleted accidentally or maliciously. Your backup data will stay immutable and protected end-to-end from ransomware attacks at the source and in the destination.
- **Recover** your workloads that help accelerate workload uptime by orchestrating several NetApp technologies. You can choose to recover specific volumes. Ransomware Resilience provides recommendations on the best options.
- **Govern**: Implement your ransomware protection strategy and monitor the outcomes.

Benefits of using Ransomware Resilience

Ransomware Resilience offers the following benefits:

- Discovers workloads and their existing snapshot and backup schedules, and ranks their relative importance.
- Evaluates your ransomware protection posture and displays it in an easy-to-understand dashboard.
- Provides recommendations on next steps based on discovery and protection posture analysis.
- Applies AI/ML-driven data protection recommendations with one-click access.
- Protects data in application-based workloads such as Oracle, VMware datastores, and file shares.
- Detects ransomware attacks on data in real time on primary storage using AI technology.
- Initiates automated actions in response to detected potential attacks by creating snapshot copies and initiating alerts about abnormal activity.
- Applies curated recovery to meet RPO policies. Ransomware Resilience orchestrates recovery from ransomware incidents by using several NetApp recovery services, including NetApp Backup and Recovery (formerly Cloud Backup) and SnapCenter.
- Uses role-based access control (RBAC) to govern access to features and operations.

Cost

New deployments of Ransomware Resilience offer a 30-day free trial. NetApp doesn’t charge you for using the trial version of Ransomware Resilience.

If you have both Backup and Recovery and Ransomware Resilience, any common data protected by both products is billed by Ransomware Resilience only.

After you purchase a license or PayGo subscription, any workload that has a ransomware detection policy (Autonomous Ransomware Protection) enabled (discovered or set by Ransomware Resilience), and at least one snapshot or backup policy, Ransomware Resilience classifies it "Protected" and it counts against purchased capacity or the PayGo subscription. If a workload is discovered without a detection policy even if it has backup or snapshot policies, it is classified “At risk” and it does *not* count against purchased capacity.

Protected workloads count against purchased capacity or the subscription after the 90-day trial period ends. Ransomware Resilience is charged on a per GB basis for the data associated with protected workloads before efficiencies.

Licensing

With Ransomware Resilience, you can use different licensing plans including a free trial, a pay-as-you-go subscription, or bring your own license.

Ransomware Resilience requires a NetApp ONTAP One license.

The Ransomware Resilience license does not include additional NetApp products. Ransomware Resilience can use Backup and Recovery even if you don’t have a license for it.

To detect anomalous user behavior, Ransomware Resilience uses NetApp Autonomous Ransomware Protection, a machine learning (ML) model within ONTAP that detects malicious file activity. This model is included in the Ransomware Resilience license.

For details, see Set up licensing.

NetApp Console

Ransomware Resilience is accessible through the NetApp Console.

The NetApp Console provides centralized management of NetApp storage and data services across on-premises and cloud environments at enterprise grade. The Console is required to access and use NetApp data services. As a management interface, it enables you to manage many storage resources from one interface. Console administrators can control access to storage and services for all systems within the enterprise.

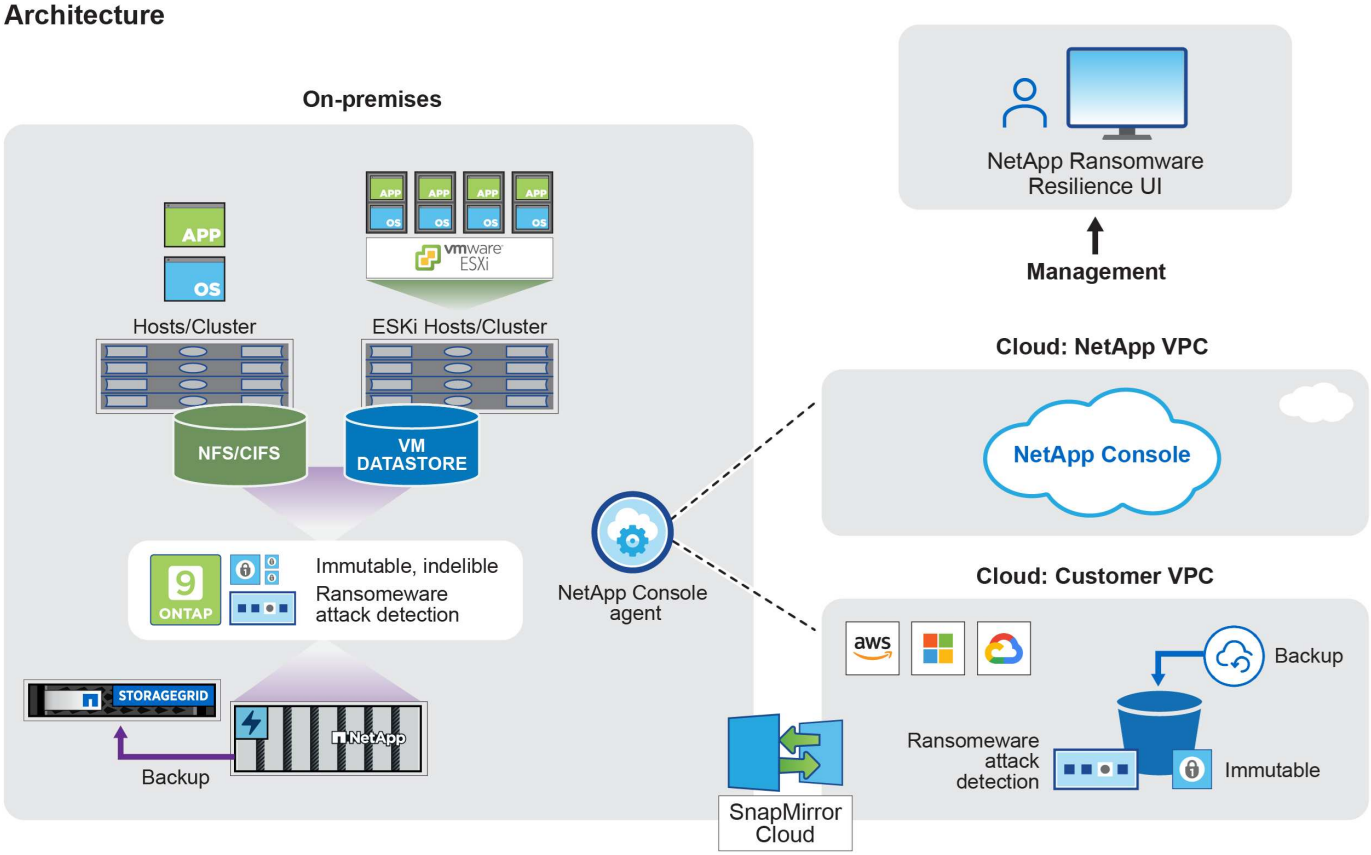
You don't need a license or subscription to start using NetApp Console and you only incur charges when you need to deploy Console agents in your cloud to ensure connectivity to your storage systems or NetApp data services. However, some NetApp data services accessible from the Console are licensed or subscription-based.

Learn more about the NetApp Console.

How Ransomware Resilience works

Ransomware Resilience uses NetApp Backup and Recovery to discover and set snapshot and backup policies for file share workloads, and SnapCenter or SnapCenter for VMware to discover and set snapshot and backup policies for application and VM workloads. In addition, Ransomware Resilience uses Backup and Recovery and SnapCenter / SnapCenter for VMware to perform file- and workload-consistent recovery.

Architecture



Feature	Description
IDENTIFY	• Finds all customer on-premises NAS (NFS and CIFS protocols), SAN (FC, iSCSI, and NVMe), and Cloud Volumes ONTAP data connected to the Console. • Identifies customer data from ONTAP and SnapCenter service APIs and associates it with workloads. Learn more about ONTAP and SnapCenter Software. • Discovers each volume's current protection level of NetApp snapshot copies and backup policies as well as any on-box detection capabilities. Ransomware Resilience then associates this protection posture with the workloads by using Backup and Recovery, ONTAP services, and NetApp technologies such as Autonomous Ransomware Protection (ARP or ARP/AI depending on your ONTAP version), FPolicy, backup policies, and snapshot policies. Learn more about Autonomous Ransomware Protection, NetApp Backup and Recovery, and ONTAP FPolicy. • Assigns a business priority to each workload based on automatically discovered protection levels and recommends protection policies for workloads based on their business priority. Workload priority is based on snapshot frequencies already applied to each volume associated with the workload.
PROTECT	• Actively monitors workloads and orchestrates the use of Backup and Recovery, SnapCenter, and ONTAP APIs by applying policies to each of the identified workloads.
DETECT	• Detects potential attacks with an integrated machine learning (ML) model that detects potentially anomalous encryption and activity. • Provides dual-layer detection that starts with detecting potential ransomware attacks in the primary storage and responding to abnormal activities by taking additional automated snapshot copies to create the nearest data restore points. Ransomware Resilience provides the ability to dig deeper to identify potential attacks with greater precision without impacting the performance of the primary workloads. • Determines the specific suspect files and maps that attack to the associated workloads, using ONTAP, Autonomous Ransomware Protection (ARP or ARP/AI depending on your ONTAP version) and FPolicy technologies.
RESPOND	• Shows relevant data, such as file activity, user activity, and entropy, to help you complete forensic reviews about the attack. • Initiates quick snapshot copies by using NetApp technologies and products such as ONTAP, Autonomous Ransomware Protection (ARP or ARP/AI depending on your ONTAP version), and FPolicy.
RECOVER	• Determines the best snapshot or backup and recommends the best recovery point actual (RPA) by using Backup and Recovery, ONTAP, Autonomous Ransomware Protection (ARP or ARP/AI depending on your ONTAP version), and FPolicy technologies and services. • Orchestrates the recovery of workloads including VMs, file shares, block storage, and databases with application consistency.

Feature	Description
GOVERN	• Assigns the ransomware protection strategies • Helps you monitor the outcomes.

Supported backup targets, systems, and workload data sources

Ransomware Resilience supports the following backup targets, systems, and data sources:

Supported backup targets

- Amazon Web Services (AWS) S3
- Google Cloud Platform
- Microsoft Azure Blob
- NetApp StorageGRID

Supported systems

Environment	Protocol	Supported versions
Amazon FSx for NetApp ONTAP*	NFS, CIFS, and SAN	N/A
Cloud Volumes ONTAP for AWS	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
Cloud Volumes ONTAP for Google Cloud Platform	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
Cloud Volumes ONTAP for Microsoft Azure	CIFS & NFS	9.12.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
ONTAP (on-premises)	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later

* Amazon FSx for NetApp ONTAP uses Autonomous Ransomware Protection (ARP) and not ARP/AI. For more information about the difference, see ARP/AI.

Using ARP/AI in ONTAP requires ONTAP 9.16 or greater.
ONTAP doesn't provide ransomware protection support for FabricPool FlexCache, FlexGroup volumes, consistency groups mount point volumes, mount path volumes, offline volumes, and Data protection (DP) volumes. Ensure you review supported and unsupported configurations in ONTAP.

Supported workload data sources

Ransomware Resilience protects the following application-based workloads on primary data volumes:

- Block storage
- Databases:

    - Microsoft SQL Server
    - Oracle
    - PostgreSQL
- NetApp file shares
- VMware datastores

If you're using SnapCenter or SnapCenter for VMware, all workloads supported by those products are also identified in Ransomware Resilience. Ransomware Resilience can protect and recover these in a workload-consistent manner.

Terms that might help you with ransomware protection

You might benefit by understanding some terminology related to ransomware protection.

- **Protection**: Protection in Ransomware Resilience means ensuring that snapshots and immutable backups occur on a regular basis to a different security domain using protection policies.
- **Workload**: A workload in Ransomware Resilience can include Oracle databases, VMware datastores, or file shares.

NetApp Ransomware Resilience prerequisites

Get started with NetApp Ransomware Resilience by verifying the readiness of your operational environment, network access, and web browser.

To use Ransomware Resilience, ensure you meet the prerequisites.

Supported systems

Ensure you're using a supported system:

Environment	Protocol	Supported versions
Amazon FSx for NetApp ONTAP*	NFS, CIFS, and SAN	N/A
Cloud Volumes ONTAP for AWS	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
Cloud Volumes ONTAP for Google Cloud Platform	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
Cloud Volumes ONTAP for Microsoft Azure	CIFS & NFS	9.12.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later
ONTAP (on-premises)	CIFS & NFS	9.11.1 and later
	SAN (FC, iSCSI, & NVMe)	9.17.1 and later

* Amazon FSx for NetApp ONTAP uses Autonomous Ransomware Protection (ARP) and not ARP/AI. For more information about the difference, see ARP/AI.

NetApp Console requirements

Your NetApp Console configuration requires:

- A NetApp Console user account with Organization Admin privileges for discovering resources.
- A Console organization and system with at least one active Console agent connecting to a supported system.
  - If your on-premises ONTAP clusters or Cloud Volumes ONTAP in AWS or in Azure cloud are not set up in the Console, see Learn how to configure a Console agent and standard Console requirements.

> If you have multiple Console agents in a single Console organization, the Ransomware Resilience will scan ONTAP resources across all Console agents beyond the one that is currently selected in the Console UI.

- The Console agent must have the `cloudmanager-ransomware-protection` container in an active state.
- At least one Console system with a NetApp on-premises ONTAP cluster or Cloud Volumes ONTAP in AWS or Azure. Ransomware Resilience supports both NAS (NFS and SMB) and SAN (iSCSI, FC, and NVMe) protocols.
  - Ransomware Resilience is supported with ONTAP or Cloud Volumes ONTAP clusters with ONTAP version 9.11.1 or greater.

> To use Ransomware Resilience on SAN workloads, you must be running ONTAP 9.17.1 or later.

ONTAP requirements

- You must be running ONTAP 9.11.1 or later with an ONTAP One license enabled on the on-premises ONTAP instance. For more information about ONTAP support, see Autonomous Ransomware Protection overview.
- To apply protection configurations (such as enabling Autonomous Ransomware Protection), Ransomware Resilience needs admin permissions on the ONTAP cluster. The ONTAP cluster should have been onboarded using ONTAP cluster admin user credentials only.

> If you've connected an ONTAP cluster to the Console with non-admin credentials, [you must update the credentials in the ONTAP cluster](#update-non-admin-user-permissions-in-an-ontap-system).

Data backups

- An account in NetApp StorageGRID, AWS S3, Azure Blob, or Google Cloud Platform for backup targets with appropriate access permissions configured.

  Refer to the AWS, Azure, or S3 permissions list for details.

- NetApp Backup and Recovery does not need to be enabled on the system.

  Ransomware Resilience helps configure a backup destination through the Settings option. See Configure settings.

Suspicious user behavior requirements

For Ransomware Resilience to provide alerts about suspicious user behavior, you must configure a user activity agent. To install a user activity agent, ensure your system meets the requirements.

Update non-admin user permissions in an ONTAP system

If you need to update non-admin user permissions for a particular system, complete these steps.

1. Log in to the Console and look for the system that needs its ONTAP user permissions updated.
2. Select the system to see details.
3. Select **View additional information** to display the username.
4. Log in to the ONTAP cluster CLI as an admin user.
5. Display the existing roles for that user. Enter:

```
security login show -user-or-group-name <username>
```

6. Change the role for the user. Enter:

```
security login modify -user-or-group-name <username> -application
console|http|ontapi|ssh|telnet -authentication-method password -role
admin
```

7. Return to the NetApp Console to use Ransomware Resilience.

Quick start for NetApp Ransomware Resilience

Understand the high-level steps you need to follow to set up Ransomware Resilience and protect your workloads.

Follow the links in each step for detailed information.

Review prerequisites

These tasks require the *Console admin* role.

- Ensure you've installed a Console agent
- Ensure your system meets the requirements
- Review Ransomware Resilience user roles and assign permissions to users accessing Ransomware Resilience
- Set up licensing

Get started with Ransomware Resilience

These tasks require the *Ransomware Resilience admin* role.

- Discover workloads in the Console
- View workload protection health on the Dashboard
- Optionally, conduct a ransomware attack readiness drill

3 **Configure protection and detection in Ransomware Resilience**

These tasks require the *Ransomware Resilience admin* role. Configuring suspicious user behavior activity requires the additional *Ransomware Resilience user behavior admin* role.

- Protect workloads
  - Optionally, enhance protection by configuring suspicious user activity detection
- Optionally, configure backup destinations:
  - Prepare NetApp StorageGRID, Amazon Web Services, Google Cloud Platform, or Microsoft Azure as a backup destination.
  - Configure backup destinations
- Respond to detection of potential ransomware attacks
- Recover from an attack (after incidents are neutralized)

4 **What's next?**

After you configure protection in Ransomware Resilience, here's what you might do next.

- Enable Data Classification to identify governance and security risks
- Send alerts to SIEM
- Download alert, protection, readiness drill, recovery, or summary reports

Set up NetApp Ransomware Resilience

You can easily deploy NetApp Ransomware Resilience. Before you begin, review prerequisites to ensure that your environment is ready.

Prepare the backup destination

Prepare one of the following backup destinations:

- NetApp StorageGRID
- Amazon Web Services
- Google Cloud Platform
- Microsoft Azure

After you configure options in the backup destination itself, you will later configure it as a backup destination in Ransomware Resilience. For details about how to configure the backup destination in Ransomware Resilience, refer to Configure backup destinations.

Prepare StorageGRID to become a backup destination

If you want to use StorageGRID as your backup destination, refer to StorageGRID documentation for details about StorageGRID.

Prepare AWS to become a backup destination

- Set up an account in AWS.
- Configure AWS permissions in AWS.

For details about managing your AWS storage in the Console, refer to Manage your Amazon S3 buckets.

Prepare Azure to become a backup destination

- Set up an account in Azure.
- Configure Azure permissions in Azure.

For details about managing your Azure storage in the Console, refer to Manage your Azure storage accounts.

Set up the NetApp Console

The next step is to set up the Console and Ransomware Resilience.

Review Console requirements for standard mode.

Create a Console agent

Contact your NetApp Sales Rep to try out or use this service. Then, when you use the Console agent, it will include the appropriate capabilities for Ransomware Resilience.

To create a Console agent using Ransomware Resilience, contact your Console organization admin who has permissions to create Console agents, and refer to the documentation that describes how to create a Console agent.

If you have multiple Console agents, the Ransomware Resilience scan datas across all Console agents beyond the one that currently shows in the Console. This service discovers all projects and all Console agents associated with this organization.

Access NetApp Ransomware Resilience

Log in to NetApp Ransomware Resilience through the NetApp Console.

To log in to the Console, you can use your NetApp Support Site credentials or you can sign up for a NetApp cloud login using your email and a password. Learn more about logging in.

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, Ransomware Resilience admin, or Ransomware Resilience viewer role. Learn about Ransomware Resilience roles for NetApp Console.

