NAKIVO Backup & Replication v10.9

User Guide for Microsoft 365

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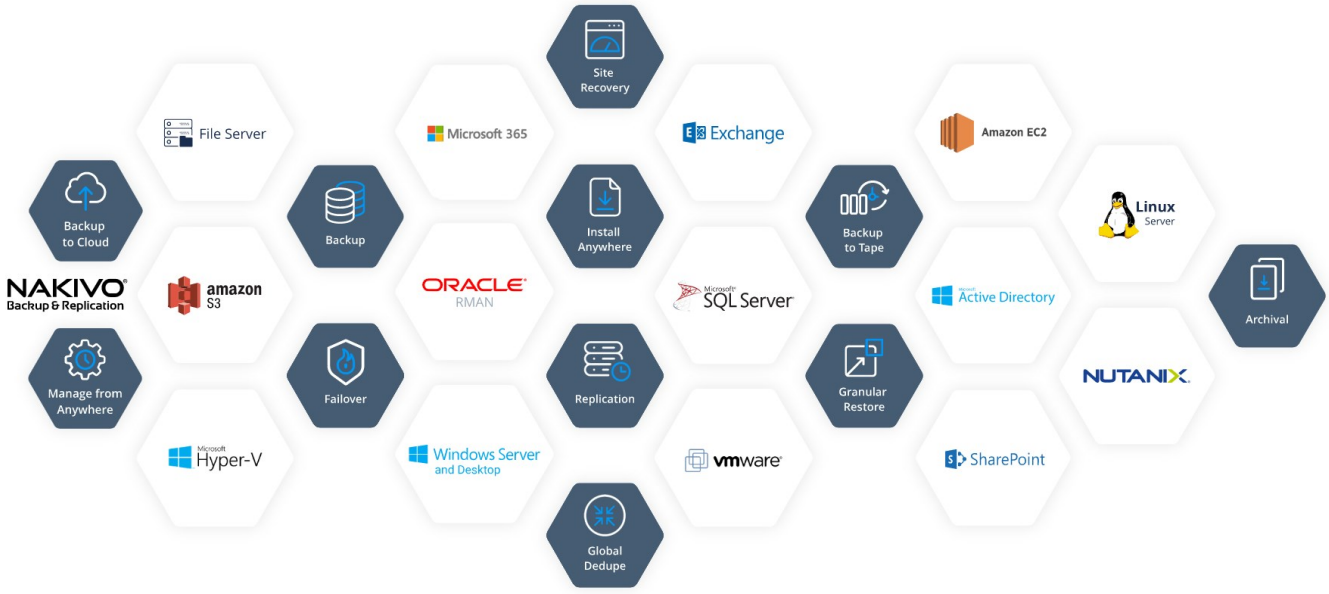
NAKIVO Backup & Replication Overview

NAKIVO Backup & Replication offers backup, replication, failover, backup to cloud, backup to tape, backup copy, backup data reduction, instant verification, granular restore and disaster recovery orchestration for virtual, physical, cloud and SaaS environments - all in one convenient web interface.



The product provides image-based, application-aware, incremental backup and replication. You can easily schedule jobs using the calendar in the product's web interface and save up to 1,000 recovery points for each backup, rotating them on a GFS basis. You can also protect your VMs and instances more efficiently by taking advantage of Changed Block Tracking (for VMware), Resilient Change Tracking (for Hyper-V), or Changed Regions Tracking (for Nutanix), LAN-Free Data Transfer, Network Acceleration, and other product features.

The solution includes an advanced disaster recovery (DR) functionality. It allows you to automate and orchestrate DR activities across multiple sites. Build advanced site recovery workflows to failover an entire site in just a few clicks, perform non-disruptive recoverability testing, and make sure you have a workable DR plan in place to help minimize downtime and prevent loss of revenue or data.

NAKIVO Backup & Replication allows you to simplify data protection management through the automation of core tasks such as backup, replication, and backup copy. Instead of tracking every change in your environment and manually adding VMs or physical machines to jobs, you can set up policies based on a VM/physical machine name, tag, size, location, power state, configuration, or other parameters. NAKIVO Backup & Replication can regularly scan your infrastructure and automatically protect VMs, physical machines, and Amazon EC2 instances that match policy rules.

With NAKIVO Backup & Replication, you can also ensure the safety and integrity of your Microsoft Office 365 data. The product allows you to reliably protect Microsoft Exchange mailboxes, OneDrives for Business, and SharePoint Online sites.

Two-Factor Authentication

NAKIVO Backup & Replication allows you to add an additional layer of security with two-factor authentication (2FA). By enabling 2FA, you add another step to the user login process to prevent malicious access to the solution and the organization's backup data. User authentication requires entering a code generated in one of the following ways:

- A code generated by the Google Authenticator mobile app
- A code sent to the specified email address
- One of the single-use backup codes

You can find more information in the following articles:

- "Configuring Two-Factor Authentication" on page 280
- "Logging in to NAKIVO Backup & Replication" on page 185

Microsoft 365 Backup

With NAKIVO Backup & Replication, you can back up your organization's entire Microsoft 365 account or individual users who have access to the following services: Exchange Online, OneDrive for Business, and SharePoint Online, and Teams. The backups are stored in a SaaS Backup Repository for further recovery of Exchange Online, OneDrive for Business, and SharePoint Online, and Teams data including user, shared, and group mailboxes, OneNote items, contacts, contact lists, calendar events, emails, drives, communication, personal sites, subsites, document libraries, lists, list items, channels, posts, tabs, teams, and individual files and folders.

A common misconception among Microsoft 365 users is that data stored in the cloud is safe and that it is not necessary to back it up. However, under Microsoft's "shared responsibility model", Microsoft is responsible for reliable uptime and the physical and virtual infrastructure. Beyond simple geo-redundancy – which is not the same as a backup – ensuring data safety is the responsibility of users. To address this gap, NAKIVO Backup & Replication offers Backup for Microsoft 365 to ensure that data is accessible and recoverable at all times. By backing up Microsoft 365 application data, you ensure that if data loss occurs, the necessary items can be easily recovered to the original or a custom location.

To start using this feature, take the following preliminary steps:

- Add your Microsoft 365 accounts to the inventory
- Create a SaaS Backup Repository
- Create a Microsoft 365 job

Microsoft 365 Object Recovery

NAKIVO Backup & Replication provides you with the ability to instantly browse, search, and recover Microsoft 365 objects directly from compressed backups. The Microsoft 365 objects can be restored to their original location, or to a certain Exchange Online mailbox, OneDrive for Business instance or SharePoint Online site. The feature streamlines, automates, and speeds up the process of restoring your data, and is available out-of-the-box in NAKIVO Backup & Replication. For more details, refer to "Object Recovery for Microsoft 365" on page 448.

Advanced Bandwidth Throttling

NAKIVO Backup & Replication was designed to transfer data at the maximum available speeds for the purposes of completing VM backup, replication, and recovery jobs as quickly as possible. However, if you run data protection jobs during business hours, your LAN or WAN networks risk being overloaded. This can affect the performance of applications and degrade user experience (think of email messages taking too long to be sent, excessive load times for websites, etc.). NAKIVO Backup & Replication addresses this issue with the flexible Advanced Bandwidth Throttling feature. With Advanced Bandwidth Throttling, you can set limits for your data protection jobs and make sure they don't take more bandwidth than you can afford to allocate.

Advanced Bandwidth Throttling allows you to set global rules that limit the data transfer speeds of your backup processes. Such rules can apply to different jobs and on different schedules. For instance, you can create a global rule preventing your backup jobs from consuming more than 50 MByte/s during business hours, but leave the bandwidth unrestricted for Sunday backups. You can also create bandwidth throttling rules on a per-job basis, if you want to have more granular control over the whole process. Individual limits override global rules, sparing you the need to adjust the global rule for every job.

The Advanced Bandwidth Throttling feature of NAKIVO Backup & Replication is an effective means of optimizing backup operations and controlling your network traffic. With global and individual limits on data transfer speeds, the feature can help you ensure the performance of your business applications is never affected by backup workloads – even if you have little bandwidth to spare. With bandwidth rules, usage of LAN/WAN bandwidth by NAKIVO Backup & Replication jobs may be restricted to a specific amount. For more information, refer to the following sections:

- About Bandwidth Rules
- Distributing Bandwidth Between Tasks

About Bandwidth Rules

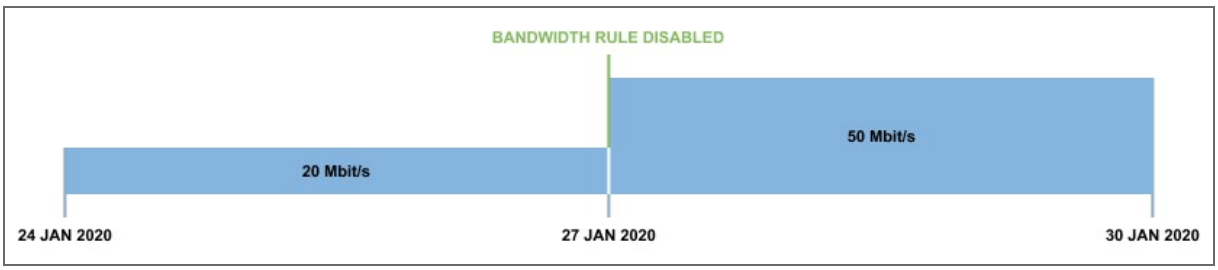
A bandwidth rule specifies the bandwidth amount that can be used by one job, by multiple jobs, or by all applicable jobs.

A bandwidth rule can be:

- **Global Rule** – a bandwidth rule applied to all applicable Jobs.
- **Per Job Rule** – a bandwidth rule only applied to specific Jobs.

Per Job rules have higher priority than **Global Rules**. A per job rule will be applied to the job when both the per job rule and a global rule are active for the same job. In case multiple per job rules are active for the same job, the bandwidth rule with the lowest bandwidth amount will be applied. In case there are multiple global rules – and no per job bandwidth rules,– the global rule with the lowest bandwidth amount will be applied. When a NAKIVO Backup & Replication job is running and a bandwidth rule is applied to this job, the job will get bandwidth amount that is allowed by the bandwidth rule (for example 10 Mbit/s).

When a NAKIVO Backup & Replication job is running with a bandwidth rule applied and the bandwidth rule becomes disabled for this job – and there are no other bandwidth rules applied to the job,– the job will get unlimited bandwidth.



Bandwidth rules may be always active, active on schedule, or disabled. Refer to "Bandwidth Throttling" on page 239 for details.

When a job containing multiple VMs starts running with a bandwidth rule active, the rule divides bandwidth between tasks. Incremental backup tasks receive significantly less bandwidth than full backup tasks; this ensures that no tasks receive too little bandwidth to be processed in a reasonable time. When the Transporter is ready and there is enough unallocated bandwidth, the tasks start to be processed. Any change to the bandwidth amount will only be applied to the tasks not yet started for processing. Once started for processing, the tasks do not change the consumed bandwidth amount. It means there will be no dynamic change in the bandwidth amount for the tasks already being processed.

Bandwidth rules are applicable to the following types of NAKIVO Backup & Replication jobs:

- Backup Job (except for Microsoft 365)
- Backup Copy Job
- Replication Job (except for Amazon EC2)

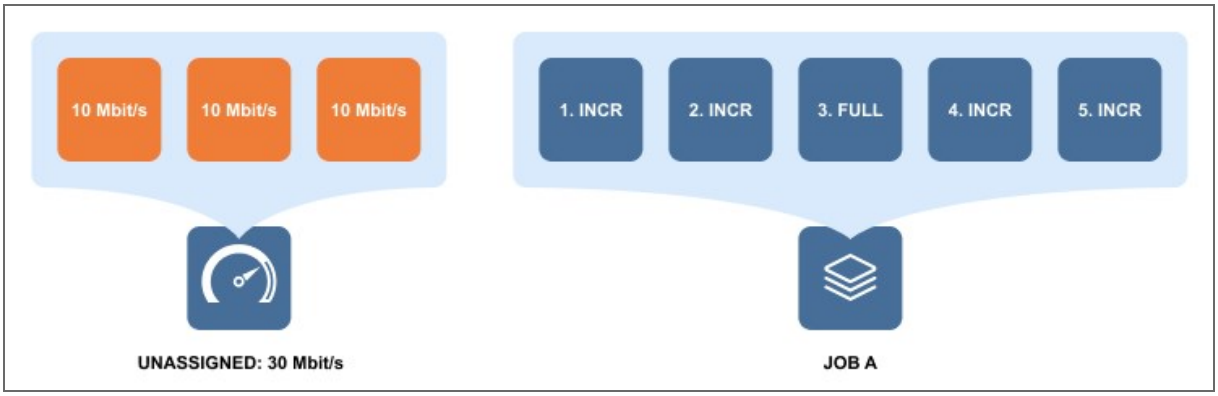
- Recovery Job
- Replica Failback (except for Amazon EC2)

Distributing Bandwidth Between Tasks

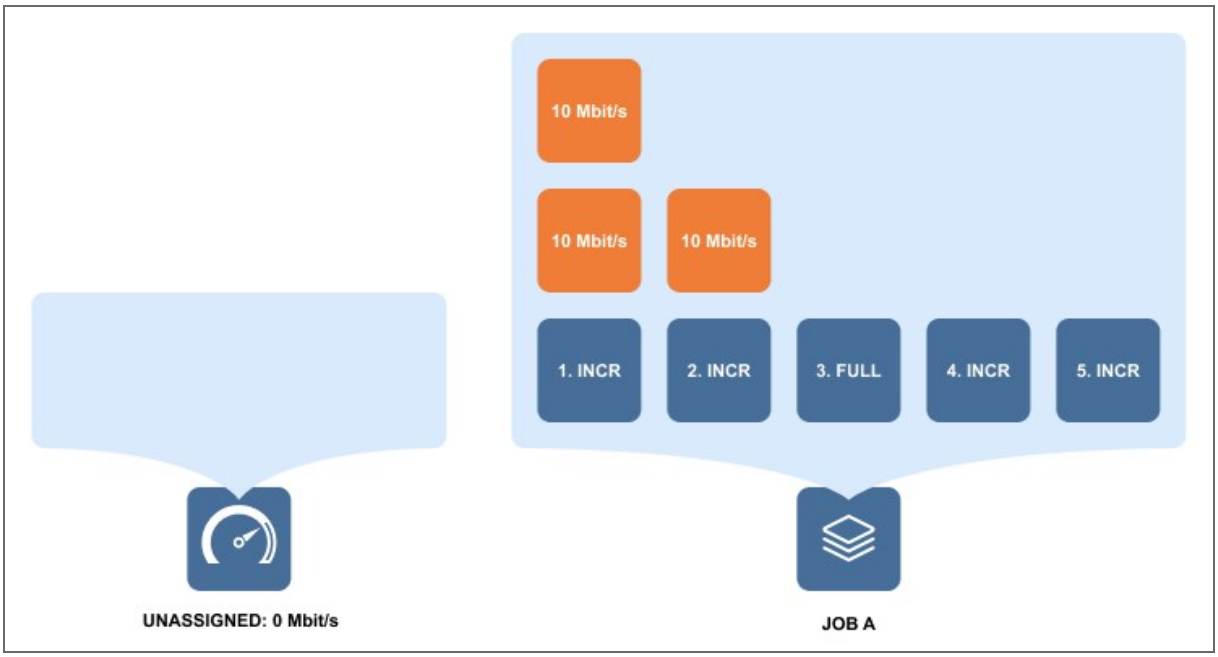
To illustrate distribution of bandwidth between tasks, one can take a backup job – Job A,– of 5 VMs; the 3rd VM backup is a full backup and the rest are incremental backups.

Job A starts running with the 30 Mbit/s bandwidth rule activated as follows:

1. The bandwidth amount is split into 3 chunks 10 Mbit/s each.



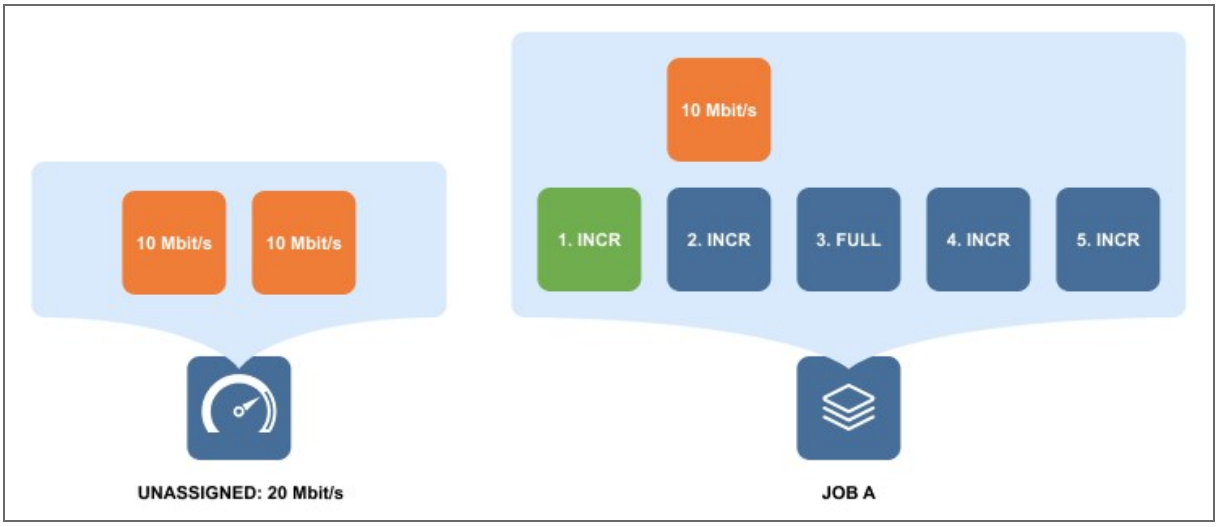
2. VM 1 and VM 2 backups receive 10 Mbit/s each. One bandwidth chunk remains unassigned since the full backup usually requires all the bandwidth to start.
3. The remaining bandwidth is distributed from the start of the queue, so VM 1 backup receives additional 10 Mbit/s.
4. VM 1 backup and VM 2 backup start running.



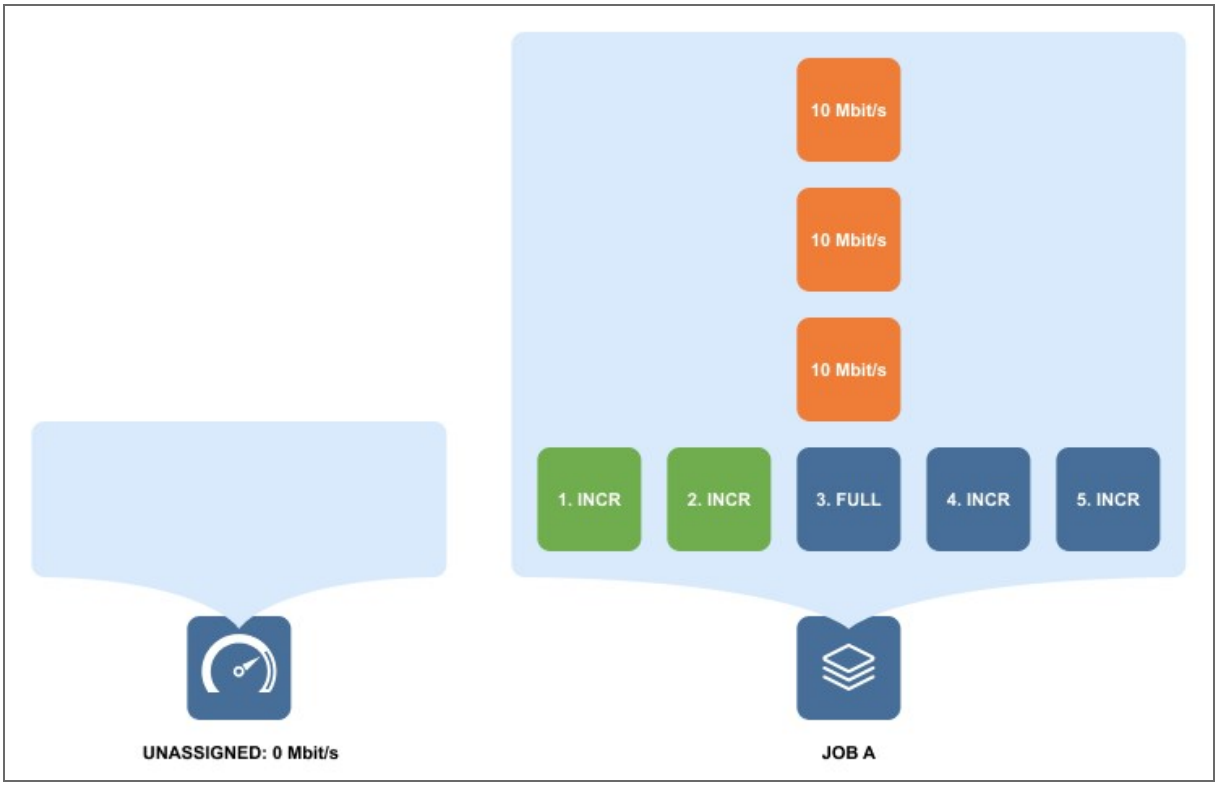
Note

The Transporter can process a limited number of concurrent tasks.

5. When VM 1 backup finishes execution, it frees two bandwidth chunks 10 Mbit/s each. However, VM 3 full backup still cannot start because it requires all the available bandwidth to start running. Hence, these two bandwidth chunks are left idle.

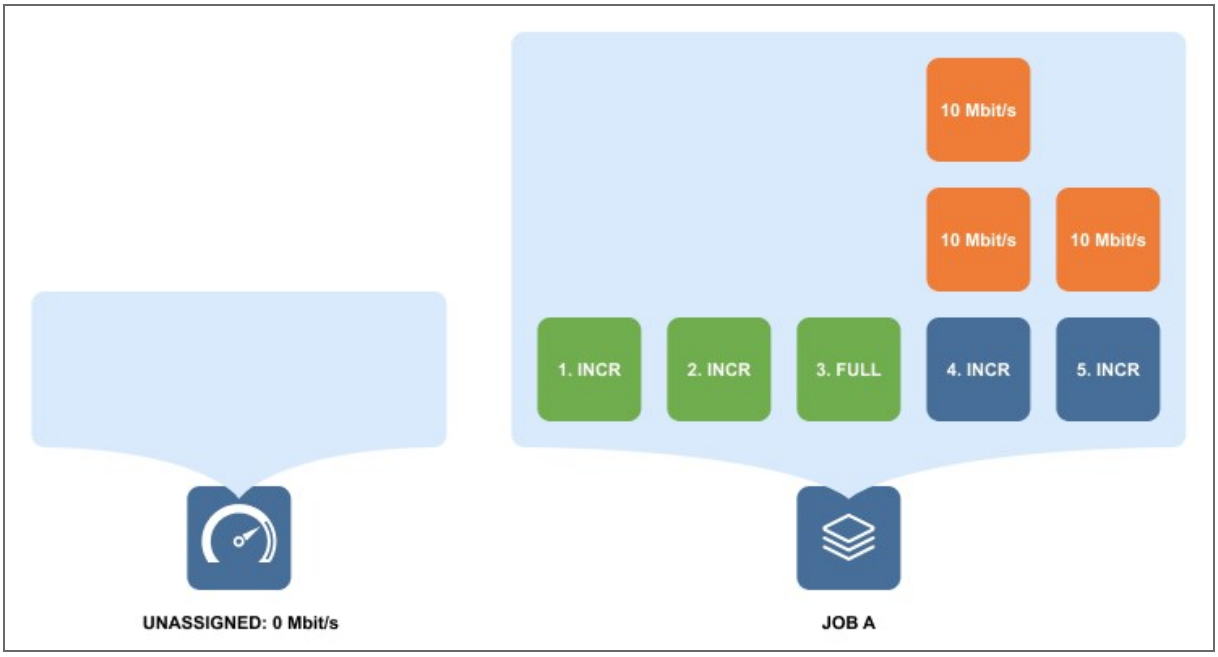


6. When VM 2 backup finishes running, it frees another bandwidth chunk, and full backup of VM 3 starts running with all the bandwidth assigned.



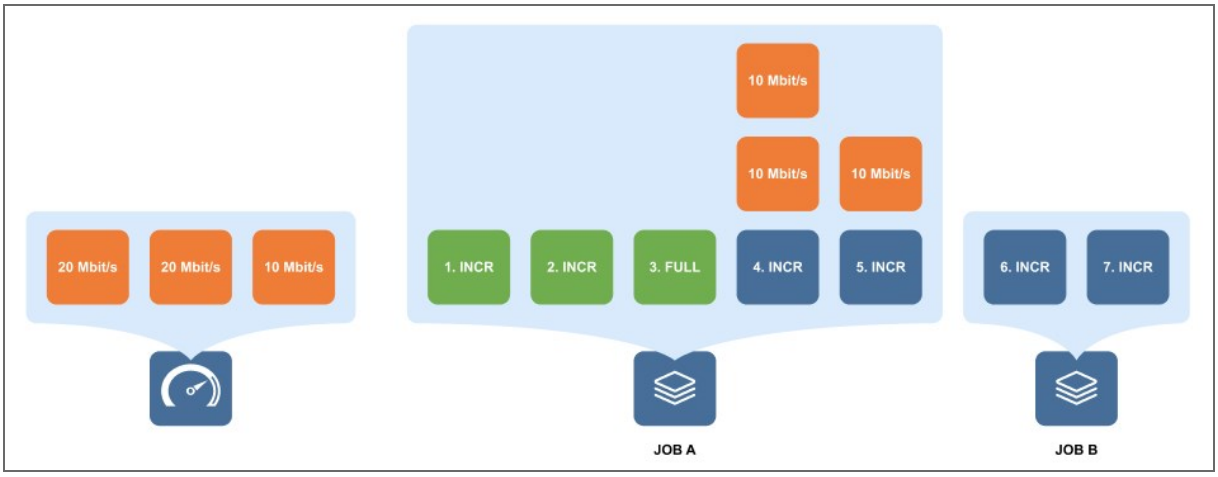
7. When full backup of VM 3 is finished, three bandwidth chunks are now available for the two remaining VM backups.

8. VM 4 backup receives the 20 Mbit/s bandwidth in total and VM 5 backup receives a 10 Mbit/s bandwidth chunk.

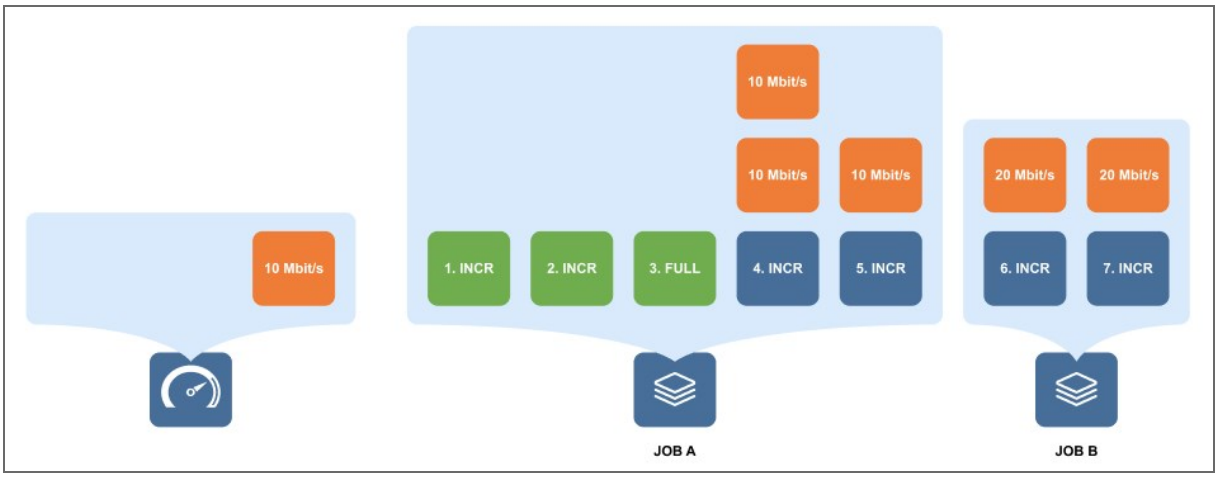


When the rule changes the bandwidth to 80 Mbit/s and is also activated for another Job B consisting of two VM incremental backups, the Transporter starts distributing bandwidth as follows:

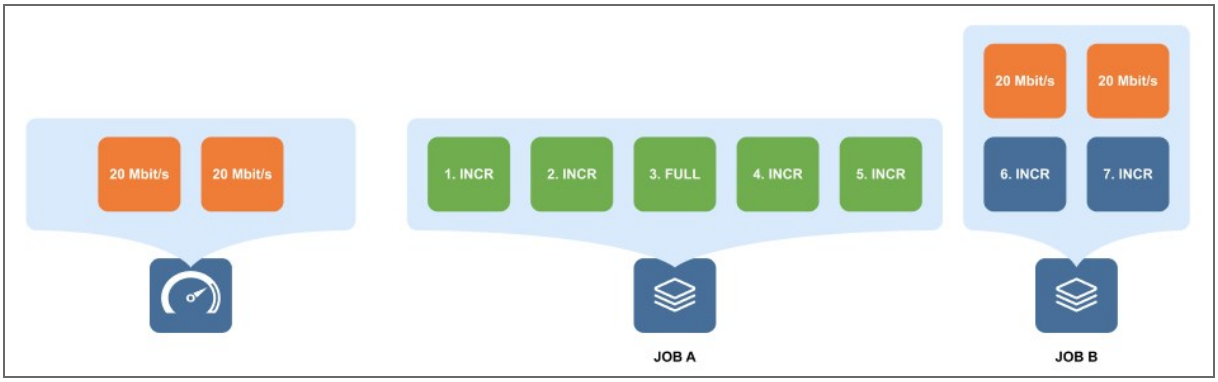
1. The 80 Mbit/s amount is split into 4 chunks of 20 Mbit/s.



2. VM 6 backup and VM 7 backup of Job B receive a 20 Mbit/s bandwidth chunk each and start running, with 10 Mbit/s remaining unassigned.

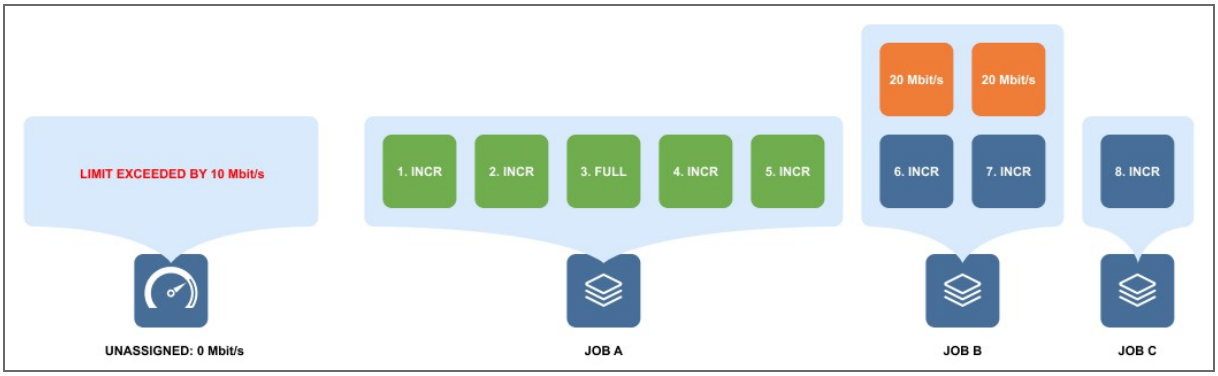


3. When VM 4 backup and VM 5 backup of Job A are finished, two 20 Mbit/s bandwidth chunks are freed. However there are no queued tasks to assign them to, so the bandwidth is left idle.



When the bandwidth rule changes the bandwidth amount back to 30 Mbit/s and is also activated for another Job C consisting of one VM incremental backup, the Transporter starts distributing bandwidth as follows:

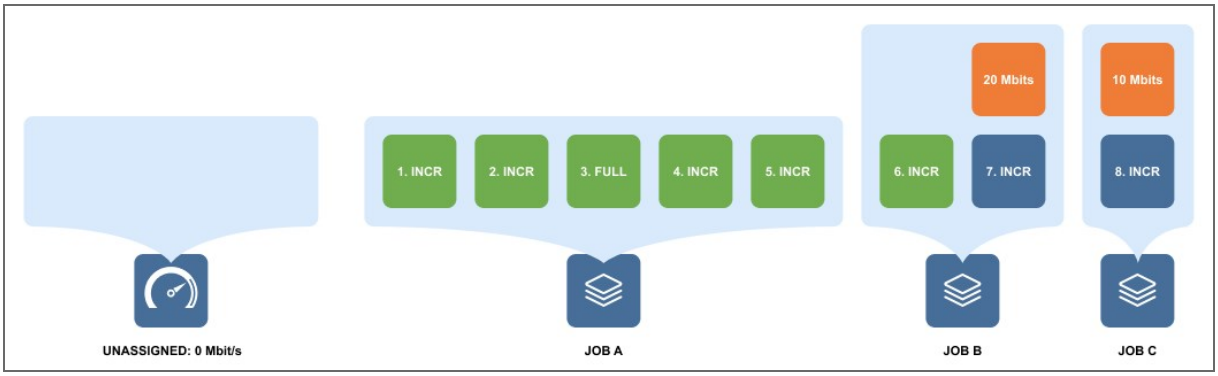
1. The 30 Mbit/s amount is split into three chunks of 10 Mbit/s.
2. The currently running tasks occupy 40 Mbit/s of bandwidth, which is three 10 Mbit/s bandwidth chunks and one 10 Mbit/s bandwidth chunk over the limit. Therefore, there is no free bandwidth for VM 8 backup of Job C to use.



Note

Jobs and tasks may wait for a long time until bandwidth is available for them to start.

3. When VM 6 backup is finished, freeing up 20 Mbit/s of bandwidth, of which 10 Mbit/s was exceeding the 30 Mbit/s limit, VM 8 backup of Job C starts executing using another 10 Mbit/s bandwidth chunk.



External Product Database Support

With NAKIVO Backup & Replication, you can use an external database for the Director instead of the built-in database. This feature can help you avoid corruption of the built-in database, which can sometimes occur in large environments. You can migrate the existing database to a supported external database at any time. The feature is available for both the single-tenant and the multi-tenant modes of the product. For more information, refer to the following articles:

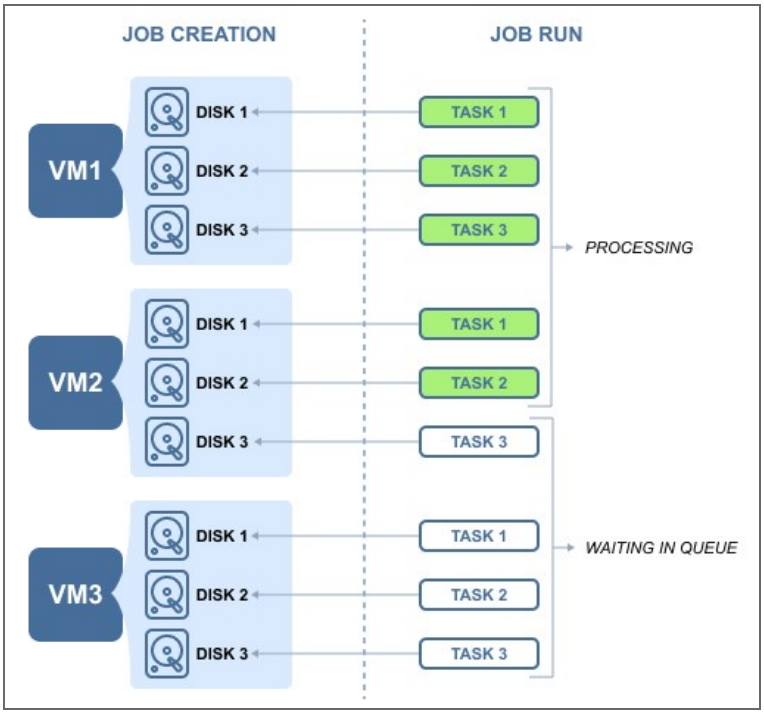
- Database Options
- Troubleshooting External Database Connection Issues

Jobs and Concurrent Tasks

Job is a data protection activity that is performed by NAKIVO Backup & Replication in accordance with a distinct configuration. These are the main types of NAKIVO Backup & Replication jobs:

- Backup jobs
- Replication jobs
- Recovery Jobs

In NAKIVO Backup & Replication, a job can have one or more job objects to process. Depending on your preferences, job objects may be reordered for processing within a job. See the example below.



Each job object may consist of one or more machine disks, Oracle databases, Exchange Online mailboxes, OneDrive for Business instances or SharePoint Online sites that have to be processed within a job run. Data processing that is related to a specific VM disk or service constitutes a single task, in the scope of the corresponding job. Such tasks are processed by a Transporter. For the sake of managing the load over the infrastructure, any Transporter is configured to process a limited number of concurrent tasks. When a task is processed, the Transporter starts processing another task if available. A task can be one disk, file or recovery session, Oracle database, Exchange Online mailbox, OneDrive instance, or a SharePoint Online site. By default, NAKIVO Backup & Replication is set to process 6 concurrent tasks per one Transporter. Refer to “Editing Nodes” on page 348 to learn how to change the Transporter maximum load.

Pre and Post Job Scripts

NAKIVO Backup & Replication provides you with the ability to run a script before a job begins (a pre-job script) and after the job has been completed (a post-job script).

By running your pre- and post- job scripts, you can do just about anything: start custom pre-freeze and post-thaw scripts on Linux systems to wake servers, establish connections, mount volumes, start and stop services, send commands to 3rd-party reporting, monitoring and automation tools, and etc.

Recovery Point Retention

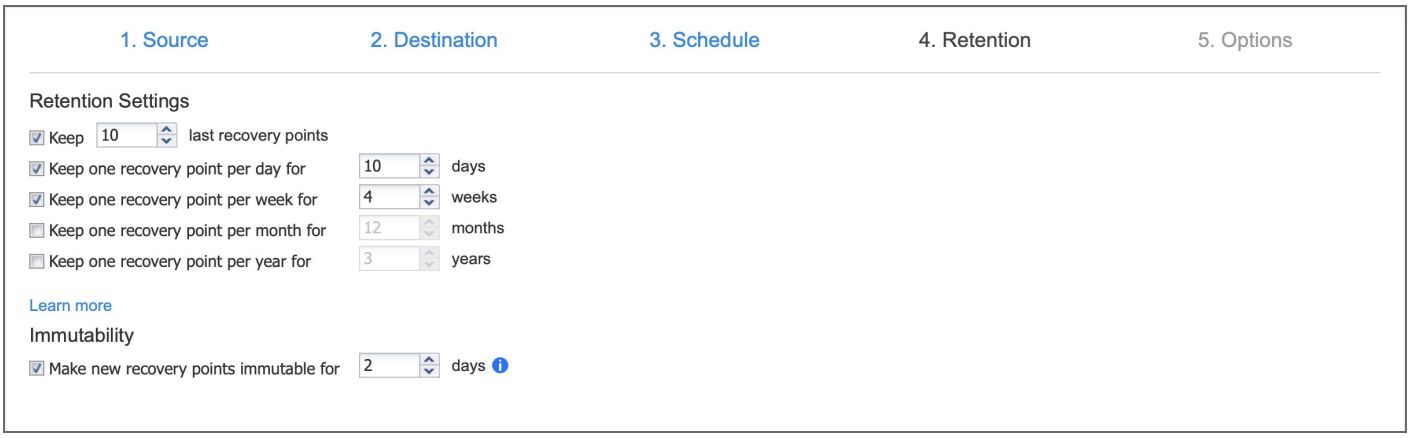
After each job run, NAKIVO Backup & Replication creates a recovery point for each VM, object, instance, machine, or account in a Backup Repository. A recovery point represents the backup of the respective source as of a particular moment in time and allows you to recover individual files, application objects, or the entire VM/object/instance/machine/account from the Backup Repository.

Legacy Retention Approach

With the legacy retention method, NAKIVO Backup & Replication offers Grand-Father-Son (GFS) retention. This method allows you to save storage space while retaining the recovery points for any period that you need with the following options:

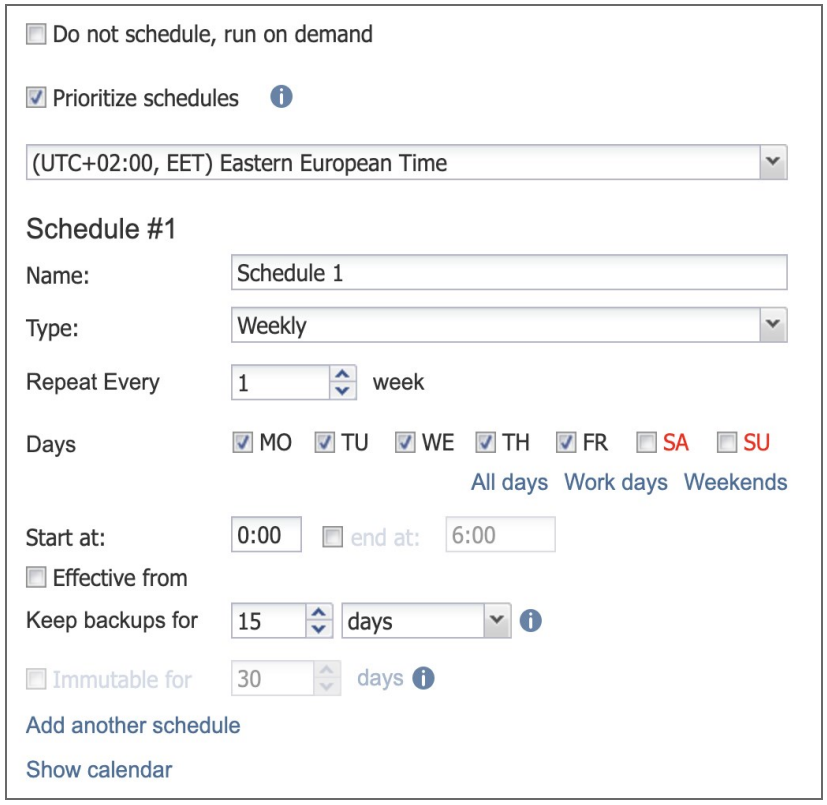
- Retain a specified number of last recovery points: after the specified number of recovery points in the backup repository is exceeded, the oldest recovery point is deleted.
- Retain one recovery point for a specified period of time: one recovery point is stored for the specified period of time, after which this recovery point is deleted.
- Make new recovery points immutable: this option sets an immutability flag on new recovery points,

preventing their deletion or modification for a specified period of time.



Schedule Retention Approach

With the schedule retention method, NAKIVO Backup & Replication allows you to set retention settings directly in the scheduling step of the job creation/editing process. This method allows you to set multiple schedules at chosen intervals for one job. These schedules can each be configured with their own retention settings with the "**Keep backups for**" option. This method is available for all backup and backup copy jobs with the exception of Oracle database backups.



With schedule retention settings, you can set up a clear recovery point retention policy for each job schedule and time interval. For example, if you set one job schedule to "**Keep backups for: 3 days**" and the job runs every weekday at noon, then a recovery point created with this schedule on a Monday will expire at noon on that Thursday. To ensure timely removal, NAKIVO Backup & Replication performs hourly status checks of all recovery points and deletes those that have expired.

Note

Recovery points created with or migrated to the scheduler retention scheme are given expiration dates.

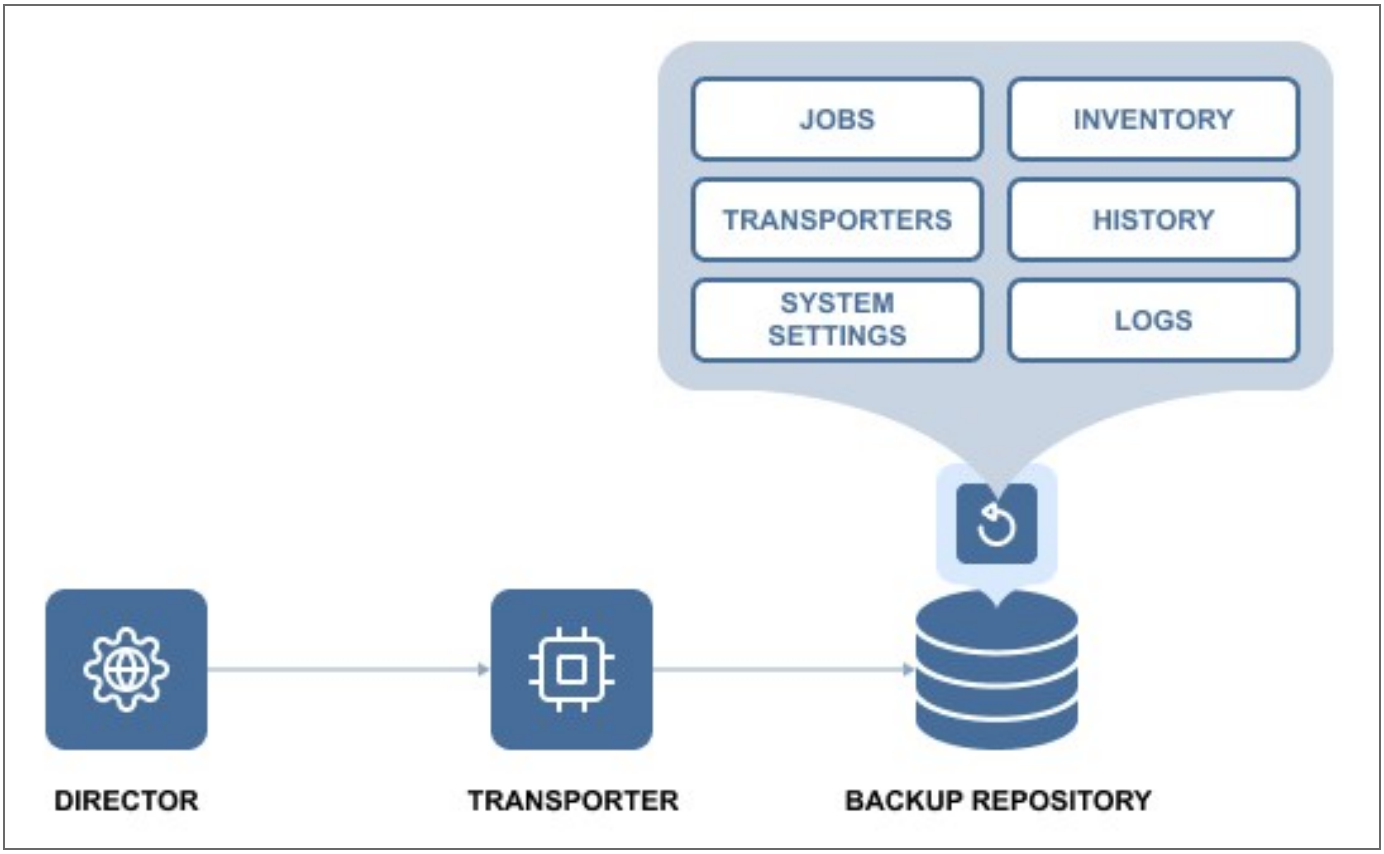
- To view the expiration dates and other details of recovery points created with this approach, refer to "Viewing Backup Repository Details" on page 369.
- To learn more about how expiration dates are assigned to recovery points, refer to this article in the Knowledge Base.

Self-Backup Feature

The Self-Backup feature provides automated protection of everything you have configured in NAKIVO Backup & Replication.

A truly complete data protection solution needs to back up not only your VMs, but also itself. There are good reasons for that. For example, the VM running the product may become corrupted, struck by a virus attack, or accidentally deleted. Regardless of the cause, you will need to restore the disrupted product as quickly as possible. Fortunately, a new instance of NAKIVO Backup & Replication can be installed in less than one minute. However, you will still need to restore the product configuration (such as jobs). Also, you do not want to lose the backup history. To save you time, NAKIVO Backup & Replication automatically backs up the entire configuration, including all jobs, inventory, information about connected Transporters, Backup Repositories and other.

The Self-Backup feature is enabled by default, and NAKIVO Backup & Replication sends daily self-backups to the first five backup repositories available in the product. Each self-backup is kept for five days, by default. Should you like to, you can fine-tune the backup targets, schedule, and retention policy.



If you accidentally make some undesired changes in the product, you can easily roll back to a previous system state from the backup. Migrating the system configuration to a new product instance is simple: just install a new copy of NAKIVO Backup & Replication, import a Backup Repository that contains a self-backup, and select a recovery point. The previous product configuration is restored along with all settings.
The Self-Backup feature saves you time and brings you peace of mind, ensuring reliable protection of everything you configure in NAKIVO Backup & Replication.
For information on the Self-Backup configuration, refer to "Self-Backup" on page 260.

Amazon EC2 Concepts

- Instance
- EBS Volume
- Region
- Availability Zone
- VPC
- Subnet
- Security Group
- Key Pair
- Elastic Network Adapter

Instance

An *Amazon EC2 Instance* is a virtual server in Amazon's Elastic Compute Cloud (EC2). Amazon EC2 provides different Instance types so you can choose the CPU, memory, storage, and networking capacity you need.

EBS Volume

An *Amazon EBS Volume* is a virtual disk that can be attached to any Amazon EC2 Instance that is in the same Availability Zone. Amazon EBS volumes persist independently from the life of the instance, i.e. deleting an Amazon EC2 Instance does not delete EBS Volumes that were connected to it.

Region

An *Amazon EC2 Region* is a geographic area where an Amazon EC2 Instance is hosted. Amazon EC2 provides multiple Regions so you can create and run your Amazon EC2 Instances in locations that meet your requirements. Each Region is completely independent and isolated from others.

Availability Zone

An *Amazon EC2 Availability Zone* is a location within an Amazon EC2 Region. Each Availability Zone is isolated from failures in other Availability Zones, yet all Availability Zones within the same region are connected with low-latency network connectivity to others in the same Region.

VPC

A *virtual private cloud* (VPC) is a virtual network in Amazon EC2. A VPC is dedicated to your AWS Account and is logically isolated from other virtual networks in the AWS cloud. Similar to regular networks, you can configure your VPCs: select IP address ranges, create subnets, configure route tables, network gateways, and security settings. After you have created and configured a VPC, you can connect your Amazon EC2 Instances to the VPC.

Subnet

A *subnet* is a range of IP addresses in a VPC. You can connect Amazon EC2 Instances to a subnet that you select: public subnets provide access to the Internet, while private subnets don't.

Security Group

A *security group* is a virtual firewall that controls the traffic for one or more instances. When you create an Amazon EC2 Instance, you associate one or more security groups with the Instance. You add rules to each security group that allows traffic to or from its associated instances. You can modify the rules for a security group at any time; the new rules are automatically applied to all instances that are associated with the security group. When we decide whether to allow traffic to reach an instance, we evaluate all the rules from all the security groups that are associated with the instance.

Key Pair

Amazon EC2 uses *key pairs* to encrypt and decrypt login information. A key pair consists of a Public Key that is used to encrypt passwords, and a Private Key is used to decrypt them. When creating a new Amazon EC2 Instance, you need to either create a new Key Pair for it or assign an existing key pair for the Instance. To log in to your Amazon EC2 Instance, you must provide the private key for it. Note that Linux instances have no password, and you use a key pair to log in using SSH. With Windows instances, you use a key pair to obtain the administrator password and then log in using RDP.

Elastic Network Adapter

Elastic Network Adapter (ENA) is a custom network interface with accompanying drivers providing Enhanced Networking on EC2 instances. ENA is optimized to deliver high throughput and packet per second performance and consistently low latencies on EC2 instances. Depending on the type of EC2 instance, you can utilize up to 20 Gbit/s of network bandwidth with ENA. For more information, refer to the corresponding article on the AWS website.

BaaS

NAKIVO Backup & Replication allows for creating and managing multiple isolated tenants within one product instance.

This section contains the following topics:

Branding

Whether you plan to use NAKIVO Backup & Replication internally or provide backup/DR-as-a-Service to external customers, you may find it beneficial to align the product's look and feel with your company's brand. NAKIVO Backup & Replication provides a simple way to customize your product's interface so that it looks like an integral part of your organization. You can customize:

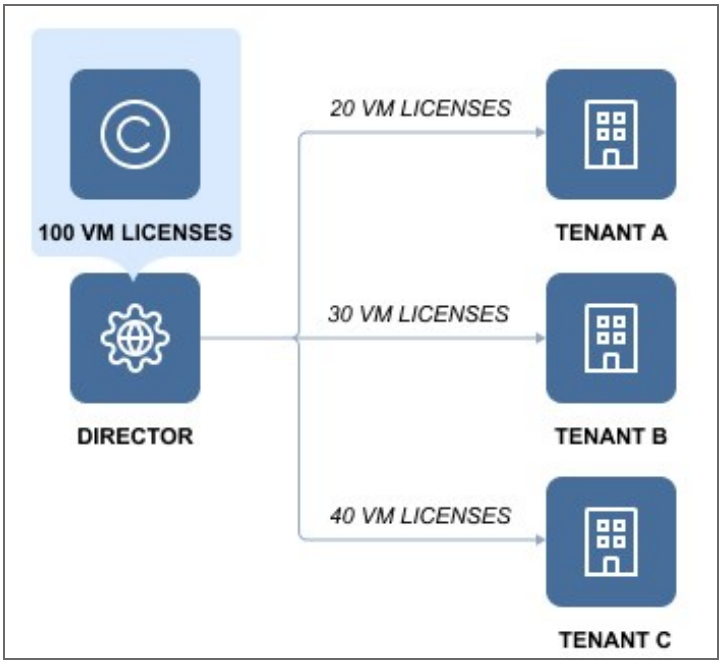
- **Product**: Product title and product logo.
- **Company information**: Company name and website URL.
- **Contact information**: Email, support email, and contact phone.

For information on branding configuration, refer to “Branding” on page 242.

License Delegation

In Multi-tenant mode, NAKIVO Backup & Replication enables you to create multiple isolated tenants in a single copy of the product. The tenants can represent branch offices/departments in enterprise environments or clients in Cloud Provider environments.

Since tenants are isolated and need to have a limit as to how many licenses each of them can use, NAKIVO Backup & Replication has provided the License Delegation feature. In Multi-tenant mode, a Master Admin (tenant manager) can install one multi-socket license in the product and then assign or delegate a specific number of licenses to each tenant. For example, the Master Admin can install a 20-socket license in the Multi-tenant mode of NAKIVO Backup & Replication, and assign 3 licenses to Tenant A, 2 licenses to Tenant B, and 4 licenses to Tenant C, and let 11 licenses remain unused.



At any moment, the Master Admin can redistribute licenses: revoke any number of licenses from any tenant, which will return them to the Master License Pool, and add licenses to another tenant. The License Delegation feature makes license management simple and manageable in large and distributed environments.

MSP Console

The MSP Console feature allows users to connect their standalone instance of NAKIVO Backup & Replication to a managed service provider (MSP) and vice versa. With this feature, the standalone user is referred to as a remote tenant. Unlike local tenants in the traditional Multi-Tenancy workflow, remote tenants retain the ability to manage their resources in their data protection infrastructure. Conversely, using the MSP Console, MSPs are able to monitor a remote tenant's instance of NAKIVO Backup & Replication once a connection has been established on both sides.

To establish a connection, the MSP must first create a remote tenant account for the standalone user. The remote tenant must then use the credentials provided to connect to the MSPs instance of NAKIVO Backup & Replication.

For more information on using the MSP Console feature as a remote tenant, refer to the following topics:

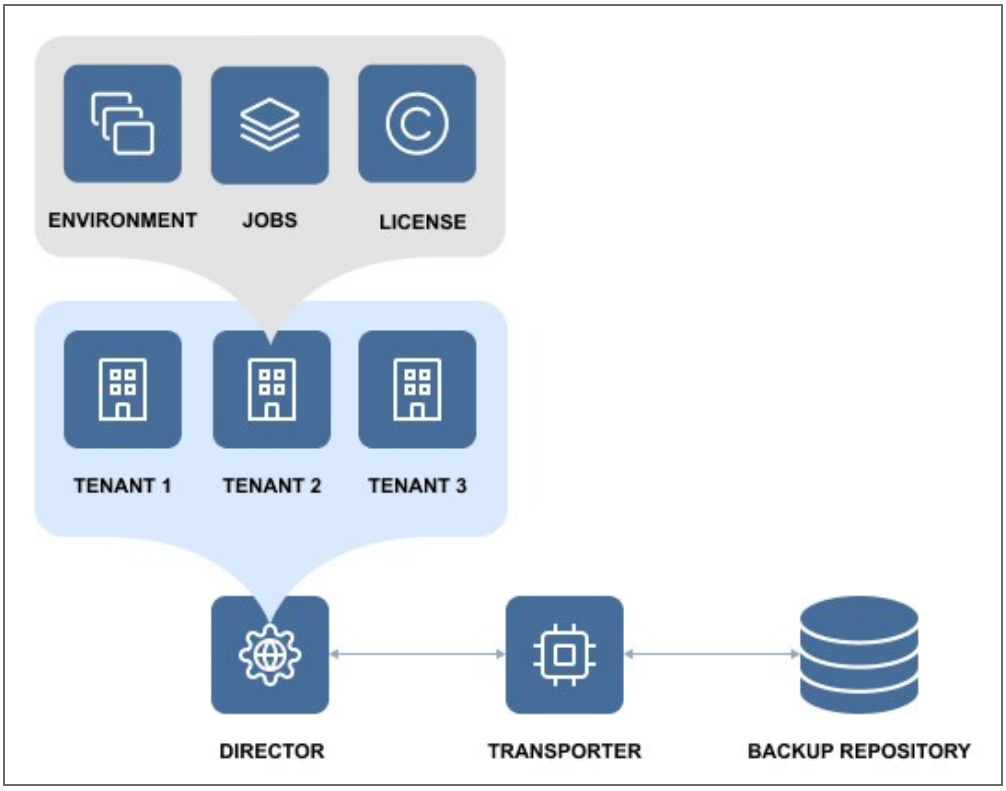
- “MSP” on page 249
- “Adding an MSP” on page 250
- “Managing an MSP Connection” on page 251

For more information on using the MSP Console feature as a managed service provider (MSP), refer to the following topics:

- “Creating a Remote Tenant” on page 469
- “Remote Tenant Configuration” on page 471
- “Tenant Management” on page 473

Multi-Tenancy

Multi-tenancy enables you to create and manage up to 1,000 isolated tenants within a single copy of the product. Tenants can represent business units, branch offices, departments, customers, and any other entities.



In Multi-tenant mode, each tenant can access their own environment through a self-service portal, and perform all data protection and recovery tasks. At the same time, tenants are isolated from each other and cannot access the environment and jobs of other tenants.

With Multi-tenancy, you can:

- Deliver Backup-as-a-Service, Replication-as-a-Service, and Disaster-Recovery-as-a-Service more efficiently and cost-effectively.
- Reduce complexity by managing multiple tenants in a single pane of glass.
- Offload data protection and recovery tasks to tenants.
- Reduce footprint by managing tenants in a single instance of the product.

Self-Service

In the multi-tenant mode, you can provide tenants with access to their dashboards. By default, a tenant admin account is automatically created when you create a new tenant. If you assign the **Self-service administrator** role to the tenant admin, the tenant admin has full control over all product features inside the tenant dashboard. This includes editing and updating tenant inventory, Transporters, and Backup Repositories, creating and managing jobs and groups, as well as managing local users and user roles. For each tenant, one guest account can be created. The tenant guest usually has limited permissions inside the tenant.

To provide a tenant with access to the self-service interface, send them the following information:

- Link to NAKIVO Backup & Replication Director
- Tenant login
- Tenant password

NAKIVO Licensing Policy

This page offers an overview of the NAKIVO Backup & Replication licensing policy. The policy includes the licensing models for different platforms and the type of technical support provided with each model.

Licensing for NAKIVO Backup & Replication

NAKIVO Backup & Replication is available in 5 editions with a Perpetual License or a Subscription License depending on the platform to be protected and an organization's data protection requirements.

Perpetual Licenses

Perpetual Licenses are available for virtual machines, physical machines, NAS, and Oracle Database on the following terms:

- For VMware vSphere, Microsoft Hyper-V, and Nutanix AHV virtual machines (VMs), the solution is licensed per CPU socket. That is, a license is required for each CPU socket on hosts with VMs to be backed up or replicated. Licensed sockets can be used for any of the three platforms and may be reassigned at any time.
- For physical machines, the solution is licensed per server and per workstation. Perpetual Licenses for physical machine backup (servers or workstations) are sold in bundles of 5 servers/workstations.

  Note
  A per-server Perpetual License cannot be used for physical workstations, and a per-workstation Perpetual License cannot be used for servers.

- It is possible to purchase a license for a single bundle of 5 physical servers in case you also purchase a license for a bundle of 10 physical workstations along with it.

- For NAS backup, the solution is licensed per terabyte (see NAS File Share Backup Rules for more details).
- For Oracle Database, the solution is licensed per database (available with the Enterprise Plus edition only).

Perpetual Licenses come with one year of Standard Support. Additional years of support can be purchased upfront. Upgrades to 24/7 Support are also available.

Note

Valid support is required to receive product updates.

See a breakdown of the different editions below. For a detailed comparison of each edition's features, refer to the Editions Comparison section on the Pricing and Editions page.

Edition	Platform	License unit limitations	Overview
Pro Essentials	VMware vSphere	Min. 2 sockets Max. 6 sockets	All the features of the Pro edition but with a limit on the number of license units (see License Units)
	Nutanix AHV		
	Microsoft Hyper-V		
	Windows/Linux Physical Machines	Min. 10 servers Max. 50 servers	
		Min. 10 workstations Max. 150 workstations	
	NAS	Min. 1 TB Max. 50 TB	
Enterprise Essentials	VMware vSphere	Min. 2 sockets Max. 6 sockets	All the features of the Enterprise edition but with a limit on the number of licensed units (see License Units)
	Nutanix AHV		
	Microsoft Hyper-V		
	Windows/Linux Physical Machines	Min. 10 servers Max. 50 servers	
		Min. 10 workstations Max. 150 workstations	
	NAS	Min. 1 TB Max. 50 TB	

Pro	VMware vSphere	No limits	Includes most product features with limitations on backup to the cloud, administrative tools, and BaaS
	Nutanix AHV		
	Microsoft Hyper-V		
	Windows/Linux Physical Machines		
	NAS		
Enterprise	VMware vSphere	No limits	Includes all product features except Oracle Database backup and a few administration features (see the Pricing and Editions page for the full list)
	Nutanix AHV		
	Microsoft Hyper-V		
	Windows/Linux Physical Machines		
	NAS		
Enterprise Plus	VMware vSphere	No limits	The most complete edition of NAKIVO Backup & Replication
	Nutanix AHV		
	Microsoft Hyper-V		
	Windows/Linux Physical Machines		
	NAS		
	Oracle Database		

Per-Workload Subscription Licenses

The Per-Workload Subscription Licenses are available for virtual machines, physical machines, NAS, and Oracle Database on the following terms:

- For VMware vSphere, Microsoft Hyper-V, Nutanix AHV, and Amazon EC2, the solution is licensed per VM/instance.
- For physical machines, the solution is licensed per 1 server or 3 workstations.
- For NAS, the solution is licensed per 0.5 terabytes (see NAS File Share Backup Rules for more details).
- For Oracle Database, the solution is licensed per database (available with the Enterprise Plus edition only).

Subscription Licenses are annual subscriptions (1 to 5 years) that are billed upfront and include 24/7 Support for the licensed period.

See a breakdown of the different editions below. For a detailed comparison of each edition's features, refer to the Editions Comparison section on the Pricing and Editions page.

Edition	Platform	License unit limitations	Overview
Pro Essentials	VMware vSphere	Min. 5 workloads Max. 50 workloads	All the features of the Pro edition but with a limit on the number of license units (see License Units)
	Nutanix AHV		
	Microsoft Hyper-V		
	Amazon EC2		
	Windows/Linux Physical Machines		
	NAS		
Enterprise Essentials	VMware vSphere	Min. 5 workloads Max. 50 workloads	All the features of the Enterprise edition but with a limit on the number of licensed units (see License Units)
	Nutanix AHV		
	Microsoft Hyper-V		
	Amazon EC2		
	Windows/Linux Physical Machines		
	NAS		
Pro	VMware vSphere	No limits	Includes most product features with limitations on backup to the cloud, administrative tools, and BaaS
	Nutanix AHV		
	Microsoft Hyper-V		
	Amazon EC2		
	Windows/Linux Physical Machines		
	NAS		

Enterprise	VMware vSphere	No limits	Includes all product features except Oracle Database backup and a few administration features (see the Pricing and Editions page for the full list)
	Nutanix AHV		
	Microsoft Hyper-V		
	Amazon EC2		
	Windows/Linux Physical Machines		
	NAS		
Enterprise Plus	VMware vSphere	No limits	The most complete edition of NAKIVO Backup & Replication
	Nutanix AHV		
	Microsoft Hyper-V		
	Amazon EC2		
	Windows/Linux Physical Machines		
	NAS		
	Oracle Database		

License Units

License units are defined differently for Perpetual Licenses and Per-Workload Subscription Licenses as shown below. In addition, there are limitations on the number of license units with the Pro Essentials and Enterprise Essentials editions.

Units for Perpetual Licenses

Platform	License Unit	Pro Essentials/Enterprise Essentials Editions Limits*
VMware vSphere	1 CPU Socket	2-6 Units (Sockets)
Microsoft Hyper-V		
Nutanix AHV		
Windows/Linux Physical Server	5 Servers	2-10 Units (10-50 Servers)
Windows/Linux Workstation	5 Workstations	2-30 Units (10-150 Workstations)

NAS File Share	1 Terabyte	1-50 Units (1-50 TB)
Oracle Database	1 Database	N/A

*A Perpetual License for Pro Essentials/Enterprise Essentials can cover up to 30 units of virtual machines, physical machines, and/or NAS combined.

Below is an example of a valid order for a single Pro Essentials/Enterprise Essentials Perpetual License that combines virtual, physical, and file share protection for a total of 30 units:

- 6 Sockets (6 units)
- 40 Physical Servers (8 units in bundles of 5)
- 40 Physical Workstations (8 units in bundles of 5)
- 8 TB of file share space (8 units)

Workloads in Per-Workload Subscription License

<table>
<tr><th>Platform</th><th>License Unit (Workload)</th><th>Pro Essentials/Enterprise Essentials Editions Limits</th></tr>
<tr><td>VMware vSphere</td><td rowspan="3">1 VM</td><td rowspan="9">Minimum of 5 workloads
Maximum of 50 workloads</td></tr>
<tr><td>Microsoft Hyper-V</td></tr>
<tr><td>Nutanix AHV</td></tr>
<tr><td>Amazon EC2</td><td>1 Instance</td></tr>
<tr><td>Windows/Linux Physical Server</td><td>1 Server</td></tr>
<tr><td>Windows/Linux Workstation</td><td>3 Workstations</td></tr>
<tr><td>NAS File Share</td><td>0.5 Terabyte</td></tr>
<tr><td>Oracle Database</td><td>1 Database</td></tr>
</table>

NAS File Share Backup Rules

File share backup has a few additional rules and details regarding licensing. Licenses are consumed based on the following rules:

- License consumption is calculated based on backed up source file share data, determined during each file share backup job run.

    - NAKIVO Backup & Replication sums up the last-known amount of protected source data across all file share backup jobs.
    - If the same file share and/or its contents are protected by multiple jobs, the source data is still summed.
    - If a job run reaches or exceeds the licensed data size, the job will become disabled. It will not be possible to create new file share backup jobs, and the current job cannot be re-enabled until it is edited to exclude a sufficient amount of backup data.
- Adding shares to inventory does **not** consume licenses.
- File share backup metadata does **not** contribute to licensed file share size.

In addition, there are specific rules regarding the calculation of licenses for protected source data:

- If the total source data size is greater than zero and less than or equal to 0.5 TB, one license unit is consumed.

  Note

  In this section, **license unit** refers only to 0.5 TB. While file share backup is licensed per-Terabyte in a Perpetual License, license **consumption** is counted in 0.5 TB increments for both Perpetual and Per-Workload Subscription license types.

- If the total source data size exceeds 0.5 TB, the number of consumed licenses is determined as follows:
  1. The total source data size is rounded down to the nearest multiple of 0.5 TB
  2. The rounded amount is divided by 0.5 TB
  3. The resulting value is the number of licensed units consumed

  Example: Total backed up source data of 1850 GB (1.85 TB) is rounded down to 1.5 TB and divided by 0.5 TB to get **3 license units consumed**.

Licensing for Backup for Microsoft 365

Backup for Microsoft 365 is licensed per user on an annual basis (1 to 3 years). A user is defined as a unique Microsoft 365 account that has access to Exchange Online, OneDrive for Business, SharePoint Online, and/or Teams. Each user is equivalent to one license unit.

Organizations may purchase a Subscription License for Backup for Microsoft 365 as a standalone offering or combine it with any existing NAKIVO Backup & Replication edition and license type (Perpetual or Per-Workload Subscription). Subscription Licenses come with 24/7 Support covering the licensed period.

See the overview below of possible pairings for a Microsoft 365 Subscription License with any edition of NAKIVO Backup & Replication.

Purchased with	Support level	Coverage

Perpetual License (any edition)	24/7 Support for Microsoft 365 License; Standard Support for Perpetual License	Minimum 10 license units (users) per order
	24/7 Support across the board (requires Support Upgrade for Perpetual License)	
Subscription License (any edition)	24/7 Support across the board	Minimum 10 license units (users) per order

When combining a Subscription License for Backup for Microsoft 365 with a NAKIVO Backup & Replication Perpetual License of any type, the following technical support conditions apply:

- The end date for support coverage must be the same for both licenses.
- You may upgrade Perpetual License Standard Support to 24/7 Support, or keep it at the default Standard Support.

Backup for Microsoft 365 Licensing Rules

Licenses are consumed per user based on the following rules:

- A user is considered to be one of the following:
  - A user mailbox
  - A user OneDrive
  - A user licensed in Microsoft 365 who has access to a Team that will be backed up
  - A user who has access to a site depending on the following conditions:
    - A user (including a user in groups) that has "Edit" or "Full Control" permissions for a site consumes 1 license unit.
    - For personal sites, only the owner of the personal site consumes a license unit. Other users with access to this personal site do not consume any license units.
    - A personal site owner with access to a regular site requires only one license unit.
- License units are matched to a given email account across services. If there is no matching email account, then a new license is required. For example:
  - A user with access to a SharePoint Online site who also has a mailbox under the same email account requires only one license unit.
  - If a mailbox does not correspond to a licensed email account, a separate license unit is required to back it up.
- License units are not given per SharePoint site or affected by the size of a site.
- License units are not given per Team.
- Shared mailboxes do not require a license.

- Group mailboxes do not require a license.
- Group sites do not require a license.
- Guest accounts do not require a license.
- Student users do not require a license:
    - A user that only has a Student SKU does not require a license.
    - A user with both a Student SKU and Faculty SKU requires a license.

IT Monitoring Licensing

IT Monitoring for VMware vSphere virtual machines is available with a Perpetual License (per socket) or Per-Workload Subscription License (per VM), and can be purchased separately from NAKIVO Backup & Replication. An IT Monitoring license can also be combined with an existing license of the same type and edition of NAKIVO Backup & Replication.

Perpetual Licenses for IT Monitoring

- Licensed per CPU socket: A license is required for each CPU socket on hosts with VMs to be monitored.
- Perpetual Licenses come with one year of Standard Support. Additional years of support can be purchased upfront. Upgrades to 24/7 Support are also available.

  Note
  Valid support is required to receive product updates.

Subscription Licenses for IT Monitoring

- Licensed per VM
- Annual subscriptions (1 to 5 years) that are billed upfront
- Include 24/7 Support for the licensed period
- License unit limits for the Pro Essentials/Enterprise Essentials editions: 5-50 workloads

If purchased together with NAKIVO Backup & Replication, the licenses for both products must have the same:

- Edition
- Number of license units (sockets or VMs)
- Support end date
- Type of support (Standard or 24/7)

Frequently Asked Questions

Q: What is a socket?

A: A socket refers to the socket on the motherboard onto which a CPU is inserted. For a Perpetual license, only the number of sockets is counted; the number of CPU cores per socket is not taken into account.

Q: Does adding another Transporter require an additional license?

A: NAKIVO Backup & Replication is not licensed per Transporter. You can install additional Transporters regardless of the licensing model (Perpetual or Subscription).

Q: Do I need to license both source and target hosts in a disaster recovery scenario?

A: Only the source side of replication requires a license. For a scenario wherein you replicate a VM from Site A, recover it in Site B, then failback to Site A, only hosts on Site A side need to be licensed.

Additional Resources

NAKIVO Pricing & Editions

NAKIVO Customer Support Policy

NAKIVO Customer Support Agreement

End-User License Agreement

Deployment

This section contains the following topics :

Architecture

What is NAKIVO Backup & Replication?

NAKIVO Backup & Replication is an all-in-one solution designed to back up, replicate, and recover virtual machines and cloud instances. The product can also back up and recover physical machines.

Solution Components

NAKIVO Backup & Replication is a server application that can be installed on a virtual or physical machine. The application is designed to achieve top speeds for CPU and RAM to achieve the top speed of VM backup, replication, and recovery. Thus, NAKIVO Backup & Replication components should be installed on a machine designated for backup and replication so it does not interfere with the performance of other applications.

NAKIVO Backup and Replication consists of the following components:

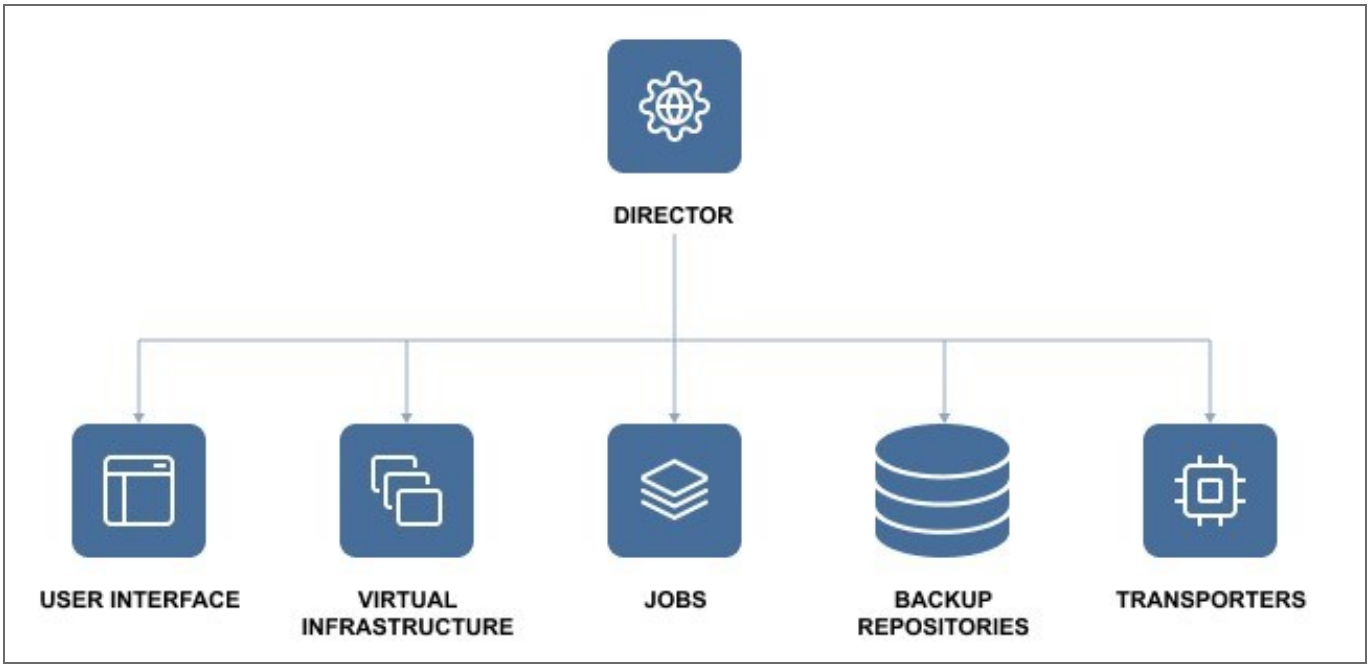
- “Director” on page 41
- “Transporter” on page 43
- “Backup Repository” on page 47

All components can be installed on a single machine or can be distributed across multiple machines and geographical locations.

Director

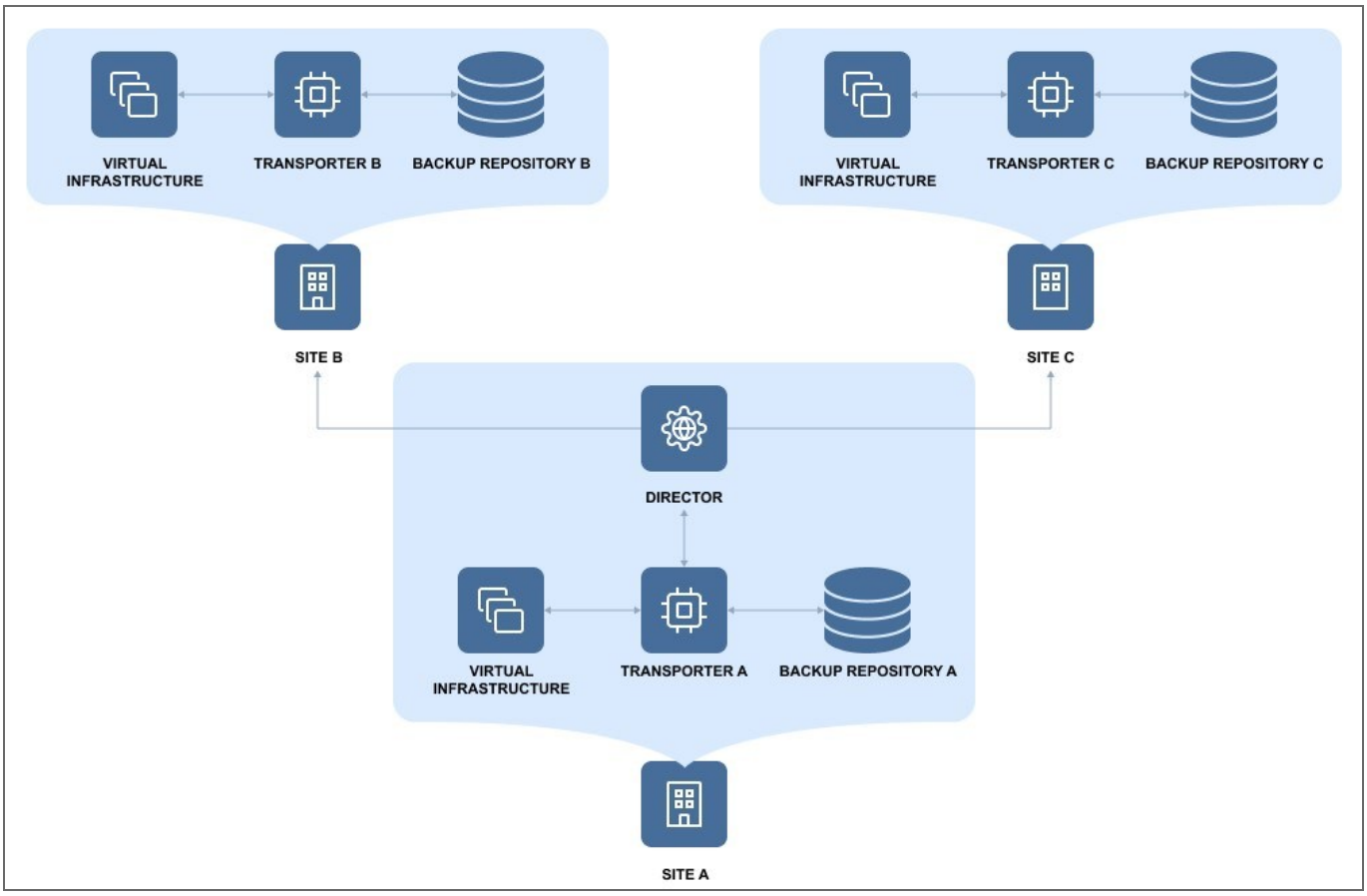
What is Director?

Director is the central management instance of the product. It provides Web interface, locates and maintains the inventory, provides users with the ability to create and run jobs, manages Backup Repositories, Transporters, and other product elements.



How Many Directors Should be Deployed

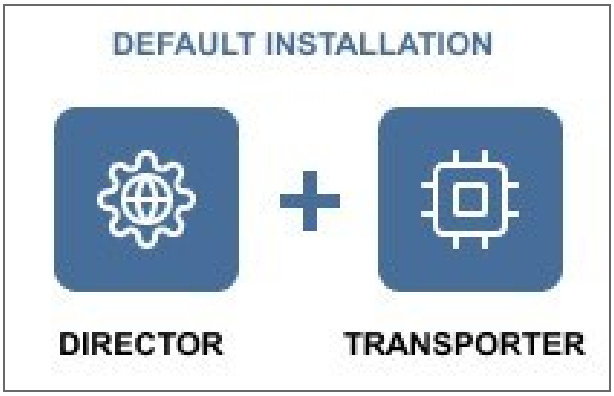
Only one instance of the Director should be installed per customer. As a central management point for data protection, one instance of the Director can manage multiple geographically distributed virtual and cloud environments, Backup Repositories, and Transporters. See the example below.


VIRTUAL INFRASTRUCTURE
TRANSPORTER B
BACKUP REPOSITORY B
VIRTUAL INFRASTRUCTURE
TRANSPORTER C
BACKUP REPOSITORY C
SITE B
SITE C
DIRECTOR
VIRTUAL INFRASTRUCTURE
TRANSPORTER A
BACKUP REPOSITORY A
SITE A

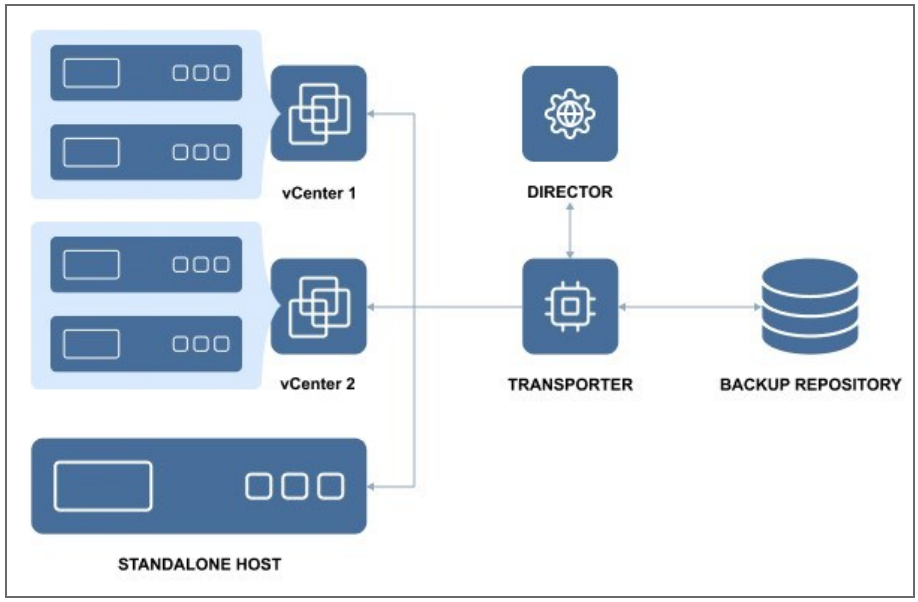
Transporter

What is a Transporter?

The Transporter is the component of the product that does all of the heavy lifting. It performs backup, replication, and recovery, as well as data compression, deduplication, and encryption. An instance of the Transporter is automatically installed along with the Director to enable backup, replication, and recovery out of the box. The default Transporter is called "Onboard Transporter", and it must not be removed or added to the product by another Director.



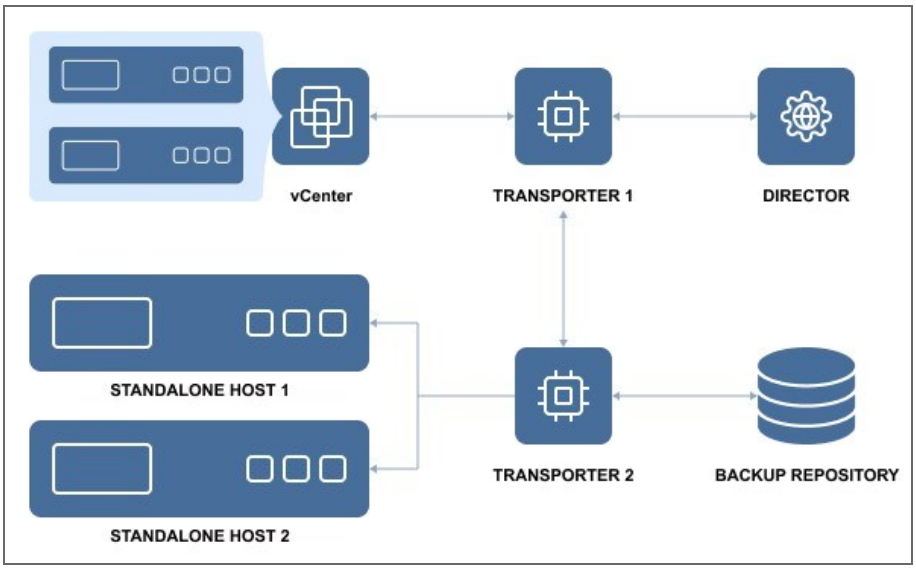
A single Transporter can back up, replicate, and recover multiple VMs and cloud instances.



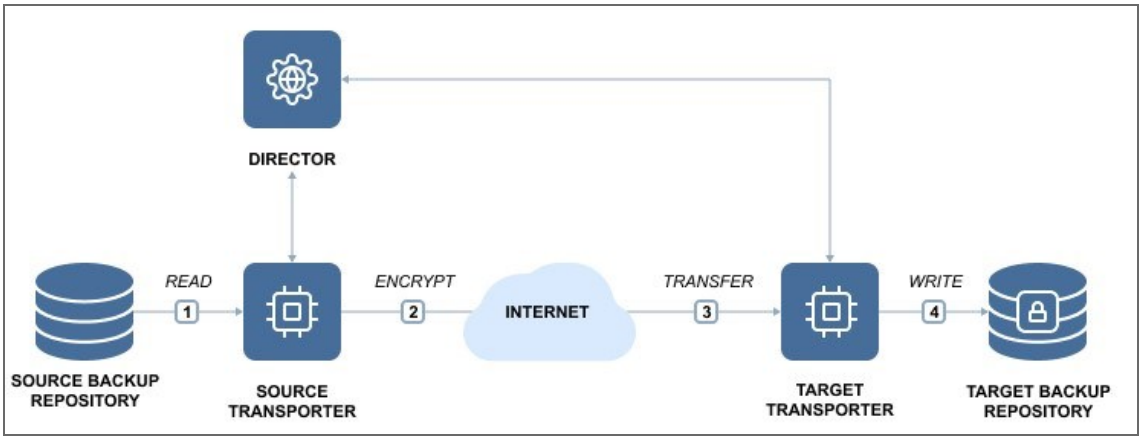
One Transporter can simultaneously process multiple source disks (6 by default) during backup, replication, and recovery. If jobs contain more disks than the Transporter is set to process simultaneously, the disks will be put in a queue and will be processed once the Transporter frees up.

How Many Transporters Should be Deployed?

In most cases, it is sufficient to deploy only one Transporter per site. In large environments, where multiple source items need to be processed simultaneously, multiple Transporters can be deployed to distribute the workload.



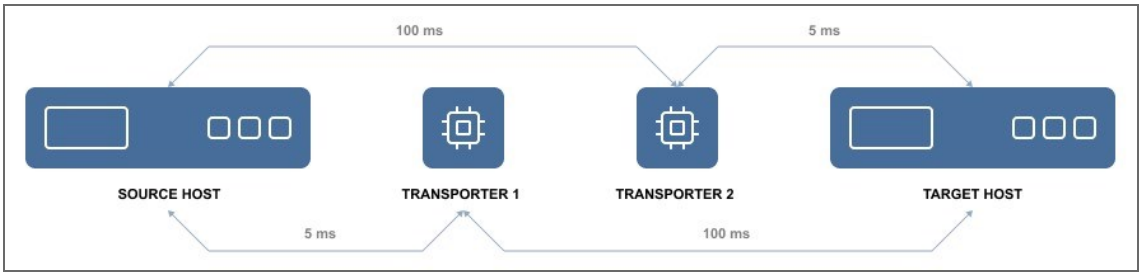
Deploying multiple Transporters also enables network acceleration and AES 256 encryption of traffic between a pair of Transporters. For example, if VMs are replicated over WAN between two sites, the Transporter installed in the source site can compress and encrypt data before transferring it over WAN, and the Transporter installed in the Target site can unencrypt and decompress the data prior to writing it to the target server.



If you plan to transfer data over WAN without a VPN connection from your source site to the target site, make sure the source and target Transporters are added to the product using external IP addresses or DNS names that can be properly resolved in WAN, so that the two Transporters can connect to each other.

How Transporters are Selected for Jobs

In large and geographically distributed environments multiple Transporters can be deployed to distribute the data protection workload, optimize network traffic, and improve data transfer speeds. Thus, if more than one Transporter is deployed for NAKIVO Backup & Replication, it is important to determine which one should be used to read data from a particular source and which one should be used to write data to a target.
By default, the product automatically determines which Transporter should be used based on the proximity of a Transporter to the source or target server. The proximity is measured by using the ping round trip time.



In the example above, Transporter 1 will be selected to read data from the Source ESXi, and Transporter 2 will be selected to write data to the Target ESXi.
The Transporter selection can also be configured manually during job creation.

Transporter Security

It is possible to set a Master Password for the Transporter and use a CA certificate to make NAKIVO Backup & Replication more secure. The certificate can be set for the Onboard Transporter during the full installation of the product or for individual Transporters during Transporter-only installation, or by using the Windows Updater on Windows operating systems. The master password can be set only during the Transporter-only installation.
This option is available for the following supported target platforms:

- VMware vSphere
- Microsoft Hyper-V
- Amazon EC2
- Nutanix AHV
- Supported NAS models
- Virtual Appliances
- Physical machines

To use CA certificates, make sure that they adhere to the necessary requirements. Refer to Custom CA-Signed Certificate Compatibility.

Backup Repository

What is a Backup Repository?

A Backup Repository is a folder used by NAKIVO Backup & Replication to store backups. When you add a Backup Repository to the product, NAKIVO Backup & Replication creates a folder named “NakivoBackup” in the specified location and keeps all backed up data and Backup Repository metadata in that folder.

Important

- Do not modify or delete any files inside the “NakivoBackup” folder. Modifying or deleting any file inside the “NakivoBackup” folder may irreversibly damage an entire Backup Repository.
- To avoid disrupting NAKIVO Backup & Replication processes and data corruption, add the application to the whitelist/exclusions list of the antivirus software running on the machine on which the NAKIVO Backup Repository is set up.