Steps

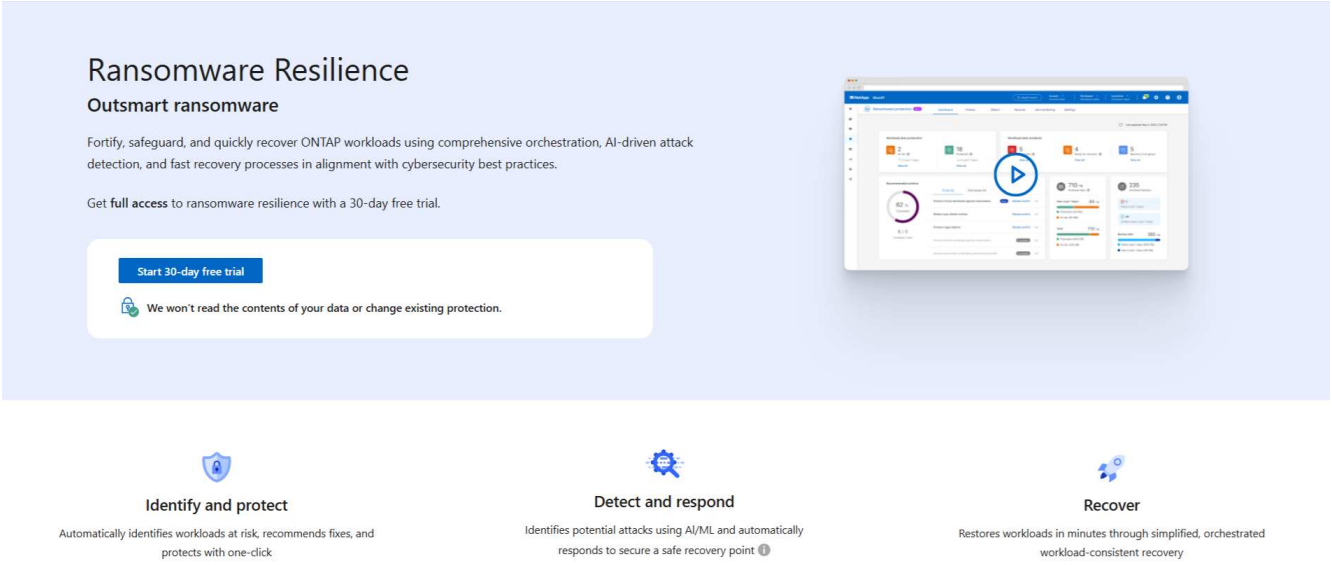
1. Open a web browser and go to the Console.

The Console login page appears.

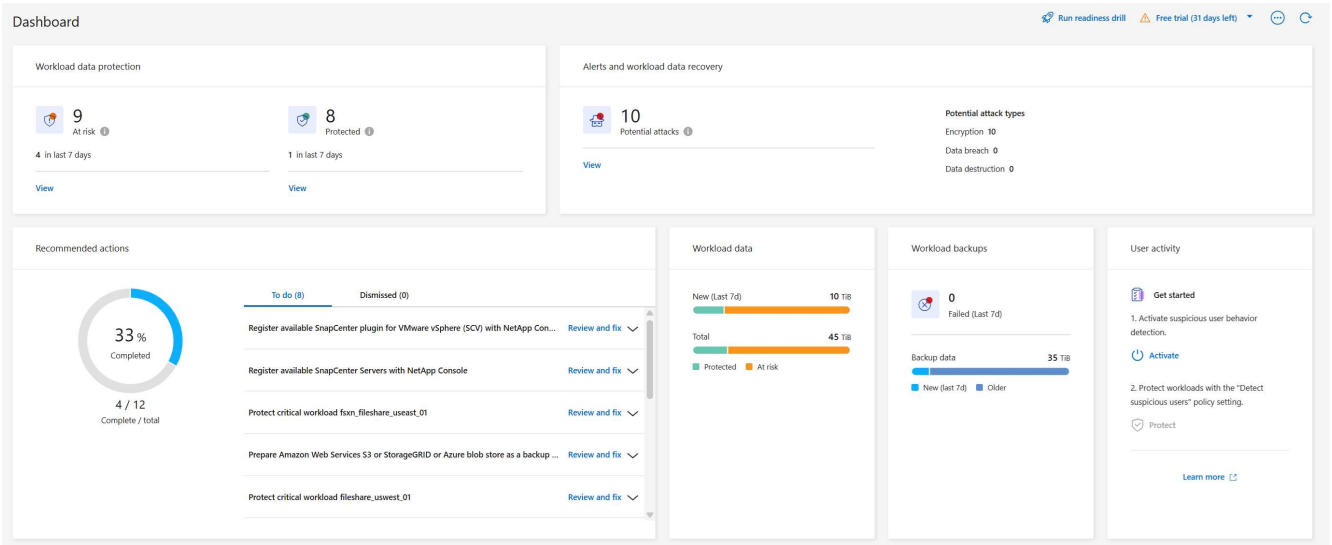
2. Log in to the Console.
3. From the Console left navigation, select **Protection** > **Ransomware Resilience**.

   If this is your first time logging in to this service, the landing page appears.

   If you don't have a Console agent or it's not the one for this service, you need to deploy one. Learn how to set up a Console agent.



   Otherwise, the Ransomware Resilience dashboard appears.



4. If you haven't done so already, select the **Discover Workloads** option.

   Refer to Discover Workloads.

Set up licensing for NetApp Ransomware Resilience

With NetApp Ransomware Resilience, you can use different licensing plans.

To perform this task, you need the Organization admin, Folder or project admin role. Learn about Console access roles.

License types

Ransomware Resilience is available with the following license types:

- 30-day free trial
- Purchase a pay-as-you-go (PAYGO) subscription with Amazon Web Services (AWS) Marketplace, Google Cloud Marketplace, or Azure Marketplace
- Bring your own license (BYOL): a NetApp License File (NLF) that you obtain from your NetApp sales rep. You can use the license serial number to get the BYOL activated in the Console.

After you set up your BYOL or purchase a PAYGO subscription, you can see the license in the Licenses and subscriptions section of the Console.

After the free trial ends or the license or subscription expires, you can still:

- View workloads and workload health
- Delete resources such as policies
- Run all scheduled operations created during the trial period or under the license

Other licenses

The Ransomware Resilience license does not include additional NetApp products. However, Ransomware Resilience can integrate with NetApp Backup and Recovery, even if you do not have a separate license for Backup and Recovery.

If you have both Backup and Recovery and Ransomware Resilience, any common data protected by both products will be billed by Ransomware Resilience only.

Try Ransomware Resilience with a 30-day free trial

You can try Ransomware Resilience with a 30-day free trial. You must be a Console Organization administrator to start the free trial.

Storage capacity limits are not enforced during the trial.

You can get a license or subscribe at any time and you will not be charged until the 30-day trial ends. To continue after the 30-day trial, you'll need to purchase a BYOL license or PAYGO subscription.

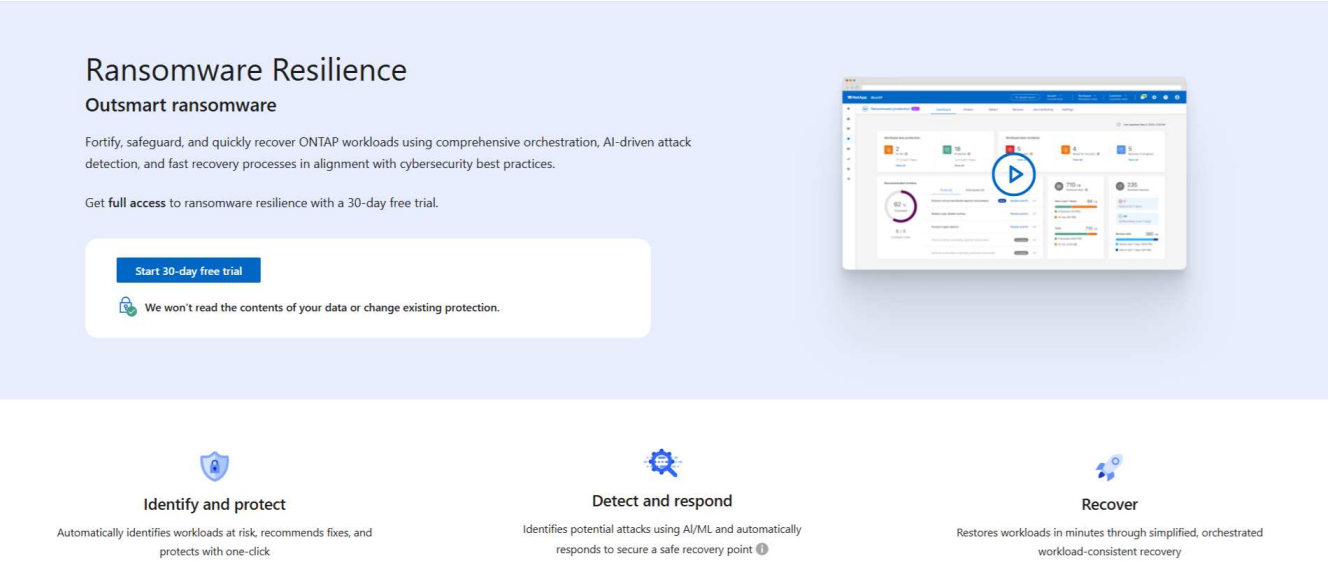
During the trial, you have full functionality.

Steps

1. Access the Console.
2. Log in to the Console.

3. From the NetApp Console, select **Protection** > **Ransomware Resilience**.

   If this is your first time logging in to this service, the landing page appears.



4. If you haven't already added a Console agent for other services, add one.
5. In the Ransomware Resilience landing page, select **Start by discovering workloads** to discover your workloads.

   This option is only available if you've successfully installed a Console agent.

6. To review the free trial information, select the drop-down option in the top right.

After the trial ends, obtain a subscription or license

After the free trial ends, you can either subscribe through one of the Marketplaces or purchase a license from NetApp.

If you already have a PAYGO subscription, the license is automatically switched to the subscription after the free trial ends.

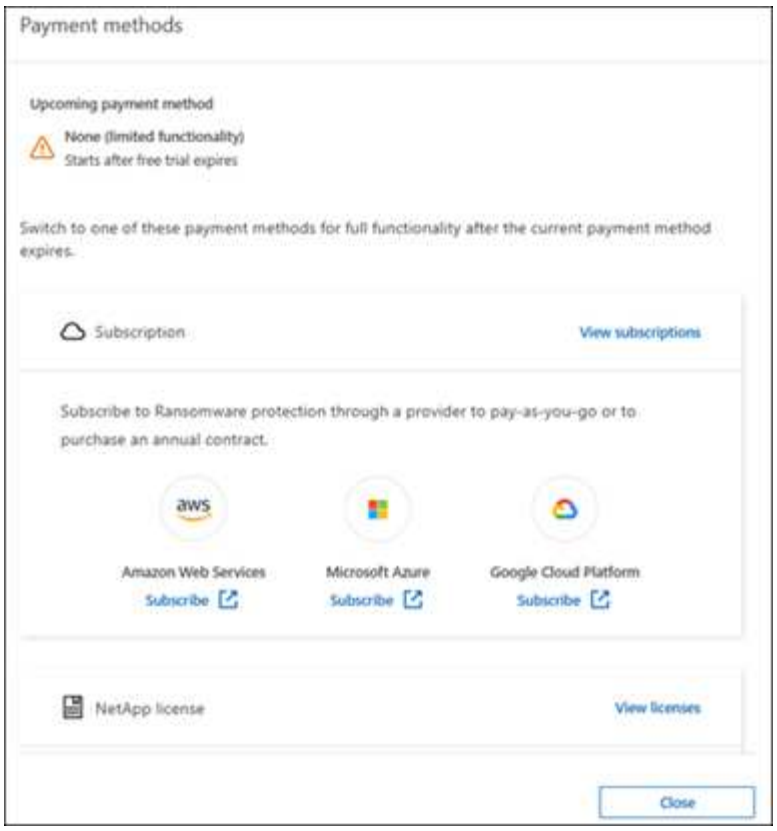
Subscribe through AWS Marketplace
Subscribe through Microsoft Azure Marketplace
Subscribe through Google Cloud Platform Marketplace
Bring your own license (BYOL)

Subscribe through AWS Marketplace

This procedure provides a high level overview of how to subscribe directly in the AWS Marketplace.

Steps

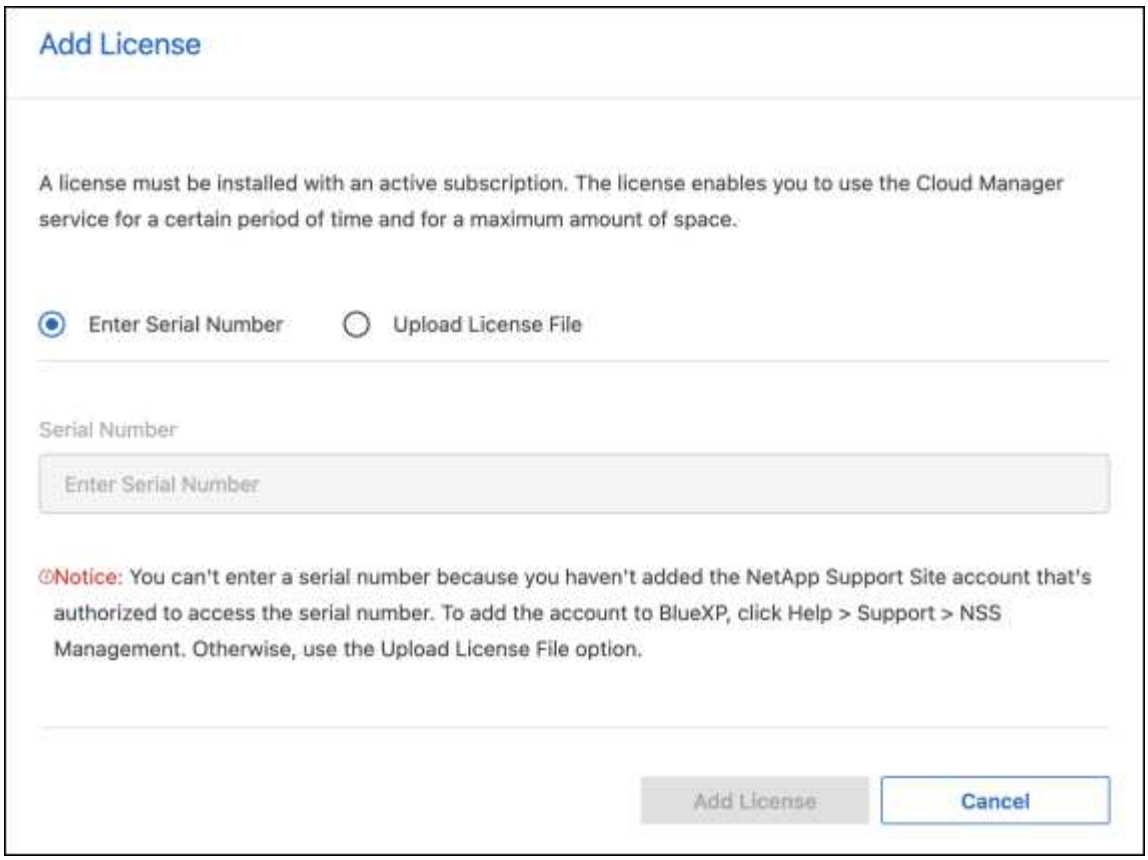
1. In Ransomware Resilience, do one of the following:
   - If you have a message stating free trial is expiring, select **View payment methods**.
   - If you haven't started the trial, select the **Free trial** notice at the top right then **View payment methods**.



2. In the Payment methods page, select **Subscribe** for **Amazon Web Services**.
3. In AWS Marketplace, select **View purchase options**.
4. Use AWS Marketplace to subscribe to **NetApp Intelligent Services** and **Ransomware Resilience**.
5. When you return to Ransomware Resilience, a message states that you are subscribed.

> An email is sent to you that includes the Ransomware Resilience serial number, and indicates that Ransomware Resilience is subscribed in AWS Marketplace.

6. Return to the Ransomware Resilience payment methods page.
7. Add the license to the Console by selecting **Add license**.



8. In the Add License page, select **Enter Serial Number**, enter the serial number that was included in the email sent to you, then select **Add License**.
9. To view license details, from the Console left navigation, select **Administration** > **Licenses and subscriptions**.
   - To see subscription information, select **Subscriptions**.
   - To see BYOL licenses, select **Data Services Licenses**.
10. Return to Ransomware Resilience. From the Console left navigation, select **Protection** > **Ransomware Resilience**.

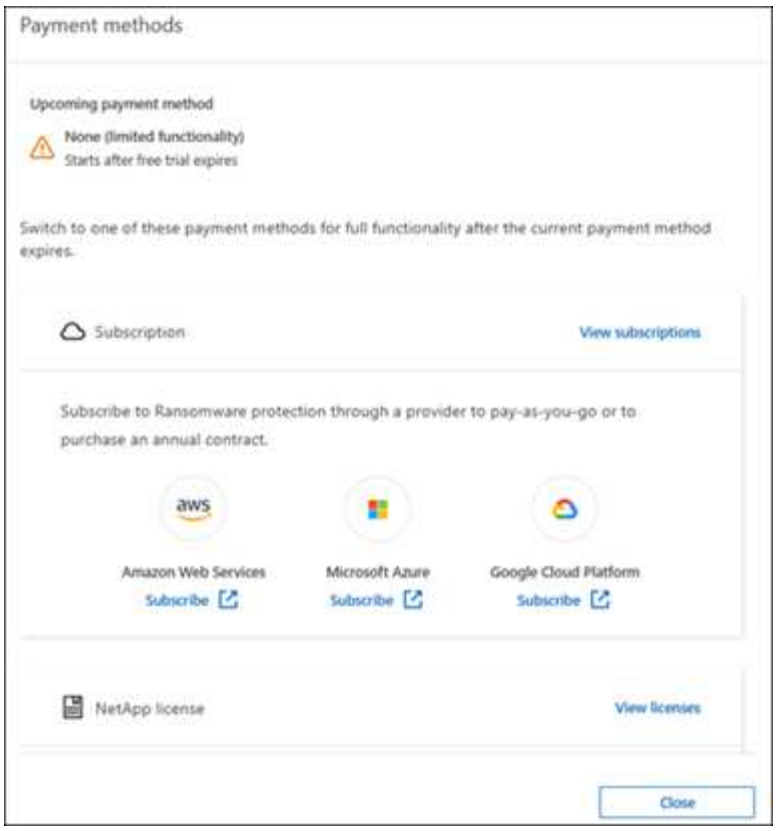
    A message confirms a license has been added.

Subscribe through Microsoft Azure Marketplace

This procedure provides a high level overview of how to subscribe directly in the Azure Marketplace.

Steps

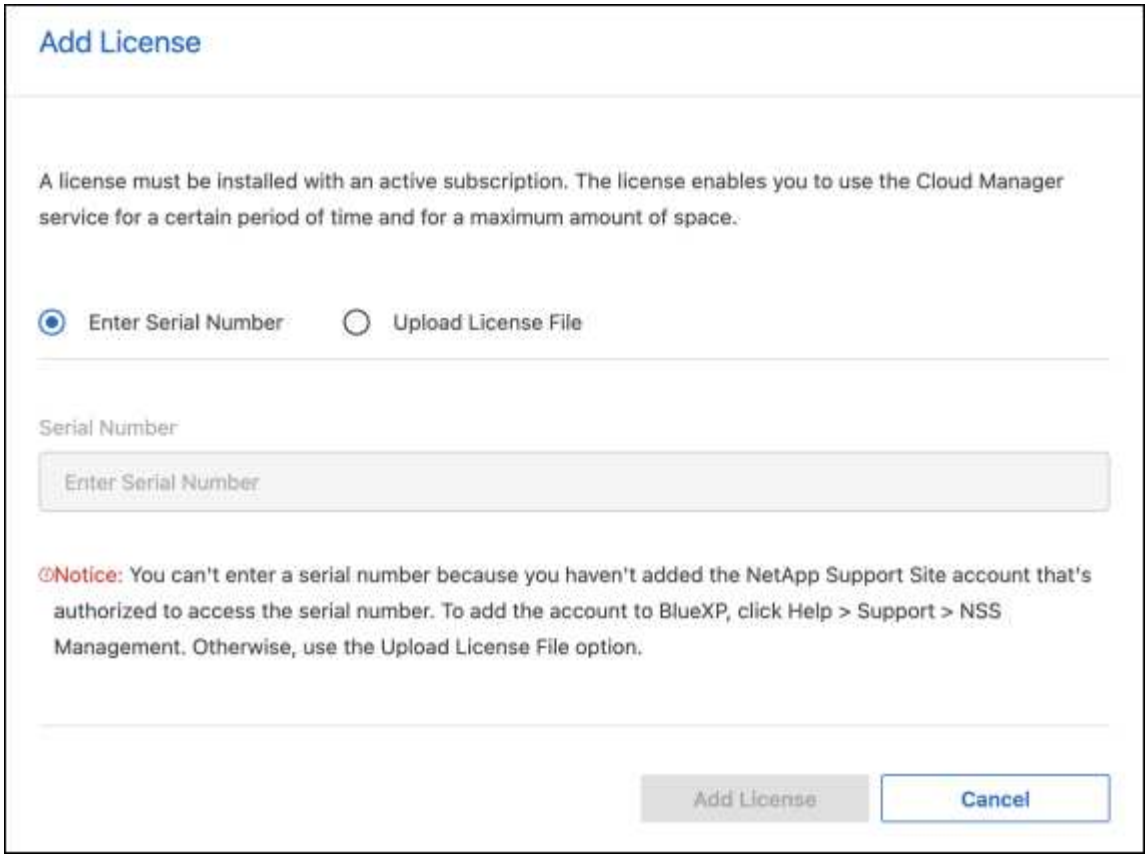
1. In Ransomware Resilience, do one of the following:
   - If you have a message stating free trial is expiring, select **View payment methods**.
   - If you haven’t started the trial, select the **Free trial** notice at the top right then **View payment methods**.



2. In the Payment methods page, select **Subscribe** for **Microsoft Azure Marketplace**.
3. In Azure Marketplace, select **View purchase options**.
4. Use Azure Marketplace to subscribe to **NetApp Intelligent Services** and **Ransomware Resilience**.
5. When you return to Ransomware Resilience, a message states that you are subscribed.

> An email is sent to you that includes the Ransomware Resilience serial number, and indicates that Ransomware Resilience is subscribed in Azure Marketplace.

6. Return to Ransomware Resilience Payment methods page.
7. To add the license, select **Add a license**.



8. In the Add License page, select **Enter Serial Number** then enter the serial number frin the email sent to you. Select **Add License**.
9. To view license details in Licenses and subscriptions, from the Console left navigation, select **Governance** > **Licenses and subscriptions**.
   - To see subscription information, select **Subscriptions**.
   - To see BYOL licenses, select **Data Services Licenses**.
10. Return to Ransomware Resilience. From the Console left navigation, select **Protection** > **Ransomware Resilience**.

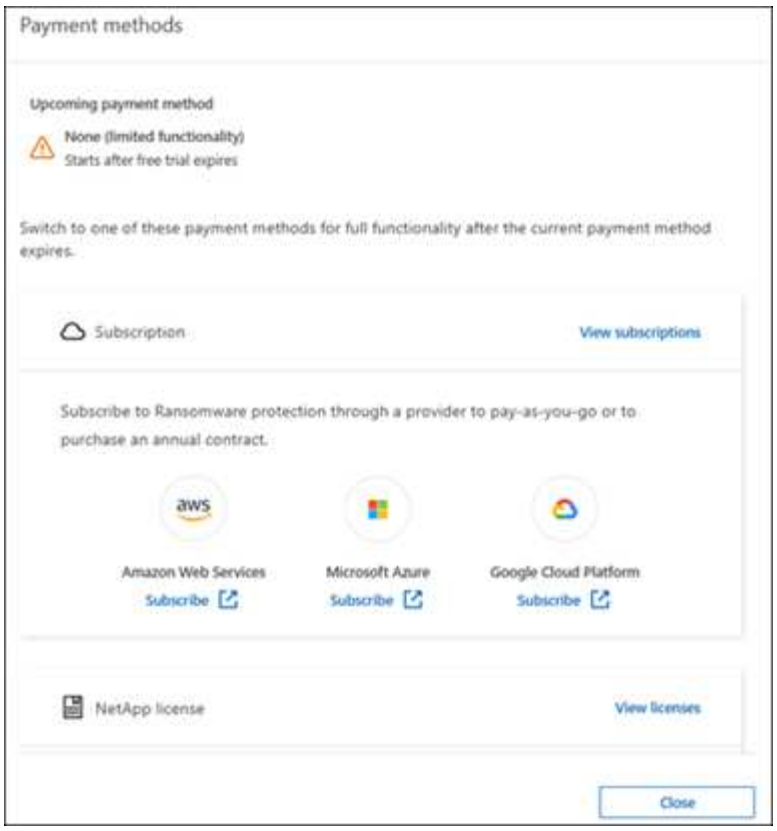
    A message appears indicating that a license has been added.

Subscribe through Google Cloud Platform Marketplace

This procedure provides a high level overview of how to subscribe directly in the Google Cloud Platform Marketplace.

Steps

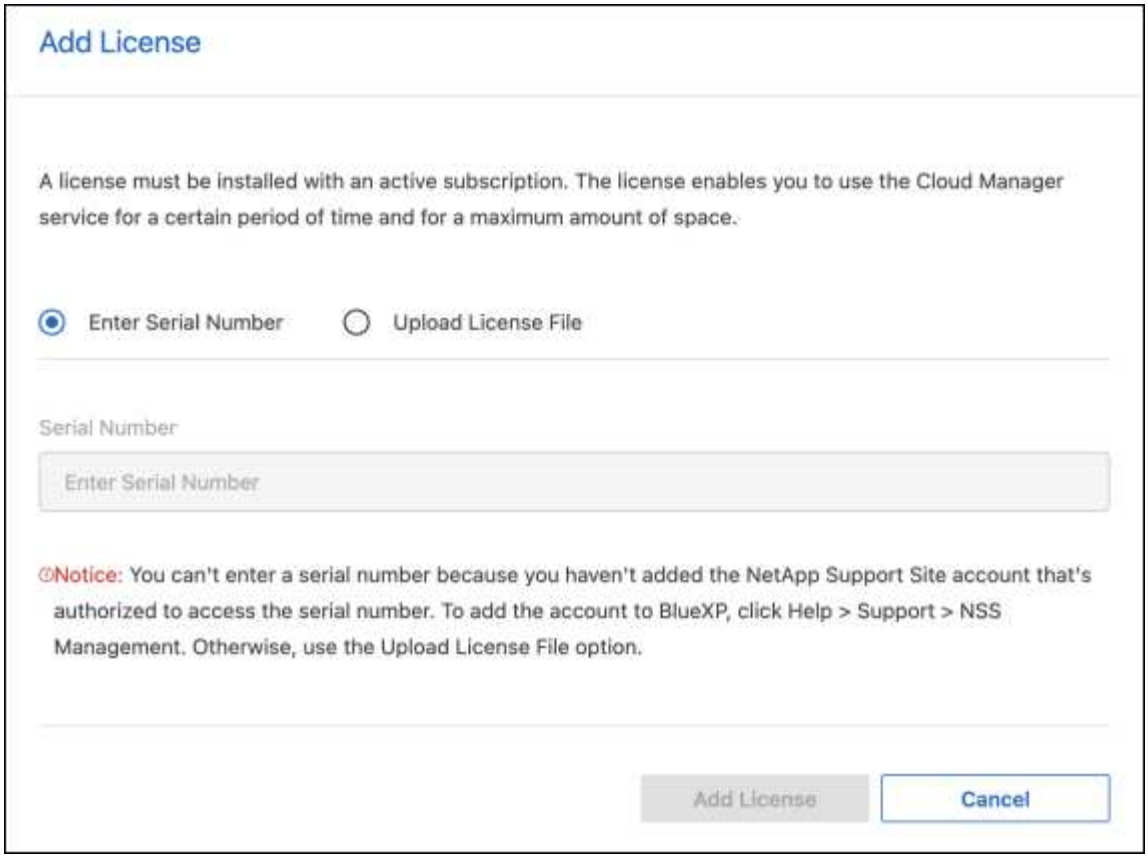
1. In the Ransomware Resilience, do one of the following:
   - If you have a message stating free trial is expiring, select **View payment methods**.
   - If you haven’t started the trial, select the **Free trial** notice at the top right then **View payment methods**.



2. In the Payment methods page, select **Subscribe** for Google Cloud Platform Marketplace*.
3. In Google Cloud Platform Marketplace, select **Subscribe**.
4. Use Google Cloud Platform Marketplace to subscribe to **NetApp Intelligent Services** and **Ransomware Resilience**.
5. When you return to Ransomware Resilience, a message states that you are subscribed.

> An email is sent to you that includes the Ransomware Resilience serial number and indicates that Ransomware Resilience is subscribed in Google Cloud Platform Marketplace.

6. Return to Ransomware Resilience Payment methods page.
7. To add the license to the Console, select **Add license**.



8. In the Add License page, select **Enter Serial Number**. Enter the serial number in the email sent to you. Select **Add License**.
9. To view license details, from the Console left navigation, select **Governance** > **Licenses and subscriptions**.
   - To see subscription information, select **Subscriptions**.
   - To see BYOL licenses, select **Data Services Licenses**.
10. Return to Ransomware Resilience. From the Console left navigation, select **Protection** > **Ransomware Resilience**.

    A message appears indicating that a license has been added.

Bring your own license (BYOL)

If you want to bring your own license (BYOL), you need to purchase the license, get the NetApp License File (NLF), then add the license to the Console.

Add your license file to the Console

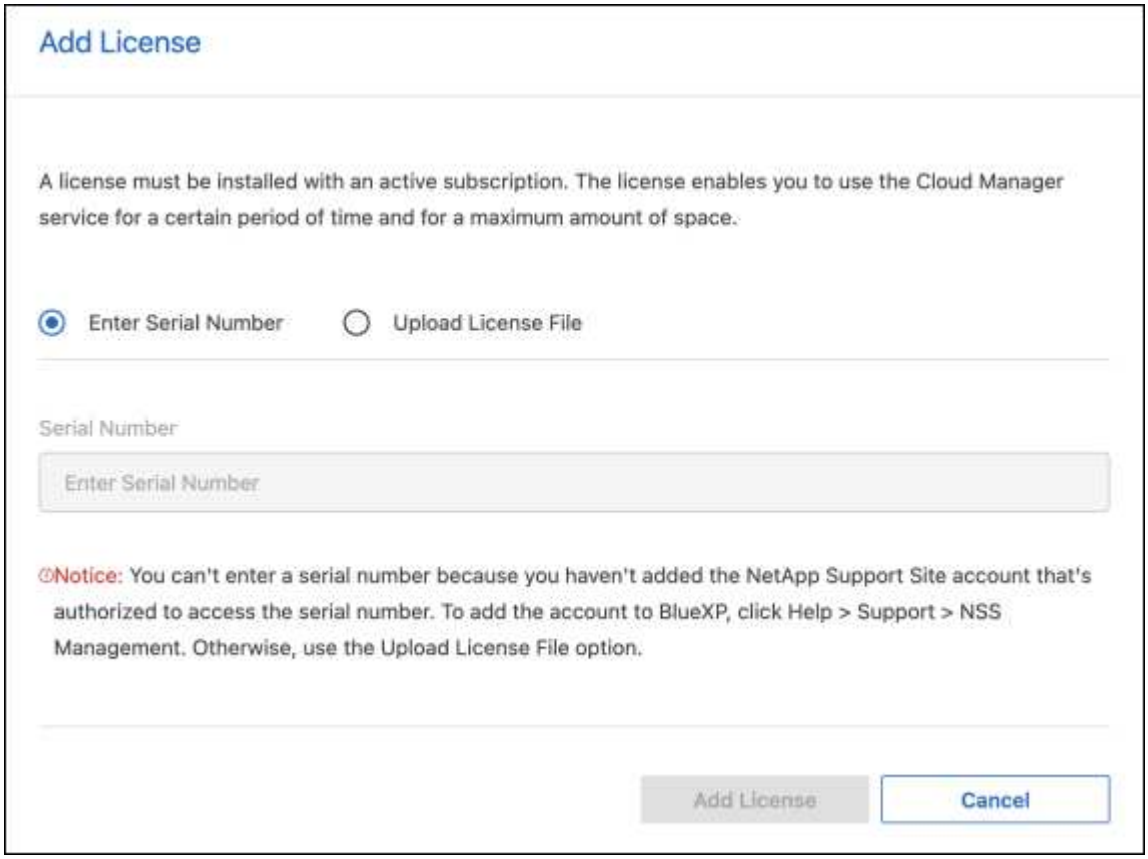
After you've purchased your Ransomware Resilience license from your NetApp sales rep, you activate the license by entering the Ransomware Resilience serial number and NetApp Support Site (NSS) account information.

Before you begin

You need the Ransomware Resilience serial number. Locate this number from your sales order, or contact the account team for this information.

Steps

1. After you obtain the license, return to Ransomware Resilience. Select the **View payment methods** option in the upper right. Or, in the message that the free trial is expiring, select **Subscribe or purchase a license**.
2. Select **Add license** to go to the Console Licesnses and subscriptions page.
3. From the **Data Services Licenses** tab, select **Add license**.



4. In the Add License page, enter the serial number and NetApp Support Site account information.
   - If you have the Console license serial number and know your NSS account, select the **Enter Serial Number** option and enter that information.

     If your NetApp Support Site account isn't available from the drop-down list, add the NSS account to the Console.

   - If you have the zvondolr license file (required when installed in a dark site), select the **Upload License File** option and follow the prompts to attach the file.
5. Select **Add License**.

Result

The Licenses and subscriptions page shows Ransomware Resilience has a license.

Update your Console license when it expires

If your licensed term is nearing the expiration date, or if your licensed capacity is reaching the limit, you'll be notified in the Ransomware Resilience UI. You can update your Ransomware Resilience license before it expires so there's no interruption in your ability to access your scanned data.

This message also appears in Licenses and subscriptions and in Notification settings.

Steps

1. You can send an email to support to request an update to your license.

   After you pay for the license and it is registered with the NetApp Support Site, the Console automatically updates the license. The Data Services Licenses page will reflect the change in 5 to 10 minutes.

2. If the Console can't automatically update the license, you need to manually upload the license file.
   a. You can obtain the license file from the NetApp Support Site.
   b. In the Console, select **Administration** > **Licenses and subscriptions**.
   c. Select the **Data Services Licenses** tab, select the **Actions …** icon for the serial number you are updating then select **Update License**.

End the PAYGO subscription

If you want to end your PAYGO subscription, you can do so at any time.

Steps

1. In Ransomware Resilience, at the top right, select the license option.
2. Select **View payment methods**.
3. In the drop-down details, uncheck the box **Use after current payment method expires**.
4. Select **Save**.

More information

- NetApp Console licenses and subscriptions documentation

Discover workloads in NetApp Ransomware Resilience

Before you can use NetApp Ransomware Resilience, it first needs to discover workload data. During discovery, Ransomware Resilience analyzes all volumes and files in systems across all Console agents and projects within an organization.

In the Discovery dashboard, Ransomware Resilience displays supported and unsupported system configurations. Ransomware Resilience assesses Oracle applications, VMware datastores, file shares, and block storage.

Ransomware Resilience does not discover workloads with volumes using FlexGroup.

Ransomware Resilience checks your current backup protection, snapshot copies, and NetApp Autonomous Ransomware Protection options. Ransomware Resilience also detects protection information from SnapCenter for VMware for VM datastores, SnapCenter for Oracle, and NetApp Backup and Recovery for file shares and VM file shares. It then recommends ways to improve your ransomware protection.

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

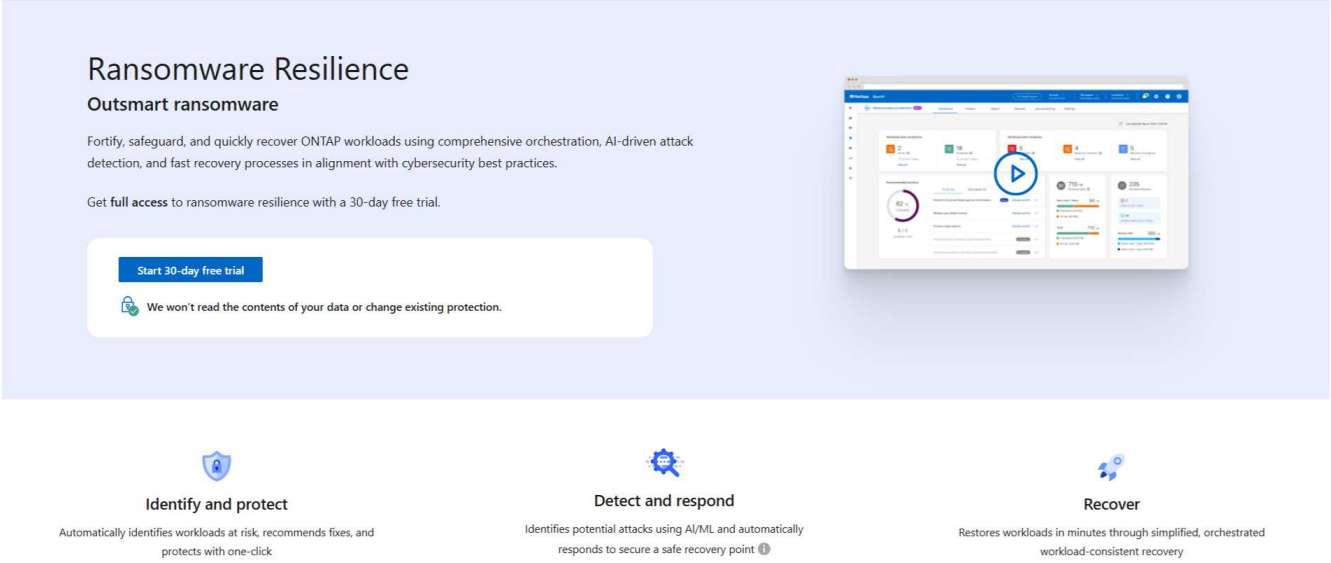
Select workloads to discover and protect

Within each Console agent, select the systems where you want to discover workloads.