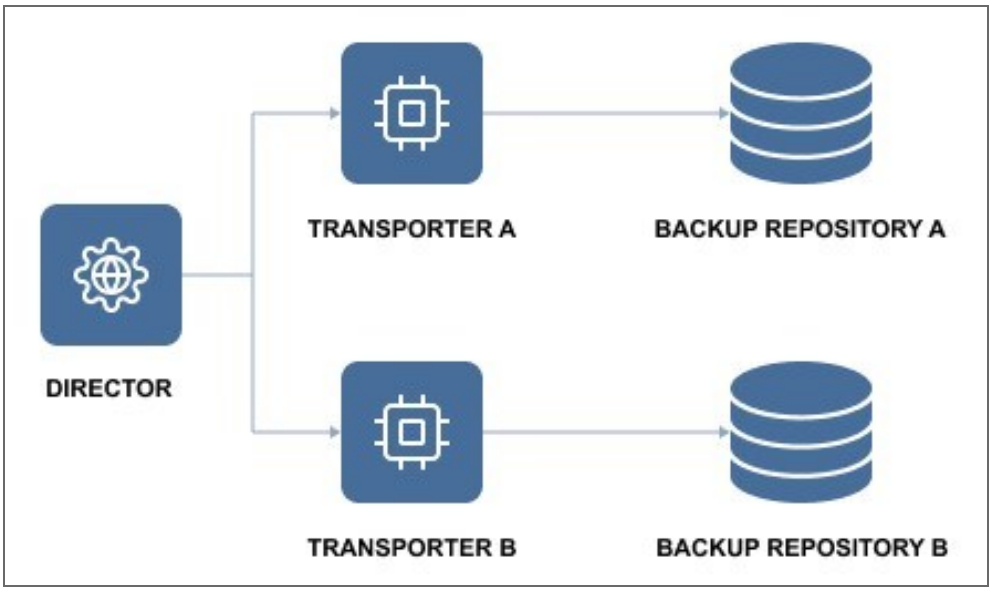
By default, a Backup Repository is created when the full solution (both Director and Transporter) is installed. The default Backup Repository is named “Onboard repository”.

How Much Data Can Be Stored in a Backup Repository?

The maximum recommended size of a Backup Repository used with NAKIVO Backup & Replication is 128 TB of data after compression and deduplication. For repositories larger than 128 TB, it is recommended to use an **Incremental with full backups** type of Backup Repository. The number of Backup Repositories per installation is unlimited. Additionally, Backup Repositories can be configured to compress and deduplicate backups at the block level to save storage space.

How is a Backup Repository Managed?

Each Backup Repository is managed by a single Transporter called an Assigned Transporter. In other words, only one Transporter can read data from and write data to a particular Backup Repository.



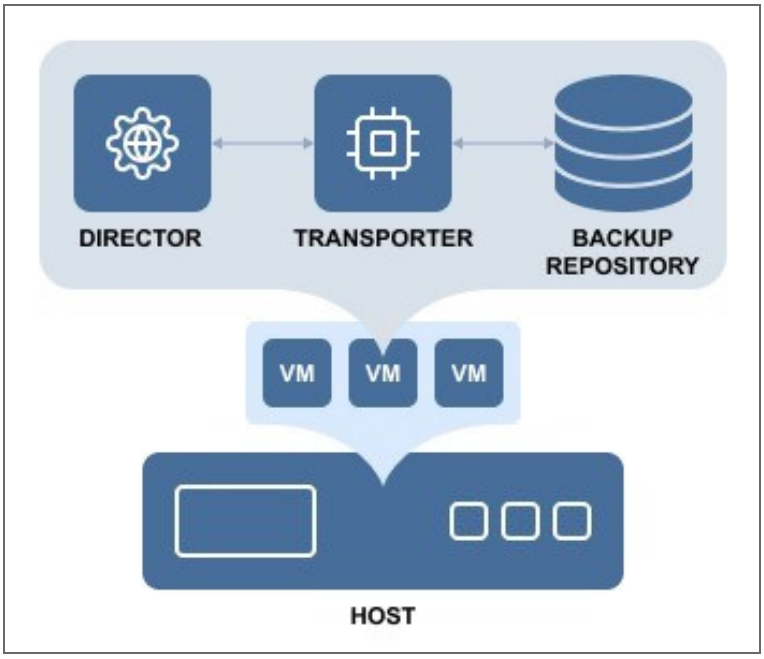
The Assigned Transporter is responsible for all interaction with its Backup Repository. A single Transporter can be assigned to and manage multiple Backup Repositories.

Deployment Scenarios

NAKIVO Backup & Replication is a modular solution that can be fully installed on a single machine to protect small and mid-sized environments, as well as scale out horizontally and support large distributed environments. Refer to the sections below to learn more about the product deployment scenarios.

Single Site Deployment

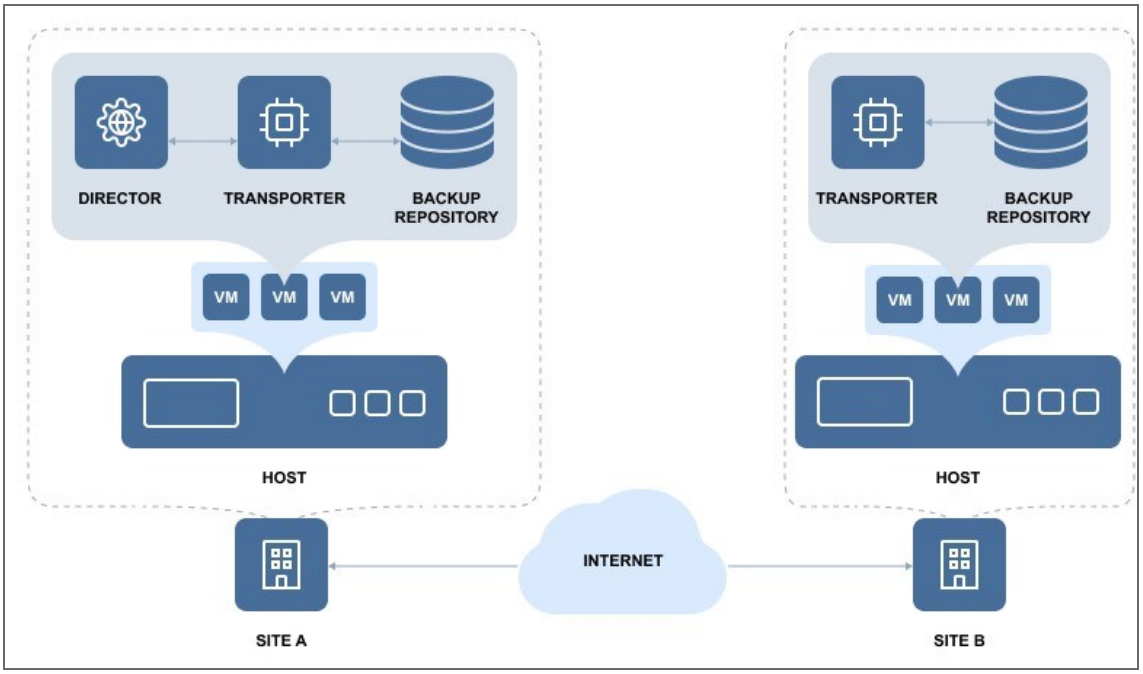
For a single site deployment, it is often sufficient to install both the Director and Transporter on a single VM/physical machine within your infrastructure.



This deployment provides you with the ability to back up, replicate, and recover multiple VMs from multiple source hosts.

Distributed Deployment

If you have multiple sites and need to back up and/or replicate over WAN, install the Director and Transporter on one site, and at least one Transporter on all other sites.



Note

Make sure the required ports are open on the appropriate endpoints. The full list of required ports can be found in Deployment Requirements.

Multi-Tenant Deployment

Installation of a multi-tenant solution of NAKIVO Backup & Replication allows you to create multiple isolated tenants within a single product deployment and manage them from a single pane of glass. In the Multi-Tenant mode, tenants can access the self-service portal to offload backup, and recovery tasks from the service provider.

- "Multi-Tenant Mode" on page 462

Backup from a Remote Site to a Master Site

Deployment Scenario

In this scenario, tenant VMs are running at remote sites and are backed up to a single master site.

Example

A service provider needs to back up customers' VMs to the service provider's datacenter so that the customers don't see each other's backups and can recover their own files and emails through a self-service interface.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at the master site.
3. Install at least one Transporter at each remote site.
4. For each tenant, prepare a separate folder at the master site for creating separate Backup Repositories.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs at remote sites. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to machines at remote sites on which Transporters are installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
C	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts at the master site where VM replicas will be created. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
D	Connection from the machine on which the Director is installed to the machine at the master site where the Transporter is installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
E	Connection from the machine at the Master site where the Transporter is installed to ESXi hosts at the master site where VM replicas will be created.

F	Connection from the machine at the Master site where the Transporter is installed to machines at remote sites where Transporters are installed. The ports used for data transfer between a pair of Transporters are open in firewalls.
G	At remote sites, connections from machines on which Transporters are installed to vCenter servers and ESXi hosts running source VMs.

Note

For security purposes, a VPN connection should be established between the master site and remote sites.

Replication from a Remote Site to a Master Site

Deployment Scenario

In this scenario, tenant VMs are running at remote sites and are replicated to a single master site.

Example

A service provider wants to introduce Replication-as-a-Service to customers and replicate their VMs to the service provider's datacenter.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at the master site.
3. Install at least one Transporter at each remote site.
4. For each tenant, prepare a separate ESXi host that will serve as a replication target.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs at remote sites. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to machines at remote sites on which Transporters are installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
C	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts at the master site where VM replicas will be created. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
D	Connection from the machine on which the Director is installed to the machine at the master site where the Transporter is installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
E	Connection from the machine at the master site where the Transporter is installed to ESXi hosts at the master site where VM replicas will be created.

F	Connection from the machine at the master site where the Transporter is installed to machines at remote sites where Transporters are installed. The ports used for data transfer between a pair of Transporters are open in firewalls.
G	At remote sites, connections from machines on which Transporters are installed to vCenter servers and ESXi hosts running source VMs.

Note

For security purposes, a VPN connection should be established between the master site and remote sites.

Local Backup at Remote Site

Deployment Scenario

In this scenario, tenant VMs are running and backed up locally at the remote sites.

Example

An Enterprise has two branch offices running VMware virtual infrastructure. The IT manager located at the headquarters is responsible for the Enterprise data protection and needs to back up VMs locally at their branch offices to ensure fast operational recovery. Employees of the branch offices should have access to their VM backups and be able to recover their files and emails.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at each remote site.
3. For each tenant, prepare a separate folder at a remote site for creating a Backup Repository.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs at remote sites. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to machines at remote sites where the Transporters are installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
C	Connection from the machines on which the Transporters are installed at remote sites to vCenter servers and ESXi hosts running source VMs.

Note

For security purposes, a VPN connection should be established between the master site and remote sites.

Local Replication at Remote Site

Deployment Scenario

In this scenario, tenant VMs are running and replicated locally at the remote sites.

Example

An Enterprise has two branch offices running VMware virtual infrastructure. The IT manager located at the headquarters is responsible for the Enterprise data protection and needs to replicate business critical VMs locally at the branch offices for high availability.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at each remote site.
3. For each tenant, prepare a separate folder at the remote site for creating a Backup Repository.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs at remote sites. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to machines at remote sites where Transporters are installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
C	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts where VM replicas will be created at remote sites. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
D	At remote sites, connections from machines where Transporters are installed to vCenter servers and ESXi hosts running source VMs.
E	At remote sites, connections from machines where Transporters are installed to vCenter servers and ESXi hosts where VM replicas will be created.

Note

For security purposes, a VPN connection should be established between the master site and remote sites.

Backup at Master Site

Deployment Scenario

In this scenario, tenant VMs are running at the master site and the backing up of tenant VMs is also performed at the master site.

Example

A service provider runs VMs of customer A and customer B in the service provider's datacenter. The Service Provider seeks to offer Backup-as-a-Service to both customers. The customers should be able to recover their files and emails through a self-service interface without being able to see each other's backups.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at the master site.
3. For each tenant, prepare a separate folder at the master site for creating a Backup Repository.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to the machine on which the Transporter is installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
C	Connection from the machine on which the Transporter is installed to vCenter servers and ESXi hosts running source VMs.
D	Connection from the machine on which the Transporter is installed to the folders where tenant Backup Repositories will be created.

Note

For security purposes, a VPN connection should be established between the master site and remote sites.

Replication at Master Site

Deployment Scenario

In this scenario, tenant VMs are running at the Master site and the replication of tenant VMs is also performed at the Master site.

Example

A service provider runs customers' VMs in the service provider's datacenter. To ensure high availability of tenant VMs, the service provider seeks to replicate customer VMs to a different server.

Deployment Steps

To deploy the above scenario, perform the following steps:

1. Install the Director in multi-tenant mode at the master site.
2. Install at least one Transporter at the master site.
3. For each tenant, prepare a separate ESXi host that will serve as a replication target.

Connections

The implementation of the above scenario requires that the following connections be available:

Connection	Description
A	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts that run source VMs. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
B	Connection from the machine on which the Director is installed to the machine on which the Transporter is installed. The port used for communication with the Transporters (9446 by default) is open in firewalls.
C	Connection from the machine on which the Director is installed to vCenter servers and ESXi hosts where VM replicas will be created. The port used for communication with vCenter servers and ESXi hosts (443 by default) is open in firewalls.
D	Connection from the machine on which the Transporter is installed to vCenter servers and ESXi hosts running source VMs.
E	Connection from the machine on which the Transporter is installed to vCenter servers and ESXi hosts where VM replicas will be created.

System Requirements

Before you start using NAKIVO Backup & Replication, make sure that the servers or machines that you plan to use as backup infrastructure components meet the requirements listed in the following topics:

Supported Platforms

NAKIVO Backup & Replication provides data protection for the following platforms:

- Microsoft 365 (Exchange Online, OneDrive for Business, SharePoint Online, Teams)

Notes

- To learn about the limitations of NAKIVO Backup & Replication related to supported platforms, refer to the Platform Limitations section of the latest Release Notes.
- To add a supported platform to NAKIVO Backup & Replication, make sure that your system has been updated with the latest patch and all the necessary requirements are met.
- The support for sub-versions that are not stated in the user guide can be clarified with the support team.

Find the necessary requirements below:

- Microsoft 365 Requirements

Microsoft 365 Requirements

To provide data protection for your Microsoft 365, the following requirements must be met:

- Exchange Online must be purchased as a part of the Microsoft 365 plan or a standalone service.
- The required API permissions must be provided to NAKIVO Backup & Replication. Refer to Required API Permissions for Microsoft 365.
- For automatic enabling of the "Site Collection Administrator" role, a Microsoft 365 account user must have the "SharePoint admin" or "Global admin" role. This is required for backing up and recovery of SharePoint Online sites.
- Two-factor/multi-factor authentication must be disabled in SharePoint Online administrator account.
- Microsoft 365 account must be accessible over the network.
- Conditional Access must be disabled in Azure portal. Alternatively, the account must be added as "excluded" from the Conditional Access.
- To backup and restore Microsoft 365 services, a Transporter should be installed on one of the following operating systems:

Windows

- Windows Server 2022 (21H2) (x64)
- Windows Server 20H2 (x64)
- Windows Server 2019 Standard (x64)
- Windows Server 2016 Standard (x64)
- Windows Server 2012 R2 Standard (x64)

    - Update for Windows Server 2012 R2 (KB3179574)
- Windows Server 2012 Standard (x64)
- Windows 11 (x64)
- Windows 10 Enterprise (x64)
- Windows 10 Home (x64)
- Windows 10 Pro (x64)
- Windows 8 Professional (x64)

Linux

- Debian 11.7 (64-bit)
- Debian 11.6 (64-bit)
- Debian 11.5 (64-bit)
- Debian 11.4 (64-bit)
- Debian 11.3 (64-bit)
- Debian 11.2 (64-bit)
- Debian 11.1 (64-bit)
- Debian 11.0 (64-bit)
- Debian 10.13 (64-bit)
- Debian 10.12 (64-bit)
- Debian 10.11 (64-bit)
- Debian 10.10 (64-bit)
- Debian 10.9 (64-bit)
- Debian 10.8 (64-bit)
- Debian 10.7 (64-bit)
- Debian 10.6 (64-bit)
- Debian 10.5 (64-bit)
- Debian 10.4 (64-bit)
- Debian 10.3 (64-bit)
- Debian 10.2 (64-bit)
- Debian 10.1 (64-bit)
- Ubuntu 22.04 Server (x64)
- Ubuntu 20.04 Server (x64)
- Ubuntu 18.04 Server (x64)
- Ubuntu 16.04 Server (x64)
- SUSE Linux Enterprise Server 12 SP3 – 15 SP4 (x64)
- Red Hat Enterprise Linux v7.4 – v9.2 (x64)

- CentOS v7.0 – v8.4 (x64)
- CentOS Stream 8 – 9 (x64)

NAS

Refer to “Deployment Requirements” on page 65 to see the list of supported NAS devices.

Note

ARM-based NAS devices are not supported for backup and recovery of Microsoft 365 accounts.

Deployment Requirements

NAKIVO Backup & Replication can be deployed as a virtual appliance (VA) or installed directly onto a supported machine or network-attached storage (NAS). Below is the list of deployment requirements and performance-related recommendations.

Hardware

VM or Physical Machine

NAKIVO Backup & Replication can be installed on a machine with the following minimum hardware characteristics:

Director and Onboard Transporter:

- **CPU**: x86-64, 2 cores
- **RAM**: 4 GB + 250 MB for each concurrent task
  - For SaaS Backup Repository-related activities:
    - additional 2 GB
    - additional 100 MB for each concurrent Java Transporter task
- **Free space**: 10 GB

Transporter only:

- **CPU**: x86-64, 2 cores
- **RAM**: 2 GB + 250 MB for each concurrent task
  - For SaaS Backup Repository-related activities:
    - additional 2 GB
    - additional 100 MB for each concurrent Java Transporter task
- **Free space**: 5 GB

Network Attached Storage

NAKIVO Backup & Replication can be installed on supported NAS with the following minimum hardware characteristics:

Director and Onboard Transporter:

- **CPU**: x86-64, 2 cores
- **RAM**: 1 GB
    - For SaaS Backup Repository-related activities:
        - minimum total RAM: 4 GB
        - additional 100 MB for each concurrent Java Transporter task
- **Free space**: 10 GB

Transporter only:

- **CPU**: x86-64, 2 cores
- **RAM**: 512 MB
    - For SaaS Backup Repository-related activities:
        - minimum total RAM: 4 GB
        - additional 100 MB for each concurrent Java Transporter task
- **Free space**: 5 GB

Note

Onboard Transporters installed on NAS devices with ARM CPU do not support VMware infrastructures. Refer to Transporter Does Not Support VMware vSphere for a solution.

Supported NAS Devices

- **Synology**: For a full list of supported models, refer to “Supported Synology NAS Devices” on page 85
- **QNAP**: For a full list of supported models, refer to “Supported QNAP NAS Devices” on page 78
- **ASUSTOR**: For a full list of supported models, refer to “Supported ASUSTOR NAS Devices” on page 73
- **NETGEAR**: For a full list of supported. For a full list of supporter models, refer to “Supported NETGEAR NAS Devices” on page 75.
- **Western Digital**: For a full list of supported models, refer to “Supported Western Digital NAS Devices” on page 89.

Scalability and UI Performance

For optimal user interface performance, it’s important to allocate an appropriate amount of resources to your NAKIVO Backup & Replication instance. The following are the guidelines for allocating RAM to your instance based on the number of jobs created by this instance:

1. Up to 29 jobs: 2 GB of allocated RAM
2. 30–49 jobs: 4 GB of allocated RAM
3. 50–99 jobs: 8 GB of allocated RAM
4. 100–199 jobs: 16 GB of allocated RAM
5. 200+ jobs: 20 GB of allocated RAM

Note

The above guidelines refer to both active and disabled jobs.

If your instance has less than the recommended amount of allocated RAM for the respective number of jobs, consider adding more resources to the machine hosting the instance.

The machines used to open product web UI should meet the following requirements:

- **Processor**: 1.5 GHz or higher
- **RAM**: 1 GB or more
- **Display resolution**: 1366x768 pixels or higher
- **Web browser**: Mozilla Firefox or Google Chrome
- Cookies, Javascript and images must be enabled in the web browser.

Operating Systems

NAKIVO Backup & Replication can be installed on the following operating systems:

Note

- SELinux module must be disabled to install NAKIVO Backup & Replication on Linux.
- Installation on Windows Core is currently not supported.

Windows

- Microsoft Windows Server 2022 (21H2) (x64)
- Microsoft Windows Server 20H2 (x64)
- Microsoft Windows Server 2019 Standard (x64)
- Microsoft Windows Server 2016 Standard (x64)
- Microsoft Windows Server 2012 R2 Standard (x64)
- Microsoft Windows Server 2012 Standard (x64)
- Microsoft Windows 11 (x64)
- Microsoft Windows 10 Enterprise (x64)
- Microsoft Windows 10 Home (x64)

- Microsoft Windows 10 Professional (x64)
- Microsoft Windows 8 Professional (x64)

Linux

- Debian 11.7 (64-bit)
- Debian 11.6 (64-bit)
- Debian 11.5 (64-bit)
- Debian 11.4 (64-bit)
- Debian 11.3 (64-bit)
- Debian 11.2 (64-bit)
- Debian 11.1 (64-bit)
- Debian 11.0 (64-bit)
- Debian 10.13 (64-bit)
- Debian 10.12 (64-bit)
- Debian 10.11 (64-bit)
- Debian 10.10 (64-bit)
- Debian 10.9 (64-bit)
- Debian 10.8 (64-bit)
- Debian 10.7 (64-bit)
- Debian 10.6 (64-bit)
- Debian 10.5 (64-bit)
- Debian 10.4 (64-bit)
- Debian 10.3 (64-bit)
- Debian 10.2 (64-bit)
- Debian 10.1 (64-bit)
- Ubuntu 22.04 Server LTS (x64)
- Ubuntu 20.04 Server (x64)
- Ubuntu 18.04 Server (x64)
- Ubuntu 16.04 Server (x64)
- SUSE Linux Enterprise Server 15 SP4 (x64)
- SUSE Linux Enterprise Server 15 SP3 (x64)
- SUSE Linux Enterprise Server 15 SP2 (x64)
- SUSE Linux Enterprise Server 15 SP1 (x64)
- SUSE Linux Enterprise Server 12 SP5 (x64)
- SUSE Linux Enterprise Server 12 SP4 (x64)
- SUSE Linux Enterprise Server 12 SP3 (x64)
- Red Hat Enterprise Linux 9.2 (x64)

- Red Hat Enterprise Linux 9.1 (x64)
- Red Hat Enterprise Linux 9.0 (x64)
- Red Hat Enterprise Linux 8.6 (x64)
- Red Hat Enterprise Linux 8.5 (x64)
- Red Hat Enterprise Linux 8.4 (x64)
- Red Hat Enterprise Linux 8.3 (x64)
- Red Hat Enterprise Linux 8.2 (x64)
- Red Hat Enterprise Linux 8.1 (x64)
- Red Hat Enterprise Linux 8.0 (x64)
- Red Hat Enterprise Linux 7.9 (x64)
- Red Hat Enterprise Linux 7.8 (x64)
- Red Hat Enterprise Linux 7.7 (x64)
- Red Hat Enterprise Linux 7.6 (x64)
- Red Hat Enterprise Linux 7.5 (x64)
- Red Hat Enterprise Linux 7.4 (x64)
- CentOS Stream 9 (x64)
- CentOS Stream 8 (x64)
- CentOS Linux 8.4 (x64)
- CentOS Linux 8.3 (x64)
- CentOS Linux 8.2 (x64)
- CentOS Linux 8.1 (x64)
- CentOS Linux 8.0 (x64)
- CentOS Linux 7.9 (x64)
- CentOS Linux 7.8 (x64)
- CentOS Linux 7.7 (x64)
- CentOS Linux 7.6 (x64)
- CentOS Linux 7.5 (x64)
- CentOS Linux 7.4 (x64)
- CentOS Linux 7.3 (x64)
- CentOS Linux 7.2 (x64)
- CentOS Linux 7.1 (x64)
- CentOS Linux 7.0 (x64)

NAS

- ASUSTOR ADM v3.5-v4.1
- Netgear ReadyNAS OS v6.10.3
- Netgear ReadyNAS OS v6.9

- Synology DSM v6.0-v7.1.1
- QNAP QTS v4.3-v5.0
- QNAP QuTS Hero h4.5.3-v5.0
- WD MyCloud v5
- TrueNAS CORE v12-13

Supported Operating System Localizations

NAKIVO Backup & Replication can be installed on a supported OS with the following OS localization:

- English
- Italian
- German
- French
- Spanish

Networking Requirements

Required TCP Ports

NAKIVO Backup & Replication requires the following TCP ports to be open for a successful operation:

TCP Port (Default)	Where	Description
NAKIVO Backup & Replication		
4443	Director	Used to access the Director web UI. Must be opened on the Director machine.
9446	Transporter	Used by Director and Transporters to communicate with the Transporter. Must be opened on the Transporter machine.
9448 - 10000	Transporter	Used by Transporters for cross-Transporter data transfer. Must be opened on the Transporter machine.
VMware		
443	vCenter Server, ESXi host	Used by Director and Transporters to access VMware infrastructure. Must be opened on vCenter Servers and ESXi hosts.

902	ESXi host	Used by Transporters to access VMware infrastructure. Must be opened on ESXi hosts.
3260	Transporter, ESXi host	Used by Proxy Transporters to access VMware infrastructure during a Flash VM Boot. Must be opened on the Transporter machine and the ESXi host used as the target for a Flash VM Boot.
Hyper-V		
137 - 139	Hyper-V hosts	Used by Director to upload files and install configuration service. Must be opened on Hyper-V servers.
445	Hyper-V hosts	Used by Director to upload files and install configuration service.
5986 (opens automatically)	Hyper-V hosts	Used by Transporter to add a host to inventory and establish a connection with it.
9445 (opens automatically)	Hyper-V hosts	Used by Director to upload files and install configuration service. Must be opened on Hyper-V host if NAKIVO Backup & Replication is installed on a host and this host is added to inventory simultaneously.
9446 (opens automatically)	Hyper-V hosts	Used by Director and Transporters to communicate with the Transporter. Must be opened on Used by Transporters for cross-Transporter data transfer. Must be opened on the Transporter machine. the Transporter machine.
9448 -10000 (opens automatically)	Hyper-V hosts	Used by Transporters for cross-Transporter data transfer. Must be opened on the Transporter machine.
Physical machine (Windows)		
445	Windows machine	Used by Director to upload files and install configuration service via SMB.
9446 (opens automatically)	Windows machine	Used to create the Transporter installed by default.

Physical machine (Linux)		
22	Linux machine	Used by Director to access a Linux physical machine via SSH.
9446 (opens auto-matically)	Linux machine	Used to create the Transporter installed by default.

Network Conditions

NAKIVO Backup & Replication has been tested to work in the following minimal network conditions:

- **Latency (RTT)**: Up to 250 ms
- **Packet loss**: Up to 1 %
- **Bandwidth**: 1 Mb/s or higher
- **ICMP ping traffic:** It should be allowed on all hosts on which NAKIVO Backup & Replication components are installed as well as on all source and target hosts.

Web Browsers

NAKIVO Backup & Replication user interface can be accessed through the following web browsers:

- Google Chrome: Version 80
- Mozilla Firefox: Version 74

Supported ASUSTOR NAS Devices

NAKIVO Backup & Replication supports the following ASUSTOR NAS devices :

Director and Onboard Transporter

- AS3102T
- AS3102T v2
- AS3104T
- AS3202T
- AS3204T
- AS3204T v2
- AS4002T
- AS4004T
- AS5202T
- AS5304T
- AS5002T
- AS5004T
- AS5008T
- AS5010T
- AS6102T
- AS6104T
- AS6302T
- AS5102T
- AS5104T
- AS5108T
- AS5110T
- AS6202T
- AS6204T
- AS6208T
- AS6210T
- AS6404T
- AS6204RS / AS6204RD
- AS-609RS / AS-609RD
- AS7004T
- AS7008T
- AS7010T
- AS6212RD
- AS7009RD / AS7009RDX
- AS7012RD / AS7012RDX
- AS-602T
- AS-604RS / AS-604RD
- AS-604T

- AS-606T
- AS-608T
- AS6508T
- AS6510T
- AS7110T
- AS6602T
- AS6604T
- AS7116RDX
- AS7112RDX
- AS1102T
- AS1104T
- AS3302T
- AS3304T
- AS6504RD
- AS6504RS
- AS6512RD
- AS6508T
- AS6510T
- AS7110T
- AS6602T
- AS6604T
- AS7116RDX
- AS7112RDX

Transporter Only

- AS1002T
- AS1002T v2
- AS1004T
- AS1004T v2

For minimum hardware requirements, refer to “Network Attached Storage” on page 66.

Supported NETGEAR NAS Devices

NAKIVO Backup & Replication supports the following NETGEAR NAS devices:

Director and Onboard Transporter

- RN51600
- RN51661D
- RN51661E
- RN51662D
- RN51662E
- RN51663D
- RN51663E
- RN51664E
- ReadyNAS 524X
- ReadyNAS 526X
- ReadyNAS 528X
- ReadyNAS 626X
- ReadyNAS 628X
- RN716X
- RN628X
- RN626X
- RN528X
- RN526X
- RN524X
- RN31600
- RN31661D
- RN31661E
- RN31662D
- RN31662E
- RN31663D
- RN31663E
- RN31664E
- ReadyNAS 422
- ReadyNAS 424
- ReadyNAS 426
- ReadyNAS 428
- RN516
- RN426
- RN424
- RN422
- RN31400
- RN31421D

- RN31441D
- RN31441E
- RN31442D
- RN31442E
- RN31443D
- RN31443E
- RN316
- RN31200
- RN31211D
- RN31212D
- RN31221D
- RN31221E
- RN31222D
- RN31222E
- RN31223D
- RN314
- RN312
- RN322121E
- RN322122E
- RN322123E
- RN322124E
- RN32261E
- RN32262E
- RN32263E
- RN4220S
- RN4220X
- RN422X122
- RN422X123
- RN422X124
- RN422X62E
- RN422X63E
- RN422X64E
- RR2304
- RN21241D
- RN21241E
- RN21243D
- RN21243E
- RN3130
- RN31342E
- RN3138
- RN3220
- RR2312
- RR3312

- RN4220
- RR4312X
- RR4312S
- RR4360X
- RR4360S
- RN202
- RN204
- RN212
- RN214
- RN2120

Transporter Only

- RN102
- RN10200
- RN10211D
- RN10221D
- RN10222D
- RN10223D
- RN104
- RN10400
- RN10421D
- RN10441D
- RN10442D
- RN10443D

For minimum hardware requirements, refer to “Network Attached Storage” on page 66

Supported QNAP NAS Devices

NAKIVO Backup & Replication supports the following QNAP NAS Devices:

Director and Onboard Transporter

- HS-251+
- HS-453DX
- TS-251
- TS-251+
- TS-251A
- TS-251B
- TS-253Be
- TS-328
- TS-332X
- TS-351
- TS-431P
- TS-431P2
- TS-431X
- TS-431X2
- TS-431XeU
- TS-432XU
- TS-432XU-RP
- TS-451
- TS-451+
- TS-451A
- IS-400 Pro
- IS-453S
- TBS-453A
- TBS-453DX
- TS-128A
- TS-131P
- TS-231P
- TS-231P2
- TS-253 Pro
- TS-253A
- TS-253B
- TS-228A
- TS-451U
- TS-453 mini
- TS-453 Pro
- TS-453A
- TS-453B

- TS-453Be
- TS-453Bmini
- TS-453BT3
- TS-453BU
- TS-453BU-RP
- TS-453U
- TS-453U-RP
- TS-463U
- TS-463U-RP
- TS-463XU
- TS-463XU-RP
- TS-473
- TS-563
- TS-653 Pro
- TS-653A
- TS-653B
- TS-653B
- TS-673
- TS-677
- TS-832X
- TS-832XU
- TS-832XU-RP
- TS-853 Pro
- TS-853A
- TS-853BU
- TS-853BU-RP
- TS-853U
- TS-853U-RP
- TS-863U
- TS-863U-RP
- TS-863XU
- TS-863XU-RP
- TS-873
- TS-873U
- TS-873U-RP
- TS-877
- TS-877XU
- TS-877XU-RP
- TS-883XU
- TS-883XU-RP
- TS-932X
- TS-963X
- TS-977XU

- TS-977XU-RP
- TS-983XU
- TS-983XU-RP
- TS-1232XU
- TS-1232XU-RP
- TS-1253BU
- TS-1253BU-RP
- TS-1253U
- TS-1253U-RP
- TS-1263U-RP
- TS-1263U
- TS-1263XU
- TS-1263XU-RP
- TS-1273U
- TS-1273U-RP
- TS-1277
- TS-1277XU-RP
- TS-1283XU-RP
- TS-1635AX
- TS-1673U
- TS-1673U-RP
- TS-1677X
- TS-1677XU-RP
- TS-1683XU-RP
- TS-1685
- TS-2477XU-RP
- TS-2483XU-RP
- TVS-463
- TVS-471
- TVS-472XT
- TVS-473e
- TVS-473
- TVS-663
- TVS-671
- TVS-672XT
- TVS-673
- TVS-673e
- TVS-682
- TVS-682T
- TVS-863
- TVS-863+
- TVS-871
- TVS-871T

- TVS-871U-RP
- TVS-872XT
- TVS-872XU
- TVS-872XU-RP
- TVS-873e
- TVS-873
- TVS-882
- TVS-882T
- TVS-882ST2
- TVS-882BR
- TVS-882BRT3
- TVS-882ST3
- TVS-951X
- TVS-972XU
- TVS-972XU-RP
- TVS-1271U-RP
- TVS-1272XU-RP
- TVS-1282
- TVS-1282T
- TVS-1282T3
- TVS-1582TU
- TVS-1672XU-RP
- TVS-2472XU-RP
- SS-EC1279U-SAS-RP
- SS-EC1879U-SAS-RP
- SS-EC2479U-SAS-RP
- TDS-16489U
- TES-3085U
- TES-1885U
- TS-EC880U
- TS-EC880U R2
- TS-EC1280U
- TS-EC1280U R2
- TS-EC1680U
- TS-EC1680U R2
- TS-EC2480U
- TS-EC2480U R2
- TVS-EC880
- TVS-EC1080
- TVS-EC1080+
- TVS-EC1280U-SAS-RP
- TVS-EC1580MU-SAS-RP
- TVS-EC1680U-SAS-RP

- TVS-EC1680U-SAS-RP R2
- TVS-EC2480U-SAS-RP
- TVS-EC2480U-SAS-RP R2
- TVS-EC2480U-SAS-RP R2
- TVS-EC1580MU-SAS-RP R2
- TVS-EC1280U-SAS-RP R2
- TDS-16489U-SE1-R2
- TDS-16489U-SE2-R2
- TDS-16489U-SF2-R2
- TDS-16489U-SF3-R2
- TS-2888X-W2195-512G
- TS-2888X-W2195-256G
- TS-2888X-W2195-128G
- TS-2888X-W2175-512G
- TS-2888X-W2175-256G
- TS-2888X-W2175-128G
- TS-2888X-W2145-512G
- TS-2888X-W2145-256G
- TS-2888X-W2145-128G
- TS-2888X-W2133-64G
- TS-2888X-W2123-32G
- ES2486dc
- TS-1886XU-RP
- TS-230
- TS-251C
- TS-251D
- TS-253D
- TS-451DeU
- TS-453D
- TS-653B
- TS-653D
- TS-h1277XU-RP
- TS-h1283XU-RP
- TS-h977XU-RP
- TVS-472XT-PT
- TVS-672N
- TVS-872N
- TVS-EC2480U-SAS-RP-R2
- TS-431P3
- TS-231P3
- TS-431X3
- TS-h686-D1602
- TS-h886-D1622

- TS-873AU
- TS-873AU-RP
- TS-1273AU-RP
- TS-1673AU-RP
- TS-932PX
- GM-1001
- TS-432PXU
- TS-432PXU-RP
- TS-832PXU
- TS-832PXU-RP
- TS-1232PXU-RP
- TS-451D2
- TS-h2490FU-7232P-64G
- TS-h2490FU-7302P-128G
- TS-h1886XU-RP
- TS-h1683XU-RP
- TS-h2483XU-RP
- TVS-h1288X
- TVS-h1688X
- TS-h973AX-8G
- TS-h973AX-32G
- TS-832PX
- TS-h3088XU-RP-W1270-64G
- TS-h3088XU-RP-W1250-32G
- TS-453DU-4G
- TS-473A
- TS-673A
- TS-873A
- TS-EC879U-RP
- TS-831X-4G
- TS-831X-8G
- TS-831X-16G
- TS-EC879U-RP
- TS-h987XU-RP
- TS-h3077AFU
- TS-h1277AXU-RP
- TS-h1677AXU-RP
- TVS-h674T
- TVS-h874T
- TBS-574TX
- TS-AI642
- TS-855X

Transporter Only

- TS-131P
- TS-231P
- TS-431P
- TS-431X

For minimum hardware requirements, refer to “Network Attached Storage” on page 66.

Supported Synology NAS Devices

NAKIVO Backup & Replication supports the following Synology NAS devices:

Director and Onboard Transporter

- FS3017
- FS2017
- FS1018
- RS18017xs+
- RS18016xs+
- RS10613xs+
- RS4017xs+
- RS3618xs
- RS3617xs+
- RS3617RPxs
- RS3617xs
- RS3614xs+
- RS3614RPxs
- RS3614xs
- RS3413xs+
- RS3412RPxs
- RS3412xs
- RS3411RPxs
- RS3411xs
- RS2818RP+
- RS2418RP+
- RS2418+
- RS2416RP+
- RS2416+
- RS2414RP+
- RS2414+
- RS2212RP+
- RS2212+
- RS2211RP+
- RS2211+
- RS1619xs+
- RS1219+
- RS818RP+
- RS818+
- RS816
- RS815RP+
- RS815+

- RS815
- RS814RP+
- RS814+
- RS814
- RS812RP+
- RS812+
- RS810RP+
- RS810+
- RC18015xs+
- DS3617xs
- DS3615xs
- DS3612xs
- DS3611xs
- DS3018xs
- DS2415+
- DS2413+
- DS2411+
- DS2015xs
- DS1819+
- DS1817+
- DS1817
- DS1815+
- DS1813+
- DS1812+
- DS1618+
- DS1517+
- DS1517
- DS1515+
- DS1515
- DS1513+
- DS1512+
- DS1511+
- DS918+
- DS916+
- DS718+
- DS716+II
- DS716+
- DS715
- DS713+
- DS712+
- DS710+
- DS418
- DS418play

- DS418j
- DS416
- DS416play
- DS415+
- DS414
- DS412+
- DS411+II
- DS411+
- DS218+
- DS218
- DS218play
- DS216+II
- DS216+
- DS216play
- DS215+
- DS214+
- DS118
- DS116
- DS1019+
- DS2419+
- DS420+
- DS420j
- DS620slim
- DS720+
- DS920+
- FS3400
- FS3600
- FS6400
- RS819
- RS820+
- RS820RP+
- SA3200D
- SA3400
- SA3600
- DS1520+
- DS1621+
- DS1621xs+
- DS1821+
- DS220
- RS1221+
- RS1221RP+
- RS2421+
- RS2421RP+

- RS4021xs+

Transporter Only

- RS217
- RS214
- DS416slim
- DS416j
- DS414slim
- DS414j
- DS218j
- DS216
- DS216j
- DS215j
- DS214
- DS213j
- DS115
- DS114
- DS220j
- DS419slim

Important

For minimum hardware requirements, refer to “Network Attached Storage” on page 66.

Supported Western Digital NAS Devices

NAKIVO Backup & Replication supports the following Western Digital NAS devices for Director and Onboard installation:

- MyCloud DL2100
- MyCloud DL4100
- MyCloud PR2100
- MyCloud PR4100

For minimum hardware requirements, refer to "Network Attached Storage" on page 66.

Feature Requirements

Some NAKIVO Backup & Replication features require certain conditions in order to function properly. To learn about the limitations of NAKIVO Backup & Replication, refer to the Feature Limitations section of the latest Release Notes. The requirements for product features are listed below.

- Auto-Update
- Object Recovery and Log Truncation for Microsoft Exchange Server
- Object Recovery and Log Truncation for Microsoft SQL Server
- Object Recovery for Microsoft Active Directory
- VM Limitation for Multi-Tenancy
- External Database
- Merge Jobs
- MSP Console

Auto-Update

Auto-update is available for instances of NAKIVO Backup & Replication installed on the following operating systems:

- Linux
- Windows

Note

Auto-update is not supported for NAS systems.

Auto-update is available for the following types of Transporters:

- Auto-injected Transporters on Linux (includes physical Transporters)
- Manually installed Transporters on Linux
- Auto-injected Transporters on Windows (includes Hyper-V and physical Transporters)

- Manually installed Transporters on Windows
- Auto-injected Transporters in AWS (Linux)
- Auto-injected Transporter in VMware (Linux)

Note
Manually installed Transporters on Linux and Windows must be v10.8 or newer to support auto-update.

Before initiating an auto-update, make sure that the following conditions are met:

- If updating a manually installed Transporter on Linux or Windows, make sure that you have configured a **Master Password** for the Transporter in the Managing Credentials menu.
- At least 1 GB of free space is available on the machine on which the full solution is installed.
- If you have a perpetual license, your Maintenance & Support period is active. You can verify this on the product Licensing page.

Object Recovery and Log Truncation for Microsoft Exchange

To successfully perform object recovery and log truncation for Microsoft Exchange, make sure you meet the following requirements:

Supported Microsoft Exchange versions

NAKIVO Backup & Replication supports the following versions of Microsoft Exchange for object recovery and log truncation:

- Microsoft Exchange 2019
- Microsoft Exchange 2016
- Microsoft Exchange 2013

Permissions

The following requirements should be met for log truncation:

- Selected users should have permissions to "Log on as a batch job".
- Active Directory Module For Windows PowerShell must be installed.
- The VM must be accessible over network.
- The following user permissions should be provided:
    - If NAKIVO Backup & Replication uses the administrator user account, it should belong to the following groups:
        - Administrators
        - Domain Users
        - Organization Management
    - If NAKIVO Backup & Replication uses accounts other than the `administrator` user account:

- The user should belong to the following groups:
  - Administrators
  - Domain Users
  - Organizational Management
- The user should have the Full control permission granted for the folder in which the Exchange database is located.

Services and Settings

NAKIVO Backup & Replication requires PowerShell v2 or later to be available on the Microsoft Exchange machine.

- VMware VM must be running on VMware ESXi 5.0 and later.
- VMware Tools or Hyper-V Integration Services must be running on VMware or Hyper-V VMs correspondingly.

Object Recovery and Log Truncation for Microsoft SQL Server

To successfully perform object recovery and log truncation for a Microsoft SQL Server, you must meet general requirements as well as requirements for object recovery and log truncation.

General Requirements

To successfully perform object recovery and log truncation for a Microsoft SQL Server, make sure you meet the following general requirements:

Supported Versions of Microsoft SQL Server

NAKIVO Backup & Replication supports the following versions of Microsoft SQL Server for object recovery and log truncation:

- Microsoft SQL Server 2022
- Microsoft SQL Server 2019
- Microsoft SQL Server 2017
- Microsoft SQL Server 2016
- Microsoft SQL Server 2014
- Microsoft SQL Server 2012

Permissions

- A user logging in to Microsoft SQL Server must have a `sysadmin` role.
- The user running Microsoft SQL Service should have permissions to "Log on as a batch job".

Services and Settings

- NAKIVO Backup & Replication requires PowerShell v2 or later.
- VMware Tools or Hyper-V Integration Services must be running on VMware or Hyper-V VMs correspondingly.
- `sqlcmd` utility must be installed on the machine running Microsoft SQL server.

- Ports 137-139 must be opened for `cifs`.
- The SMB 2 protocol should be enabled.

Requirements for Microsoft SQL Server Object Recovery

- The user running Microsoft SQL service must have executive permissions to the `Data` folder and all other folders in which the databases are located.
- If "Rename recovered item if such item exists" option is selected during the recovery, NAKIVO Backup & Replication skips keys, constraints, indexes, and statistical properties when recovering a table to an original location.
- If "Overwrite the original item if such item exists" option is chosen, all the above properties are preserved. Tables that contain a foreign key cannot be recovered with this option.
- Full administrative permissions are required.
- Default administrative shares must be enabled.
- The "File server" role must be enabled.
- Ports 445 and 9445 must be opened on the instance.

Requirements for Microsoft SQL Server Log Truncation

- VMware VM must be running on VMware ESXi 5.0 and later.
- System databases are skipped during the log truncation.
- Databases with the "Simple" recovery model are skipped during the log truncation.
- A database must be in the "online" state.
- The SMB 2 protocol should be enabled.

Object Recovery for Microsoft Active Directory

Supported Versions

NAKIVO Backup & Replication supports the following versions of Microsoft Active Directory for objects recovery:

- Windows Server 2022 (21H2)
- Windows Server 20H2 (20H2)
- Windows Server 2019
- Windows Server 2016
- Windows Server 2012 R2
- Windows Server 2012

Requirements for Object Recovery for Microsoft Active Directory

- The ISCI Initiator service must be running on the recovery server.
- The vc_redist.x86.exe (v.2015) file must be installed on the recovery server.
- Active Directory Web Services must be running.
- Port 5000 must not be blocked by other services and must be opened in the firewall of AD.
- Active Directory Module For Windows PowerShell must be installed.

The following platforms are supported:

- VMware vSphere (including Free ESXi)
- Physical machines (Windows, Linux)
- NAS systems

Requirements

To use Direct Connect, the Transporter must be installed on one of the following operating systems:

- Windows
- Linux
- NAS

Direct Connect supports the following Nodes:

- Onboard Transporter
- Installed service
- VMware vSphere appliance

Note

Direct Connect is not supported for Onboard Transporters located on NAS devices.

The following deployment scenarios are supported:

- Director and Transporter(s) installed at the MSP's site and more than one Direct Connect Transporter installed at each tenant site.
- Primary repository at the tenant's site (managed by one of the tenant's Transporters) and a secondary repository at the MSP's site.
- Backup Export
- Site Recovery

VM Limitation for Multi-Tenancy

The feature is only available if a license with Socket limit mode is installed.

The following hypervisors are supported:

- VMware vSphere
- VMware Cloud Director
- Microsoft Hyper-V
- Nutanix AHV
- **CPU**: x86-64, 4+ cores
- **RAM**: 8 GB
- **Disk Free Space**: 5 GB

External Database

The following external databases are supported:

- PostgreSQL v10-15

The following system requirements apply to the machine housing the external database:

- **CPU**: x86-64, 4+ cores
- **RAM**: 4-8+ GB
- **Free Space**: 50 GB
- **OS**: Windows and Linux operating systems.

Notes

- Using SSD is highly recommended.
- The external database can be created on a physical machine or VM or stored in a container.
- Database migration is supported for both the single-tenant and multi-tenant modes of the solution. However, only the Master Admin can perform database migration in multi-tenant mode.
- All tenants share the same database server after the migration, but each tenant has a separate database.
- All tenant databases must be the same type as the database of the Master Admin.
- Some NAS devices may already contain the PostgreSQL as inbox package.

Merge Jobs

The feature supports the following types of jobs:

- Backup
- Backup copy
- Replication

Job merging can be performed in the following cases:

- Both source and target jobs are of the same type and platform.
- The source job is in an idle state.

Job merging cannot be performed in the following cases:

- One of the selected jobs is a backup copy job with the destination set to tape.
- The target job uses the **Policies** view.
- The Transporter selection settings of the target job cannot be applied to the source job objects.
- Both source and target jobs contain or reference the same workload.

MSP Console

To use the **MSP Console** feature, the managed service provider (MSP) needs to configure the following TCP ports:

- **MSP Director port**: This is the TCP port used by the Director for the MSP's instance of NAKIVO Backup & Replication. By default, this is TCP port 4443. The MSP must provide a remote tenant with their Director port number during configuration. The remote tenant needs to enter this port number when adding the MSP.
- **Listening port**: Additionally, the MSP must have a port open for listening to the remote tenant. By default, TCP port 6702 is used. The MSP may change the listening port used by changing the **system.msp.console.listening.port** parameter in Expert settings.
- Antivirus software must be running on the scan server. The antivirus services must be started after installation.
- The firewall must be disabled on the scan server.
- Special permissions must be configured for NAKIVO Backup & Replication recovery service.
- iSCSI must be available on the scan server.
- TCP port 9445 must not be blocked.

Linux OS:

- SSH using port 22 must be enabled on the scan servers using Linux OS.
- - - Make sure to install and run Clam AV on Linux server.
  - - Sophos AV software is limited to the specific Linux operating systems.
- The following antivirus software is supported:
  - Microsoft Windows Defender:
    - Antimalware Client Version: 4.10.14393 or higher
    - Engine Version: 1.1.12805 or higher
    - Must support the command line: *Scan -ScanType %type% -File %path% -DisableRemediation -BootSectorScan*
    - See more details here
  - - Make sure to turn off firewall in the settings of this antivirus software.

Installing NAKIVO Backup & Replication

Refer to the sections below to learn how to install NAKIVO Backup & Replication:

Deploying VMware Virtual Appliance

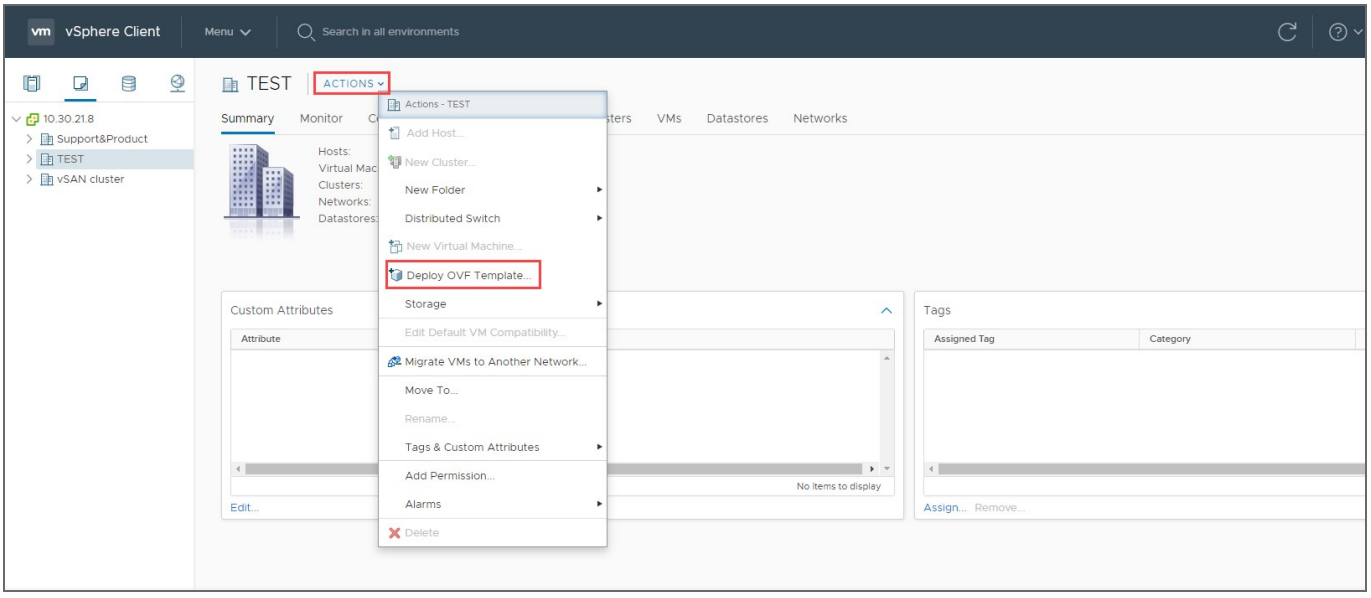
NAKIVO Backup & Replication offers the following VA deployment options:

- Full Solution
- Full Solution without Backup Repository
- Transporter-only
- Transporter with Backup Repository
- Multi-tenant Director

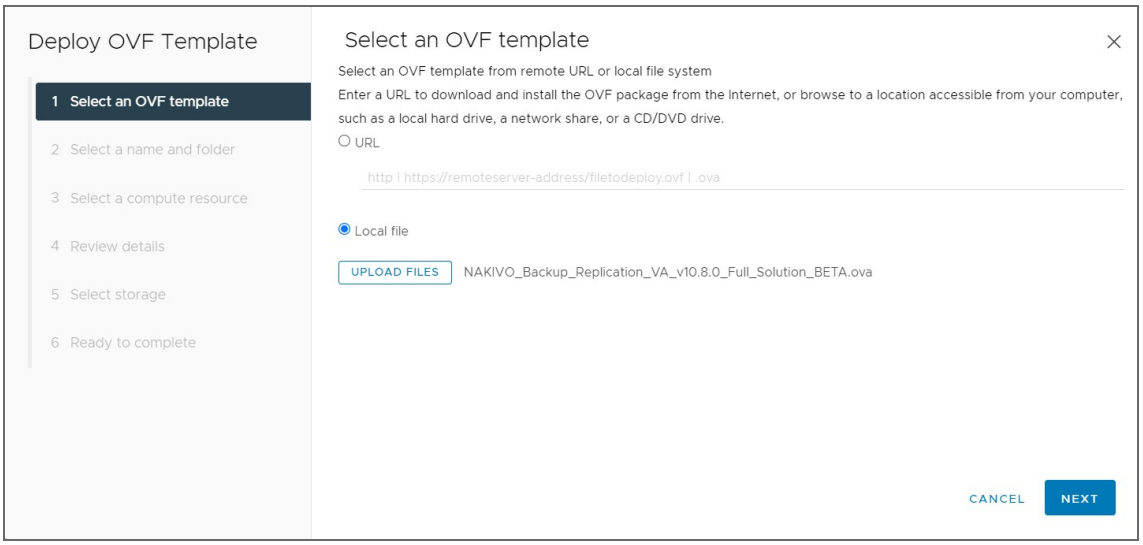
The Virtual Appliance (VA) has two disks: the first (30 GB) contains a Linux OS with NAKIVO Backup & Replication, and the second (500 GB) is used as a Backup Repository. If you deploy the Virtual Appliance disks using the **Thin Provision** option, then the disks will not reserve space on your datastore and will only consume space when actual data (such as your backups) is written to disks.

Deploying Virtual Appliance with vSphere Web Client

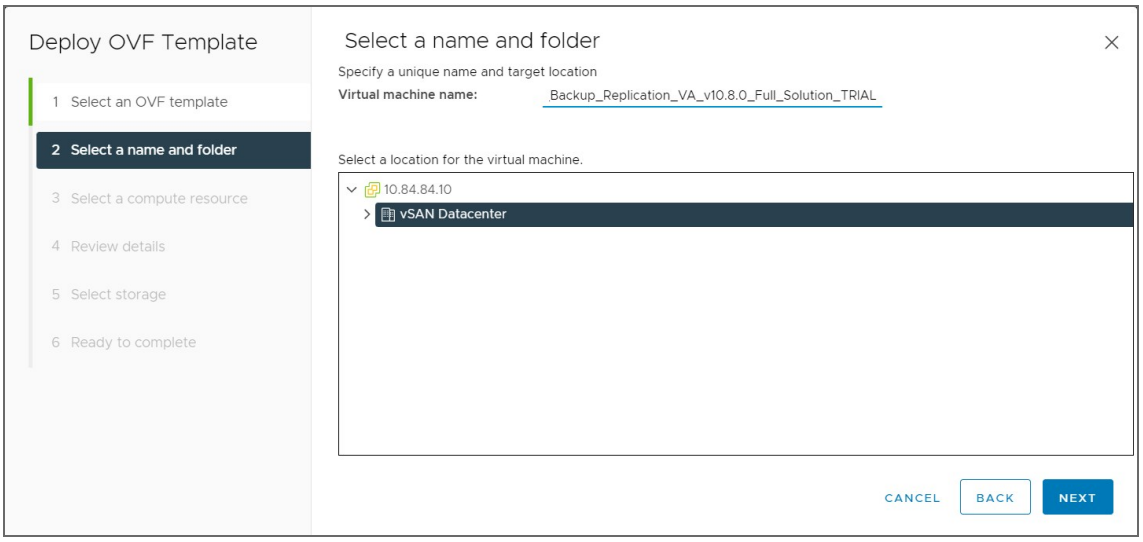
1. Download NAKIVO Backup & Replication VA.
2. Log in to your vSphere vCenter with the vSphere Web Client.
3. Select **Deploy OVF Template** from the **Actions** menu. Note that the Client Integration Plug-in must be installed to enable OVF functionality.



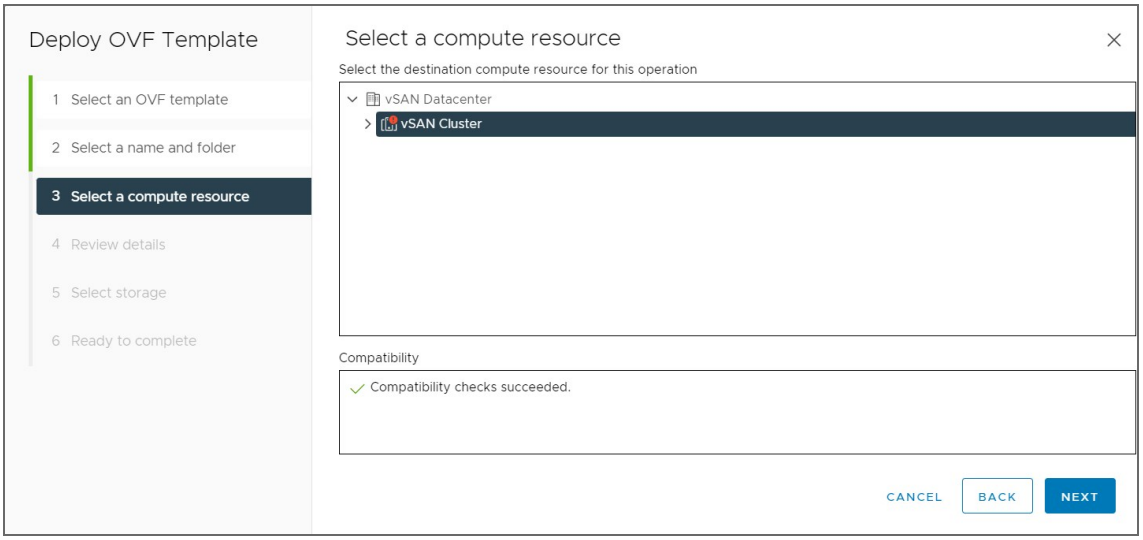
4. On the **Select an OVF template** page of the **Deploy OVF Template** wizard, select **Local file** and upload the VA file (.ova) you've downloaded. Click **Next**.



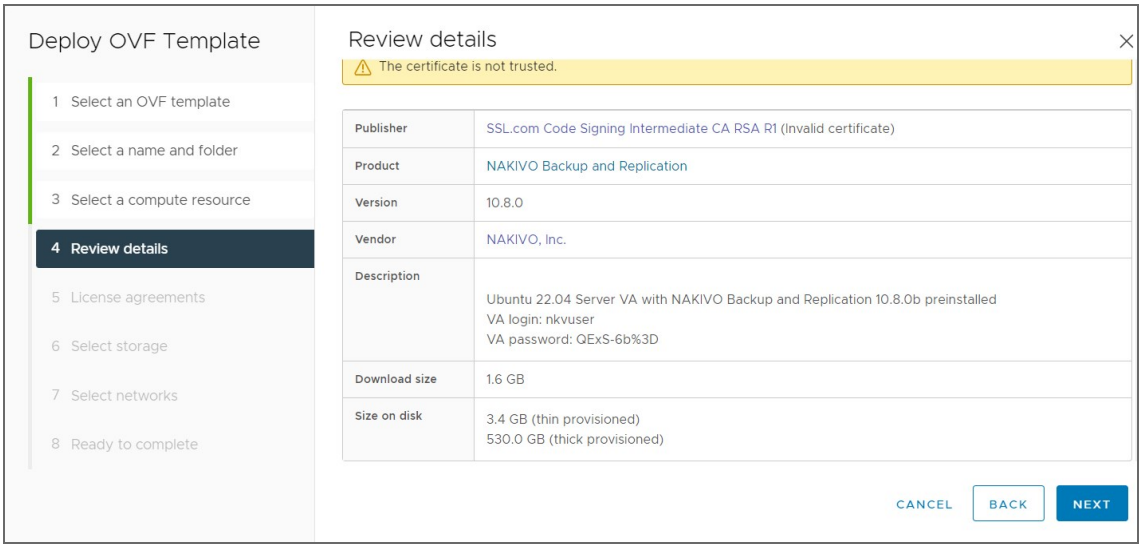
5. On the **Select a name and folder** page, specify a unique name and target location for the Virtual Appliance. Click **Next**.



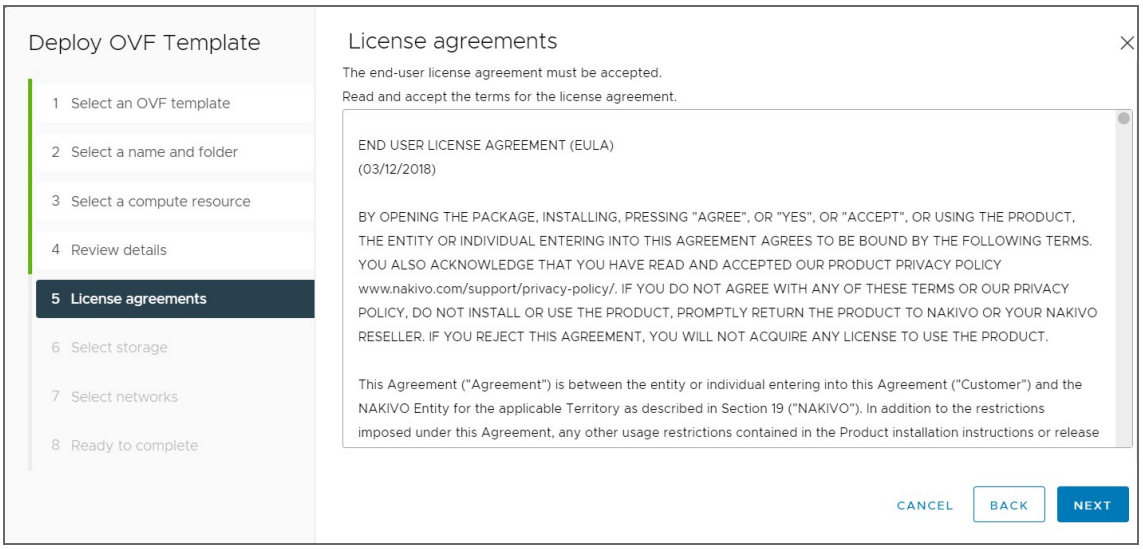
6. On the **Select a computer resource** page, select the resource pool within which you would like to deploy the Virtual Appliance and click **Next**.



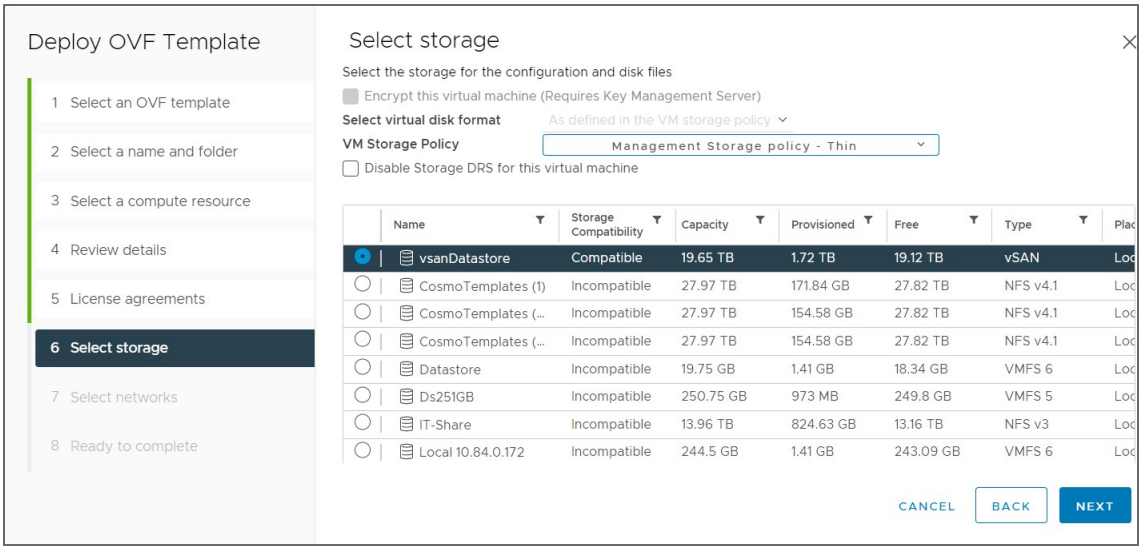
7. On the **Review details** page, review the template details and click **Next**.



8. On the **License agreements** page, read the end-user license agreement (EULA). If you agree to its terms, select **I accept all license agreements** and then click **Next**.



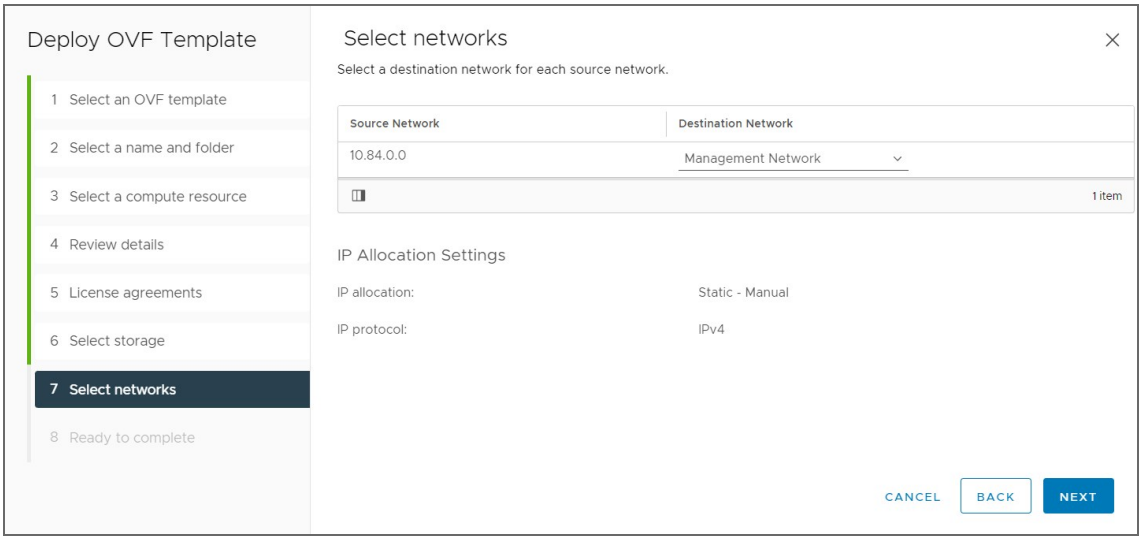
9. On the **Select storage** page, select a datastore in which you would like to keep the Virtual Appliance disk, virtual disk format (*Thin Provisioning* is recommended), VM storage policy and click **Next**.



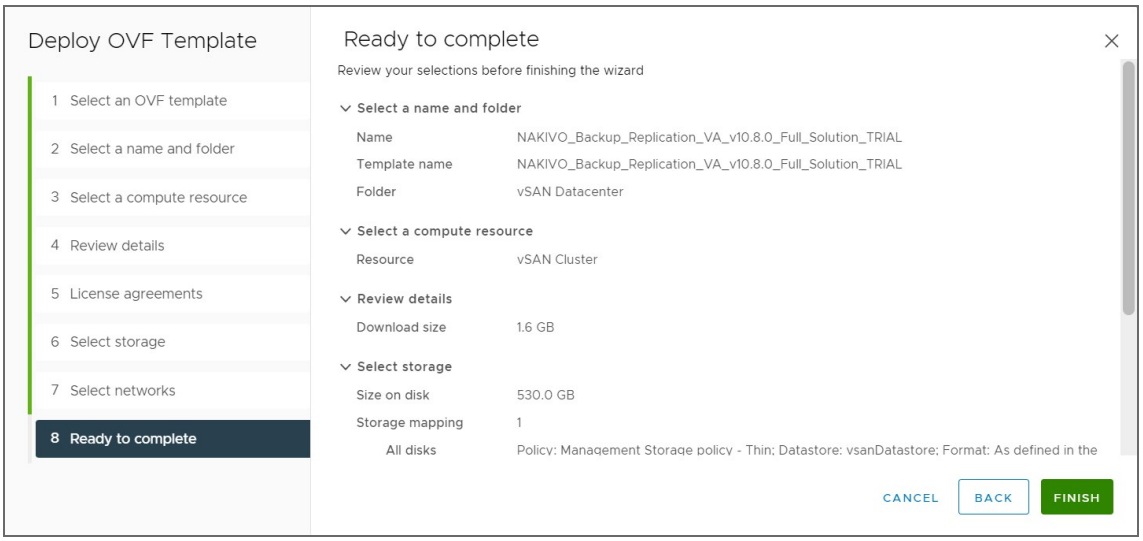
Important

If you use thick provisioning instead of thin provisioning, keep in mind that NAKIVO Backup & Replication can take up to 0,5 TB of data. Check to see if it is 0,5 TB by default for all cases.

10. On the **Select networks** page, select a network to which the Virtual Appliance will be connected. Opting for a network with DHCP and Internet access is recommended. Click **Next**.



11. On the **Ready to complete** page, review the summary of the setups you have configured and click **Finish** to complete deployment.



After the Virtual Appliance is deployed, you may need to configure it.

Important

If you plan to expose the Virtual Appliance to the Internet, change the default credentials and set up a login and password for the Web interface

Virtual Appliance OS, Credentials, and Security

The appliance runs Ubuntu 22.04, 64-bit. Use the following credentials to log in to the appliance:

- **Username**: nkvuser
- **Password**: QExS-6b%3D

For the versions of NAKIVO Backup & Replication older than 7.2, the password is `root`.

Important

- If you plan to expose the Virtual Appliance to the Internet, change the default VA credentials and set up a login and password for the Web interface.
- It is recommended to run an update on all packages in your Virtual Appliance at least once a month.

Web Interface Login

Open the following URL to access the product's web interface of the VA: `https://Appliance_VM_IP:4443`.

Refer to the Getting Started section to better understand how to continue working with NAKIVO Backup & Replication.

Deploying Nutanix AHV Virtual Appliance

Deploying Nutanix AHV Virtual Appliance

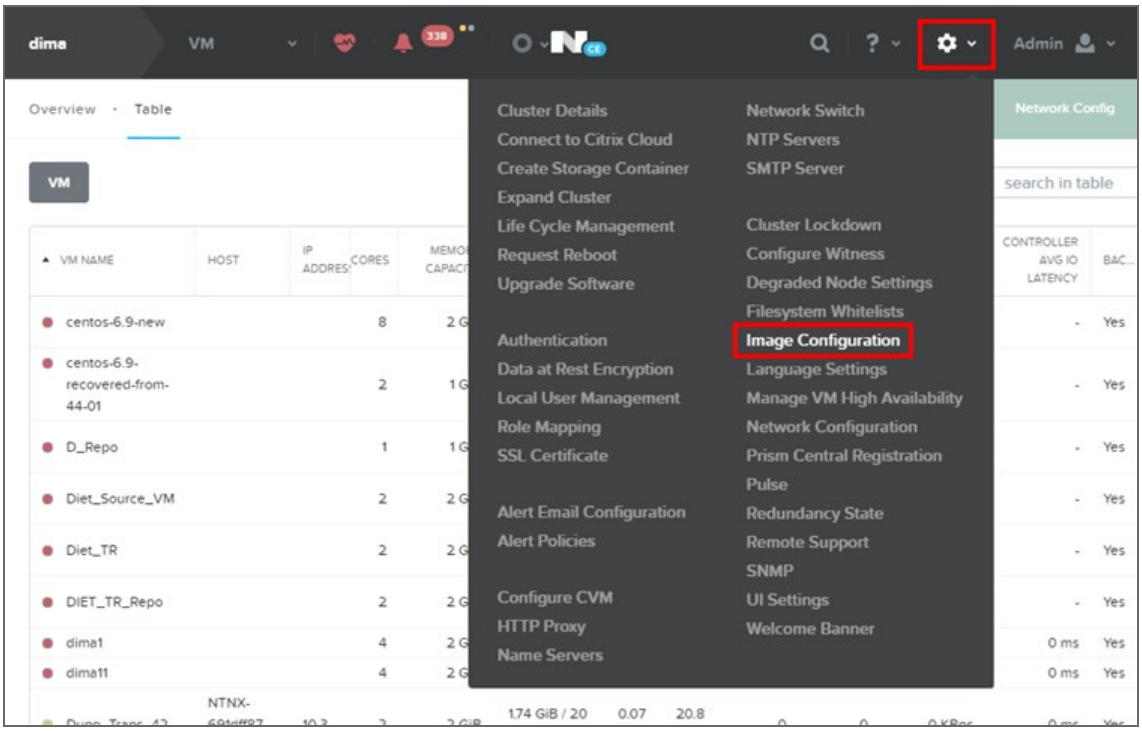
The NAKIVO Backup & Replication instance must be deployed in a Nutanix AHV cluster in order to enable backup and recovery functions.

NAKIVO Backup & Replication offers the following solutions:

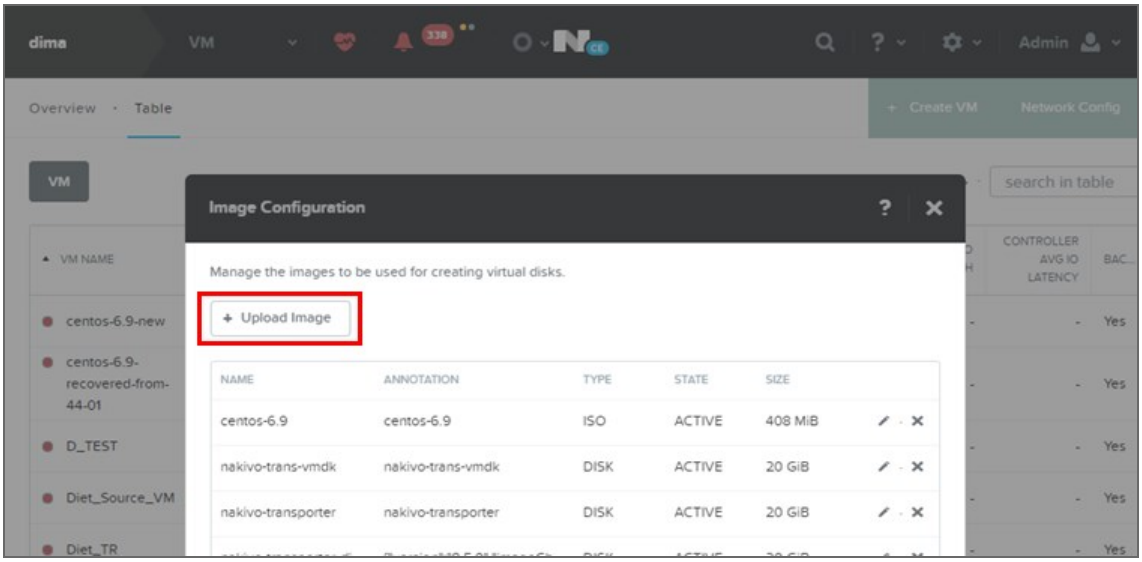
- Full Solution (Single Tenant) - requires a 100 GB thin provisioned disk
- Transporter-only - requires a 20 GB thin provisioned disk

To deploy a virtual appliance via the Nutanix Prism application, follow the steps below:

1. Download the .VMDK file with a full or transporter-only image from the Nakivo website and store it locally.
2. Log in to the Prism console.
3. From the **Configurations** menu, select **Image Configuration**.

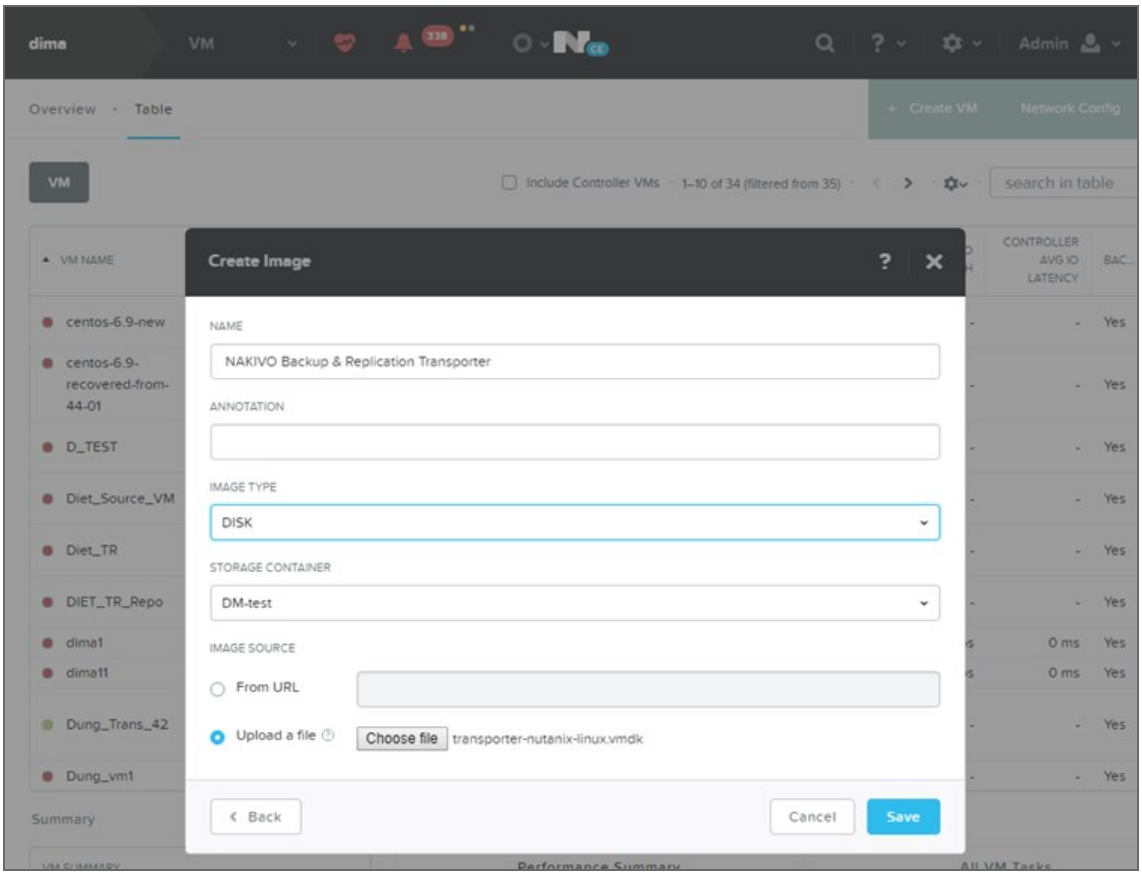


4. In the **Image Configuration** dialog, click **Upload Image**.

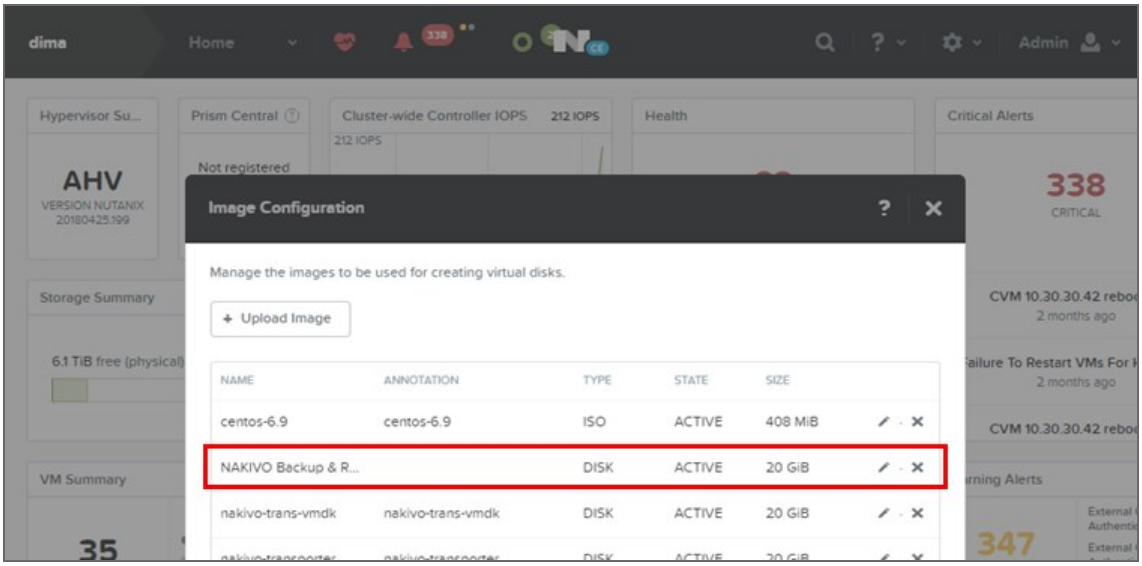


5. In the **Create Image** dialog, fill in the following options:
    - **Name**: Enter a name for the new image.
    - **Image Type**: From the drop-down list, select **DISK**.
    - **Storage Container**: Select the storage container you wish to use from the drop-down list. The list includes all storage containers created for this cluster. If there are no storage containers currently available, a **Create Storage Container** link is displayed.
    - **Image Source**: Click the **Upload a file** radio button to upload a file from your workstation. Click

the **Choose File** button and then select the file to upload from the file search window.



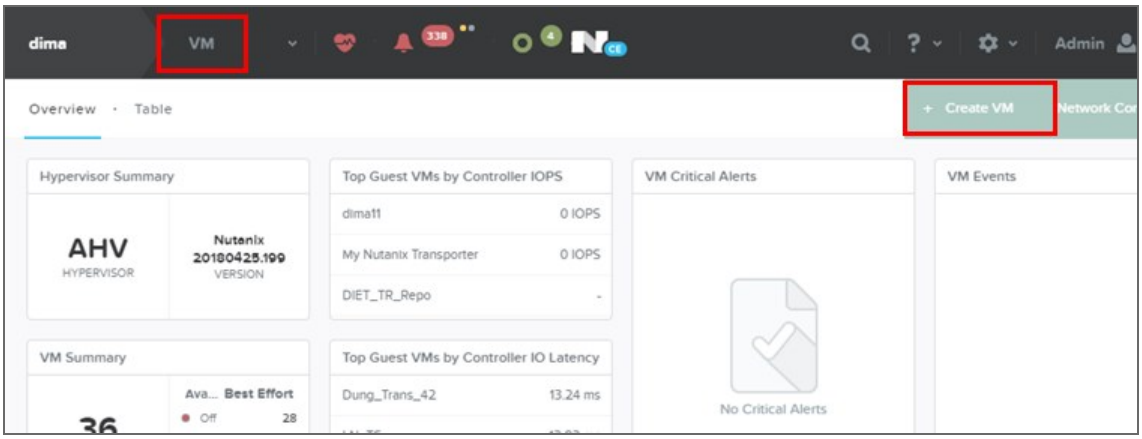
6. When all fields are correct, click the **Save** button.
   After the file uploading completes, the **Create Image** window closes and the **Image Configuration** window reappears with the new image present in the list.



Note

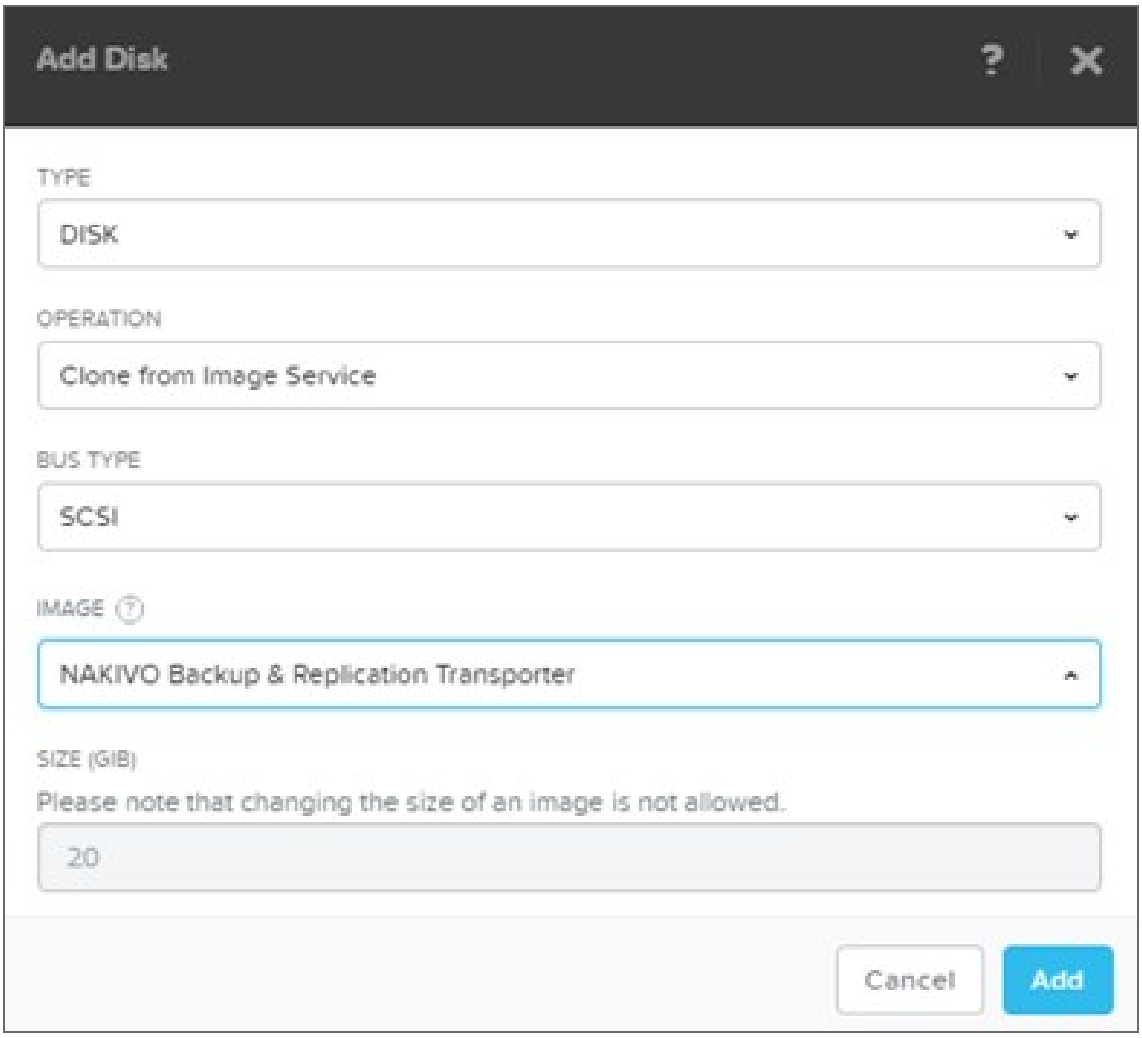
Make sure the status of the disk is **Active** before proceeding to the next step.

7. Close the **Image Configuration** window, go to the **VM** view and click **Create VM**.



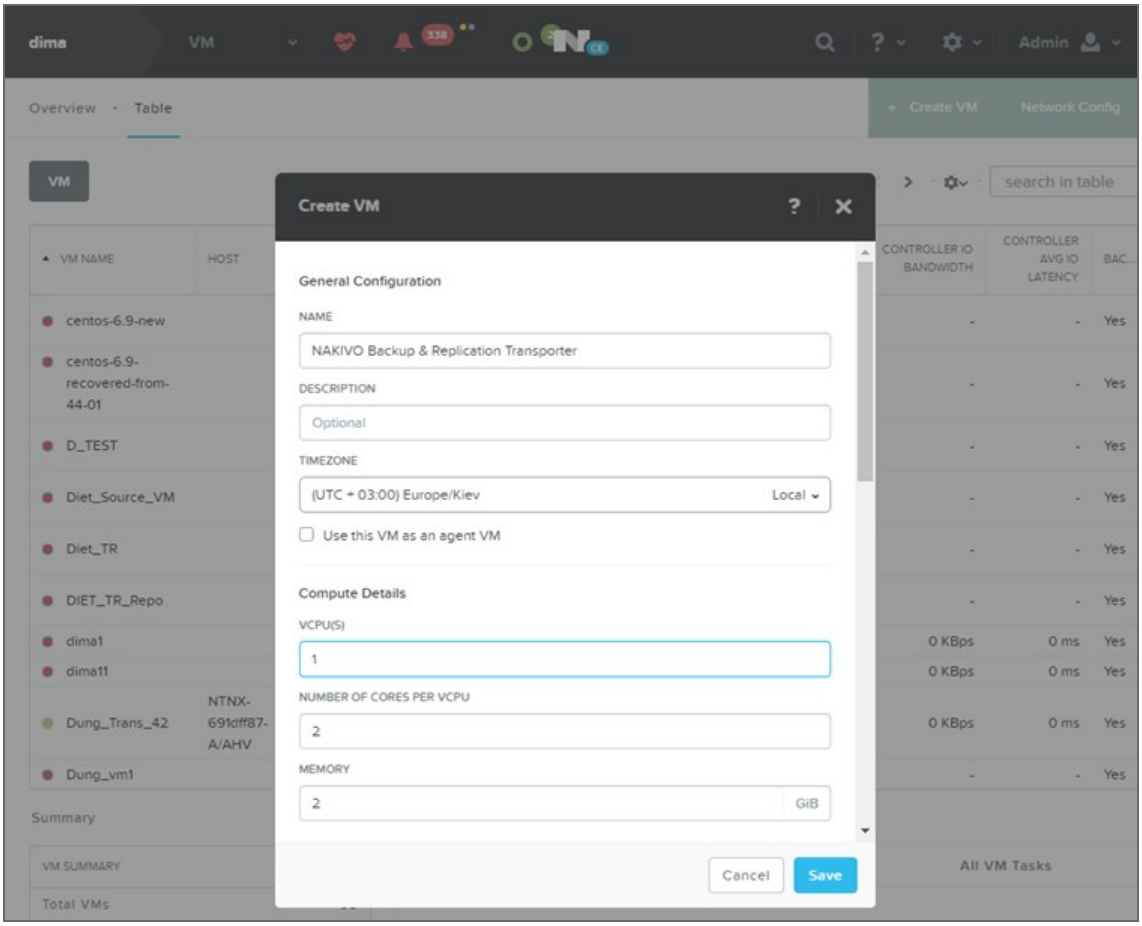
8. In the **Create VM** dialog, fill in the following options:
   - **Name**: Enter a name for the VM.
   - **vCPU(s)**: Enter the number of virtual CPUs to allocate to this VM (minimum 1).
   - **Number of Cores per vCPU**: Enter the number of cores assigned to each virtual CPU (minimum 2).
   - **Memory**: Enter the amount of memory (in GBs) to allocate to this VM (minimum 4 GB + 250 MB for each concurrent job for full solution/minimum 2 GB + 250 MB for each concurrent job Transporter-only solution).
   - In the **Disk** section, click **Add New Disk**, and specify the following settings in the **Add Disk** dialog:
     a. **Type**: Select **Disk**.
     b. **Operation**: Select **Clone from Image Service**.
     c. **Bus Type**: Select **SCSI**.

d. **Image**: Select your uploaded image from the list.