Steps

1. From the NetApp Console, select **Protection** > **Ransomware protection**.

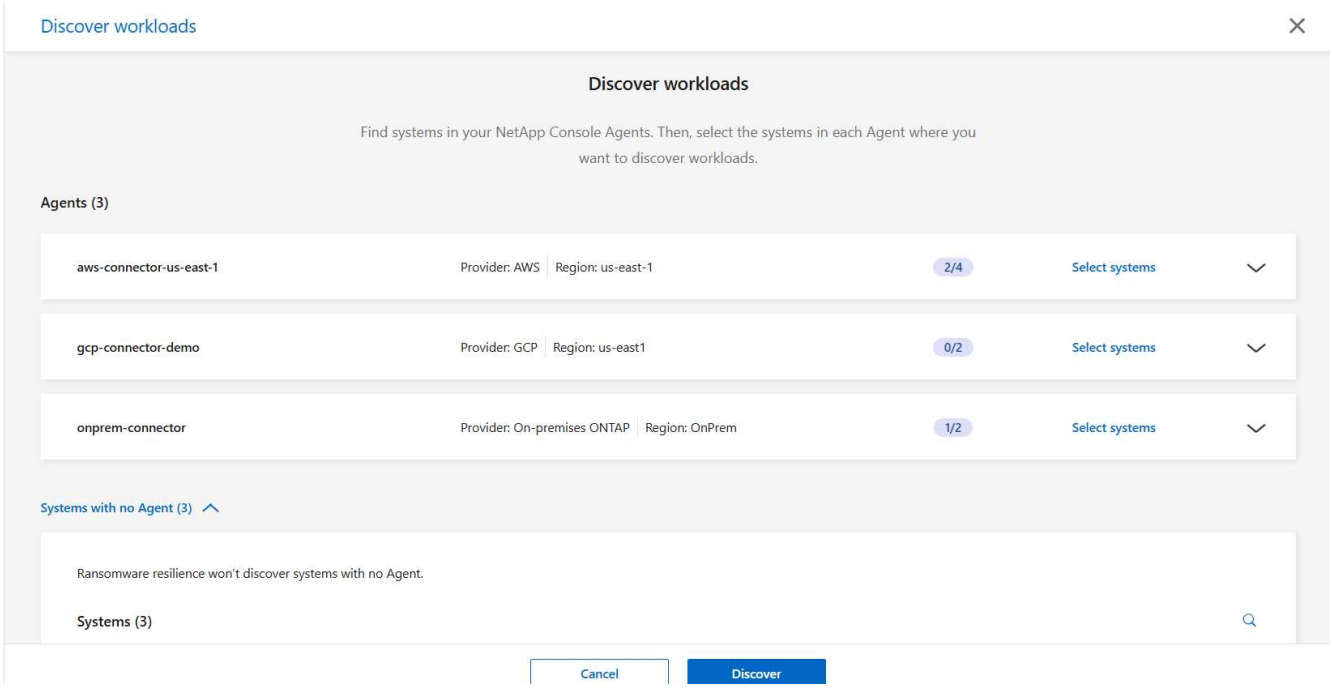
   If this is your first login, the landing page appears.



   If you started the free trial, the **Start 30-day free trial** button label changes to **Start by discovering workloads**.

2. From the initial landing page, select **Start by discovering workloads**.

   Ransomware Resilience finds both supported and unsupported systems. This process might take a few minutes.

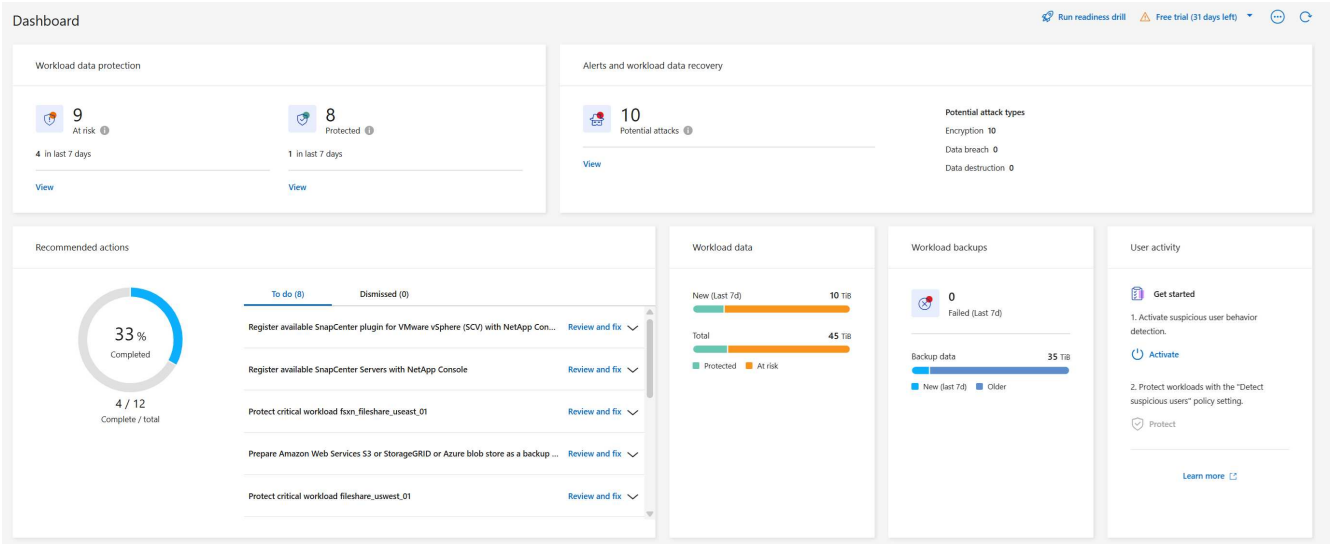


3. To discover workloads for a specific Console agent, select **Select systems** next to the Console agent where you want to discover workloads.
4. Select the systems where you want to discover workloads.
5. Select **Discover**.

   Ransomware Resilience only discovers workload data when you select system. The discovery process can take several minutes.

6. To download the list of discovered workloads, select **Download results**.
7. To display the Ransomware Resilience dashboard, select **Go to Dashboard**.

   The Dashboard shows data protection health. The number of at-risk or protected workloads updates as new workloads are discovered.



Learn what the Dashboard shows you.

Discover newly created workloads for previously selected systems

If you've added workloads to a previously discovered system, you need to reinitiate discovery to protect the new workloads.

Steps

1. To identify the time of the last discovery, look at the date and time stamp next to **Refresh** icon at the top right of the Ransomware Resilience dashboard.
2. From the Dashboard, select the **Refresh** icon to find new workloads.

If you find there are volumes not displaying for the system you've discovered, the volumes might be unsupported. To find a list of unsupported volumes, go to the **Settings** menu then select the action menu in the Workload discovery card to download a JSON report of supported and unsupported volumes.

Discover new systems

If you have already discovered systems, you can find new or previously unselected ones.

Steps

1. From the Ransomware Resilience menu, select the vertical … option at the top right. From the drop-down menu, select **Settings**.
2. In the Workload discovery card, select **Discover workloads**. Discovery can take a few minutes. A loading icon displays the progress.
3. Ransomware Resilience discovers both supported and unsupported systems. It does not support a system if its ONTAP version is below the required version. When you hover over an unsupported system, a tooltip displays the reason. Select the systems where you want to discover workloads.
4. Select **Discover**.

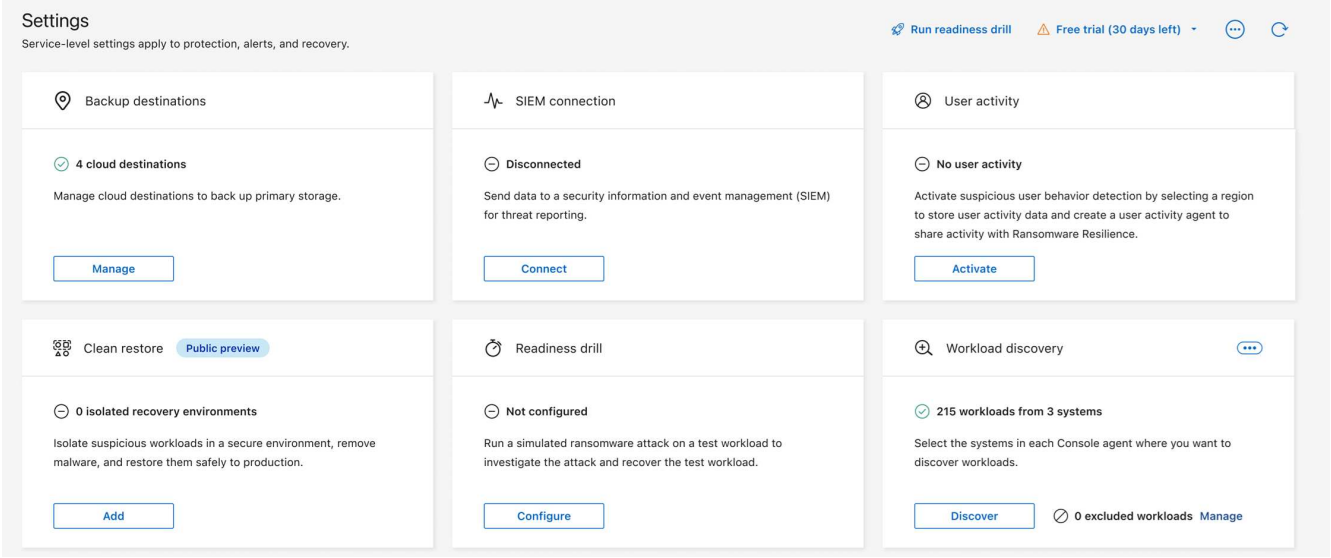
Exclude workloads

Ransomware Resilience allows your to exclude specific workloads in a system from ransomware protection and detection.

You can only exclude workloads that are supported and have been discovered successfully. You can modify the list of excluded workloads at any time. You aren't billed for workloads excluded from Ransomware Resilience.

Add workloads to the excluded workloads list

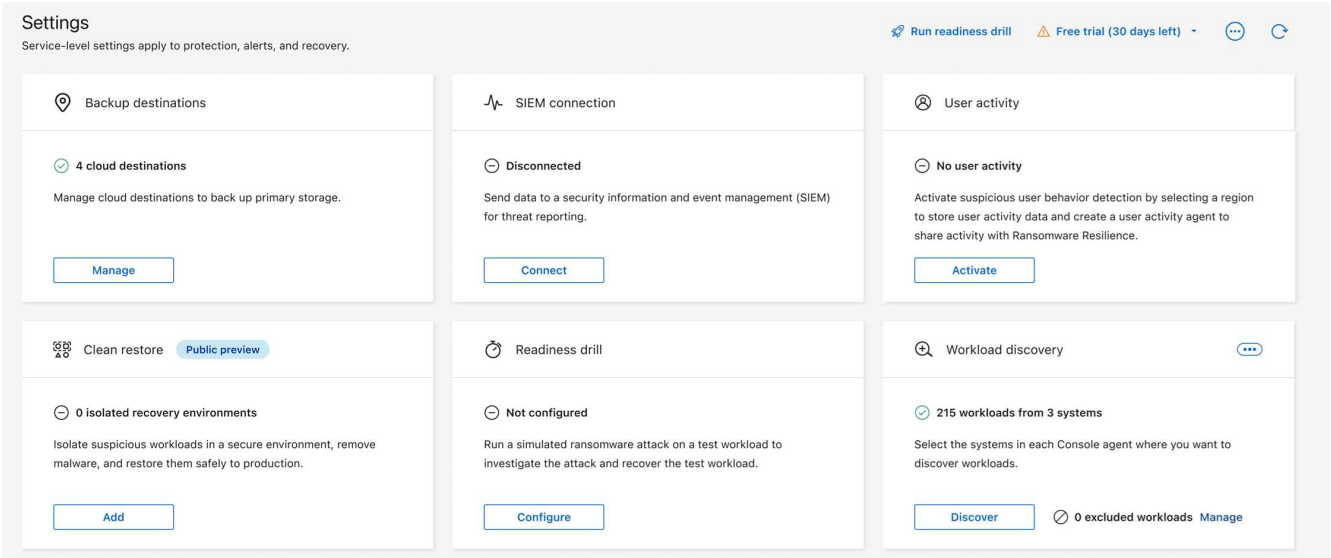
1. In Ransomware Resilience, select **Settings**.
2. In the Settings dashboard, locate the Workload discovery dashboard. The card identifies the number of excluded workloads. To add workloads, next to the excluded workloads, select **Manage**.



3. In the Excluded workloads page, select **Add**.
4. Select the workloads you want to exclude then **Add**.
5. Review the excluded workloads in the Excluded workloads page. While the workload is being added, a progress indicator displays next to its name. If a workload was not excluded successfully, it doesn't display on the page.

Remove workloads from the excluded workload list

1. In Ransomware Resilience, select **Settings**.
2. In the Settings dashboard, locate the Workload discovery dashboard. The card identifies the number of excluded workloads. Next to the excluded workloads, select **Manage**.

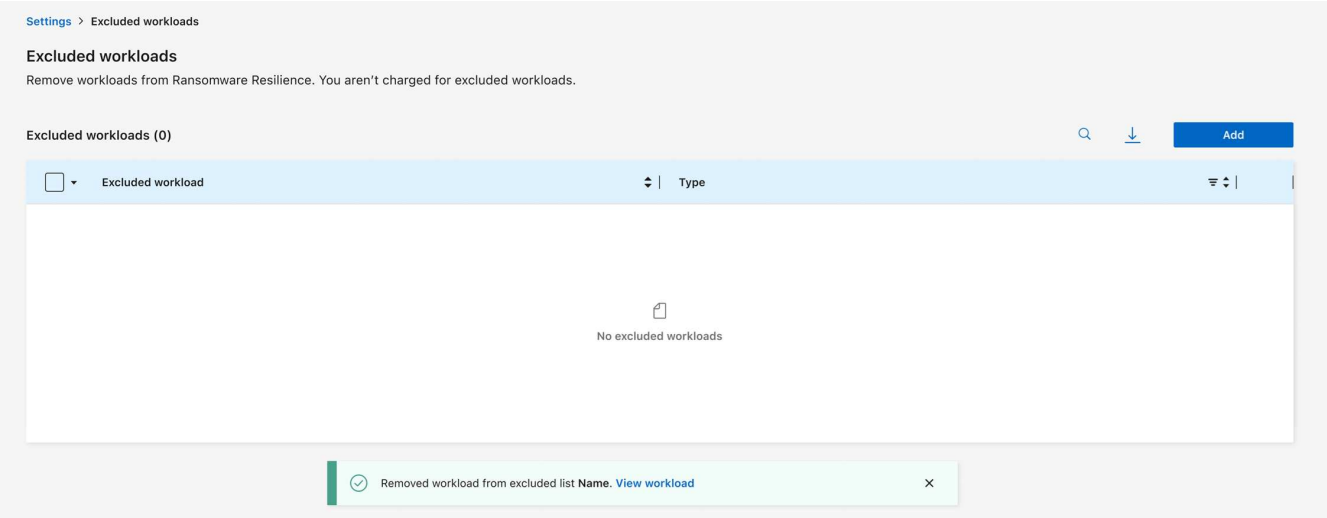


3. To remove an individual workload, select the action menu for the workload you want to remove from the excluded list.

   To remove multiple workloads, select the checkbox next to the workloads you want to remove then **Remove from excluded**.

4. In the dialog, select **Remove** to confirm that you want to remove the workloads from the exclude list.

5. If the workload is removed from the exluded workload list successfully, a success message appears on the Excluded workload page and the workload no longer appears in the list of excluded workloads. If the action fails, an error message appears; attempt the operation again.



Conduct a ransomware attack readiness drill in NetApp Ransomware Resilience

Run a ransomware attack readiness drill by simulating an attack on a new sample workload. Investigate the simulated attack and recover the workload. Use this feature to test alert notifications, response, and recovery. Run the drill as often as needed.

Your real workload data is not impacted.

You can run readiness drills on NFS and CIFS (SMB) workloads.

Configure a ransomware attack readiness drill

Before you run a simulation, set up a drill on the Settings page. Access the Settings page from the Actions option in the top menu.

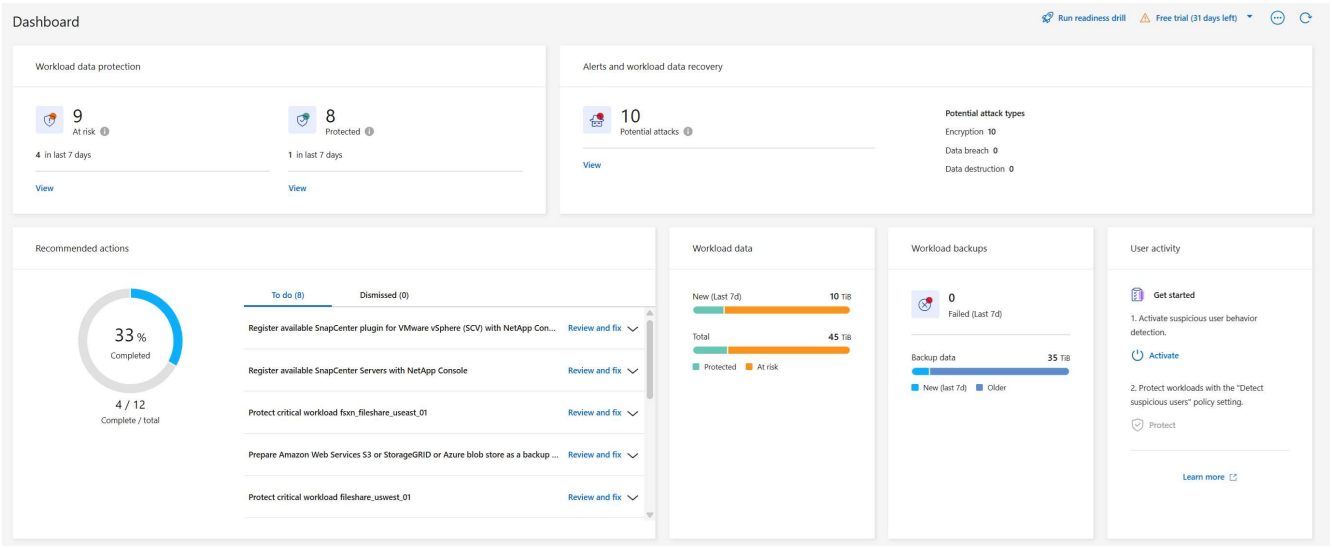
You need to enter a user name and password for the following situations:

- If user name or password changes occurred for the previously selected storage VM
- If you select a different CIFS (SMB) storage VM
- If you enter a different test workload name

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

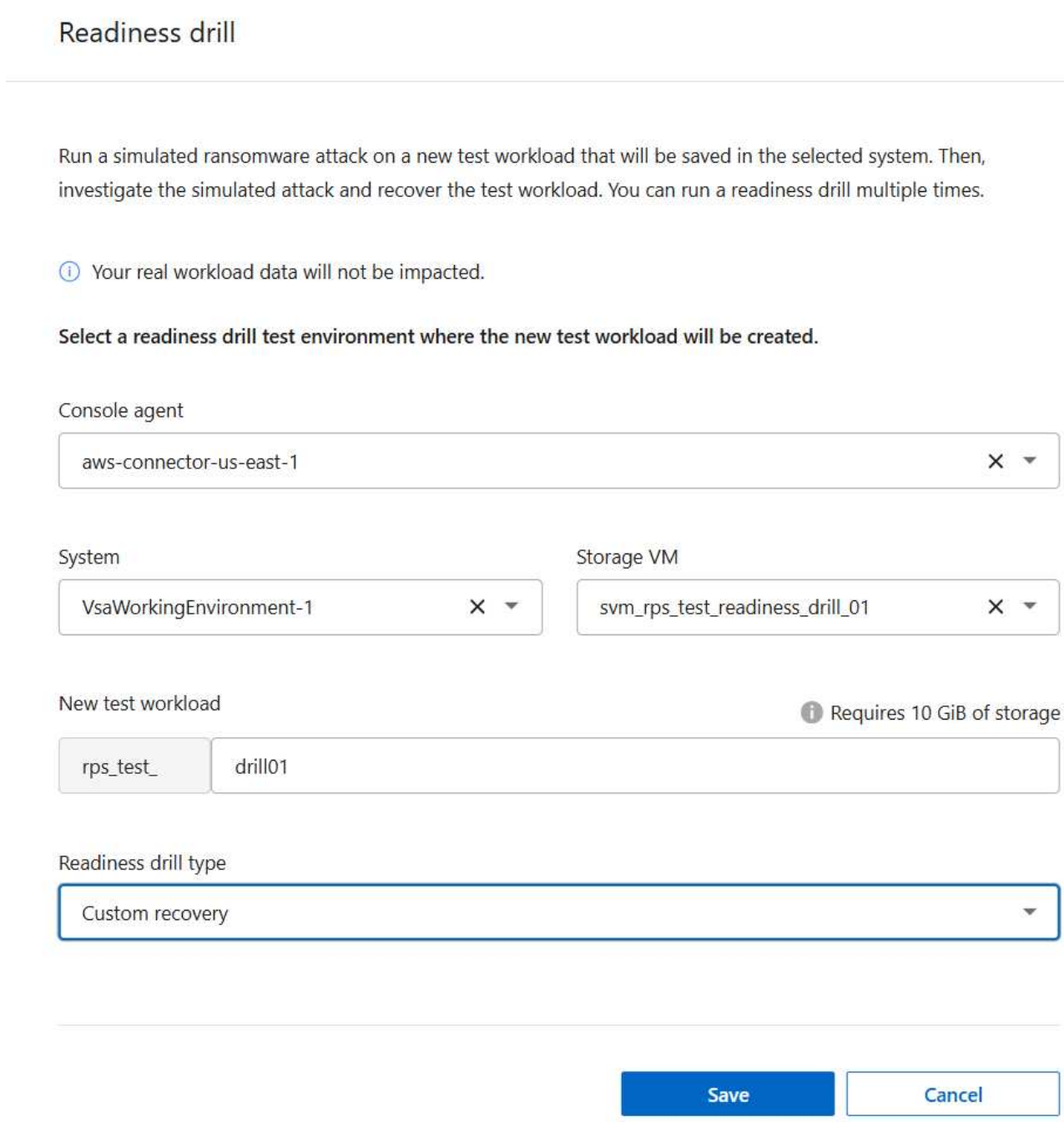
Steps

1. From the NetApp Ransomware Resilience menu, select the **Run readiness drill** button at the top right.



2. In the Readiness drill card on the Settings page, select **Configure**.

   The Console displays the Configure readiness drill page.



3. Do the following:
   a. Select the Console agent you want to use for the readiness drill.
   b. Select a test system.
   c. Select a test storage SVM.
   d. If you selected a CIFS (SMB) storage VM, **User name** and **Password** fields appear. Enter the user name and password for the storage VM.
   e. Select the readiness drill type. For a manual recovery from an encryption data breach, choose **Custom recovery**. For recovery from suspicious user activity, choose **Data breach**.
   f. Enter the name of a new test workload to be created. Do not include dashes in the name.

4. Select **Save**.

You can edit the readiness drill configuration later using the Settings page.

Start a readiness drill

After you configure the readiness drill, you can start the drill.

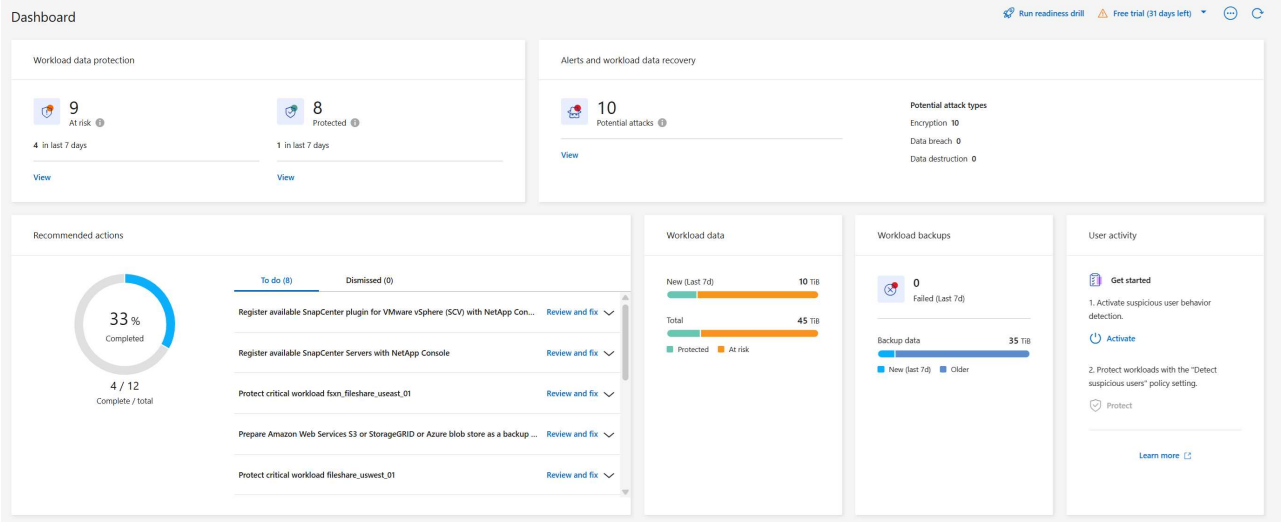
Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

When you start the readiness drill, Ransomware Resilience skips the learning mode and starts the drill in active mode. The detection status of the workload is Active.

A workload can have a ransomware detection **Learning mode** status when a detection policy is recently assigned and Ransomware Resilience scans workloads.

Steps

1. Do one of the following:
   - From the Ransomware Resilience menu, select the **Run readiness drill** button at the top right.



   - OR, from the Settings page, in the Readiness drill card, select **Start**.

You can't edit the readiness drill configuration while the drill is running. You can reset the drill to stop it and modify the configuration.

Respond to a readiness drill alert

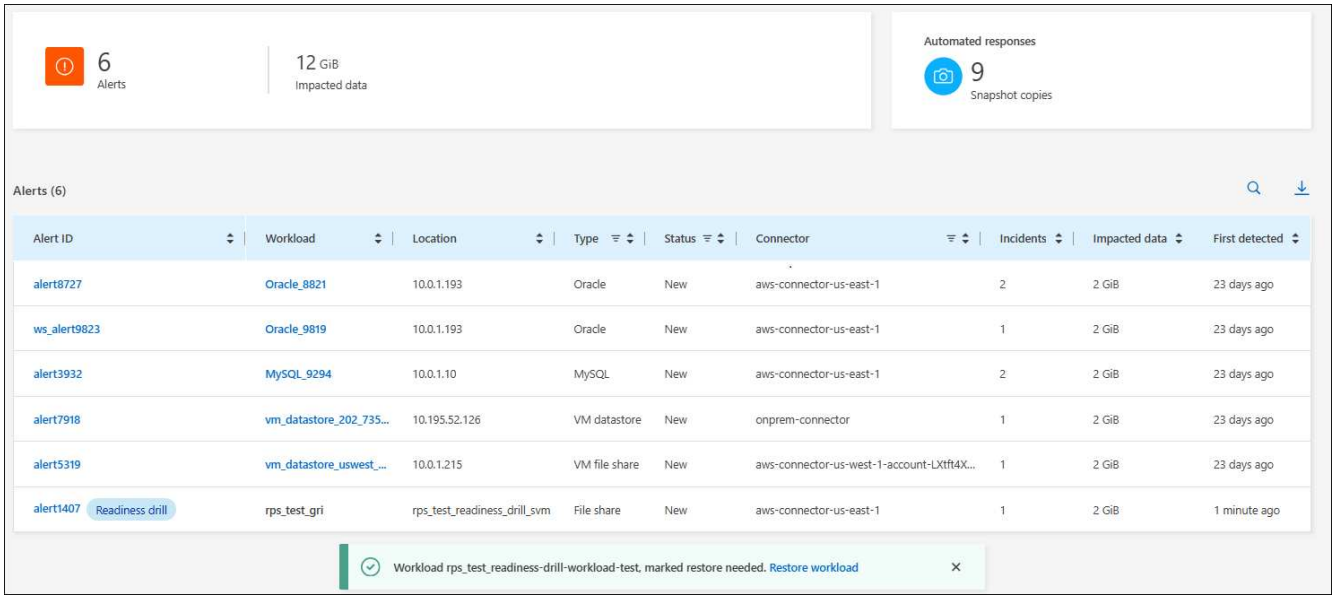
Test your readiness by responding to a readiness drill alert.

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

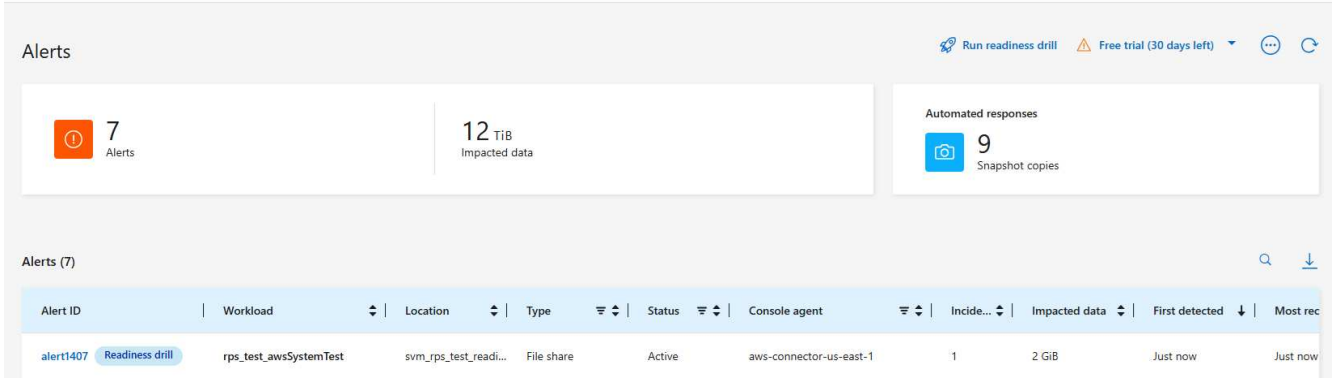
Steps

1. From the Ransomware Resilience menu, select **Alerts**.

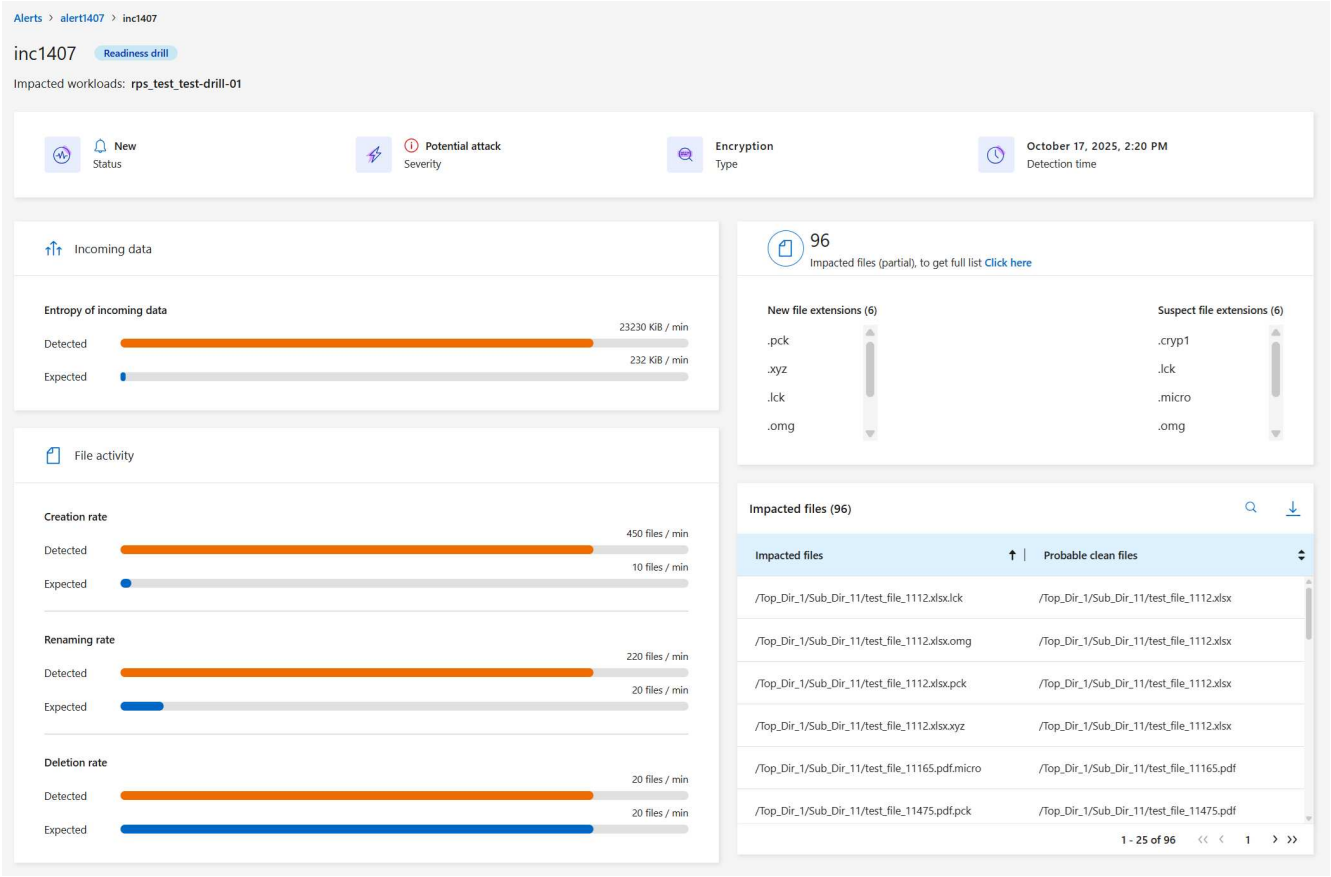
   The Console displays the Alerts page. In the Alert ID column, you see "Readiness drill" next to the ID.



2. Select the alert with the "Readiness drill" indication. A list of incident alerts appears on the Alerts details page.



3. Review the alert incidents.
4. Select an alert incident.



Here are some things to look for:

- Look at the Potential attack severity.

  If the severity indicates that a user is suspected of malicious activity, review the user name. You can also block the user.

- Look at the file activity and suspected processes:
  - Look at the incoming detected data compared to the expected data.
  - Look at the creation rate of files that is detected compared to the expected rate.
  - Look at the file renaming rate that is detected compared to the expected rate.
  - Look at the deletion rate compared to the expected rate.
- Look at the list of impacted files. Look at the extensions that might be causing the attack.
- Determine the impact and breadth of the attack by reviewing the number of impacted files and directories.

Restore the test workload

After reviewing the readiness drill alert, restore the test workload if needed.

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

Steps

1. Return to the Alert details page.
2. If the test workload should be restored, do the following:
   - Select **Mark restore needed**.
   - Review the confirmation, and select **Mark restore needed** in the confirmation box.
     - From the Ransomware Resilience menu, select **Recovery**.
     - Select the test workload marked with "Readiness drill" that you want to restore.
     - Select **Restore**.
     - In the Restore page, provide information for the restore:
   - Select the source snapshot copy.
   - Select the destination volume.
3. In the restore Review page, select **Restore**.

   The Console displays the status of the Readiness drill restore as "In progress" on the Recovery page.

   After the restore is complete, the Console changes the status of the workload to **Restored**.

4. Review the restored workload.

For details about the restore process, see Recover from a ransomware attack (after incidents are neutralized).

Change the Alerts status after the readiness drill

After reviewing the readiness drill alert and restoring the workload, change the alert status if needed.

Required the Console role
Organization admin, Folder or project admin, or Ransomware Resilience admin. Learn about Console access roles for all services.

Steps

1. Return to the Alert details page.
2. Select the alert again.
3. Indicate the status by selecting **Edit status** and change the status to one of the following:
   - Dismissed: If you suspect that the activity is not a ransomware attack, change the status to Dismissed.

     After you dismiss an attack, you cannot chanage it back. If you dismiss a workload, all snapshot copies taken automatically in response to the potential ransomware attack will be permanently deleted. If you dismiss the alert, the readiness drill is considered complete.

   - Resolved: The incident has been mitigated.

Review reports on the readiness drill

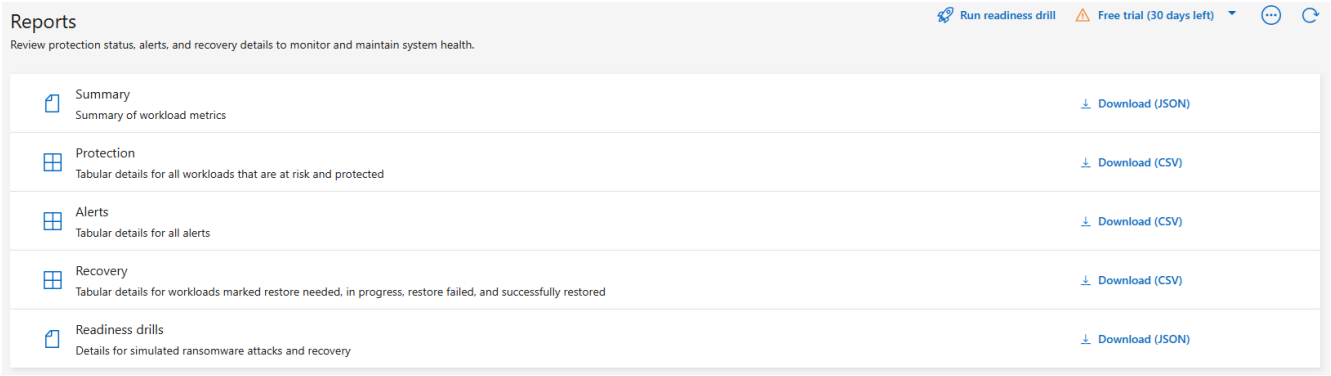
After the readiness drill is complete, you might want to review and save a report on the drill.

Required Console role

To perform this task, you need the Organization admin, Folder or project admin, Ransomware Resilience admin, or Ransomware Resilience viewer role. Learn about Ransomware Resilience roles for NetApp Console.

Steps

1. From the Ransomware Resilience menu, select **Reports**.



2. Select **Readiness drills** and **Download** to download the readiness drill report.

Configure protection settings in NetApp Ransomware Resilience

You can configure backup destinations, send data to an external security and event management (SIEM) system, conduct an attack readiness drill, configure workload discovery, or configure suspicious user activity detection by accessing the **Settings** option.

Required Console role
To perform this task, you need the Organization admin, Folder or project admin, or Ransomware Resilience admin role. Learn about Ransomware Resilience roles for NetApp Console.

What can you do in the Settings page?
From the Settings page, you can do the following:

- Simulate a ransomware attack by conducting a readiness drill and respond to a simulated ransomware alert. For details, see Conduct a ransomware attack readiness drill.
- Configure workload discovery.
- Configure suspicious user activity reporting.
- Add a backup destination.
- Connect your security and event management system (SIEM) for threat analysis and detection. Enabling threat detection automatically sends data to your SIEM for threat analysis.

Access the Settings page directly

You can easily access the Settings page from the Actions option near the top menu.

1. From the Ransomware Resilience, select the vertical … option at the top right.

2. From the drop-down menu, select **Settings**.

Simulate a ransomware attack

Conduct a ransomware readiness drill by simulating a ransomware attack on a newly created, sample workload. Then, investigate the simulated attack and recover the sample workload. This feature helps you know that you are prepared in the event of an actual ransomware attack by testing alert notification, response, and recovery processes. You can run a ransomware readiness drill multiple times.

For details, refer to Conduct a ransomware attack readiness drill.

Configure workload discovery

You can configure workload discovery to automatically discover new workloads in your environment.

1. In the Settings page, locate the **Workload discovery** tile.
2. In the **Workload discovery** tile, select **Discover workloads**.