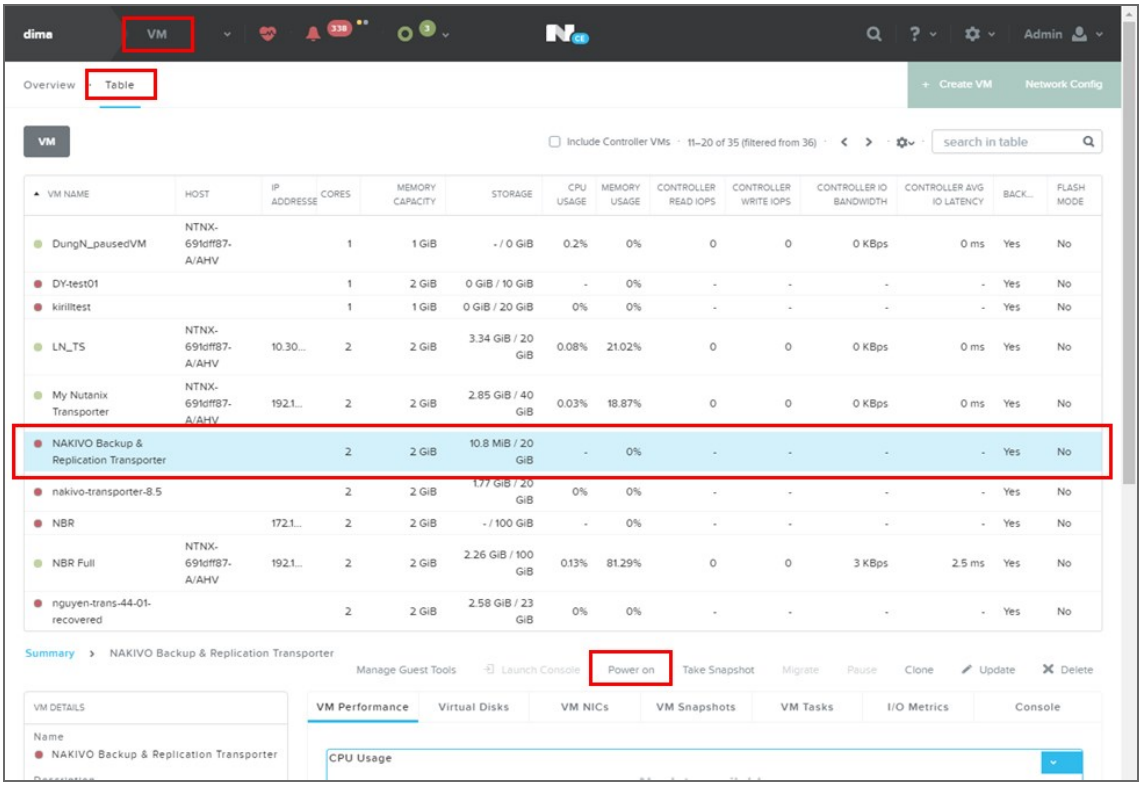


- In the **Network Adapters (NIC)** section, click **Add New NIC** and select an available VLAN from the list.

9. Click **Save**.



10. Wait until the process of VM creation is complete and locate your newly-created VM on the list.
11. Select your VM and click **Power On**.



12. After the Virtual Appliance is deployed and powered on, you may need to configure it.

Virtual Appliance OS, Credentials, and Security

The appliance runs Ubuntu 22.04, 64-bit. Use the following credentials to log in to the appliance:

- **Username**: nkvuser
- **Password**: QExS-6b%3D

For the versions of NAKIVO Backup & Replication older than 7.2, the password is `root`.

Important

- If you plan to expose the Virtual Appliance to the Internet, change the default VA credentials and set up a login and password for the Web interface.
- It is recommended to run an update on all packages in your Virtual Appliance at least once a month.

Web Interface Login

Open the following URL to access the product's web interface of the VA: `https://Appliance_VM_IP:4443`.

Refer to "Getting Started" on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Deploying Amazon Machine Image in Amazon EC2

You can deploy NAKIVO Backup & Replication as a pre-configured Amazon Machine Image (AMI) in Amazon EC2. After you complete the download form, you get a link to the AWS marketplace page where you can download the AMI.

Configuring AMI Parameters

Configure the following AMI parameters:

1. **Instance Type**: More powerful instances can process tasks faster and run more tasks simultaneously. The minimum requirement for NAKIVO Backup & Replication is the t2.micro instance type; the t2 medium instance type is recommended.
2. **Instance Details**: Assign a public IP to the instance if you wish to access the instance over the internet.
3. **Security Group**: Use the "All Traffic" rule or create a set of rules listed below:

Type	Port Range	Source	Description
SSH	2221	0.0.0.0/0	Enables remote SSH access to the instance
Custom TCP	80	0.0.0.0/0	Enables access to the web interface
Custom TCP	443	0.0.0.0/0	Required for local Transporter import
Custom TCP	902	0.0.0.0/0	Required for local Transporter import
Custom TCP	4443	0.0.0.0/0	Enables access to the web interface
Custom TCP	9446	0.0.0.0/0	Enables access to a remote Transporter
Custom TCP	9448-10000	0.0.0.0/0	Enables access to a remote Transporter
All ICMP	0-65535	0.0.0.0/0	Enables access to a remote Transporter

   Note

   Older AMIs may still use SSH Port 22 instead of 2221.

4. **Key pair**: Select an existing key pair or create a new key pair for your instance. If you select an existing key pair, make sure you have access to the private key file.

Note

The AMI deliverable uses Ubuntu 22.04 OS and a standalone EC2 instance with a Director and Transporter. Instead of the default system user **ubuntu**, the AMI uses the username **nkvuser**.

Refer to “Getting Started” on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Installing on Windows

NAKIVO Backup & Replication offers the following installation options for Windows machines:

- Full Solution
- Transporter-Only Solution
- Multi-Tenant Solution

After successful product installation, refer to the Getting Started section to learn how to continue working with NAKIVO Backup & Replication.

- Installing Full Solution on Windows
- Installing Transporter-Only on Windows
- Installing Full Solution in Multi-Tenant Mode on Windows
- Silent Installation

Installing Full Solution on Windows

To install NAKIVO Backup & Replication with default options, simply run the NAKIVO Backup & Replication installer for Windows and click **Install**. This will install all product components (Director, Transporter, and Backup Repository) and you will be able to use all product features after installation.

1. Set the installation options as follows:
   - **Installation type**: Leave the **Full solution** option selected to install the key product components (Director and Transporter)
   - **Create repository**: Leave the checkbox selected to create a Backup Repository on the machine on which NAKIVO Backup & Replication is installed.
   - Optionally, click **Browse** and select a folder to change the default location of the Backup Repository.

2. Click **MORE OPTIONS** to set up more installation options:

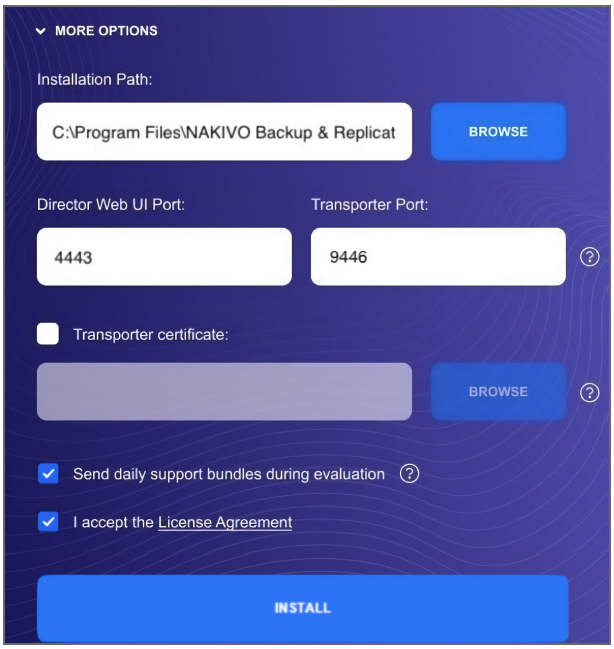
- **Installation path**: The location where NAKIVO Backup & Replication will be installed. If you want to change the default path to NAKIVO Backup & Replication, click **Browse** and select a new location.
- **Director Web UI port**: The default port that will be used to connect to the Web UI of NAKIVO Backup & Replication. Make sure that the port you specify is open in your firewall.
- **Transporter port**: The default port that will be used by the Director to communicate with the Onboard Transporter. Make sure that the port you specify is open in your firewall.
- **Transporter certificate**: This allows you to use a CA Certificate. Enter the path to the folder containing the certificate file in the field.

  Note

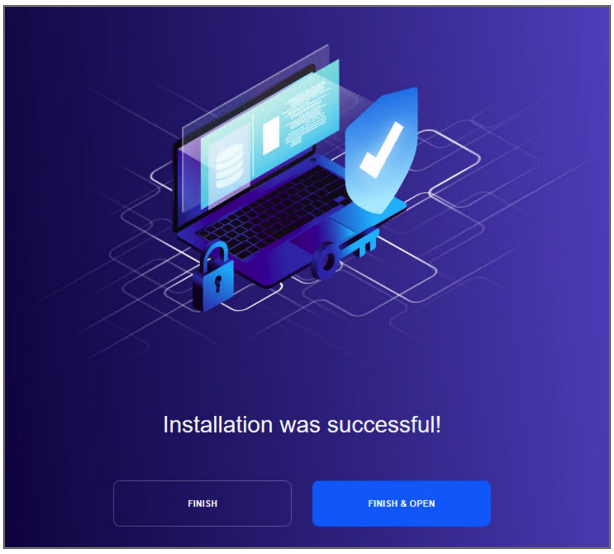
  - When the checkbox is not selected, NAKIVO Backup & Replication automatically installs a self-signed certificate.
  - It is possible to install a CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer:
    - Use the following command for Windows OS:
      `installer.exe --cert C:\certificate.pem --eula-accept`
      The short option for the Windows OS command is the following:
      `installer.exe -ct C:\certificate.pem -ea`
    - Use the following command for Linux OS:
      `installer.sh --cert /tmp/certificate.pem --eula-accept`

- **Send daily support bundles during evaluation**: When this option is selected, NAKIVO Backup & Replication automatically creates, encrypts, and uploads support bundles once a day to a NAKIVO support server during the evaluation period. The NAKIVO support team may use this information to improve the product experience and may be able to identify and resolve product issues faster.

3. **I accept the License Agreement**: Select this option to confirm that you have read and agreed to the License Agreement.
4. Click **Install**.



5. Click **Finish** to complete the installation process or **Finish & Open** to complete installation and start using NAKIVO Backup & Replication.



6. To prevent unauthorized access to the product, create your user account. Fore more details, refer to “Logging in to NAKIVO Backup & Replication” on page 185 .

Installing Transporter-Only on Windows

If you have already installed the full solution (both Director and Transporter) and wish to deploy an additional Transporter, run the NAKIVO Backup & Replication installer for Windows and follow the steps below:

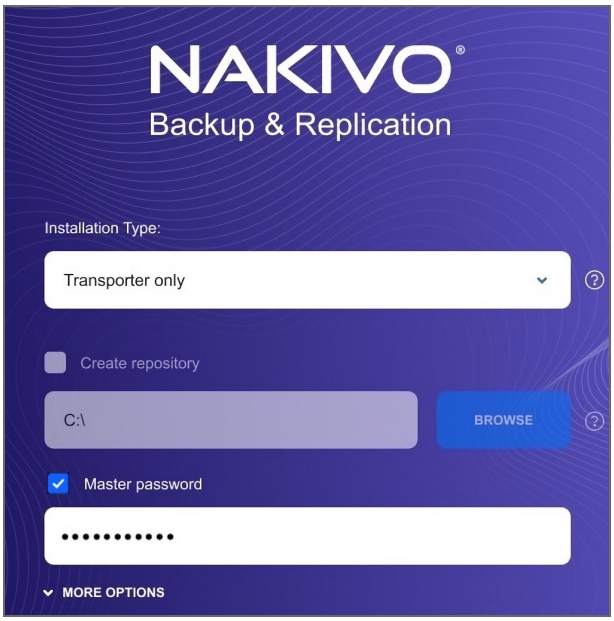
Transporter Installation Prerequisites

Prior to installing the Transporter, make sure the following prerequisites are met:

- Make sure the machine on which you plan to install the Transporter has a connection to the relevant items below:
    - The machine on which the Director is installed.
    - VMware/Hyper-V/Nutanix AHV servers on which you plan to back up or replicate VMs (provided that you plan to retrieve VM data using the Transporter you are about to install)
    - Machines on which you have installed other Transporters (provided that you plan to set up data transfer between an existing Transporter and the one you are about to install)
    - Backup Repository (provided that you plan to assign the Transporter you are about to install to a Backup Repository)
    - VMware/Hyper-V/Nutanix AHV servers which you plan to use as a destination for replicated VMs (provided that you plan to write data to the target servers and datastores using the Transporter you are about to install)
- For VMware/Hyper-V/Nutanix AHV servers discovered with DNS names, make sure those DNS names can be resolved on the machine on which to install the Transporter.

Transporter Installation Process

1. Run the NAKIVO Backup & Replication installer.
2. Choose **Transporter only** from the **Installation type** drop-down list.



3. Optionally, you can select the **Master password** checkbox and enter the password that will be used to generate a pre-shared key and secure the Transporter.

   Note

   - The master password must adhere to the following requirements:
     - Minimal length - 5 characters.
     - Maximum length - 50 characters.
   - The master password can be set and re-set manually by running the command on the machine housing the Transporter. Follow these steps:
     - Enter the following command `bhsvc -b P@ssword123`
     - Restart the Transporter service.

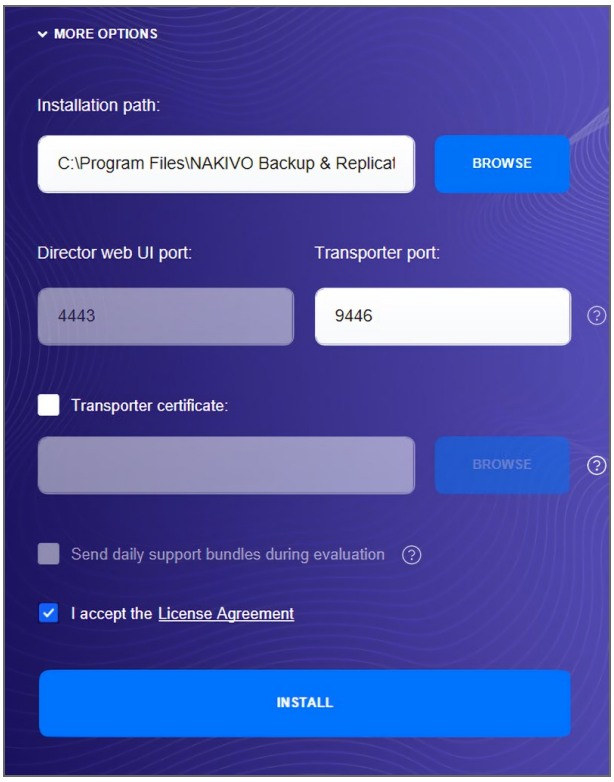
4. Click **MORE OPTIONS** and set up the following:
   - **Installation path**: The location where the Transporter will be installed. If you want to change the default path to the Transporter installation folder, click **Browse** and select a new location.
   - **Transporter port**: The default port that will be used by the Director to communicate with the Onboard Transporter. Make sure that the port you specify is open in your firewall.
   - **Transporter certificate**: This allows you to use a CA Certificate. Enter the path to the folder containing the certificate file in the field.

     Note

     - When the checkbox is not selected, NAKIVO Backup & Replication automatically installs a self-signed certificate.
     - It is possible to set up a master password and CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer:
       - Use the following command for Windows OS:
         `installer.exe --cert C:\certificate.pem --master-pass P@ssword123 --eula-accept`
         The short option for the Windows OS command is the following:
         `installer.exe -ct C:\certificate.pem -b P@ssword123 -ea`
       - Use the following command for Linux OS:
         `installer.sh --cert /tmp/certificate.pem -b P@ssword123 --eula-accept`

- **Send daily support bundles during evaluation**: If this option is selected, NAKIVO Backup & Replication will automatically create, encrypt, and upload support bundles once a day to a NAKIVO support server during the evaluation period. NAKIVO Support team may use this information to improve the product experience and may be able to identify and resolve product issues faster.

5. **I accept the License Agreement**: Select this option to confirm that you have read and agreed to the License Agreement.
6. Click **Install**.



7. When the installation is complete the **Transporter installation was successful** notification appears.

8. Add the Transporter to NAKIVO Backup & Replication.

Installing Full Solution in Multi-Tenant Mode on Windows

To install the full solution in multi-tenant mode on a Windows OS, run the NAKIVO Backup & Replication installer for Windows and follow the steps below:

1. Set the installation options as follows:
    - **Installation type**: Select the **Multi tenant solution** option from the **Installation type** drop-down list.
    - **Create repository**: Leave the checkbox selected to create a Backup Repository on the machine on which NAKIVO Backup & Replication is installed.

- Optionally, click **Browse** and select a folder to change the default location of the Backup Repository.

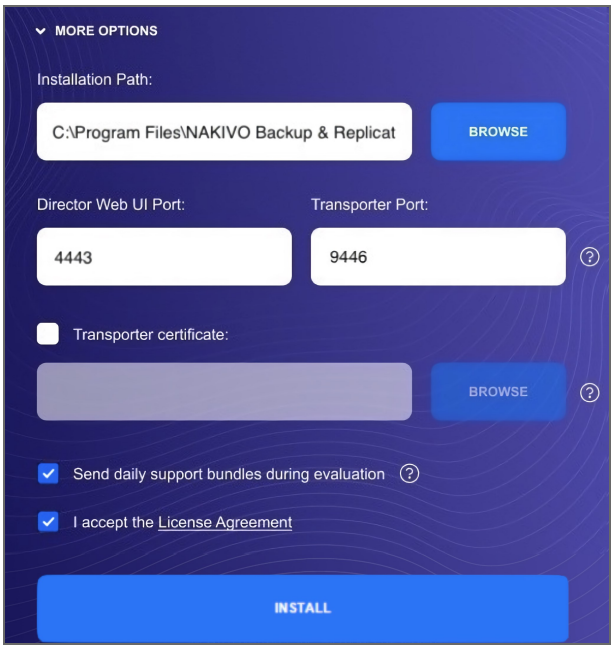
2. Click **MORE OPTIONS** to set up more installation options:
   - **Installation path**: The location where NAKIVO Backup & Replication will be installed. If you want to change the default path to the product, click **Browse** and select a new location.
   - **Director Web UI port**: The default port that will be used to connect to the Web UI of NAKIVO Backup & Replication. Make sure that the port you specify is open in your firewall.
   - **Transporter port**: The default port that will be used by the Director to communicate with the Onboard Transporter. Make sure that the port you specify is open in your firewall.
   - **Transporter certificate**: This allows you to use a CA Certificate. Enter the path to the folder containing the certificate file in the field.

     Note

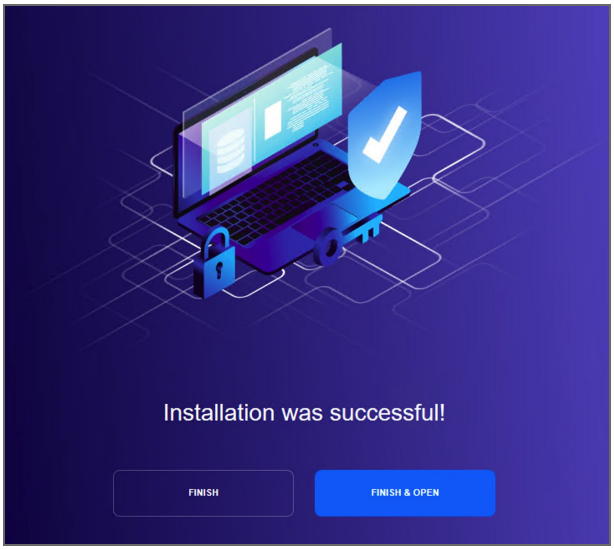
     - When the checkbox is not selected, NAKIVO Backup & Replication automatically installs a self-signed certificate.
     - It is possible to install a CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer:
       - Use the following command for Windows OS:
         `installer.exe --cert C:\certificate.pem --eula-accept`
         The short option for the Windows OS command is the following:
         `installer.exe -ct C:\certificate.pem -ea`
       - Use the following command for Linux OS:
         `installer.sh --cert /tmp/certificate.pem --eula-accept`

- **Send daily support bundles during evaluation**: When this option is selected, NAKIVO Backup & Replication automatically creates, encrypts, and uploads support bundles once a day to a NAKIVO support server during the evaluation period. The NAKIVO support team may use this information to improve the product experience and may be able to identify and resolve product issues faster.

3. **I accept the License Agreement**: Select this option to confirm that you have read and agreed to the License Agreement.
4. Click **Install**.



5. Click **Finish** to complete the installation process or **Finish & Open** to complete installation and start using NAKIVO Backup & Replication.



Note

The onboard backup repository for the Master Tenant is automatically created after the installation.

6. Create an account by completing the form. For details, refer to "Logging in to NAKIVO Backup & Replication" on page 185.

Credentials are not required to log in as Master Admin after installation. However, the default credentials are required to log into the product after the first tenant is created. To log in as Master Admin, specify "admin" as the username and leave the password field empty. You can change credentials in the product configuration.

Silent Installation on Windows

You can install NAKIVO Backup & Replication in silent mode via a command line by running the following command: **installer.exe -f --eula-accept**. This installs all product components (Director, Transporter, and Backup Repository), and you will be able to use all product features after installation.

The following arguments are available:

Argument	Description
-h	Display the list of available arguments without starting the installation.
--eula-accept, -ea	Indicates that you have read and agree to the End User License Agreement.
-f	Performs the silent installation of the full solution (Director and Transporter).
-t	Performs the silent installation of Transporter only.
-m	Performs the silent installation of the full solution in multi-tenant mode.
-u	Performs the silent update of the installed product components.
--release-notes, -n	Indicates the user has read the release notes for the new release during an update.
-sii	Performs the silent install or update ignoring the single installer instance check.

Argument	Description
--ignore-pre-install-action-failures, -ipiaf	All pre-install action failures are ignored.
--cert	Allows to set up a custom Transporter certificate.
--master-pass (short version: **-b**)	Allows to set up a custom master password for the Transporter.

Installing on Linux

Linux Installation Prerequisites

In order to install and use NAKIVO Backup & Replication on a Linux OS, make sure the following requirements are met:

- On Ubuntu and SLES, the following packages must be installed:
    - cifs-utils
    - open-iscsi
    - ntfs-3g
- On RedHat Enterprise Linux, the following packages must be installed:
    - cifs-utils
    - iscsi-initiator-utils
    - ntfs-3g
    - tar

Silent Installation on Linux

You can install NAKIVO Backup & Replication in silent mode via a command line. To install the full solution, simply run the following command: `installer.sh -f --eula-accept` This will install all product components (Director, Transporter, Backup Repository) and you will be able to use all product features after installation.

The following arguments are available:

Argument	Description
-h, -help, help	Display the list of available arguments without starting the installation.
--eula-accept, -ea	Indicates that you have read and agree to the End User License Agreement.
-f	Shall perform the silent installation of the full solution (Director and Transporter).

Argument	Description
-t	Shall perform the silent installation of Transporter only.
-m	Shall perform the silent installation of the full solution in multi-tenant mode.
-u	Shall perform the silent update of the installed product components.
-e	Shall install Transporter on Amazon EC2, or update Transporter installed on Amazon EC2. Refer to Updating on Amazon EC2 for details.
-a	Shall enable uploading support bundles to support team server (Call Home). Refer to System Settings for details.
-y	Shall accept limitations silently.
-i <install_path>	Shall install to the specified installation path.
-d <director_port>	Shall provide a custom Director port.
-p <transporter_port>	Shall provide a custom Transporter port.
-r <port1>-<port2>	Shall provide a custom transporter data ports range.
-C	Shall suppress creating the repository.
-c <repo_path>	Shall create the repository. The **<repo_path>** parameter is optional.
--rt <repo_type>	Shall create a repository of the specified type. The **<repo_type>** parameter may accept the following values: **1** – "Forever incremental with deduplication"; **2** – "Forever incremental without deduplication"; **3** – "Incremental with full backups (deduplication devices)".
--rc <compress_level>	Shall specify the repository compression level. The parameter may accept the following values: Disabled; Fast; Medium; Best.
--pnp-cleanup	Shall clean up the database of the device manager for the Linux kernel.
--cert	Allows to set up a custom Transporter certificate.
--**master-pass** (short version: **-b**)	Allows to set up a custom master password for the Transporter.

Installing Full Solution on Linux

Follow the steps below to install all components of NAKIVO Backup & Replication (both Director and Transporter) on a Linux OS:

1. Upload the installer file to the machine on which you want to install NAKIVO Backup & Replication in the *binary transfer mode*. For example:
   - Upload the installer from a Windows-based machine.
   - Upload the product from a Linux-based machine: run the following command: `wget 'server_ip/shared/NAKIVO_Backup_&_Replication_TRIAL.sh'`
2. Log in to the Linux machine and allow the execution of the installer file.
   For example: `chmod +x NAKIVO_Backup_&_Replication_TRIAL.sh`
3. Execute the installer file with root privileges.
   For example: `sudo ./NAKIVO_Backup_&_Replication_TRIAL.sh`
4. Review the license agreement (press **Space** to go to the next page of the agreement). If you agree to the terms of the license agreement, press "Y" and then press **Enter**.
5. Type "S" to install the full solution and press **Enter**.
6. Optionally, you can install CA Transporter certificate. Enter the path to the folder containing the certificate file and press **Enter**.

   Notes
   - If no path to the CA certificate was provided, NAKIVO Backup & Replication automatically installs a self-signed certificate.
   - It is possible to set up CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer. Use the following command: `installer.sh --cert /tmp/certificate.pem --eula-accept`
7. Specify the installation path for the product: Press **Enter** to accept the default installation path "/opt/nakivo" or enter a custom path and press **Enter**.
8. Specify the Director HTTPS port (which will be used to access the Web UI of NAKIVO Backup & Replication): Press **Enter** to accept the default port "4443" or enter a custom port number and press **Enter**. Make sure the port you specify is open in your firewall.
9. Specify whether to allow the product to automatically send support bundles to a NAKIVO server during the evaluation period (Call Home). If this option is enabled, NAKIVO Backup & Replication will automatically create, encrypt, and upload support bundles once a day to a NAKIVO support server during the evaluation period. NAKIVO Support team may use this information to improve the product experience and will be able to identify and resolve product issues faster.
10. Specify the Transporter port (which will be used to connect to the Transporter that is installed by default with the Director): Press **Enter** to accept the default port "9446" or enter a custom port number (1 to 65535) and press **Enter**. Make sure the port you specify is open in your firewall.
11. Specify a range of port numbers (from 1 to 65535) that will be used to transfer data by the Onboard Transporter (default are 9448-10000). The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.

12. Specify a path to the default Backup Repository: Press **Enter** to accept the default path "/opt/nakivo/repository" or enter a custom path and press **Enter** to begin the installation process.

After the installation is complete, you can log in to NAKIVO Backup & Replication by opening the following URL in your web browser: `https://machine_IP_or_DNS:director_https_port`
By default, login name and password are not required to access NAKIVO Backup & Replication. To prevent unauthorized access to the product, you can set up credentials in Configuration.

Installing Transporter on Linux

If you have already installed the full solution (both Director and Transporter) and want to deploy an additional Transporter, run the NAKIVO Backup & Replication installer for Windows and follow the steps below:

Transporter Installation Prerequisites

Prior to installing a Transporter, make sure the following prerequisites are met:

1. Make sure the machine on which you plan to install the Transporter has a connection to the relevant items below:
   - The machine on which the Director is installed
   - VMware/Hyper-V servers on which you plan to back up or replicate VMs (if you plan to retrieve VM data using the Transporter you are about to install)
   - Machines on which you have installed other Transporters (if you plan to set up data transfer between an existing Transporter and the one you are about to install)
   - Backup repository (if you plan to assign the Transporter you are about to install to a Backup Repository)
   - VMware/Hyper-V servers which you plan to use as a destination for replicated VMs (if you plan to write data to the target servers and datastores using the Transporter you are about to install)
2. If you have discovered VMware/Hyper-V servers using DNS names, make sure those DNS names can be resolved on the machine on which you plan to install the Transporter.

Transporter Installation

1. Upload the installer file to the machine on which you wish to install NAKIVO Backup & Replication in the *binary transfer mode*. For example:
   - Upload the installer from a Windows-based machine.
   - Upload the product from a Linux-based machine: run the following command: `wget 'server_ip/shared/NAKIVO_Backup_&_Replication_TRIAL.sh'`
2. Allow the execution of the installer file. For example: `chmod +x NAKIVO_Backup_&_Replication_TRIAL.sh`

3. Execute the installer file with root privileges. For example:`sudo ./NAKIVO_Backup_&_Replication_TRIAL.sh`
4. Review the license agreement (press **Space** to go to the next page of the agreement). If you agree to the terms of the license agreement, press "Y" and then press **Enter**.
5. Type "T" to install only the Transporter and press **Enter**.

   Note

   Alternatively, you can use the **-t** argument to install the Transporter silently:
   `sudo ./NAKIVO_Backup_&_Replication_TRIAL.sh -t`
6. Optionally, enter the master password that will be used to generate a pre-shared key and secure the Transporter and then press **Enter**.

   Notes

   - The master password must adhere to the following requirements:
     - Minimal length - 5 characters.
     - Maximum length - 50 characters.
   - The master password can be set and re-set manually by following these steps:
     1. Switch to root using the following command:
        `sudo -i`
     2. Stop the Transporter service.
     3. Go to the transporter folder with the following command:
        `cd /opt/nakivo/transporter`
     4. Run the following command to set the master password:
        `./bhsvc -b P@ssword123`
     5. Restart the Transporter service.
7. Specify the installation path for the product: Press **Enter** to accept the default installation path "/opt/nakivo" or enter a custom path and press **Enter**.
8. Optionally, you can install CA Transporter certificate. Enter the path to the folder containing the certificate file and press **Enter**.

   Notes

   - If no path to the CA certificate was provided, NAKIVO Backup & Replication automatically installs a self-signed certificate.
   - It is possible to set up a master password and a CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer. Use the following command:
     `installer.sh --cert /tmp/certificate.pem -b P@ssword123 --eula-accept`

9. Specify the Transporter port (used to connect to the Transporter): Press **Enter** to accept the default port "9446" or enter a custom port number and press **Enter** to begin the installation process. Make sure the port you specify is open in your firewall.

After the installation is complete, add the Transporter to NAKIVO Backup & Replication.

Installing Full Solution in Multi-Tenant Mode on Linux

Follow the steps below to install the full solution in multi-tenant mode on a Linux OS:

1. Upload the installer file to the machine on which you want to install NAKIVO Backup & Replication in the *binary transfer mode*. For example:
   - Upload the installer from a Windows-based machine.
   - Upload the product from a Linux-based machine: run the following command: `wget 'server_ip/shared/NAKIVO_Backup_&_Replication_TRIAL.sh'`
2. Log in to the Linux machine and allow the execution of the installer file.
   For example: `chmod +x NAKIVO_Backup_&_Replication_TRIAL.sh`
3. Execute the installer file with root privileges.
   For example: `sudo ./NAKIVO_Backup_&_Replication_TRIAL.sh`
4. Review the license agreement (press **Space** to go to the next page of the agreement). If you agree to the terms of the license agreement, press "Y" and then press **Enter**.
5. Type “M” to install the Director in Multi-tenant mode and press **Enter**.
   Note
   Alternatively, you can use the **-m** argument to install the solution in multi-tenant mode silently: `sudo ./NAKIVO_Backup_&_Replication_TRIAL.sh -m`
6. Optionally, you can install CA Transporter certificate. Enter the path to the folder containing the certificate file and press **Enter**.

   Notes
   - If no path to the CA certificate was provided, NAKIVO Backup & Replication automatically installs a self-signed certificate.
   - It is possible to set up CA-signed certificate for the Transporter by conducting silent installation using the command-line arguments passed to the installer. Use the following command: `installer.sh --cert /tmp/certificate.pem --eula-accept`
7. Specify the installation path for the product: Press **Enter** to accept the default installation path “/opt/nakivo” or enter a custom path and press **Enter**.
8. Specify the Director HTTPS port (which will be used to access the Web UI of NAKIVO Backup & Replication): Press **Enter** to accept the default port “4443” or enter a custom port number and press **Enter**. Make sure the port you specify is open in your firewall.

9. Specify whether to allow the product to automatically send support bundles to a NAKIVO server during the evaluation period. If this option is enabled, NAKIVO Backup & Replication will automatically create, encrypt, and upload support bundles once a day to a NAKIVO support server during the evaluation period. NAKIVO Support team may use this information to improve the product experience and will be able to identify and resolve product issues faster.
10. Specify the Transporter port (which will be used to connect to the Transporter that is installed by default with the Director): Press **Enter** to accept the default port "9446" or enter a custom port number (1 to 65535) and press **Enter**. Make sure the port you specify is open in your firewall.
11. Specify a range of port numbers (from 1 to 65535) that will be used to transfer data by the Onboard Transporter (default are 9448-10000). The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.
12. The onboard backup repository for the Master Tenant is automatically created after the installation.
13. Specify a path to the default backup repository: Press **Enter** to accept the default path `/opt/nakivo/repository` or enter a custom path and press **Enter** to begin the installation process.

Note

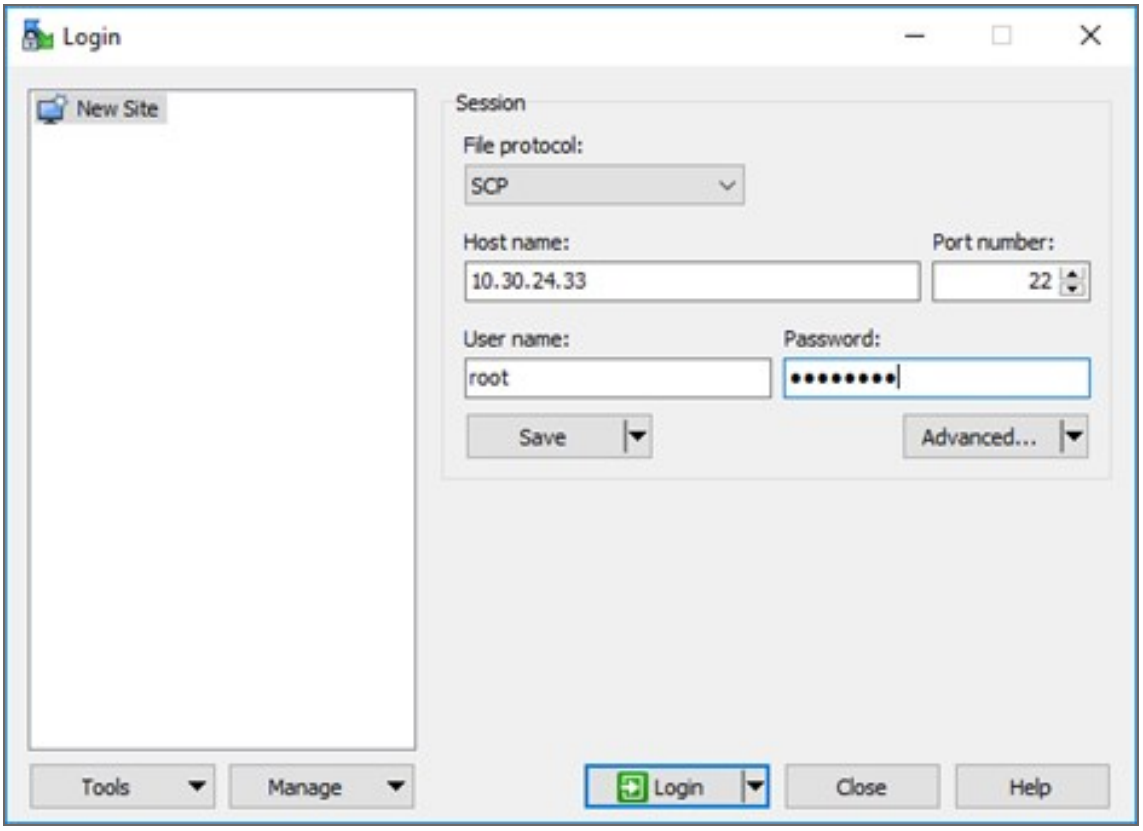
The onboard backup repository for the Master Tenant is automatically created after the installation.

After the installation is complete, you can log in to NAKIVO Backup & Replication by going to the following URL in your web browser: `https://machine_IP_or_DNS:director_https_port`.
Refer to "Getting Started" on page 184 to know how to continue working with NAKIVO Backup & Replication.

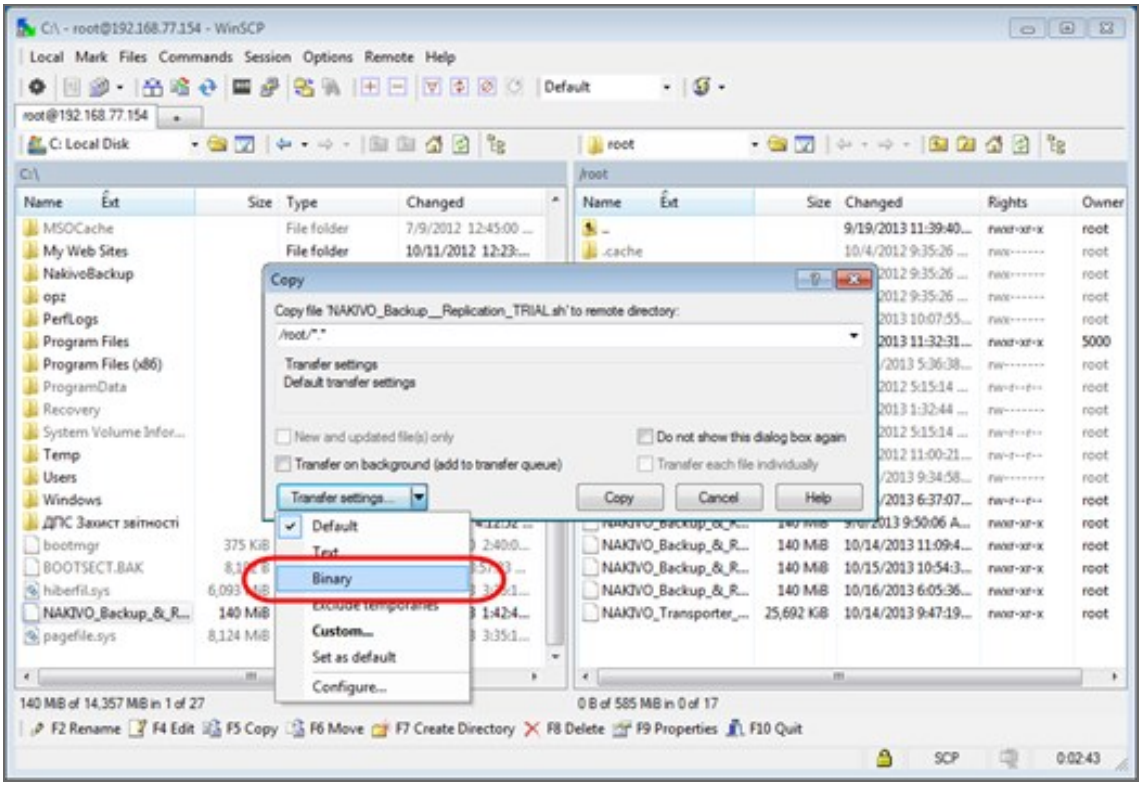
Uploading Installer from Windows Machine to Linux Machine

To upload the installer from a Windows-based machine, follow the steps below:

1. Download the free WinSCP client from http://winscp.net, install, and run it.
2. Choose **SCP** from the **File protocol** list.
3. Specify the IP address or the hostname of the Linux machine on which you would like to install the product in the **Host name** field.
4. Specify the username and password to the Linux machine in the appropriate boxes.
5. Leave other options as is and click **Login**.



6. Click **Yes** in the dialog box that opens.
7. In the left pane, find the folder that contains the Linux installer, in the right pane, go up to the root folder.
8. Drag and drop the installer from left to the right pane.
9. Choose **Binary** from the **Transfer settings** drop-down list in the Copy dialog box that opens.



10. Click **Copy**.

Installing on Synology NAS

NAKIVO Backup & Replication can be installed directly on a supported Synology NAS to create your own, high-performance backup appliance. With the appliance, all VM data protection components are unified in a single system that is fast to deploy and easy to manage, while also not consuming your environment's valuable resources. Moreover, you are getting an all-in-one backup hardware, backup software, backup storage, and data deduplication in a single box. This results in a zero VMware footprint, less power and cooling, less required maintenance, time, money, and – most of all – higher VM backup performance.

You can install a Synology package with either all NAKIVO Backup & Replication components (Director, Transporter, Backup Repository) or a Transporter only. The product can be installed via Package Center or manually. For more details, refer to the corresponding topics below:

- “Installing on Synology NAS via Package Center” on page 133
- “Installing on Synology NAS Manually” on page 135

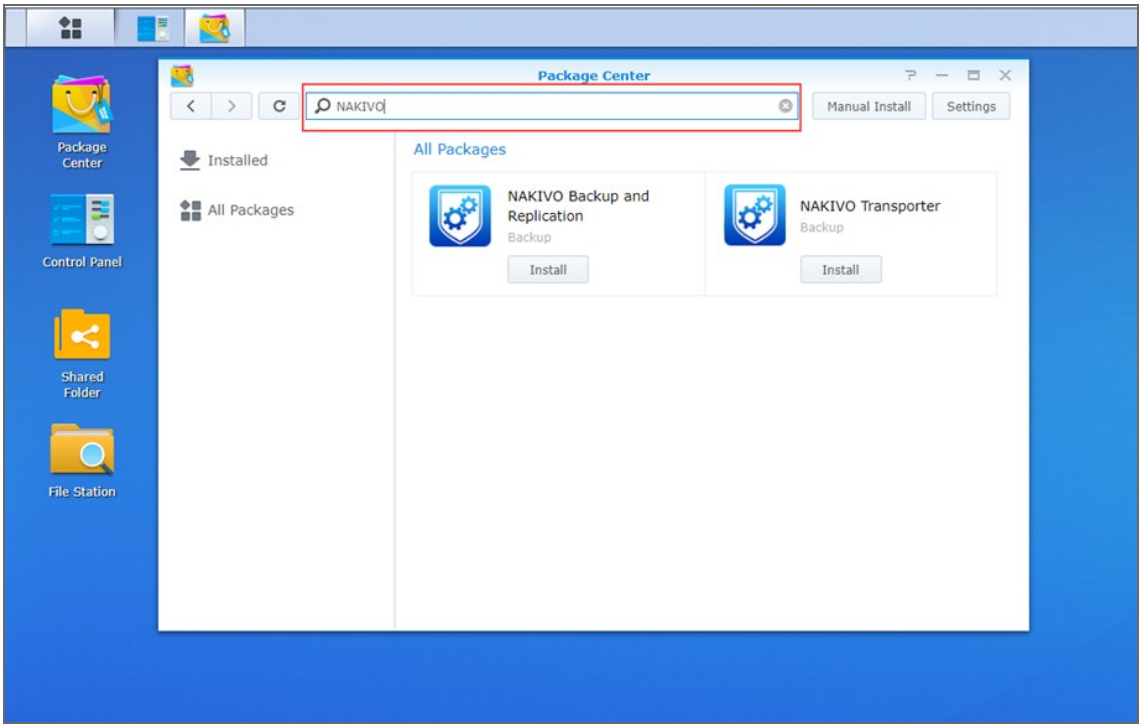
Note

A pre-shared key is not created during Transporter-only installation. When adding this Transporter to NAKIVO Backup & Replication, filling out the master password field is not required. The master password can be manually set and reset later. For details, refer to “Installed Service” on page 332.

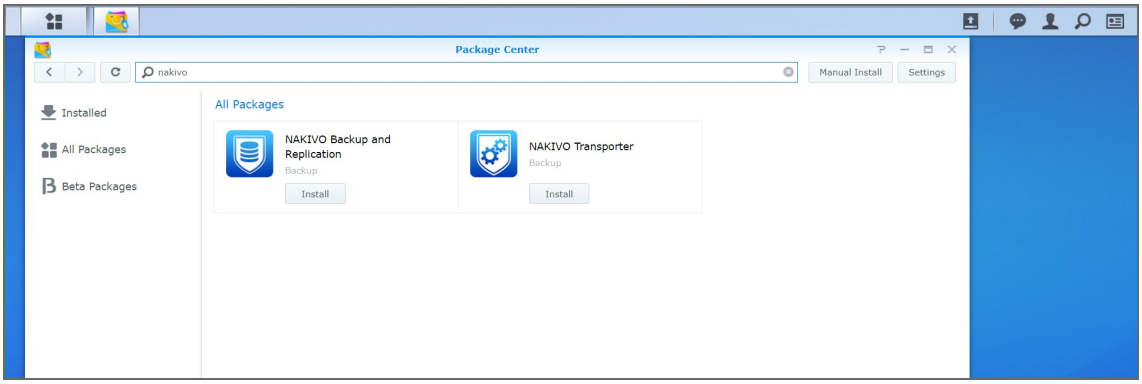
Installing on Synology NAS via Package Center

To automatically install a NAKIVO Backup & Replication application on a Synology NAS, do the following:

1. Log in to your Synology account and open **Package Center** in the management interface.
2. Use the search box to find NAKIVO Backup & Replication packages.

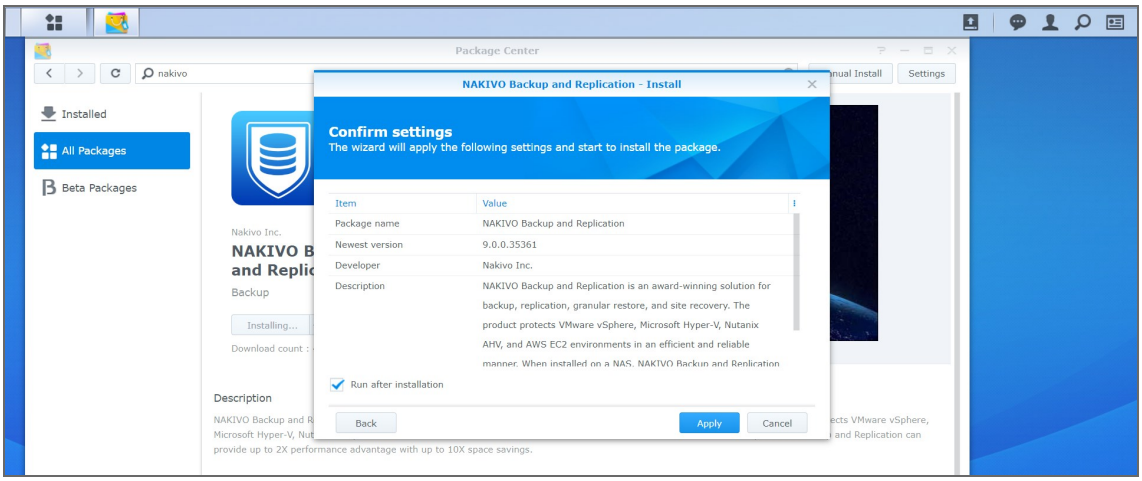


3. Click **Install** on one of the following:
   - **NAKIVO Backup and Replication** to install all product components.
   - **NAKIVO Transporter** to install a Transporter only.



4. Select the **I accept the terms of the license agreement** checkbox and click **Next**.

5. In the **Confirm settings** dialog box, click **Apply**.



Refer to “Getting Started” on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Installing on Synology NAS Manually

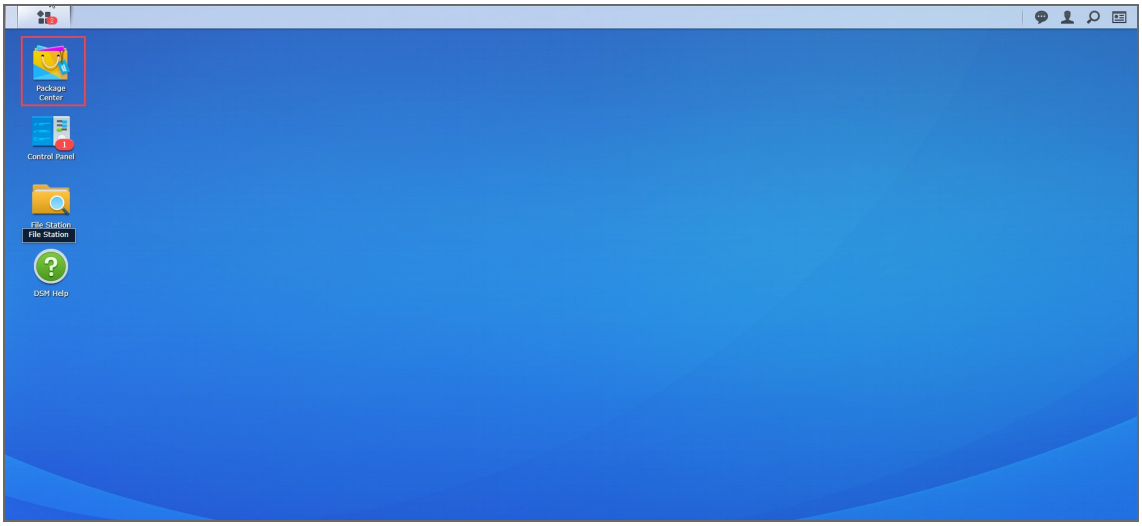
If for any reason installation of NAKIVO Backup & Replication via Package Center is not available for your Synology NAS, you can install it manually.

The following packages are available for manual installation:

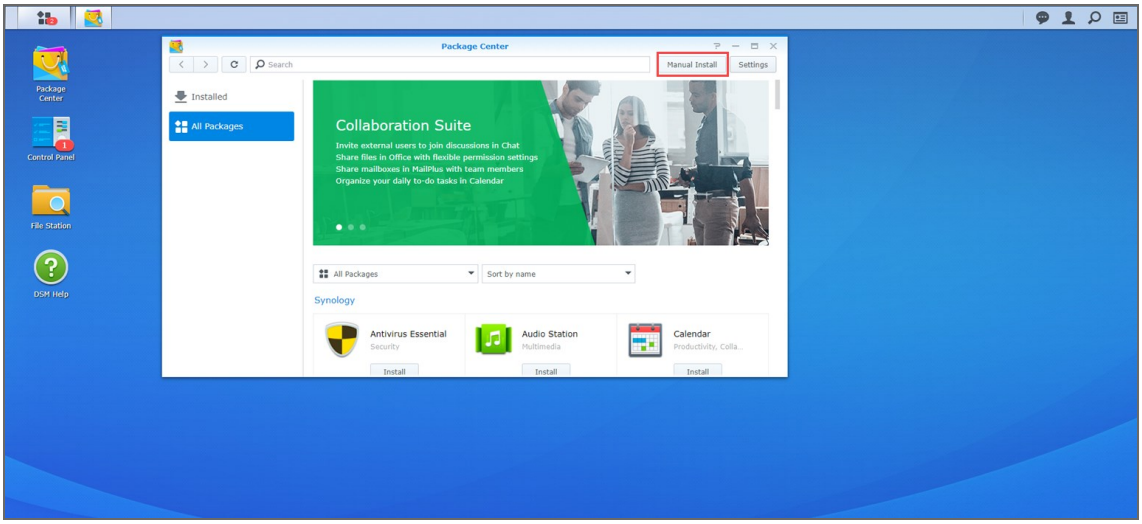
- Synology package
- Synology Transporter package
- Synology ARM package
- Synology ARM Transporter package

To manually install NAKIVO Backup & Replication on a Synology NAS, do the following:

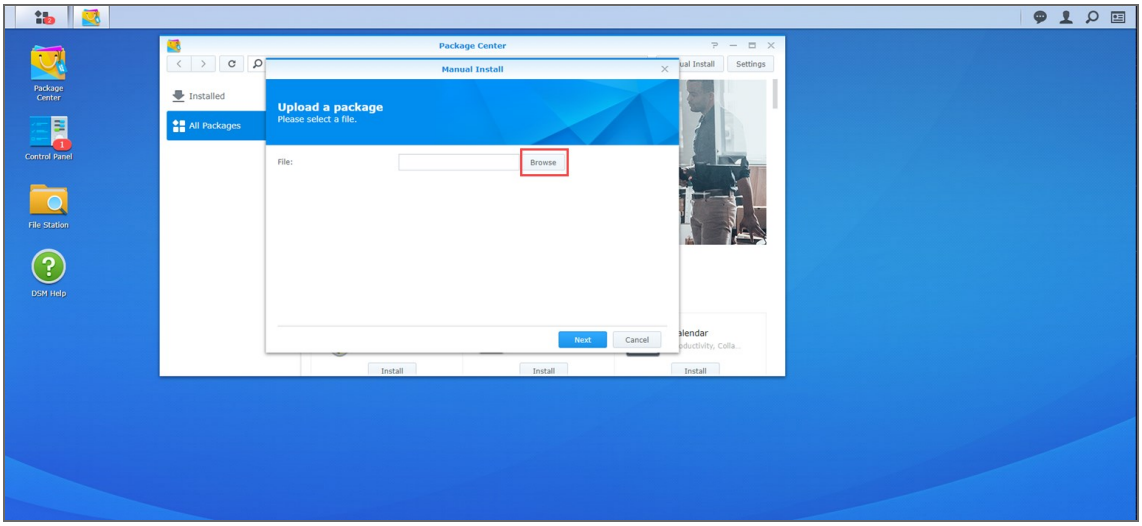
1. Download a Synology NAS package.
2. Log in to your Synology account and open the **Package Center** in the management interface.



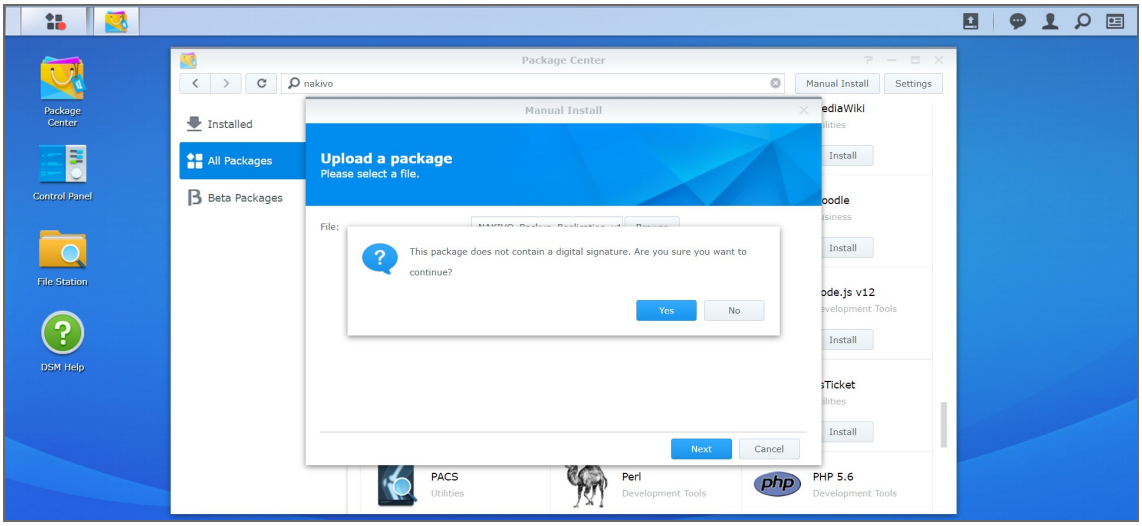
3. Click **Manual Install.**



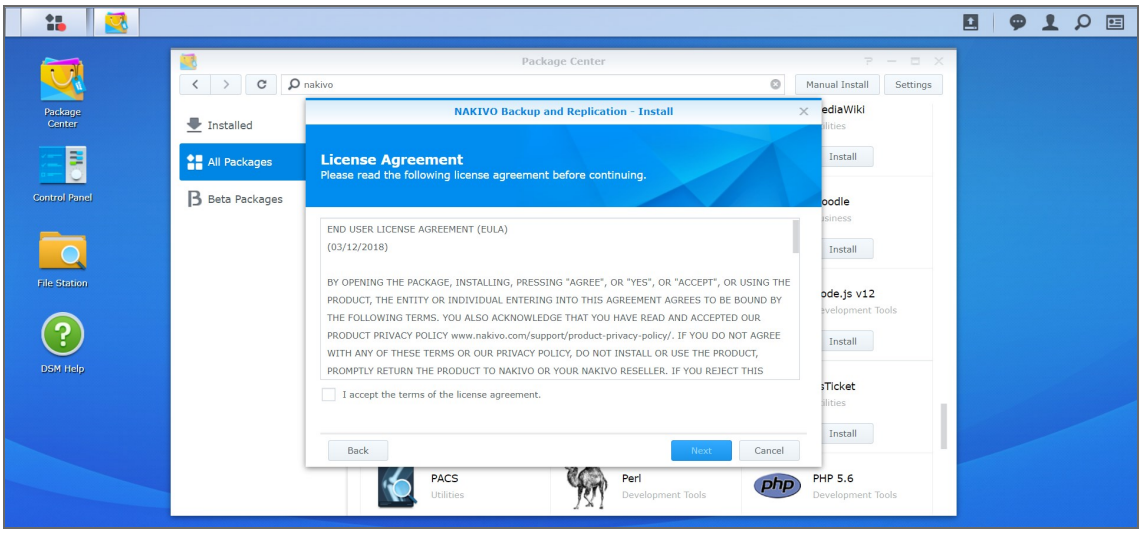
4. Click **Browse**, navigate to the Synology NAS package that you have downloaded, select it, and click **Open**.



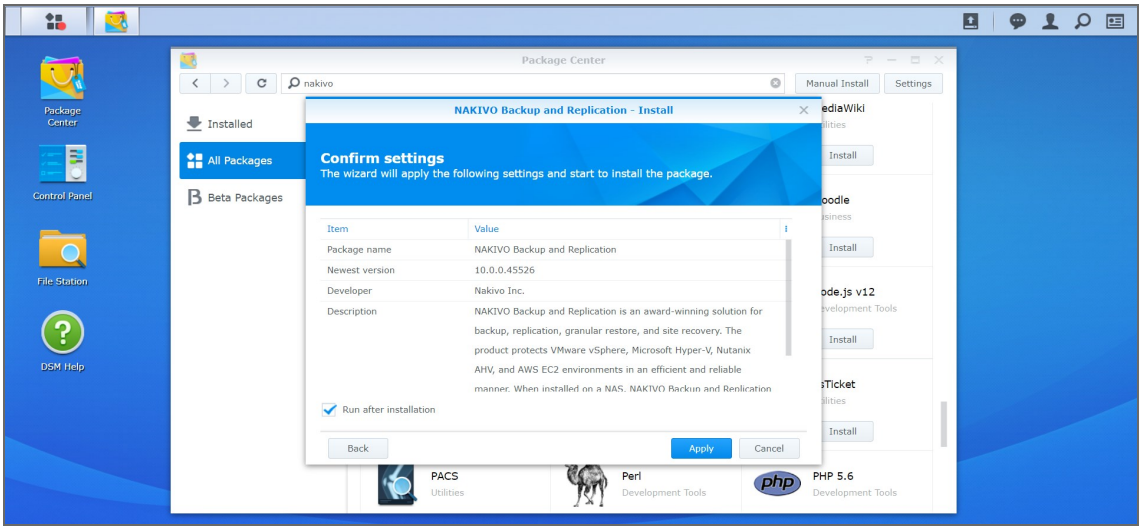
5. Click **Yes** to proceed.



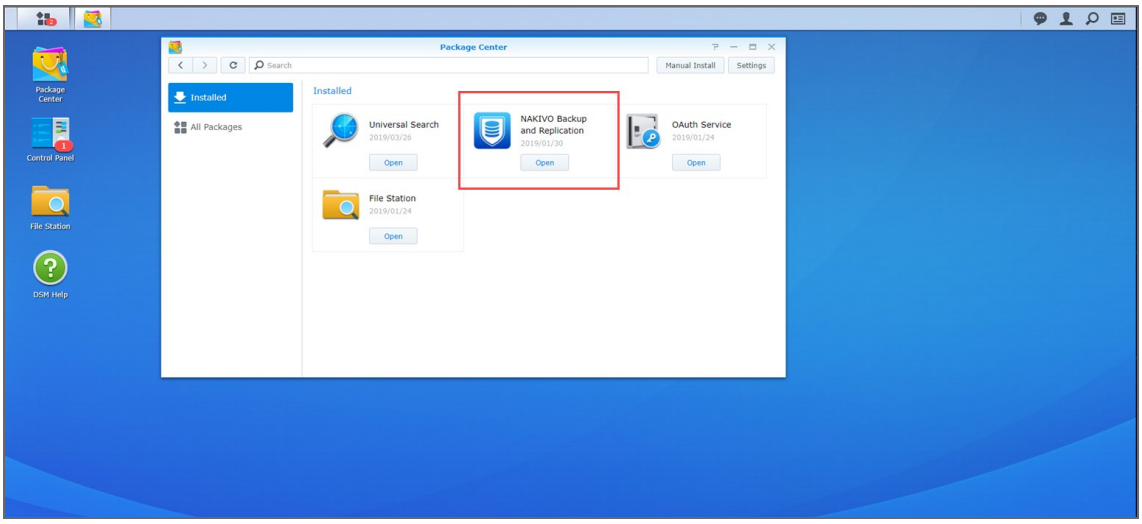
6. After reading through the License Agreement, check **I accept the terms of the license agreement** and click **Next**.



7. Optionally check **Run after installation** to start NAKIVO Backup & Replication immediately after the install process is finished. Click **Apply.**



8. Now NAKIVO Backup & Replication is installed on your NAS. To open the NAKIVO Backup & Replication Web interface, go to the following address in your web browser: `https://NAS_IP_address:4443`, or click the NAKIVO Backup & Replication icon in the main menu of the NAS.



Refer to “Getting Started” on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Installing on QNAP NAS

You can install a QNAP package with either all NAKIVO Backup & Replication components (Director, Transporter, Backup Repository) or a Transporter only.

NAKIVO Backup & Replication can be installed directly on a supported QNAP NAS to create your own, high-performance backup appliance. With this appliance, all VM data protection components are unified in a single system that is quick to deploy and easy to manage, while also not consuming your environment's valuable resources. Moreover, you are getting an all-in-one backup hardware, backup software, backup storage, and data deduplication in a single box. This results in a zero VMware footprint, less power and cooling, less required maintenance, time, money, and – most of all – higher VM backup performance.

You can install NAKIVO Backup & Replication either via QNAP store or manually.

- "Installing on QNAP NAS via QNAP Store" on page 140
- "Installing on QNAP NAS Manually" on page 142

Note

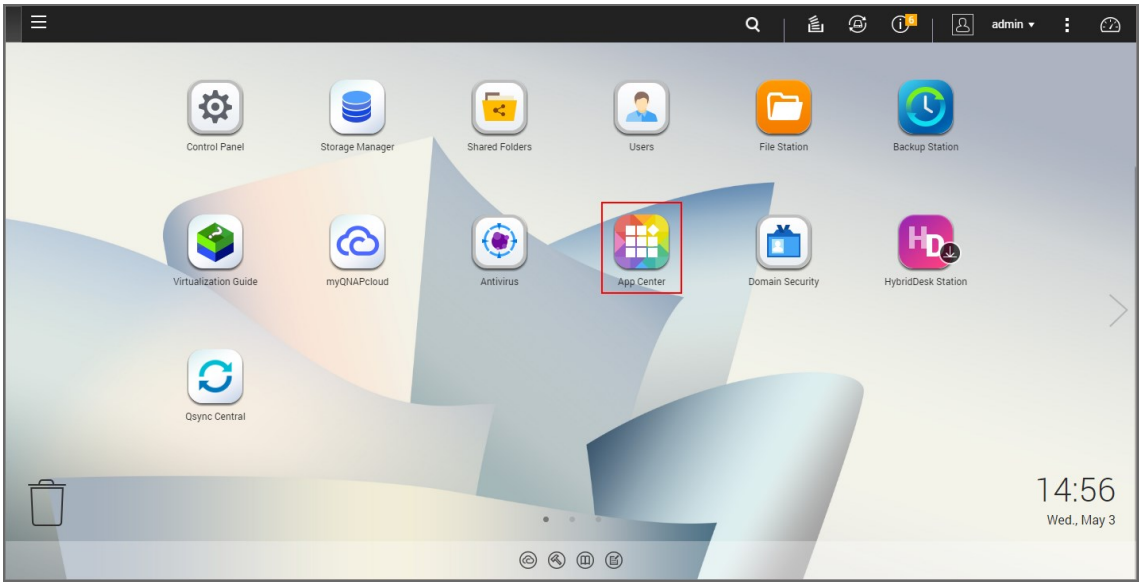
A pre-shared key is not created during Transporter-only installation. When adding this Transporter to NAKIVO Backup & Replication, filling out the master password field is not required. The master password can be manually set and reset later. For details, refer to "Installed Service" on page 332.

Installing on QNAP NAS via QNAP Store

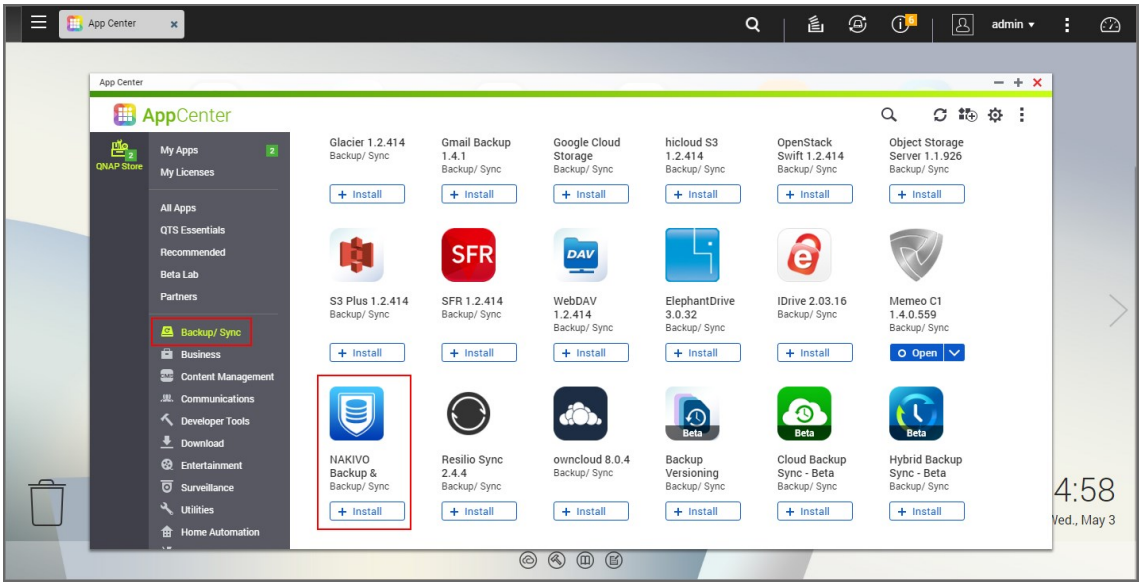
Check to see if your NAS model is supported before you begin installing NAKIVO Backup & Replication on a QNAP NAS.

To install NAKIVO Backup & Replication take the following steps:

1. Open the QNAP Desktop in your browser by entering the IP address of your QNAP NAS.



2. Go to **App Center**.
3. Select the **Backup/Sync** category and locate NAKIVO Backup & Replication. Alternatively, you can use the search bar at the top of the App Center window. Click on the magnifying glass icon and enter 'Nakivo'.



4. Click **Install**.
5. Wait till the installation is completed.

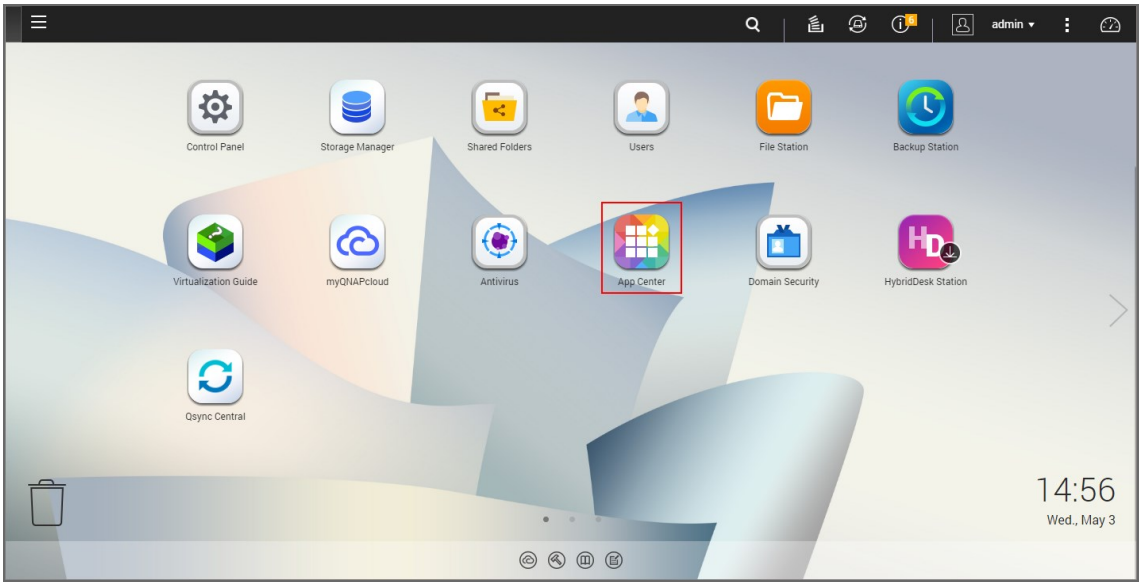
By default, NAKIVO Backup & Replication interface is available by the IP address of your QNAP NAS on the port 4443: `https://<IP_address_of_QNAP_NAS>:4443`.
Refer to “Getting Started” on page 184 to know how to continue working with NAKIVO Backup & Replication.

Installing on QNAP NAS Manually

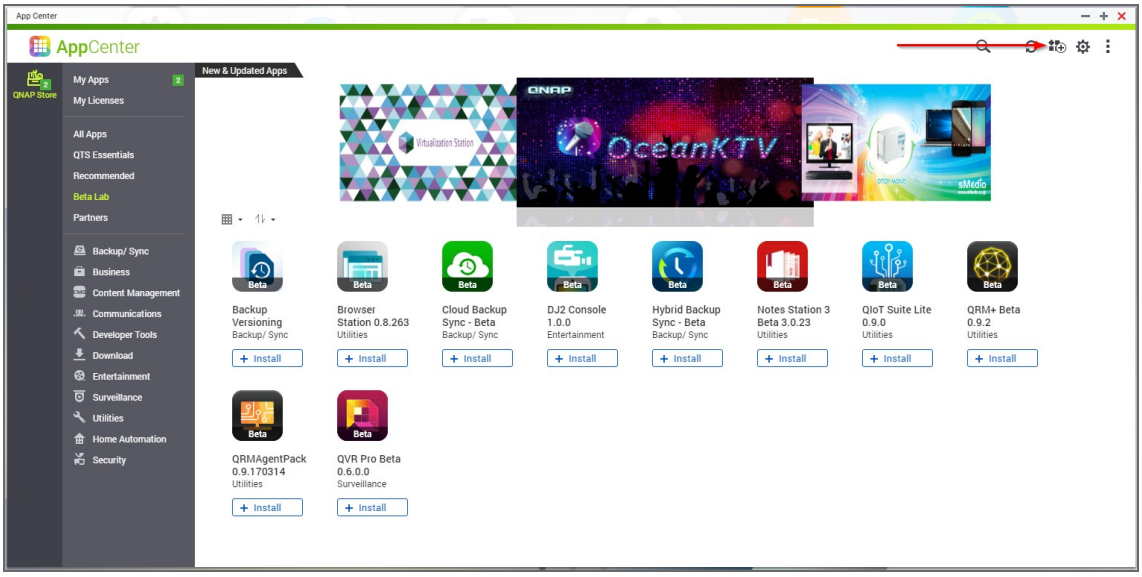
Before you begin installing NAKIVO Backup & Replication on a NAS, make sure your NAS model is supported and you have downloaded the installer (.qpkg file) for QNAP NAS.

To install NAKIVO Backup & Replication on a NAS:

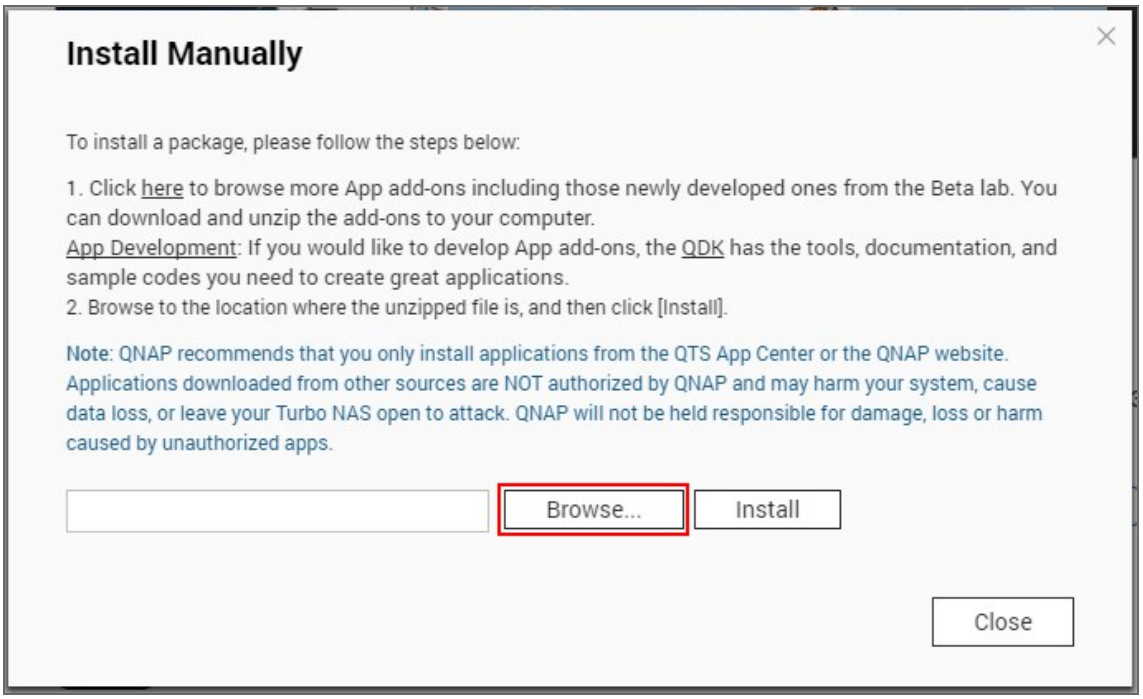
1. Open the QNAP Desktop in your browser by entering the IP address of your QNAP NAS.



2. Go to **App Center**.
3. Click the **Install Manually** icon.



4. Click **Browse** in the window that appears and locate the installer (.qpkg file) on your computer.



5. Click **Install**.
6. Wait until the installation is complete.

By default, NAKIVO Backup & Replication interface is available at the IP address of your QNAP NAS on the port 4443: `https://<IP_address_of_QNAP_NAS>:4443`.

Refer to "Getting Started" on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Installing on ASUSTOR NAS

You can install an ASUSTOR package with either all NAKIVO Backup & Replication components (Director, Transporter, Backup Repository) or a Transporter only.

NAKIVO Backup & Replication can be installed directly on a supported ASUSTOR NAS to create your own, high-performance backup appliance. With the appliance, all VM data protection components are unified in a single system that is fast to deploy and easy to manage, while also not consuming your environment's valuable resources. Moreover, you are getting an all-in-one backup hardware, backup software, backup storage, and data deduplication in a single box.

- "Installing on ASUSTOR NAS via App Central" on page 145
- "Installing on ASUSTOR NAS Manually" on page 147

Note

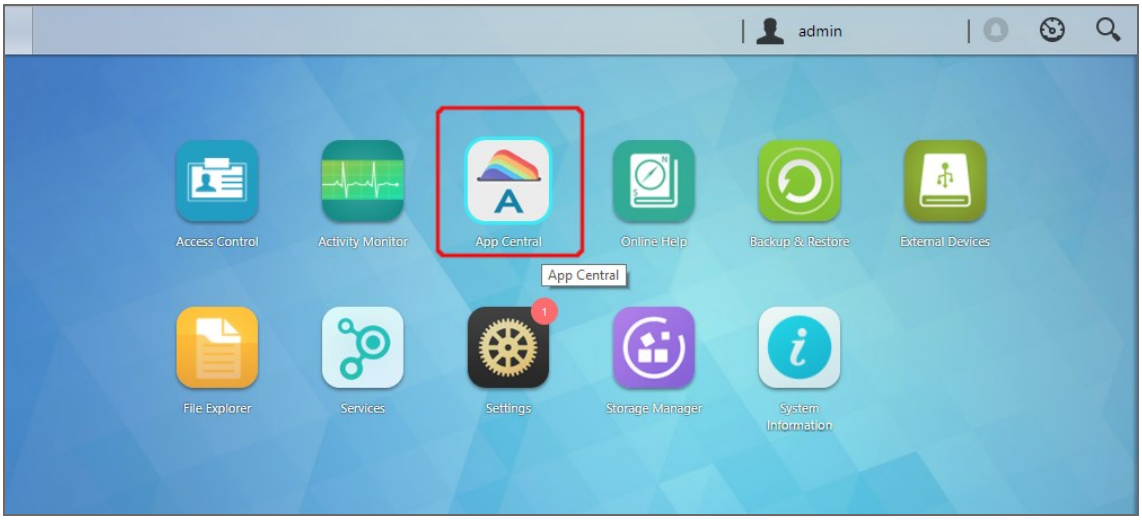
A pre-shared key is not created during Transporter-only installation. When adding this Transporter to NAKIVO Backup & Replication, filling out the master password field is not required. The master password can be manually set and reset later. For details, refer to "Installed Service" on page 332.

Installing on ASUSTOR NAS via App Central

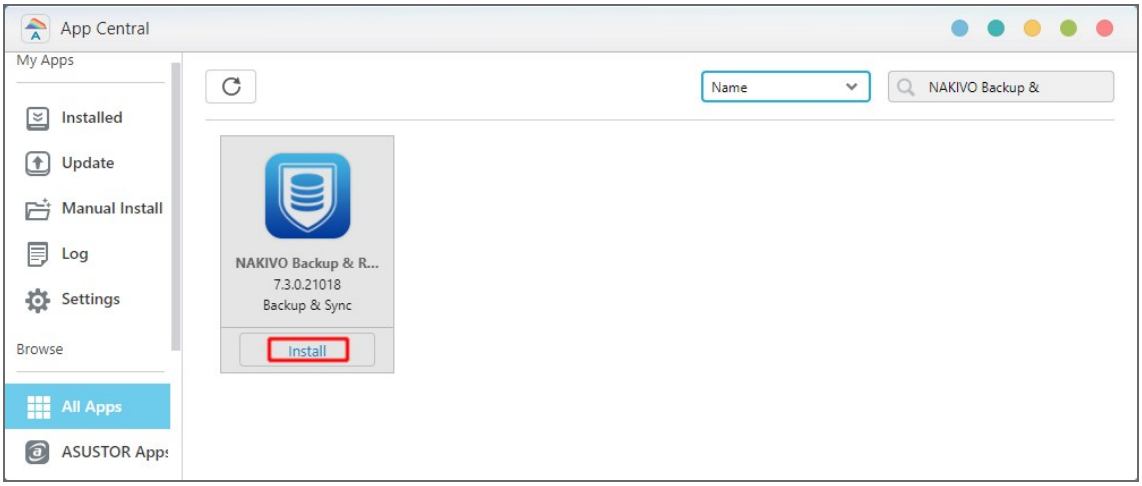
Before you begin installing NAKIVO Backup & Replication on a NAS make sure your NAS model is supported.

To install NAKIVO Backup & Replication on ASUSTOR NAS via App Central:

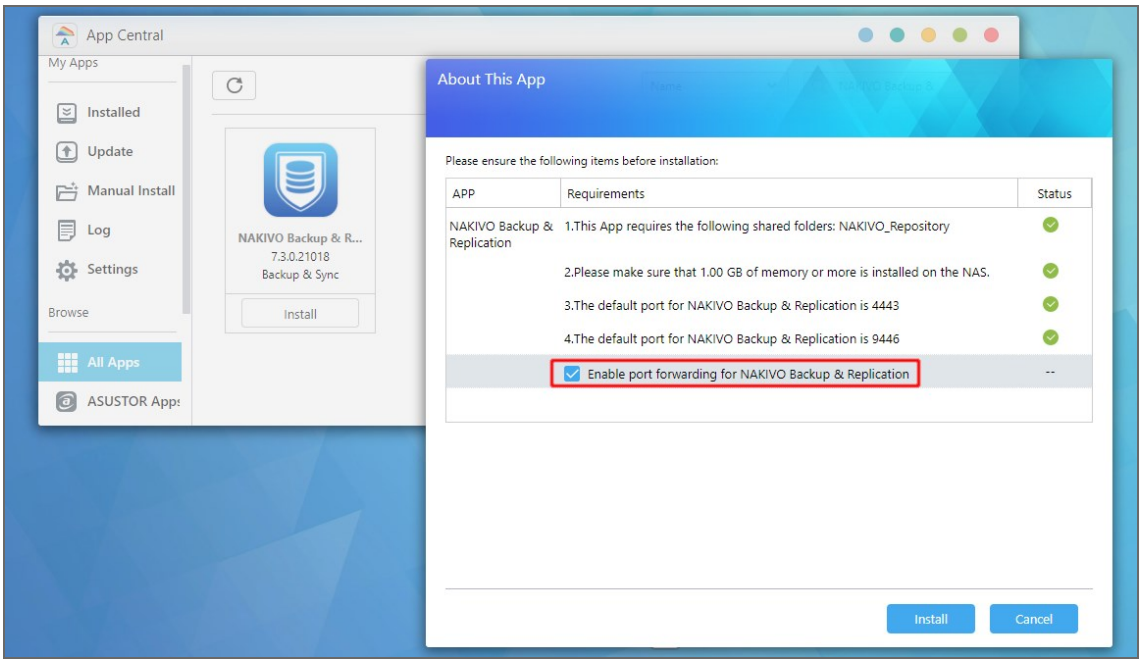
1. Open the ASUSTOR Desktop in your browser by entering the IP address of your ASUSTOR NAS.



2. Go to **App Central**.
3. Go to **Browse** > **All Apps**.
4. Find **NAKIVO Backup & Replication** in the store. Alternatively, enter **Nakivo** in the search box.
5. Click **Install**.



6. In the **About This App** dialog box that opens, select **Enable port forwarding for NAKIVO Backup & Replication** and then click **Install**.



7. Wait until the installation is complete.

By default, the NAKIVO Backup & Replication interface is available at the IP address of your ASUSTOR NAS on the port 4443: `https://<IP_address_of_ASUSTOR_NAS>:4443`.

Refer to "Getting Started" on page 184 to understand better how to continue working with NAKIVO Backup & Replication.

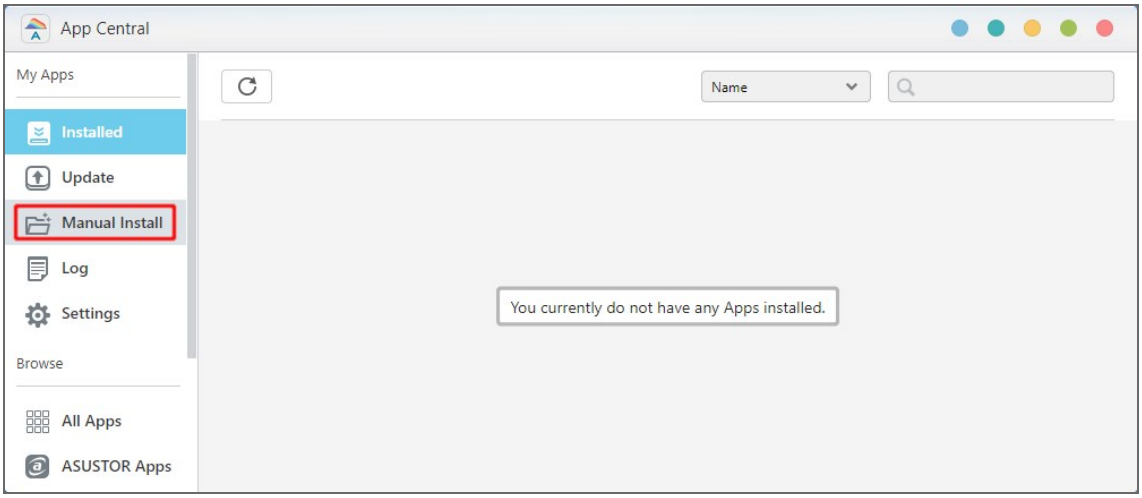
Installing on ASUSTOR NAS Manually

Before you begin installing NAKIVO Backup & Replication on a NAS, make sure your NAS model is supported and you have downloaded an installer (.apk file) for ASUSTOR NAS.

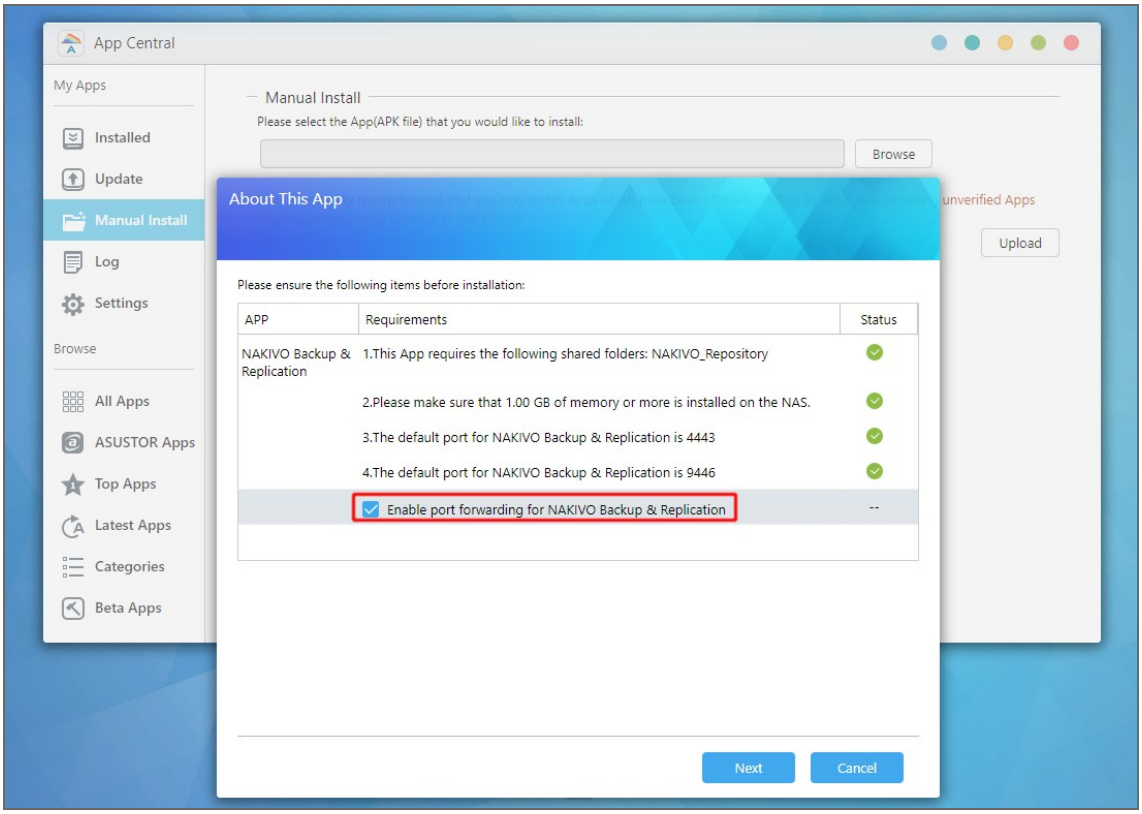
To manually install NAKIVO Backup & Replication on ASUSTOR NAS:

1. Open the ASUSTOR Desktop in your browser by entering the IP address of your ASUSTOR NAS.
2. Go to **App Central**.

3. Click **Manual Install**.



4. Click **Browse**. In the dialog box that opens, locate the installer (.apk file) on your computer.
5. Click **Upload**.
6. In the **About This App** dialog box that opens, check **Enable port forwarding for NAKIVO Backup & Replication**.



7. Click **Next**.
8. In the warning dialog box that opens, select **I understand the risks associated with installing unverified apps**.
9. Click **Install**.
10. Wait until the installation is complete.

By default, the NAKIVO Backup & Replication interface is available at the IP address of your ASUSTOR NAS on the port 4443: `https://<IP_address_of_ASUSTOR_NAS>:4443`.

Refer to "Getting Started" on page 184 to understand better how to continue working with NAKIVO Backup & Replication.

Installing on Western Digital NAS

You can install a Western Digital MyCloud package with either all NAKIVO Backup & Replication components (Director, Transporter, Backup Repository) or a Transporter only. The following packages are available:

- Western Digital MyCloud DL2100 package
- Western Digital MyCloud DL2100 Transporter package
- Western Digital MyCloud DL4100 package
- Western Digital MyCloud DL4100 Transporter package
- Western Digital MyCloud PR2100 package
- Western Digital MyCloud PR 2100 Transporter package
- Western Digital MyCloud PR 4100 package
- Western Digital MyCloud PR 4100 Transporter package

NAKIVO Backup & Replication can be installed directly on a Western Digital MyCloud NAS to create your own, high-performance backup appliance. With this appliance, all VM data protection components are unified in a single system that is quick to deploy and easy to manage, while also not consuming your environment's valuable resources. Moreover, you are getting an all-in-one backup hardware, backup software, backup storage, and data deduplication in a single box. This results in a zero VMware footprint, less power and cooling, less required maintenance, time, money, and – most of all – higher VM backup performance.

NAKIVO Backup & Replication is installed on a NAS hard drive (not on the NAS Flash memory), so if you remove the hard drive from the NAS you will also remove the product from it.

Note

A pre-shared key is not created during Transporter-only installation. When adding this Transporter to NAKIVO Backup & Replication, filling out the master password field is not required. The master password can be manually set and reset later. For details, refer to “Installed Service” on page 332.

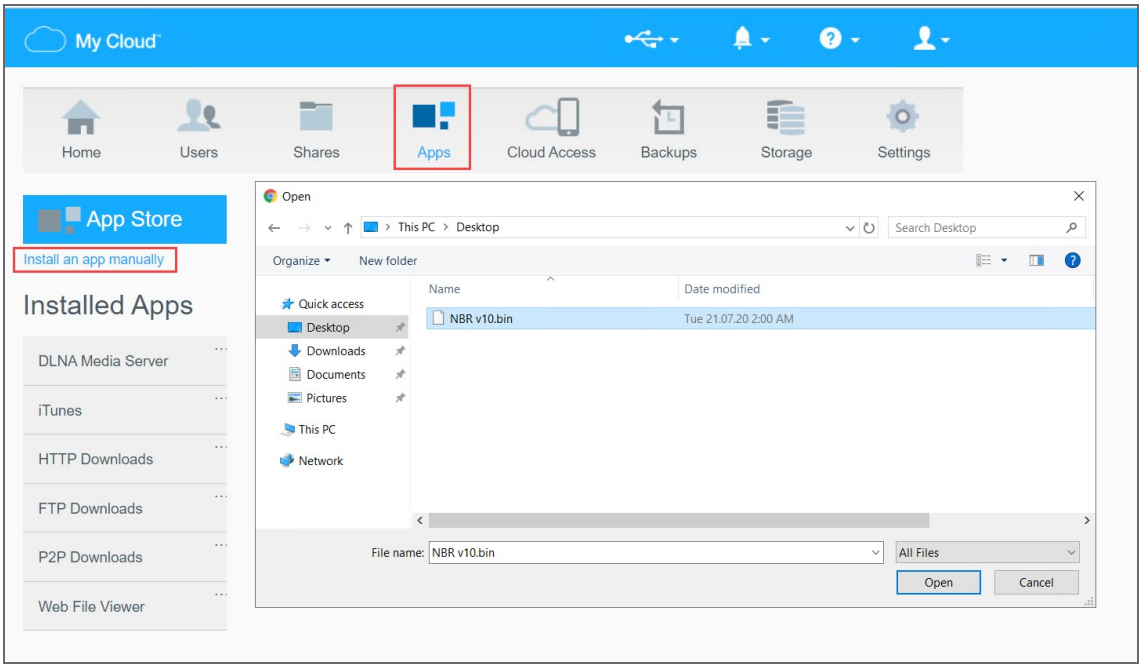
Prior to installing NAKIVO Backup & Replication onto a Western Digital MyCloud NAS device, make sure the following requirements have been met:

1. Your Western Digital MyCloud NAS model is supported by NAKIVO Backup & Replication.
2. You have access to the NAS **My Cloud** Dashboard.
3. You have NAKIVO Backup & Replication installer for Western Digital NAS available on your computer.

Follow the steps below to install NAKIVO Backup & Replication on a Western Digital MyCloud NAS device:

1. On the **My Cloud** dashboard, click **Apps**. The list of installed NAS applications opens on the left side of the page.