   This page shows Console agents with systems that were not selected earlier, newly available Console agents, and newly available systems. This page doesn't show those systems that were previously selected.

3. Select the Console agent where you want to discover workloads.
4. Review the list of systems.
5. Check the systems where you want to discover workloads or select the box at the top of the table to discover workloads in all discovered workload environments.
6. Do this for other systems as needed.
7. Select **Discover** to have Ransomware Resilience automatically discover new workloads in the selected Console agent.

From the Workload discovery card in Settings, select the action menu … then **Download report (JSON)** to review a list of supported and unsupported workloads in your systems.

Suspicious user activity

In the User activity card, you can create and manage the user activity agent that is required to detect suspicious user activity.

For more information, see Suspicious user activity.

Add a backup destination

Ransomware Resilience can identify workloads that do not have any backups yet and also workloads that do not have any backup destinations assigned yet.

To protect those workloads, you should add a backup destination. You can choose one of the following backup destinations:

- NetApp StorageGRID
- Amazon Web Services (AWS)

- Google Cloud Platform
- Microsoft Azure

Backup destinations are not available for workloads in Amazon FSx for NetApp ONTAP. Perform backup operations using the FSx for ONTAP backup service.

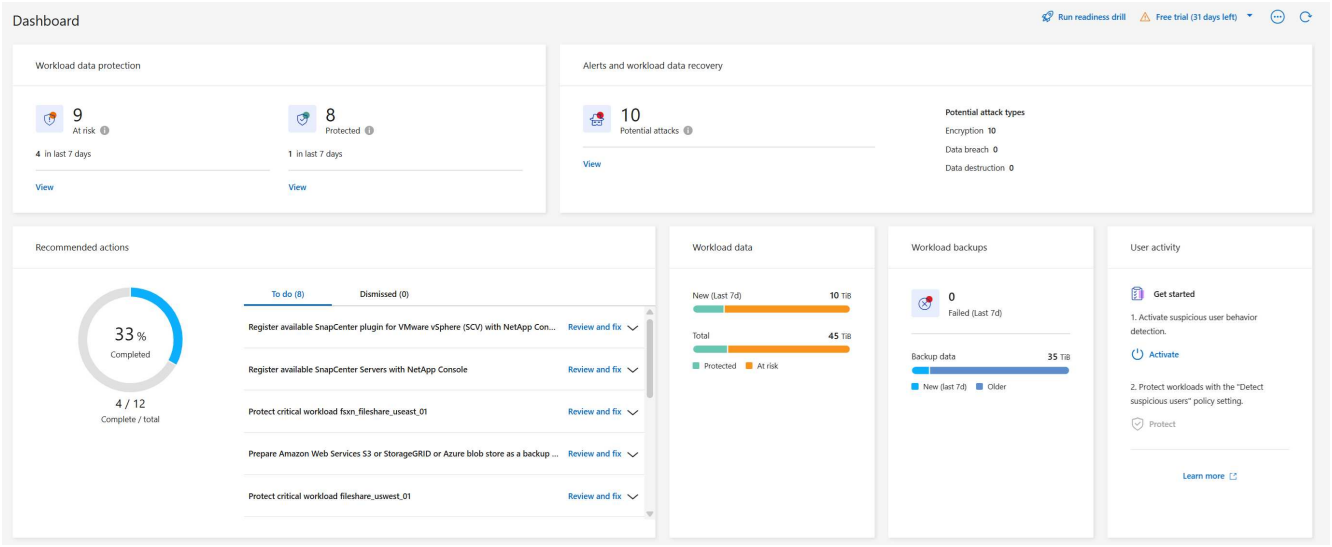
You can add a backup destination based on a recommended action from the Dashboard or from accessing the Settings option on the menu.

Access Backup Destination options from the Dashboard's recommended actions

The Dashboard provides many recommendations. One recommendation might be to configure a backup destination.

Steps

1. In the Ransomware Resilience dashboard, review the Recommended actions pane.



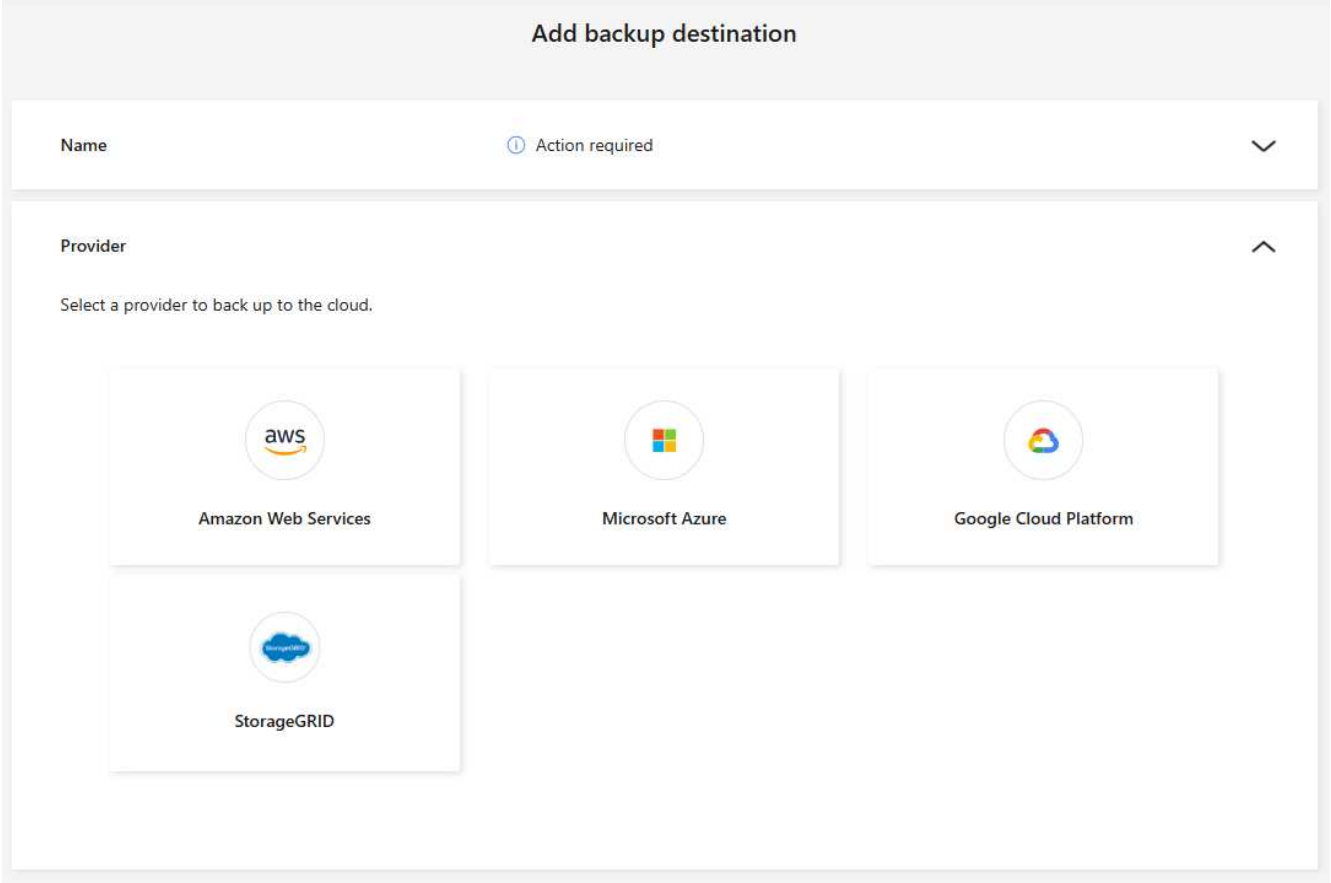
2. From the Dashboard, select **Review and fix** for the recommendation of "Prepare <backup provider> as a backup destination."
3. Continue with instructions depending on the backup provider.

Add StorageGRID as a backup destination

To set up NetApp StorageGRID as a backup destination, enter the following information.

Steps

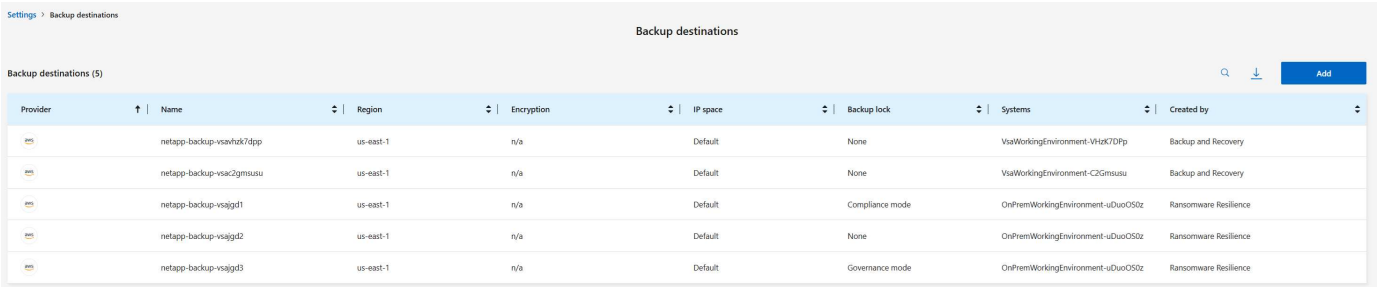
1. In the **Settings > Backup destinations** page, select **Add**.
2. Enter a name for the backup destination.



3. Select **StorageGRID**.
4. Select the down arrow next to each setting and enter or select values:
   - **Provider settings**:
     - Create a new bucket or bring your own bucket that will store the backups.
     - StorageGRID gateway node fully qualified domain name, port, StorageGRID access key and secret key credentials.
   - **Networking**: Choose the IPspace.
     - The IPspace is the cluster where the volumes you want to back up reside. The intercluster LIFs for this IPspace must have outbound internet access.
5. Select **Add**.

Result

The new backup destination is added to the list of backup destinations.



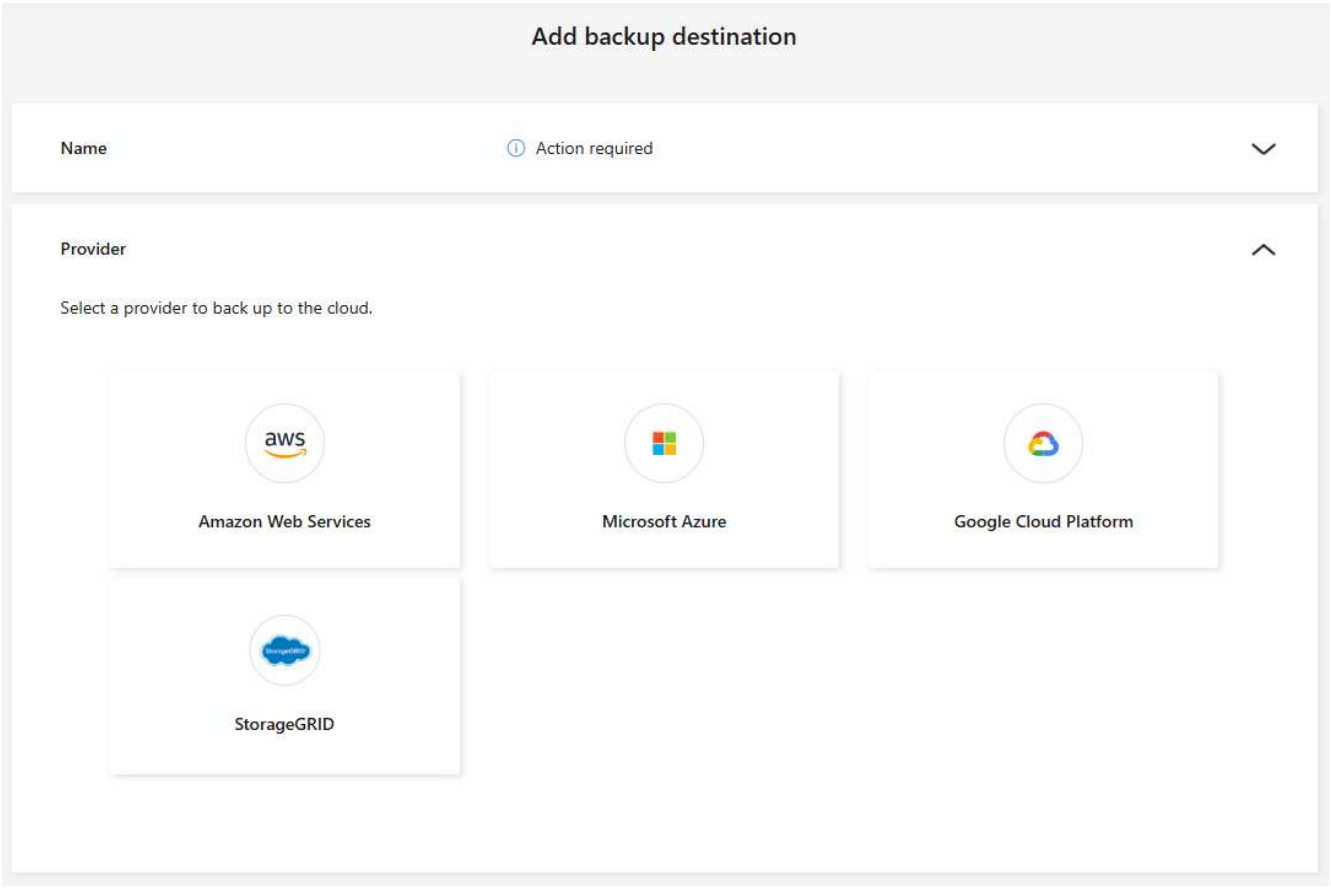
Add Amazon Web Services as a backup destination

To set up AWS as a backup destination, enter the following information.

For details about managing your AWS storage in the Console, refer to Manage your Amazon S3 buckets.

Steps

1. In the **Settings > Backup destinations** page, select **Add**.
2. Enter a name for the backup destination.



3. Select **Amazon Web Services**.
4. Select the Down arrow next to each setting and enter or select values:
   - **Provider settings**:
     - Create a new bucket, select an existing bucket if one already exists in the Console, or bring your own bucket that will store the backups.
     - AWS account, region, access key and secret key for AWS credentials

     If you want to bring your own bucket, refer to Add S3 buckets.
   - **Encryption**: If you are creating a new S3 bucket, enter encryption key information given to you from the provider. If you chose an existing bucket, encryption information is already available.

     Data in the bucket is encrypted with AWS-managed keys by default. You can continue to use AWS-managed keys, or you can manage the encryption of your data using your own keys.
   - **Networking**: Choose the IPspace and whether you'll be using a Private Endpoint.

- The IPspace is the cluster where the volumes you want to back up reside. The intercluster LIFs for this IPspace must have outbound internet access.
- Optionally, choose whether you'll use an AWS private endpoint (PrivateLink) that you previously configured.

  If you want to use AWS PrivateLink, refer to AWS PrivateLink for Amazon S3.

◦ **Backup lock**: Choose whether you want Ransomware Resilience to protect backups from being modified or deleted. This option uses the NetApp DataLock technology. Each backup will be locked during the retention period, or for a minimum of 30 days, plus a buffer period of up to 14 days.

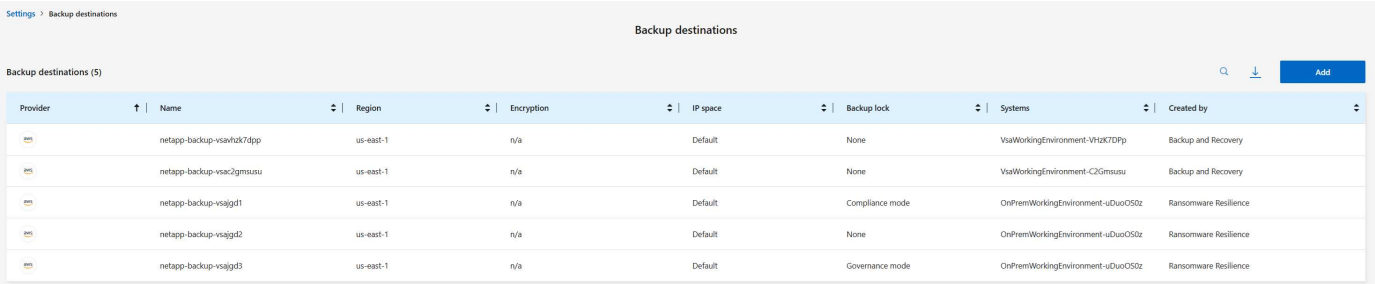
> If you configure the backup lock setting now, you cannot change the setting later after the backup destination is configured.

- **Governance mode**: Specific users (with s3:BypassGovernanceRetention permission) can overwrite or delete protected files during the retention period.
- **Compliance mode**: Users cannot overwrite or delete protected backup files during the retention period.

5. Select **Add**.

Result

The new backup destination is added to the list of backup destinations.



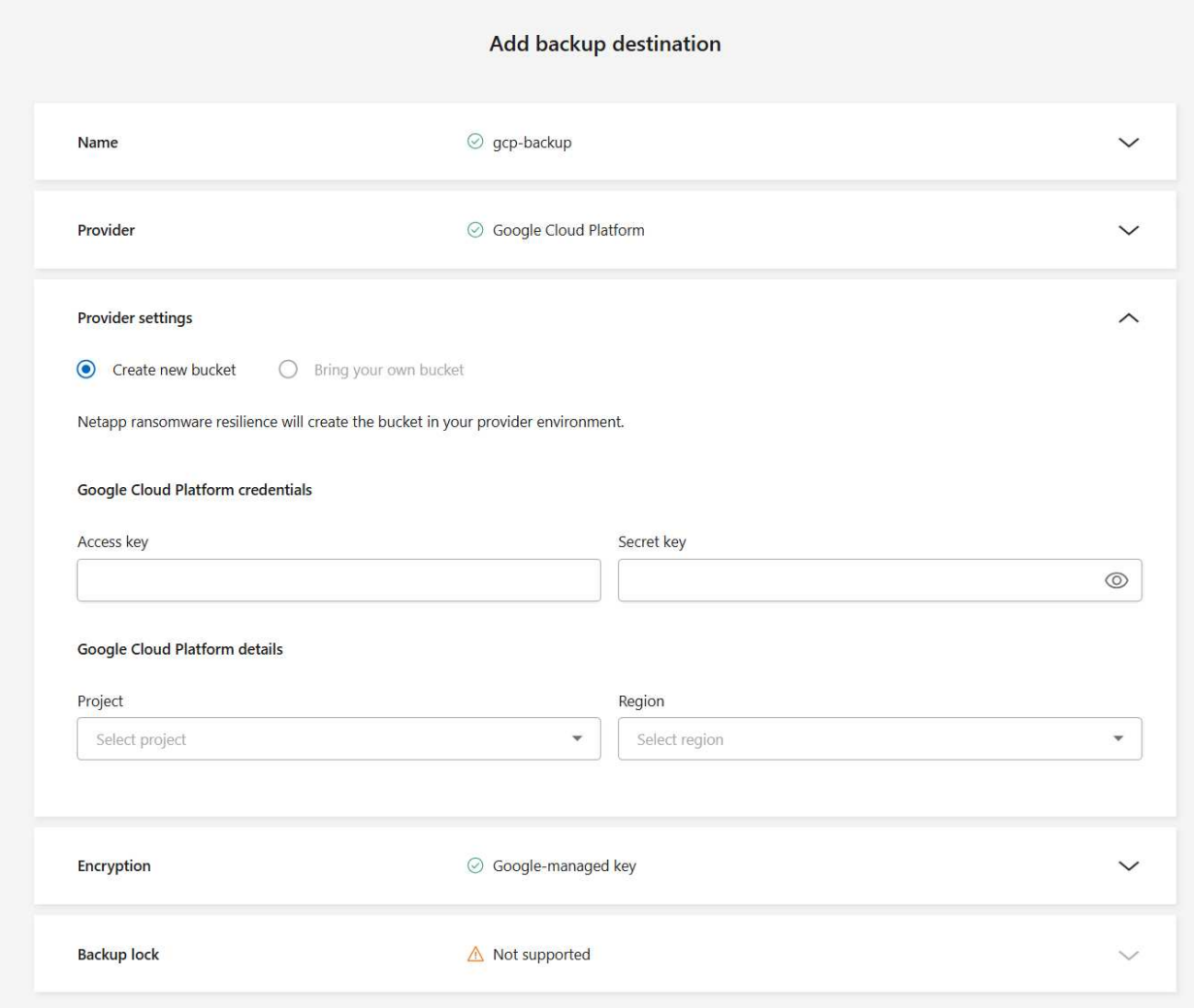
Add Google Cloud Platform as a backup destination

To set up Google Cloud Platform (GCP) as a backup destination, enter the following information.

For details about managing your GCP storage in the Console, refer to Console agent installation options in Google Cloud.

Steps

1. In the **Settings > Backup destinations** page, select **Add**.
2. Enter a name for the backup destination.
3. Select **Google Cloud Platform**.
4. Select the Down arrow next to each setting and enter or select values:
   ◦ **Provider settings**:
   - Create a new bucket. Enter the access key and secret key.
   - Enter or select your Google Cloud Platform project and region.



- **Encryption**: If you are creating a new bucket, enter encryption key information given to you from the provider. If you chose an existing bucket, encryption information is already available.

  Data in the bucket is encrypted with Google-managed keys by default. You can continue to use Google-managed keys.

- **Networking**: Choose the IPspace and whether you'll be using a Private Endpoint.
  - The IPspace is the cluster where the volumes you want to back up reside. The intercluster LIFs for this IPspace must have outbound internet access.
  - Optionally, choose whether you'll use an GCP private endpoint (PrivateLink) that you previously configured.

5. Select **Add**.

Result

The new backup destination is added to the list of backup destinations.

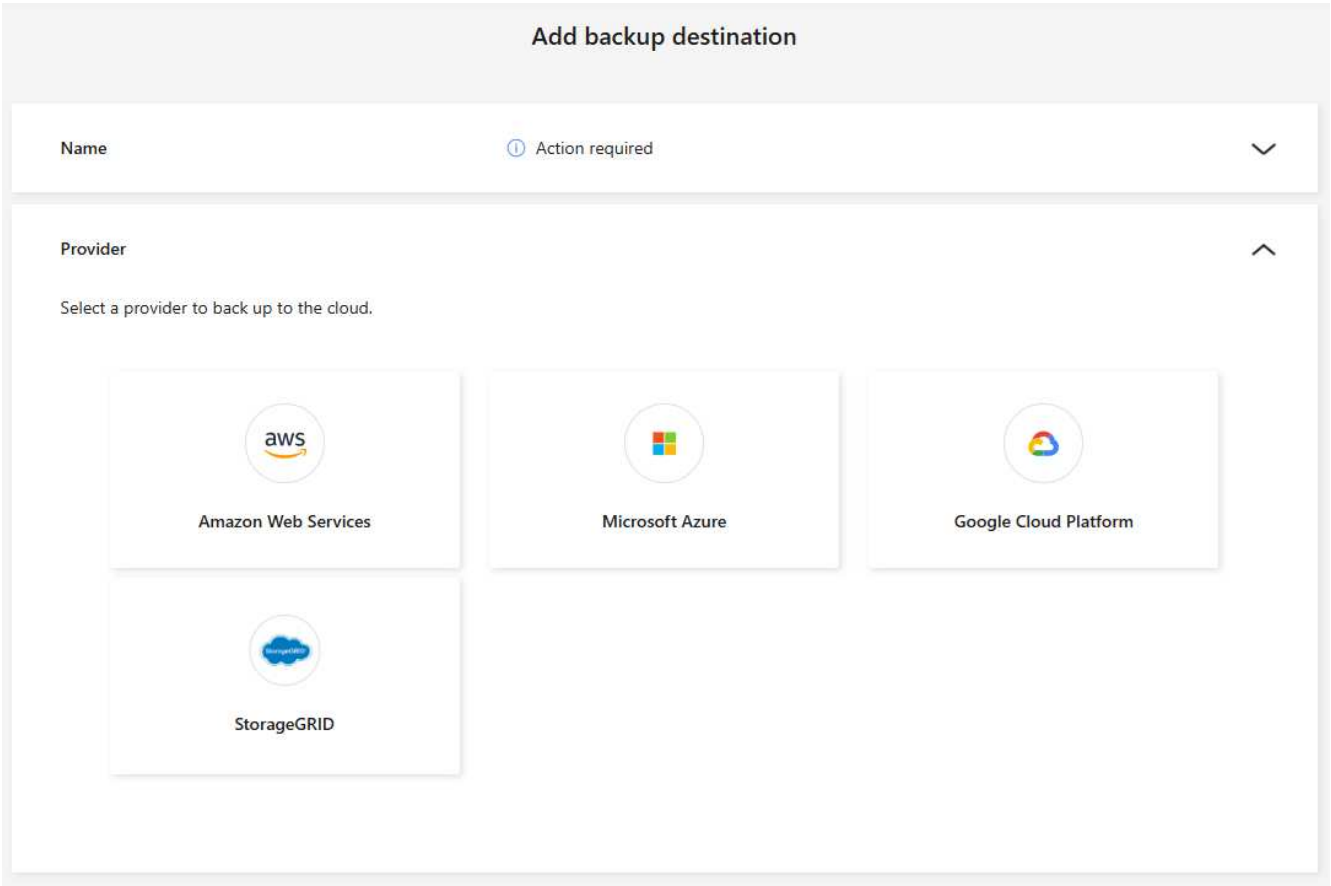
Add Microsoft Azure as a backup destination

To set up Azure as a backup destination, enter the following information.

For details about managing your Azure credentials and marketplace subscriptions in the Console, refer to Manage your Azure credentials and marketplace subscriptions.

Steps

1. In the **Settings > Backup destinations** page, select **Add**.
2. Enter a name for the backup destination.



3. Select **Azure**.
4. Select the Down arrow next to each setting and enter or select values:
   - **Provider settings**:
     - Create a new storage account, select an existing one if one already exists in the Console, or bring your own storage account that will store the backups.
     - Azure subscription, region, and resource group for Azure credentials

     If you want to bring your own storage account, refer to Add Azure Blob storage accounts.
   - **Encryption**: If you are creating a new storage account, enter encryption key information given to you from the provider. If you chose an existing account, encryption information is already available.

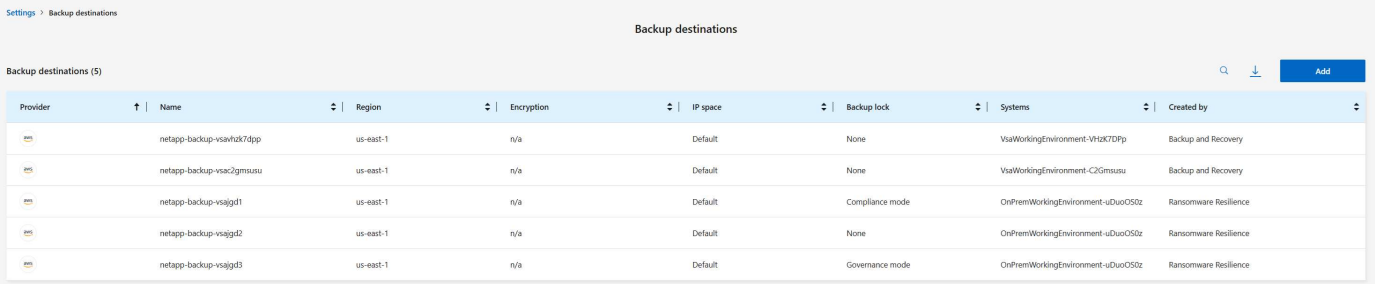
     Data in the account is encrypted with Microsoft-managed keys by default. You can continue to use Microsoft-managed keys, or you can manage the encryption of your data using your own keys.
   - **Networking**: Choose the IPspace and whether you'll be using a Private Endpoint.
     - The IPspace is the cluster where the volumes you want to back up reside. The intercluster LIFs for this IPspace must have outbound internet access.
     - Optionally, choose whether you'll use an Azure private endpoint that you previously configured.

     If you want to use Azure PrivateLink, refer to Azure PrivateLink.

5. Select **Add**.

Result

The new backup destination is added to the list of backup destinations.



Connect to a security and event management system (SIEM) for threat analysis and detection

You can automatically send data to your security and event management system (SIEM) for threat analysis and detection. You can select the AWS Security Hub, Microsoft Sentinel, or Splunk Cloud as your SIEM.

Before you enable SIEM in Ransomware Resilience, you need to configure your SIEM system.

About the event data sent to a SIEM

Ransomware Resilience can send the following event data to your SIEM system:

- **context**:
  - **os**: This is a constant with the value of ONTAP.
  - **os_version**: The version of ONTAP running on the system.
  - **connector_id**: The ID of the Console agent managing the system.
  - **cluster_id**: The cluster ID reported by ONTAP for the system.
  - **svm_name**: The name of the SVM where the alert was found.
  - **volume_name**: The name of the volume on which the alert is found.
  - **volume_id**: The ID of the volume reported by ONTAP for the system.
- **incident**:
  - **incident_id**: The incident ID generated by Ransomware Resilience for the volume under attack in Ransomware Resilience.
  - **alert_id**: The ID generated by Ransomware Resilience for the workload.
  - **severity**: One of the following alert levels: "CRITICAL", "HIGH", "MEDIUM", "LOW".
  - **description**: Details about the alert that was detected, for example, "A Potential ransomware attack detected on workload arp_learning_mode_test_2630"

Configure AWS Security Hub for threat detection

Before you enable AWS Security Hub in Ransomware Resilience, you'll need to do the following high level steps in AWS Security Hub:

- Set up permissions in AWS Security Hub.

- Set up the authentication access key and secret key in AWS Security Hub. (These steps are not provided here.)

Steps to set up permissions in AWS Security Hub

1. Go to **AWS IAM console**.
2. Select **Policies**.
3. Create a policy using the following code in JSON format:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "NetAppSecurityHubFindings",
      "Effect": "Allow",
      "Action": [
        "securityhub:BatchImportFindings",
        "securityhub:BatchUpdateFindings"
      ],
      "Resource": [
        "arn:aws:securityhub:*:*:product/*/default",
        "arn:aws:securityhub:*:*:hub/default"
      ]
    }
  ]
}
```

Configure Microsoft Sentinel for threat detection

Before you enable Microsoft Sentinel in Ransomware Resilience, you'll need to do the following high level steps in Microsoft Sentinel:

- **Prerequisites**
  - Enable Microsoft Sentinel.
  - Create a custom role in Microsoft Sentinel.
- **Registration**
  - Register Ransomware Resilience to receive events from Microsoft Sentinel.
  - Create a secret for the registration.
- **Permissions**: Assign permissions to the application.
- **Authentication**: Enter authentication credentials for the application.

Steps to enable Microsoft Sentinel

1. Go to Microsoft Sentinel.
2. Create a **Log Analytics workspace**.
3. Enable Microsoft Sentinel to use the Log Analytics workspace you just created.

Steps to create a custom role in Microsoft Sentinel

1. Go to Microsoft Sentinel.
2. Select **Subscription** > **Access control (IAM)**.
3. Enter a Custom role name. Use the name **Ransomware Resilience Sentinel Configurator**.
4. Copy the following JSON and paste it into the **JSON** tab.

```
{
  "roleName": "Ransomware Resilience Sentinel Configurator",
  "description": "",
  "assignableScopes":["/subscriptions/{subscription_id}"],
  "permissions": [