2. Above the list of NAS installed applications, click **Install an app manually**. The **File Upload** dialog opens.



3. In the **File Upload** dialog, navigate to your copy of NAKIVO Backup & Replication installer and click **Open**. The installation progress bar opens.
4. When the installation finishes successfully, a dialog box opens with a message informing you about it. Click **OK** to close the dialog box.

After the installation is complete, NAKIVO Backup & Replication will appear in the list of installed NAS applications. To access the product, do either of the following:

- Open the `https://<NAS_IP>:4443` address in your browser.
- In the list of installed NAS applications, click **NAKIVO Backup & Replication** and then click **Configure**.

Refer to "Getting Started" on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Installing on NETGEAR ReadyNAS

You can install the NETGEAR package that includes all NAKIVO Backup & Replication components (Director, Transporter, Backup Repository) or the NETGEAR Transporter package.

NAKIVO Backup & Replication can be installed directly on a supported NETGEAR ReadyNAS to create your own high-performance backup appliance. With the appliance, all VM data protection components are unified in a single system that is fast to deploy and easy to manage, while also not consuming your environment's valuable resources. Moreover, you are getting an all-in-one backup hardware, backup software, backup storage, and data deduplication in a single box. For installation instructions, refer to the following topics:

- “Installing on NETGEAR ReadyNAS via Available Apps” on page 152
- “Installing on NETGEAR ReadyNAS Manually” on page 153

Note

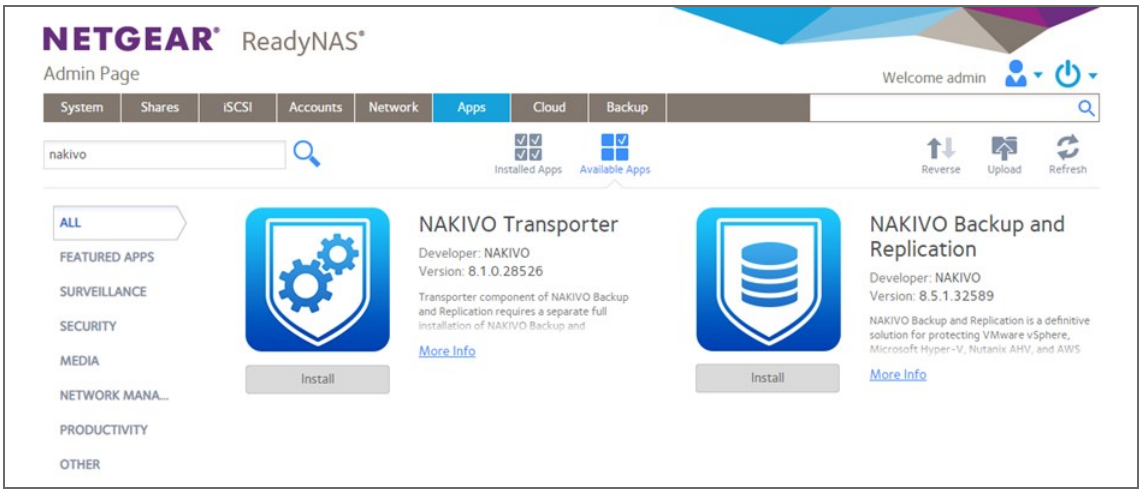
A pre-shared key is not created during Transporter-only installation. When adding this Transporter to NAKIVO Backup & Replication, filling out the master password field is not required. The master password can be manually set and reset later. For details, refer to “Installed Service” on page 332.

Installing on NETGEAR ReadyNAS via Available Apps

Before you begin installing NAKIVO Backup & Replication or NAKIVO Transporter on a NETGEAR ReadyNAS device, please check if your NETGEAR ReadyNAS model is supported.

To install NAKIVO Backup & Replication or NAKIVO Transporter, take the following steps:

1. Open the NETGEAR ReadyNAS **Admin Page** in your browser by entering the IP address of your NAS.
2. Go to **Apps** -> **Available Apps**.
3. Find **NAKIVO Backup & Replication** or **NAKIVO Transporter** in the list of available applications. Alternatively, you can enter `NAKIVO` to the filtering box in the upper left corner of the **Admin Page**.
4. Click the **Install** button below the corresponding item.



Note

Make sure that only one instance of the NAKIVO solution - either Full Product or Transporter-only - is installed on the device concurrently. Having both products installed at once may lead to incorrect operation.

5. Wait until the installation is completed.

By default, the **NAKIVO Backup & Replication** interface is available at the IP address of your NETGEAR ReadyNAS on the port 4443: `https://<IP_address_of_ NETGEAR_ReadyNAS>:4443`.

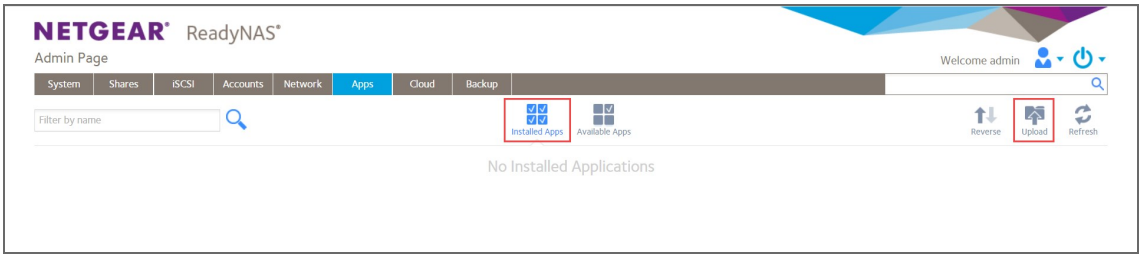
Refer to "Getting Started" on page 184 to know how to continue working with NAKIVO Backup & Replication.

Installing on NETGEAR ReadyNAS Manually

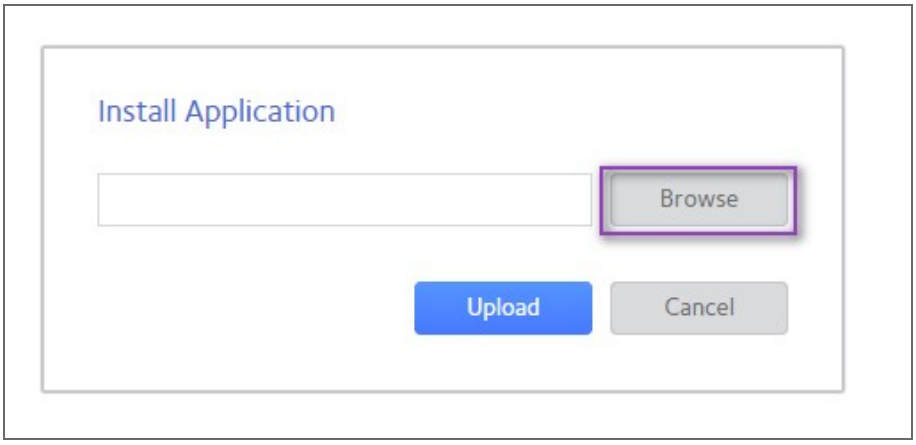
Before you begin installing NAKIVO Backup & Replication or NAKIVO Transporter on a NETGEAR ReadyNAS device, make sure your NAS model is supported and you have downloaded a relevant installer (`.deb` file) for NETGEAR ReadyNAS.

To install NAKIVO Backup & Replication or NAKIVO Transporter, take the following actions:

1. Open the NETGEAR ReadyNAS **Admin Page** in your browser by entering the IP address of your NAS.
2. Go to **Apps** and click **Upload**.



3. The **Install Application** dialog box opens. Click **Browse**.



4. In the dialog box that opens, locate the downloaded installer (`.deb` file) and then click **Upload**.
5. Wait until the installation has been completed.

   Note

   Make sure that only one instance of the NAKIVO solution - either Full Product or Transporter-only - is installed on the device concurrently. Having both products installed may lead to incorrect operations.

By default, NAKIVO Backup & Replication interface is available at the IP address of your NETGEAR ReadyNAS on the port 4443: `https://<IP_address_of_ NETGEAR_ReadyNAS>:4443`.

Refer to "Getting Started" on page 184 to understand better how to continue working with NAKIVO Backup & Replication.

Installing on Raspberry Pi

NAKIVO Backup & Replication can be installed on a Raspberry Pi computer.

- For system requirements, refer to “Deployment Requirements” on page 65 .
- For the installation procedure, refer to Installing on Generic ARM-based Device .

Refer to “Getting Started” on page 184 to better understand how to continue working with NAKIVO Backup & Replication.

Updating NAKIVO Backup & Replication

NAKIVO Backup & Replication automatically checks for updates once each day. If an update is available, a notification is displayed in the product web interface. Click the notification link to view information about the update.

Starting from v8.5, a full solution of the NAKIVO Backup & Replication installed on Windows or Linux can be updated automatically. Should you find that product auto updating is not supported or there are some network issues, you can update the product manually. For more details, refer to the corresponding articles below.

To manually update any copy of NAKIVO Backup & Replication, go to the download page with updaters.

To update your copy of the product to a newer version, you need to download an appropriate updater and run it on:

- Each machine on which you have additionally installed the Transporter.
- The machine on which the Director is installed.

Refer to the following topics for more information:

- "Software Update" on page 263
- "Updating Virtual Appliance" on page 156
- "Updating on Windows" on page 161
- "Updating on Linux" on page 163
- "Updating on Synology NAS" on page 164
- "Updating on Western Digital NAS" on page 167
- "Updating on Amazon EC2" on page 168
- "Updating on QNAP NAS" on page 174
- "Updating on ASUSTOR NAS" on page 177
- "Updating on NETGEAR ReadyNAS" on page 179

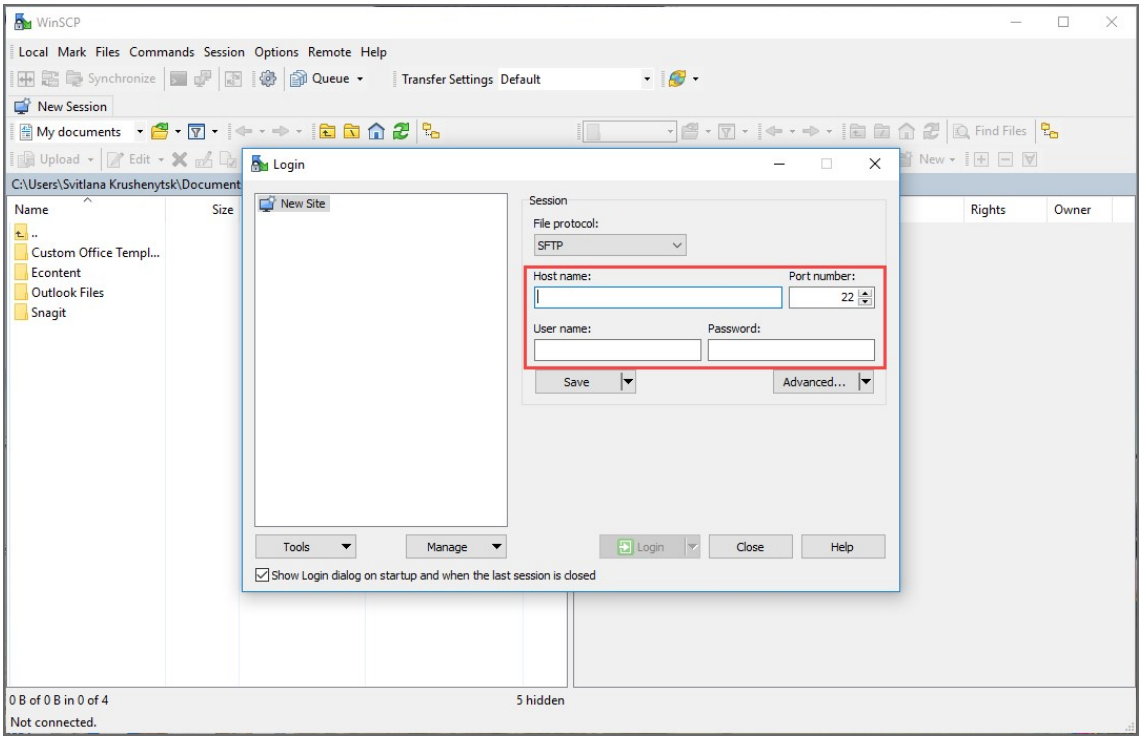
Updating Virtual Appliance

Prior to updating your virtual appliance (VA):

1. Make sure that no jobs or repository maintenance tasks are running in the product.
2. Create a snapshot of the VA to revert to the previous version in case any failure occurs.

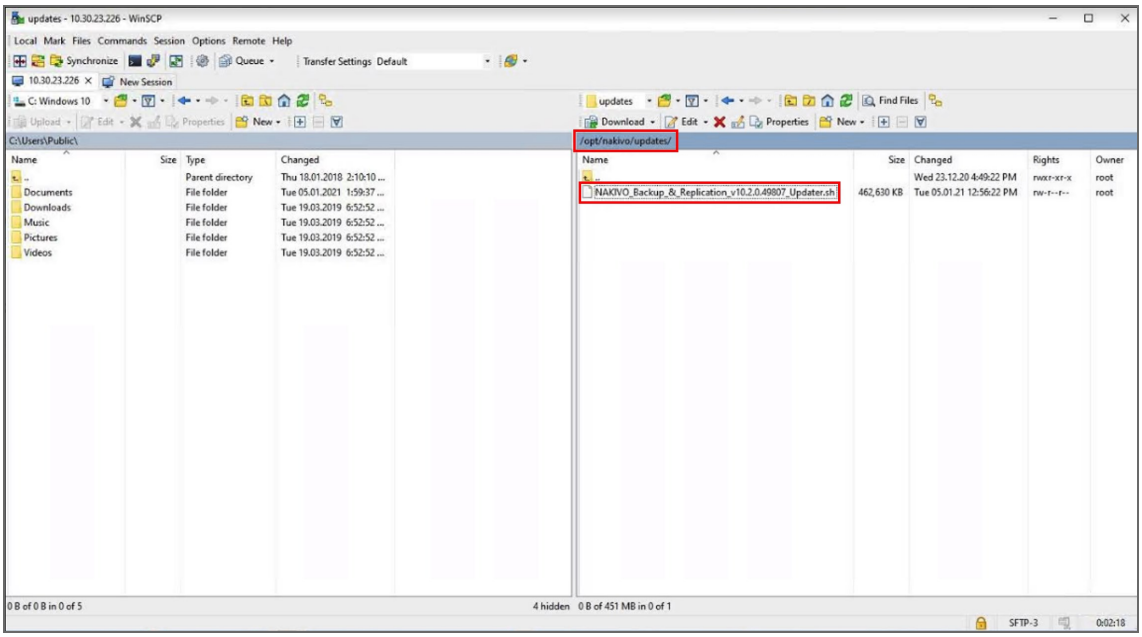
Follow the steps below to update your VA:

1. Using SSH client, log in to the VA that needs to be updated.

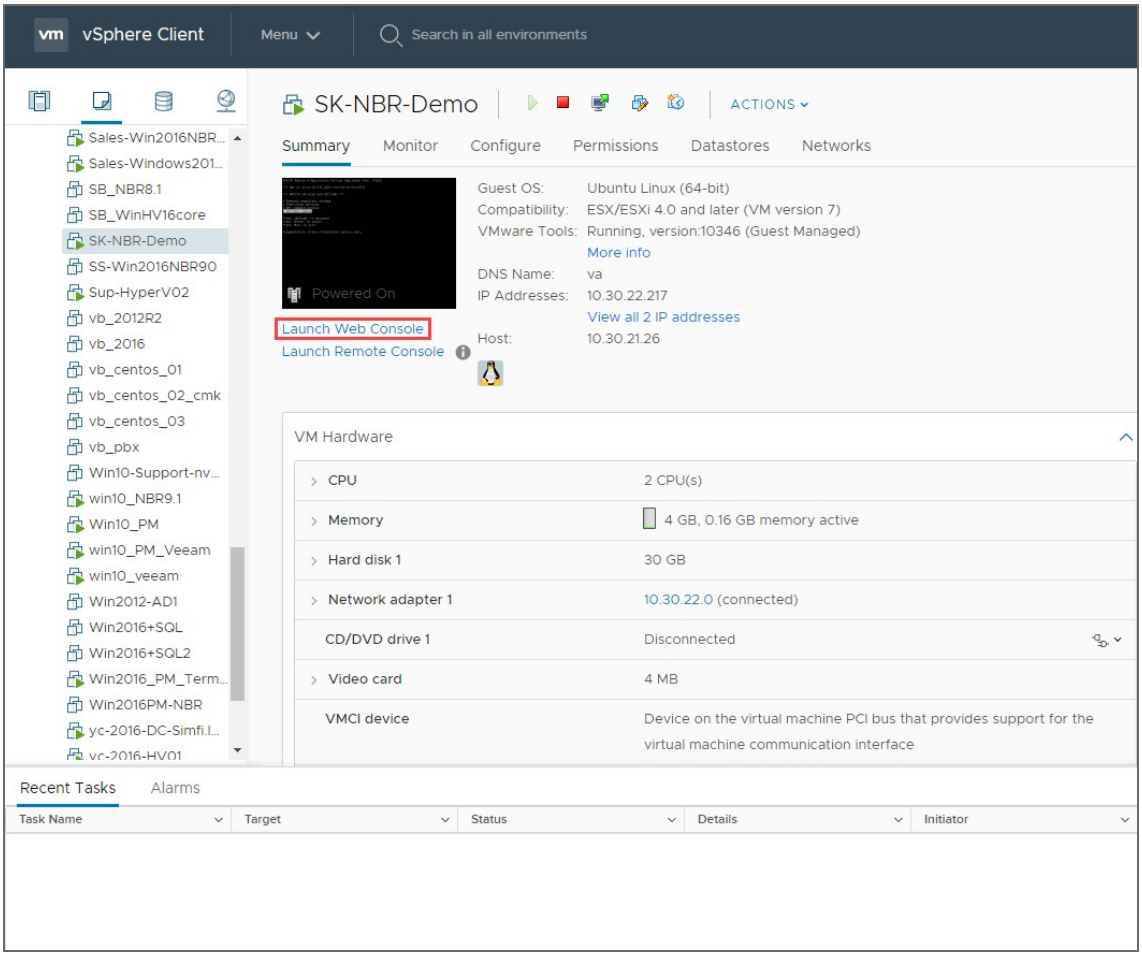


2. Download the latest *VA and Linux updater* from www.nakivo.com/resources/download/update/.

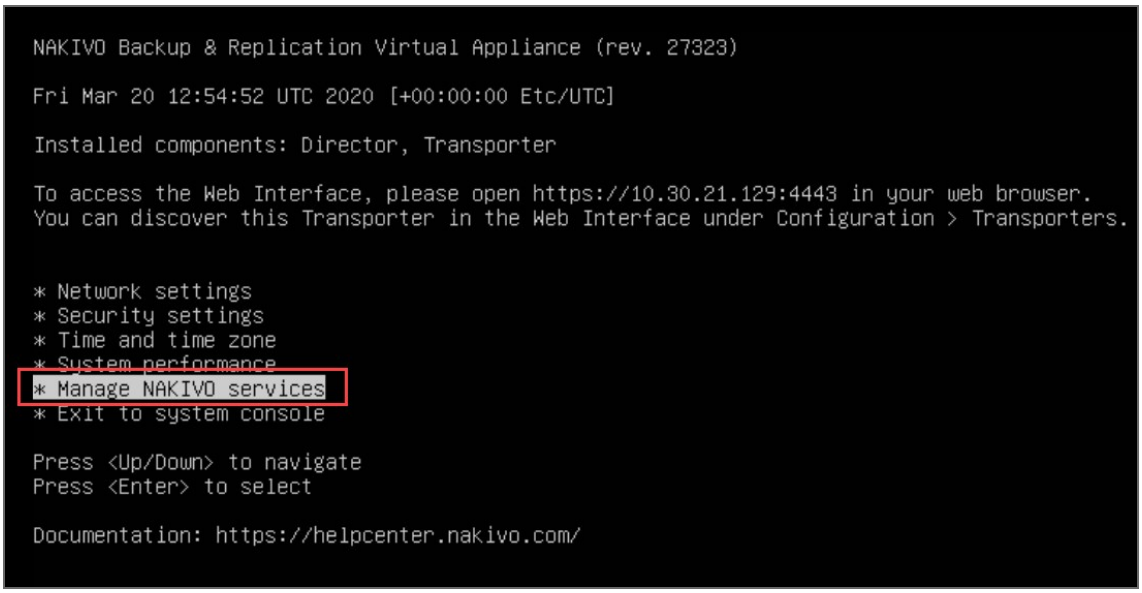
3. Change the directory to `/opt/nakivo/updates` and locate the updater.



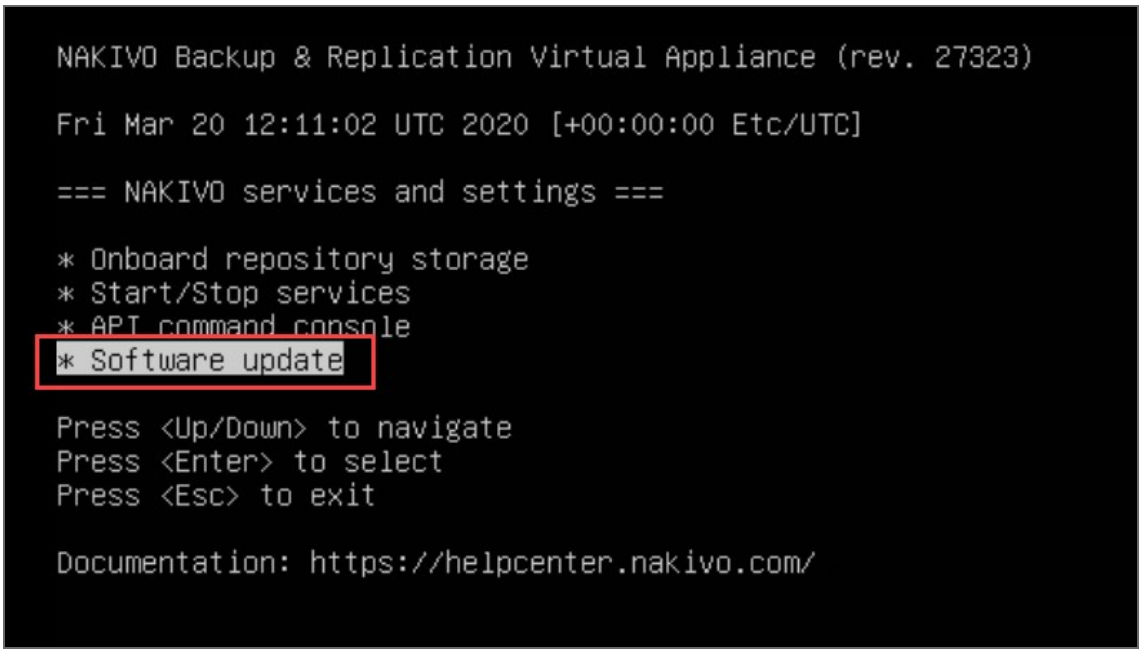
4. Log out from the SSH client.
5. Log in to your vSphere client, navigate to your VA and click **Launch Web Console**.



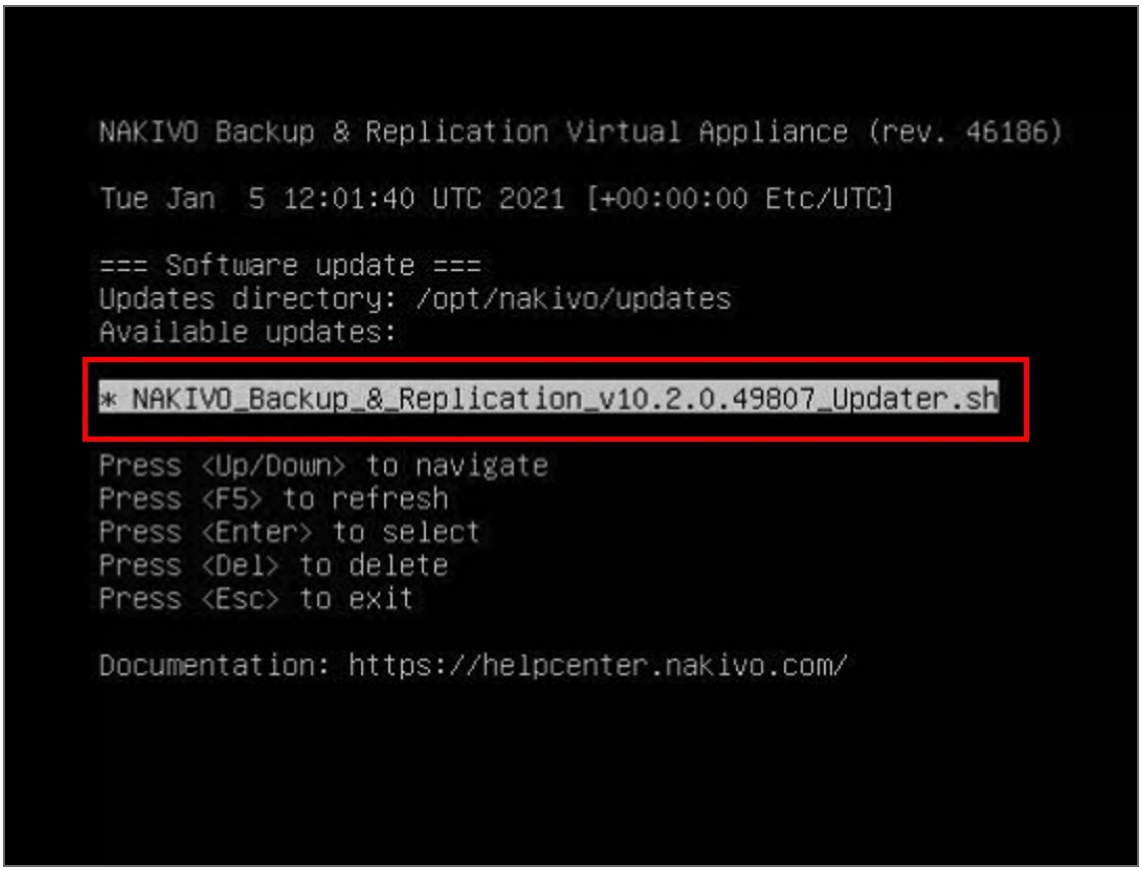
6. Do one of the following depending on the NAKIVO Backup & Replication version you use:
    - For the product Version 8.1 and above:
        1. In the VA menu, select **Manage NAKIVO services** and press **Enter**.



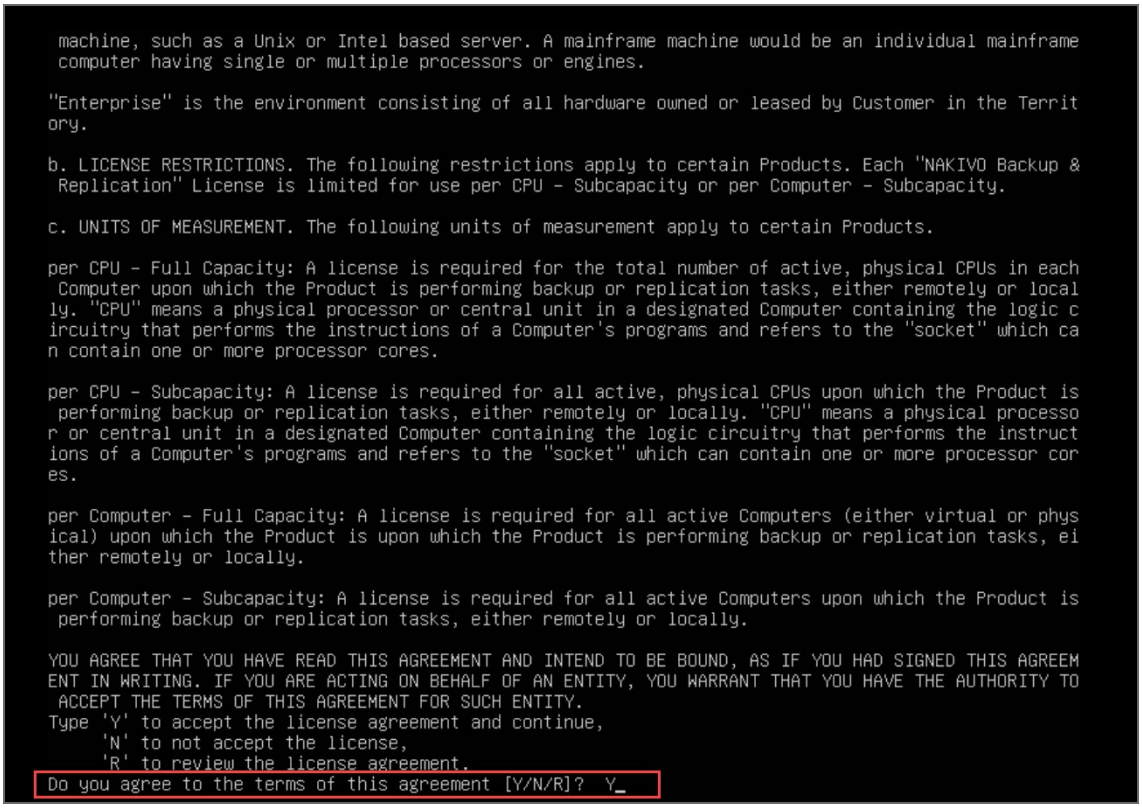
        2. In the menu that opens, select **Software update** and press **Enter**.



3. Select the updater that you have downloaded and press **Enter**.



4. Review the End User License Agreement. Press **Space** to go to the bottom of it. If you agree to the terms of the agreement, type **Y** and then press **Enter** to begin the update process.



- For earlier product versions:
    1. In the VA menu, select **Software update** and press **Enter.**
    2. Select the updater that you have downloaded and press **Enter.**
    3. Review the End User License Agreement. Press **Space** to go to the bottom of it. If you agree to the terms of the agreement, type **Y** and then press **Enter** to begin the update process.

7. When the update process is complete, a message will appear to inform you about it. Exit the VA console.
8. Update all machines on which you have deployed an additional Transporter.

Note

Updating your VA with versions prior to the previous major version (for example, updating VA version 6.1 to version 9.0) is prohibited. Please update your VA to the next major version first.

Updating on Windows

If auto-update within the NAKIVO Backup & Replication interface is not supported, follow the steps below to update the product manually:

1. Download the latest Windows updater from www.nakivo.com/resources/download/update/.
2. Make sure that no jobs or repository maintenance tasks are running in the product.
   If NAKIVO Backup & Replication is installed on a VM, create a snapshot of the VM before updating the product.
3. Run the updater on the machine on which the Director is installed, and also on all machines on which you have additionally deployed a Transporter.
4. Optionally, you can select the **Master password** checkbox and enter the password that will be used to generate a pre-shared key and secure the Transporter. This option is available only for the Transporter-only update.

   Notes

   - The master password must adhere to the following requirements:
     - Minimal length - 5 characters.
     - Maximum length - 50 characters.
   - The master password can be set and re-set manually by running the command on the machine housing the Transporter. Follow these steps:
     - Enter the following command `bhsvc -b P@ssword123`
     - Restart the Transporter service.
5. Optionally, you can select the **Transporter certificate** checkbox. This allows you to use a CA Certificate. Enter the path to the folder containing the certificate file in the field.

   Notes

   - When the checkbox is not selected, NAKIVO Backup & Replication automatically installs a self-signed certificate.
   - If the **Transporter Certificate** checkbox is not selected, a warning window appears prompting you to install it. Click **Continue** to proceed.
6. Click **Update**.
7. When the update is complete, click **Finish**.
8. If you have entered the new master password on step 4, do the following:
   a. Go to **Settings > Transporters** and click on the Transporter you have changed the master password for.
   b. Select **Edit**.
   c. Enter the new master password and click **Connect**.
   d. The **Certificate Acceptance** dialog box appears. Verify the certificate details, and click **Accept**.

e. Click **Apply** to save the changes.

f. Click on the sameTransporter once again and select **Refresh** to refresh the Transporter.

Updating on Linux

If updating on a Linux OS within the NAKIVO Backup & Replication interface is not supported, follow the steps below to update the product manually:

1. Download the latest Linux/VA updater from www.nakivo.com/resources/download/update/.
2. Upload the updater to the machine on which the Director is installed.

   Important

   Make sure you are using the *binary transfer mode* when uploading the updater to the machine with a Linux OS. For example:

   - Upload the installer from a Windows-based machine
   - Upload the product from a Linux-based machine: run the following command: `wget 'server_ip/shared/NAKIVO_Backup_Replication_vX.X.X_Updater.sh'`
3. Log in to the Linux machine and allow the execution of the updater file. For example: `chmod +x NAKIVO_Backup_Replication_vX.X.X_Updater.sh`
4. Make sure that no jobs or repository maintenance tasks are running in the product.

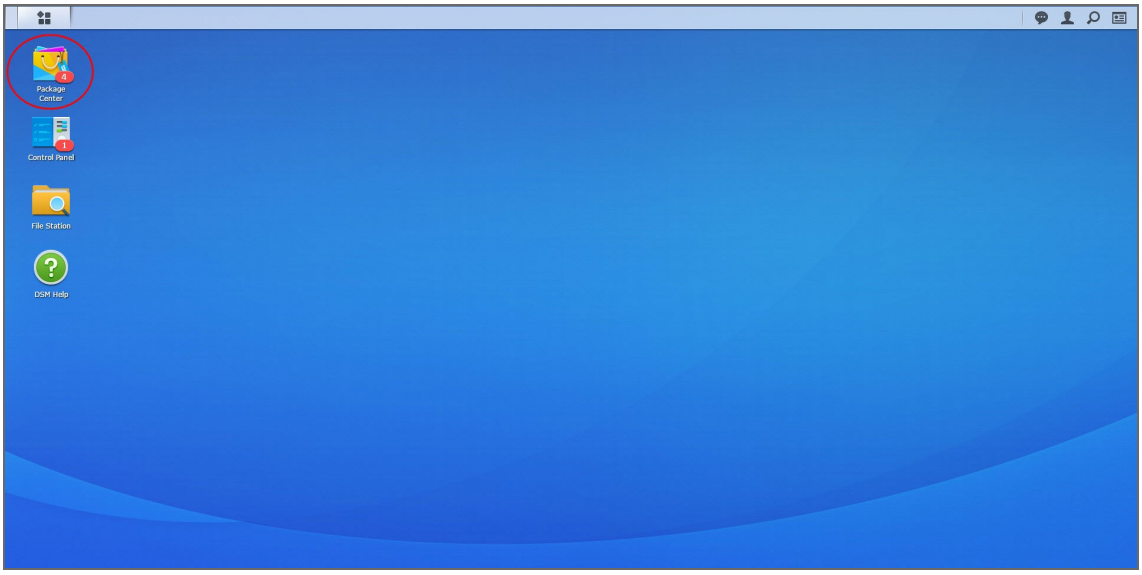
   If NAKIVO Backup & Replication is installed on a VM, create a snapshot of the VM prior to updating the product.
5. Run the updater file with root privileges. For example: `sudo ./NAKIVO_Backup_Replication_vX.X.X_Updater.sh`
6. Review the license agreement (press **Space** to go to the next page of the agreement). If you agree to the terms of the license agreement, press “Y” and then press **Enter**.
7. Enter the “Y” key and then press **Enter** to confirm that you wish to stop the services and begin the update process.
8. Update all machines on which you have additionally deployed a “Transporter” on page 43.

Updating on Synology NAS

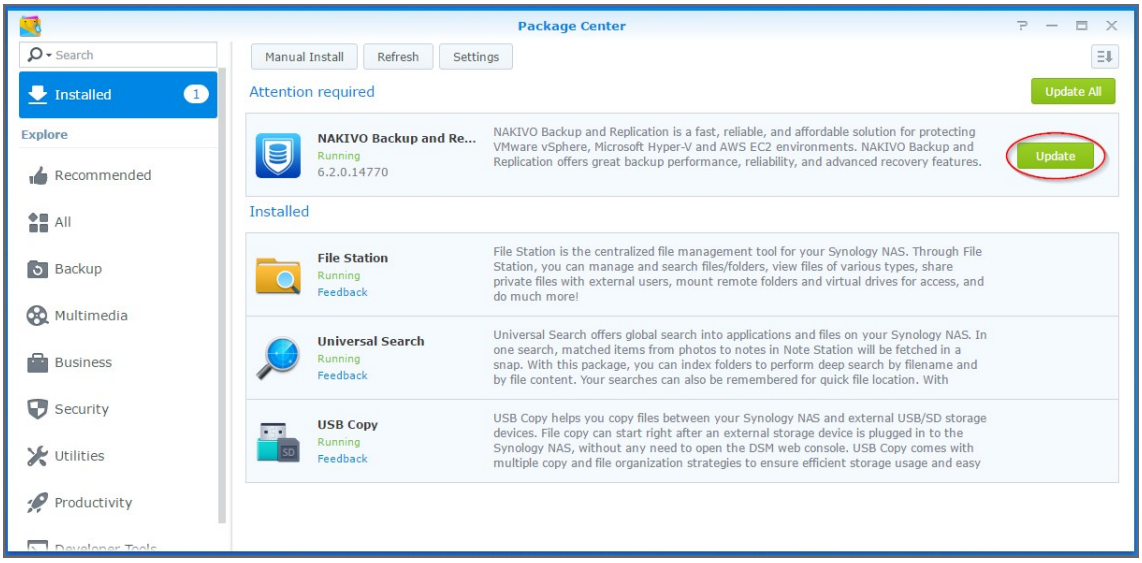
- Updating via Synology Package Center
- Updating Manually

Updating via Synology Package Center

1. Make sure that no jobs or repository maintenance tasks are running in the product.
2. In the Synology NAS management interface, open the **Package Center**.



3. Go to the **Installed** section.
4. If there is a new version of NAKIVO Backup & Replication available, you will see an **Update** button.



5. Click **Update**.

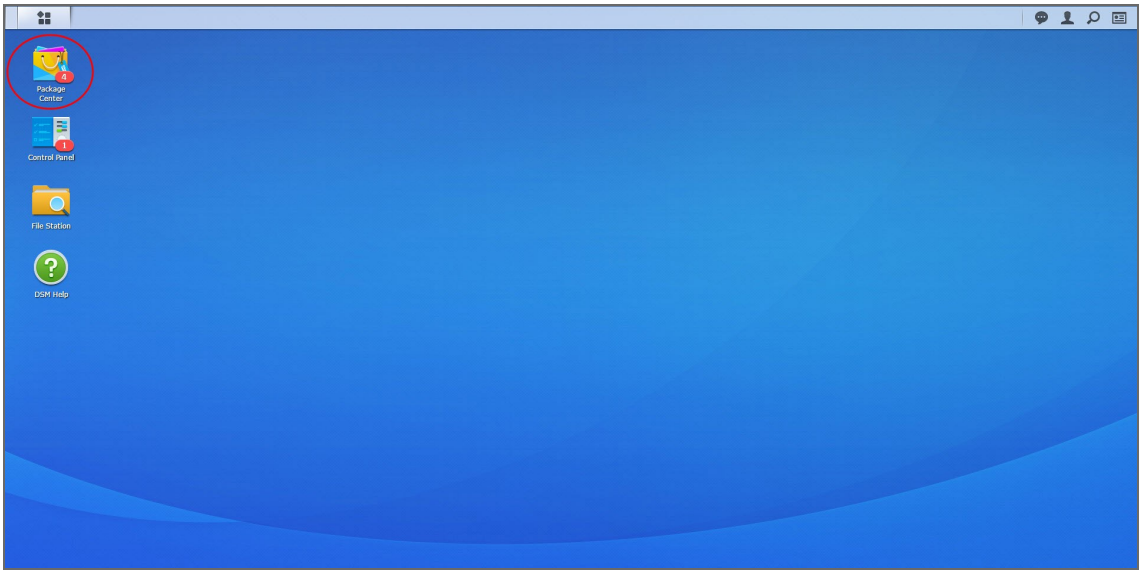
6. Wait until the update is complete.
7. Repeat these steps on all Synology NAS where you have also installed a Transporter.

Note

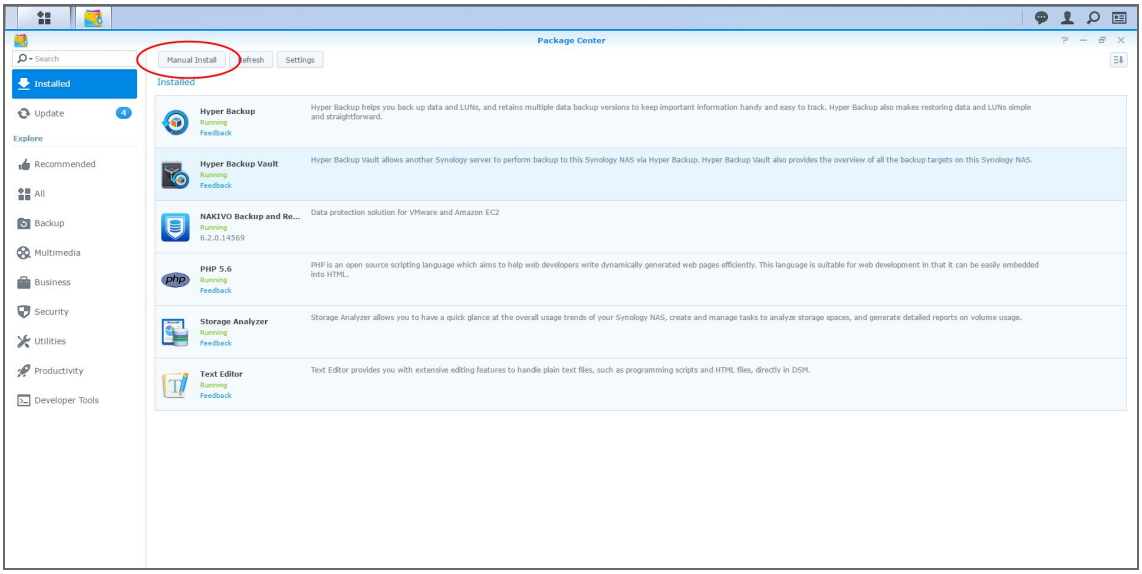
If the latest version of NAKIVO Backup & Replication is not available in the **Synology Package Center**, you may update manually by following the instructions in this Knowledge Base article.

Updating Manually

1. Download the latest Synology NAS updater from www.nakivo.com/resources/download/update/.
2. Make sure that no jobs or repository maintenance tasks are running in the product.
3. In the Synology NAS management interface, open the **Package Center**.



4. Click **Manual Install**.



5. Click **Browse**, navigate to the Synology NAS package that you have downloaded, select it, and click **Open**.
6. Click **Next**. the package is uploaded to your NAS.
7. Click **Apply**.
8. Run an appropriate updater on all machines on which you have also installed a Transporter.

Now, NAKIVO Backup & Replication has been updated.

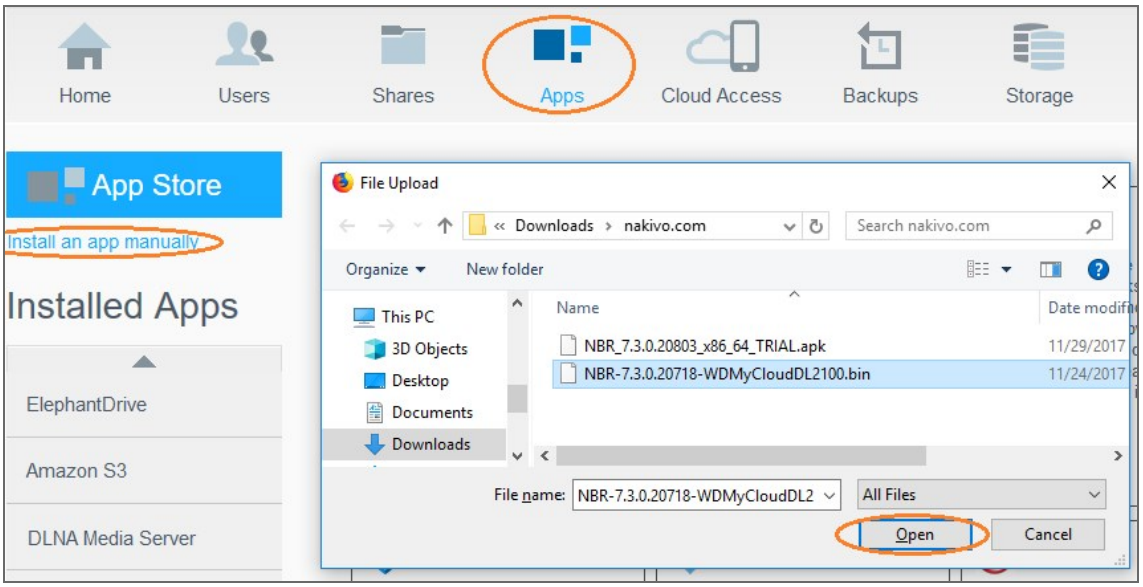
Updating on Western Digital NAS

Prior to updating NAKIVO Backup & Replication on Western Digital MyCloud NAS, make sure the following requirements have been met:

- You have access to the Western Digital NAS MyCloud Dashboard.
- NAKIVO Backup & Replication installer is available for your Western Digital NAS.

Please follow the steps below to update NAKIVO Backup & Replication on a Western Digital MyCloud NAS device:

1. Make sure that no jobs or repository maintenance tasks are running in the product.
2. In the **My Cloud** Dashboard, click **Apps**. The list of installed NAS applications opens on the left side of the page.
3. Above the list of NAS installed applications, click **Install an app manually**. The **File Upload** dialog opens.
4. In the **File Upload** dialog, navigate to your copy of the NAKIVO Backup & Replication installer for Western Digital NAS and click **Open**. The update progress bar opens.



5. Once the update has successfully finished, a dialog box opens with a message including said information. Click **OK** to close the dialog box.

Updating on Amazon EC2

The main installation of NAKIVO Backup & Replication (Director and Transporter) must be updated the way it is done on Linux.

Notes

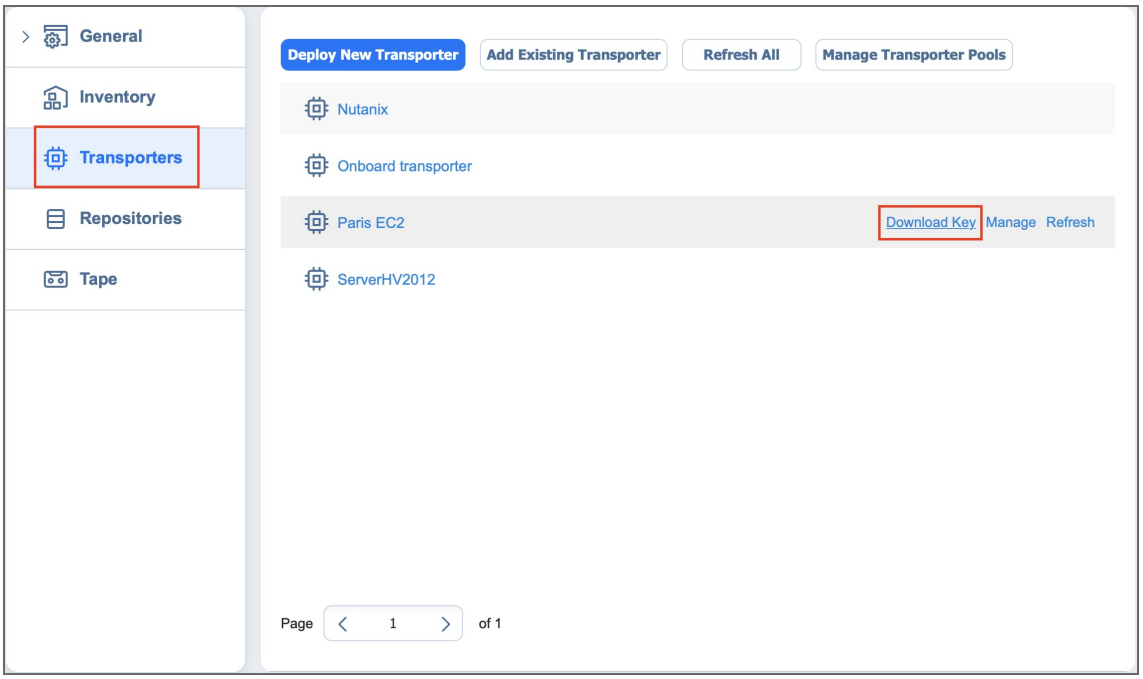
- You have to apply the **-e** argument for executing the installer, in order to avoid changing the Amazon EC2 Transporter with the regular Linux Transporter. Refer to "Installing on Linux" on page 123 for a description of the available arguments.
- Only the main installation of NAKIVO Backup & Replication needs to be updated manually. Transporters installed on Amazon EC2 instances are updated automatically.

Connecting to an Amazon EC2 Instance from Windows

You can use the following free tools to connect to your Amazon EC2 instance:

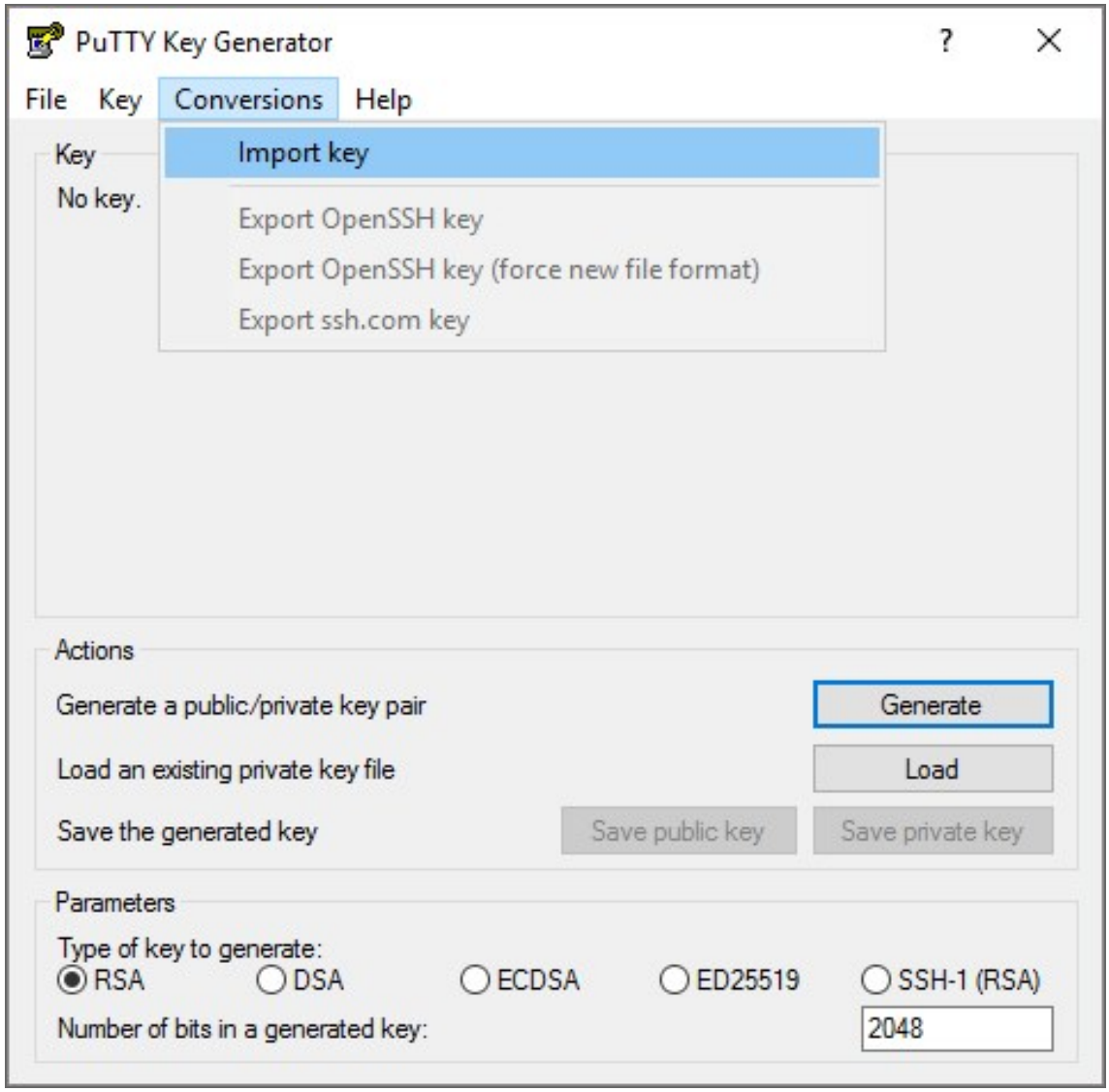
- WinSCP to upload the installer file.
- PuTTYgen tool to convert the private key.
- PuTTY tool to connect to an Amazon instance securely.

1. Log in to NAKIVO Backup & Replication.
2. Go to **Settings** > **Transporters**.
3. Download the keys of your Amazon instance.

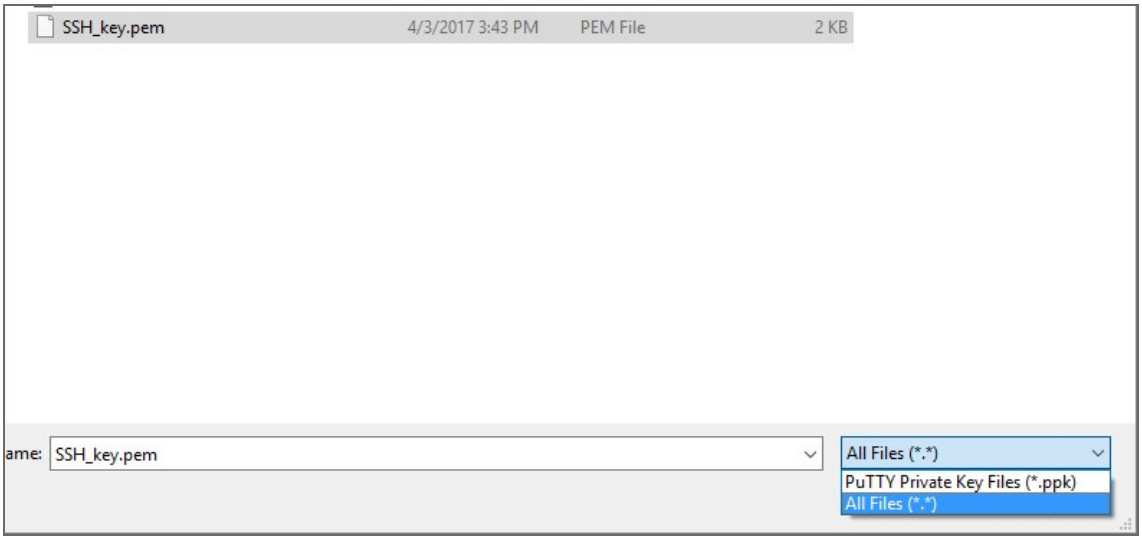


4. Click on the Transporter to view its details. Copy or remember the IP-address/hostname of the Amazon instance.
5. Unzip the folder with the key.
6. Convert the key using PuTTYgen:

1. In PuTTYgen menu, go to *Conversions > Import.*

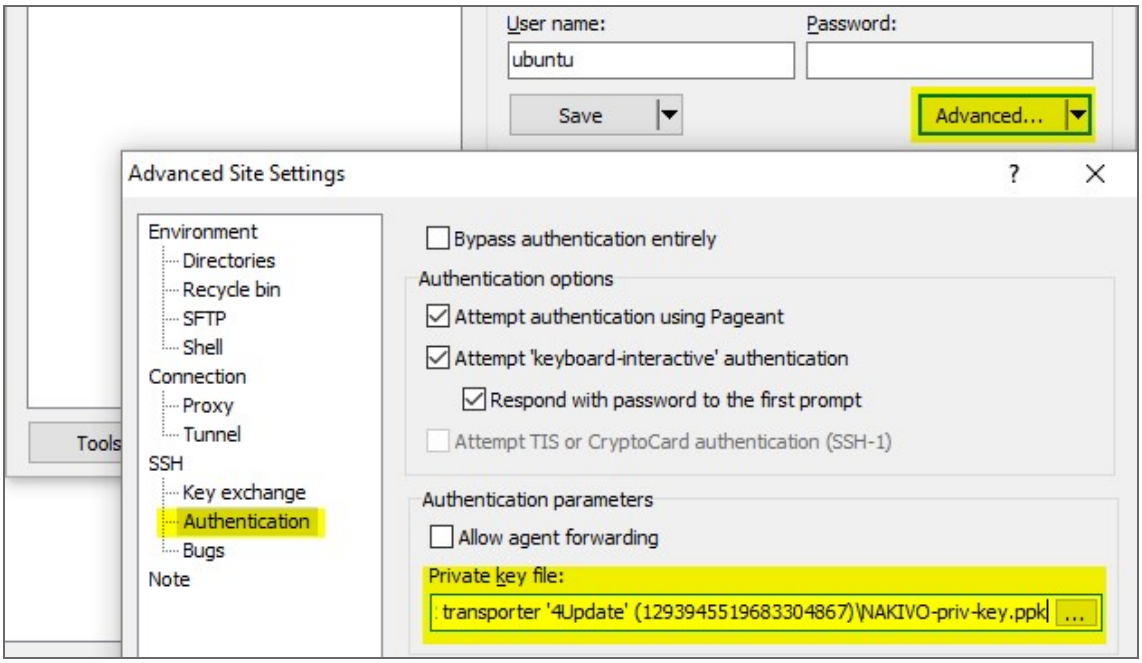


2. Locate the `SSH_key.pem` you just downloaded and unzipped. If you don't see it in the **Open**... dialogue box, change the file type to **All files**.



3. Click on **Save private key**. If PuTTYgen asks you to save the key without a passphrase, click **Yes**.

7. Open WinSCP.
8. Create a new session:
    a. Add the hostname or IP address of your Amazon instance you received on step 4 into the **Host Name** box.
    b. In the **Username** box, enter `nkvuser`.
    c. Leave the **Password** box empty.
    d. Add the private key to WinSCP:
        1. Click the **Advanced...** button.
        2. The **Advanced Site Settings** dialog box opens. Go to *SSH > Authentication > Private key file:* and select the key file you generated on step 6.



3. Click **OK**.

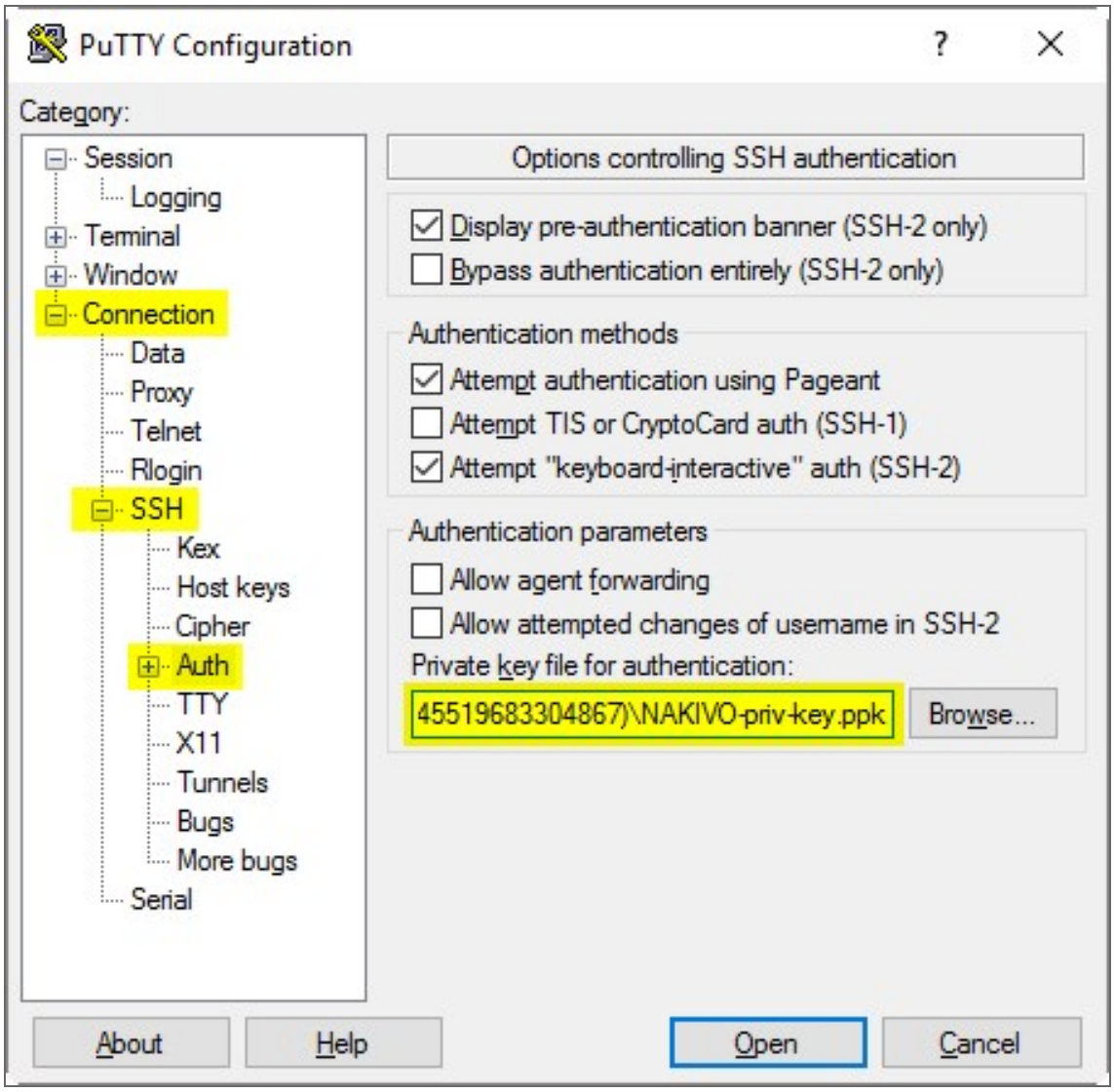
e. Click **Login**.

f. Upload the updater file.

g. Open PuTTY.

h. Enter the IP-address or hostname of the Amazon EC2 instance.

i. Go to *Connection > SSH > Auth* and add the private key in *Private key file for authentication:* box.



j. Click **Open**.

k. In the command line prompt that opens: log in to the Amazon EC2 instance:

   1. For **login**, enter `nkvuser`.
   2. For **password**, leave a blank line.

9. Update NAKIVO Backup & Replication following the instructions.

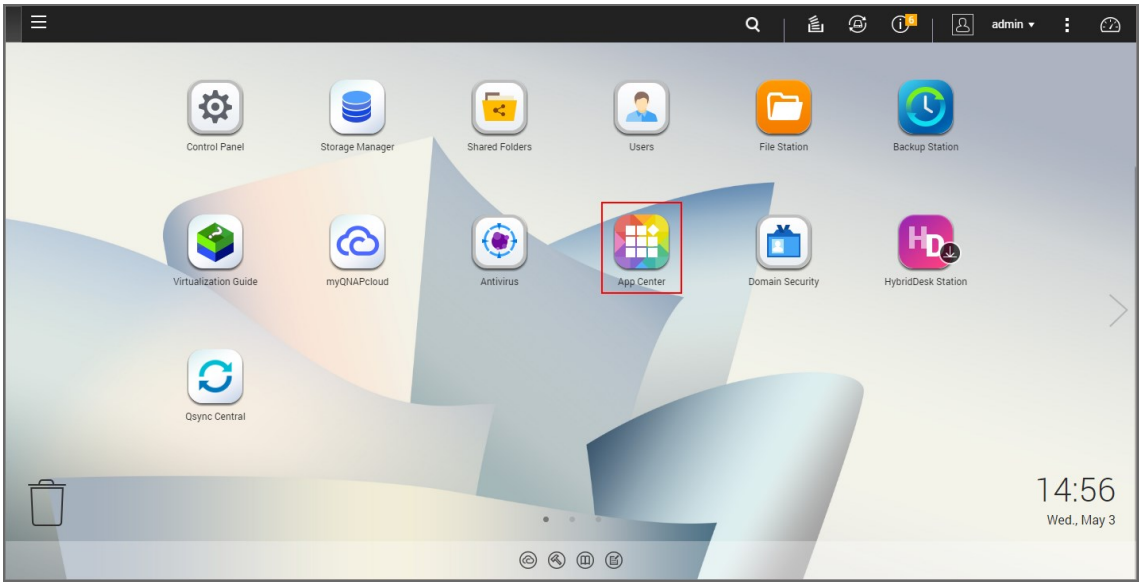
Updating on QNAP NAS

You can update NAKIVO Backup & Replication via QNAP AppCenter or manually. Refer to the following subtopics for details:

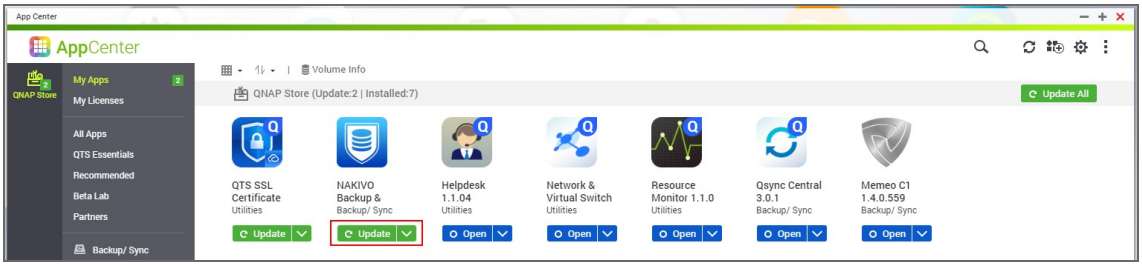
- Updating via QNAP AppCenter
- Updating Manually

Updating via QNAP AppCenter

1. Open the QNAP Desktop in your browser by entering the IP address of your QNAP NAS.



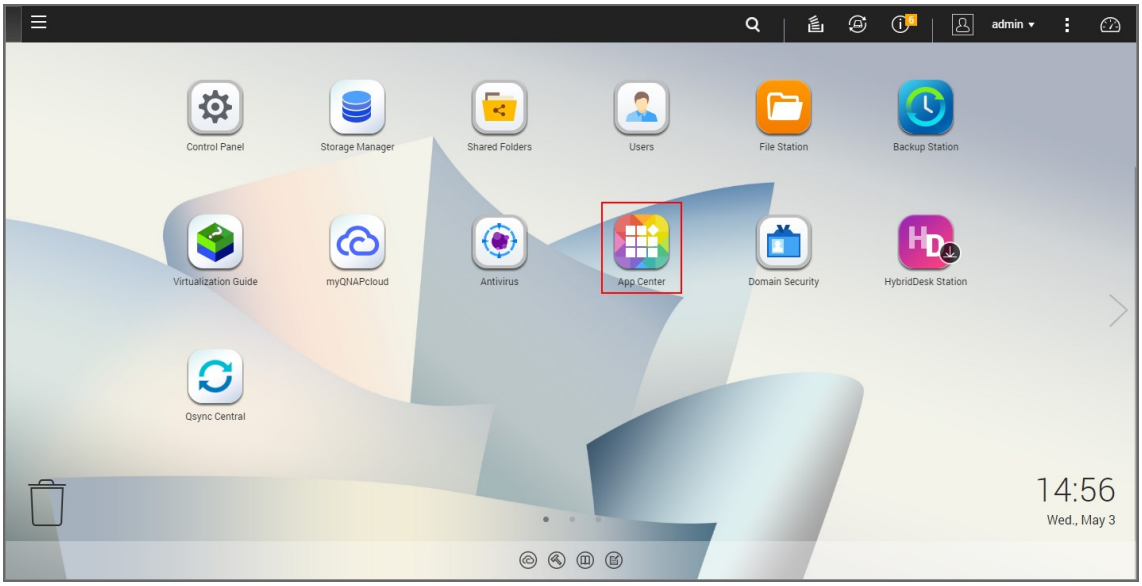
2. Make sure that no jobs or repository maintenance tasks are running in the product.
3. Go to **App Center**.
4. Select the *Backup/Sync* category and find NAKIVO Backup & Replication. Alternatively, use the search box at the top of the App Center window: click on the magnifier icon and enter "Nakivo".
5. If the new version of NAKIVO Backup & Replication is available in the QNAP App Center, you will see a green **Update** button.



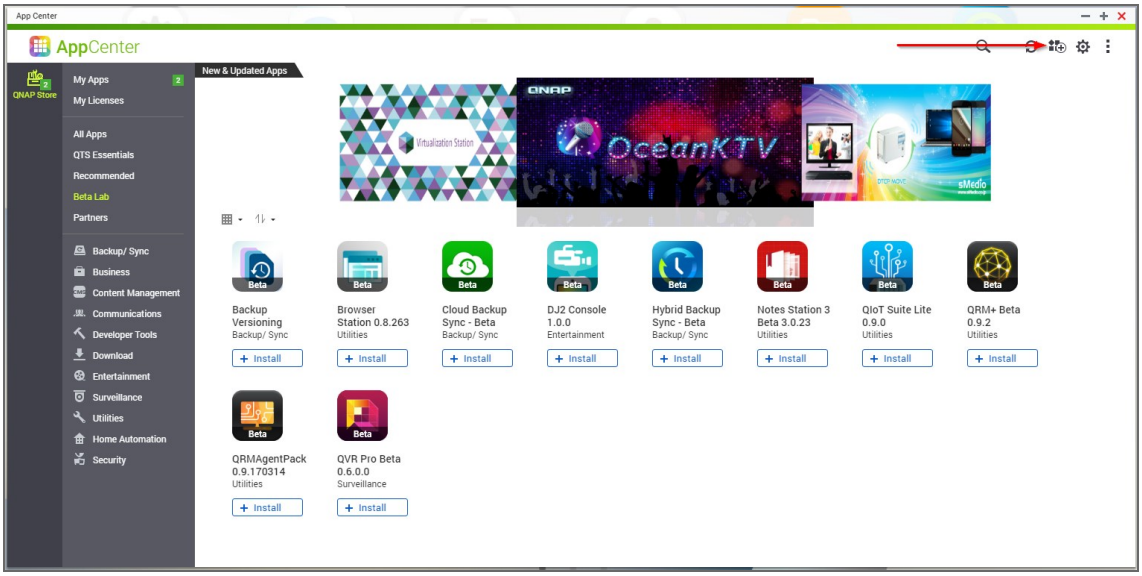
6. Click the **Update button** and wait till update finishes.

Updating Manually

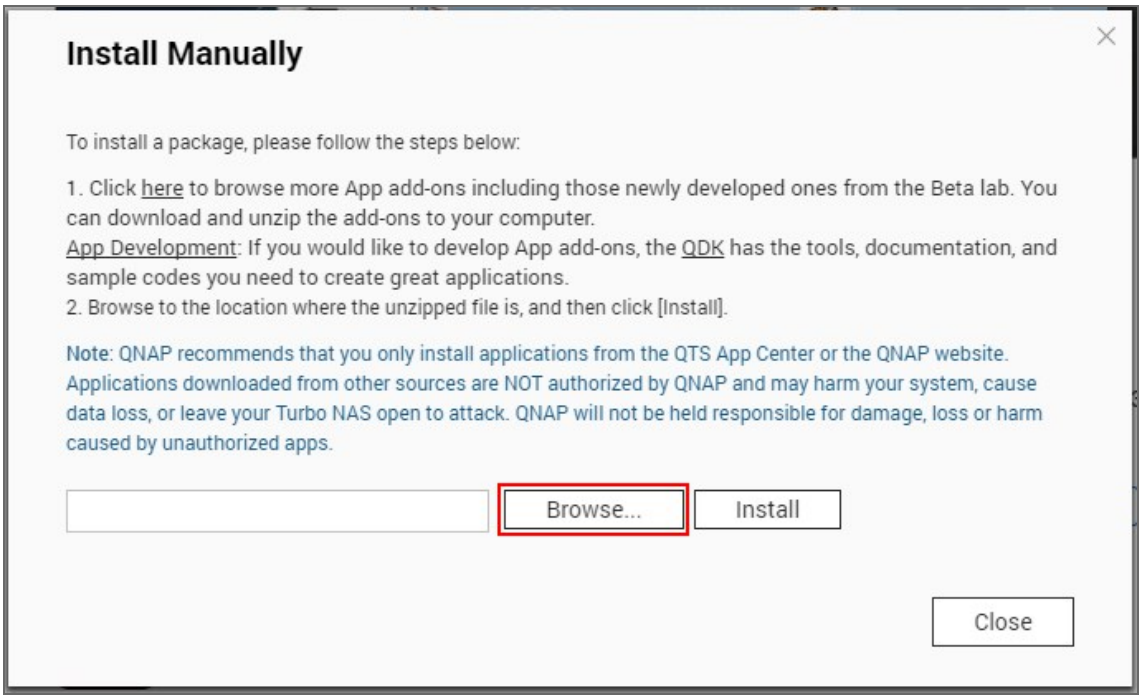
1. Download the update package from www.nakivo.com/resources/download/update/
2. Open the QNAP Desktop in your browser by entering the IP address of your QNAP NAS.



3. Go to **App Center**.
4. Click the **Install Manually** icon.



5. Click **Browse**. In the window appears, locate the installer (.qpkg file) on your computer.



6. Click **Install**.
7. Wait until the update process is finished.

Updating on ASUSTOR NAS

Updating on ASUSTOR NAS Manually

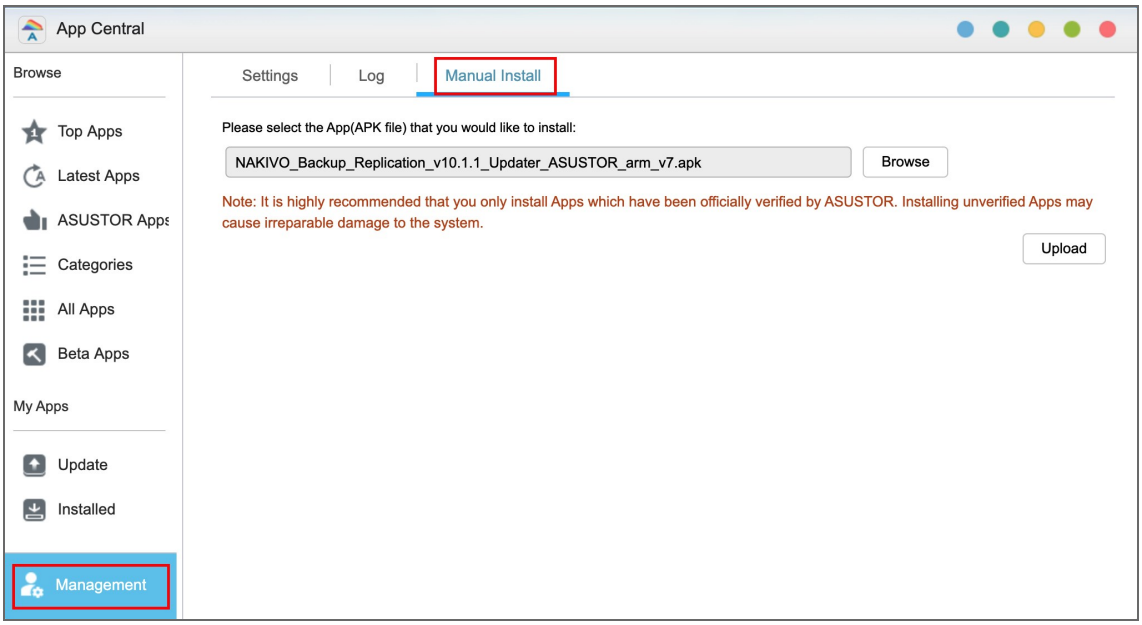
Prior to updating NAKIVO Backup & Replication on ASUSTOR NAS manually, make sure the following requirements are met:

- You have access to the ASUSTOR NAS.
- NAKIVO Backup & Replication installer is available for your ASUSTOR NAS.

Follow the steps below to update NAKIVO Backup & Replication on ASUSTOR NAS manually:

1. Make sure that no jobs or repository maintenance tasks are running in the product.
2. Open the **App Central** from the ASUSTOR NAS **Desktop**.
3. Click **Management** in the bottom left corner and click **Manual Install**.
4. The **Manual Install** pane opens to the right of the **App Central**. Click **Browse**.
5. The **Open** dialog box opens. Locate your copy of NAKIVO Backup & Replication installer for ASUSTOR NAS and click the **Open** button.
6. The **Open** dialog closes, and the **Upload** button becomes enabled. Click the **Upload** button.
7. When the upload finishes, the **About This App** dialog opens. If you are sure the requirements are met, click the **Next** button.
8. The **About This App** dialog opens a message asking you to review the summary of the NAKIVO Backup & Replication update. Select the checkbox **I understand the risks associated with installing unverified Apps** and click **Install**.
9. The **About This App** dialog closes, and the **Installed** pane of the **App Central** opens.

10. Wait until the update of NAKIVO Backup & Replication is complete.



Updating on ASUSTOR NAS via App Central

Follow the steps below to update NAKIVO Backup & Replication on ASUSTOR NAS via App Central:

1. Open the **App Central** from the ASUSTOR NAS **Desktop**.
2. In the **Browse** menu to the left, click **All Apps**. The list of applications available in **the App Central** opens in the right pane.
3. In the search box in the upper right corner of the pane, enter "Nakivo". Installations of the NAKIVO Backup & Replication application that are available at App Central are now displayed.
4. Click the **Update** button below the required NAKIVO Backup & Replication application to start uploading the update.
5. When the update is uploaded successfully, the **About This App** dialog opens. Click the **Update** button if you are sure that all the requirements are met.
6. The **About This App** dialog closes, and the **Installed** pane of the **App Central** opens. Wait until the update of the NAKIVO Backup & Replication is completed.

Updating on NETGEAR ReadyNAS

Updating on NETGEAR ReadyNAS Manually

Prior to updating NAKIVO Backup & Replication on NETGEAR ReadyNAS manually, make sure the following requirements have been met:

- You have access to the NETGEAR ReadyNAS.
- NAKIVO Backup & Replication update is available for your NETGEAR ReadyNAS.

Follow the steps below to update NAKIVO Backup & Replication on NETGEAR ReadyNAS manually:

1. Make sure that no jobs or repository maintenance tasks are running in the product.
2. Open the NETGEAR ReadyNAS **Admin Page** in your browser by entering the IP address of your NAS.
3. Go to **Apps** and click **Upload**.
4. The **Install Application** dialog box opens. Click **Browse**.
5. In the dialog box that opens, locate the downloaded installer (.deb file) and then click **Upload**.
6. Wait until the update is completed.

Updating on NETGEAR ReadyNAS via Available Apps

Prior to updating NAKIVO Backup & Replication on NETGEAR ReadyNAS via Available Apps, make sure that you have access to NETGEAR ReadyNAS.

Follow the steps below to update NAKIVO Backup & Replication on NETGEAR ReadyNAS via Available Apps:

1. Open the NETGEAR ReadyNAS **Admin Page** in your browser by entering the IP address of your NAS.
2. Go to **Apps** > **Available Apps**.
3. Find **NAKIVO Backup & Replication** in the list of available applications. Alternatively, enter NAKIVO to the filtering box in the upper left corner of the **Admin Page**.
4. If a new version of NAKIVO Backup & Replication is available in the NETGEAR **Available Apps**, the **Update** button will be available below the application item. Click the **Update** button.
5. Wait until the update is complete.

Uninstalling NAKIVO Backup & Replication

Uninstalling on Windows

To uninstall NAKIVO Backup & Replication, run the uninstaller:

1. Go to **Start** -> **Control Panel** and run **Programs and Features**.
2. Select **NAKIVO Backup & Replication** and click **Uninstall**.
3. In the **NAKIVO Backup & Replication Uninstallation** wizard, click **Uninstall**.
4. Click **Close** when the uninstallation process is completed.

Uninstalling on Linux or Generic ARM-based NAS

Refer to the sections below to learn how to uninstall NAKIVO Backup & Replication on a Linux OS or a generic ARM-based NAS.

Uninstalling Director and Onboard Transporter on Linux or Generic ARM-based NAS

To uninstall the Director and Onboard Transporter, which is installed with the Director by default, follow the steps below:

1. Run the "uninstall" script which is located in the Director folder inside the product installation folder. If the product is installed in the default location, run: /opt/nakivo/director/uninstall
2. Enter "U" and then press **Enter** to confirm uninstalling the application.

Uninstalling Transporter on Linux or Generic ARM-based NAS

To uninstall the Transporter, follow the steps below:

1. Run the "uninstall" script which is located in the transporter folder inside the product installation folder. If the product is installed in the default location, run: /opt/nakivo/transporter/uninstall

2. Enter "U" and then press **Enter** to confirm uninstalling the application.

Uninstalling on Synology NAS

Follow the steps below to uninstall NAKIVO Backup & Replication on a Synology NAS:

1. In the Synology NAS management interface, open the **Package Center**.
2. Click NAKIVO Backup & Replication.
3. Choose **Uninstall** from the **Actions** list.
4. Click **OK** in the message box that opens to confirm that you wish to uninstall the application.

When the uninstallation process is completed, NAKIVO Backup & Replication will be removed from the list of installed applications.

Uninstalling on Western Digital NAS

Follow the steps below to uninstall NAKIVO Backup & Replication on a Western Digital NAS:

1. Open the NAS My Cloud Dashboard and click **Apps**.
2. In the **Installed Apps** list, select NAKIVO Backup & Replication.
3. The NAKIVO Backup & Replication item opens to the right of the installed applications list. Click the **Uninstall** button.
4. The **Uninstall NAKIVO Backup and Replication** dialog opens. Click **OK** to confirm that you wish to uninstall the application and delete all application data and settings.
5. The **Updating** progress bar opens. Wait until the uninstallation completes.

When the uninstallation process is completed, NAKIVO Backup & Replication will be removed from the list of installed applications.

Uninstalling on QNAP NAS

Follow the steps below to uninstall NAKIVO Backup & Replication on a QNAP NAS:

1. Open the QNAP NAS Desktop and click **App Center**.
2. The **App Center** dialog opens. In the **My Apps** list, locate the NAKIVO Backup & Replication application and open the list of applicable actions by clicking the drop-down button.
3. In the list of applicable actions, click **Remove**.
4. In the dialog that opens, click **OK** to confirm removing the application and application-relevant user data.
5. Wait until the uninstallation is complete.

When the uninstallation process is completed, NAKIVO Backup & Replication will be removed from the list of installed applications.

Uninstalling on ASUSTOR NAS

Follow the steps below to uninstall NAKIVO Backup & Replication on a QNAP NAS:

1. Open the ASUSTOR NAS Desktop and click **App Central**.
2. In the list of installed applications, locate NAKIVO Backup & Replication, select it and then click the **Remove** button.
3. In the dialog that opens, click **OK** to confirm that you wish to remove the application.
4. The **Removing** progress bar opens. Wait until the uninstallation is completed.

When the uninstallation process is completed, NAKIVO Backup & Replication will be removed from the list of installed applications.

Uninstalling on NETGEAR ReadyNAS

Follow the steps below to uninstall NAKIVO Backup & Replication on NETGEAR ReadyNAS:

1. Open the NETGEAR ReadyNAS **Admin Page** and go to **Apps** > **Installed Apps**.
2. Locate **NAKIVO Backup & Replication** in the list of available applications. Alternatively, enter NAKIVO to the filtering box in the upper left corner of the **Admin Page**.
3. Click the **Remove** button below the application item.
4. The **Confirm Deletion** dialog box opens. Click **Yes** to confirm that you wish to uninstall NAKIVO Backup & Replication on NETGEAR ReadyNAS.
5. Wait until the uninstallation is completed.

When the uninstallation process is completed, NAKIVO Backup & Replication will be removed from the list of installed applications.

Terminating on Amazon EC2

Follow the steps below to terminate NAKIVO Backup & Replication that is launched as an Amazon EC2 instance:

1. Open AWS Management Console and go to **EC2 Dashboard**.
2. In the **Instances** menu, click **Instances**.
3. In the list of instances, locate the necessary NAKIVO Backup & Replication instance and select it.
4. In the **Actions** menu, go to **Instance State** and click **Terminate**.
5. In the **Terminate Instances** dialog, click **Yes, Terminate** to confirm that you wish to terminate your instance of NAKIVO Backup & Replication.
6. Wait until the instance is terminated.

In about 60 minutes, the terminated NAKIVO Backup & Replication instance will be removed from the list of Amazon EC2 instances.

Getting Started

When deployed, NAKIVO Backup & Replication is ready for use. The topics below will provide you with information on how to start working with the application.

Logging in to NAKIVO Backup & Replication

Getting to the Login Page

To go to the NAKIVO Backup & Replication login page, open the following URL in your web browser: https://machine_IP_or_DNS:4443.

Note

If you selected a custom HTTPS port during installation, replace 4443 with the custom value.

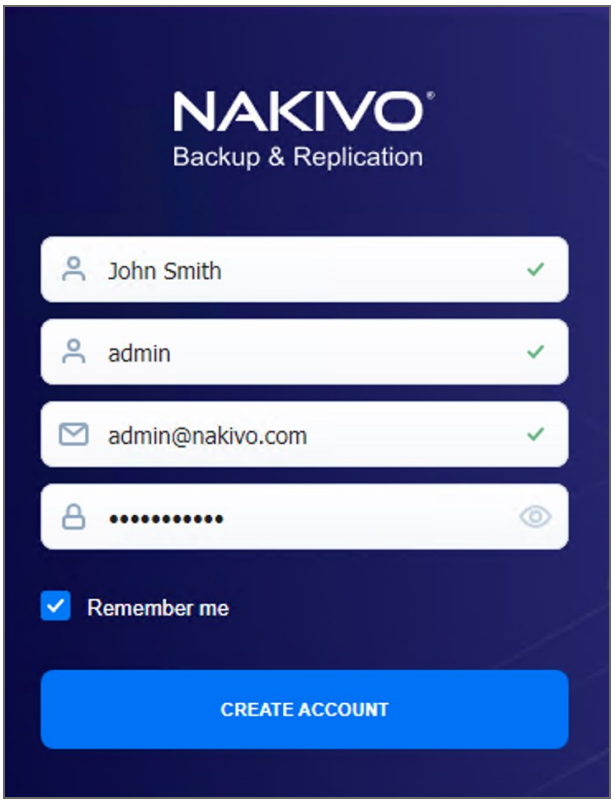
Creating a User Account

When you open the NAKIVO Backup & Replication login page for the first time, you are prompted to create a new user account. This user account is the admin account to be used to access your instance of NAKIVO Backup & Replication. Fill out the fields in the form:

1. **Name**: Provide your real name.
2. **Username**: Enter an admin username to log in to NAKIVO Backup & Replication.
3. **Email**: Provide an email.
4. **Password**: Enter a password.
5. Optionally, you can select **Remember me** to save your credentials.
6. Click **CREATE ACCOUNT**.

   Note

   If NAKIVO Backup & Replication is deployed in an Amazon EC2 instance, you will first be prompted to enter the Amazon EC2 instance ID.



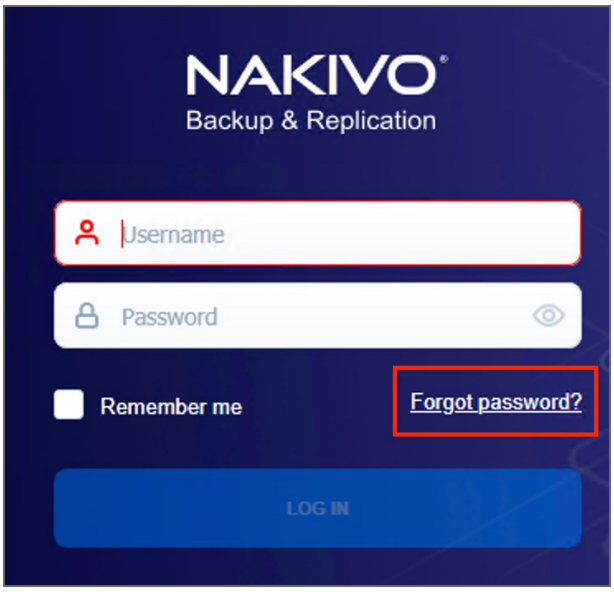
NAKIVO Backup & Replication opens in your browser displaying the configuration wizard. Refer to First Steps with NAKIVO Backup & Replication to learn how to start using NAKIVO Backup & Replication.

To log out, click **Logout** in the bottom left corner.

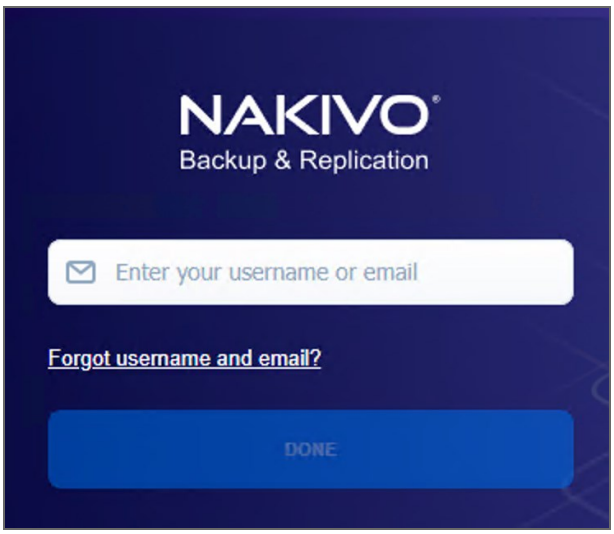
Changing Password

If you forget the password used to log in to NAKIVO Backup & Replication, you can restore it by following the steps below:

1. Go to NAKIVO Backup & Replication login page.
2. Click the **Forgot password** link.



3. Do one of the following:
   - If you have set up email settings in NAKIVO Backup & Replication, enter your email address and click **Done**.

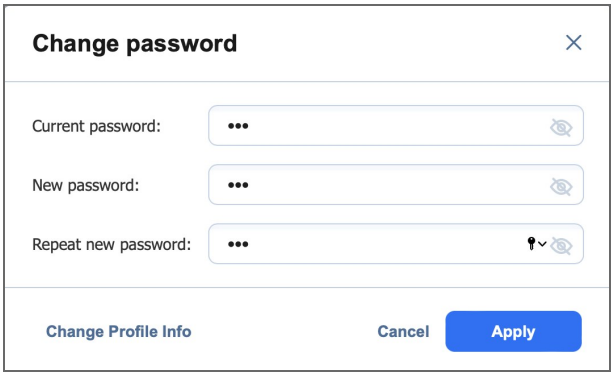


A temporary password, which is a security string, is sent to your inbox. Enter this password the next time you log in to your NAKIVO Backup & Replication instance. Once you are logged in, it's recommended that you change the temporary password for your user account. To change the temporary password:

a. Click **Logout** in the bottom left corner.
b. Select **Profile**.
c. Click **Change password**.
d. In the dialog box that opens, fill out the following fields:
   - **Current password**: Enter the temporary password that you received to your inbox.
   - **New password**: Enter a new password.

- **Repeat new password**: Enter the new password again.

e. Click **Change**.



You can also change your temporary password in **Settings**>**General**>**Users and Roles**

- If you have not set up email settings in NAKIVO Backup & Replication:
  a. Enter your username and click **Done**.
  b. Go to the product installation folder and locate the “forgot_password.txt” file.

  Important

  For security reasons, only a root user (Linux) or a member of the Administrators group (Windows) is allowed to access the installation folder and the "forgot_password.txt" file.
  c. Paste the security string from the file in the appropriate field.
  d. Click **Done**.

  Notes

  - If you are using a Virtual Appliance (VA), go to the VA console, then go to the command line and enter: `cat /opt/nakivo/director/forgot_password.txt` The security string will be displayed on the screen. You can copy and paste it into the web interface.
  - If you are using a NAS, open an SSH connection to your device and read the forgot_password.txt file in the following folders:
    - For ASUSTOR NAS: `/usr/local/AppCentral/NBR`
    - For NETGEAR NAS: `/apps/nbr`
    - For QNAP NAS: `/share/CACHEDEV1_DATA/.qpkg/NBR`
    - For Raspberry PI: `/opt/nakivo/director`
    - For Synology NAS: `/volume1/@appstore/NBR`
    - For Western Digital NAS: `/mnt/HD/HD_a2/Nas_Prog/NBR`
  - To learn how to open an `SSH` connection to your NAS device and read text files, refer to the NAS vendor documentation.

Default Password in Amazon EC2

If you have deployed NAKIVO Backup & Replication as an Amazon machine image in Amazon EC2, use the following default credentials to log in:

- **Username**: admin
- **Password**: The password is the ID of the NAKIVO Backup & Replication instance in Amazon EC2.

Passing Verification

If two-factor authentication was configured, verification needs to be passed after entering the credentials to access your NAKIVO Backup & Replication instance. This can be done in one of the following ways:

- Google Authenticator code from the mobile app
- A code sent to the specified email address
- One of the single-use backup codes

If Two-factor authentication was enabled but never configured, it must be configured now. Do the following:

1. Click **Continue**.
2. Optionally, click on the **change your email** link to enter the new email address for the user. Select **Continue** to proceed.
3. Enter the verification code that was sent to the specified email and click **Continue**. Optionally, click **Resend email** in case you did not receive it.
4. Optionally, enter the alternative email address that can be used in case the primary one becomes unavailable, and select **Continue**. Alternatively, select **Skip this step**.
5. If you have entered the alternative email address for the previous step, enter the verification code that was sent to the specified email, and click **Continue**. Optionally, click **Resend email** in case you did not receive it.
6. Follow instructions on screen to download and install Google Authenticator, and click **Continue**.
7. Add your NAKIVO Backup & Replication user account to Google Authenticator. Use one of the following methods:
    - Select **Scan QR Code** option and scan the QR code in the popup window.
    - Select **Enter a Code** option and follow the instructions to enter the shown code into the Google Authenticator app.
8. Enter the 6-digit verification code from Google Authenticator into the field. Note that the verification code is time-based. Click **Continue** to proceed.

9. A pairing key is displayed which can be used to add multiple devices to your account.

   Important
   It is highly recommended that you save the pairing key or write it down.

   You have the following options:
   - Optionally, click on the **Copy the key** link to copy your key and save it for future use.
   - Optionally, click on the **Download pairing information** link to download and save instructions on how to use the pairing key.
   - Click **Continue** when you're done.
10. Four backup codes are displayed on the next page. These one-time codes can be used to log in when you are unable to provide a verification code. Click on the **Save as PDF** link to download and save these codes in PDF format or write them down. Click **Continue**.
11. Enter one of the backup codes in the next popup window to confirm that you have saved them, and click **Finish**.

Google Authenticator Verification

If you have selected the **Google Authenticator** verification method on the **Managing Two-Factor Authentication** page, do one of the following:

- Enter the verification code from Google Authenticator into the field, and click **Proceed**.
- Enter one of the one-time backup codes.
- Click **More verification options** to use email verification.

Email Verification

If you have selected the **Email** verification method on the **Managing Two-Factor Authentication** page, do one of the following:

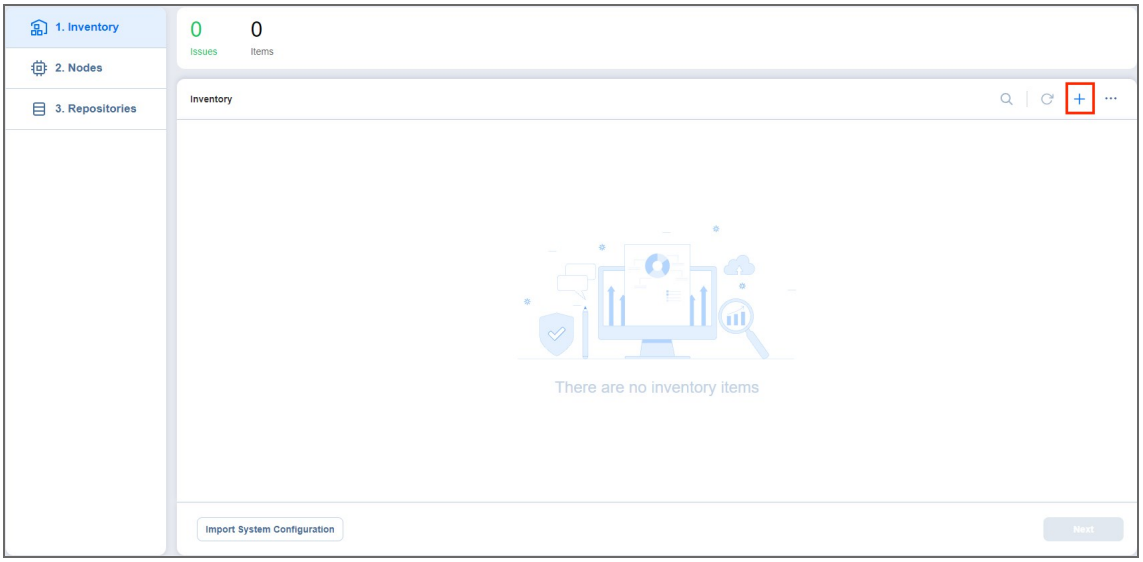
- Select one of the email addresses verified previously, and click **SEND VERIFICATION CODE**. Then click **OK**.
- Enter one of the one-time backup codes.
- Alternatively, click **More verification options** to choose a different email for verification.

First Steps with NAKIVO Backup & Replication

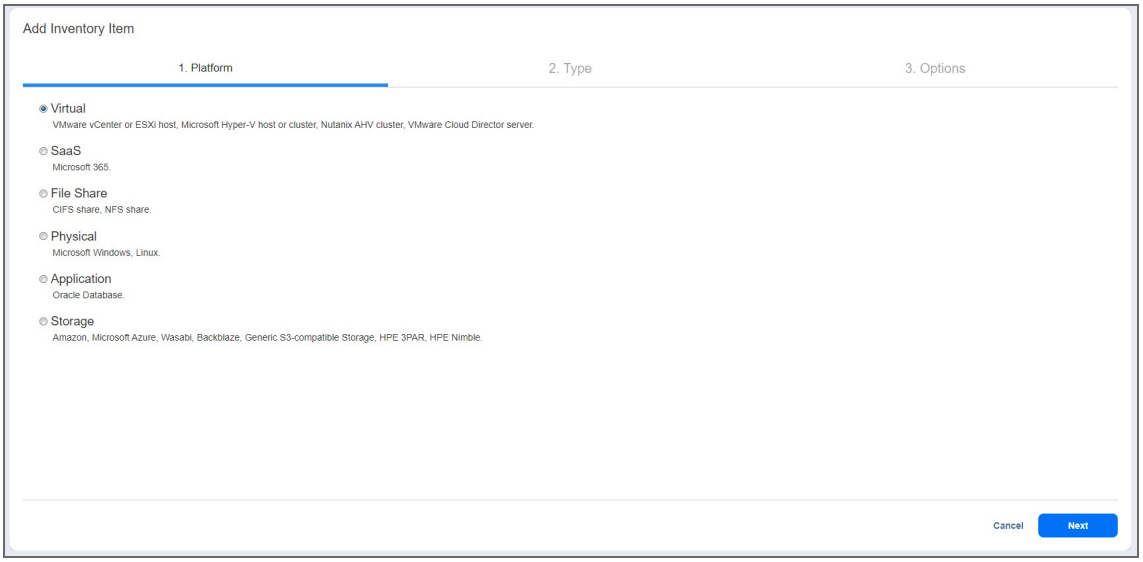
When you log in to NAKIVO Backup & Replication for the first time, the initial configuration wizard opens.

Proceed as follows:

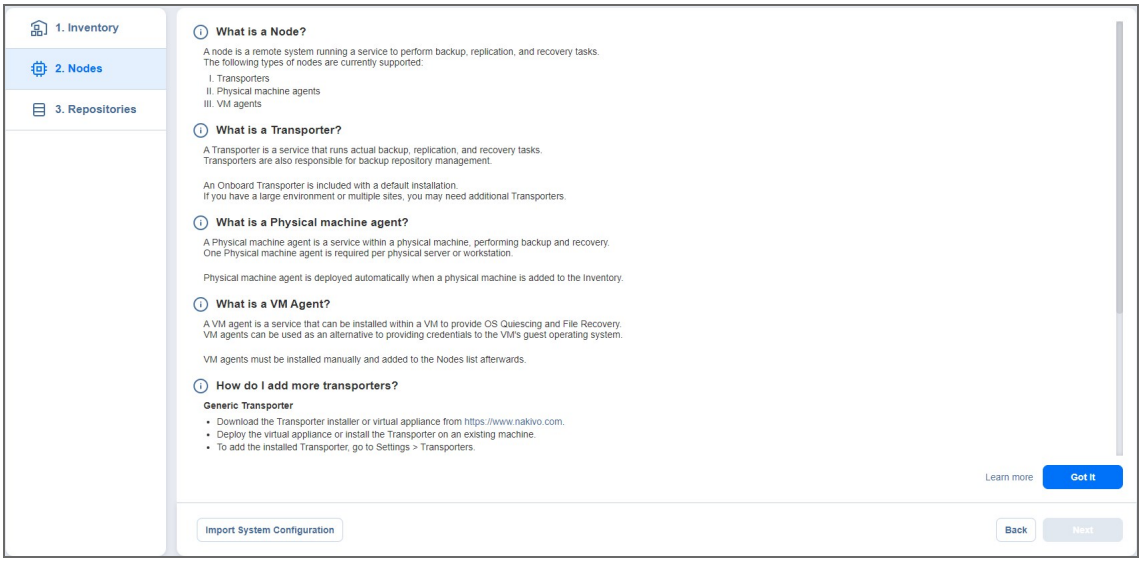
1. On the **Inventory** page of the wizard, click **Add New**.



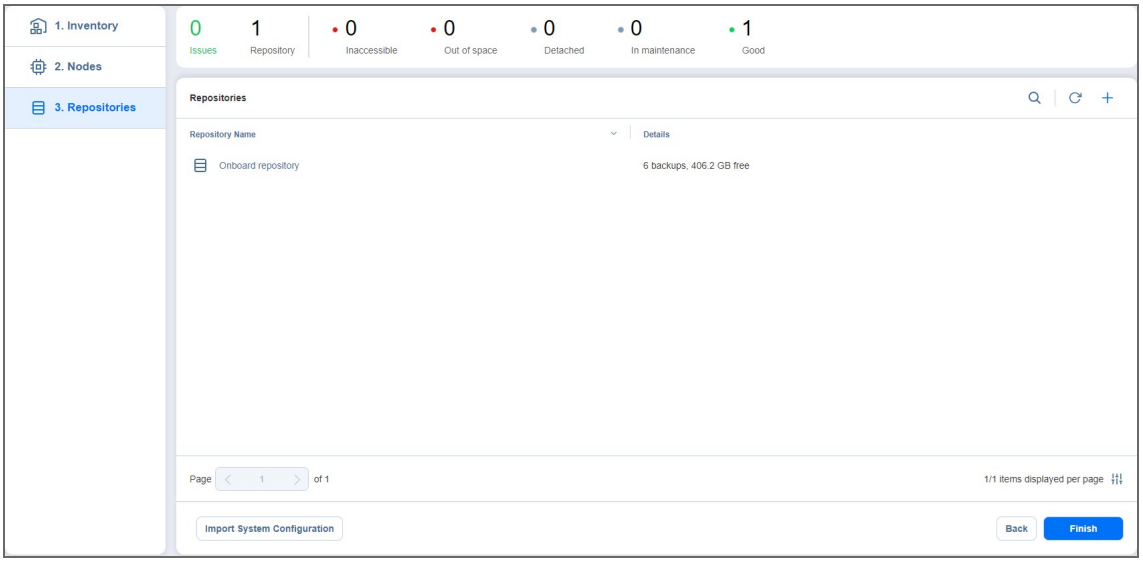
2. Select one of the given options:
    - Virtual
    - SaaS
    - File Share
    - Physical
    - Application
    - Storage



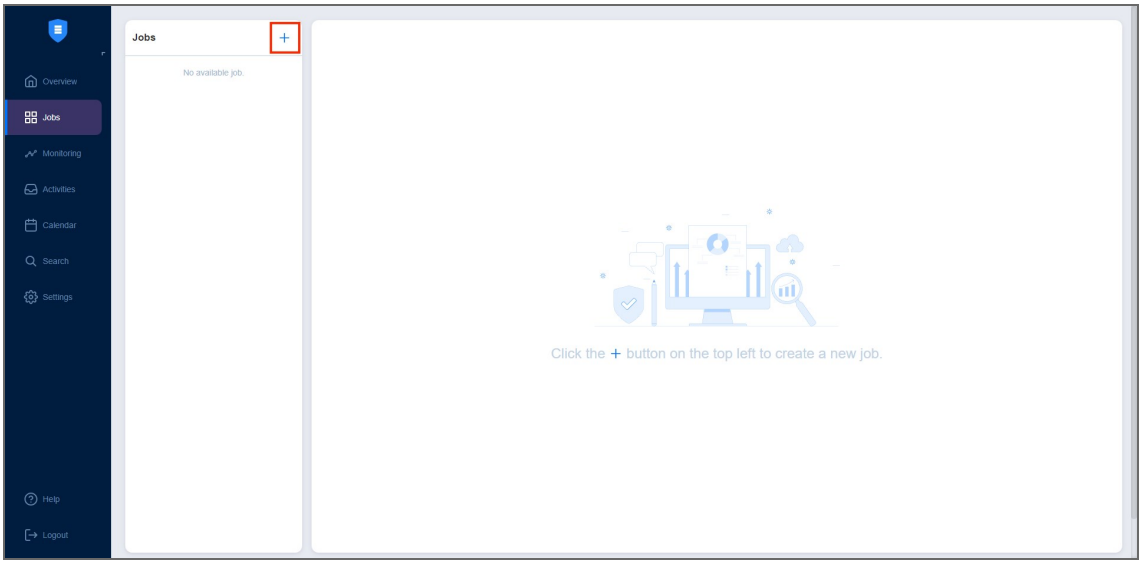
3. Proceed with adding items as described in the Inventory article.
4. On the **Transporters** page of the wizard, you will find information about the Transporter component of the NAKIVO Backup & Replication.



5. To deploy a new Transporter or add an existing one, click **Got it** and proceed as described in the Transporters article.
6. To move to the next page of the wizard, click **Next**.
7. On the **Repositories** page of the wizard, you can add a local or a remote Backup Repository to your application by clicking **Add Backup Repository.**



8. Click **Finish**.
9. The **Jobs** menu of the application opens. Proceed by creating backup jobs.



If your current license type is **Free** and the **Trial** license has not yet been applied to the current deployment of NAKIVO Backup & Replication, a dialog box appears. Using this dialog box, you can contact the sales team to change your license type or try the full functionality of the solution for 15 days. If you do not want to upgrade your license type right away, you can do it at any time in the Help menu.

Note

If you switch the license type to **Trial**, the product will automatically go back to using your **Free** license after expiration.

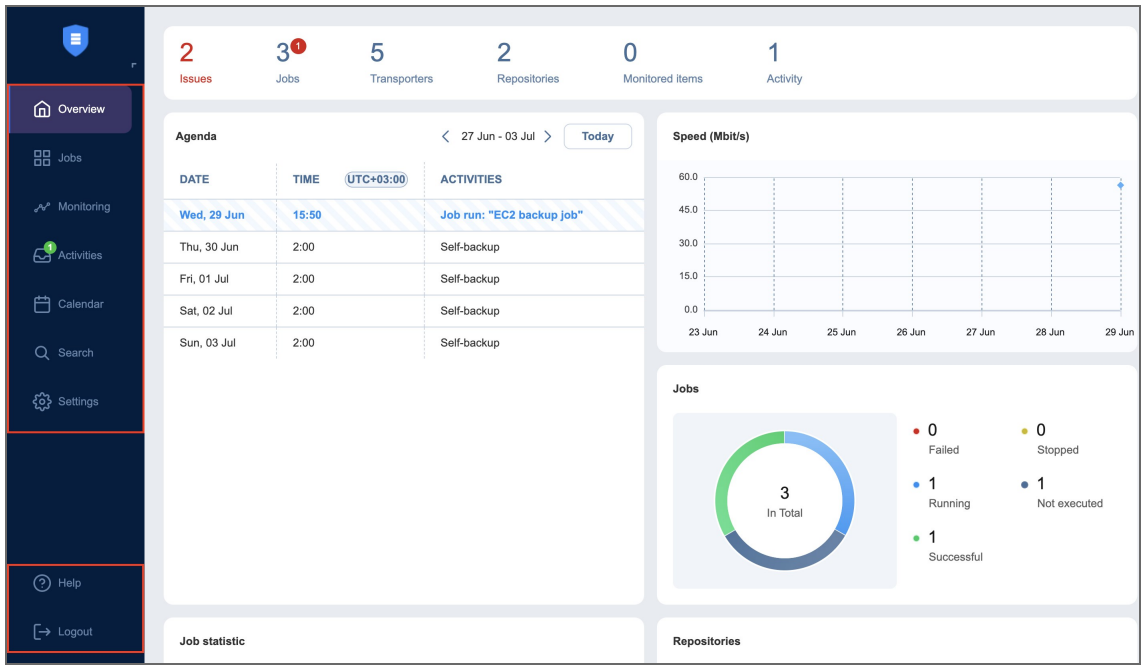
Web Interface Components

The interface of NAKIVO Backup & Replication consists of the following components:

- Main Menu
- Overview
- Jobs
- Monitoring
- Activities
- Calendar
- Search
- Settings
- Help Menu
- Online Chat Dialog
- Special Offers Toolbar
- Tenants Dashboard

Main Menu

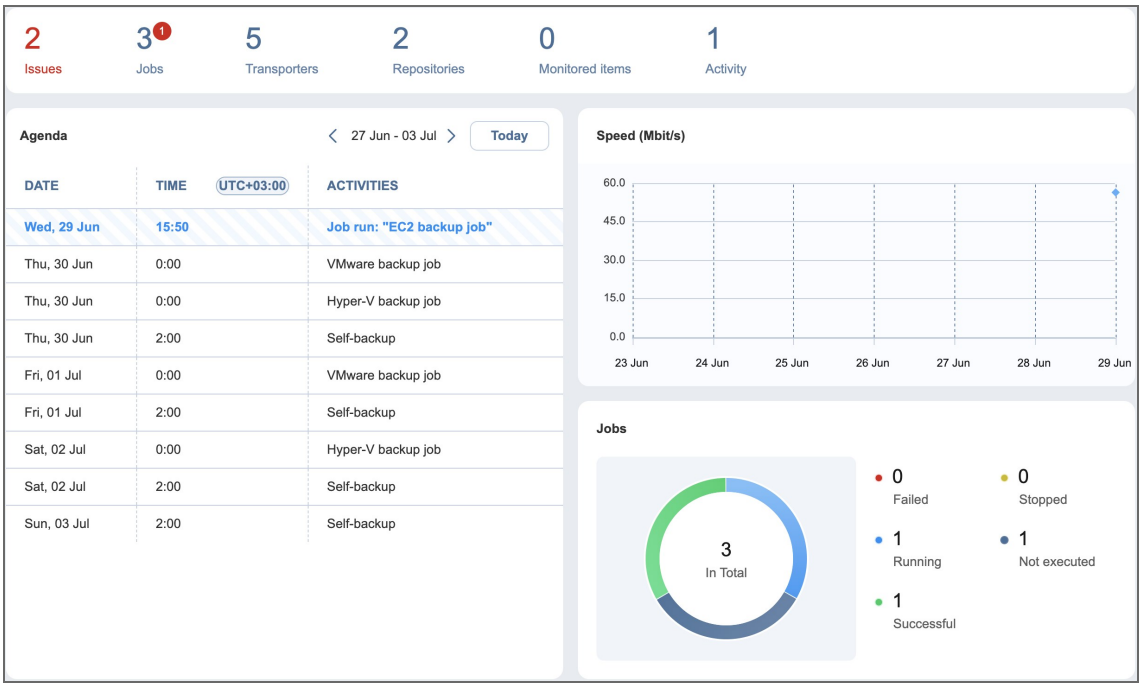
The main menu of NAKIVO Backup & Replication is located on the left side of the product interface. It provides access to the overview dashboard, jobs, activities, calendar, global search, and product settings. It also contains the **Help** menu and **Log Out** button.



Overview

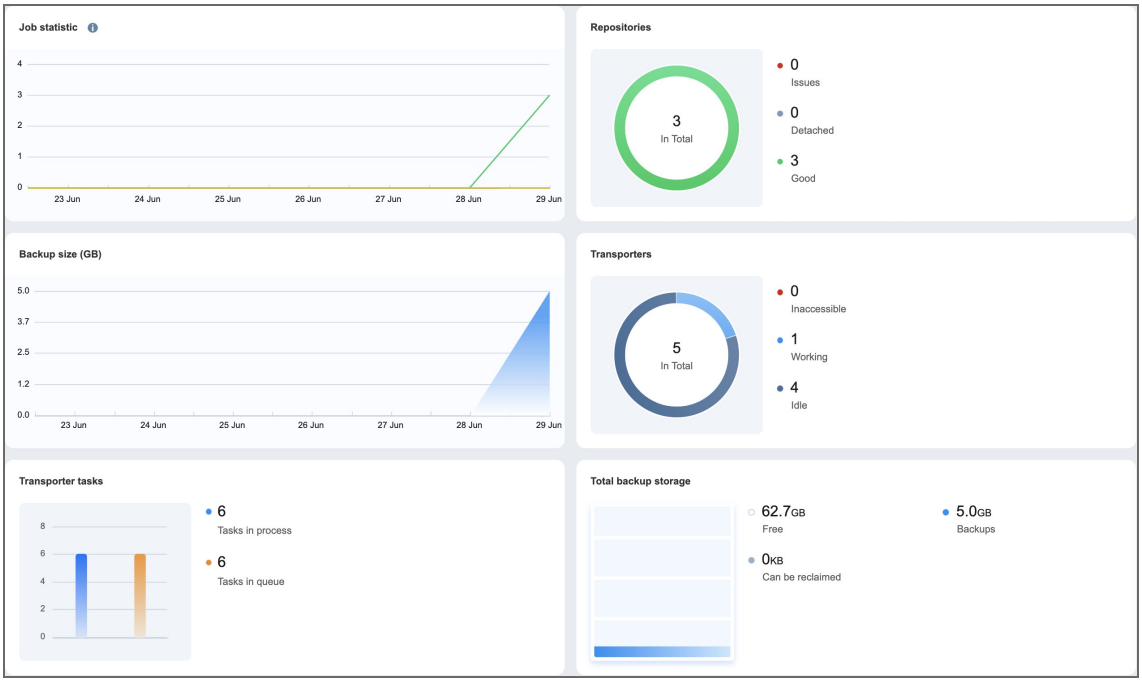
The **Overview** page displays the key statistics for your instance of NAKIVO Backup & Replication. The information is displayed in the following widgets:

- **Summary bar**: Lists the total number of issues (errors and alarms), jobs, transporters, repositories, monitored items, and running activities.
- **Agenda**: Lists running and scheduled activities for a given week. By default, this widget displays the current week.
- **Speed**: Displays the speed at which raw data has been transferred during successful job runs in the previous seven days.
- **Jobs**: Displays the total number of available jobs and their respective last run statuses.

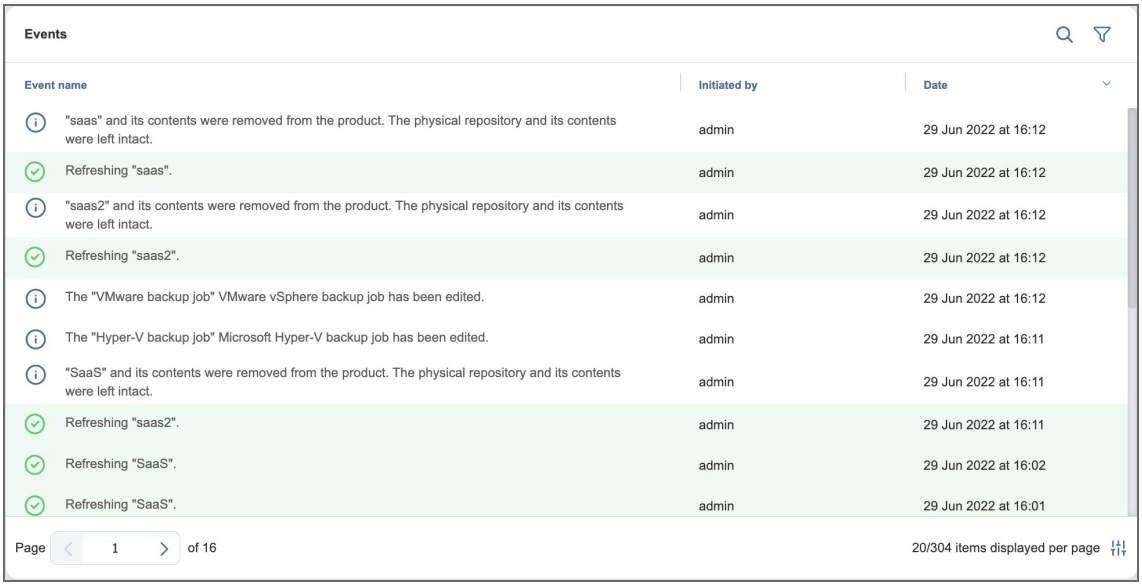


- **Job statistic**: Shows a graph of the number of successful, stopped, and failed jobs for each day in the previous seven days.
- **Repositories**: Displays the total number of available repositories and their statuses.
- **Backup size**: Displays the total size of backups created for each day in the previous seven days. Note that backups in forever incremental (**Store backups in separate files option** is not selected) Backup Repositories are considered 0KB, and thus are not reflected in the **Backup size** graph.
- **Transporters**: Displays the total number of available transporters that have been added or deployed successfully and their statuses.
- **Transporter tasks**: Displays the total number of tasks being processed or waiting to be processed by all transporters.

- **Total backup storage**: Displays the total amount of storage of all available repositories.



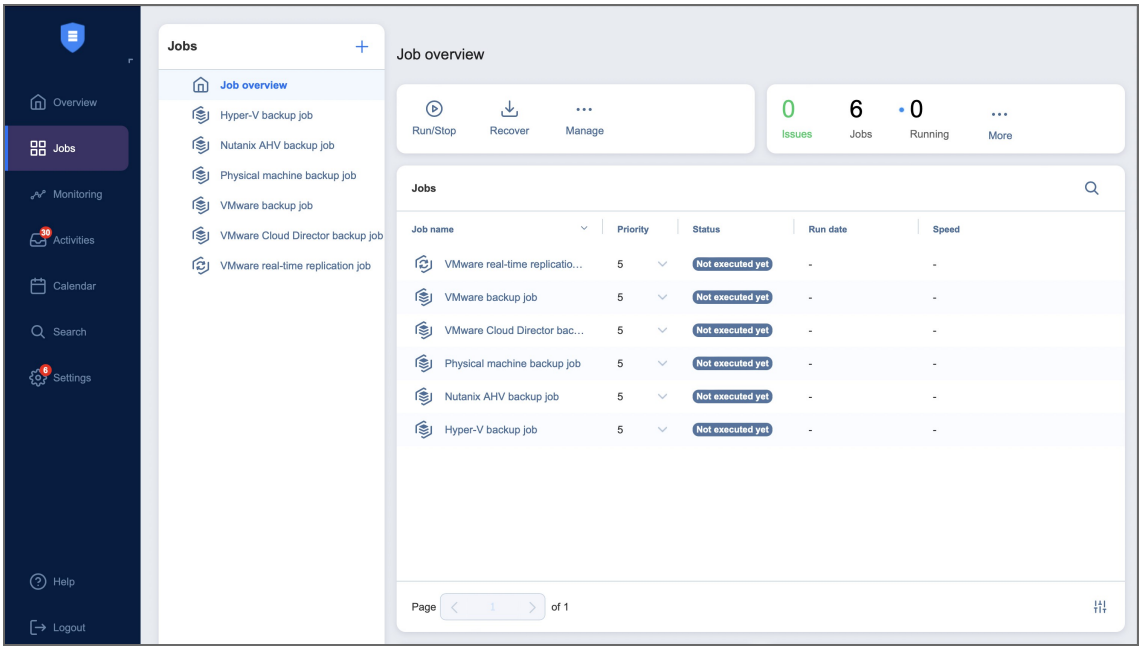
- **Events**: Lists all events, including errors, warnings, and general status information, sorted by date by default. Includes search and filter functions that simplify finding specific events by name, type, or date range.



Jobs

Using the **Jobs** page, you can:

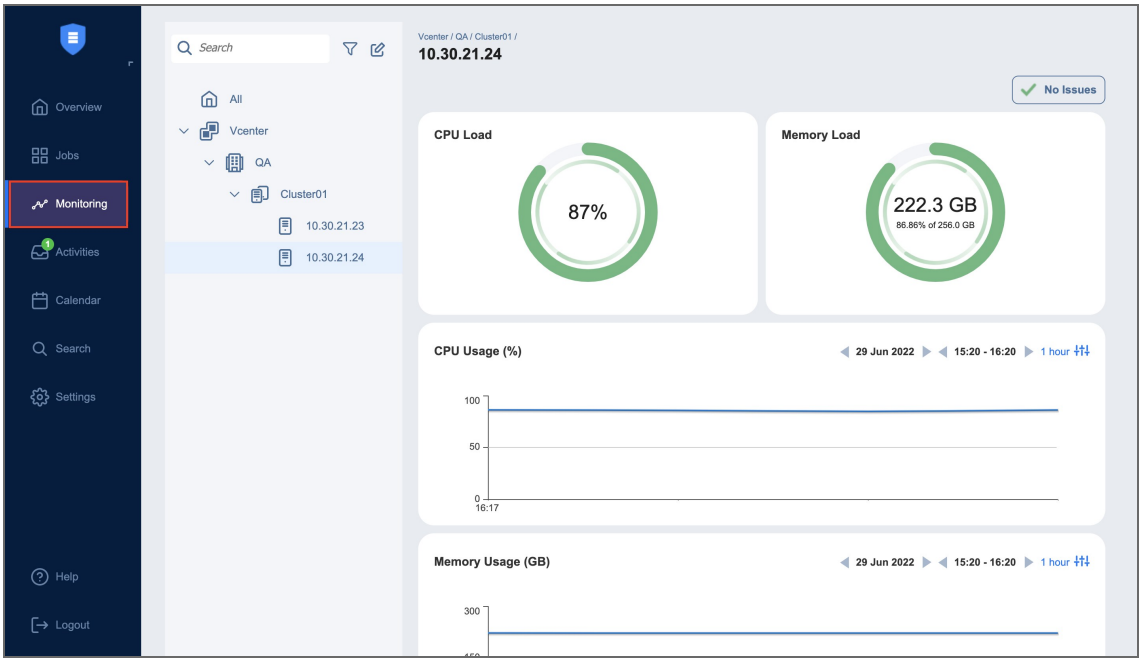
- View, run, and stop jobs on demand or on schedule
- Recover files, objects, VMs, and sites
- Manage jobs
- Create backup, backup copy, replication, recovery, and flash boot jobs
- Create job reports
- Create and manage job groups



Monitoring

On the **Monitoring** page, you can check the following metrics (current and historical):

- For VMware VMs: CPU usage, memory usage, and disk usage
- For VMware hosts: CPU usage and memory usage
- For VMware datastores: Disk usage

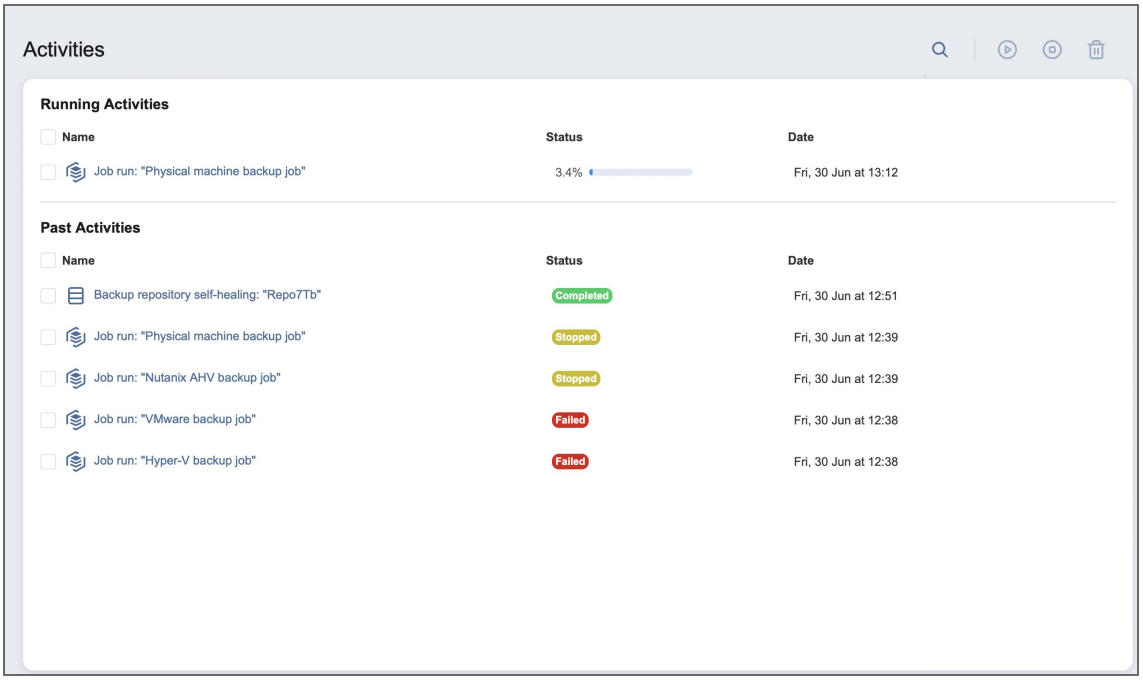


Activities

The **Activities** page displays a list of all running and past activities, such as:

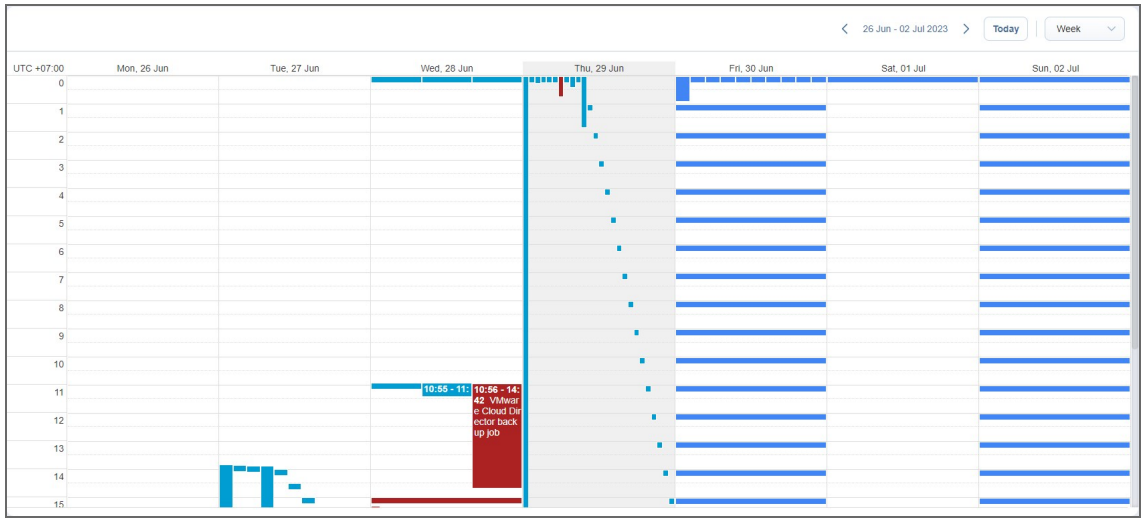
- Job run
- Repository Self-Backup
- Other

For further details and information, refer to “Managing Activities” on page 226.



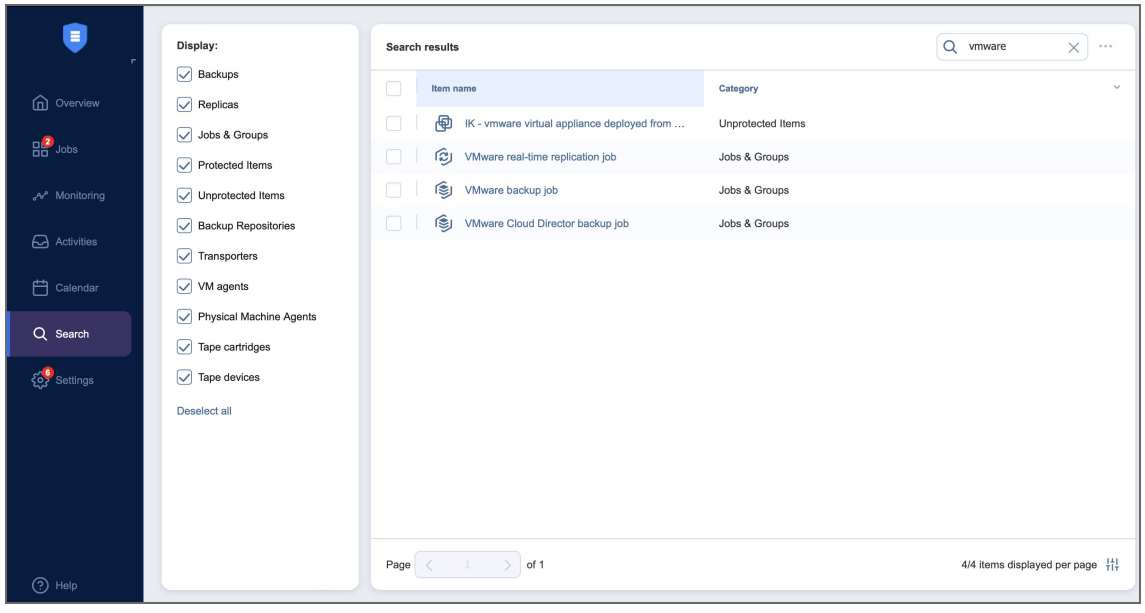
Calendar

The **Calendar** allows you to schedule jobs and view the history of all job runs in one organized space. For more information, refer to “Using Calendar” on page 230.



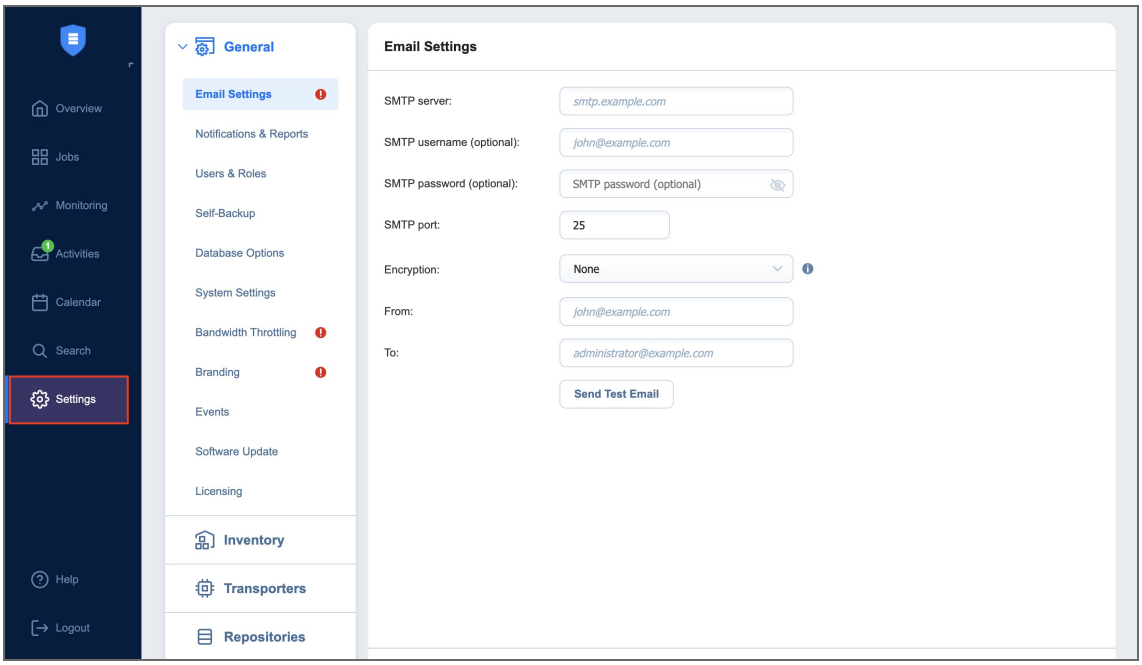
Search

The **Search** page allows you to search for items within the entire NAKIVO Backup & Replication instance–the Inventory, Transporters, Repositories, tape devices, jobs, backups, replicas, and more. For more details, refer to “Using Global Search” on page 231.



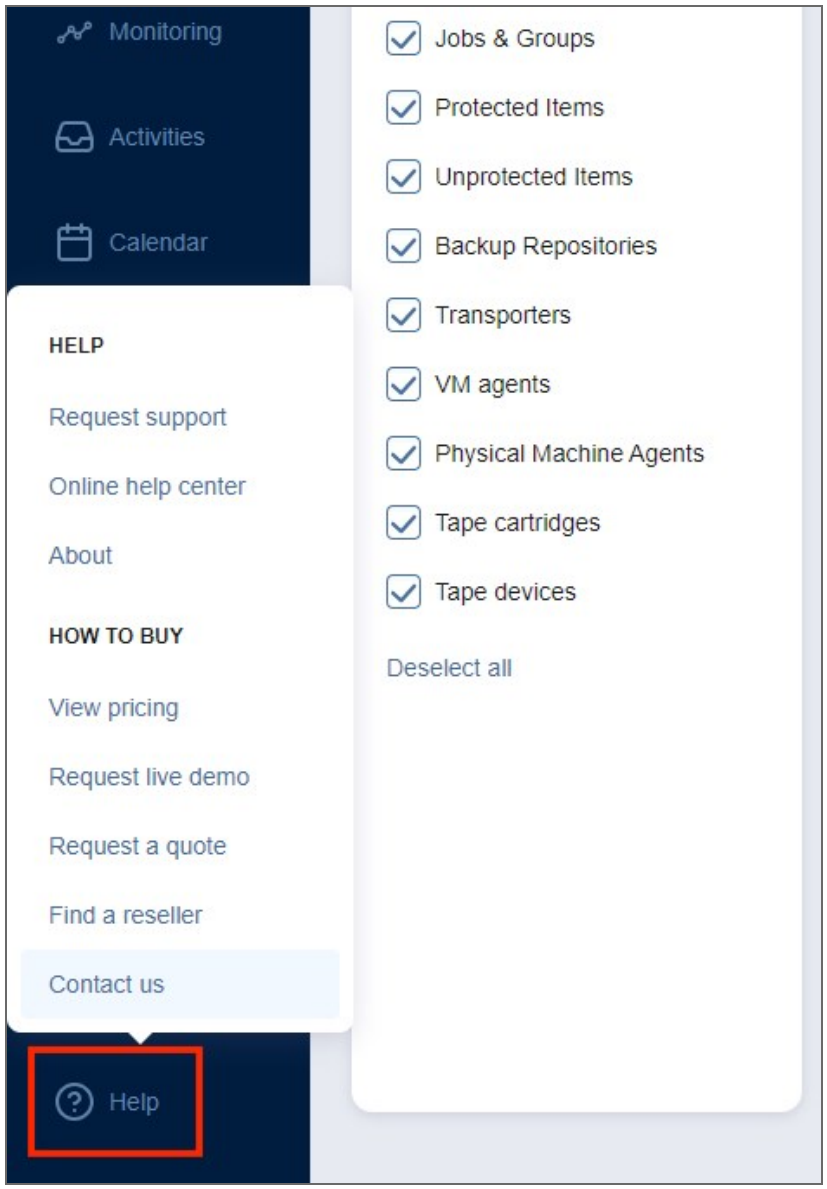
Settings

On the **Settings** page, you can configure NAKIVO Backup & Replication General, Inventory, Transporters, Repositories, and settings. Refer to “Settings” on page 237 for more detailed information.



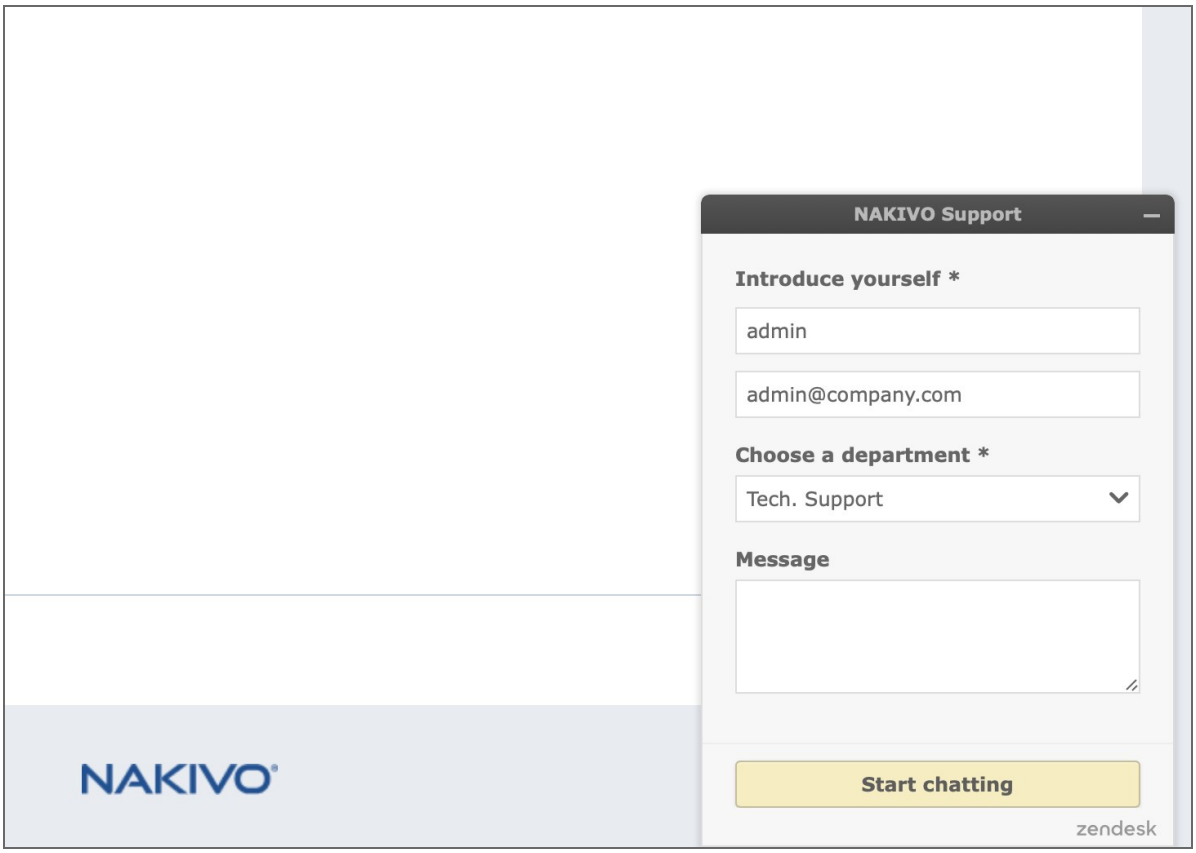
Help Menu

Use the **Help** menu to request technical support and access the NAKIVO online help center. If you are evaluating NAKIVO Backup & Replication, you may also use the **How to Buy** section of the **Help** menu to view pricing, request a live demo or quote, find a reseller, or contact Sales. If you are using a Free license, you may also upgrade to a Trial license for 15 days with the **Try full functionality** option.



Online Chat Dialog

The **NAKIVO Support** online chat is located in the right bottom corner of the application. It enables you to quickly request help from a sales or technical support representative.



Special Offers Toolbar

This element of the interface is located to the left of the NAKIVO Backup & Replication dashboard. The toolbar contains special offers. If you click the button, a dialog opens displaying information about a specific offer. If needed, the **Special Offers** toolbar can be disabled. Refer to "System Settings" on page 265 for details.

Tenants Dashboard

If you use NAKIVO Backup & Replication in a multi-tenant mode, the **Tenants** dashboard allows you to create, manage, and configure tenants.

Managing Jobs and Activities

Using NAKIVO Backup & Replication interface, you can manage jobs and tasks. This section covers the following topics:

Jobs Dashboard

The **Jobs** dashboard is a detailed interface where you can create and manage jobs, as well as get an overview of job details. For a detailed explanation of each component in the Jobs dashboard, see the sections below.

Group/Job Overview Dashboard

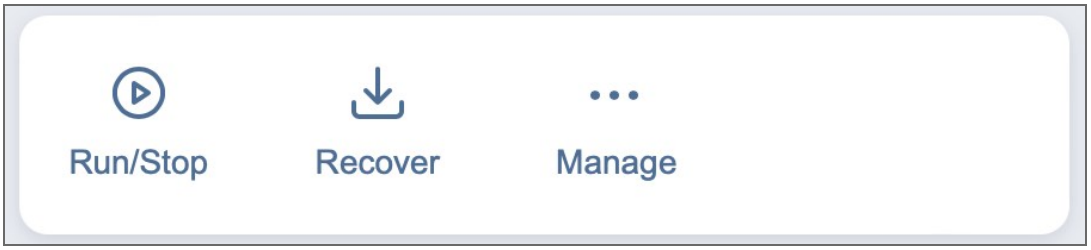
The **Job overview** and job group views offer an overview of multiple jobs. See the sections below for more information.

Action Bar

The group and **Job overview** action bars contain the following three job actions:

- **Run/Stop**: Opens the Run/Stop Jobs dialog box
- **Recover**: Brings up a list of recovery options for the selected group of jobs
- **Manage**: Brings up the options to **Rename**, **Delete**, or **Disable** a job group, as well as change the destination for all backup jobs in the group

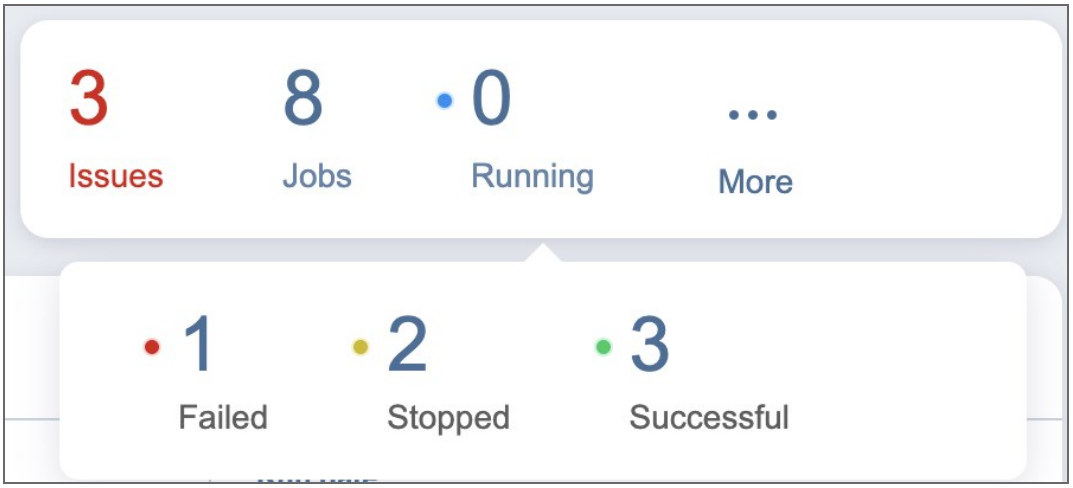
For more information on using the action bar, see "Running Jobs on Demand" on page 210.



Summary Bar

The summary bar displays information about the jobs in a given group. The data displayed is as follows:

- **Issues**: Total number of issues/alarms for the group of jobs. When clicked, this displays the Alarms & Notifications dialog box.
- **Jobs**: Total number of jobs in the group.
- **Running**: The number of running jobs in the group.
- **Failed**: The number of failed jobs in the group.
- **Stopped**: The number of stopped jobs in the group.
- **Successful**: The number of successful jobs in the group.



Jobs Table

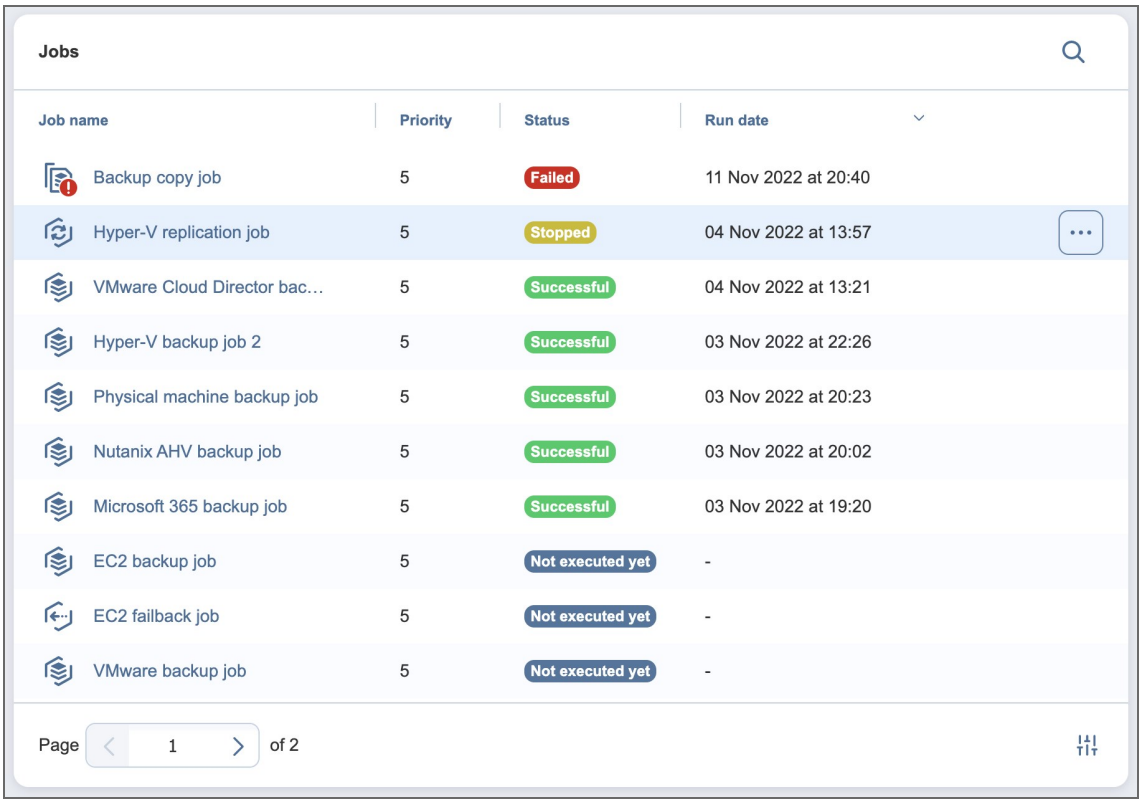
The **Jobs** table shows a list of jobs and the information about each job in the following columns:

- **Job name**: The name of a given job in the group.
- **Priority**: The priority level of a given job in the group. Click the arrow button to the right of this parameter to change the priority level of a job.

  Note

  This column is only available in the Enterprise, Enterprise Essentials, Enterprise Plus, MSP Enterprise, and MSP Enterprise Plus editions.

- **Status**: The status of a given job:
  - **Successful**: The last job run was successfully completed.
  - **Failed**: The last job run failed.
  - **Running**: The job is currently running.
  - **Stopped**: The last job run was stopped.
  - **Not executed yet**: The job has not been executed yet.
- **Run date**: The date of a given job's last run.
- **Speed**: If the job is currently running, displays the current job run speed. If the job is not currently running, displays the speed of the last job run.



To customize the sorting of the **Jobs** table, click the head of the column you wish to sort by. To change the order of the columns, drag and drop a column to the needed position. You may also search for a job by clicking the **Search** button at the top of the table. To manage a job in the table, hover over a job and click the ellipsis **Manage** button on the right side.

Group Info

This pane displays current information about the jobs in the selected group. The information includes:

- Currently running jobs, displayed as a ratio to the total number of jobs
- The status of recent jobs; **Completed**, **Failed**, or **Stopped**
- The number of source objects and their respective total size (if applicable)

Overview Panes

There are several other panes that give an overview for the chosen job group. These panes are as follows:

- **Target Storage**: The target storage(s) of the jobs in the chosen group
- **Raw Data Transfer Speed**: The raw data transfer speed for previous job runs (if no job in the group is currently running) or current job run (if a job is currently running). If a job run includes multiple backup objects, the aggregated data transfer speed of all backup objects is displayed.
- **Transferred Raw Data**: The amount of raw transferred data before compression/deduplication for the current job run or past job run(s)
- **Events**: Table of alarms/notifications for the given group of jobs
- **Transporters**: Table of the Transporters used by the group of jobs

Job Dashboard

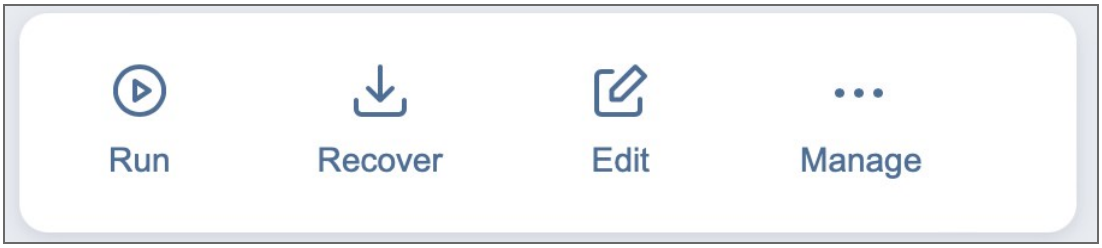
When selecting a specific job in the **Jobs** menu, the following information is displayed.

Action Bar

The job action bar contains the following four actions:

- **Run**: Opens the job run dialog box
- **Recover**: Brings up a list of recovery options for the given job (backup and replication jobs only)
- **Edit**: Opens the job edit wizard
- **Manage**: Brings up the options to **Clone**, **Merge**, **Rename**, **Create report** for, **Enable**/**Disable**, or **Delete** the job.

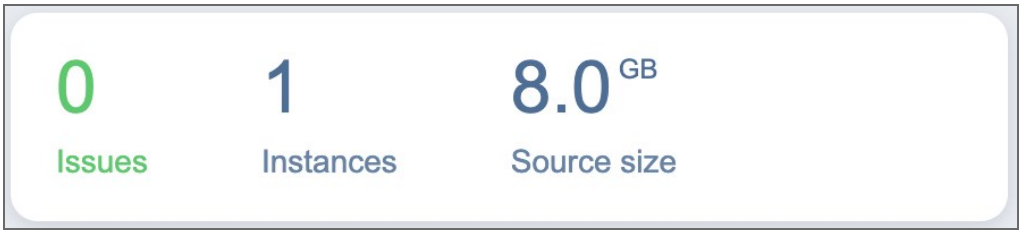
For more information on using the action bar, see "Running Jobs on Demand" on page 210.



Summary Bar

The summary bar displays information about a job. The data displayed is as follows:

- **Issues**: Total number of issues/alarms for the job. When clicked, the Alarms & Notifications dialog box is displayed.
- **Objects**: Total number of objects covered by the job
- **Source size**: Total size of the objects covered by the job

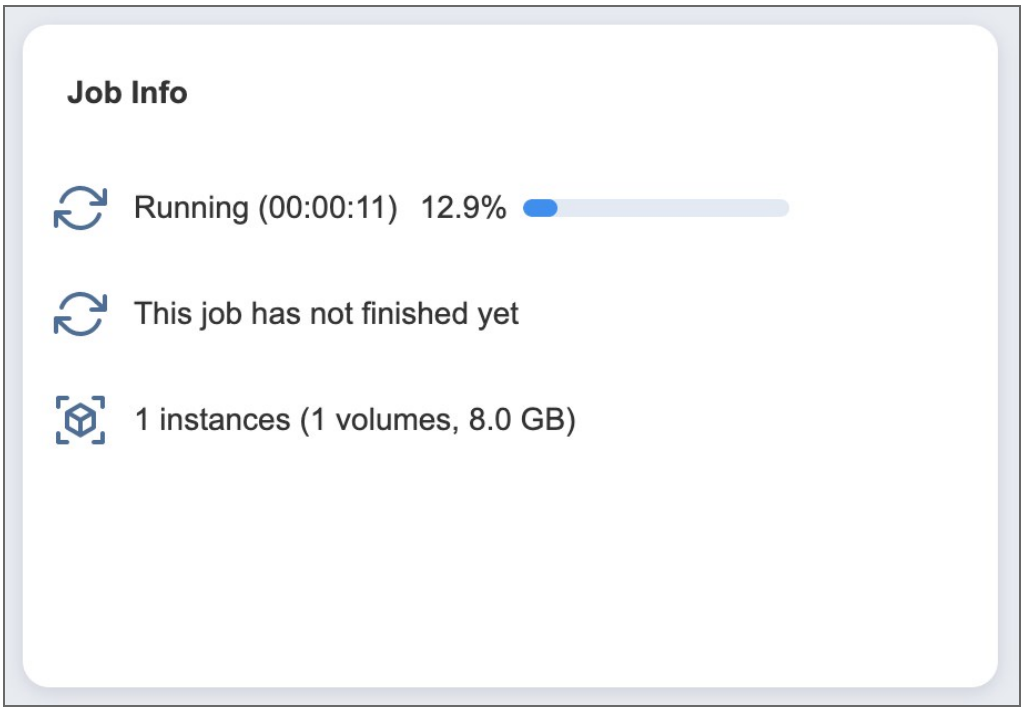


Job Info

This pane displays current information about the job. The information includes:

- The running schedule for this job
- The status of this job; **Successful**, **Failed**, **Running**, **Stopped**, or **Not executed yet**

- The number of source objects and their respective total size (if applicable)



Job Settings

This pane allows you to view and edit certain options for a job. The settings displayed are as follows:

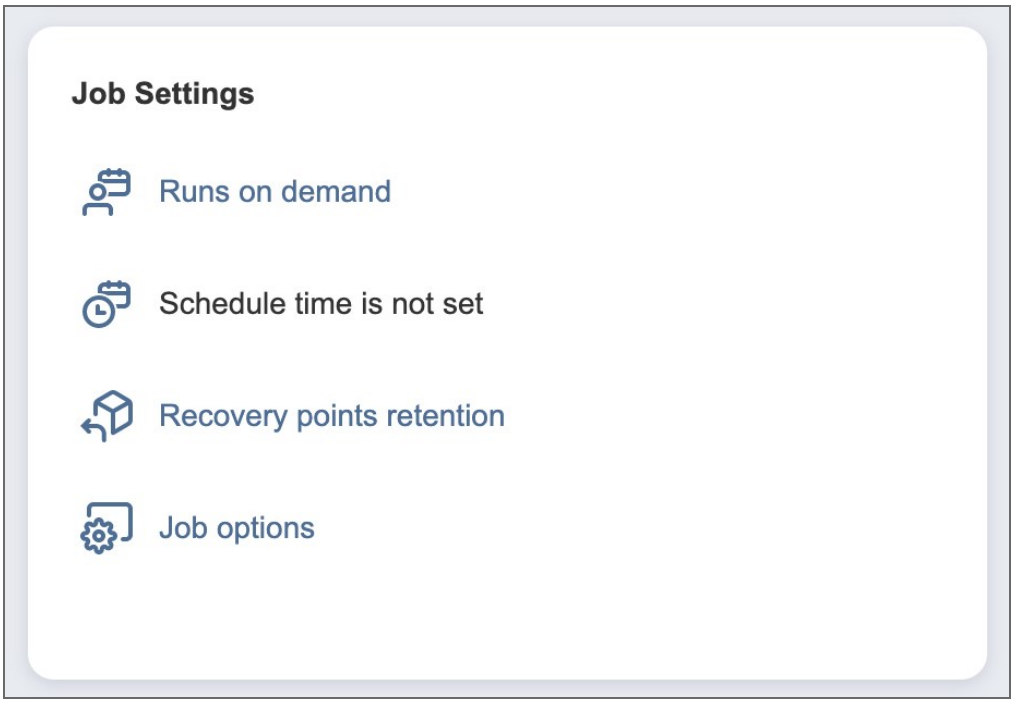
- The running schedule for this job
- Scheduled run time(s) for this job (if applicable)
- **Recovery points retention**: Clicking this opens a dialog box with **Retention Settings** for this job.

  Note

  This option is only available in the following cases:

  - Your version of NAKIVO Backup & Replication is older than v10.8.
  - You have updated NAKIVO Backup & Replication from a version older than v10.8 to v10.8 or newer and have not enabled the new scheduler for the respective job.
  - You enabled legacy retention in the Expert tab.

- **Job options**: Clicking this opens a dialog box with **Job Options** for this job.

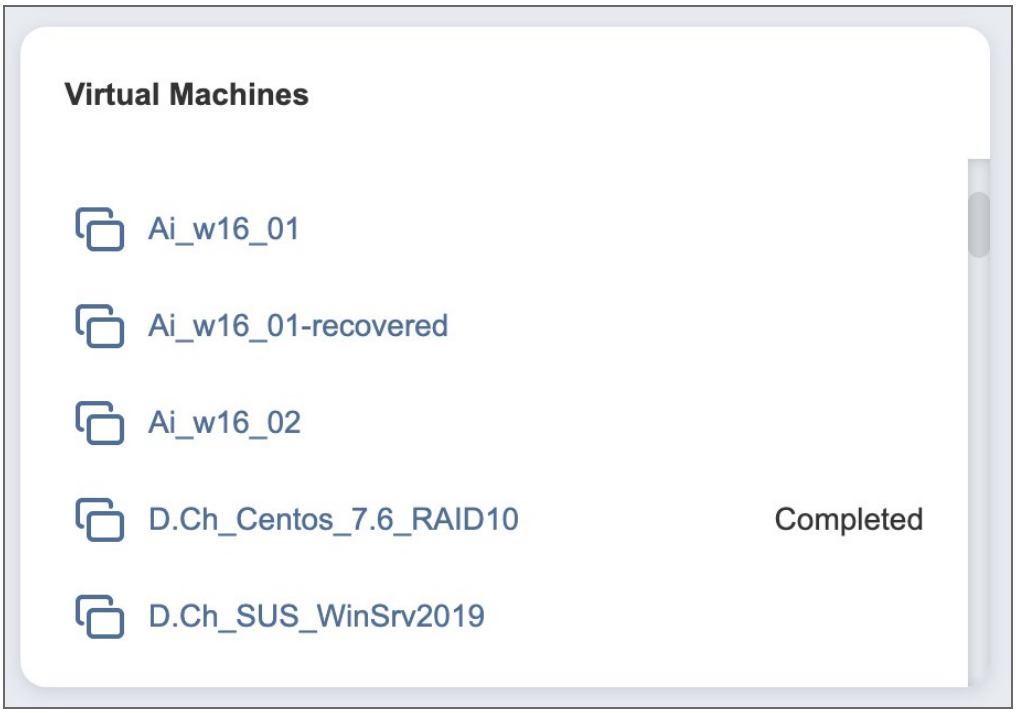


Job Objects

This pane displays a list of backup/replication/recovery objects based on the respective object type. The objects can be one of the following:

- Virtual Machines
- Instances
- Backups
- Physical Machines
- Databases
- Microsoft 365 Items

- File Share Items



Overview Panes

Several other panes give an overview of the chosen job. These panes are as follows:

- **Target Storage**: The target storage of the chosen job
- **Raw Data Transfer Speed**: The raw data transfer speed for the current job run or previous job runs if the job is not currently running. If a job run includes multiple backup objects, the aggregated data transfer speed of all backup objects is displayed.
- **Transferred Raw Data**: The amount of raw transferred data before compression/deduplication for a current job run or past job run(s)
- **Events**: Table of alarms/notifications for the given job
- **Transporters**: Table of the Transporters used by the job

Running Jobs on Demand

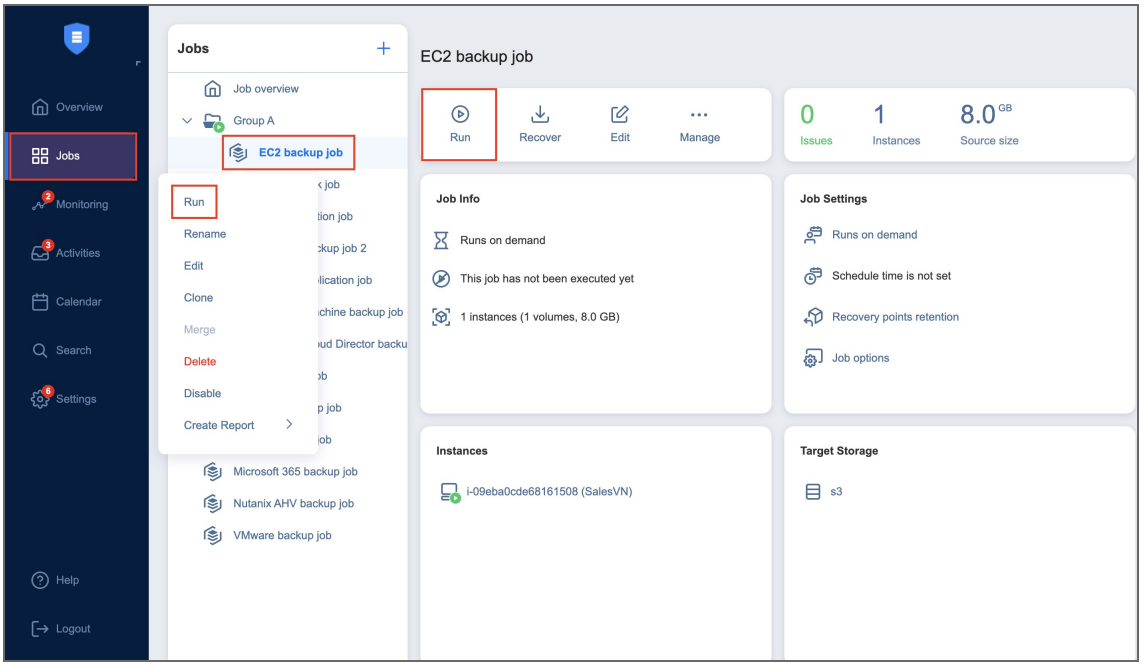
Use the **Jobs** menu to start and stop jobs on demand.

- Starting Jobs
- Stopping Jobs
- Managing Grouped Jobs

Starting Jobs

To start a job, follow the steps below:

1. Go to the **Jobs** menu, select the job from the list of jobs, and click **Run**. Alternatively, right-click a job to bring up the action menu and click **Run**.



2. Choose one of the following options:
   - **Run for all VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: The job runs for all job objects.
   - **Run for selected VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: The job runs for the job objects that you select.
   - **Run for failed VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: If applicable, the job runs for previously failed job objects only.
   - **Run for stopped VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: If applicable, the job runs for previously job stopped objects only.
3. If backups in the Backup Repository selected for a job are stored in separate files, you have to choose between the following backup types:
   - **Incremental**: The job creates an incremental backup.
   - **Full**: The job creates a full backup. When you choose this option, choose one of the full backup modes:
     - **Synthetic full**: The application first creates an incremental backup—that is, transfers only the data that changed since the last backup—and then creates a new full backup using the last full backup and the chain of subsequent incremental recovery points.

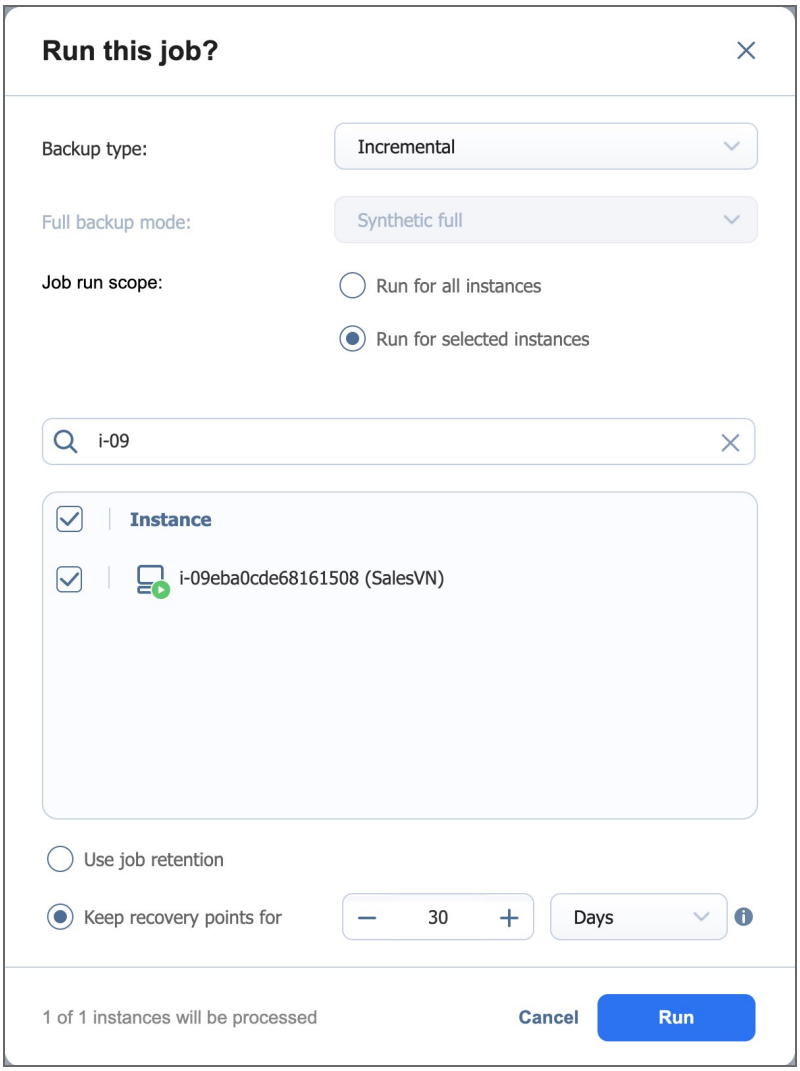
- **Active full**: The application reads all source machine data and transfers it to the backup repository to create a full backup.

4. For backup and backup copy jobs, you can use preconfigured retention settings by selecting **Use job retention** (legacy retention approach) or **Select schedule** (schedule retention approach), or specify custom retention settings for a manual job run by selecting **Keep recovery points for**.
    - **Use job retention**: Select this option to use the preconfigured legacy retention settings for a job run. If a previous run for this job was stopped or failed, the settings used for that run are selected by default.
    - **Select schedule**: Select this option to choose a preconfigured schedule and its retention settings for this job. If a previous run for this job was stopped or failed, the settings used for that run are selected by default. Recovery points created by a manual job run using this option are automatically assigned expiration dates.
    - **Keep recovery points for**: The recovery points created by this job run are kept for the specified period of time and then expire. The expired recovery points are removed during the following job run.

      Note

      If a job does not support retention or has the **Do not schedule, run on demand** option selected, only the **Keep recovery points for** option will be available.

5. Click the **Run** button to confirm your selection.

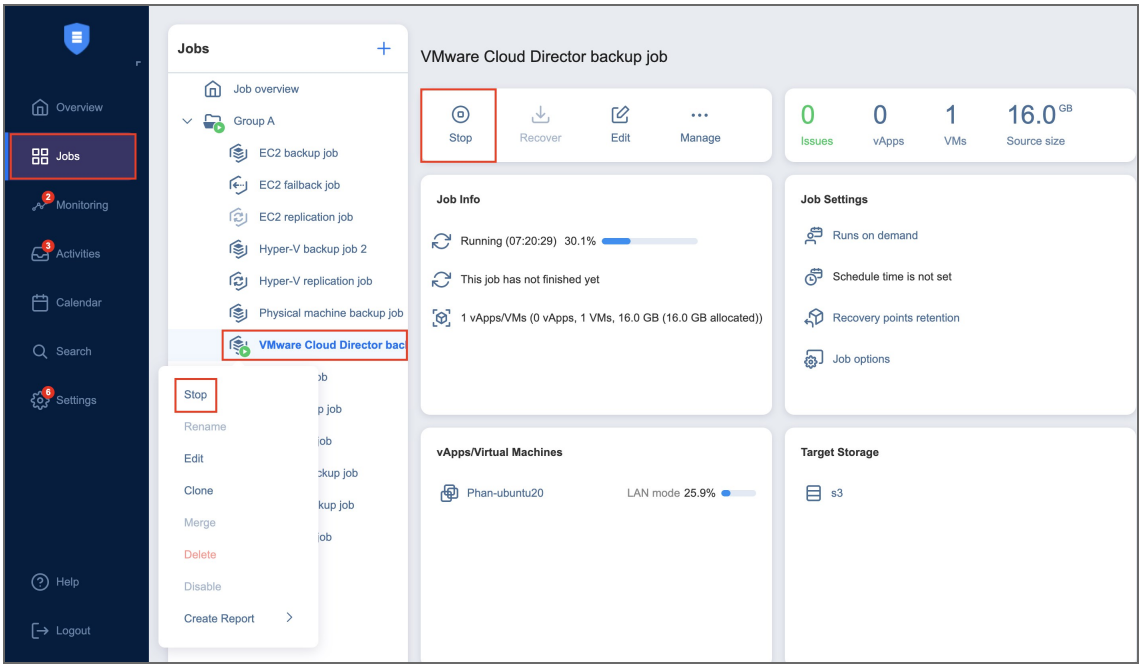


The product will close the dialog box and start running your job.

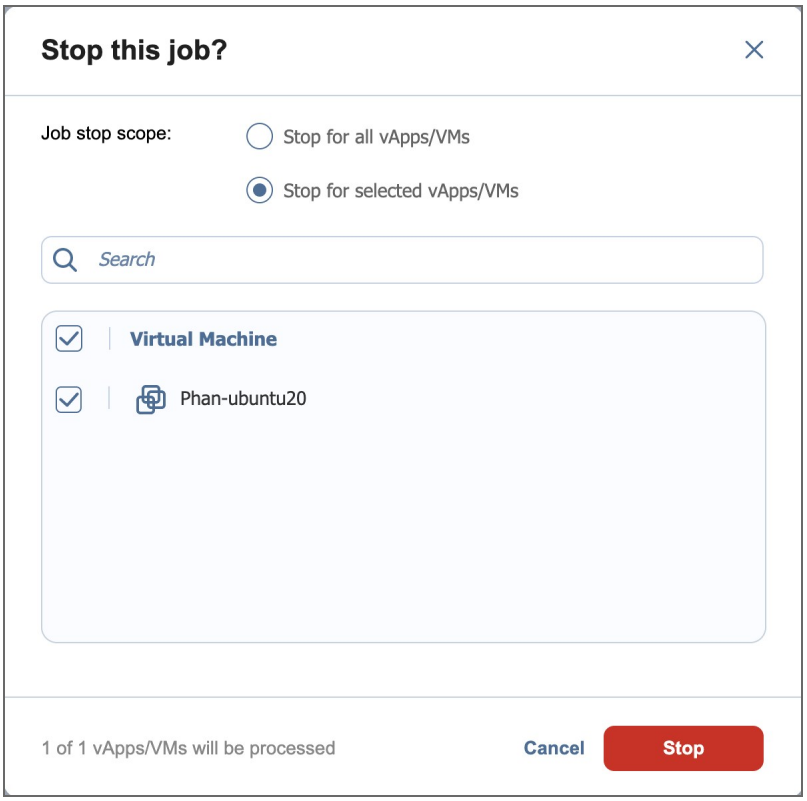
Stopping Jobs

To stop a job that is running, follow the steps below:

1. Go to the **Jobs** menu, select the job from the list of jobs, and click **Stop** . Alternatively, right-click a job to bring up the action menu and click **Stop**.



2. In the dialog box that opens, choose one of the following:
   - **Stop for all VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: The job stops for all job objects.
   - **Stop for selected VMs/VM templates/backups/physical machines/instances/databases/sites/accounts/items**: The job stops for the job objects that you select.
3. Click the **Stop** button in the dialog box to confirm your selection.

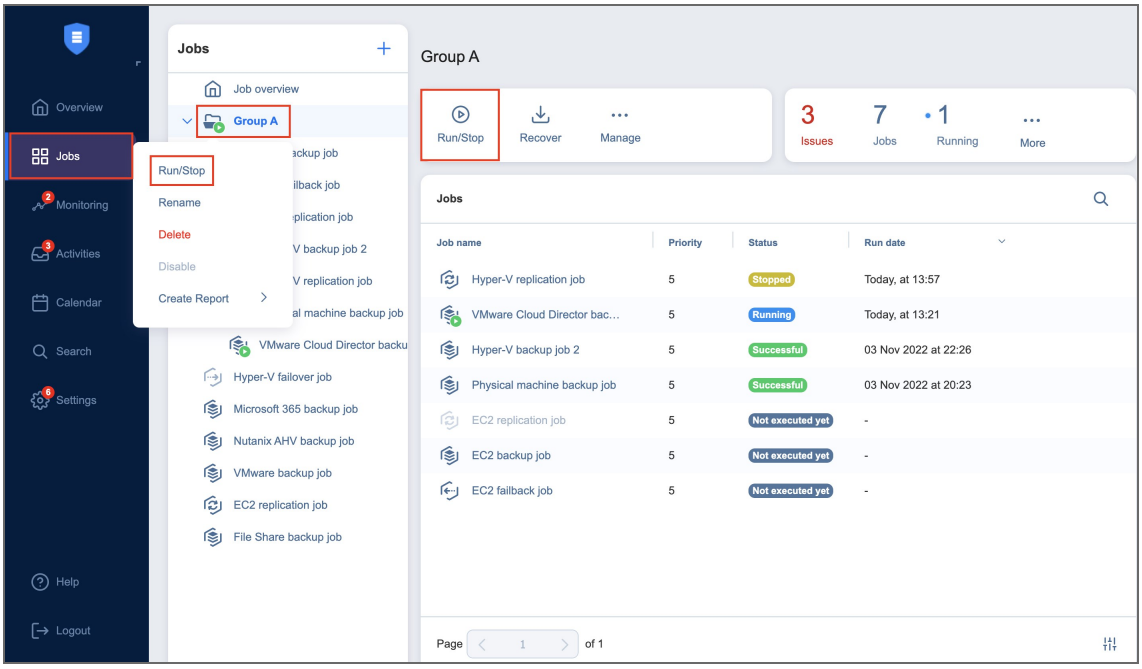


The application closes the dialog box and stops your job.

Managing Grouped Jobs

To efficiently start or stop jobs in bulk (run all failed jobs, for example), follow these steps:

1. From the **Jobs** menu, select the needed job group and click **Run/Stop**. To manage all jobs and groups at once, select **Overview** and click **Run/Stop**. Alternatively, right-click on the needed job group to bring up the action menu and click **Run/Stop**.

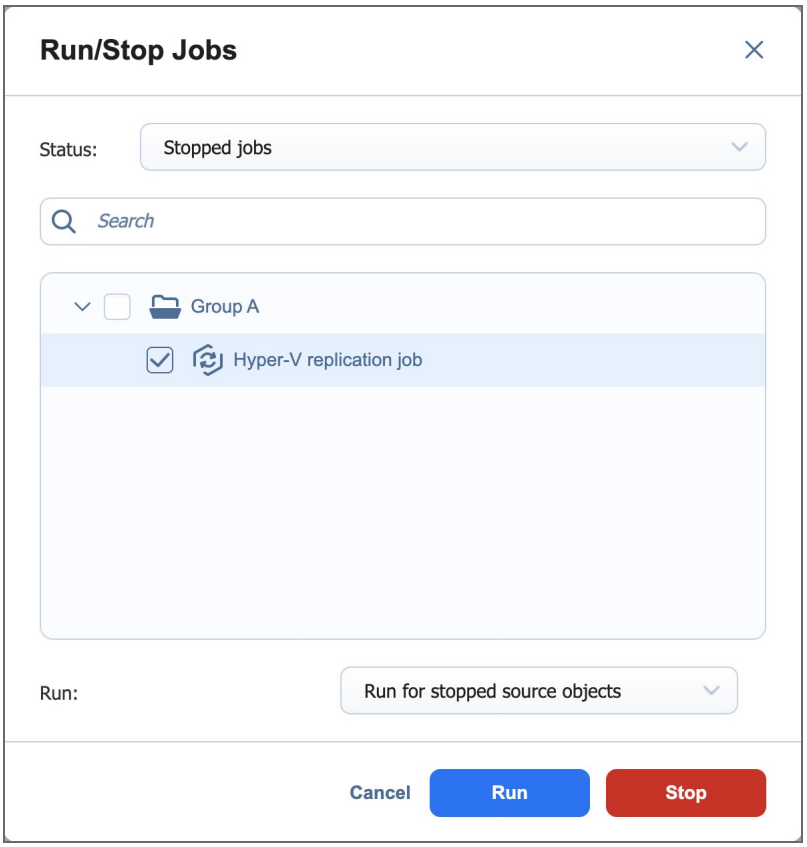


2. In the drop-down **Status** menu, select one of the following:
   - **All jobs:** Displays all jobs in the group
   - **Failed jobs:** Displays all failed jobs in the group
   - **Stopped jobs:** Displays all stopped jobs in the group
3. Select the jobs you want to run/stop.
   a. When running backup or backup copy jobs, specify the retention settings with one of the following options:
      - **Use the last retention settings**: Select this option to use the retention settings from the last job run for the manual job run.
      - **Keep recovery points for**: The recovery points created by this job run are kept for the specified period of time and then expire. The expired recovery points are removed during the following job run.

      Note

      If the group of jobs contains at least one job that isn't a backup/backup copy job, does not support retention, or has had its retention settings changed since the previous run, only the **Keep recovery points for** option will be available.

   b. In the lowest drop-down menu, specify (if applicable) whether you want the operation to run for failed source objects, stopped source objects, or all source objects.
4. Click the **Run** or **Stop** button to confirm your selection.



Managing Jobs

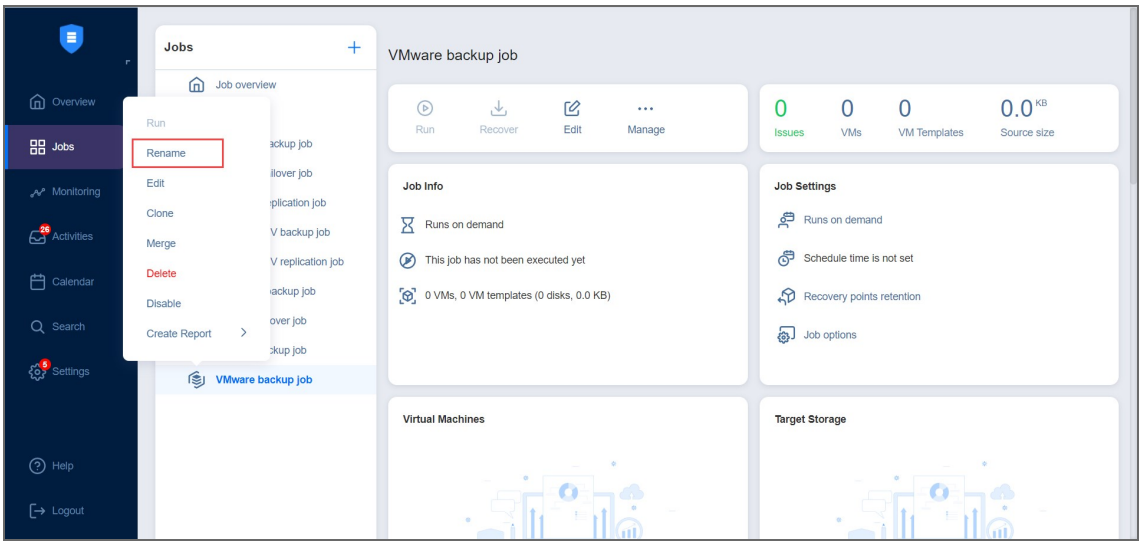
Using the **Jobs** menu, you can easily manage jobs. Use the **Manage** menu to rename, edit, merge, delete, and enable/disable jobs.

- Renaming Jobs
- Editing Jobs
- Cloning Jobs
- Merging Jobs
- Deleting Jobs
- Disabling and Enabling Jobs
- Grouping Jobs
    - Creating Groups
- Creating Job Reports

Renaming Jobs

1. From the list of jobs, right-click on the job you want to rename.
2. Click **Rename**.

3. In the dialog box that opens, specify the new name for the job and click **Rename**.



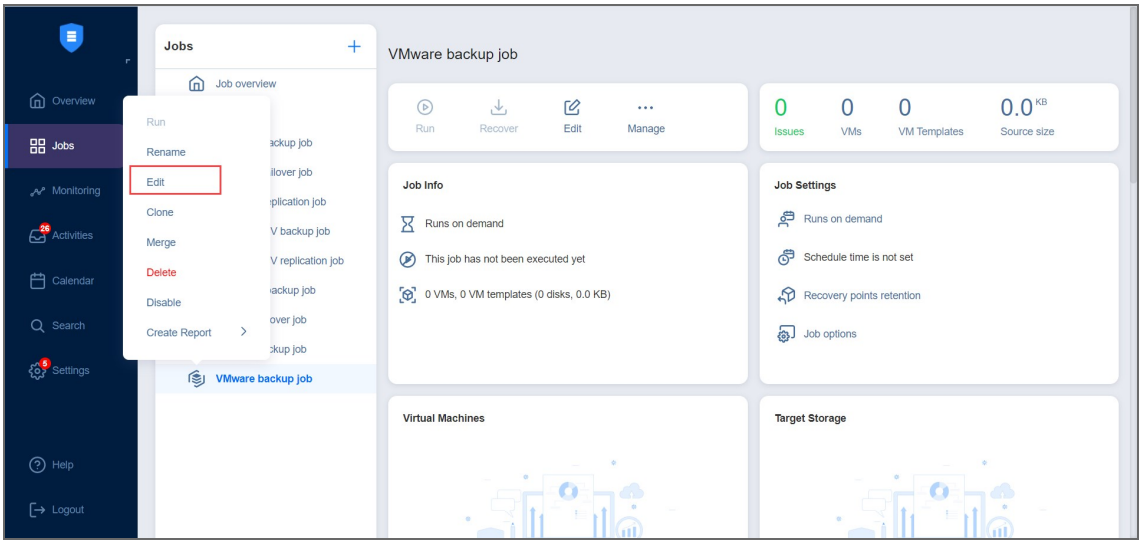
Note

You can also rename jobs by selecting a job and clicking **Manage** > **Rename**.

Editing Jobs

To edit a job, follow the steps below:

1. Right-click on the job you want to edit from the list of jobs.
2. Click **Edit**.
3. In the **Edit** wizard, click the needed page to open it for editing.
4. Make the required changes and click **Save** or **Save & Run**.



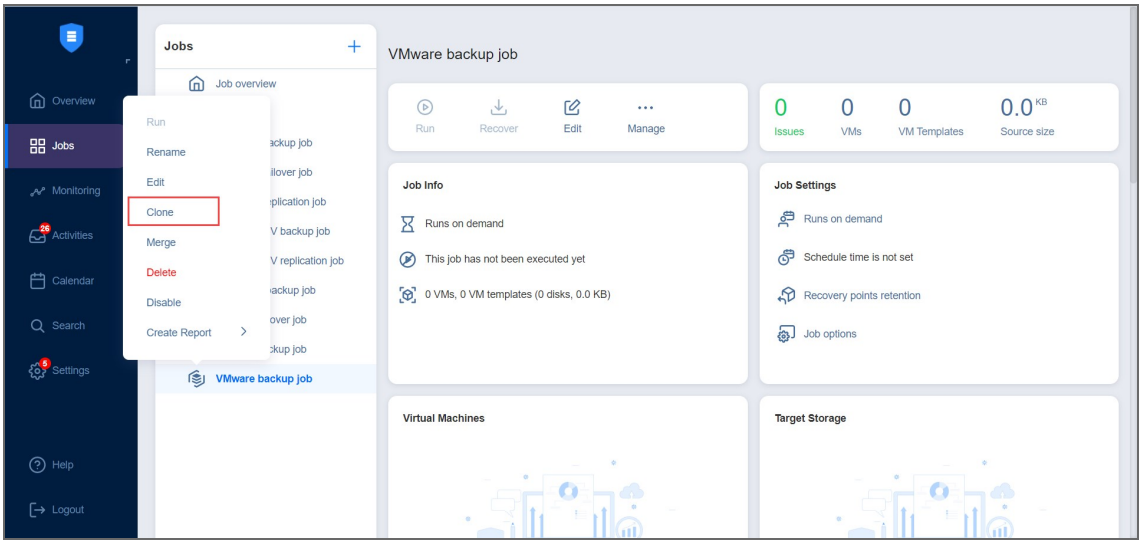
Notes

- You can edit the job while it is running, but the changes will be applied only when the job run has completed.
- You can also edit jobs by selecting a job and clicking **Manage** > **Edit**.