  ]
}
```

5. Review and save your settings.

Steps to register Ransomware Resilience to receive events from Microsoft Sentinel

1. Go to Microsoft Sentinel.
2. Select **Entra ID** > **Applications** > **App registrations**.
3. For the **Display name** for the application, enter "**Ransomware Resilience**".
4. In the **Supported account type** field, select **Accounts in this organizational directory only**.
5. Select a **Default Index** where events will be pushed.
6. Select **Review**.
7. Select **Register** to save your settings.

   After registration, the Microsoft Entra admin center displays the application Overview pane.

Steps to create a secret for the registration

1. Go to Microsoft Sentinel.
2. Select **Certificates & secrets** > **Client secrets** > **New client secret**.
3. Add a description for your application secret.
4. Select an **Expiration** for the secret or specify a custom lifetime.

   A client secret lifetime is limited to two years (24 months) or less. Microsoft recommends that you set an expiration value of less than 12 months.

5. Select **Add** to create your secret.
6. Record the secret to use in the Authentication step. The secret is never displayed again after you leave this page.

Steps to assign permissions to the application

1. Go to Microsoft Sentinel.

2. Select **Subscription** > **Access control (IAM)**.
3. Select **Add** > **Add role assignment**.
4. For the **Privileged administrator roles** field, select **Ransomware Resilience Sentinel Configurator**.

   This is the custom role that you created earlier.

5. Select **Next**.
6. In the **Assign access to** field, select **User, group, or service principal**.
7. Select **Select Members**. Then, select **Ransomware Resilience Sentinel Configurator**.
8. Select **Next**.
9. In the **What user can do** field, select **Allow user to assign all roles except privileged administrator roles Owner, UAA, RBAC (Recommended)**.
10. Select **Next**.
11. Select **Review and assign** to assign the permissions.

Steps to enter authentication credentials for the application

1. Go to Microsoft Sentinel.
2. Enter the credentials:
   a. Enter the tenant ID, the client application ID, and the client application secret.
   b. Click **Authenticate**.

      After the authentication is successful, an "Authenticated" message appears.

3. Enter the Log Analytics workspace details for the application.
   a. Select the subscription ID, the resource group, and the Log Analytics workspace.

Configure Splunk Cloud for threat detection

Before you enable Splunk Cloud in Ransomware Resilience, you'll need to do the following high level steps in Splunk Cloud:

- Enable an HTTP Event Collector in Splunk Cloud to receive event data via HTTP or HTTPS from the Console.
- Create an Event Collector token in Splunk Cloud.

Steps to enable an HTTP Event Collector in Splunk

1. Go to Splunk Cloud.
2. Select **Settings** > **Data Inputs**.
3. Select **HTTP Event Collector** > **Global Settings**.
4. On the All Tokens toggle, select **Enabled**.
5. To have the Event Collector listen and communicate over HTTPS rather than HTTP, select **Enable SSL**.
6. Enter a port in **HTTP Port Number** for the HTTP Event Collector.

Steps to create an Event Collector token in Splunk

1. Go to Splunk Cloud.
2. Select **Settings** > **Add Data**.
3. Select **Monitor** > **HTTP Event Collector**.
4. Enter a Name for the token and select **Next**.
5. Select a **Default Index** where events will be pushed, then select **Review**.
6. Confirm that all settings for the endpoint are correct, then select **Submit**.
7. Copy the token and paste it in another document to have it ready for the Authentication step.

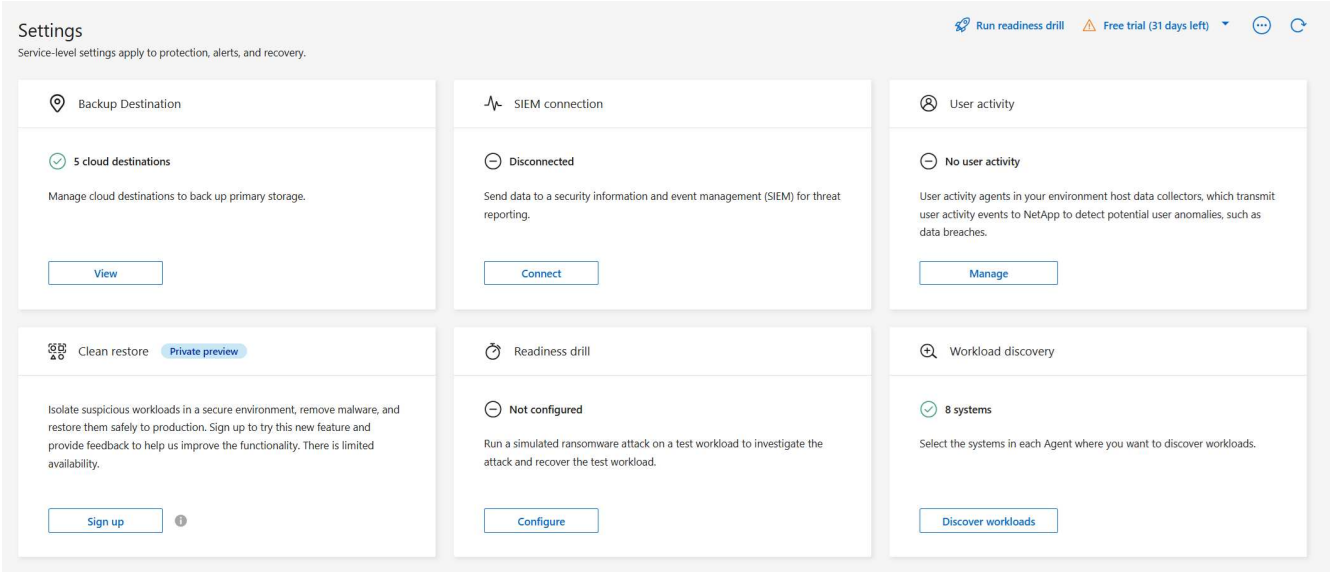
Connect SIEM in Ransomware Resilience

Enabling SIEM sends data from Ransomware Resilience to your SIEM server for threat analysis and reporting.

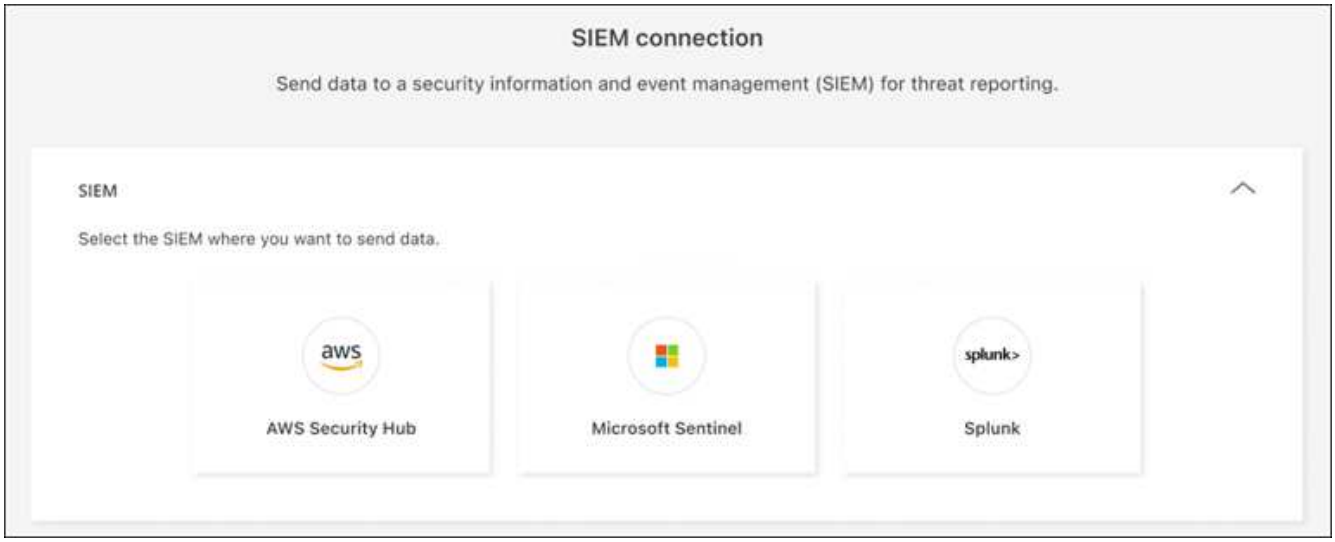
Steps

1. From the Console menu, select **Protection** > **Ransomware Resilience**.
2. From the Ransomware Resilience menu, select the vertical … option at the top right.
3. Select **Settings**.

   The Settings page appears.



4. In the Settings page, select **Connect** in the SIEM connection tile.



5. Choose one of the SIEM systems.
6. Enter the token and authentication details you configured in AWS Security Hub or Splunk Cloud.

   The information that you enter depends on the SIEM you selected.

7. Select **Enable**.

   The Settings page shows "Connected."

Configure suspicious user activity detection in NetApp Ransomware Resilience

Ransomware Resilience supports detection of suspicious user behavior in detection policies, enabling you to address ransomware incidents at the user-level.

Ransomware Resilience detects suspicious user activity by analyzing user activity events generated by FPolicy in ONTAP. To collect user activity data, you need to deploy one or more user activity agents. The user activity agent is a Linux server or VM with connectivity to devices on your tenant.

User activity agents and collectors

At least one user activity agent must be installed to activate suspicious user activity detection in Ransomware Resilience. When you activate the suspicious user activity feature from the Ransomware Resilience dashboard, you need to provide the user activity agent host information.

A user activity agent can host multiple data collectors. Data collectors send data to a SaaS location for analysis. There are two types of collectors:

- The **data collector** collects user activity data from ONTAP.
- The **user directory connector** connects to your directory to map user IDs to usernames.

Collectors are configured in the Ransomware Resilience settings.

Required Console role

To activate suspicious user activity detection, you need the **Organization admin role**. For subsequent suspicious user activity configurations, you need the **Ransomware Resilience user behavior admin role**. Learn about Ransomware Resilience roles for NetApp Console.

Ensure each role is applied at the organization level.

System requirements

To install a user activity agent, you need a host or VM that meets the following requirements.

Operating system requirements

Operating system	Supported versions
AlmaLinux	9.4 (64 bit) through 9.5 (64 bit), and 10 (64 bit), including SELinux
CentOS	CentOS Stream 9 (64 bit)
Debian	11 (64 bit), 12 (64 bit), including SELinux
OpenSUSE Leap	15.3 (64 bit) through 15.6 (64 bit)
Oracle Linux	8.10 (64 bit), and 9.1 (64 bit) through 9.6 (64 bit), including SELinux
Red Hat	8.10 (64 bit), 9.1 (64 bit) through 9.6 (64 bit), and 10 (64 bit), including SELinux
Rocky	Rocky 9.4 (64 bit) through 9.6 (64 bit), including SELinux
SUSE Enterprise Linux	15 SP4 (64 bit) through 15 SP6 (64 bit), including SELinux
Ubuntu	20.04 LTS (64 bit), 22.04 LTS (64 bit) and 24.04 LTS (64 bit)

The machine you use for the user activity agent should not be running other application-level software. A dedicated server is recommended.

The `unzip` command is required for installation. The `sudo su -` command is required for installation, running scripts, and uninstall.

Server requirements

The server must meet the following minimum requirements:

- **CPU**: 4 cores
- **RAM**: 16 GB RAM
- **Disk space**: 36 GB free disk space

Allocate extra disk space to allow for the creation of the filesystem. Ensure that there is at least 35 GB of free space in the filesystem.
If `/opt` is a mounted folder from a NAS storage, local users must have access to this folder. User activity agent creation can fail if local users don't have the necessary permissions.

It's recommended you install the user activity agent on a different system than your Ransomware Resilience environment. If you do install them on the same machine, you should allow for 50 to 55 GB of disk space. For Linux, allocate 25-30 GB of space to `/opt/netapp` and 25 GB to `var/log/netapp`.

It's recommended you synchronize the time on both the ONTAP system and the user activity agent machine using Network Time Protocol (NTP) or Simple Network Time Protocol (SNTP).

Cloud network access rules

Review the cloud network access rules for your relevant geography (Asia Pacific, Europe, or United States).

During the initial installation, replace the `<site_name>` with a wildcard (`*`) permission. After the agent is activated and fully operational, you can replace the permission with the site name. Contact your NetApp represenative for the site name.

APAC-based user-activity agent deployments

Protocol	Port	Source	Destination	Description
HTTPS (TCP)	443	User activity agent	• <site_name>.cs01-ap-1.cloudinsights.netapp.com • <site_name>.c01-ap-1.cloudinsights.netapp.com • <site_name>.c02-ap-1.cloudinsights.netapp.com • gentlogin.cs01-ap-1.cloudinsights.netapp.com	Access to Ransomware Resilience

Europe-based user-activity agent deployments

Protocol	Port	Source	Destination	Description
HTTPS (TCP)	443	User activity agent	• <site_name>.cs01-eu-1.cloudinsights.netapp.com • <site_name>.c01-eu-1.cloudinsights.netapp.com • <site_name>.c02-eu-1.cloudinsights.netapp.com • agentlogin.cs01-eu-1.cloudinsights.netapp.com	Access to Ransomware Resilience

US-based user-activity agent deployments

Protocol	Port	Source	Destination	Description
HTTPS (TCP)	443	User activity agent	• <site_name>.cs01.cloudinsights.netapp.com • <site_name>.c01.cloudinsights.netapp.com • <site_name>.c02.cloudinsights.netapp.com • agentlogin.cs01.cloudinsights.netapp.com	Access to Ransomware Resilience

In-network rules

Protocol	Port	Source	Destination	Description
TCP	389(LDAP) 636 (LDAPs / start-tls)	User activity agent	LDAP Server URL	Connect to LDAP
HTTPS (TCP)	443	User activity agent	Cluster or SVM management IP address (depending on SVM collector configuration)	API communication with ONTAP
TCP	35000 - 55000	SVM data LIF IP addresses	User activity agent	Communication from ONTAP to the user activity agent for Fpolicy events. These ports must be opened towards the user activity agent in order for ONTAP to send events to it, including any firewall on the User activity agent itself (if present). **NOTE:** You don't need to reserve **all** of these ports, but the ports you reserve for this must be within this range. It's recommended you start by reserving 100 ports and increase if necessary.

Protocol	Port	Source	Destination	Description
TCP	35000-55000	Cluster Management IP	User activity agent	Communication from ONTAP cluster management IP to the user activity agent for **EMS events**. These ports must be opened towards the user activity agent in order for ONTAP to send EMS events to it, including any firewall on the user activity agent itself. **NOTE:** You don't need to reserve **all** of these ports, but the ports you reserve for this must be within this range. It's recommended you start by reserving 100 ports and increase if necessary.
SSH	22	User activity agent	Cluster management	Needed for CIFS/SMB user blocking.

Enable suspicious user activity detection

Ensure you've met the system requirements for the user activity agent. Ensure that your configuration adheres to the supported cloud providers and regions.

Cloud provider support

Suspicious user activity data can be stored in AWS and Azure in the following regions:

Cloud provider	Region
AWS	• Asia Pacific (Sydney) (ap-southeast-2) • Europe (Frankfurt) (eu-central-1) • US East (N. Virginia) (us-east-1)
Azure	East US

Add a user activity agent

User activity agents are executable environments for data collectors; data collectors share user activity events with Ransomware Resilience. You must create at least one user activity agent to enable suspicious user

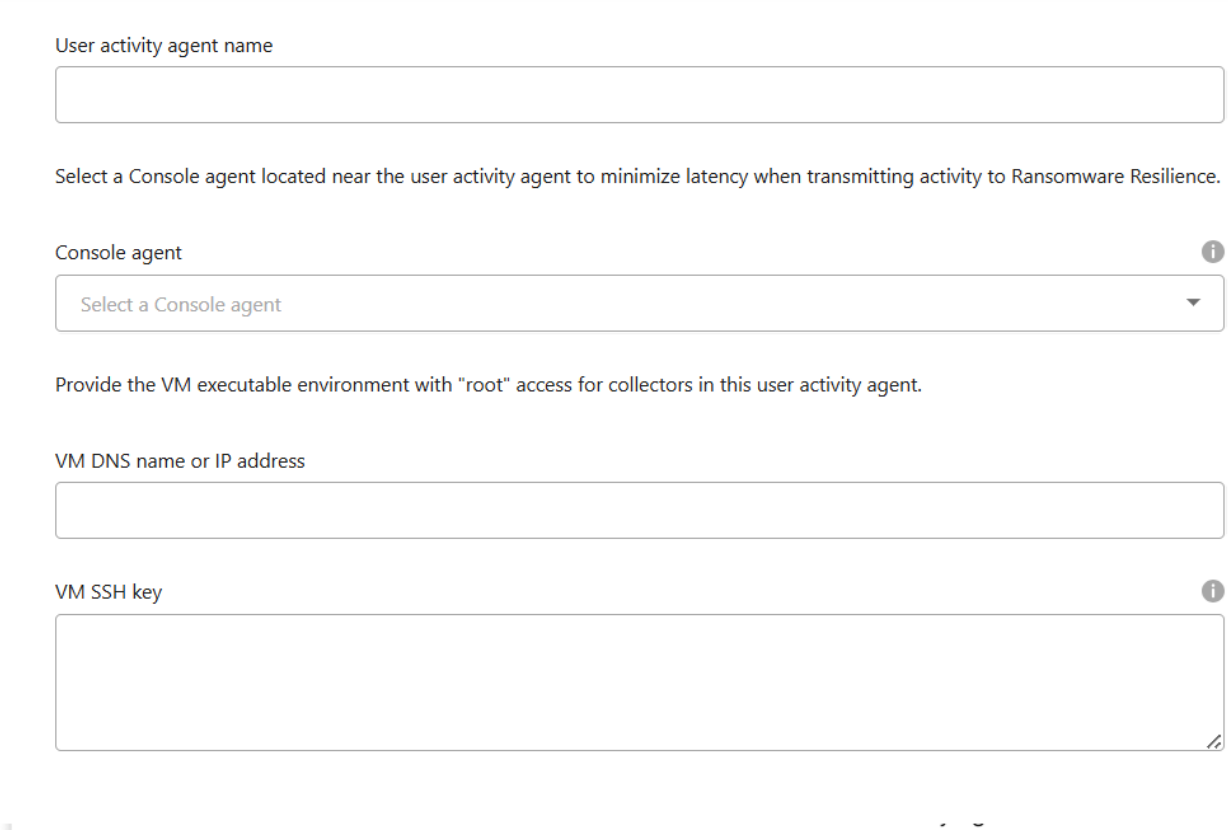
activity detection.

Steps

1. If this is your first time creating a user activity agent, go to the **Dashboard**. In the **User activity** tile, select **Activate**.

   If you're adding an additional user activity agent, go to **Settings**, locate the **User activity** tile, then select **Manage**. On the User activity screen, select the **User activity agents** tab then **Add**.

2. Select a **Cloud provider** then a **Region**. Select **Next**.
3. Provide the user activity agent details:
   - **User activity agent name**
   - **Console agent** - The Console agent should be in the same network as the user activity agent and have SSH connectivity to the user activity agent's IP address.
   - **VM DNS name or IP address**
   - **VM SSH Key**



4. Select **Next**.
5. Review your settings. Select **Activate** to complete adding the user activity agent.
6. Confirm the user activity agent was successfully created. In the User activity tile, a successful deployment displays as Running.

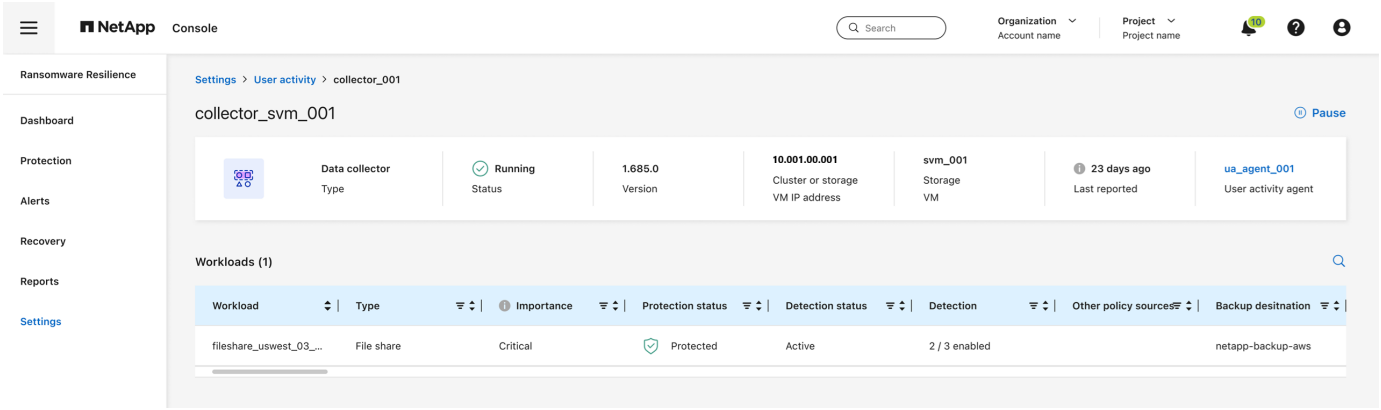
Result

After the user activity agent is successfully created, return to the **Settings** menu then select **Manage** in the User activity tile. Select the **User activity agent** tab then select the user activity agent to view details about it, including data collectors and user directory connectors.

Add a data collector

Data collectors are created automatically when you enable a ransomware protection strategy with suspicious user activity detection. For more information, see add a detection policy.

You can view the details of the data collector. From Settings, select **Manage** in the User activity tile. Select the **Data collector** tab then select the data collector to view its details or pause it.



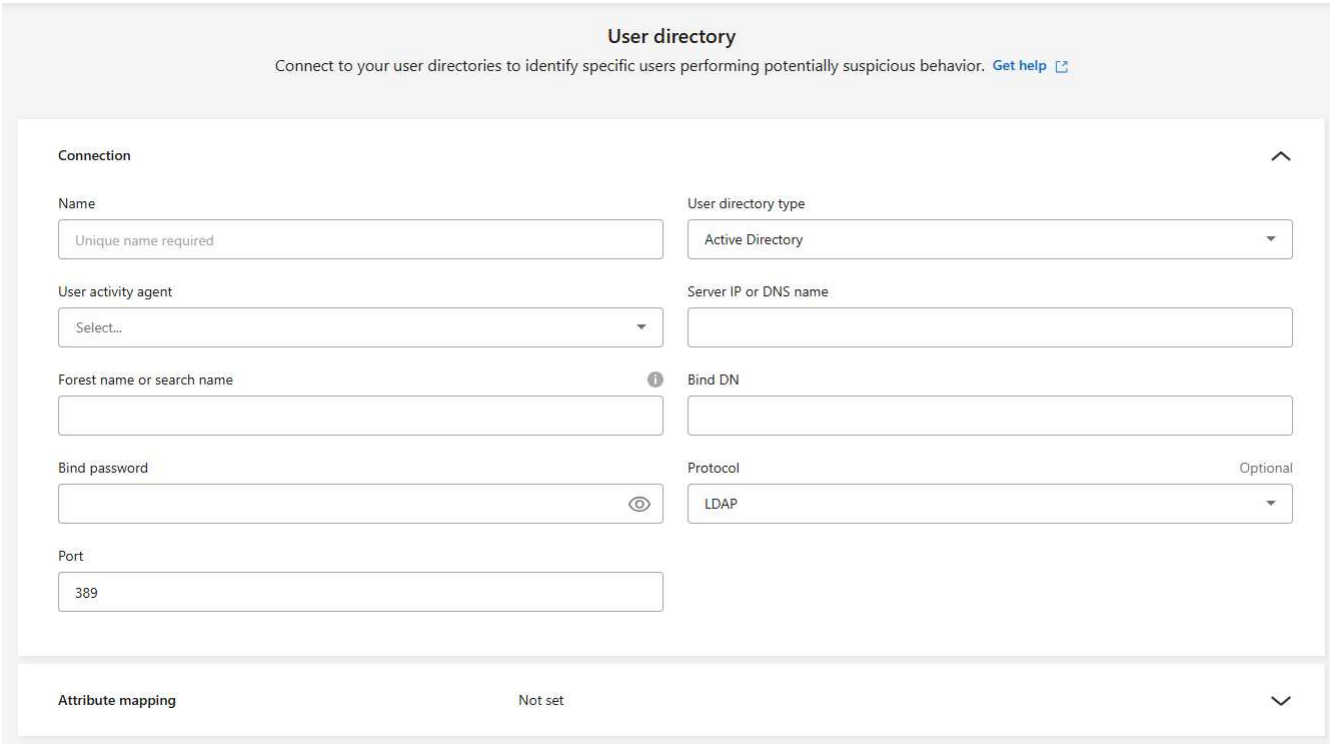
Add a user directory connector

To map user IDs to usernames, you must create a user directory connector.

Steps

1. In Ransomware Resilience, go to **Settings**.
2. In the User activity tile, select **Manage**.
3. Select the **User directory connectors** tab then **Add**.
4. Configure the connection. Enter the required information for each field.

Field	Description
Name	Enter a unique name for the user directory connector
User directory type	The directory type
Server IP address or domain name	The IP address or Fully-Qualified Domain Name (FQDN) of the server hosting the connection
Forest name or search name	You can specify the forest level of the directory structure as the direct domain name (for example `unit.company.com`) or a set of relative distinguished names (for example: `DC=unit,DC=company,DC=com`). You can also enter an `OU` to filter by an organizational unit or a `CN` to limit to a specific user (for example: `CN=user,OU=engineering,DC=unit,DC=company,DC=com`).
BIND DN	The BIND DN is a user account permitted to search the directory, such as user@domain.com. The user requires the Domain Read Only permission.
BIND password	The password for the user provided in BIND DN
Protocol	The protocol field is optional. You can use LDAP, LDAPS, or LDAP over StartTLS.
Port	Enter your chosen port number



Provide the attribute mapping details:

- **Display name**
- **SID** (if you're using LDAP)
- **User name**
- **Unix ID** (if you're using NFS)
- If you select **Include optional attributes**, you can also add an email address, telephone number, role, state, country, department, photo, manager DN, or groups.
  Select **Advanced** to add an optional search query.

5. Select **Add**.
6. Return to the user directory connectors tab to check the status of your user directory connector. If created successfully, the status of the user directory connector displays as **Running**.

Delete a user directory connector

1. In Ransomware Resilience, go to **Settings**.
2. Locate the User activity tile, select **Manage**.
3. Select the **User directory connector** tab.
4. Identify the user directory connector you want to delete. In the action menu at the end of the line, select the three dots … then **Delete**.
5. In the pop-up dialog, select **Delete** to confirm your actions.

Respond to suspicious user activity alerts

After you configure suspicious user activity detection, you can monitor events in the alerts page. For more information, see Detect malicious activity and anomalous user behavior.

[1] Although it’s possible that an attack might go undetected, our research indicates NetApp technology has resulted in a high degree of detection for certain file encryption-based ransomware attacks.