Cloning Jobs

To clone a job, follow the steps below:

1. Right-click on the job you want to clone from the list of jobs.
2. Click **Clone**.



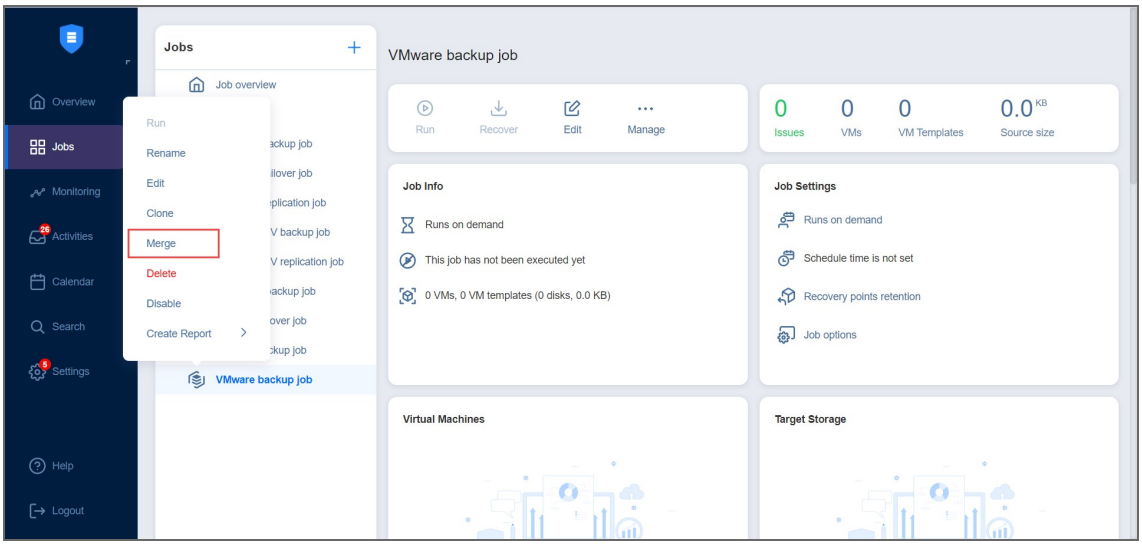
Note

You can also clone jobs by selecting a job and clicking **Manage** > **Clone**.

Merging Jobs

NAKIVO Backup & Replication allows you to merge jobs of the same type. Before doing this, make sure to check feature requirements and how the feature works. To merge the jobs, do the following:

1. From the list of jobs, right-click on the source job you want to merge.
2. Click **Merge**.
3. Choose the target job for the merge and click **Apply**.
4. After the merge is finished, click **Close** to close the popup.



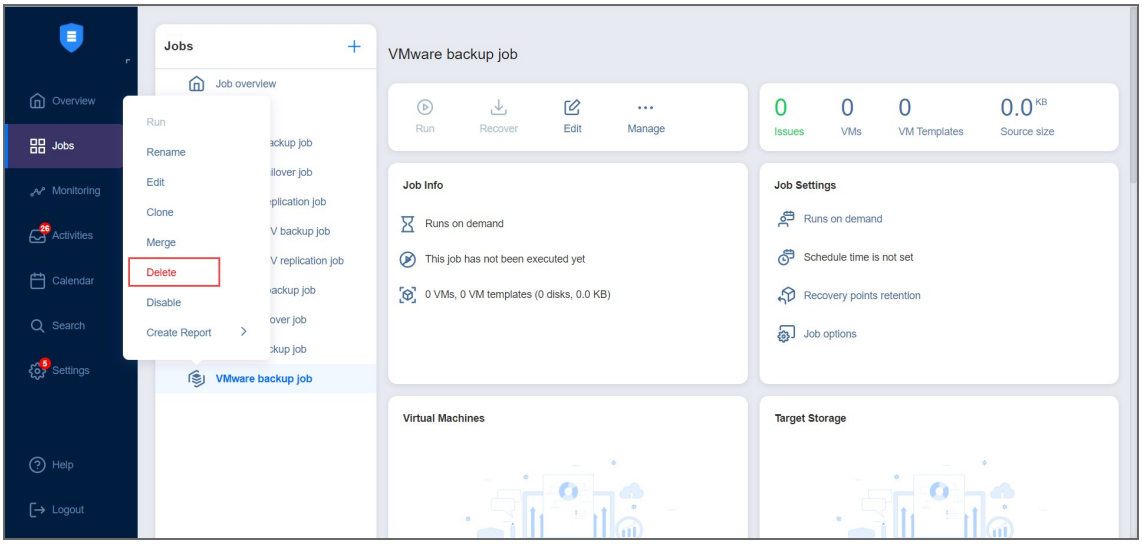
Notes

- The **Merge** button may be unavailable in the following cases:
- The selected job does not meet the feature requirements.
- The selected job is currently running.
- There are no target jobs available to merge the selected job with.

Deleting Jobs

To delete a job follow the steps below:

1. Right-click on the job you want to delete from the list of jobs.
2. Click **Delete**.
3. In the dialog box that opens, select one of the following:
    - **Delete job and keep backups**
    - **Delete job and backups**
4. Click **Delete**



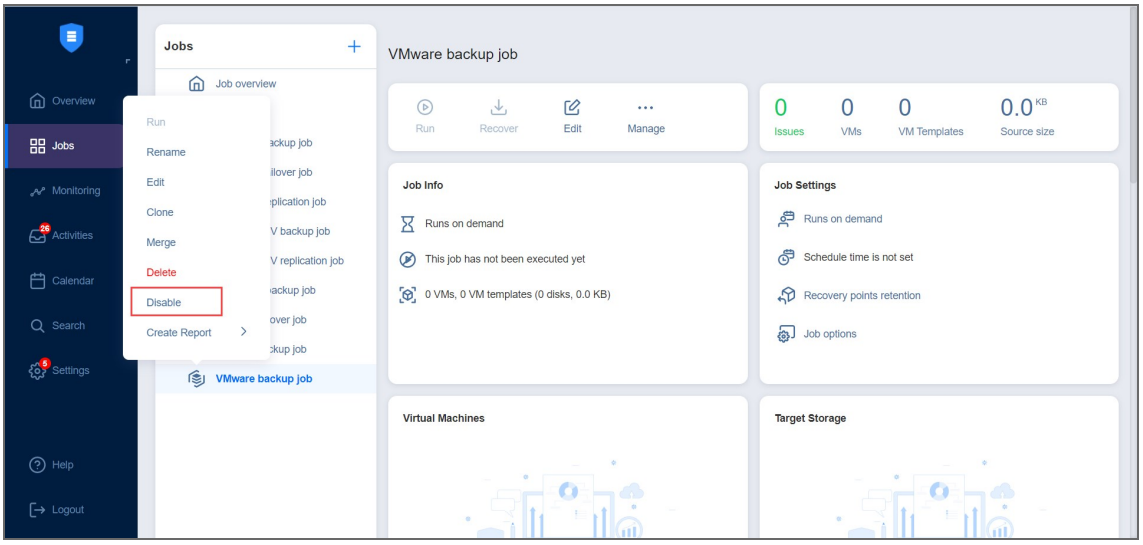
Notes

- You can also delete jobs by selecting a job and clicking **Manage** > **Delete**.
- Backups can also be deleted from Backup Repositories.

Disabling and Enabling Jobs

NAKIVO Backup & Replication provides you with the ability to disable jobs. A disabled job does not run based on the schedule and cannnot be run on demand.

1. From the list of jobs, right-click on the job you want to disable.
2. Click **Disable**.



To enable a job, select **Enable** from the **Manage** menu.

Note

You can also manage jobs by selecting a job and selecting the desired action from the **Manage** menu.

Grouping Jobs

Groups are folders which allow you to:

- Logically arrange jobs (to represent organizations, locations, services, etc.).
- Perform bulk actions with all or selected jobs in a group.

Creating Groups

To create a group, follow the steps below:

1. In the **Jobs** menu, click **Create** and then click **Job group**.
2. Type in the group name in the dialog box that opens and click **Create**.

The following actions are available to manage groups:

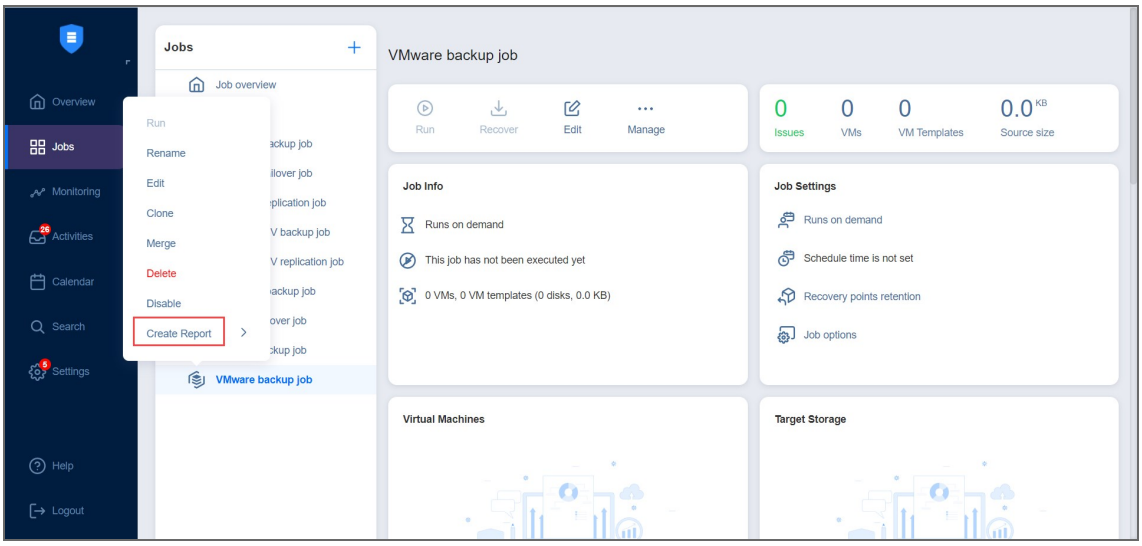
- To add a job to a group, simply drag the job into the group.
- To remove a job from the group, drag the job outside the group.
- To delete a group, right-click the group and choose **Delete** from the shortcut menu that opens. Confirm the group deletion when prompted to do so. Note that when deleting a group, the jobs in the group are not deleted. The jobs are moved to the parent group (or to *Overview*).
- To rename a group, double-click the group and enter a new name.
- To enable or disable all jobs inside a group, click the **Enable/Disable** switch.
- To run jobs available in a group, click **Run/Stop** and then click **Run** Jobs. In the dialog box that opens, select the jobs you want to run and click **Run Jobs**.
- To stop running the jobs available in a group, click **Run/Stop** and then click **Stop Jobs**. In the dialog box that opens, select the jobs you want to stop and click **Stop Jobs**.

Creating Job Reports

To create a general report for all your jobs:

1. Select **Overview** in the **Jobs** menu.
2. Click **Create Report**.
3. Choose one of the following reports:
    - **Overview report**: Contains information about the status and errors of all jobs.
    - **Recovery point size report**: Contains information regarding the sizes of recovery points of backups/replicas for the chosen job or jobs.
    - **Protection coverage report**: Contains information about all VMs and instances protected by backup/replication jobs, as well as about all unprotected VMs and instances. Choose either the PDF or CSV format for the **Protection coverage report** and click **Create**.

4. Choose a location to save the report and click **Save**.



To generate reports from for an individual job, do the following:

1. Go to the list of jobs.
2. Select the job that you need to generate a report for and right-click it or click **Create**.
3. Select one of the following reports from the **Create report** menu:
   - **Last-run report**: Provides data on the last run of the job.
   - **Point-in-time Report**: Provides data on a particular job run. To generate a report, choose a date in the popup and click **Create.**
   - **Job history report**: Provides data on job runs that occurred during a specified time period. To generate a report, pick a start date on the left and finish date on the right side of the popup and click **Create**.
   - **Recovery point size report**: Contains information regarding the sizes of recovery points for backups/replicas for the chosen job or jobs.
   - **Protection coverage report**:Contains information about all VMs and instances protected by backup/replication jobs, as well as about all unprotected VMs and instances.
   - **Failed item protection report**: Contains information about job objects for which processing failed during the last job run. Only backup and replication jobs are included.
   - **Site recovery job report**: Contains a summary of the site recovery job, including the result of passing the **Recovery time objective** value, information about all actions performed, and all registered alarms and notifications.

Job Alarms and Notifications

NAKIVO Backup & Replication displays:

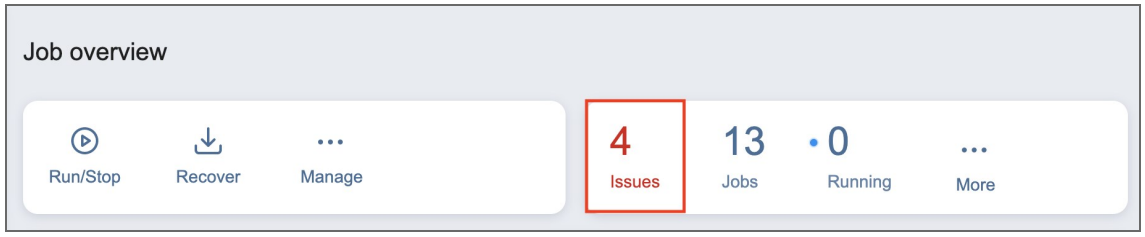
- **Alarms:** Job failures
- **Notifications**: Infrastructure changes and minor errors that do not lead to processing failure

For details, refer to the following sections:

- Viewing Alarms and Notifications
- Dismissing Alarms and Notifications

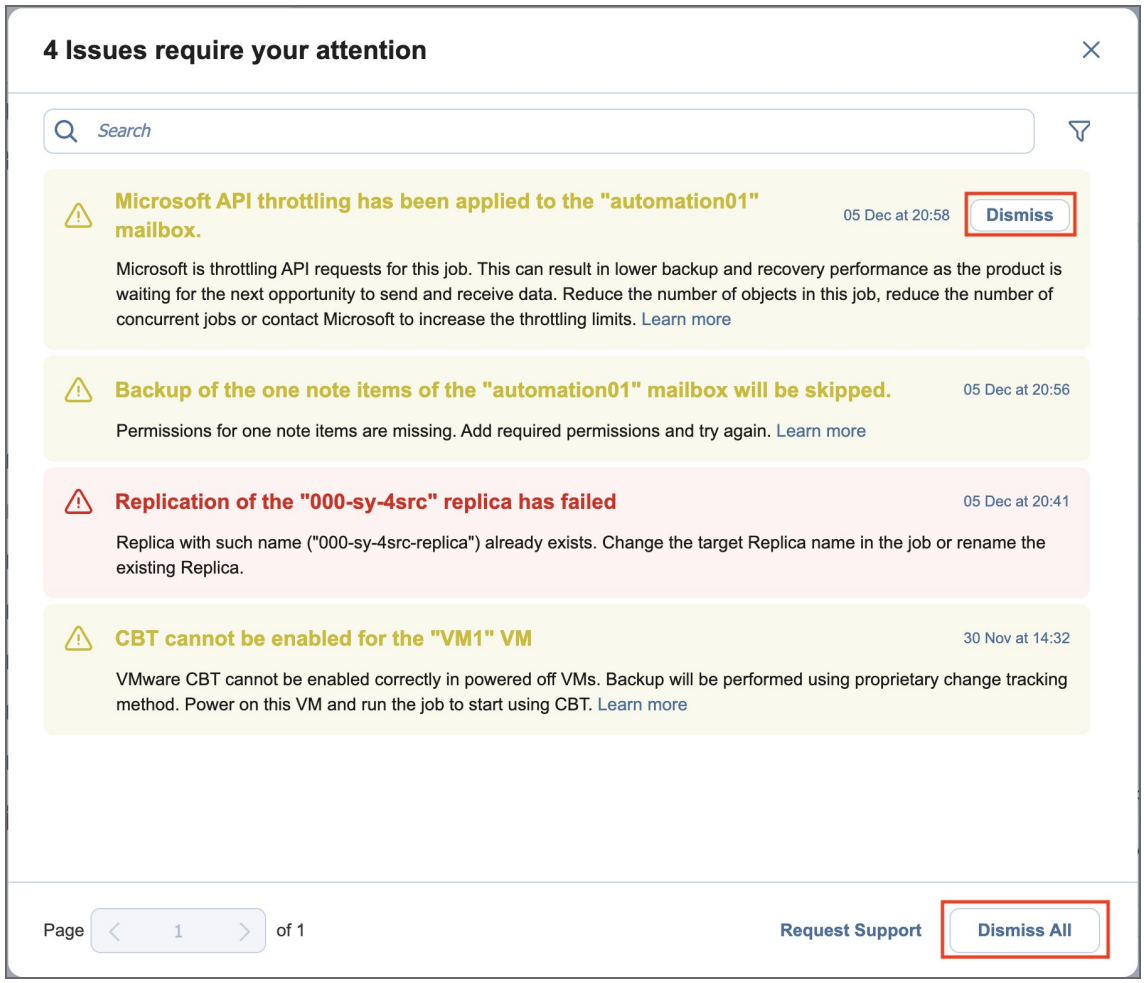
Viewing Alarms and Notifications

To view alarms and notifications, click the red **Issues** number in the **Summary bar**.



Dismissing Alarms and Notifications

To dismiss all alarms and notifications in a job or selected group, click **Dismiss All**. To dismiss an individual alarm or notification, hover the mouse pointer over the alarm or notification and click **Dismiss**.


4 Issues require your attention
Search
Microsoft API throttling has been applied to the "automation01" mailbox.
05 Dec at 20:58
Dismiss
Microsoft is throttling API requests for this job. This can result in lower backup and recovery performance as the product is waiting for the next opportunity to send and receive data. Reduce the number of objects in this job, reduce the number of concurrent jobs or contact Microsoft to increase the throttling limits. Learn more
Backup of the one note items of the "automation01" mailbox will be skipped.
05 Dec at 20:56
Permissions for one note items are missing. Add required permissions and try again. Learn more
Replication of the "000-sy-4src" replica has failed
05 Dec at 20:41
Replica with such name ("000-sy-4src-replica") already exists. Change the target Replica name in the job or rename the existing Replica.
CBT cannot be enabled for the "VM1" VM
30 Nov at 14:32
VMware CBT cannot be enabled correctly in powered off VMs. Backup will be performed using proprietary change tracking method. Power on this VM and run the job to start using CBT. Learn more
Page
1
of 1
Request Support
Dismiss All

Managing Activities

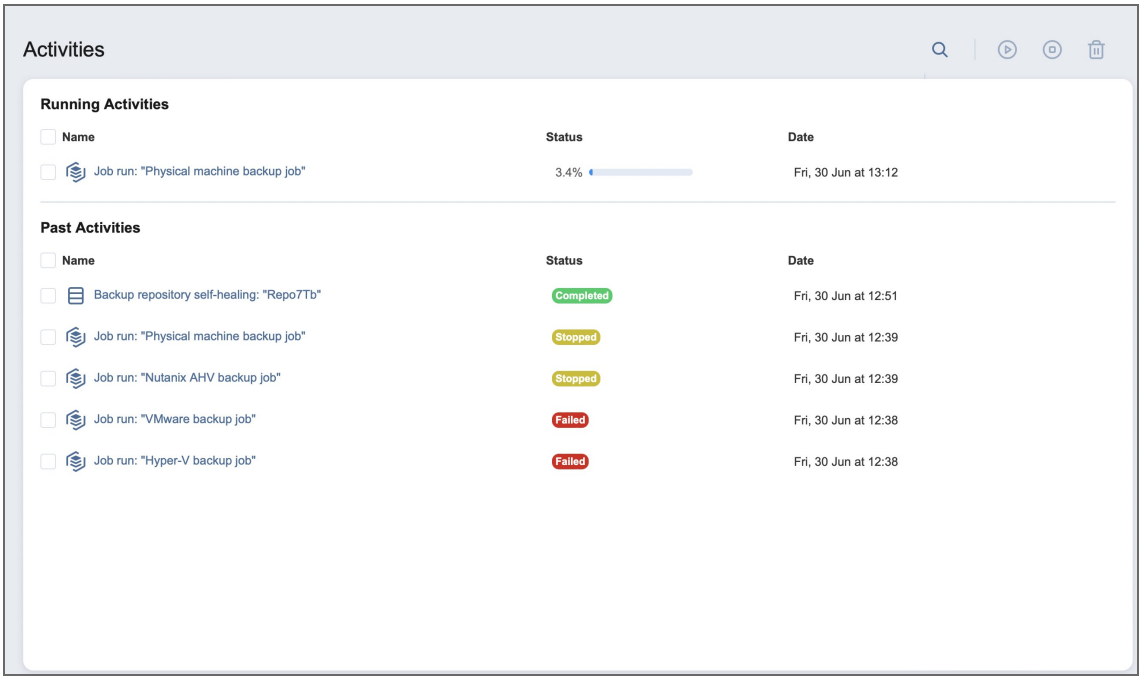
The **Activities** page displays current and past tasks performed by NAKIVO Backup & Replication. From this dashboard, the following actions can be done:

- Viewing Activities
- Searching for Activities
- Viewing Activity Details
- Stopping Running Activities
- Running Activities Again
- Removing Activities

Past activities are stored for the number of days specified in the **Store job history for the last X days** setting in the General tab.

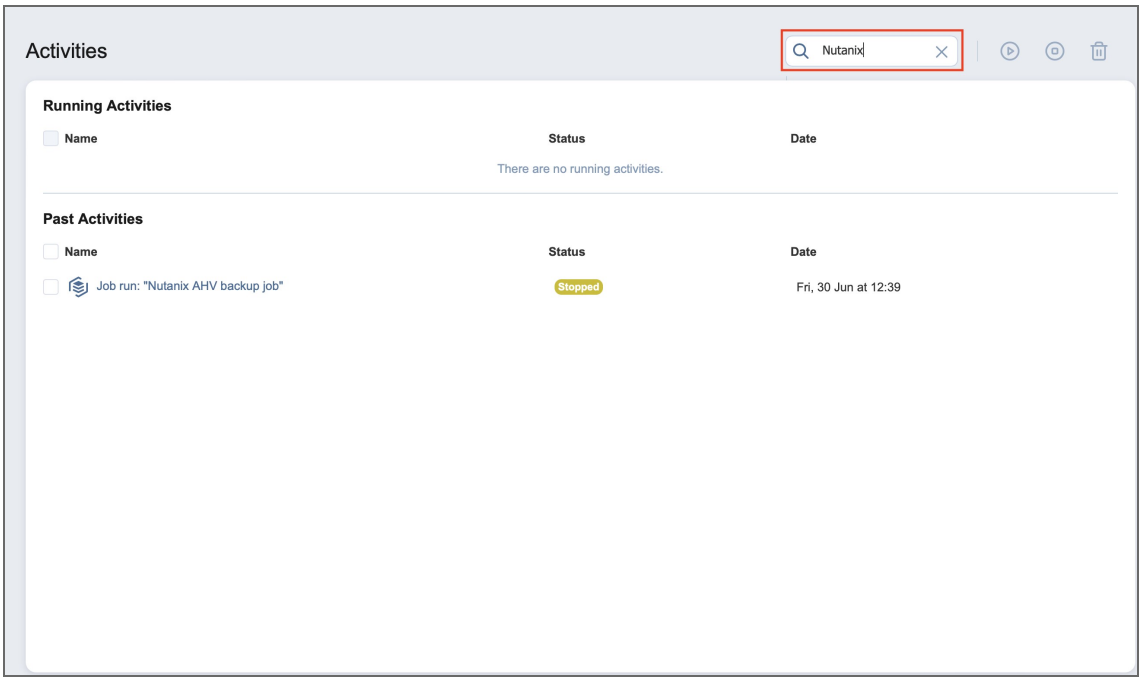
Viewing Activities

The **Activities** dashboard allows viewing all your current and past activities in the application.



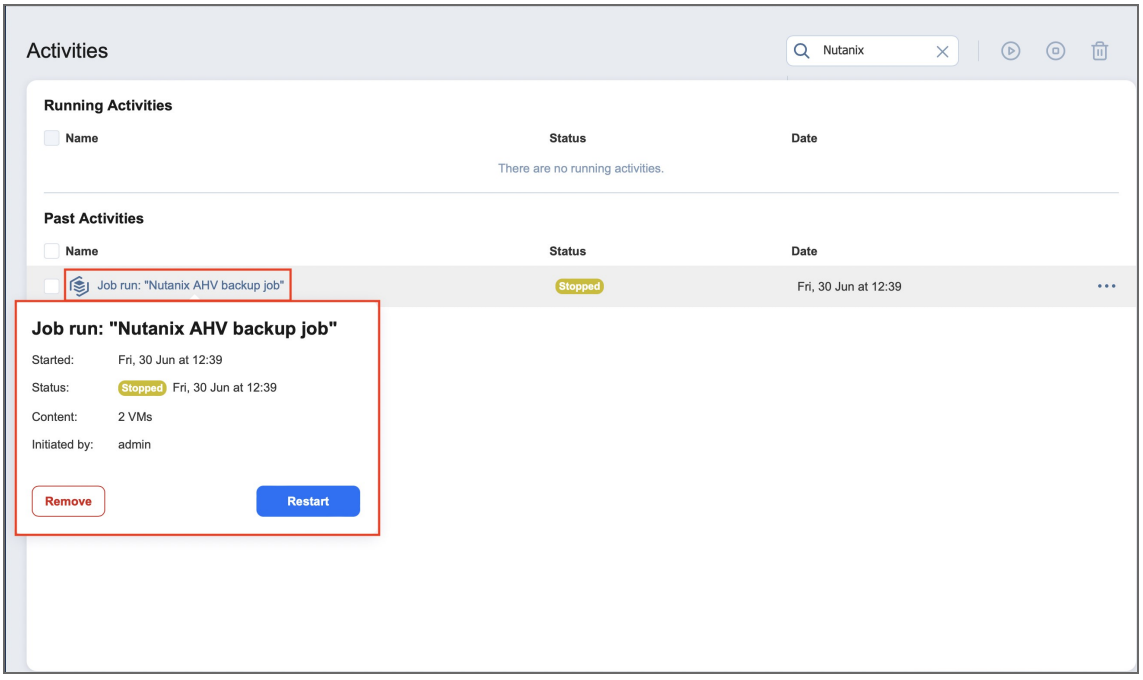
Searching for Activities

Find activity by typing in part of its name in the **Search** field.



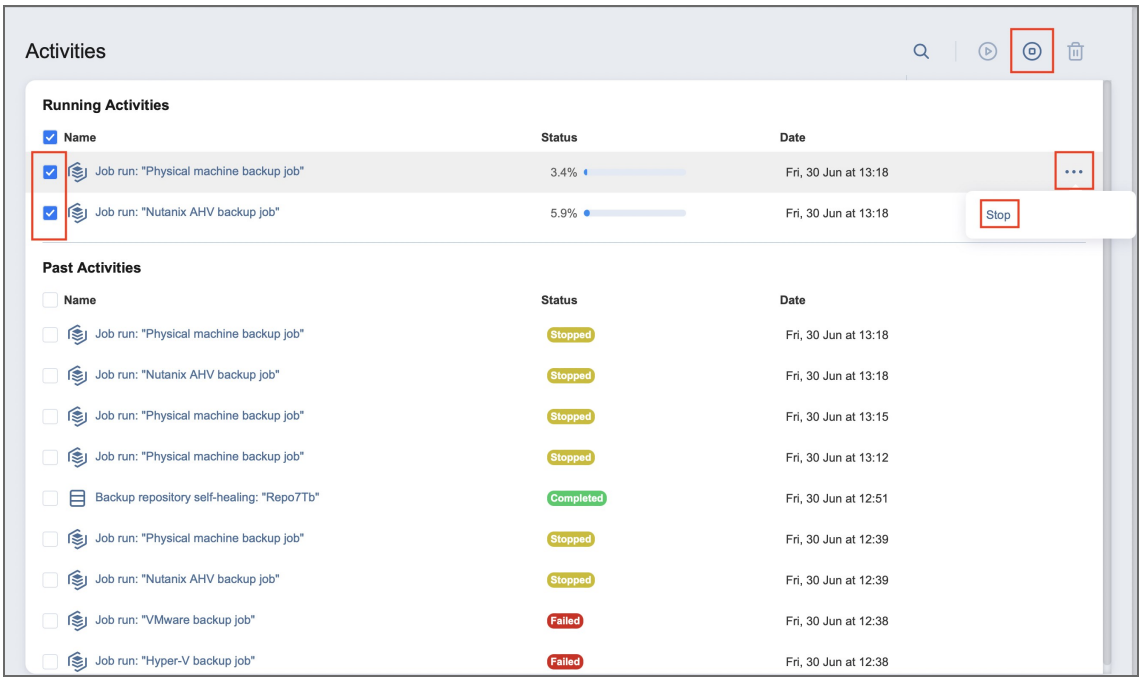
Viewing Activity Details

View the details of an activity by selecting an activity name.



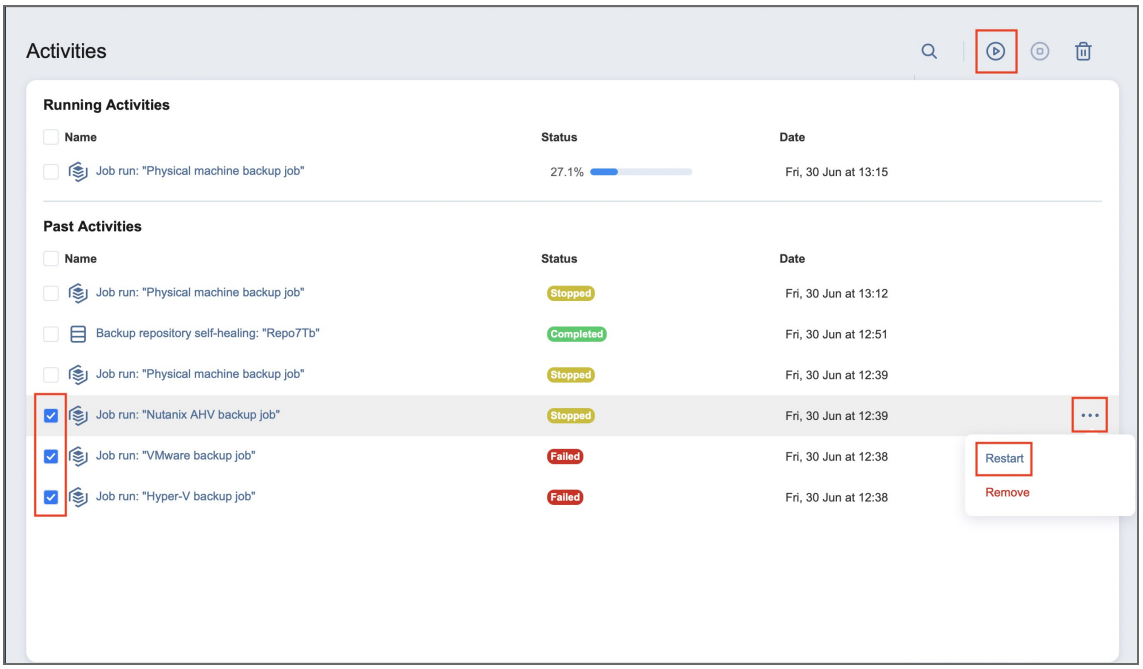
Stopping Running Activities

To stop running activities, tick the checkbox next to each desired activity and click **Stop** in the toolbar above. To stop all running activities, tick the **Select/Deselect all** checkbox at the top and click **Stop**. You can also stop a single activity by clicking the **Stop** icon that appears when you hover over a specific running activity.



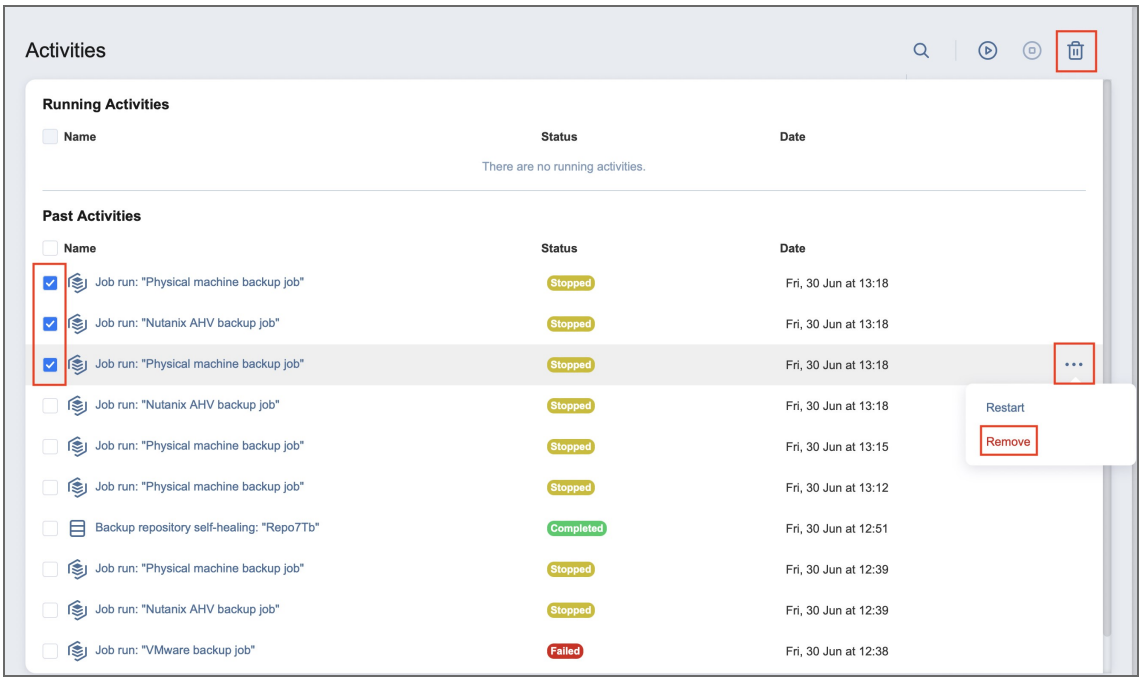
Running Activities Again

To run activities again (if possible), tick the checkbox next to each desired activity and click **Start** in the toolbar above. To run all activities again at once, tick the **Select/Deselect all** checkbox at the top and click **Start**. You can also run a single activity by clicking the **Start** icon that appears when you hover over a specific activity.



Removing Activities

To remove activities from the list, tick the checkbox next to each desired activity and click **Remove** in the toolbar above. To remove all activities from the list at once, tick the **Select/Deselect all** checkbox at the top and click **Remove**. You can also remove a single activity by clicking the **Remove** icon that appears when you hover over a specific activity.



Using Calendar

The **Calendar** allows you to schedule and view the history of past job runs.

- Understanding Calendar Formatting
- Creating Jobs with Calendar
- Editing Jobs with Calendar

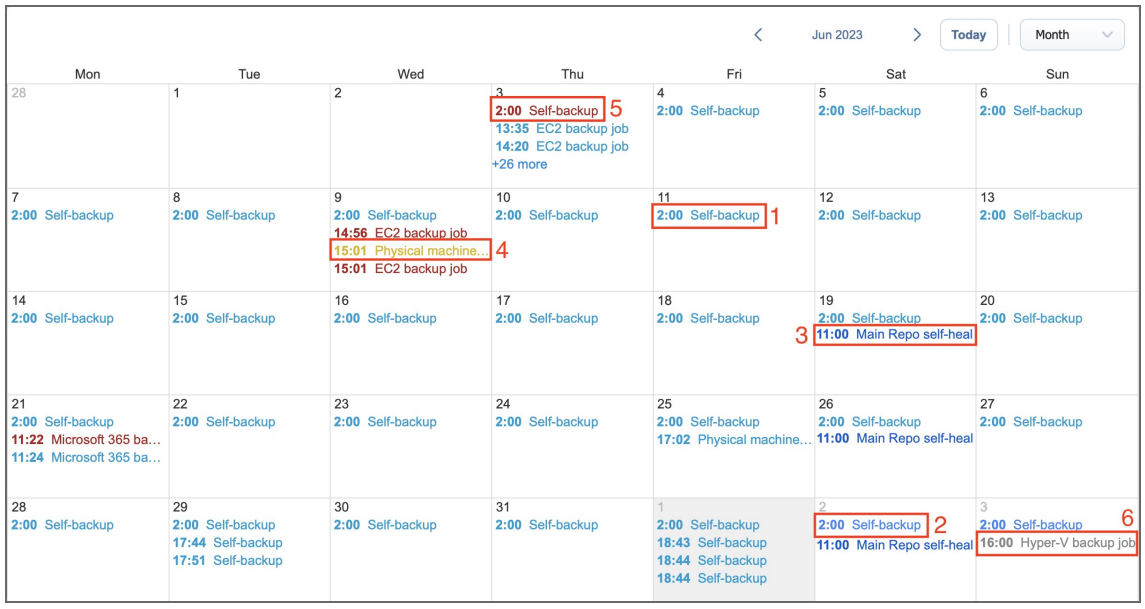
Understanding Calendar Formatting

Jobs in the Calendar view are formatted by start/end time and color coded by status. The color coding format is as follows:

1. Successful job runs are marked in teal.
2. Future scheduled job runs and currently running jobs are marked in sky blue.
3. Repository maintenance jobs (such as scheduled self-healing) are marked in navy blue.
4. Stopped job runs are marked in yellow.
5. Failed job runs are marked in red.
6. Job runs belonging to disabled jobs are marked in gray.

Note

Job runs that complete later than their start date are marked in the Calendar for the appropriate number of days. In **Month** view, such jobs are also marked with background fill. For example, a job that started on a Monday and finished on a Wednesday will be marked in one continuous solid light blue line across three days.



Creating Jobs with Calendar

To create a job:

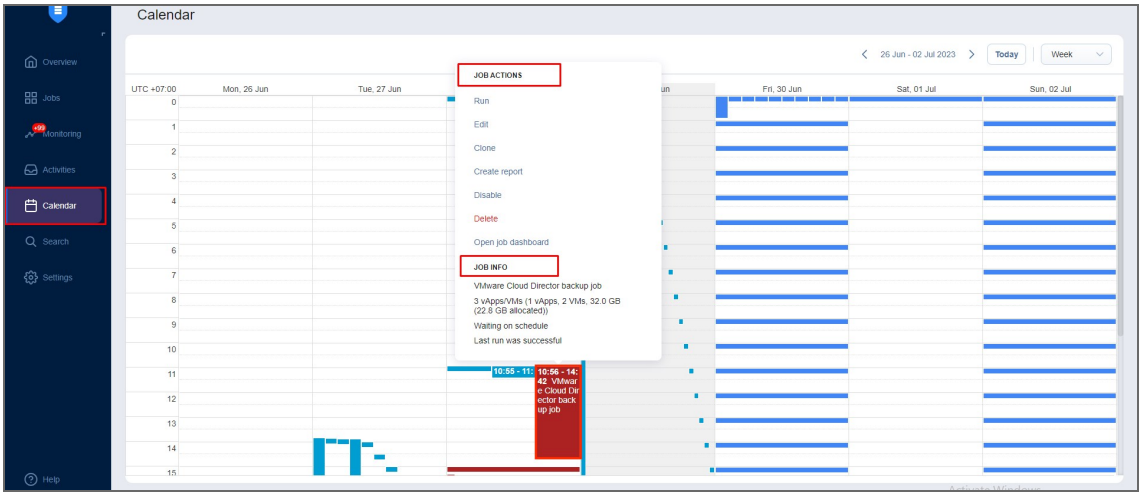
1. Click on the date and time when you'd like to run the job
2. Select the type of job you need.
3. On the **Schedule** page of the wizard, the time you've selected in the **Calendar** will be selected.

Editing Jobs with Calendar

If you click on the job title on the Calendar dashboard, the **Job Actions** menu will appear.

Using this menu, you can:

- Run a job on demand.
- Edit a job.
- Clone a job.
- Delete a job. If the job repeats on schedule, this action will affect all job runs.
- Disable/Enable a job. If the job repeats on schedule, this action will affect all job runs.
- Open the Job Dashboard.
- Create a report.



Using Global Search

Using the **Global Search** dashboard, search for items within the entire inventory of NAKIVO Backup & Replication, Transporters, Backup Repositories, jobs, backups, and replicas.

- Opening Global Search
- Running Global Search
- Filtering Search Results
- Applying Bulk Action
- Viewing Object Info

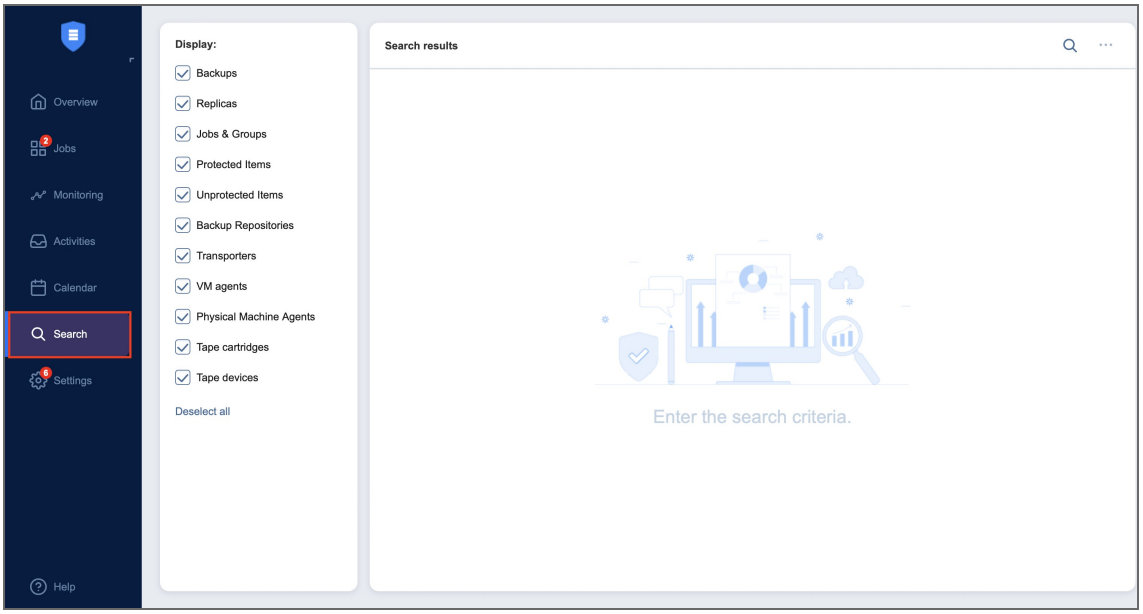
Note

When the multi-tenant mode is enabled, Global Search will operate within a specific tenant. For more information about multi-tenancy in NAKIVO Backup & Replication, please consult with the following resources:

- “Multi-Tenancy” on page 27
- “Multi-Tenant Mode” on page 462

Opening Global Search

To open **Global Search**, click the **Search** icon in the main toolbar of the application.



Running Global Search

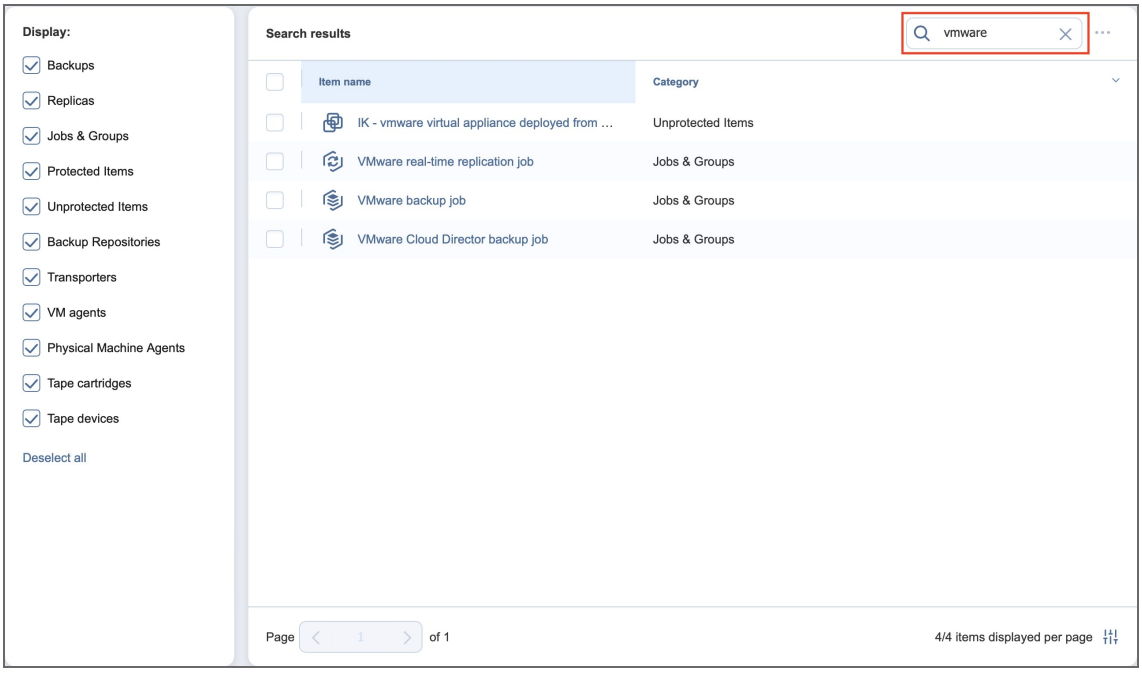
When the **Global Search** dashboard opens, you can enter your search string into the search box.

The string you have entered will be immediately followed by a display of the search results in the form of a list.

To help you fine-tune your search, the following wildcards are applicable:

- "**?**" representing a single character.

  "*****" representing zero or more characters.



Please note the following:

- Search is case insensitive.
- Search results are grouped by categories.

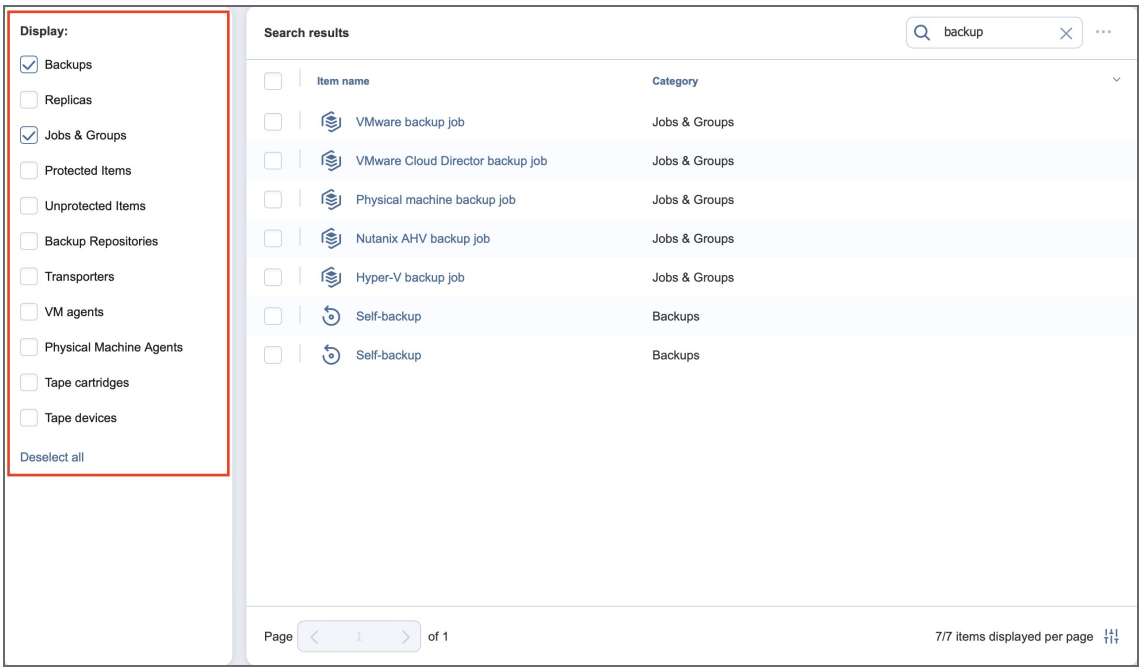
Filtering Search Results

By default, your search results are unfiltered. This means that the search is applied to all categories of NAKIVO Backup & Replication objects.

To narrow your search results, deselect some categories in the categories list:

- Backups
- Replicas
- Jobs & Groups
- Protected Items
- Unprotected Items
- Backup Repositories
- Transporters
- VM agents
- Physical machine agents
- Tape cartridges
- Tape devices

The filtered search results will be displayed immediately in the search results list.



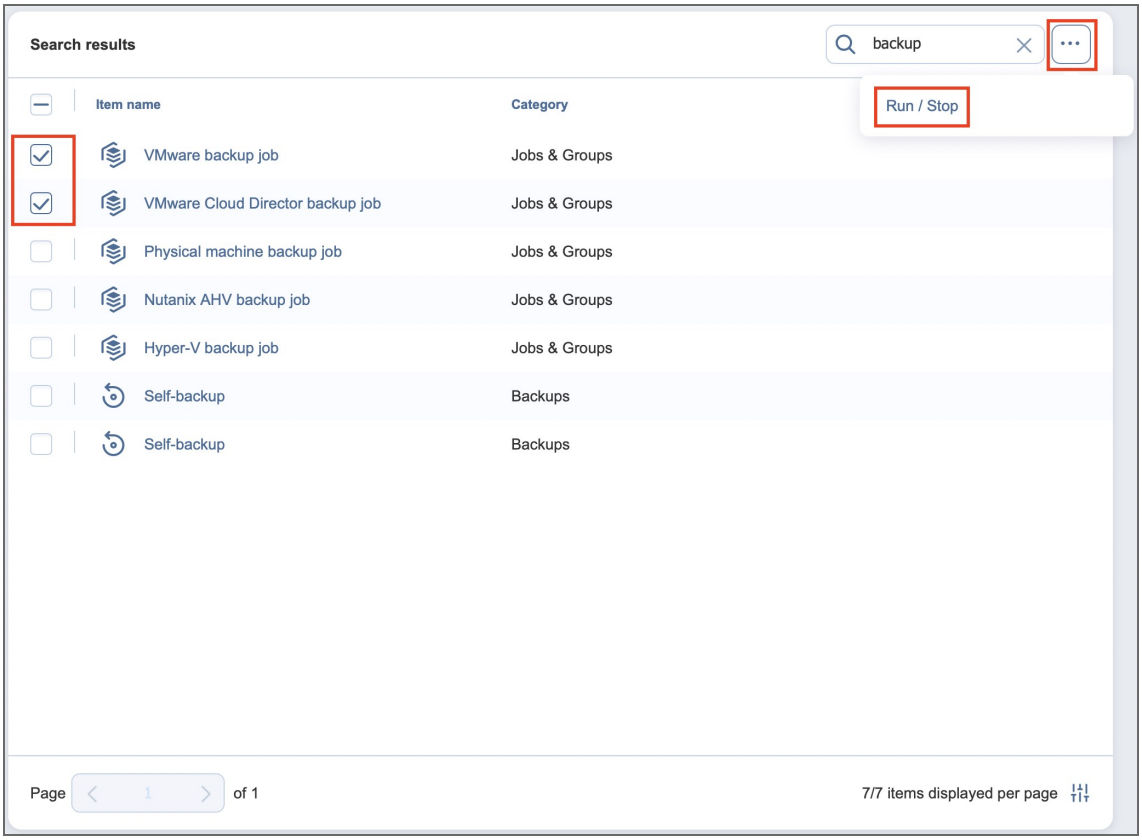
To get back to the default filtering settings, click **Select all** below the categories list.

Applying Bulk Action

With NAKIVO Backup & Replication Global Search, you can apply a bulk action to objects belonging to the same category and of the same type.

Proceed as follows to apply a bulk action:

1. In the search result list, select similar objects.
2. The **Bulk Action** button becomes active in the upper right corner of the dialog. Click **Bulk Action**.



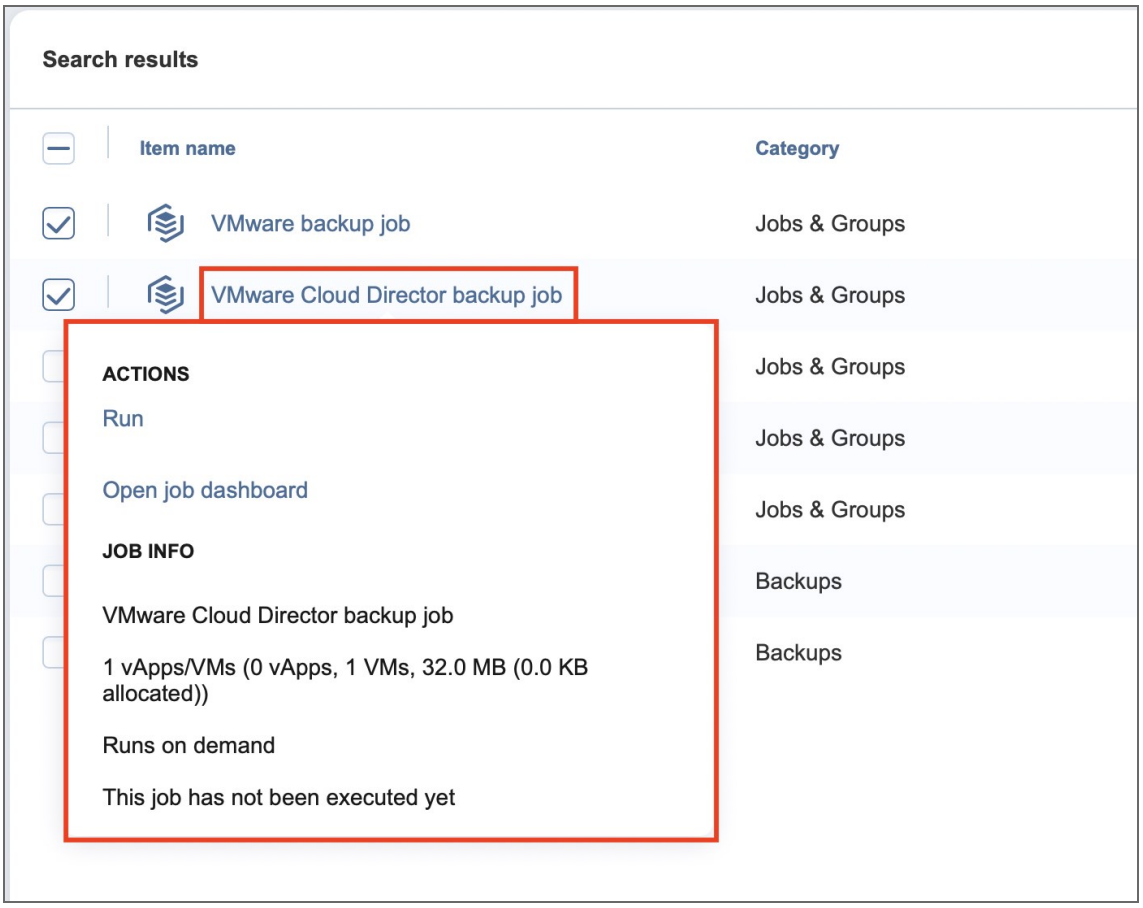
A dialog opens with the list of actions applicable to the selected items. To proceed with the necessary action, click the corresponding item in the list of actions.

Note

Bulk actions are not applicable to NAKIVO Backup & Replication dissimilar objects.

Viewing Object Info

To view info on a specific object available in the search result, click the object.



A dialog opens displaying object info, along with the list of typical actions applicable to the object.

Settings

This section covers the following topics:

General

This section contains the following topics:

Bandwidth Throttling

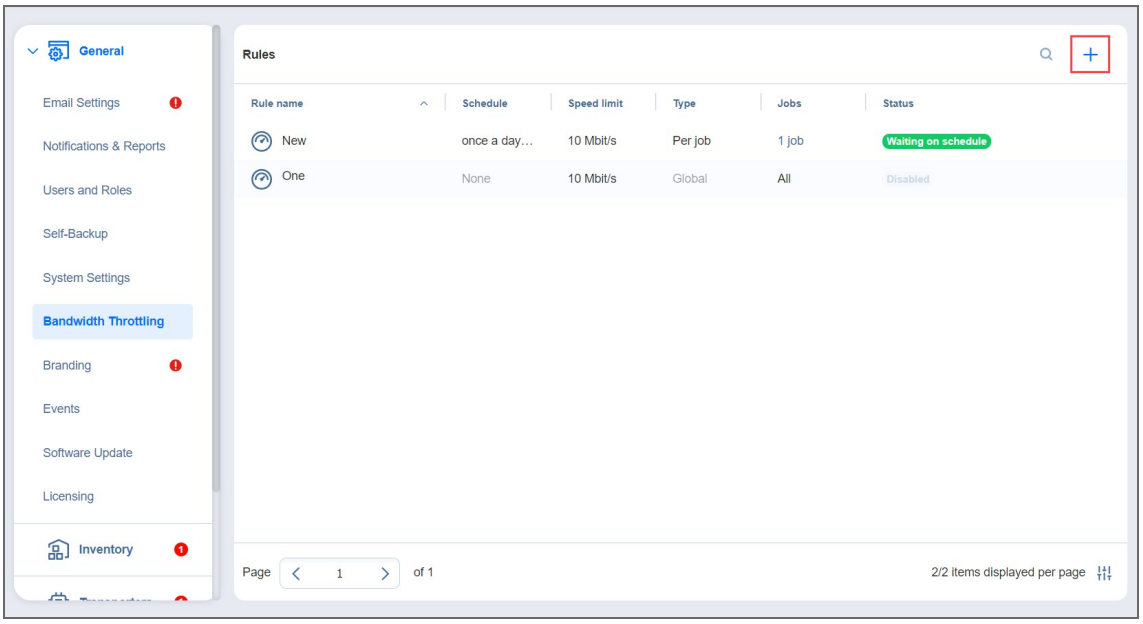
With bandwidth throttling settings, you can control the throughput of the data processing by setting specific limits for all or for separate jobs. Bandwidth throttling is managed with bandwidth rules. When a bandwidth rule is applied to your job, the speed of data transfer from source to target will not exceed the specified limit. Refer to “Advanced Bandwidth Throttling” on page 8 for a description of bandwidth rules.

This topic contains the following instructions:

Accessing Bandwidth Throttling Settings

To access bandwidth throttling settings, follow the steps below:

1. Click **Settings** in the left pane of the application to open the **Settings** dashboard.
2. In the **General** tab of the **Settings** dashboard, click **Bandwidth throttling**. The *Bandwidth throttling* section opens.



Creating Bandwidth Rules

Please follow the steps below to create a bandwidth rule:

1. In the *Bandwidth throttling* section of the **General** tab of **Settings**, click the “**+**” icon.
2. The New Bandwidth Rule wizard opens. Proceed as follows:

a. Choose a type for your bandwidth rule:
   - **Global**: The rule will be applied to all applicable jobs.
   - **Per job**: The rule will be applied to the selected jobs.

     Note

     When applied to specific jobs, **Per job** bandwidth rules have higher priority over **Global** bandwidth rules.

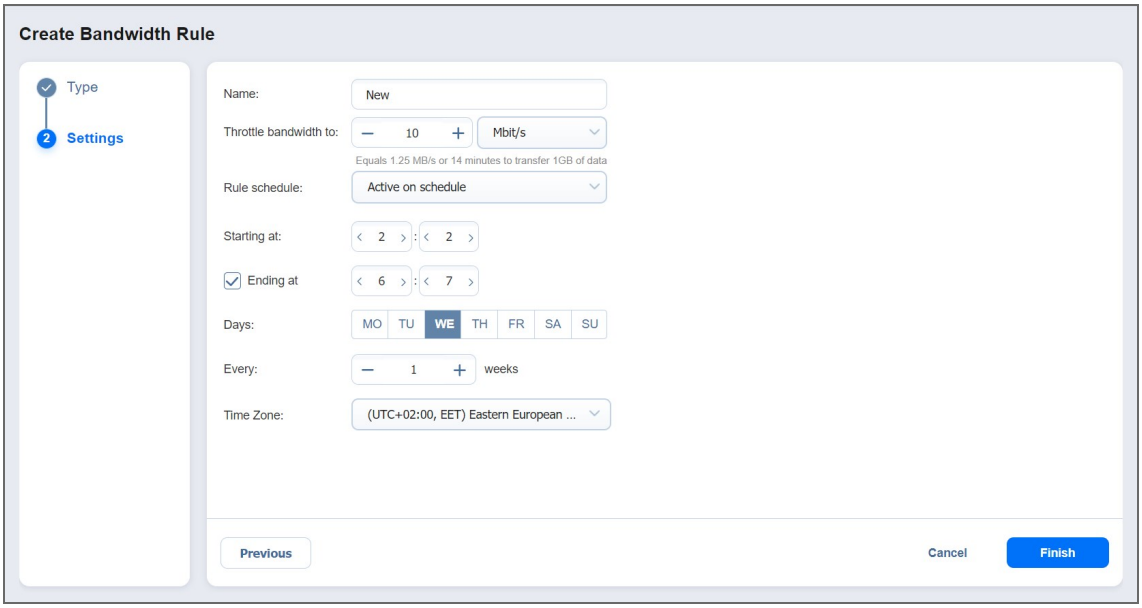
b. **Job**: Choose a job to apply the bandwidth rule to.

c. **Settings**: Configure the following settings:
   a. **Name**: Enter a name for your bandwidth rule.
   b. **Throttle bandwidth to**: Enter the value of the bandwidth limit; and choose the measurement unit: Mbit/s or Gbit/s.

      Notes
      - For your convenience, a description is available below the value you've entered, explaining what the value means.
      - In some cases, the actual data transfer speed may exceed the limit you set by up to 0.3 MByte/s or 2.4 Mbit/s.

   c. **Rule schedule**: Choose either of the following:
      - **Always active**: The rule will always be active.
      - **Active on schedule**: The rule will be active on schedule. When chosen, the following options are available:
        a. **Starting at** and **ending at**: Enter the time, in hours and minutes, when the rule will be active.
        b. **Days**: Select weekdays for which the rule will be active.
        c. **Time zone**: Choose a time zone of your rule.
      - **Disabled**: The rule will be disabled.

3. Click **Finish**.



Managing Bandwidth Rules

You can search for the specific rule by clicking the **magnifying glass** icon in the upper-right part of the screen and entering the name in the search box.

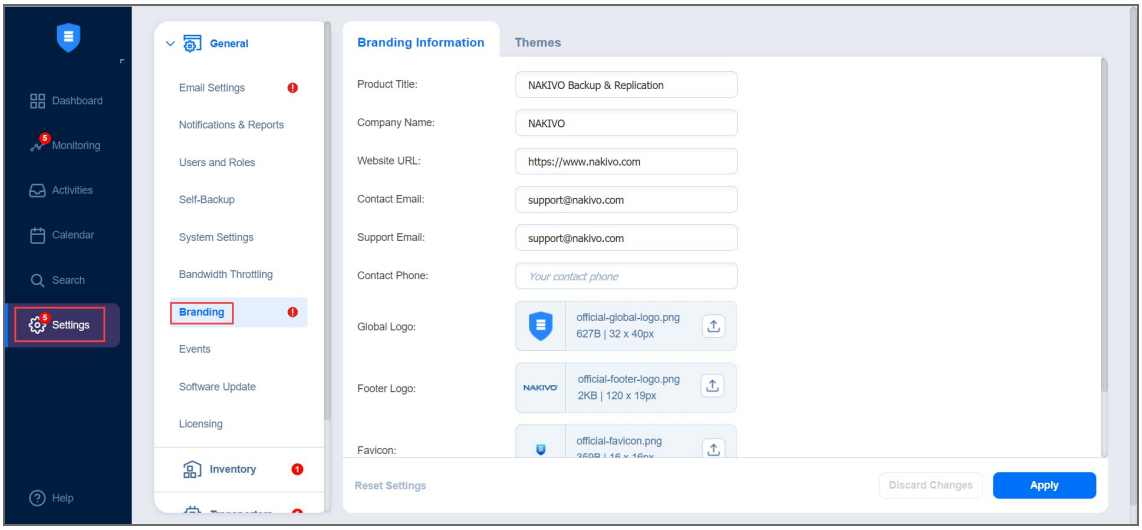
Click on the **ellipsis** to the right of the rule's name to manage bandwidth rules with the following commands:

- **Edit**: The Edit Bandwidth Rule dialog opens where you can modify your rule.
- **Disable/Enable**: When applied, the command will disable/enable the rule.
- **Remove**: When applied, a dialog will open asking you to confirm the operation. Click **Delete** to confirm that you wish to delete your rule.

Branding

You can change the product branding settings such as product name, logo, background, and so on. To configure these product settings, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Go to the **General** tab and click **Branding**.



3. Change the following, as appropriate:
   - **Product title**
   - **Company name**
   - **Website URL**
   - **Contact email**
   - **Support email**
   - **Contact phone**
   - **Page background**
   - **Global logo**
   - **Footer logo**
   - **Favicon**
4. On the **Themes** tab, you can configure the colors of your NAKIVO Backup & Replication instance.
5. After making the necessary changes, click **Apply**. Alternatively, click **Discard Changes** to discard any changes you have made.
6. Optionally, click **Reset Settings** to return all the settings to their default values.

During upload, the logo and bookmark icon images are internally resized while preserving the aspect ratio. The background image is used as it is. To get the best image quality, follow the recommendations below.

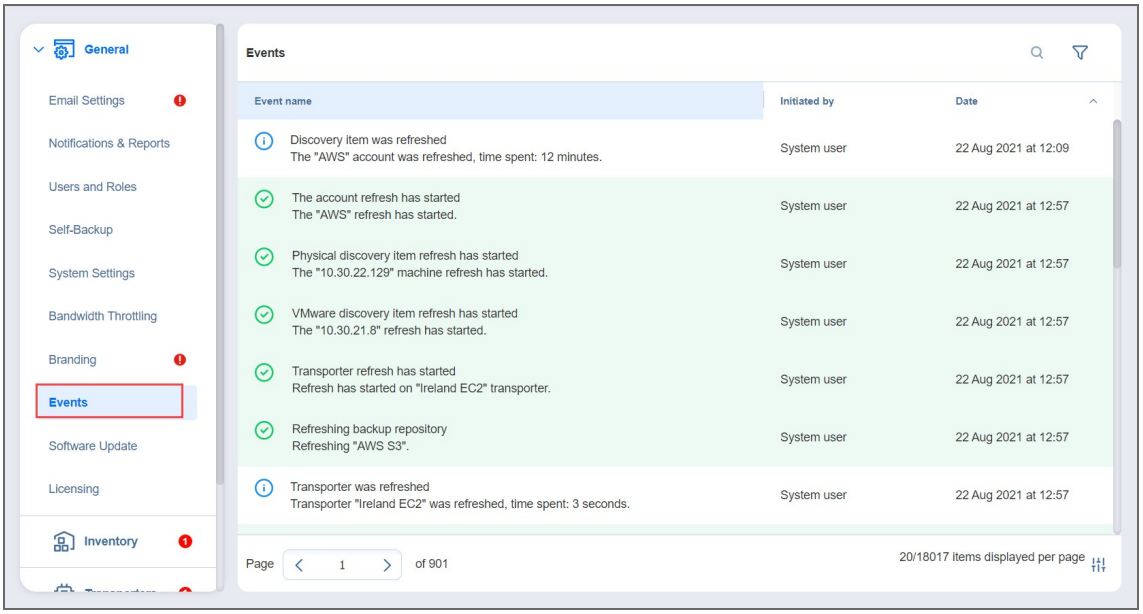
Image	Best format	Best resolution
Global logo	.png	32x40
Footer logo	.png	32x40
Favicon	.png	16x16

Configuring Events

NAKIVO Backup & Replication can store and display system events. By default, events are stored for 60 days; you can change the time period in **Settings**.

To view events, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Open the **General** tab and click **Events**. The **Events** page opens, displaying the NAKIVO Backup & Replication system events.



3. Optionally, you can enter a search string to the **Search** box. This allows you to see events related only to NAKIVO Backup & Replication items – Transporters, repositories, jobs, backups, and replicas,– contained in your search string.
4. Optionally, you can select filter the events by the following parameters:
    - **Initiated by**: Select one of the users of the product in the dropbox
    - **Event type**: Choose among the following event types:
        - Info
        - Warning
        - Error
        - Debug
    - **Date**: After selecting this parameter, choose the start and end dates. This allows you to limit the events list within a specific time period.

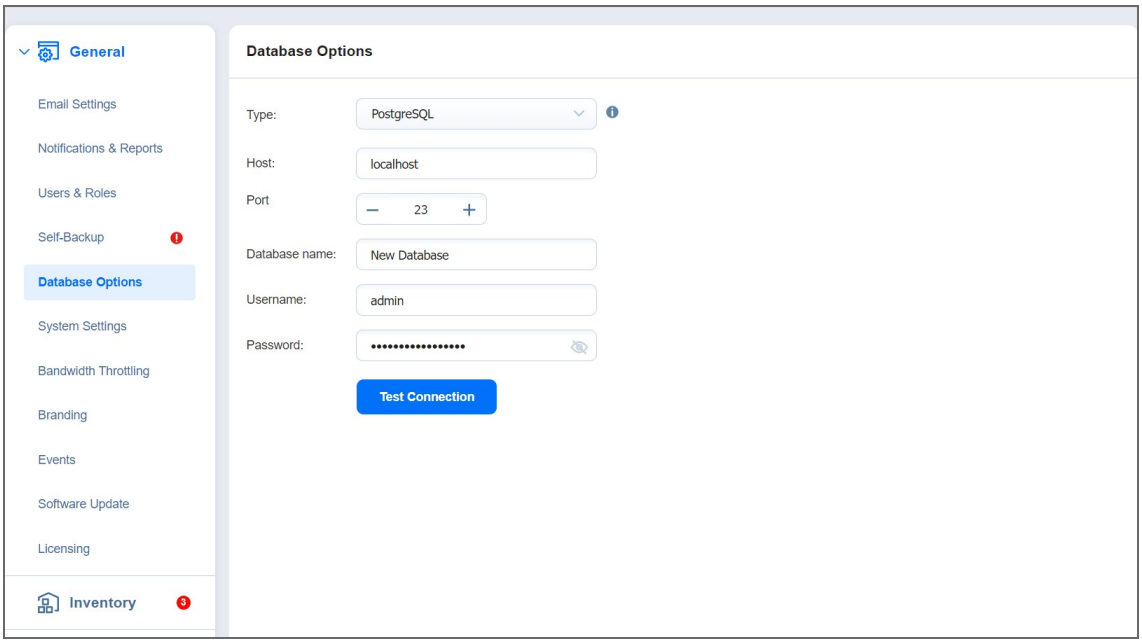
Database Options

NAKIVO Backup & Replication allows you to migrate the internal H2 database used by the NAKIVO Backup & Replication Director to an external database. To do that, take the following steps:

Important

- If you migrate the internal H2 database to an external database, you will not be able to switch back to the internal database or an external database of the same type later.
- For multi-tenant mode, only the Master Admin can perform database migration. The functionality is not available for the local tenant. The remote tenant can still perform database migration as described below if they log in as single tenant into NAKIVO Backup & Replication.
- The migration occurs for all local tenants at the same time. If the migration fails for one of the tenants, the product reverts to the previous database type automatically.

1. Go to **Settings > General > Database Options**.
2. Select the external database from the list of supported platforms in the **Type** drop-down list. Note that the internal database is selected by default.
3. In the **Host** field, enter the hostname or IP of the server housing the database.
4. In the **Port** field, enter the relevant port number.
5. Enter the name for your database in the **Database name** field.
6. Enter **Username** and **Password** in the corresponding fields.
7. Click **Test Connection**.
8. If the test is successful, click **Apply Settings**:
    - If the database does not exist, a dialog box appears asking if you would like to create one and proceed with the migration. Click **Migrate**.
    - If the database belongs to the current NAKIVO Backup & Replication installation, a dialog box appears asking if you would like to update the settings of the existing database. Click **Update** to proceed.
    - If the database already exists and is compatible with the current NAKIVO Backup & Replication installation, a dialog box appears asking if you would like to use it, cleanup all its records and replace the contents of the database with the new data. Click **Proceed**.



Notes

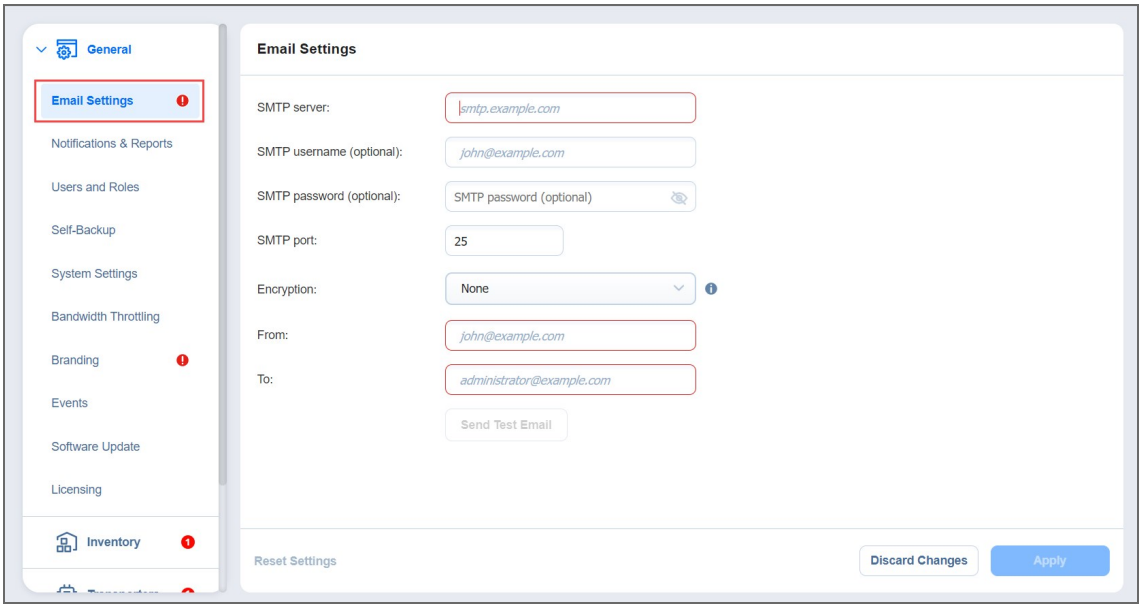
- If you have the Self-Backup feature enabled, the self-backup process starts before the database switch and runs again after the switch is completed.
- Self-backup of an external database is possible only with a single-tenant instance of the solution.
- If the external database is installed on another VM or is using an IP address instead of *localhost*, take the following steps before migration:
  1. Open the *pg_hba.conf* file located in the external database installation folder.
  2. Change **IPv4 local connections** settings *from 127.0.0.1/32* to *0.0.0.0/0*.
  3. Save changes.
  4. Restart external database service.
- If the connection between PostgreSQL and NAKIVO Backup & Replication cannot be established, add the following string to the *pg_hba.conf* file:
  host DATABASE USER ADDRESS METHOD [OPTIONS]
  host all all 0.0.0.0/0 md5
  Note that method (md5) may be different for some versions of PostgreSQL. Check the respective method for your version of PostgreSQL before applying the changes.
- If Master Tenant connects to existing database that already houses the data from previous migrations, such database is automatically mapped to the tenants during the new migration using the database UUID.
- It is not possible to recover from a self-backup and system migration in the following cases:
  - The NAKIVO Backup & Replication installation uses the H2 database while the self-backup contains data from an external database.

    - The NAKIVO Backup & Replication installation uses an external database while the self-backup contains data from the H2 database.
- It is not possible to edit the external database **Host**, **Port**, and **Database name** after a successful migration.
- If the internal database is used, the product checks the performance capability adequacy of this database to the current product workload:
    - This check is performed every 10 days by default.
    - If the total number of protected workloads for single tenant or per tenant for Multi-Tenant mode exceeds the limit of 100 VMs/instances/physical machines/oracle databases, the product displays the notification with recommendation to switch to the external database.

Email Settings

On this page, you can configure your email settings. Do this by following the steps below:

- Log in to NAKIVO Backup & Replication.
- Click **Settings** in the left pane of the product.
- Go to the **General** tab.
- Click **Email Settings** to configure email settings on the page that opens.



Important

If you use an email with two-factor authentication, grant access permissions to NAKIVO Backup & Replication via your account security settings and generate a unique password. As an example, use instructions for Google accounts provided in the Create & use App Passwords article. When configuring email setting of the product, enter this password in the **SMTP password** box.

1. To set email settings, fill out the fields in the Email settings section:
    - **SMTP server**: The address of the server responsible for sending emails.
    - **SMTP username**: The username on the server (usually the same as the email username).
    - **SMTP password**: Usually the same as the password to your email.
    - **SMTP port**: Depends on encryption type.
    - **Encryption**: Select the type of encryption:
        - **None**: Always use a plaintext connection. Not recommended.
        - **TLS, if possible**: Start with plaintext, then use STARTTLS to switch to secure connection if supported by the server.
        - **TLS, required**: Start with plaintext, then use STARTTLS to switch to secure connection;

drop the connection if not supported by the server.

- **SSL, required**: Use the SSL-encrypted connection.

- **From**: Specify the sender email address
- **To**: Specify the receiver email address

Click **Send Test Email** to verify that the settings are correct.

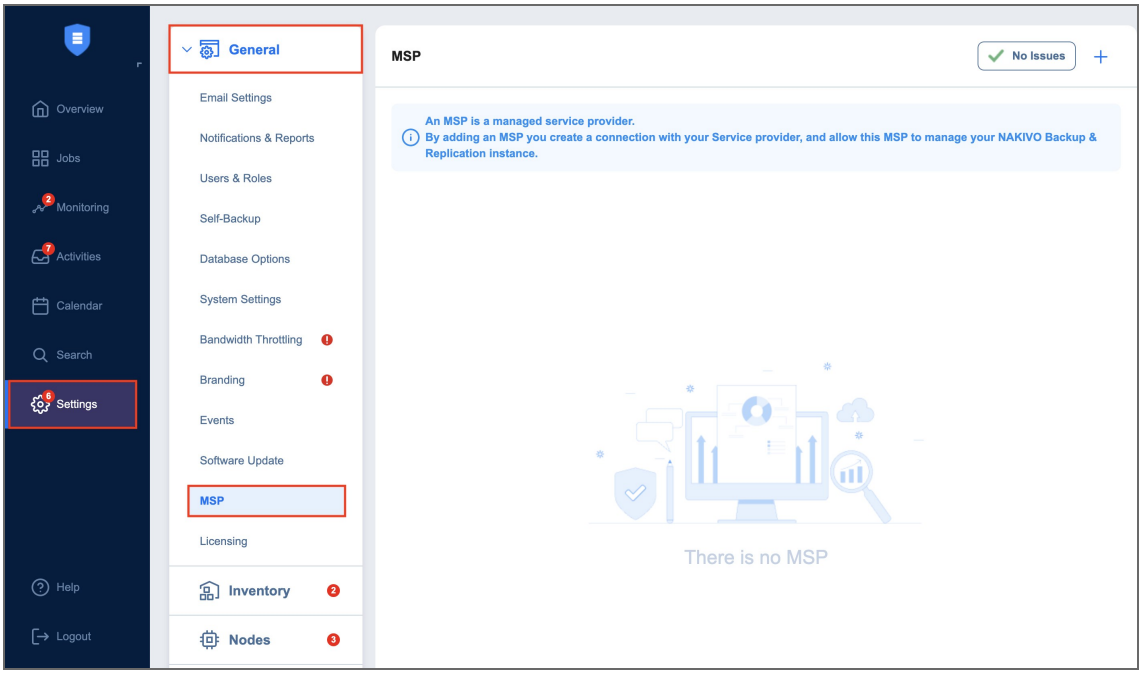
Note

If you want to use a Gmail account to receive email notifications, turn on the **Less secure apps access** setting by navigating to **Manage your Google Account > Security** in your Google account.

2. Click **Apply** to save the settings.
3. Alternatively, click **Discard Changes** to discard any changes you have made to the email configuration.
4. Optionally, click **Reset Settings** to return all the settings to their default values.

MSP

To use the **MSP Console** feature as a tenant, you will first need to link your instance of NAKIVO Backup & Replication to a managed service provide (MSP), allowing the MSP to manage your instance. To do so, you should first add and configure the MSP details on the **MSP** page in **Settings**. These details can be provided by the MSP after Remote Tenant Configuration.

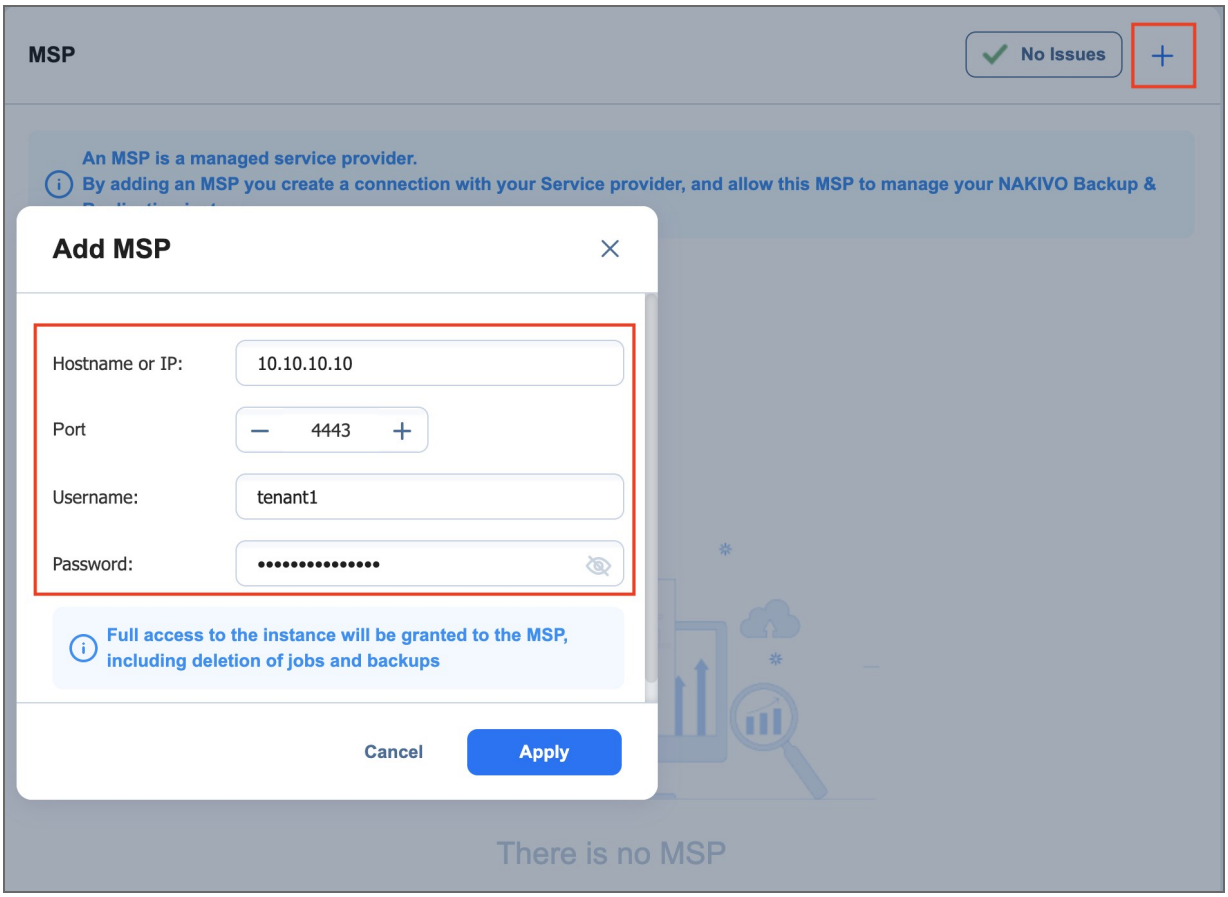


On the **MSP** page, you can add and remove connections to an MSP. Establishing a connection to an MSP as a remote tenant allows them to monitor and manage your instance of NAKIVO Backup & Replication. See the topics below for more information:

Adding an MSP

To add an MSP to which you would like to link your instance of NAKIVO Backup & Replication, you need the Master Tenant’s hostname or IP address, port number, and the remote tenant credentials they have generated for you. Once you have the above information, follow the steps below:

1. From the **MSP** menu, click the **Add** button in the top right corner.
2. Fill in the **Hostname or IP**, **Port**, **Username**, and **Password** fields based on the information provided by your Master Tenant.



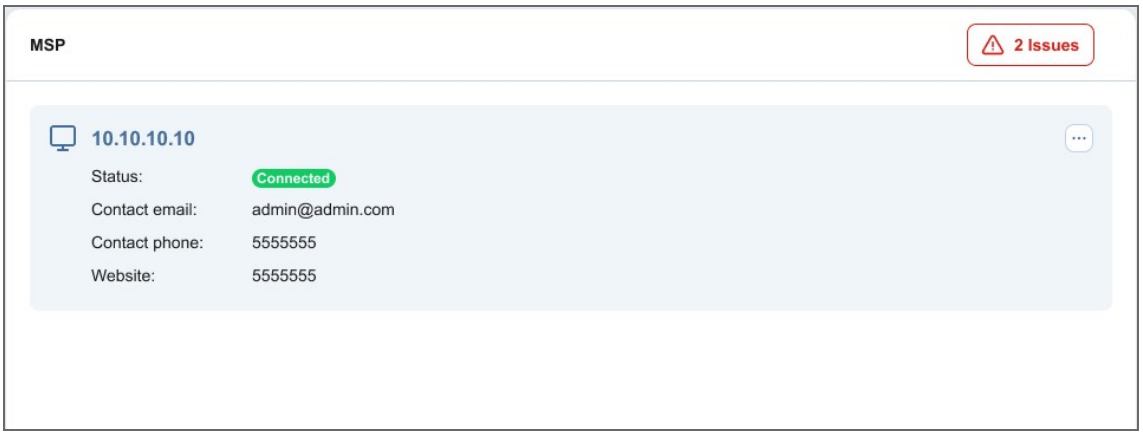
3. Click **Apply**. The following screen will display the MSP’s certificate details.

Note

- Your version of NAKIVO Backup & Replication must be the same as the MSP’s version. Otherwise, you will not be able to use the **MSP Console** feature with the given MSP.

- The MSP uses a separate listening port for communication with a remote tenant's instance (port 6702 is used by default). If the MSP changes the listening port used, the connection may be interrupted. For more information on required TCP ports, see the **MSP Console** section in "Feature Requirements" on page 89.

4. Read through the MSP's certificate details and click **Accept**.
5. The added MSP should now appear in your **MSP** menu.



Once the MSP is added, you will have successfully established a connection with the Master Tenant as a remote tenant. This allows the Master Tenant to access your instance of NAKIVO Backup & Replication as long as the connection is active.

Managing an MSP Connection

There are several options available for managing an established connection to an MSP. See the sections below for more information on managing your **MSP Console** connection.

- Viewing MSP Details
- Disconnecting/Reconnecting an MSP
- Deleting an MSP

Viewing MSP Details

The MSP block in the **MSP** menu contains the following information:

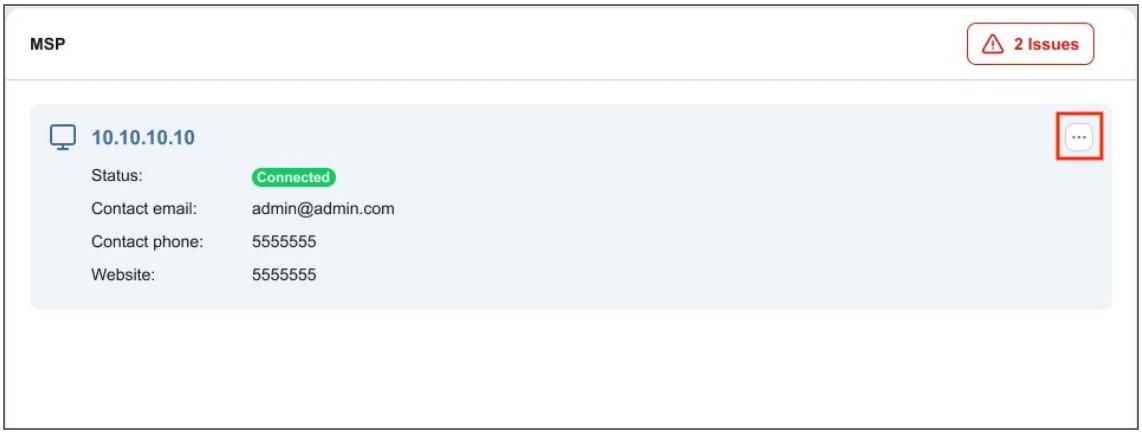
- **Hostname or IP**: The hostname or IP address of the Master Tenant.
- **Connection status**: Current status of your connection to the MSP.
  - **Connected**: Your NAKIVO Backup & Replication is connected to the MSP
  - **Disconnected**: Your NAKIVO Backup & Replication is disconnected from the MSP
  - **Connecting**: Your NAKIVO Backup & Replication is actively trying to establish a connection to the MSP

- **Contact information**: The Master Tenant's email address, phone number, and website, updated automatically.

Disconnecting/Reconnecting an MSP

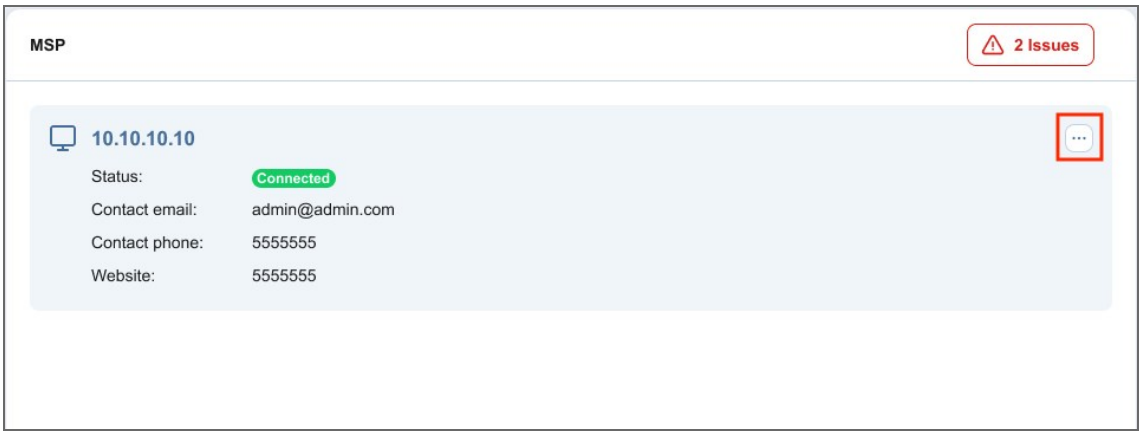
To disconnect your instance of NAKIVO Backup & Replication from an MSP, click the ellipsis **Manage** button in the top right corner of the MSP block. In the popup, click **Disconnect**. This will suspend the connection to the MSP until resumed.

To reconnect to the MSP, simply click the ellipsis **Manage** button in the top right corner of the MSP block and click **Connect** in the popup. You will not be asked to provide the same details you did when first connecting to the MSP unless the MSP has changed their certificate or your remote tenant credentials.



Deleting an MSP

To delete an MSP connection, click the ellipsis **Manage** button in the top right corner of the MSP block. In the popup, click **Delete** and confirm the action. This action will erase all tenant data from the MSP's side and vice versa.

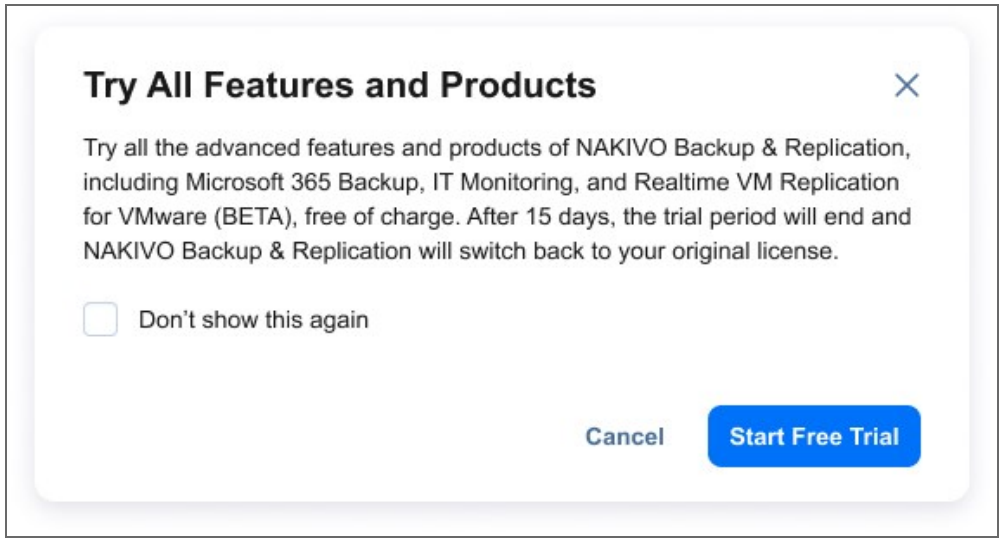

MSP
2 Issues
10.10.10.10
Status:
Connected
Contact email:
admin@admin.com
Contact phone:
5555555
Website:
5555555

Licensing

To check your license details, follow these steps:

1. Go to the main menu of NAKIVO Backup & Replication and click **Settings** > **General**.
2. Go to the **Licensing** tab to see license details.

Optionally, you can click the **Try All Features and Products** button to enable all Enterprise Plus license features for 15 days. After this time period ends, NAKIVO Backup & Replication automatically switches back to your original license.



Notes

The button is not displayed in the following cases:

- You are using NAKIVO Backup & Replication as a tenant in Multi-Tenant mode.
- You are using one of the following license editions:
  - Free
  - Trial
  - Beta
  - Promo
  - Enterprise Plus
  - MSP Enterprise Plus

In the **License Information** section, you can find detailed license information, including:

- **Type**: Type of the license
- **Edition**: Edition of the license
- **Serial number**: Serial number of the license
- **License expiration date**: Date when the the license expires

In the **Perpetual licensing section**, you can see the following information:

- Number of licensed and used CPU sockets
- Number of licensed and used VMs
- Number of licensed and used physical servers
- Number of licensed and used physical workstations
- Number of licensed and used EC2 instances
- Number of licensed and used Oracle databases

In the **Per-workload subscription licensing** section, you can see the following information:

- Number of licensed and used workloads
- Subscription end date

In the **Microsoft 365 subscription licensing** section, you can see the following information:

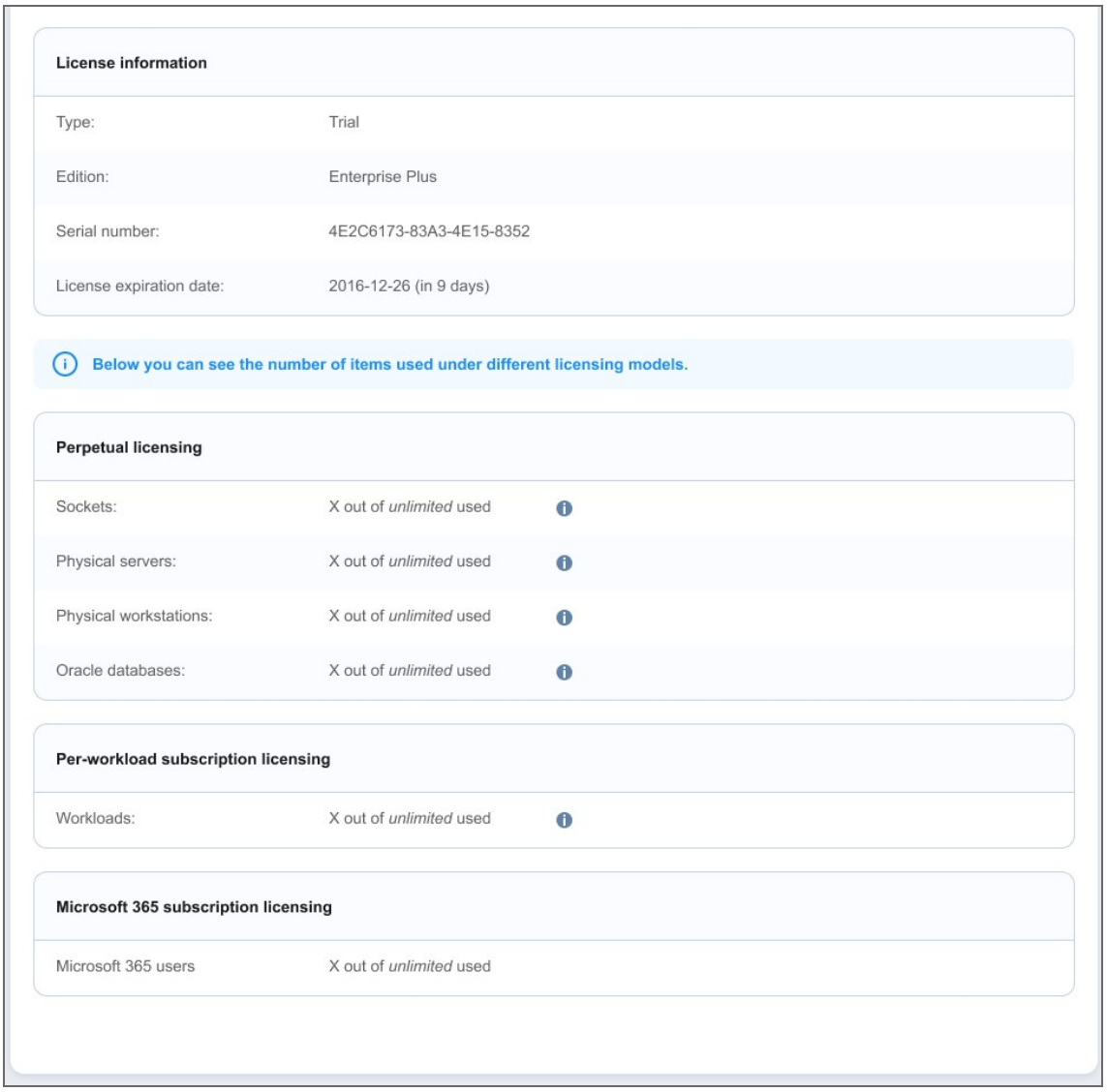
- Number of licensed and used Microsoft 365 users
- Subscription end date

If you are logged in as a tenant in multi-tenant mode, the following information is displayed in the **Obtain more licenses** section:

- **Email address** of the master tenant
- **Contact phone** of the master tenant
- **Company website** of the master tenant

To change your license, follow the steps below:

1. Go to the main menu of NAKIVO Backup & Replication and click **Settings**.
2. Go to the **Licensing** tab and click **Change License**.
3. Locate and open the license file in the window that appears.



Upgrading from Free License

If your license type is **Free** and the **Trial** license has not yet been applied to you deployment of NAKIVO Backup & Replication, you can try the full functionality of the solution for 15 days. To do that:

1. Open the **Help Menu**.
2. Select the **Try full functionality** option. A new popup window appears.
3. Click **Start Free Trial.**

Note

Once the **Trial** license expires, the product automatically switches back to the **Free** license.

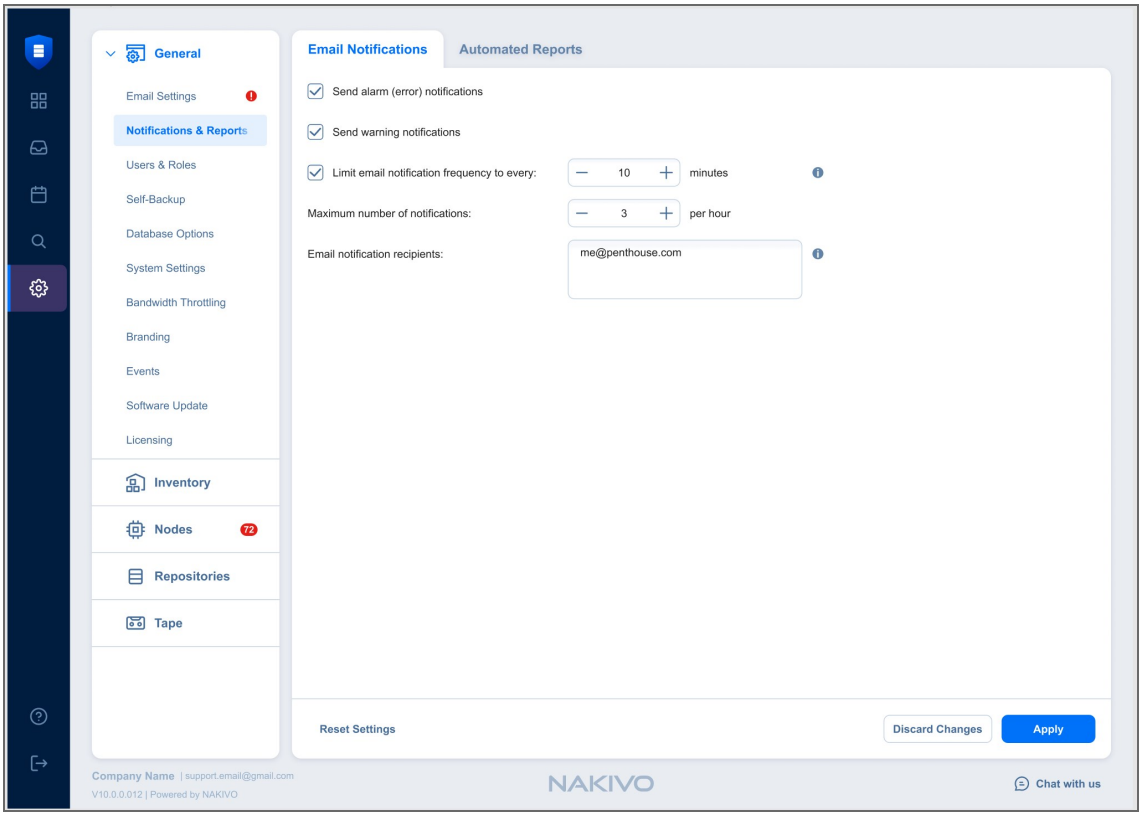
Notifications & Reports

NAKIVO Backup & Replication can send notifications and reports over email.

- Email Notifications
- Automatic Reports

To receive automatic notifications, configure email settings by following the steps below:

1. Log in to NAKIVO Backup & Replication.
2. Click **Settings** in the left pane of the product.
3. Go to the **General** tab.
4. Click **Notifications & Reports** to configure notifications and automatic reports section on the page that opens.
5. Click **Apply** to save the settings after you're done.
6. Alternatively, click **Discard Changes** to discard any changes you have made to the email configuration.
7. Optionally, click **Reset Settings** to return all the settings to their default values.



Note

To configure email notifications and automatic reports, you must first configure email settings.

Email Notifications

To set Email notifications, fill out the fields in the *Email notifications* section:

- **Send alarm (error) notifications**: If this option is selected, NAKIVO Backup & Replication will send email notifications to the specified recipients in case an error (for example, a job failure) occurs in the product. For users in Multi-Tenant Mode, these notifications also identify the relevant tenant and the instance where the error occurred.
- **Send warning notifications**: If this option is selected, NAKIVO Backup & Replication will send email notifications to the specified recipients in case the product generates a warning message (for example, lost connection to a host or Backup Repository). For users in Multi-Tenant Mode, these notifications also identify the relevant tenant and the instance that generated the warning.
- **Limit email notification frequency**: This option allows you to set up an email notification frequency in minutes. If deselected, notification emails will be sent every 5 minutes with no hourly limit.
- **Maximum number of notifications**: Use this option to change the limit of email notifications receivable per hour. If this limit is reached, any additional notifications will be delivered the following hour.
- **Email notification recipients**: Specify the recipients who will be receiving alarm and warning notifications (if enabled).

Automatic Reports

To set automatic reports, fill out the fields in the Automatic Reports section:

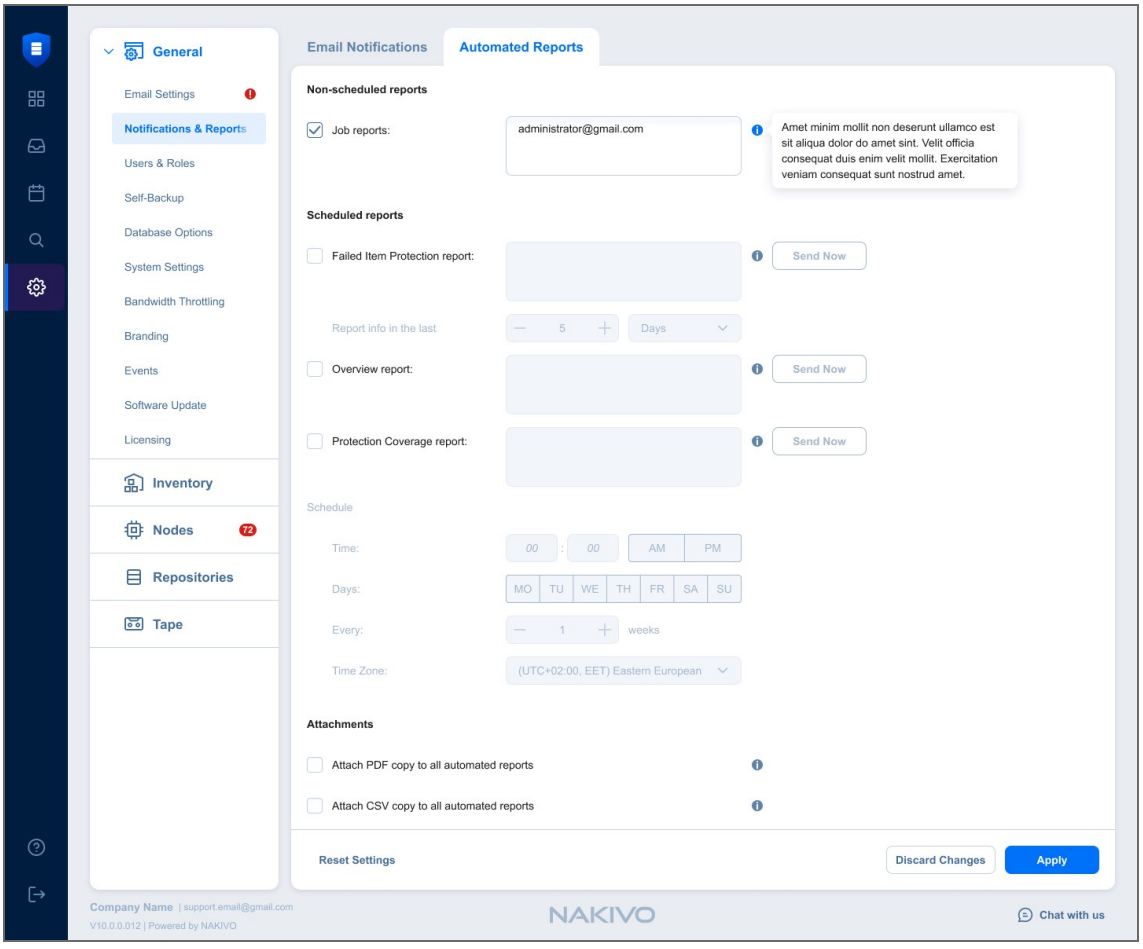
- **Job reports**: If this option is selected, NAKIVO Backup & Replication will send an HTML report after the completion of every job (regardless of the job success or failure) to email addresses specified in the text field. Use a semi-colon to separate multiple email addresses.
- **Failed Item Protection report**: Contains information about all items which had failed to be protected by backup and/or replication jobs, and the error message. Additionally, configure **Report info in the last** option by entering the number of days you want to get the report for.
- **Overview report**: If this option is selected, NAKIVO Backup & Replication will generate the Overview report (which includes information about all jobs and groups in the product) on the date and time specified in the scheduler and will send the report to the recipients specified in the text field. Use a semi-colon to separate multiple email addresses.
- **Protection Coverage**: If this option is selected, NAKIVO Backup & Replication will generate the Protection Coverage report. This includes information about all VMs & instances protected by backup and/or replication jobs as well as the information about all unprotected VMs & instances. The report will be sent to the recipients specified in the text field on the date and time specified in the scheduler. Use a semi-colon to separate multiple email addresses.
- **Schedule**: Configure the schedule at which you want to get the reports.

- **Attach PDF copy to all automated reports**: Select this option to get the additional attached copy of the report in the PDF format.
- **Attach CSV copy to all automated reports**: Select this option to get the additional attached copy of the report in the CSV format.

Note

NAKIVO Backup & Replication supports the following special characters in reports:

- US special characters
- Characters in the following languages:
  - Vietnamese
  - Japanese
  - Korean
  - Chinese
  - Arabic



Self-Backup

The self-backup feature allows you to automatically protect configuration settings of your NAKIVO Backup & Replication instance. For more information, refer to “Self-Backup Feature” on page 19.

Note

Self-backup is not supported for the multi-tenant configuration.

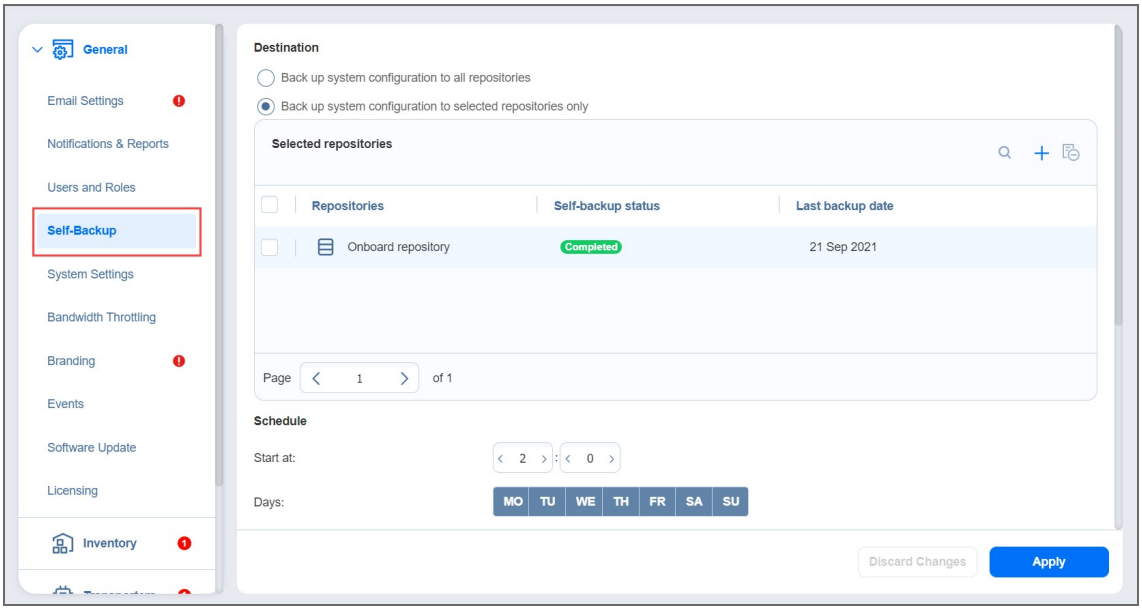
To configure self-backup options, proceed as described in the following sections:

- Accessing Self-Backup Options
- Setting Up Self-Backup Destination
- Self-Backup Schedule
- Self-Backup Options
- Self-Backup Encryption
- Recovering from Self-Backup

Accessing Self-Backup Options

To access self-backup options, follow the steps below:

1. Click **Settings** in the left pane of NAKIVO Backup & Replication.
2. Go to the **General** tab and click **Self-backup**.
3. After making the necessary changes, click **Apply**. Alternatively, click **Discard Changes** to discard any changes you have made.



Setting Up Self-Backup Destination

To configure a self-backup destination, follow the steps below:

1. Select **Back up system configuration to all repositories** to enable all repositories in the list of repositories where system configuration will be backed up. If deselected, you can remove specific repositories from the list.

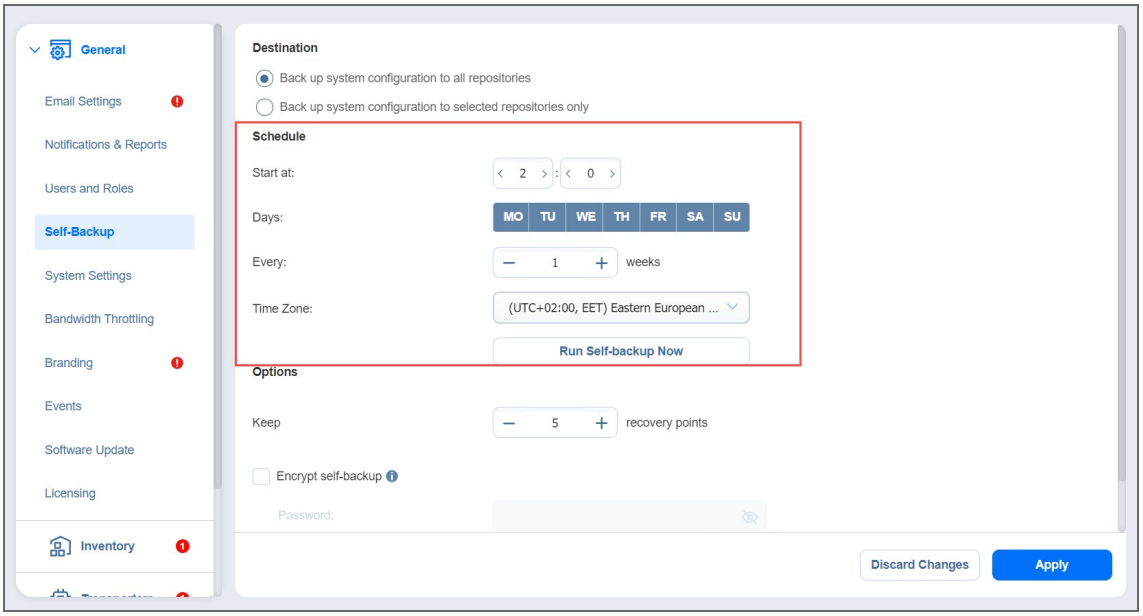
   Important

2. Alternatively, select **Back up system configuration to selected repositories only** and select specific repositories you wish to use for self-backup.
3. If necessary, add a Backup Repository to the list:
   - Click the "**+**" icon to add repositories to the list of repositories for system backing up.
   - In the **Add Backup Repositories** dialog that opens, select the necessary repositories and close the dialog.

Self-Backup Schedule

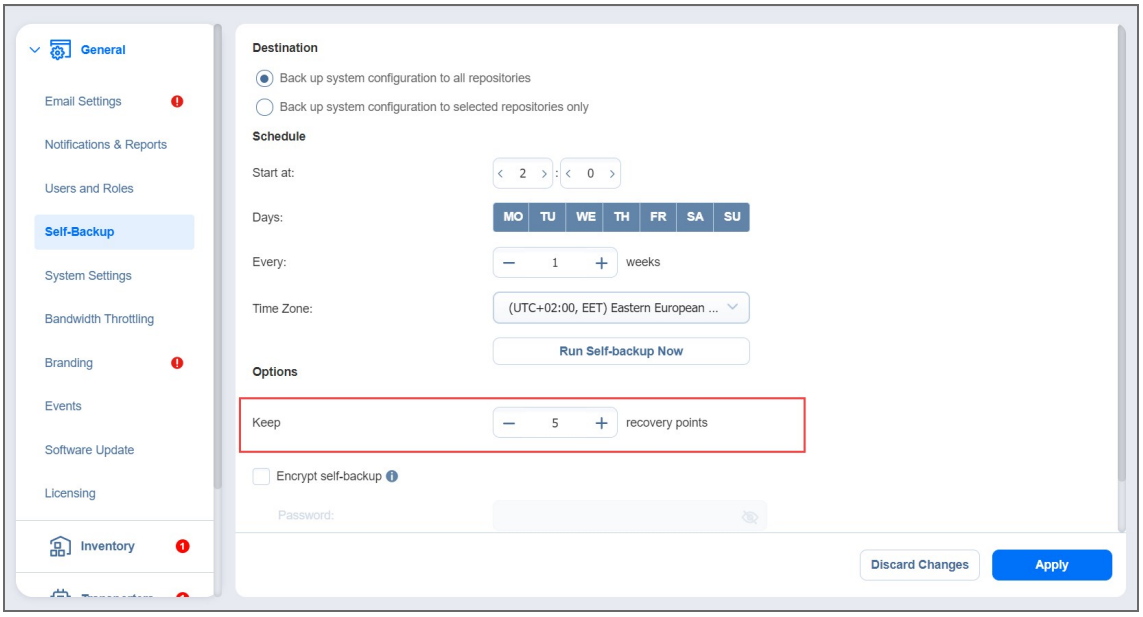
To configure the self-backup schedule, follow the steps below:

1. In the **Schedule section**, enter time to trigger starting the self-backup. You can choose a specific time zone from the list, enter the hours and minutes of the day, and select the necessary days of the week.
2. If you need to start the self-backup immediately, click **Run Self-backup Now**.
3. When ready with configuring the self-backup schedule, click **Apply**.



Self-Backup Options

In the **Options** section of the self-backup settings, you can enter a number of recovery points to be kept for the self-backup. To apply your settings, click the **Apply** button.



Self-Backup Encryption

Select **Encrypt self-backup** to encrypt your backup for additional security. Afterwards, enter the password in the **Password** and **Confirm Password** fields which are required to recover from the self-backup.

Recovering from Self-Backup

To recover the configuration of NAKIVO Backup & Replication from a self-backup stored in a Backup Repository, do the following:

1. Go to **Settings** > **Repositories**.
2. Select one of the repositories that contain a self-backup.
3. Select the self-backup from the **Backups** list and click **Recover**.
4. Select a recovery point and click **Restore.**
5. Wait while the system configuration is restored. When the self-backup recovery process is completed, a message announcing success appears.

   Note

   If a selected recovery point was created from an encrypted self-backup, you will have to enter the password to it.

Software Update

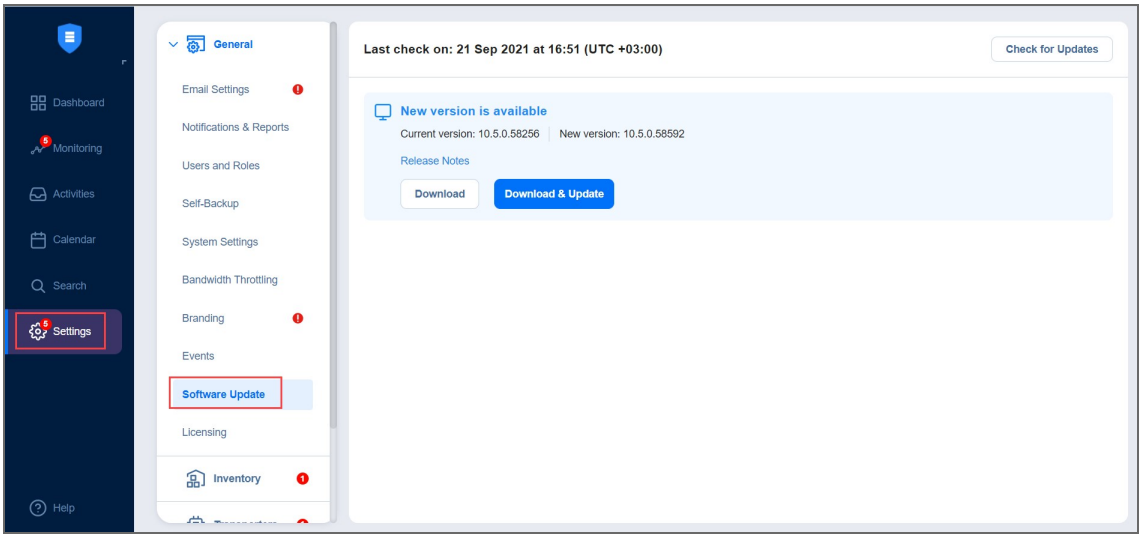
- Download & Update Option
- Download Option

When the full solution of NAKIVO Backup & Replication (that is, the Director and the Transporter) is installed on a Windows or Linux machine, you can download product updates from the **Software Update** tab in the web interface. This feature automatically updates your NAKIVO Backup & Replication instance, the Onboard Transporter, and any other nodes that support auto-update.

For a list of supported nodes and requirements for the auto-update feature, see the **Auto-Update** section in "Feature Requirements" on page 89.

To check if an update is available, do the following:

1. Click **Settings** in the left pane of the product.
2. Go to the **General** tab.
3. Go to the **Software Update** page.
4. Click **Check for Updates** if needed.



Note

If you are using a multi-tenant solution, only master-tenant users with the appropriate permissions are able to see and manage software updates.

Download & Update Option

To download and install the update, do the following:

1. Optionally, click **Release Notes** to see features and improvements implemented in the new product version.
2. Select the **I have read the Release Notes** checkbox.

3. Click **Download & update**.
4. Click **Update Now**.

Before downloading the update, the product performs a self-backup and stops all current activities including running jobs, recovery jobs, repository maintenance, etc. When the download is complete, the product updating process begins. The product downloads the update to the Director first. When the Director is updated, the update is automatically uploaded to the Transporters that are then updated simultaneously. If some Transporters are not updated, you can update them manually. Refer to the corresponding articles for details.

Notes

- For a list of supported Transporters, see the **Auto-Update** section in "Feature Requirements" on page 89.
- Only 20 Transporters can be updated simultaneously. All other Transporters will be sent to a queue and updated once the previous update is completed.

Download Option

If you wish to postpone an update or schedule it, take the following steps to download the update without installing it:

1. Optionally, click **Release Notes** to see features and improvements implemented in the new product version.
2. Select the **I have read the Release Notes** checkbox.
3. Click **Download**.
4. After the download is completed, do one of the following:
    - Click **Update Now** if you want to start the updating process. Updating the product will stop all current activities, including running jobs, recovery jobs, repository maintenance, etc.
    - Click **Schedule Update** to update the solution at a specific time:
        1. In the dialog box that opens, pick a day and time for updating. Click **Apply**.
        2. On a working day before the scheduled update, you will see a notification in the product menu with the **Update Reminder** dialog box. By hovering over this notification, you can:
            a. Click **Reschedule** if you want to reschedule the update and pick a different time.
            b. Click **Cancel update** to cancel updating the full solution.

            Note
            A notification about the update will also be sent to your email if email settings are configured.

System Settings

To configure the system settings, follow the steps below:

1. Click **Settings** in the main menu on the left.
2. Go to the **General** tab and click **System settings.**
3. Set the following options:
    - In the **Configuration** tab:
        - **Store system events for the last x days**: Events older than the specified number of days (can be from 5 to 365) will be deleted.
        - **Store job history for the last x days**: The history of the jobs older than the specified number of days (can be from 5 to 90) will be deleted.

          Note

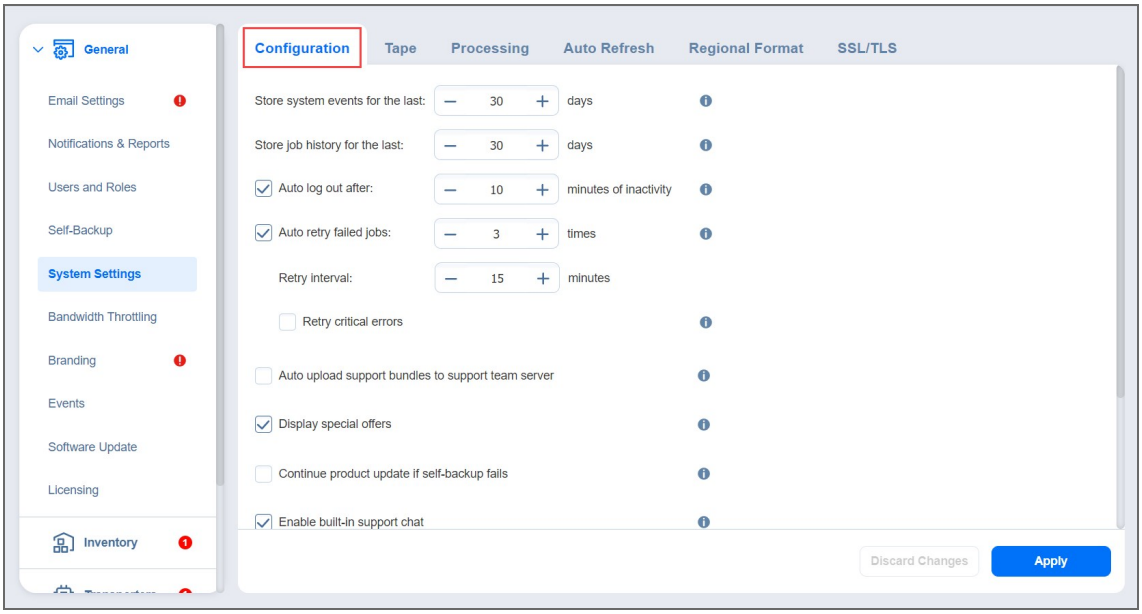
          This option is not displayed for the Master tenant in Multi-tenancy mode.

        - **Auto log out after x minutes of inactivity**: When this option is selected, the current user will be automatically logged out of NAKIVO Backup & Replication after the specified period of inactivity.
        - **Auto retry failed jobs x times with y minutes interval**: When this option is selected, failed jobs are automatically retried the specified number of times (from 2 to 10) and with the specified time interval (from 1 to 60). Jobs with failed backup, replication, and recovery remain in the “running” state until all retries have either succeeded or failed.
            - **Retry critical errors**: When this option is selected, NAKIVO Backup & Replication tries to automatically rerun jobs with critical and non-critical errors a specified number of times.

              Notes

                - The term **critical error** refers to persistent errors that are unlikely to change without any additional intervention, that is, hardware failure.
                - The term **non-critical error** refers to non-persistent errors that are likely to change without any additional intervention, that is, unstable network connection.

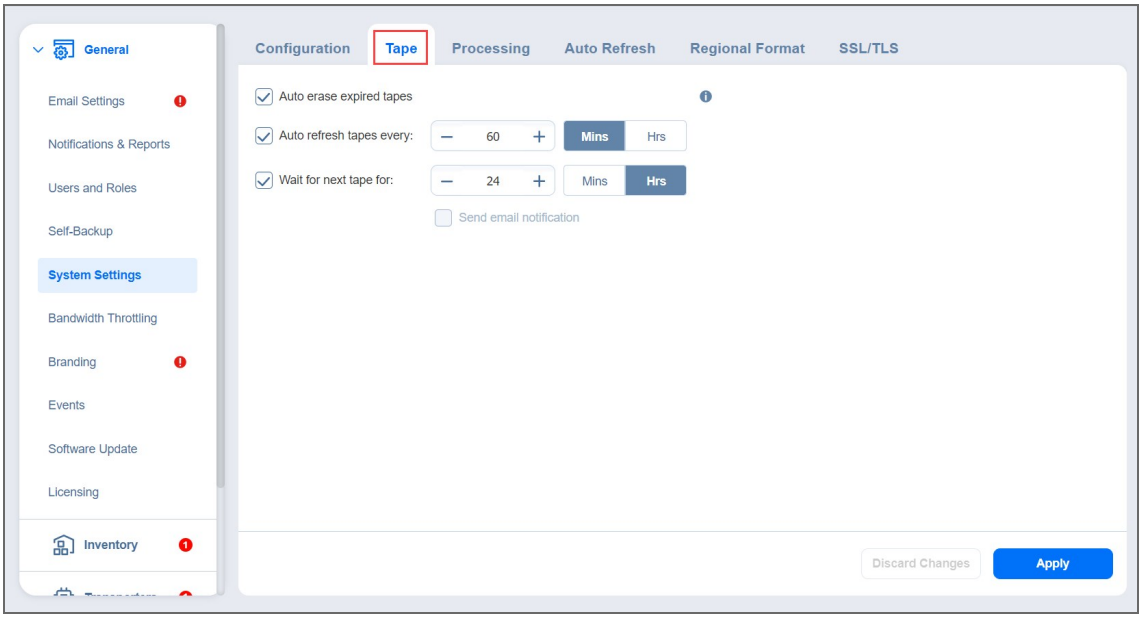
- **Auto upload support bundles to support team server**: When this option is selected, NAKIVO Backup & Replication automatically creates, encrypts, and uploads support bundles once a day to a NAKIVO support server. The NAKIVO Support Team may use this information to improve the product experience and to identify and resolve product issues faster.
- **Display special offers**: When this option is enabled, the NAKIVO special offers toolbar appears in the NAKIVO Backup & Replication interface.
- **Continue product update if self-backup fails**: When this option is selected, updates proceed even if self-backup cannot be performed.
- **Enable built-in support chat**: When this option is selected, you can contact a NAKIVO representative via chat in the NAKIVO Backup & Replication interface. When selected in the multi-tenant mode, the built-in support chat is available to all tenants of the NAKIVO Backup & Replication instance.
- **Enable Aptare Integration**: Select this option to integrate the APTARE storage resource management platform with NAKIVO Backup & Replication.
- **Send anonymous product usage data**: Enable this option to send anonymous product usage data to NAKIVO for efficient product development and enhancement. Note that no personal data is collected.
- Click the **Use New Scheduler** link to enable the use of a new scheduler that merges the retention and schedule steps. The scheduler allows you to set backup retention settings per schedule and get expiration dates for recovery points.
- You can click **Restart Director service** to stop all current activities and restart the Director. After clicking the link, a confirmation window appears. Click **Reboot** to confirm the restart.
- **Import System Configuration**: Find more information on the topic here.
- **Export System Configuration**: Find more information on the topic here.



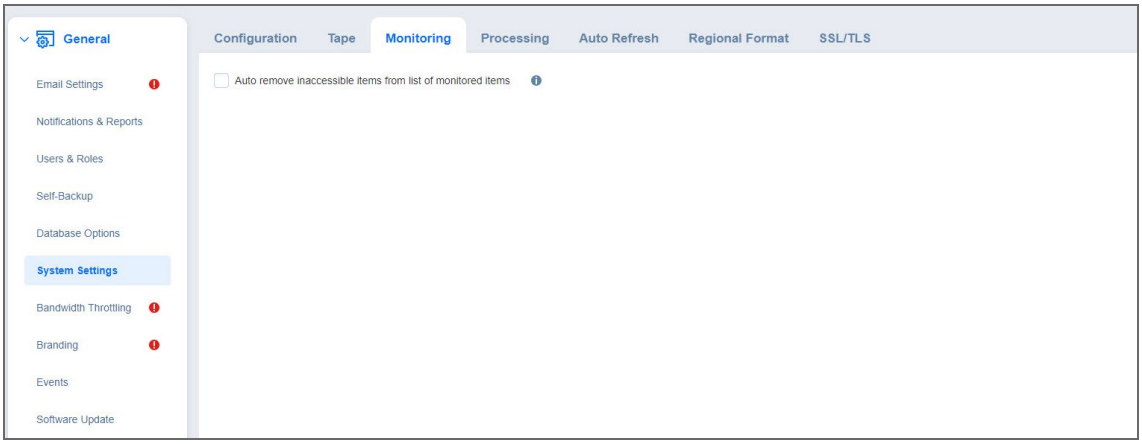
- In the **Tape** tab:
  - **Auto erase expired tapes**: When this option is selected, expired tapes are erased automatically.

    Important

    If this option is selected, the following prerequisites must be met for a cartridge to be erased:
    - All recovery points within the tape cartridge are expired.
    - There are no dependent recovery points on other tape cartridges.
    - The product keeps at least one full chain of recovery points.
  - **Auto refresh tapes every**: Select how often the contents of the tapes are refreshed in minutes or hours. Deselect if refreshing is not required.
  - **Wait for next tape for**: Specify how long the system should wait for the next tape if there is no appropriate amount. Select the **Send email notification** checkbox to receive email notifications.

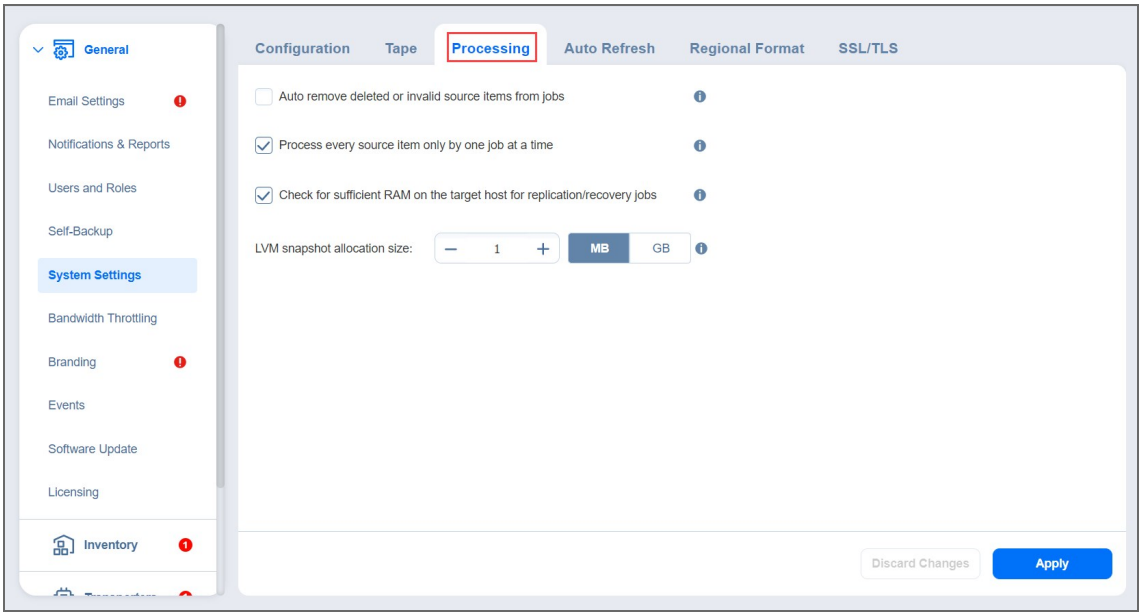


- In the **Monitoring** tab:
  - **Auto remove inaccessible items from list of monitored items**: When this option is selected, all inaccessible items are removed automatically from the list of monitored items.



- In the **Processing** tab:
  - **Auto remove deleted or invalid source items from jobs**: This option applies to a protected container (such as a VMware cluster or EC2 region). When this option is selected, if NAKIVO Backup & Replication discovers (during the inventory refresh) that a VM(s) and/or EC2 instance(s) is no longer available in the protected container, NAKIVO Backup & Replication automatically removes these VMs and EC2 instances from all jobs.
  - **Process every source item only by one job at a time**: When this option is selected, all machines in backup and replication jobs are processed by one job at a time only. Running jobs and respective source objects will not be affected after changing this setting. For physical servers, this option is always enabled.

- **Check for sufficient RAM on the target host for replication/recovery jobs**: When this option is deselected, NAKIVO Backup & Replication does not check whether the amount of RAM on the target host is sufficient for replication and recovery jobs.
- **LVM snapshot allocation size**: This option allows you to set an LVM allocation snapshot size for a Linux physical server backup. The default size is 1 GB. The maximum size is 1000 GB.

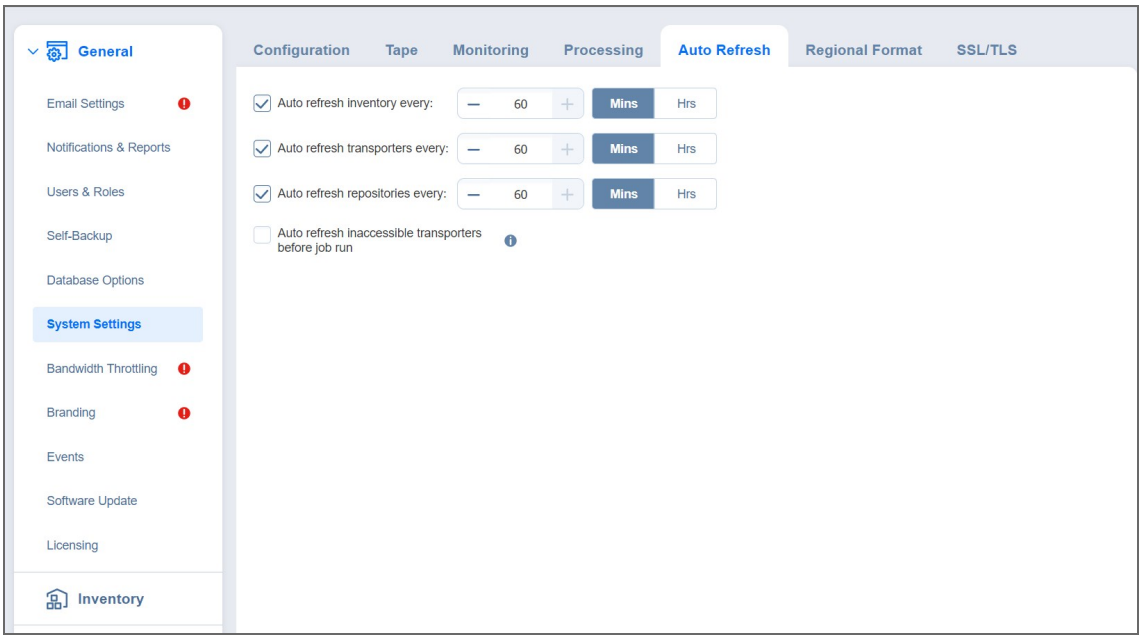


- In the **Auto Refresh** tab:
  - **Auto refresh inventory every X minutes**: Specify how often you want your inventories to be refreshed.
  - **Auto refresh transporters every X minutes**: Specify how often you want your transporters to be refreshed.
  - **Auto refresh repositories every X minutes**: Specify how often you want your repositories to be refreshed.
  - **Auto refresh inaccessible transporters before job run**: If this option is enabled, the product refreshes all inaccessible transporters before a job is processed.

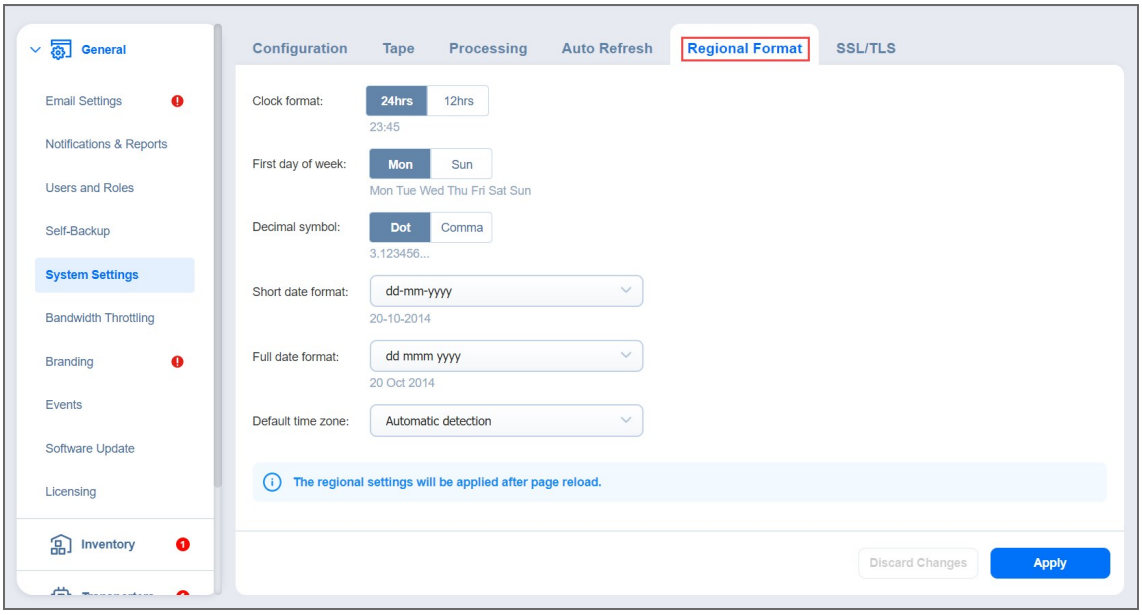
    Notes

    - Repositories assigned to the inaccessible transporters are refreshed as well during the auto refresh.
    - The **Auto refresh inaccessible transporters before job run** option is supported only for the following platforms:
      - VMware vSphere
      - AWS

- Cloud Director
- Nutanix AHV



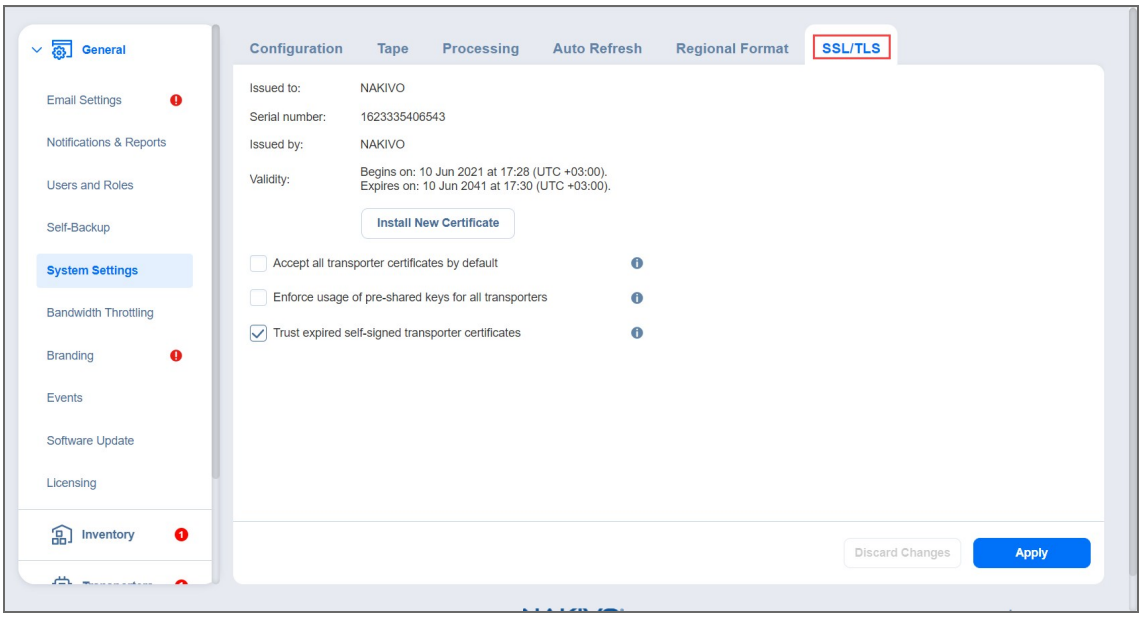
- In the **Regional Format** tab, set:
  - **Clock format**
  - **First day of week**
  - **Decimal symbol**
  - **Short date format**
  - **Full date format**
  - **Default time zone**



Note

If any time zone other than **(UTC+00:00, UTC) Coordinated Universal Time** is chosen, daylight savings times are honored.

- In the **SSL/TLS** tab, you can either:
  - **Install new certificate**: A dialog opens allowing you to install a new TLS/SSL certificate for the NAKIVO Backup & Replication web interface. Certificates are generated either internally or through certification authorities. Proceed as follows to install a new certificate:
    - Click **Browse** and navigate to the location of either of the following certificate file types:
      - **Private key**: A file in the *.key format.
      - **Private key password (optional)**: A password for your private key.
      - **Certificate file**: A file in the *.pem, *.crt, *.cer, *.p7b, or *.p7s format.
      - **Intermediate certificate (optional)**: A file in one of the following formats: *.pem, *.crt, *.cer, *.p7b, *.p7s.
  - **Accept all transporter certificates by default**: Select this option to automatically accept all transporter certificates. After selecting the option, click **Continue** in the warning popup window that appears to confirm the selection.
  - **Enforce usage of pre-shared keys for all transporters**: Selecting this option makes sure that transport function only when pre-shared key is installed.
  - **Trust expired self-signed transporter certificates**: Selecting this option makes the solution trust the expired self-signed transporter certificates.



4. After making the necessary changes, click **Apply**. Alternatively, click **Discard Changes** to discard any changes you have made.

Notes

- NAKIVO Backup & Replication supports Certificates with the RSA algorithm only.
- In the *Web Interface TLS/SSL Certificate* section, you can see a notification about imminent TLS/SSL Certificate expiration in 30 days and onwards. If your certificate has expired, you will be asked to install a valid certificate.

System Migration

NAKIVO Backup & Replication provides you with the ability to migrate all your settings (including inventory, jobs, credentials, transporter settings, and so on) to a new instance (copy) of the product.

Important

System configuration export and import are designed for migration purposes only, and not to serve as a system configuration backup. After you have exported system configuration from an old instance of the product, do not run jobs in that old instance. Doing so will result in failed jobs in the new instance after the migration. All jobs will have to be recreated, and full initial job run will be required.

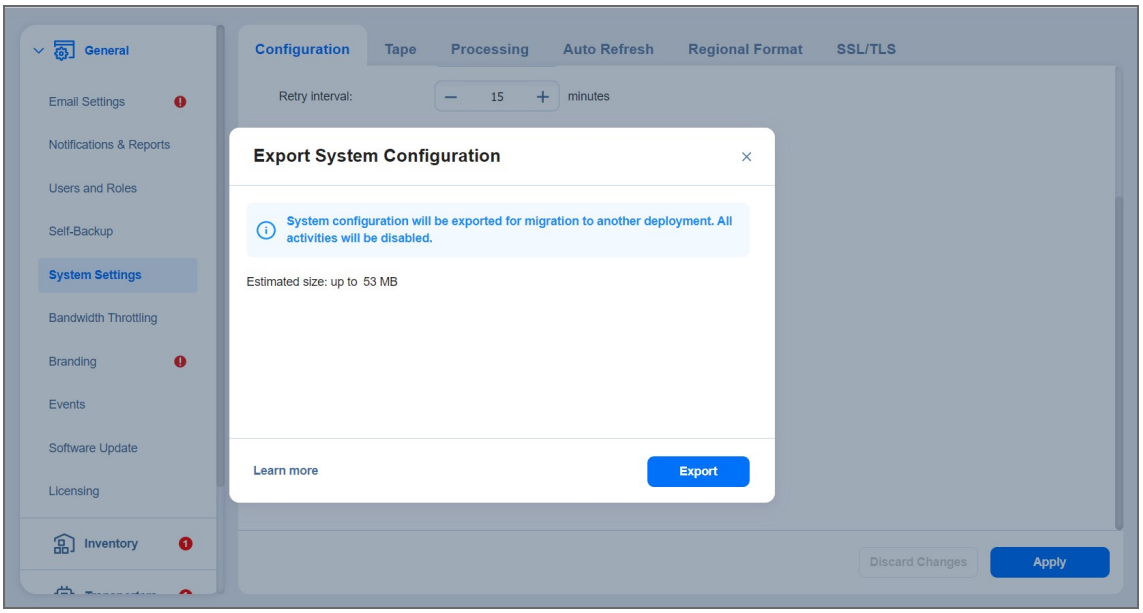
See the topics below for more information:

- Exporting System Configuration
- Importing System Configuration

Exporting System Configuration

To export system configuration from the old deployment, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Select **System Settings** tab in the **General** section.
3. On the **Configuration** tab, click **Export System Configuration**.
4. In the dialog window that appears, click **Export**.



5. Click **Proceed** to confirm the operation.

Note

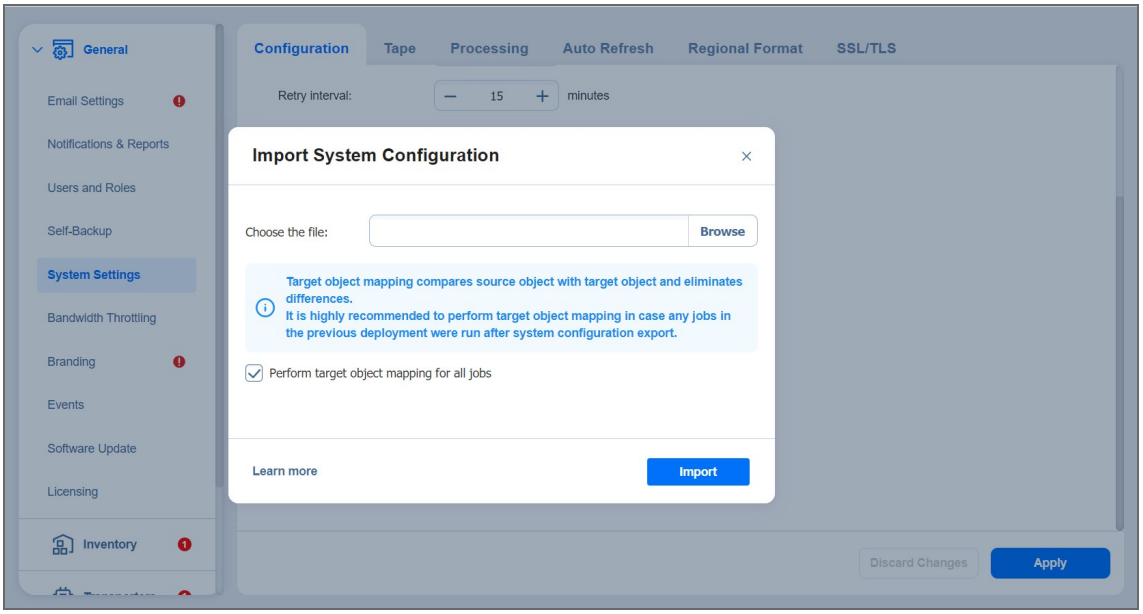
All activities in the old instance (such as jobs and recovery sessions) will be automatically stopped and all jobs will be disabled.

6. Wait until the export is completed and download the export bundle.
7. Do not run jobs in the old instance.

Importing System Configuration

To import system configuration into a new instance of the product, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Select **System Settings** tab in the **General** section.
3. On the **Configuration** tab, click **Import System Configuration**.
4. In the dialog window that appears, locate the system configuration bundle using the **Browse** button.



5. Click **Import**.
6. Click **Proceed** to confirm the operation.

Important

- If there is any existing data in the new instance, it will be overwritten with the import operation.
- If a physical configuration of your source deployment differs from a target deployment, a Backup Repository may become inaccessible after the bundle import is completed.

7. Wait until the import is completed, and close the dialog window.

Notes

- Backup Repositories are not migrated by the system configuration export and import. If you have a local Backup Repository on the old instance of the product, you may want to move it to the new location. After moving the Backup Repository, you may need to edit Backup Repository settings in the new instance so that the new settings refer to the actual Backup Repository location.

- In case a custom TLS/SSL certificate of the Web server was used in the old instance, a manual service restart will be required in the new deployment.

Users and Roles

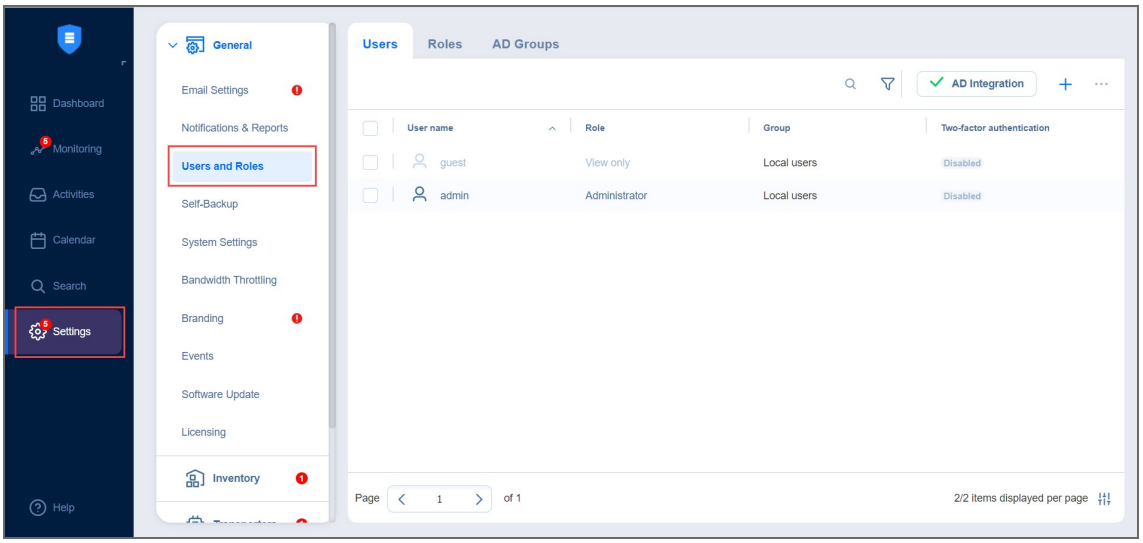
Accessing NAKIVO Backup & Replication is possible either with a user account created in the product or with an account added to the product from Active Directory. Each user in the product is assigned a role, which is a set of specific permissions.

- Managing Users and Roles
- Navigating Users View
- Navigating Roles View
- Navigating AD Groups View

Managing Users and Roles

Managing users and roles can be done by following these steps:

1. Log in to NAKIVO Backup & Replication.
2. Click **Settings** (cog icon) in the left pane of the product.
3. Go to the **General** tab and click **Users and Roles**.



Navigating Users View

To see the list of all local users, select the **Users** view in the upper pane. On this page of the solution you can do the following:

- See the list of all local users added to NAKIVO Backup & Replication.
- Sort the list by **Name**, **Role**, **2FA**, **Access level**, or **Group** by clicking on the respective name of the column.

Note

The **Access level** column is displayed only for the **Master tenant** in Multi-tenant mode. It displays the access level assigned to the user.

- Filter the list of users by entering the name of the user fully or partially into the Search bar or by selecting the Filter option.
    - Clicking **Filter** opens a new window that allows you to filter the list of local users according to **User name**, **Role**, **State**, and **Group**.
- Add a new local user by clicking "**+**" icon.
- Integrate Active Directory account by clicking **AD Integration**.
- Edit, delete, disable, enable Two-factor authentication, and assign a new role to the local user individually. These actions, except **Edit**, can also be done in bulk by checking the box in the upper left pane to select all users and clicking "**ellipsis**" icon.

Note

When selecting all local users to apply a bulk action, NAKIVO Backup & Replication selects only those users that are displayed on the screen.

- Edit the role assigned to the local use by clicking on the name of the role in the respective column.

Navigating Roles View

To see the list of all local users, select the **Roles** view in the upper pane. On this page of the solution you can do the following:

- See the list of all user roles added to NAKIVO Backup & Replication.
- Sort the list by **Role name**, **Access level**, or **Number of users** by clicking on the respective name of the column.

Note

The **Access level** column is displayed only for the **Master tenant** in Multi-tenant mode. It displays the access level that the role has.

- Filter the list of users by entering the name of the user fully or partially into the **Search** bar or by selecting the **Filter** option.
    - Clicking Filter opens a new window that allows you to filter the list of local users according to **Role name** or **Number of users**.

- Add a new local user by clicking the “**+**” icon.
- Edit, delete, or clone the user roles individually. These actions, except **Edit**, can also be done in bulk by checking the box in the upper left pane to select all users and clicking "**ellipsis**" icon. When selecting all local users to apply a bulk action, NAKIVO Backup & Replication selects only those users that are displayed on the screen.
- **Edit**, **Delete**, **Clone** the role by clicking the ellipses to the right of the role's name.

Navigating AD Groups View

To see the list of all Active Directory groups, select the **AD Groups** view in the upper pane. On this page of the solution you can do the following:

- See the list of all AD groups added to NAKIVO Backup & Replication.
- Sort the list by **Group name**, **Logged in users**, **Access level**, or **Role** by clicking on the respective name of the column.

  Note

  The **Access level** column is displayed only for the **Master tenant** in Multi-tenant mode. It displays the access level assigned to the AD group.

- Filter the list of users by entering the name of the user fully or partially into the **Search** bar or by selecting the Filter option.
  - Clicking **Filter** opens a new window that allows you to filter the list of local users according to **Group name**, **Role**, **Number of users**, and **Status**.
- Add a new AD group by clicking “**+**” icon.
- Integrate Active Directory account by clicking **AD Integration**.
- Edit, delete, disable, enable Two-factor authentication, and assign a new role to the local user individually. These actions, except **Edit**, can also be done in bulk by checking the box in the upper left pane to select all users and clicking "**ellipsis**" icon.

  Note

  When selecting all AD groups to apply a bulk action, NAKIVO Backup & Replication selects only those groups that are displayed on the screen.

- Edit the role assigned to the user by clicking on the name of the role in the respective column.

For details, refer to the following sections:

- “Managing Active Directory Users” on page 284
- “Managing Local Users” on page 291

- “Managing User Roles” on page 299
- “Configuring Two-Factor Authentication” on page 280

Configuring Two-Factor Authentication

NAKIVO Backup & Replication allows you to add an additional layer of security with two-factor authentication (2FA). For details, refer to the topics below:

- Enabling Two-Factor Authentication
- Managing Two-Factor Authentication
- Setting Up Google Authenticator

Enabling Two-Factor Authentication

Two-factor authentication can be enabled in either of the following pages:

- On the **Editing local user** page, select the **Two-factor authentication** checkbox.

  Notes

  - Users without **User management** permission cannot enable Two-factor authentication.
  - Users without **Administrator** role or **Configuration** permission can only configure Two-factor authentication on the login screen of NAKIVO Backup & Replication.
  - It is possible to enable Two-factor authentication only after configuring Email Notifications.

- On the Users view, hover over user's name and select **Manage > Enable two-factor authentication**.

Proceed with configuring two-factor authentication:

1. Click **Continue** in the dialogue window that appears.
2. Click **Continue** in the **Verify your Email Address** popup that appears.
   - Optionally, click on the **change your email** link to enter the new email address for the user
   - Select **Continue** to proceed with 2FA configuration.
3. Enter the verification code that was sent to the specified email address, and click **Continue**.
4. Optionally, enter the alternative email address that can be used in case the primary one becomes unavailable, and select **Continue**. Alternatively, select **skip** to skip this step.
5. If you have entered the alternative email address during the previous step, enter the verification code that was sent to the specified email, and click **Continue** to proceed with Google Authenticator configuration. Alternatively when configuring 2FA on the **Editing local user** page, select **Cancel** on the **Get Google Authenticator** popup to set up Google Authenticator later.

   Note

   When configuring 2FA on the login screen, clicking **Cancel** returns you to the main login screen.

Managing Two-Factor Authentication

You can manage two-factor authentication in the following way:

1. Click the **manage** link to the right of **Two-factor authentication** checkbox.
2. Choose one of the following verification methods:
    - **Google Authenticator**: Choose this option to use the Google Authenticator app to generate verification codes. Optionally, click on the **Google Authenticator pairing key** link to see your pairing key or on the **Backup codes** link to view your backup codes.
    - **Email**: Choose this option to receive verification codes via email. Optionally, you can view and change your primary email by clicking **change email** link and add an alternative email by clicking **add** link. Here you can also view your backup codes by clicking the **Backup codes** link.
3. Click **OK** when you're done.

Setting Up Google Authenticator

NAKIVO Backup & Replication uses Google Authenticator for two-factor authentication. To set up Google Authenticator, do the following:

1. Optionally, if you selected **Cancel** on the **Get Google Authenticator** popup, click the **configure** link to the right of the **Two-factor authentication** checkbox if you are configuring.
2. Follow the instructions in the popup window to download and install Google Authenticator.
3. Add your NAKIVO Backup & Replication user account to Google Authenticator. Use one of the following methods:
    - Select **Scan QR Code** option, and scan the QR code in the popup window.
    - Select **Enter a Code** option, and follow the instructions in the popup window to enter the shown code into the Google Authenticator app.
4. A popup window appears containing the pairing key, which can be used for adding multiple devices to your account.

    Important
    It is highly recommended that you save the pairing key or write it down.

    You have the following options:
    - Optionally, click on the **copy the Key** link to copy your key and save it for future use.
    - Optionally, click on the **download pairing information** link to download and save instructions on how to use the pairing key.
    - Click **Continue** when you're done.
5. The **Backup codes** popup window with four backup codes appears. These one-time codes can be used to log in when you are unable to provide a verification code. Click on the **download as PDF** link to download and save these codes in PDF format or write them down. Additionally, you can click the **generate backup codes** link to generate new codes. Click **Continue**.
6. Enter one of the backup codes in the next popup window to confirm that you have saved them, and click **Finish**.

    Notes
    - The backup code used in this step remains valid for one more use.
    - The **manage** link replaces the **configure** link after this step has been completed.

Managing Active Directory Users

With NAKIVO Backup & Replication, you can configure Active Directory integration at any time. You can also freely add, edit, disable, delete AD users, or assign a role to them. For details, refer to the topics below:

Adding Active Directory User

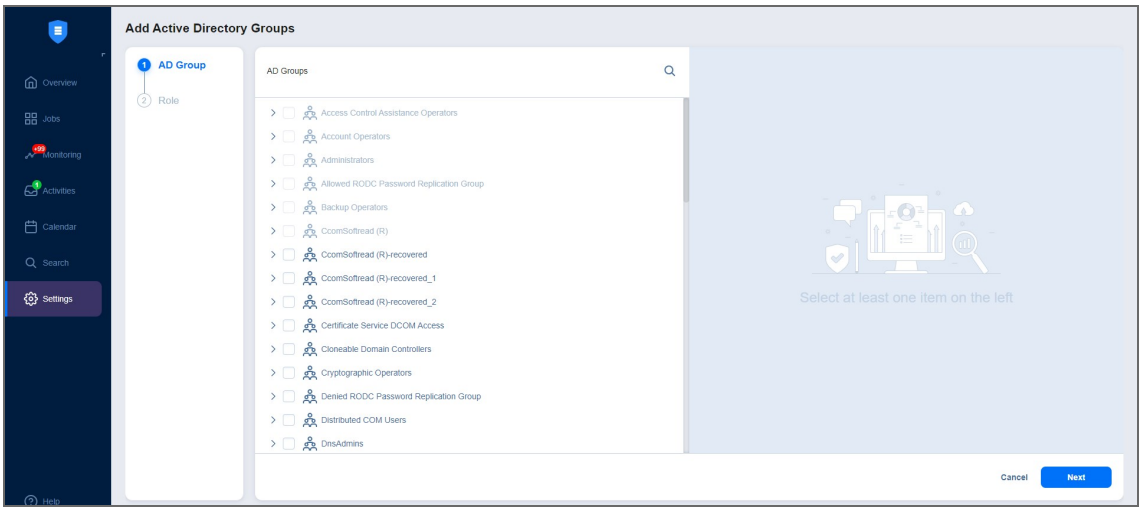
After configuring AD integration in the **Active Directory Configuration** wizard, you can proceed with adding AD user(s). Alternatively, switch to **AD Groups** tab and then click on the "**+**" symbol. Proceed as follows:

1. Optionally, you can filter the tree of Active Directory users by entering a string to the **Search** box. You can enter a section or the whole name of the item.
2. Select Active Directory users and groups by placing a checkmark to their left.
3. The selected items appear in the right pane of the page. If necessary, reorder the selected items by dragging them to a new position. By doing so, you can specify to add the most important users and groups first.

   Note

   Only logged in users that belong to the group can be added.

4. Review the list of selected items. If necessary, remove a selected user or group from the list in either of the following ways:
   - Deselect the item in the left pane. This will remove the item from the right pane.
   - In the right pane, hover the pointer over the item you wish to remove and click the **Remove** button. This will deselect the item in the left pane
5. Click **Next** to proceed to the **Role** Tab.
6. On the **Role** tab, choose a user role to be assigned to the users.



7. In the lower right corner of the page, click **Finish**. Active Directory users appear in the NAKIVO Backup & Replication list of users.

Assigning Role to Active Directory User

Follow the steps below to assign a role to an Active Directory user:

1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the Active Directory user, and then click **ellipsis** symbol in the rightmost column of the row.
3. In the menu that opens, click **Assign role**.
4. In the dialog box that opens, select a new user role from the **Role** list and then click **Save**.

The Active Directory user appears in the list of users with the assigned role.

Configuring Active Directory Integration

To configure Active Directory integration, follow these steps:

1. Go to **Settings > General > Users and Roles**.
2. The **Users & Roles** page opens. Click the **Configure AD Integration** button.
3. The **Active Directory Configuration Wizard** opens on the **Settings** page. Proceed as follows:
    a. In the **Domain name** box, enter the domain name.
    b. In the **Preferred DC hostname/IP** box, enter the name of the preferred domain controller or its IP address.
    c. Optionally, you can enter the name of the preferred Active Directory groups in the **Prioritized integrated groups** box.

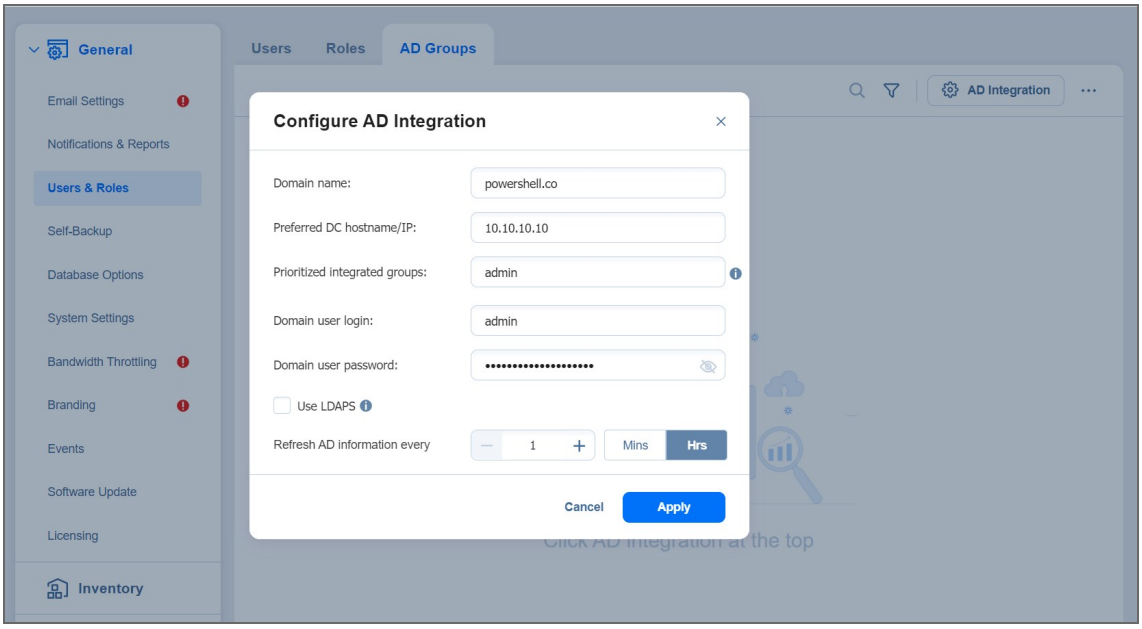
    Note

    If a user is a member of two or more Active Directory groups, enter the prioritized group's name in this field.
    d. In the **Domain user login** box, enter the username that will be applied when integrating Active Directory.
    e. In the **Domain user password** box, enter the user password that will be applied when integrating Active Directory.
    f. Optionally, enable **Use LDAPS** option. If checked, port 636 is used for LDAP (Lightweight Directory Access Protocol) over SSL.
    g. **Refresh AD information every**: Specify a periodicity of refreshing Active Directory information.
    h. In case Active Directory integration was successfully completed before, you can optionally click **Remove AD Integration** to cancel the AD integration.

    Note

    The **Remove AD Integration** option is disabled if AD integration is not configured.

    i. Click **Apply** after you're done.



j. On the **Users** page of the wizard, proceed with adding an Active Directory user.

When the wizard closes, the **Users & Roles** page opens, displaying the newly-added Active Directory users in the list of users.

Deleting Active Directory User

Follow the steps below to delete an Active Directory user:

1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the Active Directory user you want to delete, and then click **ellipsis** icon in the rightmost cell of the row.
3. In the menu that opens, click **Delete**.
4. In the dialog box that opens, click **Delete** to confirm that you wish to delete the AD user.

The Active Directory user disappears from the list of users.

Disabling Active Directory User

Follow the steps below to disable an Active Directory user:

1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the Active Directory user you want to disable, and then click **ellipsis** icon in the rightmost column of the row.
3. In the menu that opens, click **Disable**.
4. In the dialog box that opens, click **Disable** to confirm that you want to disable the Active Directory user.

The Active Directory user appears dimmed in the list of users.

Editing Active Directory User

Follow the steps below to edit an Active Directory user:

1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. In the list of users, do either of the following:
   a. Locate the Active Directory user and click its name.
   b. Hover over the Active Directory user, click **ellipsis** icon in the rightmost column of the row.
   c. Click **Edit**.
3. The **Edit Active Directory User** page opens. Edit the Active Directory user properties if necessary:
   a. In the **General** tab, edit the user.
   b. In the **Role** tab, edit the user role.
   c. Click **Save** to save your modifications to the Active Directory user.

Managing Local Users

With NAKIVO Backup & Replication, you can freely add, edit, disable, delete local users, or assign a role to them. For details, refer to the topics below:

- "Adding Local Users" on page 292
- "Assigning Role to Local User" on page 294
- "Deleting Local User" on page 295
- "Disabling Local User" on page 296
- "Editing Local User" on page 297

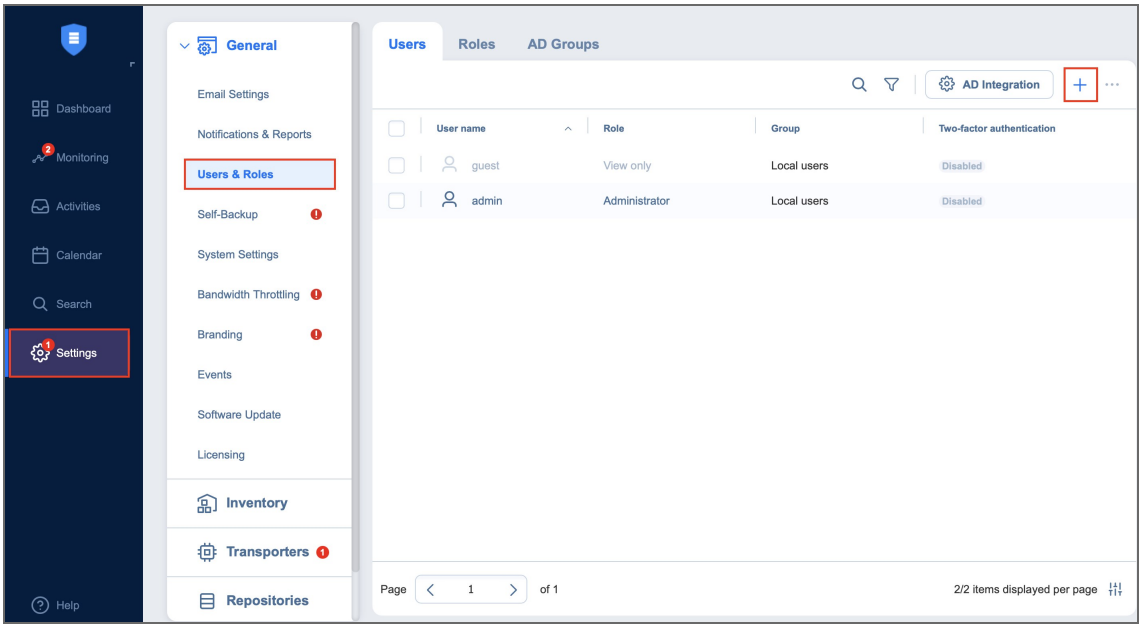
The application has the following built-in local users:

- **admin**: This user has the **Administrator** role assigned. You cannot delete it, disable it, or assign another role.
- **guest**: This user has the **View only** role assigned, with configurable file and object recovery permissions. By default, the account is disabled.

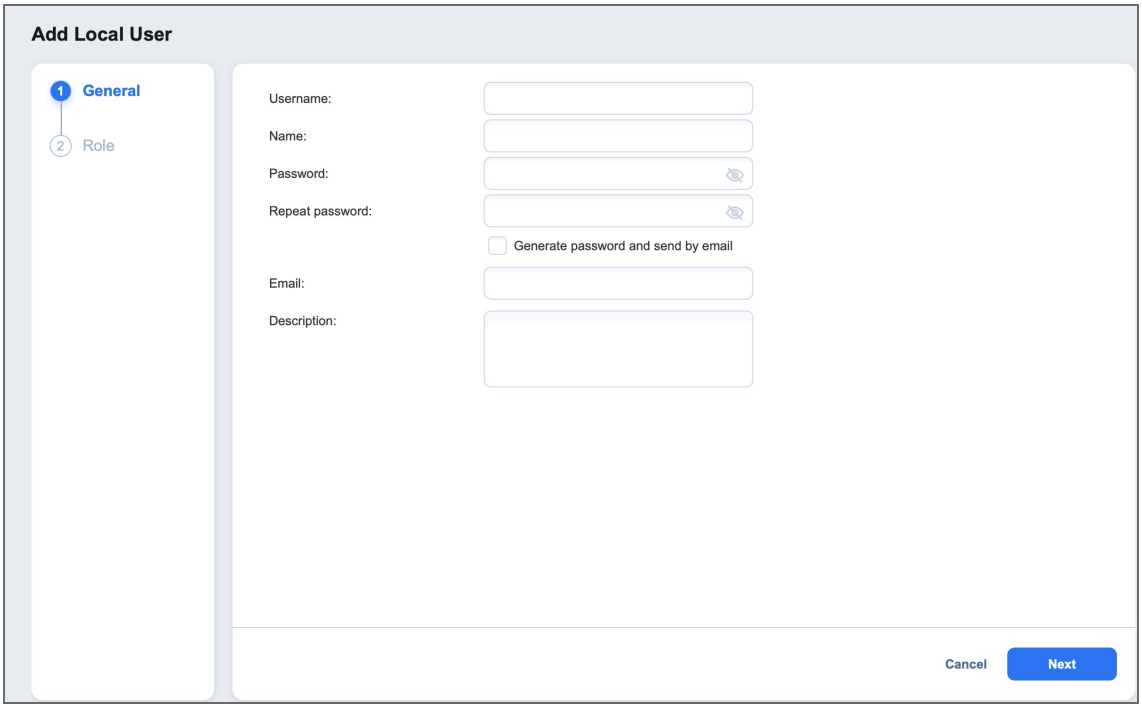
Adding Local Users

Follow the steps below to add a local user:

1. Go to **Settings > General > Users and Roles**
2. The **Users and Roles** page opens on the **Users** tab.
3. Click the **+** symbol.



4. The **Add Local User** page opens. Proceed as follows:
   a. In the **Username** box, enter the user name.
   b. In the **Name** box, enter the user's real name.
   c. In the **Password** box, enter the user password. To generate a password automatically and send it to the user, select **Generate password and send by email**.
   d. In the **Repeat password** box, re-enter the user password.
   e. In the **Email** box, enter the user's email address.
   f. In the **Description** box, optionally enter a user description.

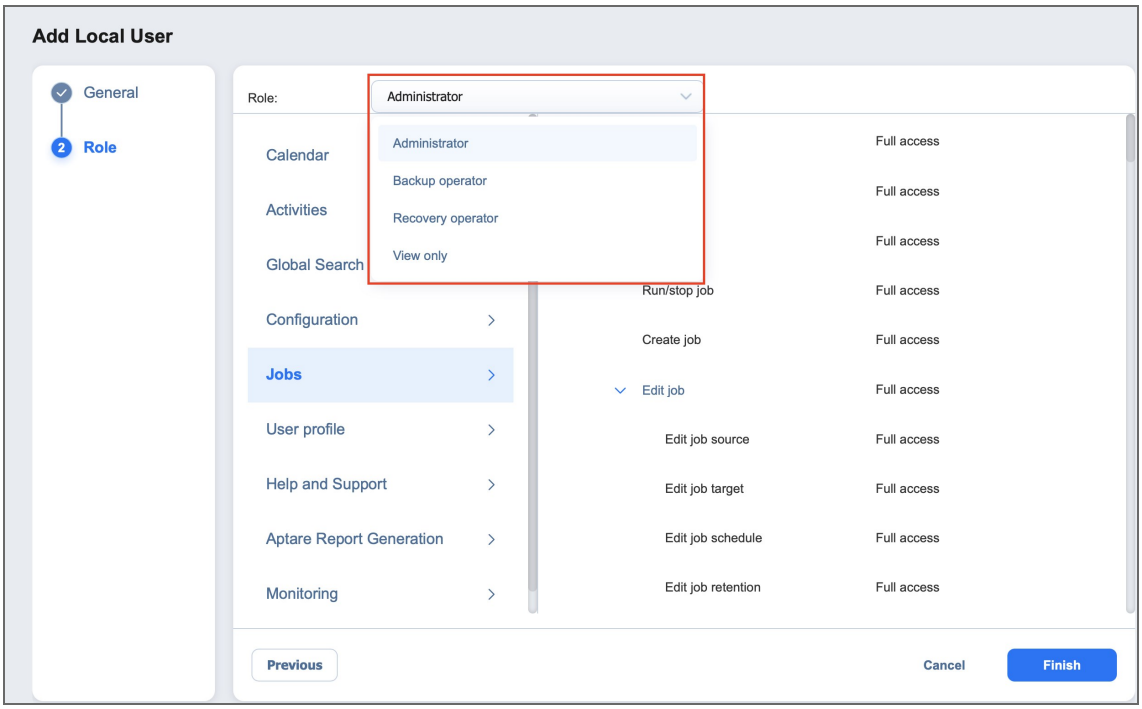


g. Click **Next** to proceed to the **Role** Tab.

h. In the **Access level** dropdown list, select an access level for the new user (for multi-tenant solutions only).

i. In the **Role** dropdown list, select a user role. Refer to "Managing User Roles" on page 299 for more details about user roles.

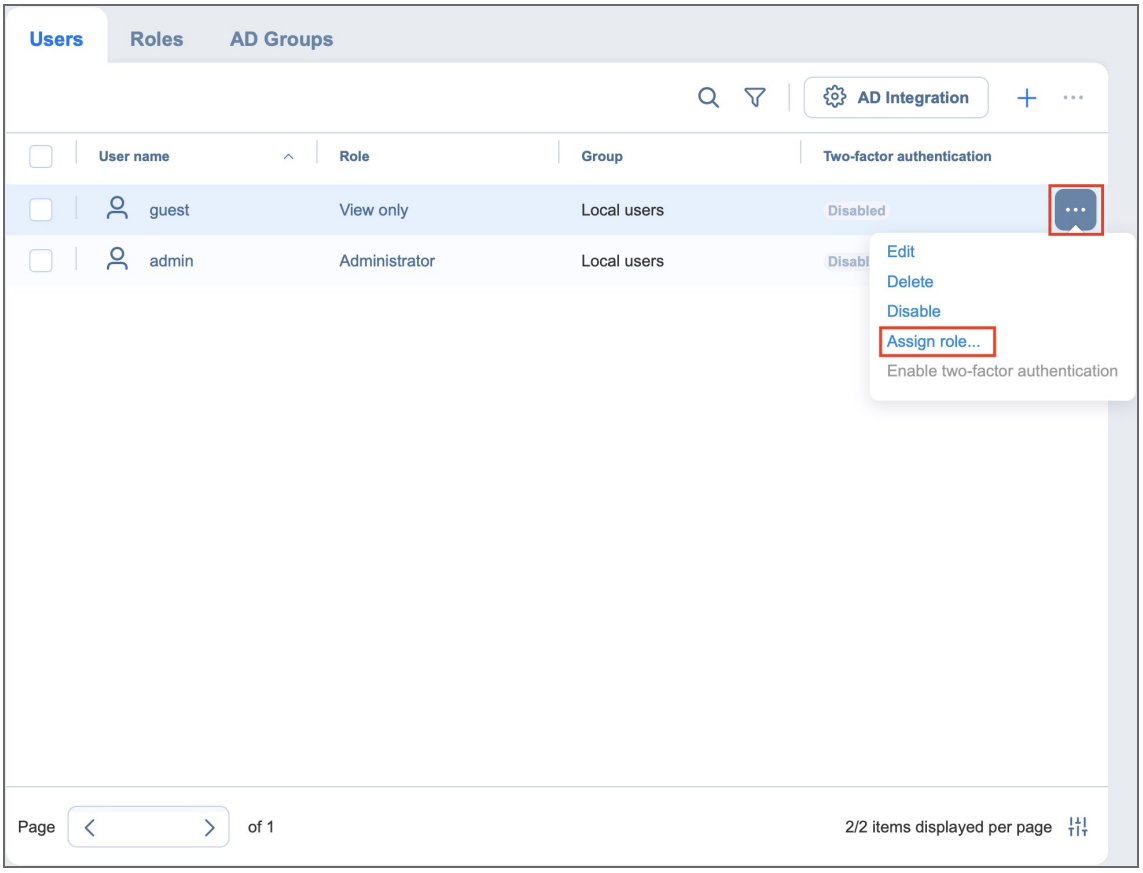
j. In the lower right corner of the page, click **Finish**. The local user will appear in the list of users.



Assigning Role to Local User

Follow the steps below to assign a role to a local user:

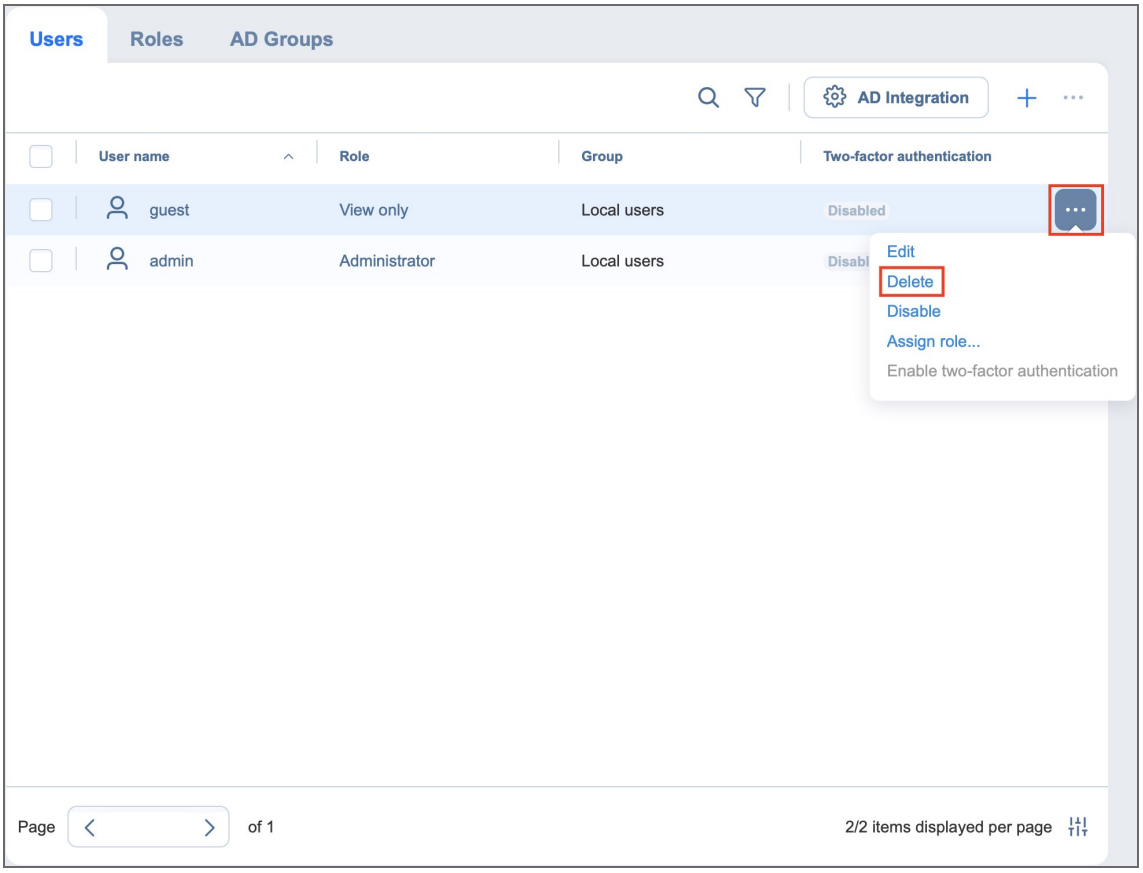
1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the local user, and then click the **Ellipsis** icon in the rightmost cell of the row.
3. In the resulting menu, click **Assign role**.
4. In the dialog box that opens, select a new user role from the **Role** drop-down list and then click **Save**. The local user will appear in the list of users with the assigned role.



Deleting Local User

Follow the steps below to delete a local user:

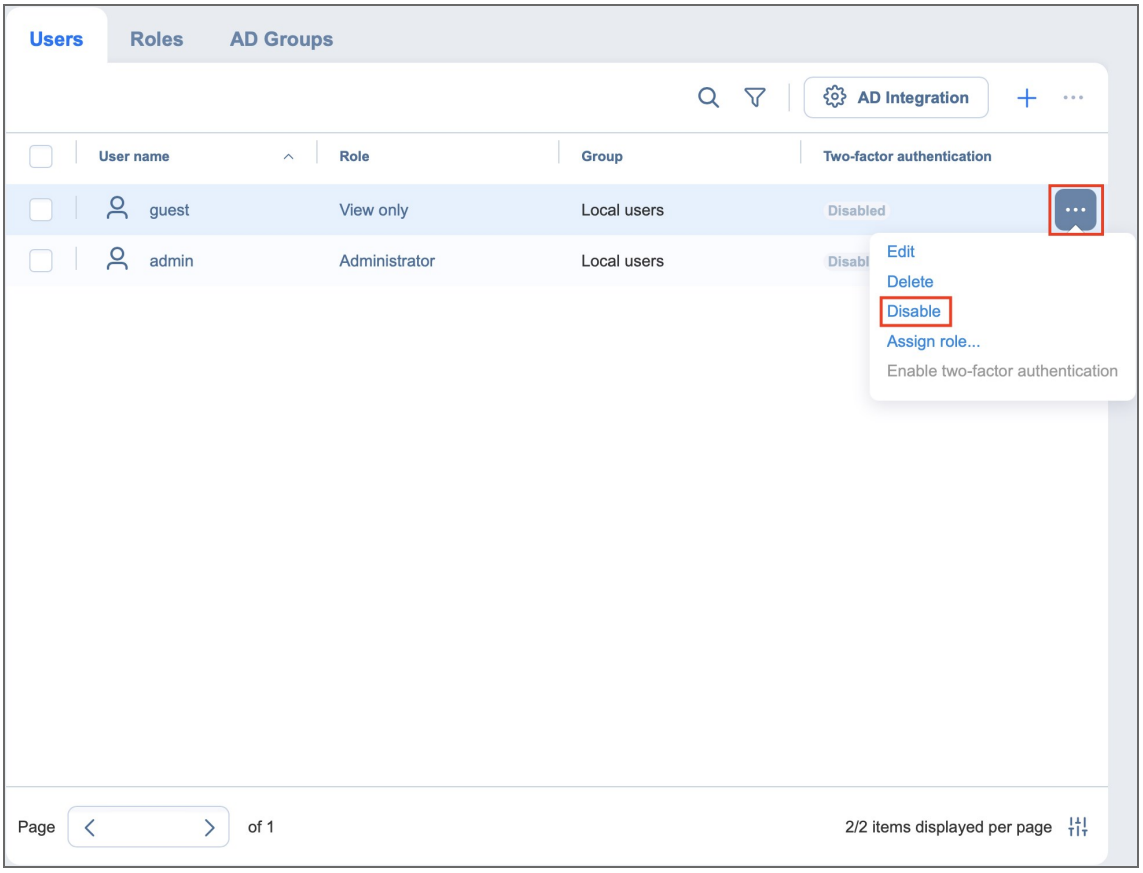
1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the local user you wish to be deleted, and then click the **Ellipsis** icon in the rightmost cell of the row.
3. In the resulting menu, click **Delete**.
4. In the dialog box that opens, click **Delete** again to delete the local user. The user will disappear from the list of users.



Disabling Local User

Follow the steps below to disable a local user:

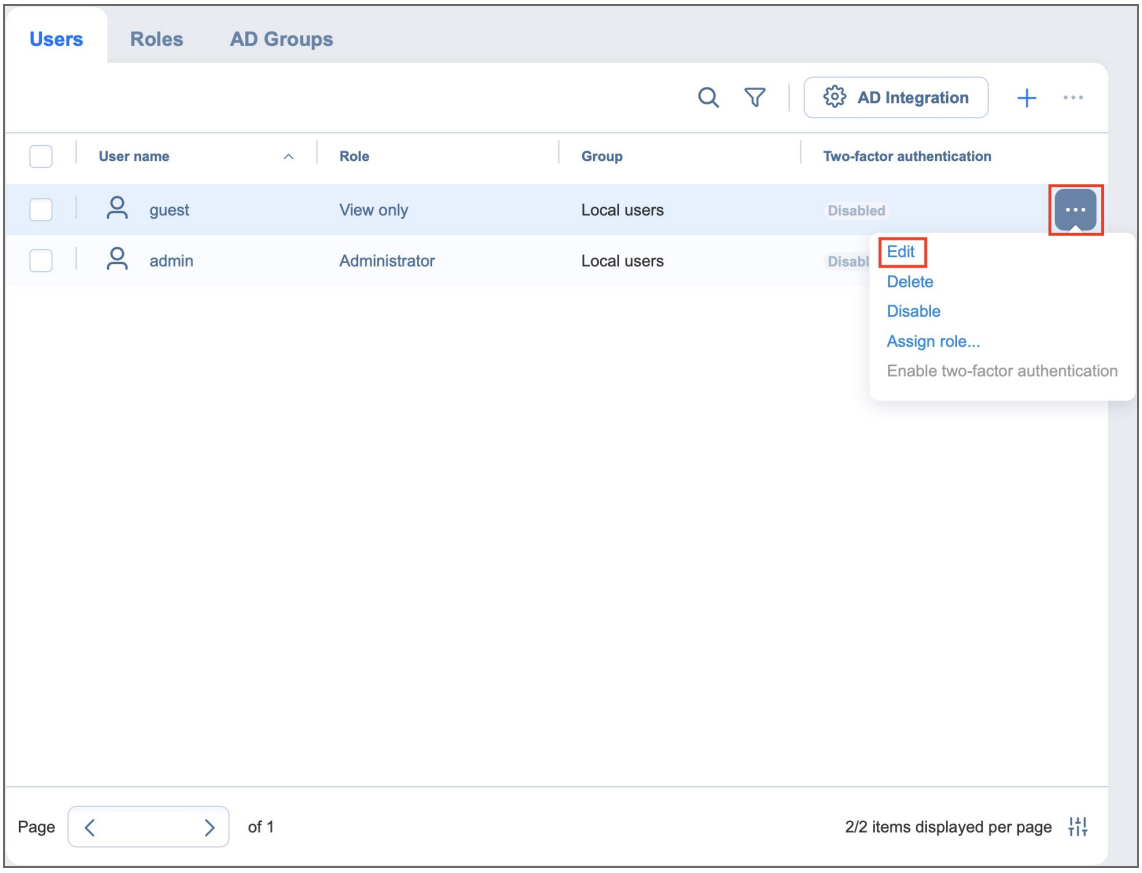
1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. Hover over the local user you wish to be disabled, and then click the **Ellipsis** icon in the rightmost cell of the row.
3. In the resulting menu, click **Disable**.
4. In the dialog box that opens, click **Disable** again to disable the local user. The user will appear dimmed in the list of local users.



Editing Local User

Please follow the steps below to edit a local user:

1. Go to **Settings > General > Users and Roles**.
2. The **Users and Roles** page opens in the **Users** view. In the list of users, do either of the following:
    a. Locate the local user that you want to edit and click on the user name.
    b. Hover over the local user and click the **Ellipsis** icon in the rightmost cell of the row. In the resulting menu, click **Edit**.



3. The **Edit User** page opens. Edit the local user properties if needed:
    a. In the **Username** box, edit the user name.
    b. In the **Name** box, edit the user's real name.
    c. In the **Password** box, edit the user password.
    d. If you edited the user password, re-enter the user password in the **Repeat password** box.
    e. In the **Email** box, edit the user's email address.
    f. Optionally, enable **Two-factor authentication**.

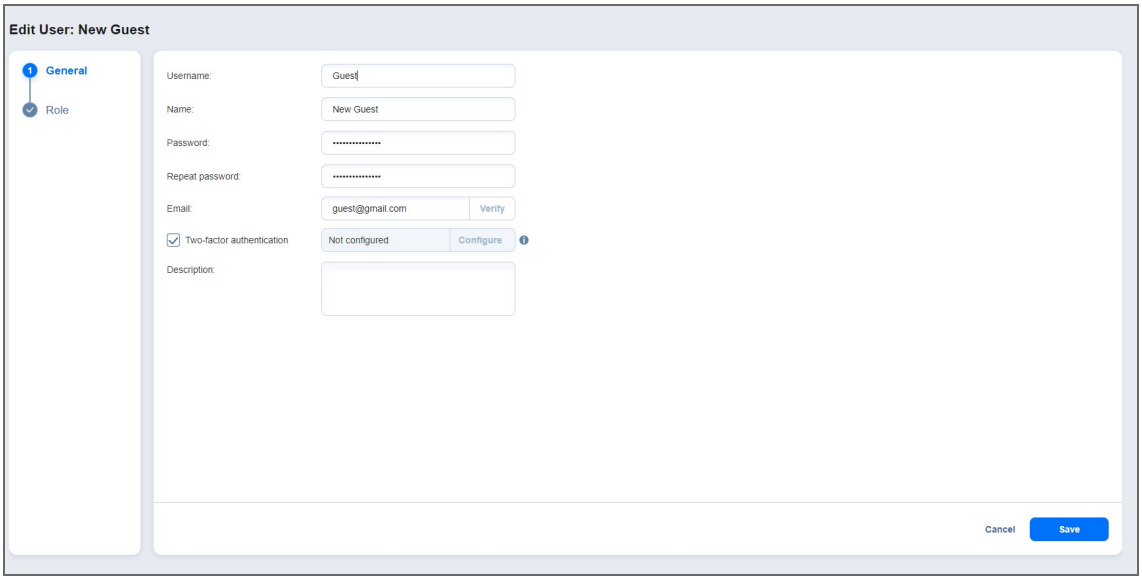
    Note

This feature is disabled when no email address has been provided for the user.

g. In the **Description** box, edit the user description.

h. In the **Role** tab, edit the user's role.

i. Click **Save** to save your modifications to the local user.



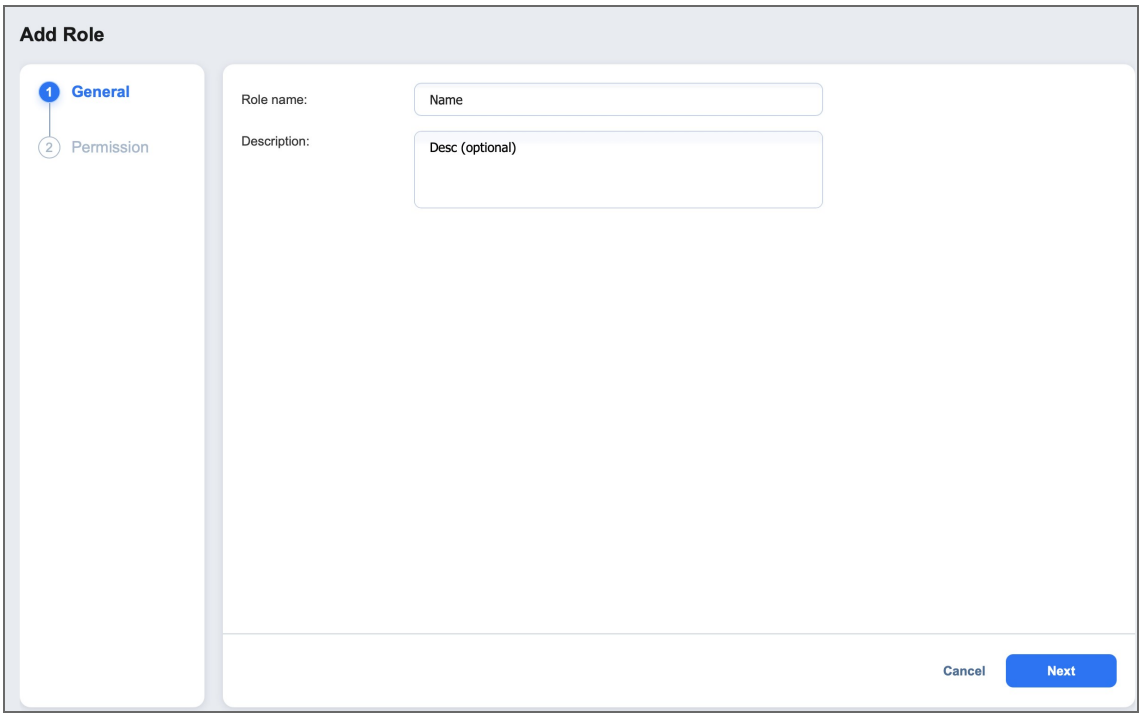
Managing User Roles

A user role with full access to the **User management** permission is assigned to your user profile to manage user roles. You cannot edit or delete the user role that is assigned to your user profile. The following topics describe how to manage roles of NAKIVO Backup &Replication users in detail:

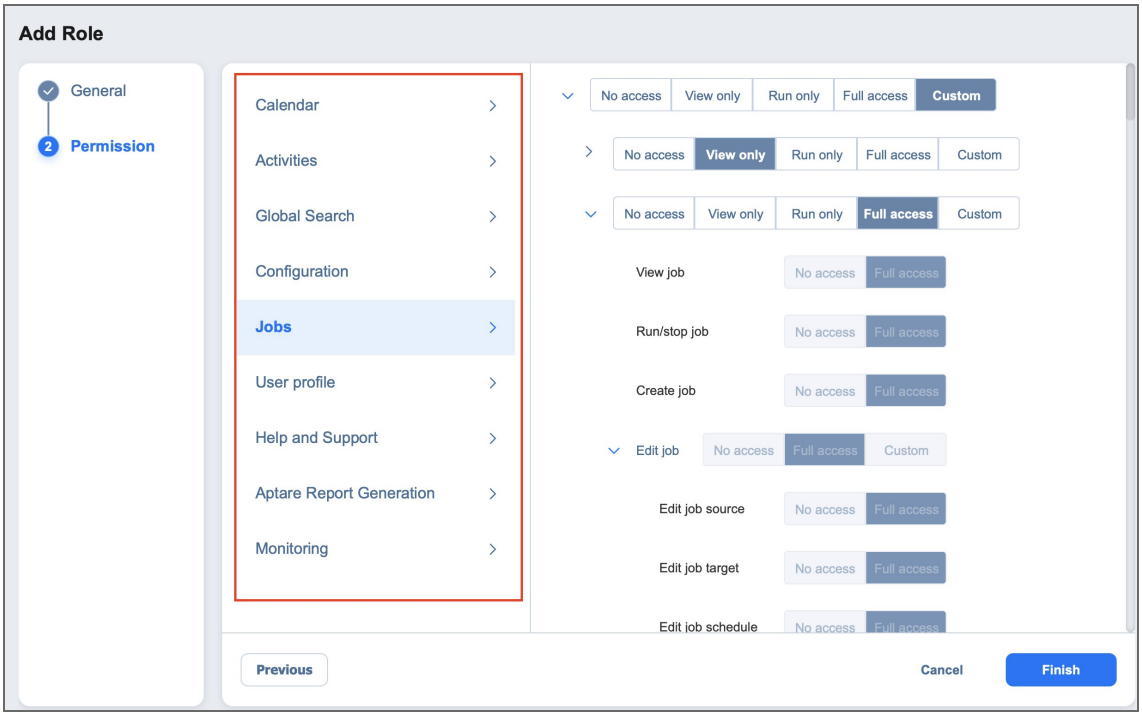
Adding User Role

Follow the steps below to add a user role:

1. Go to **Settings > General > Users and Roles**.
2. On the **Users and Roles** page, switch to the **Roles** tab.
3. Click **+** symbol and then select **Add Role**.
4. The **Add Role** page opens. Proceed as follows:
    a. In the **Role name** box, enter the role name.
    b. If you are working with a multi-tenant environment, choose either a tenant, master tenant, or all tenants, from the **Access level** list.
    c. In the **Description** box, optionally enter a user description.



    d. Click **Next** to proceed to **Permission** tab.
    e. A list of permissions opens. Specify necessary permissions for the user role.



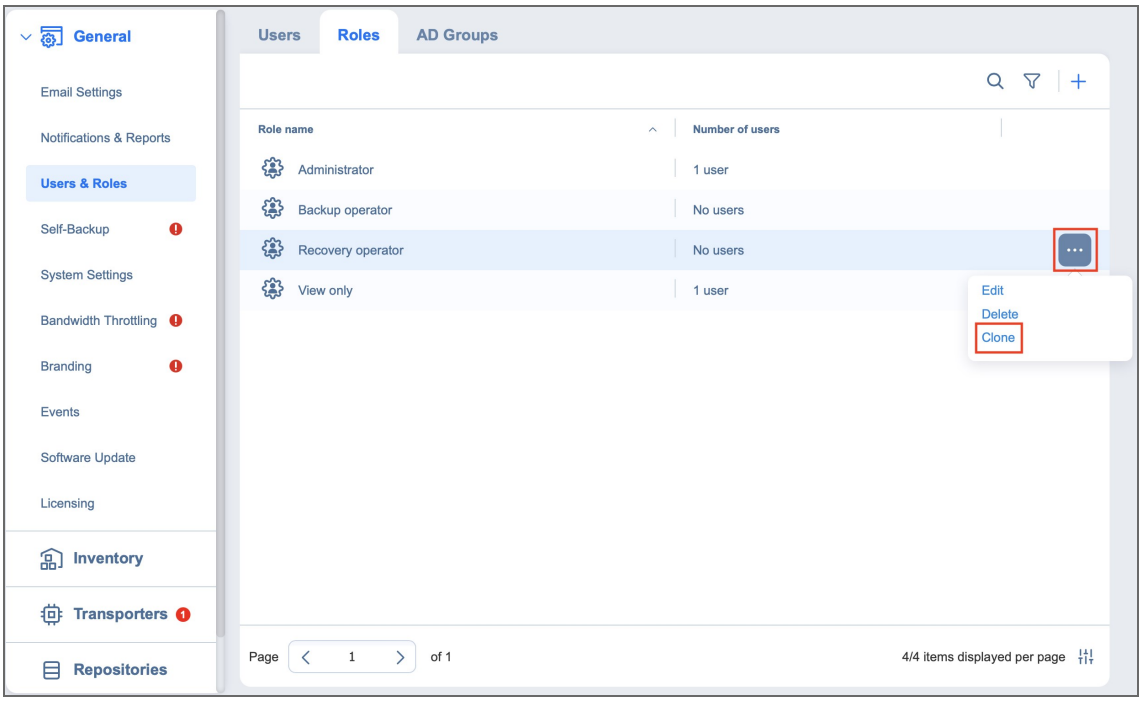
f. Click **Finish** in the lower right corner of the page.

The user role appears in the list of roles.

Cloning User Role

Follow the steps below to clone a user role:

1. Go to **Settings > General > Users and Roles**.
2. On the **Users and Roles** page, switch to the **Roles** tab.
3. Hover over the user role, click the **Ellipsis** icon in the rightmost column of the row and then click **Clone**.
4. A dialog opens asking you to enter the name of the new user role. Enter the name of the new user role and click **Save**.

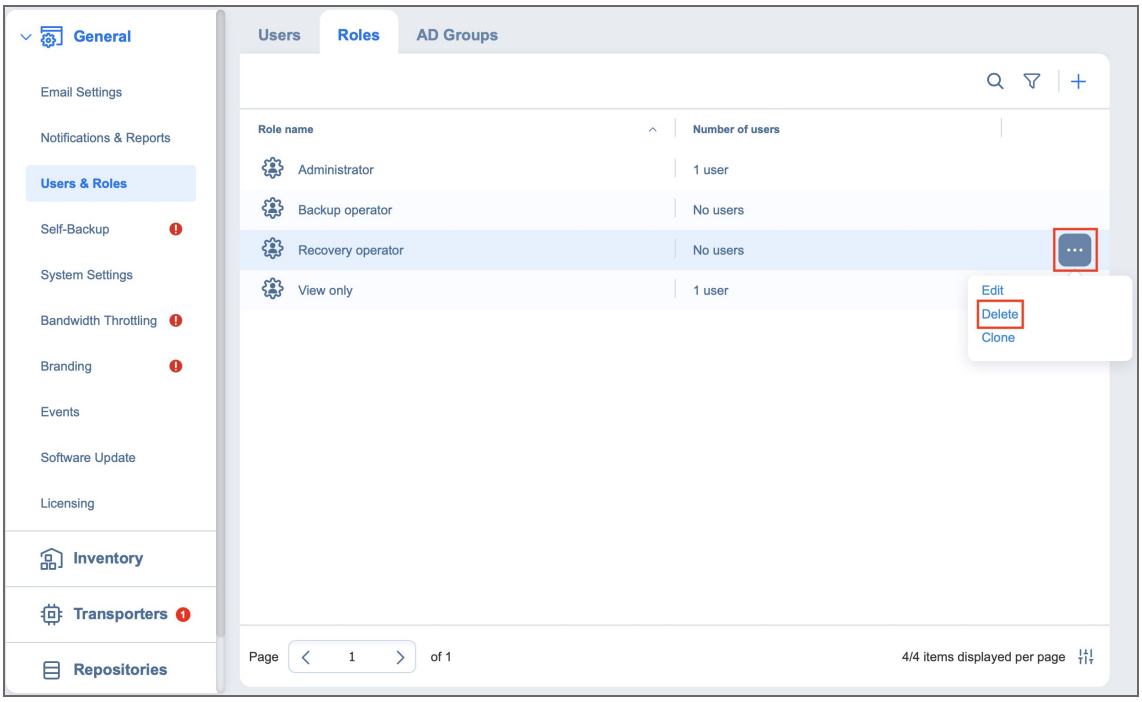


The new user role appears in the list of roles.

Deleting User Role

Follow the steps below to delete a user role:

1. Go to **Settings > General > Users and Roles**.
2. On the **Users and Roles** page, switch to the **Roles** tab.
3. Hover over the user role, click the **Ellipsis** icon in the rightmost column of the row and then click **Delete**.
4. In the dialog box that opens, click **Delete** to confirm deletion of the local user.

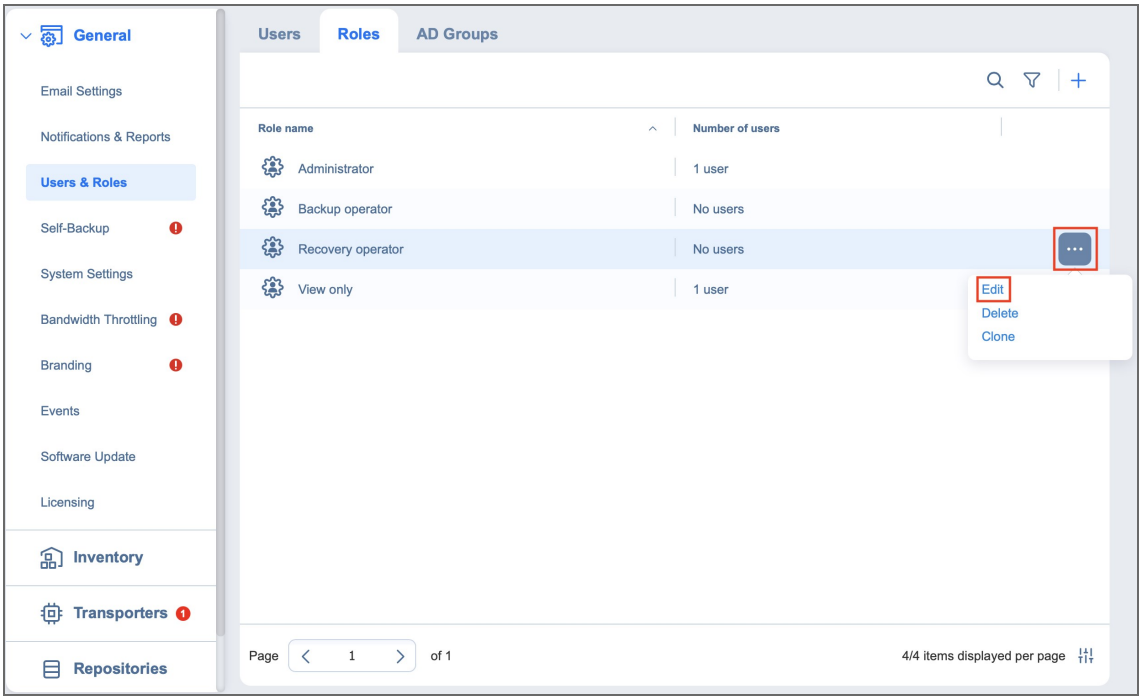


The user role disappears from the list of roles.

Editing User Role

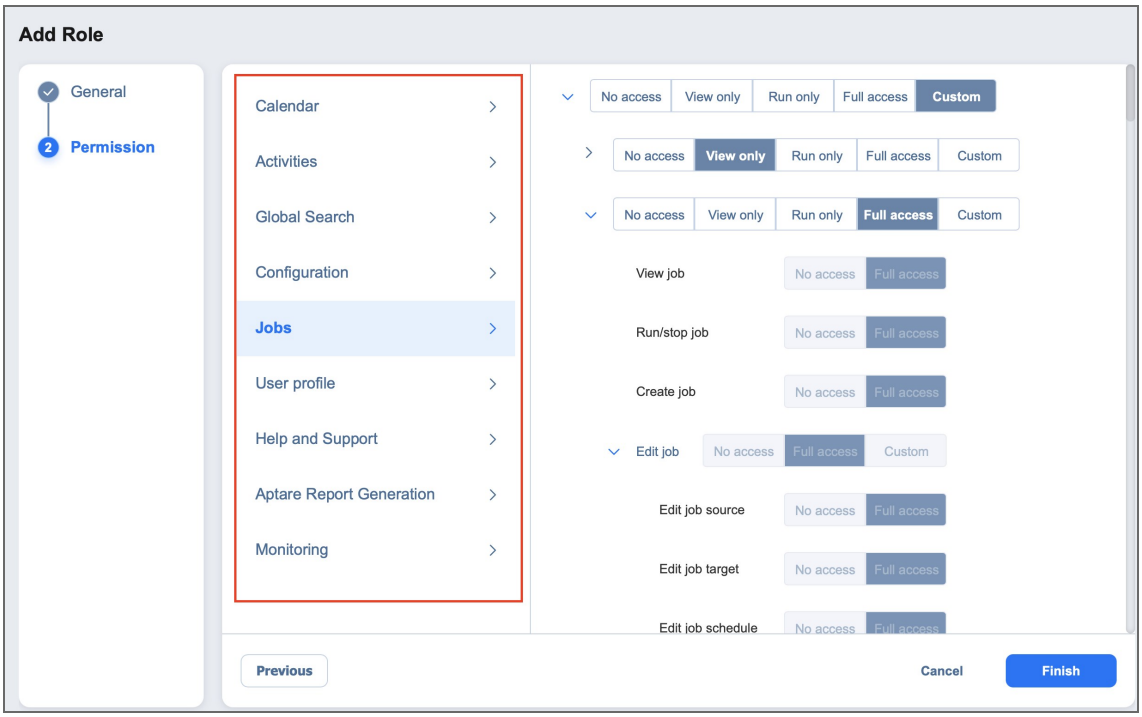
Follow the steps below to edit a user role:

1. Go to **Settings > General > Users and Roles**.
2. On the **Users and Roles** page, switch to the **Roles** tab.
3. In the list of roles, do either of the following:
   a. Locate the user role and click on it.
   b. Hover over the user role, click the **Ellipsis** icon in the rightmost column of the row, and click **Edit**.



4. The **Edit Role** page opens. Edit the user role properties if needed:
   a. In the **Role name** box, edit the user role name.
   b. If you are working with a multi-tenant environment, you can change the access level for this role by choosing another tenant, master tenant, or all tenants in the **Access level** list.
   c. In the **Description** box, edit the user description.
   d. You can view the **Number of users** with this role, as well as view a full list by clicking the ***x* users** button.
   e. In the **Permissions** tab, you can edit all necessary permissions for the user role.

f. When finished, click **Save** in the lower right corner of the page.



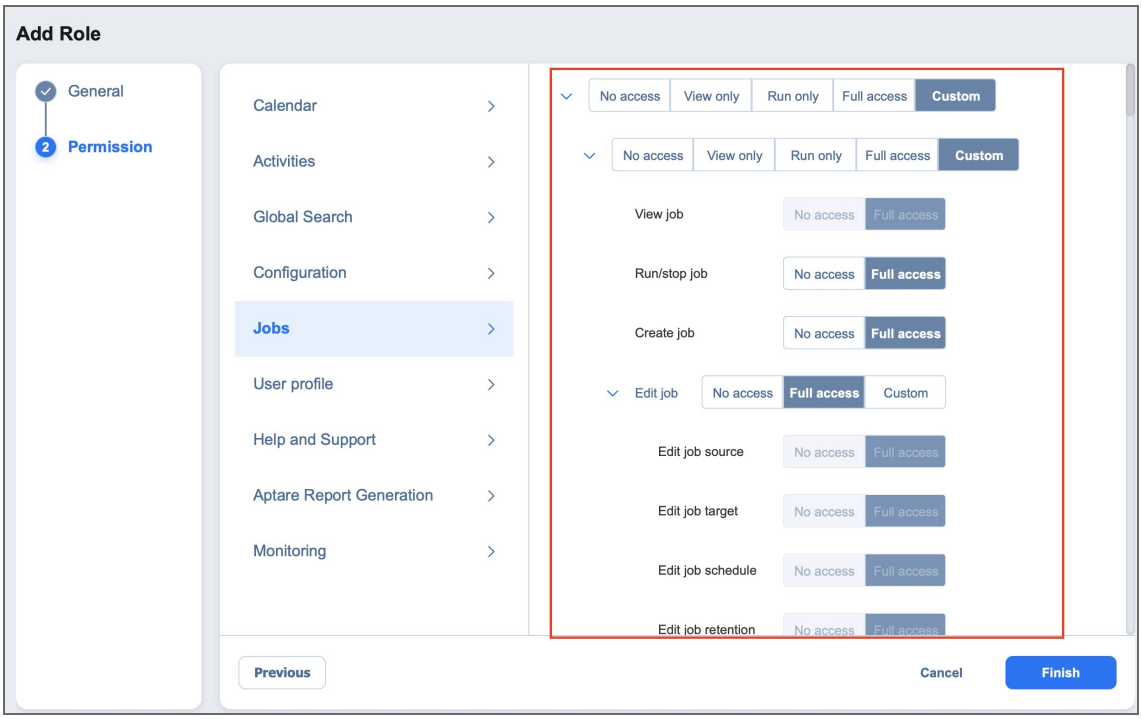
Overview of User Roles

NAKIVO Backup & Replication allows you to assign roles and grant specific permissions to users of the product.

User Roles

A user role consists of a set of permissions that can be granted to a NAKIVO Backup & Replication user. Available permissions are grouped by the following product objects:

- **Calendar**: Contains permissions for accessing the Calendar dashboard.
- **Activities**: Contains permissions for accessing the Activities dashboard.
- **Global Search**: Contains permissions for accessing Global Search.
- **Configuration**: Contains a series of permissions for accessing configuration of NAKIVO Backup & Replication.
- **Jobs**: Contains a series of permissions for managing jobs.
- **User profile**: Contains a series of permissions for managing user profile.
- **Help and Support**: Contains a series of permissions for accessing email support, online help center, chat support, and system information.
- **Aptare Report Generation**: Contains permissions for managing Aptare report generation.
- **Monitoring**: Contains permissions for managing Monitoring feature.



Access Levels

There are the following access levels that can be set up for particular permission:

- **No access**: The user cannot view, edit, and run the commands, neither from the graphical interface nor from the command line.
- **View only**: The user can view the commands in the graphical interface but cannot edit or run them; using the command line, the user can only run the commands that do not change NAKIVO Backup & Replication objects.
- **Run only**: The user can only view and run commands, both from the graphical interface and the command line.
- **Full access**: The user can view, edit, and run the commands, both from the graphical interface and the command line.
- **Custom**: A custom set of permissions is configured for a product object.

Built-In User Roles

The product offers you a number of built-in user roles:

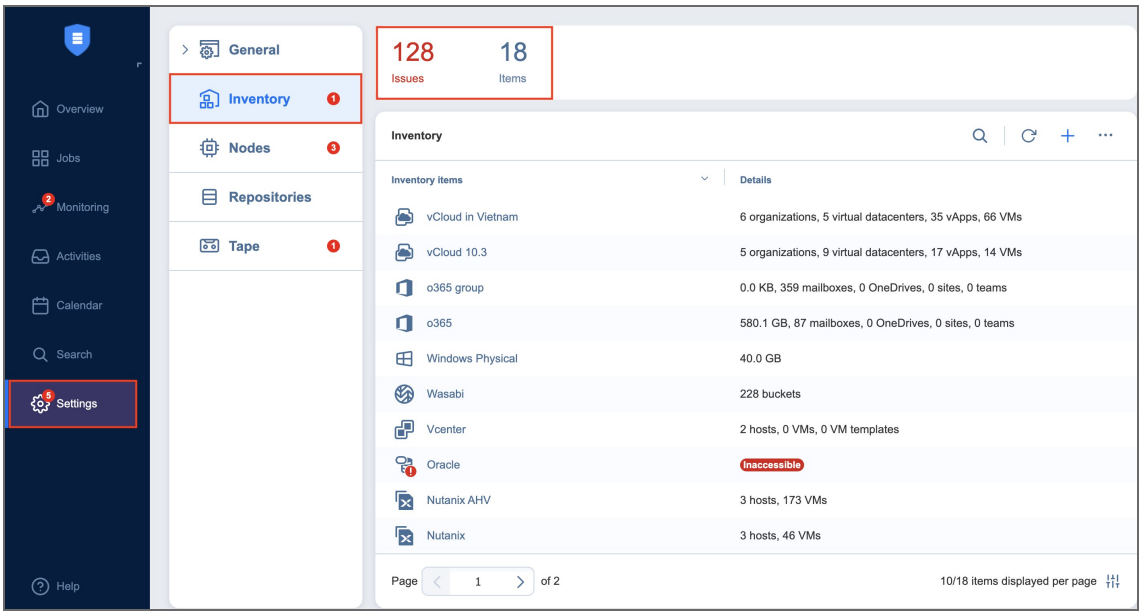
- Backup operator
- Recovery operator
- Self-service administrator
- Self-service user
- View only

Built-in user roles can be used for performing typical user management tasks. If you need an extra level of security, you can add a new user role or take a built-in user role as a starting point by cloning it.
The user profile can only have a single role assigned.

Inventory

Prior to creating backup, replication, or recovery jobs, you need to add your virtual/cloud/physical infrastructure, Microsoft 365 account, Oracle database, or supported storage device to the product's Inventory. The discovered item is added to the internal product database, which is refreshed every 1 hour by default. The **Inventory** tab contains a **Summary** bar, which offers an overview of all Inventory items. The data displayed is as follows:

- **Issues**: Total number of issues/alarms related to Inventory items
- **Items**: Total number of items in Inventory



Refer to the following sections to learn more about adding and managing Inventory items:

- "Adding Microsoft 365 Accounts" on page 310
- "Managing Credentials" on page 326
- "Managing Inventory" on page 321

Adding Microsoft 365 Accounts

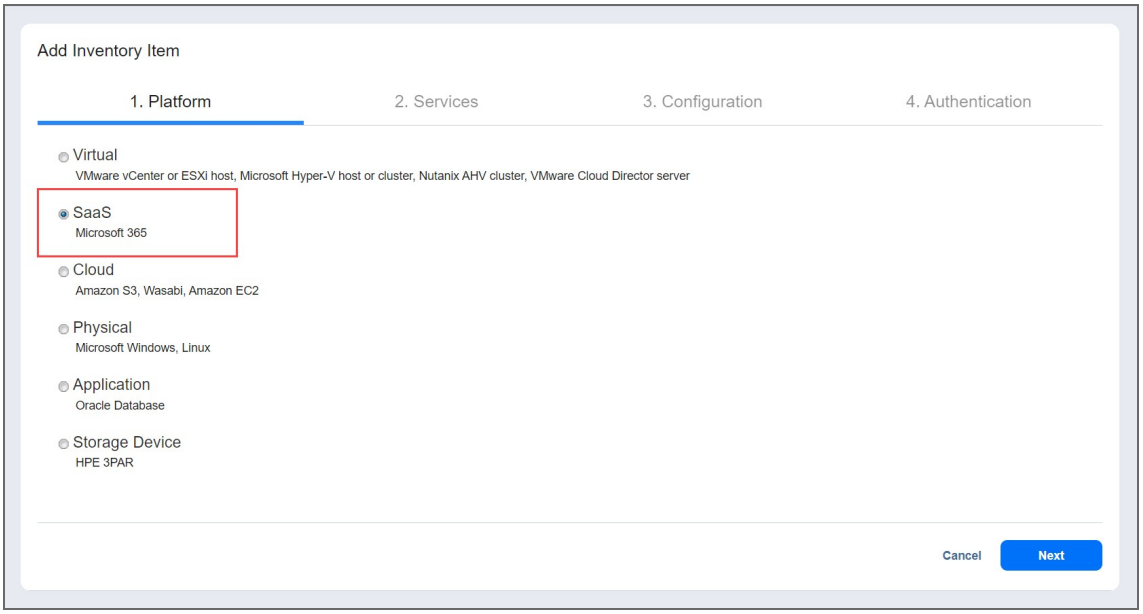
Before you start backing up items from your organization's Microsoft 365 account, you need to add the Microsoft 365 account to Inventory in NAKIVO Backup & Replication.

- Adding Microsoft 365 Account to Inventory
- Obtaining Microsoft 365 Credentials

Adding Microsoft 365 Account to Inventory

To add a Microsoft 365 account to Inventory, do the following:

1. Check if you meet the requirements for Backup for Microsoft 365.
2. Click **Settings** in the left pane.
3. Go to the **Inventory** tab and click **+**.
4. On the **Platform** page of the wizard, select **SaaS**. Click **Next** to proceed.



5. On the **Services** page, provide the following information:
   - **Display name**: Enter a name for the account.
   - **Services**: Select the Microsoft 365 services that you want to back up:
     - **Exchange Online Users**
     - **Exchange Online Groups**
     - **OneDrive for Business**
     - **SharePoint Online**

- **Teams**

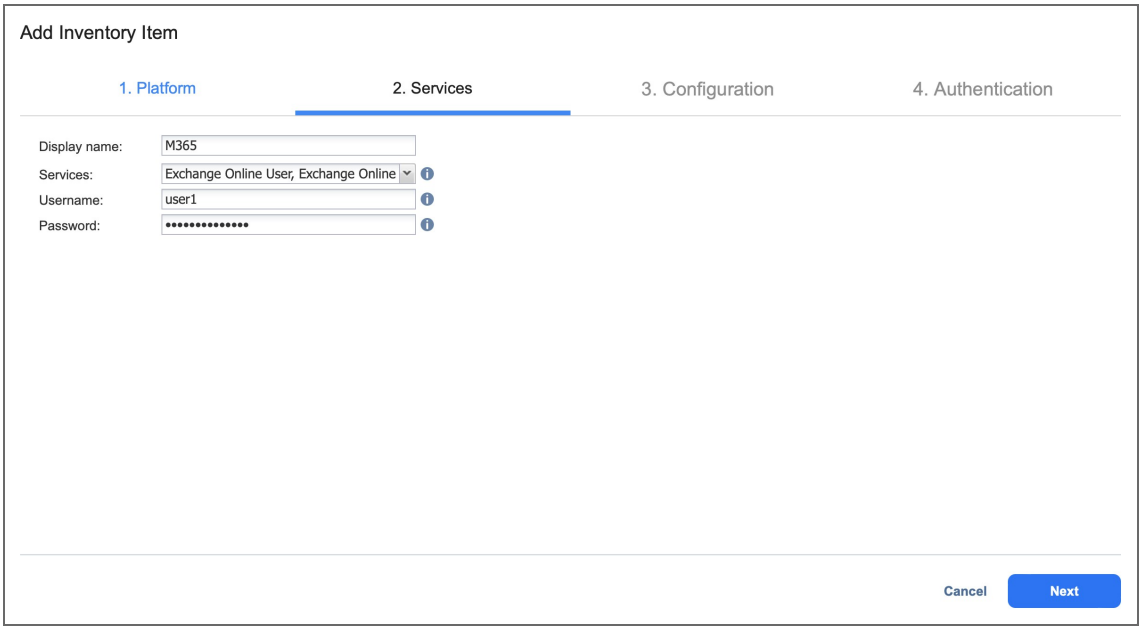
  Note

  For NAKIVO Backup & Replication to successfully discover **Teams**, the following conditions must be met:

  - Microsoft Teams Exploratory experience license or higher (access to Microsoft Teams API is required).
  - The administrator account must have the Global Administrator role or Team Administrator role assigned.

- **Username**: Provide the administrator username required for **Exchange Online Groups** or **Teams**.
- **Password**: Provide the administrator password required for **Exchange Online Groups** or **Teams**.

6. Click **Next** to proceed.



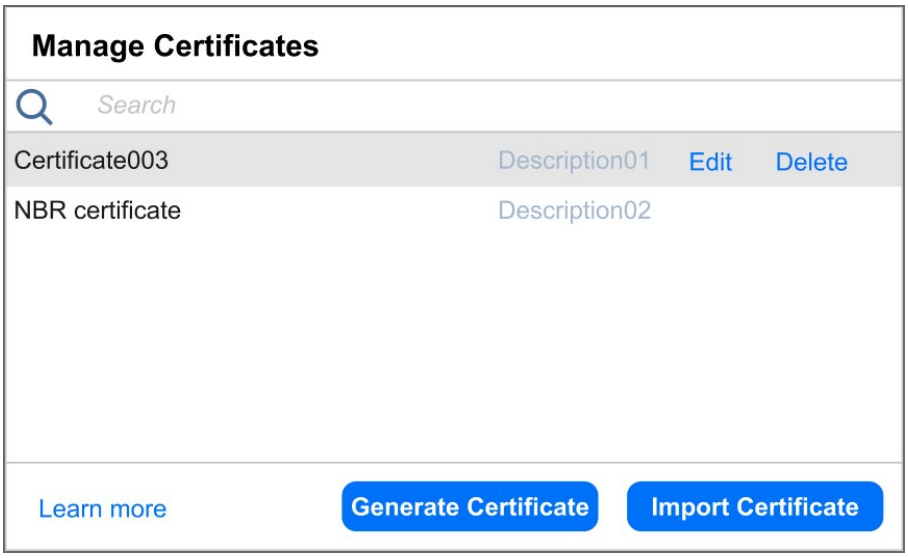
7. On the **Configuration** page, choose one of the following:
   - **Automatically register a new Azure AD application**: When this option is selected, NAKIVO Backup & Replication automatically registers the Microsoft 365 account as a new application along with a new self-signed certificate in Azure Active Directory and grants the required permissions after authentication.

- **Use an existing Azure AD application**: When this option is selected, you can manually add an existing Microsoft 365 application already registered in Azure Active Directory.

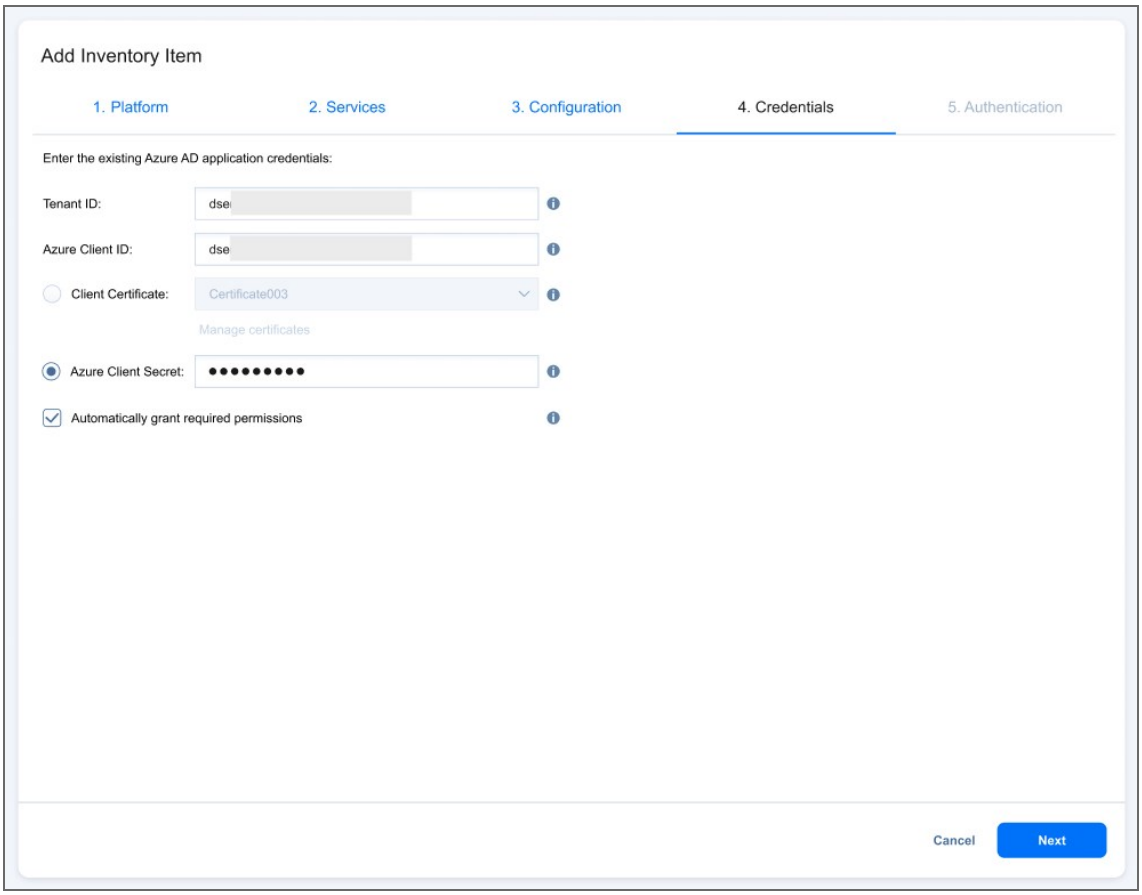
  Note
  In order to add a Microsoft 365 account to NAKIVO Backup & Replication, the account has to be registered in Azure Active Directory.

8. Click **Next** to proceed. If you selected **Automatically register a new Azure AD application**, skip to step 12.
9. The **Credentials** page opens if you have chosen **Use an existing Azure AD application** option on the **Configuration** page. Provide the following information:
   - **Tenant ID**: Enter your Azure Tenant ID created when registering your Microsoft 365 account in the Azure Portal.
   - **Azure Client ID**: Enter your Azure Client ID created when registering your Microsoft 365 account in the Azure Portal.
10. Choose one of the following authentication methods:
    - **Client Certificate**: Choose a saved certificate from the drop-down list to use an existing certificate. If you don't have any saved certificates or want to generate a new one, click the **Manage certificates** button. In the resulting pop-up, you can edit and delete existing certificates, generate new certificates, or import existing certificates.
      - To generate a certificate, click the **Generate Certificate** button. In the **Generate New Self-Signed Certificate** pop-up, enter a display name and (optionally) a description for the certificate. Clicking **Save** will generate a new self-signed certificate and add it to the list of saved certificates.
      - To import an existing certificate, click the **Import Certificate** button. In the **Import Certificate** pop-up, enter a display name for the certificate and click the **Browse…** button to upload a certificate in the required .pfx format. Then, enter the certificate password if required, and (optionally) add a description for the certificate. Clicking **Save** will add the

certificate to the list of saved certificates.



- **Azure Client Secret**: Enter your Azure Client Secret obtained from the Azure Portal. For more information on obtaining the Azure credentials, refer to the Obtaining Microsoft 365 Credentials below.



11. Depending on the authentication method you selected, you can optionally select **Automatically grant required permissions** (for Azure Client Secret authentication) or **Automatically grant required permissions and register certificate** (for Client Certificate authentication). This allows NAKIVO Backup & Replication to automatically check the required API permissions for the selected services of your organization's Microsoft 365 account and to add them if they are missing. If you do not select this option, you have to manually grant the required permissions. If this option is selected for Client Certificate authentication, NAKIVO Backup & Replication will also automatically register the selected certificate with the specified application, if it is not already registered. If you do not select this option, you have to manually register the certificate with the application. If you have selected either option, click **Next**. Alternatively, click **Finish** to complete adding the item to Inventory.
12. If you have selected **Automatically grant required permissions** or **Automatically grant required permissions and register certificate** on the **Credentials** page or **Automatically register a new Azure AD** application on the **Configuration** page, the **Authentication** page opens. Do the following:
    - If you selected **Automatically register a new Azure AD application** on the **Configuration** page, enter a name for the application in the **Application name** field.
    - If you selected **Automatically register a new Azure AD application** on the **Configuration** page, add a client certificate as described in step 10.
    - The **Code** field shows the code that needs to be entered at https://microsoft.com/devicelogin.
    - Clicking the link will open the page in a new tab and you will be required to log in to the Microsoft Azure Cross-Platform Command-Line Interface (xplat-cli) using the provided code.
    - If the provided credentials are correct, the account will be authenticated and you will be able to continue with the discovery process.

Notes

- The Global Administrator role must be assigned to the account in the Microsoft 365 admin center for the authentication process to be successful.
- If **SharePoint Online** was selected on the **Services** page, the SharePoint Administrator role must be assigned to the account in Microsoft 365 admin center for the authentication process to be successful.
- It is possible to bypass the **Authentication** step if the IP address or hostname of your NAKIVO Backup & Replication installation location is added as a trusted location in Azure Active Directory. For more information, refer to this page.
- If **Automatically register a new Azure AD application** is selected in the **Configuration** step, then the credentials to the newly registered application will be downloaded to the browser after successful authentication.

- When generating a new certificate, the new self-signed certificate will be downloaded to the browser in .pfx format after clicking **Save** in the **Generate New Self-Signed Certificate** pop-up.
- If NAKIVO Backup & Replication is updated from a version that did not include support for Microsoft 365 Groups to a version that does, it is possible for the group mailboxes and group sites to be discovered automatically for existing Microsoft 365 accounts:
  - If you have selected **Automatically grant required permissions** on the **Credentials** page, the group mailboxes and group sites will be added automatically with all of the required permissions granted.
  - If you have not selected **Automatically grant required permissions** on the **Credentials** page, the group mailboxes and group sites will remain undiscovered by the solution.
- If NAKIVO Backup & Replication is updated from a version that did not include support for Microsoft Teams to a version that does, Teams will not be discovered automatically. In order to discover Teams, you will need to edit the appropriate Microsoft 365 account in Inventory and add **Teams** as a service.

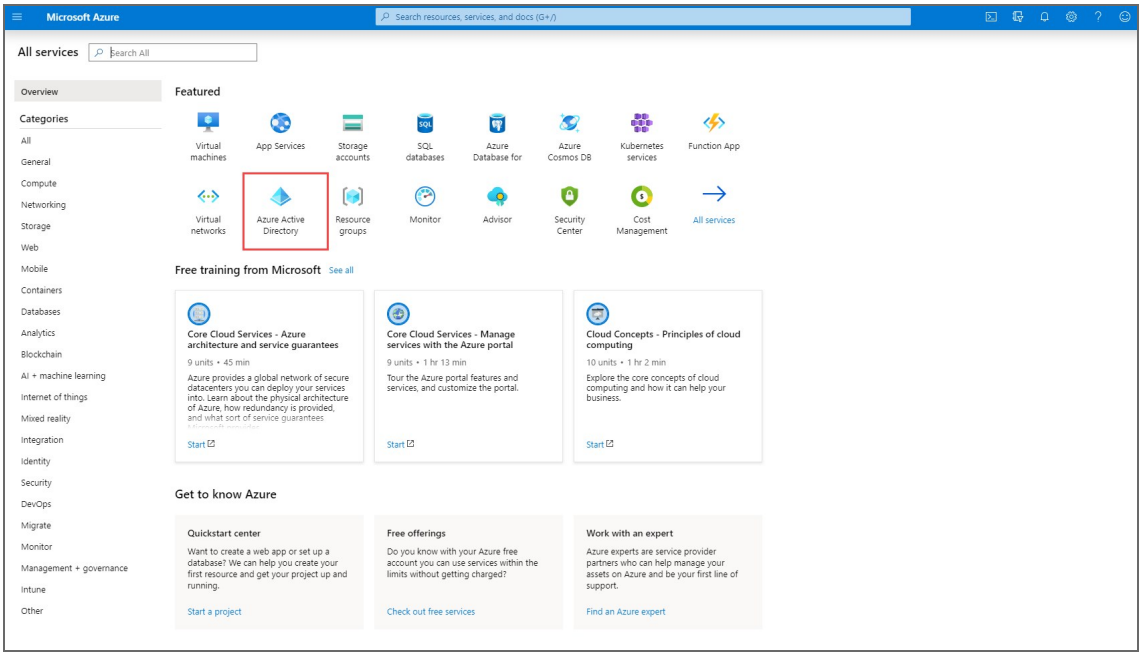
13. Click **Finish** to complete adding the item to Inventory.

    Note
    If you selected only **SharePoint Online** in the **Services** step and authenticated using a Client Secret in the **Credentials** step, clicking **Finish** will first prompt you to enter your SharePoint Online **Username** and **Password** in the **Services** step.

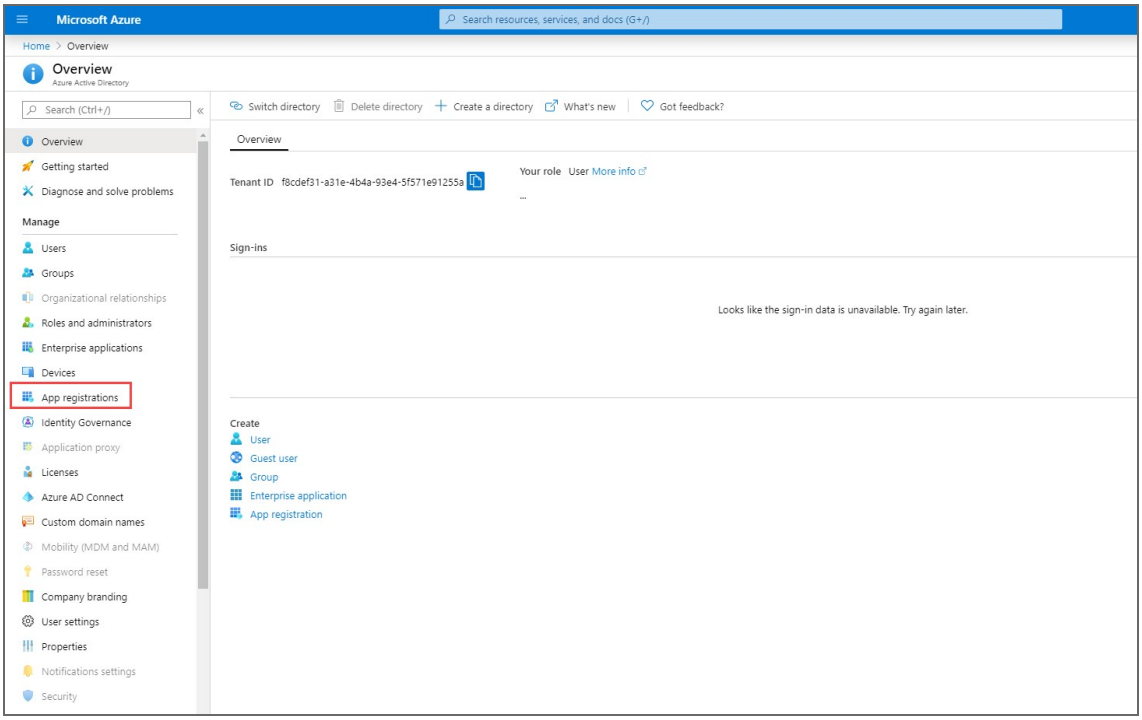
Obtaining Microsoft 365 Credentials

To obtain the credentials required to add a Microsoft 365 account to Inventory in NAKIVO Backup & Replication, follow the steps below:

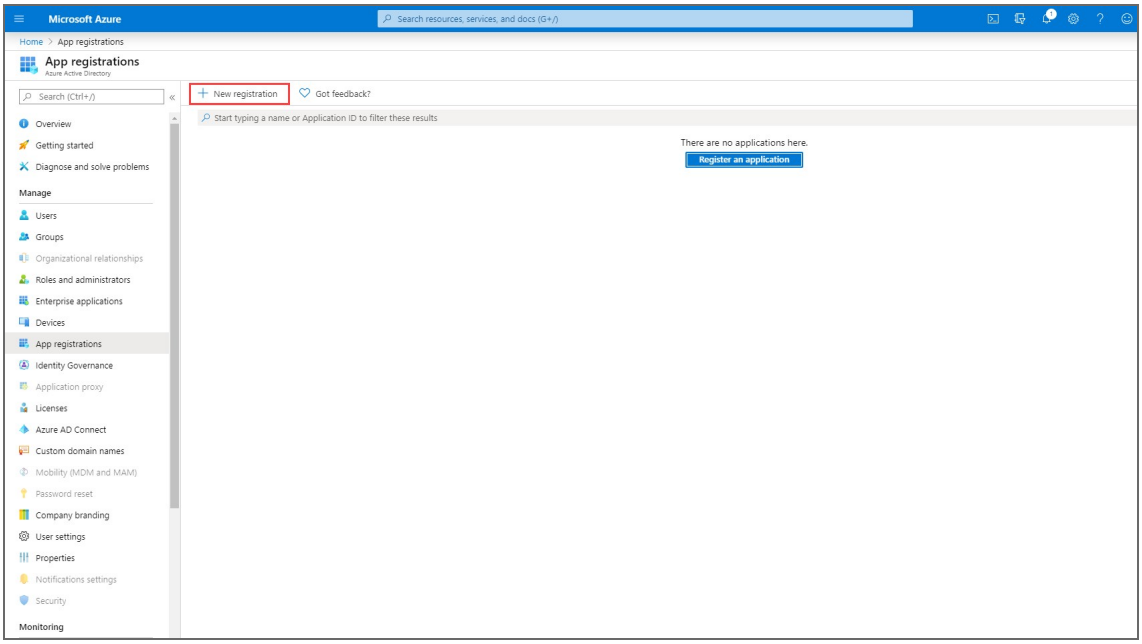
1. Open the Azure Portal by going to portal.azure.com
2. Sign in to Microsoft Azure with your Microsoft 365 account credentials.
3. Select **Azure Active Directory** from the Dashboard or from the Portal Menu.



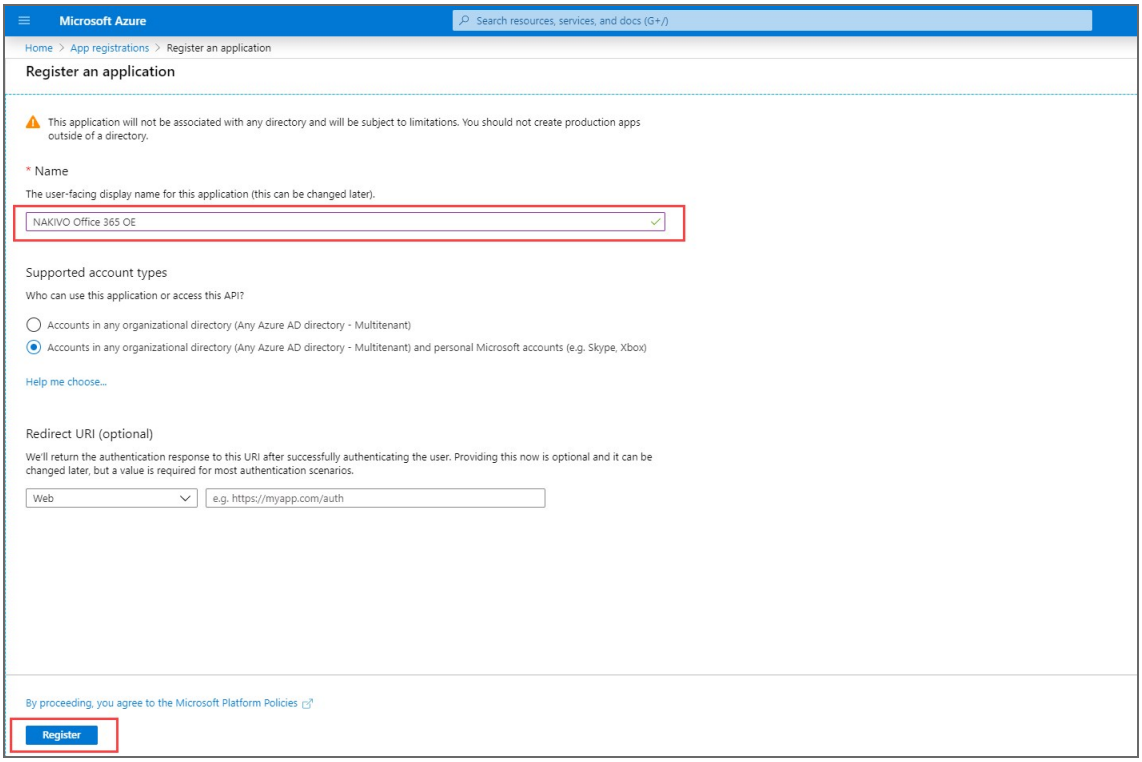
4. In the left menu, click **App registrations**.



5. Click **New registration** on the **App registrations** page.

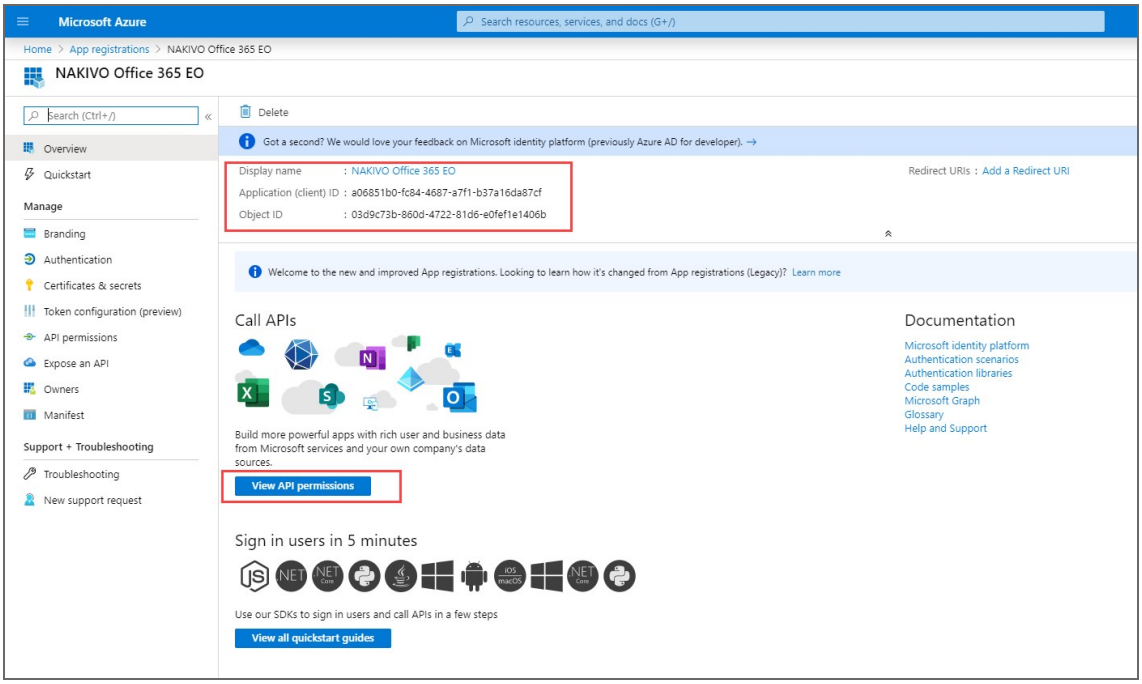


6. On the **Register an application** page, enter a name for the application and click **Register**.



The application has been successfully registered and **Tenant ID** and **Azure Client ID** are displayed: **Directory (tenant) ID** and **Application (client) ID** respectively.

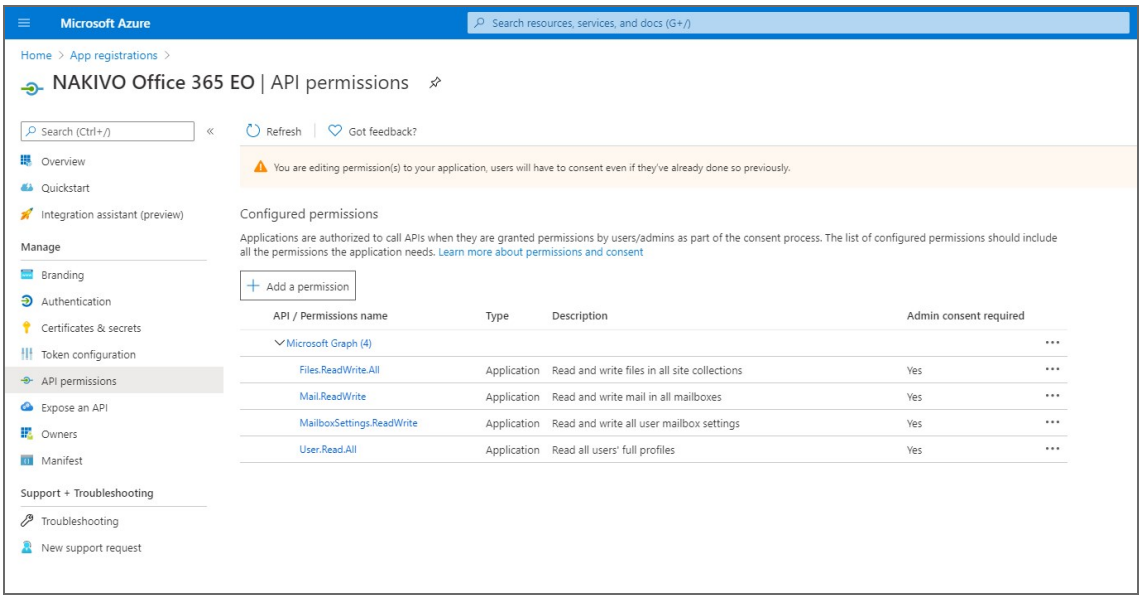
7. Click **View API Permissions** to add the necessary permissions.



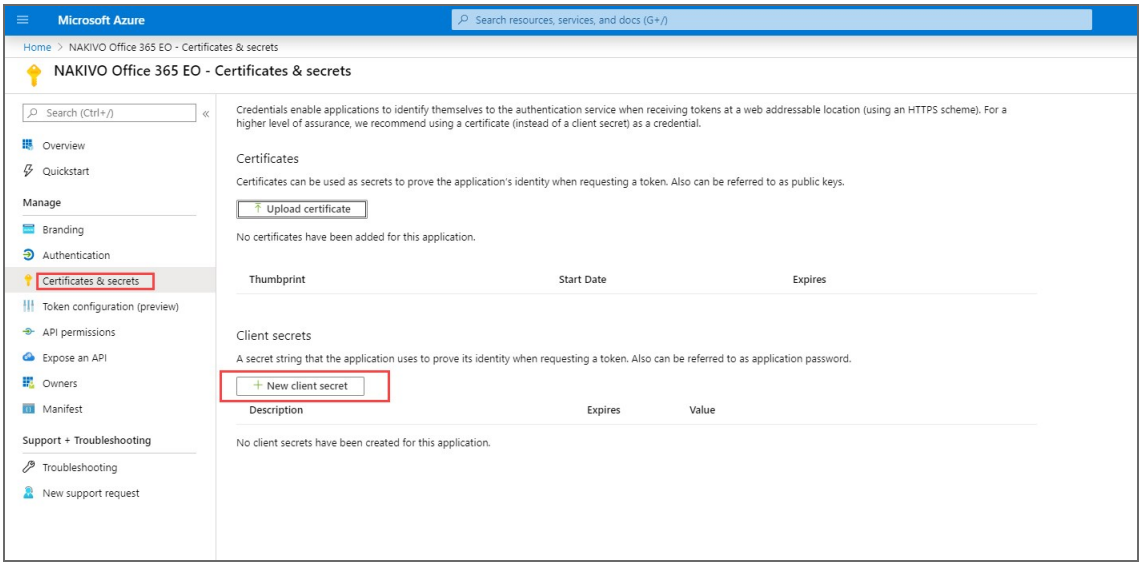
8. Click **Microsoft Graph**.
9. Click the **Application permissions** tab.
10. Provide the necessary API Permissions. Refer to Required API Permissions from Microsoft 365 for details.

    Notes

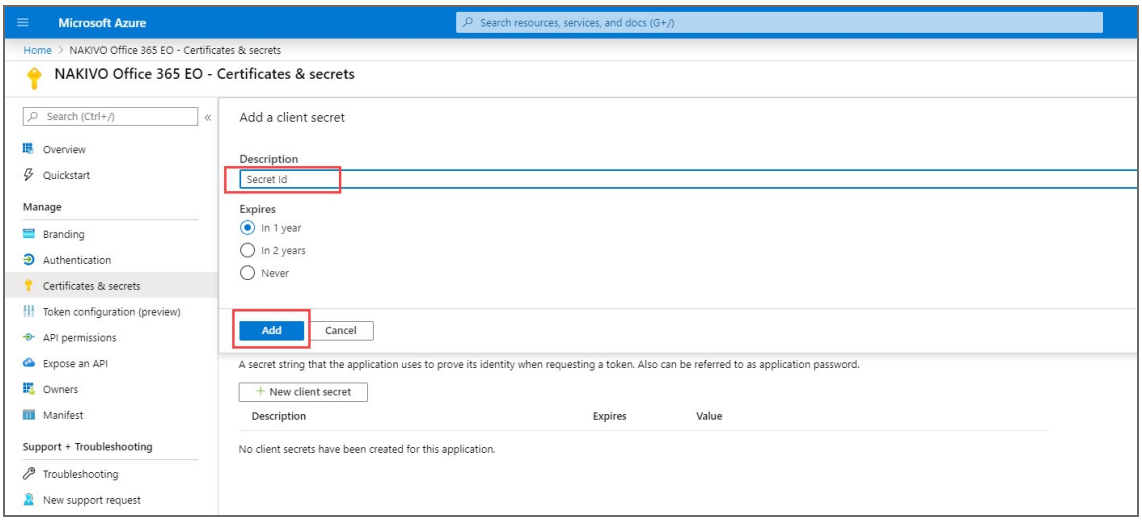
    - To skip discovering Exchange Online mailboxes, OneDrives or SharePoint sites in inventory, disable the API permissions for the corresponding service.
    - If the necessary Microsoft Exchange Online/OneDrive/Shaepoint API permissions are not provided, the corresponding service will not be discovered by NAKIVO Backup & Replication.
    - If the necessary API permissions for Microsoft Exchange Online contact and calendar items are not provided, the items will not be supported for backup and recovery operations.
    - To recover messages and contacts containing a lot of content, you also need to enable full_access_as_app for Office 365 Exchange Online in **APIs my organization uses**.
11. Click **Update Permissions**.



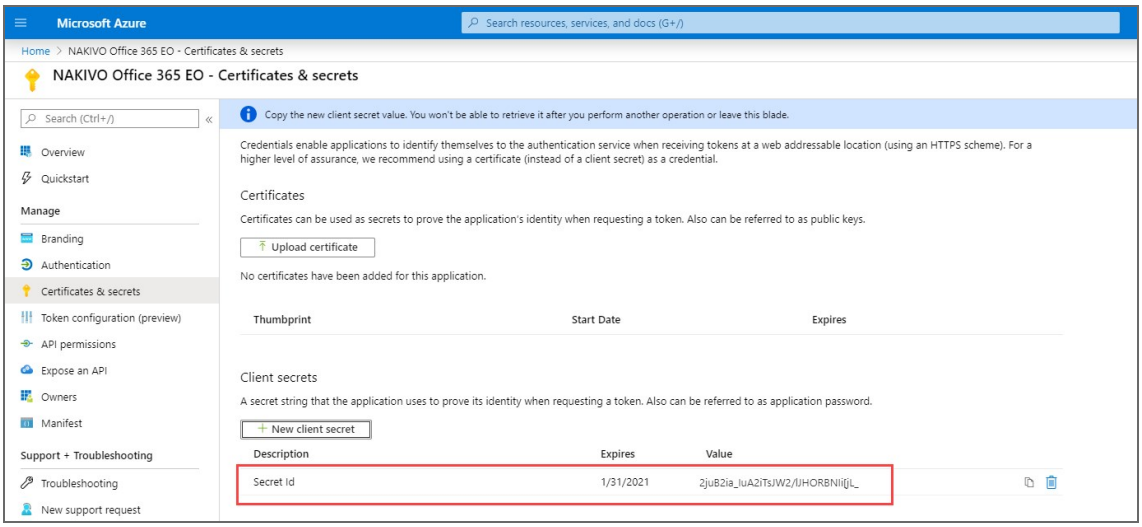
12. Click **Certificates & secrets > New client secret** to create a new client secret for your app.



13. Enter a description for the client secret, select the expiration period, and click **Add**.



The new **Client secret** is generated.



Make sure to save the client secret ID in a safe location. If you lose it, you will need to generate a new one.

Managing Inventory

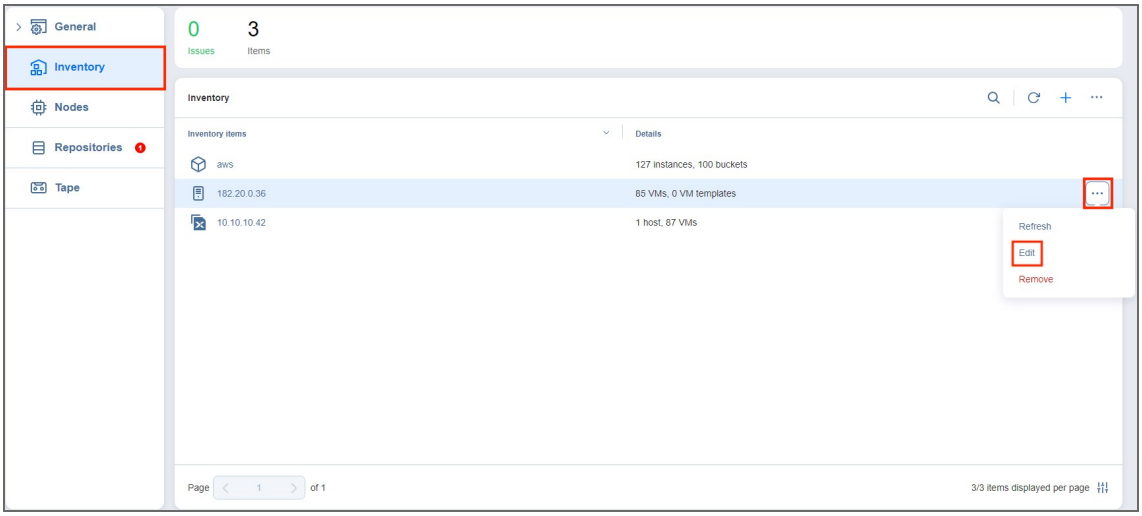
Refer to the following topics:

- “Editing Inventory Items” on page 322
- “Refreshing Inventory” on page 323
- “Removing Items from Inventory” on page 325

Editing Inventory Items

If the credentials of an inventory item are no longer correct, the connection to the inventory item will be lost. To re-establish a connection, update the required fields in the product by following the steps below:

1. Click **Settings** in the left pane of the product.
2. Go to the **Inventory** tab.
3. Hover over the item you would like to edit.
4. Click **Manage** on the right side and then click **Edit**.



5. Update the appropriate fields and click **Save**.

Refreshing Inventory

NAKIVO Backup & Replication keeps the information about the discovered infrastructure in its internal database, which is refreshed every 1 hour by default. During the inventory refresh, the product collects all required information about your virtual infrastructure, such as a list of hosts and VMs, their power state, and so on.

Only one item can be refreshed at a time. If you have added multiple items to the inventory, they will remain in the queue until they are able to be refreshed. Refer to the sections below to learn how to refresh the discovered infrastructure.

- Changing Inventory Refresh Frequency
- Manually Refreshing All Inventory
- Manually Refreshing a Discovered Item

Changing Inventory Refresh Frequency

1. Click **Settings** in the left pane of the product.
2. Go to the **System setting > Auto refresh** tab.
3. Do either of the following:
    - To prevent the product from automatically refreshing the inventory, deselect the **Refresh inventory every X [time period]** checkbox.
    - To change the inventory refresh frequency, enter a new value in the **Refresh inventory every X [time period]** field (from 1 to 60 minutes or from 1 to 24 hours).

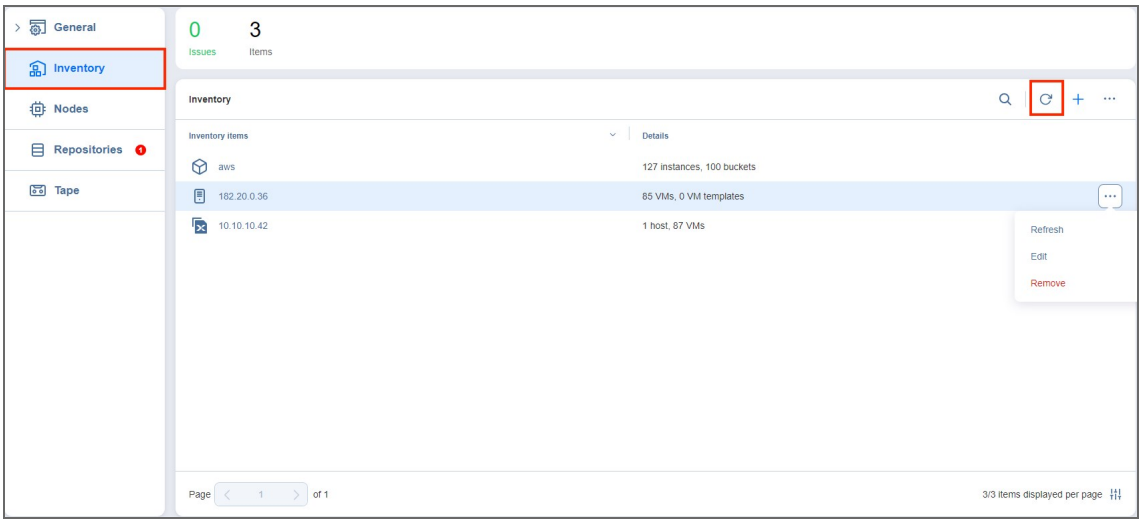
Note

New settings are applied instantly and do not need to be saved.

Manually Refreshing the Entire Inventory

To refresh all inventory items, follow the steps below:

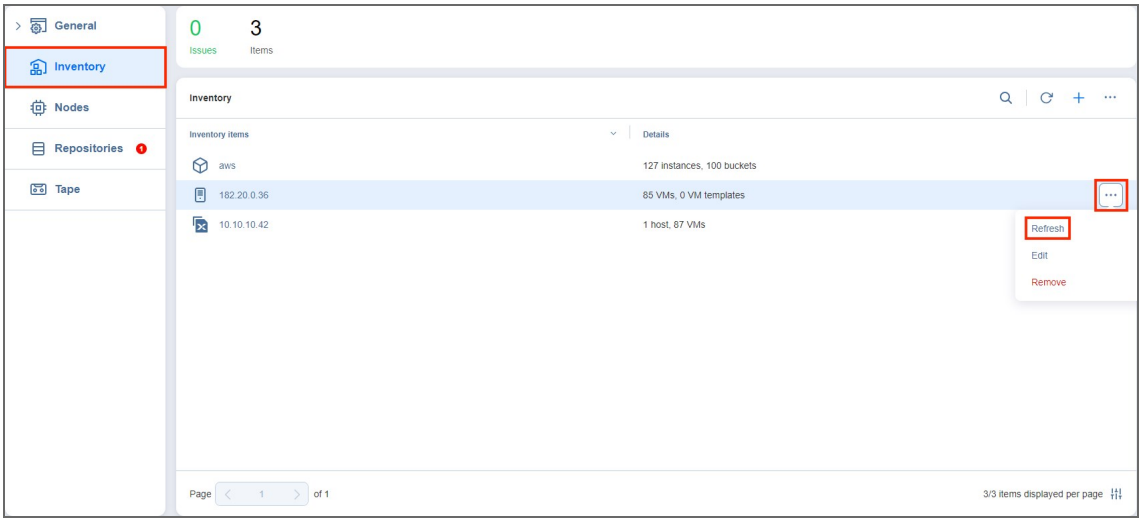
1. Click **Settings** in the left pane of the product and go to the **Inventory** tab.
2. Click the **Refresh All** button.



Manually Refreshing an Inventory Item

To refresh a single inventory item, follow the steps below:

1. Click **Settings** in the left pane of the product and go to the **Inventory** tab.
2. Click the ••• button next to the item that you would like to refresh.
3. Click **Refresh**.

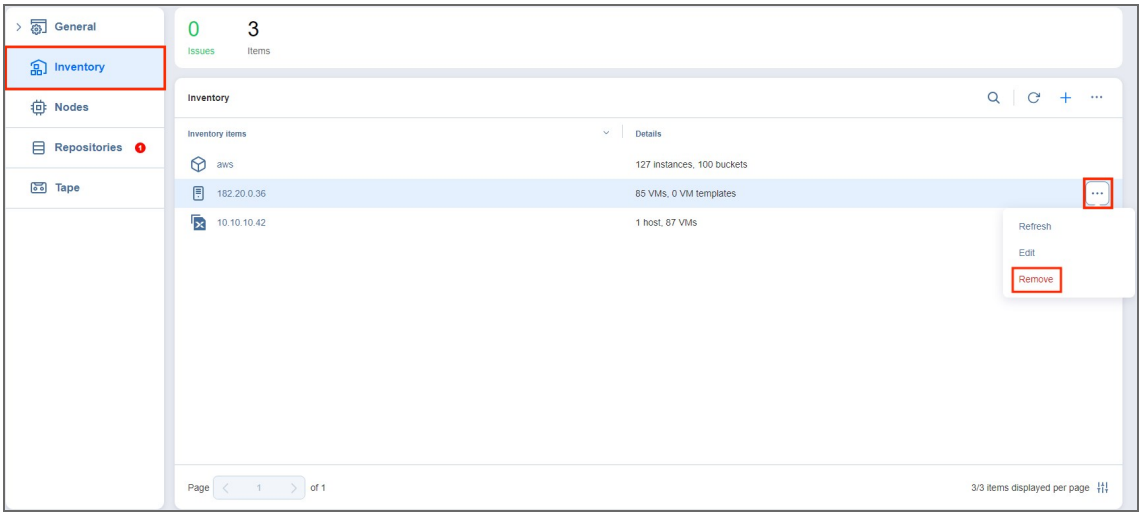


Removing Items from Inventory

You cannot remove an inventory item if there is at least one backup or replication job that uses the item or its children. In order to remove such items from the inventory, you first need to delete (or edit) the corresponding jobs so no VMs/Instances are backed up or replicated on the host/server/account being removed.

To remove an item from the inventory, follow the steps below:

1. Click **Settings** in the left pane of the product and go to the **Inventory** tab.
2. Hover over the item that you would like to remove from the inventory.
3. Click **Manage** on the right side and click **Remove**.



Managing Credentials

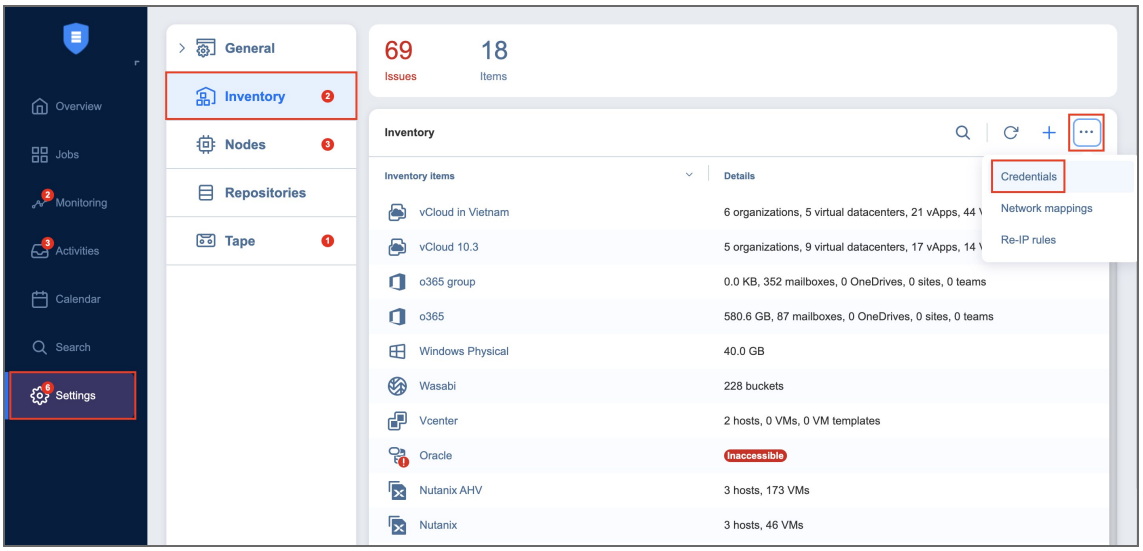
NAKIVO Backup & Replication provides you with the ability to store your OS login and password, Amazon EC2 instance private keys, and SSH keys to your Linux machines. Refer to the following topics:

- Adding Credentials
- Editing Credentials
- Deleting Credentials

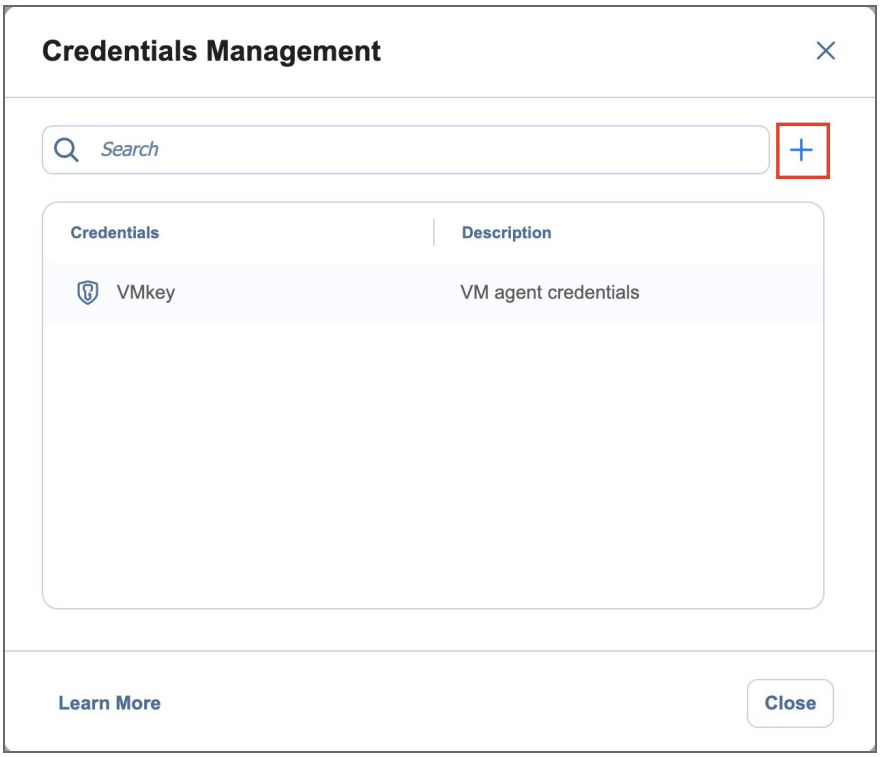
Adding Credentials

To add new credentials, do the following:

1. Click **Settings** in the left pane of the product.
2. Go to the **Inventory** tab.
3. Click **Manage**.
4. In the dialog box that opens, click **Credentials**.



5. In the **Manage Credentials** dialog box that opens, click **Add Credentials**.



6. Then, do the following:
   - **Type**: Select the type of credentials:
     - To set up a basic username and password, fill out the **Username**, **Password**, and (optionally) **Description** fields and click **Save**.
     - To set up a master password, select **Master password** from the drop-down list and fill out the **Name**, **Password**, and (optionally) **Description** fields and click Save.
     - To add a private key to an Amazon EC2 instance or a Linux physical machine, do the following:
       a. **Private key**: Select **Private Key** from the Type menu.
       b. **Username**: Enter a username for the private key.
       c. **Password**: Create a password for the private key.
       d. **Repeat password**: Repeat password.

          Note
          If you generated your key with a passphrase, you have to enter this passphrase into the **Password** and **Repeat password** boxes.

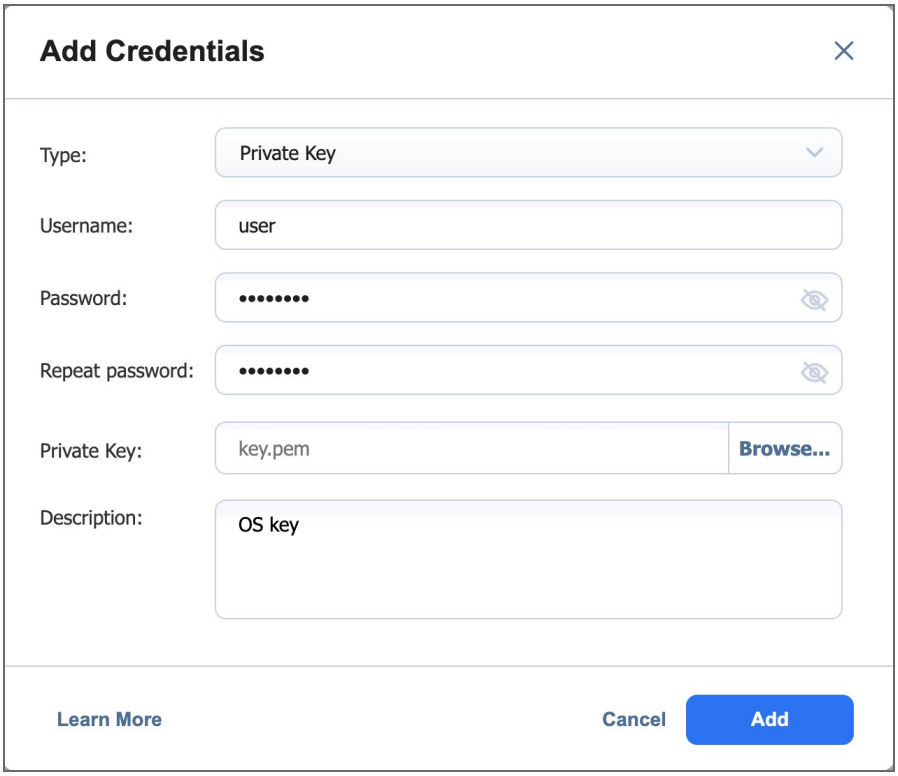
       e. Locate and select the private key.

          Note

- Supported key formats: RSA, DSA
- By default, newer versions of *ssh-keygen* generate keys with the unsupported *-----BEGIN OPENSSH PRIVATE KEY-----* format. To generate a key with the *-----BEGIN RSA PRIVATE KEY-----* format, include *-m PEM* in your *ssh-keygen* command.
- Supported file extensions: no extension, .pem, .key, .cer, .der, .txt

f. Fill out the **Description** box.

g. Click **Save**.

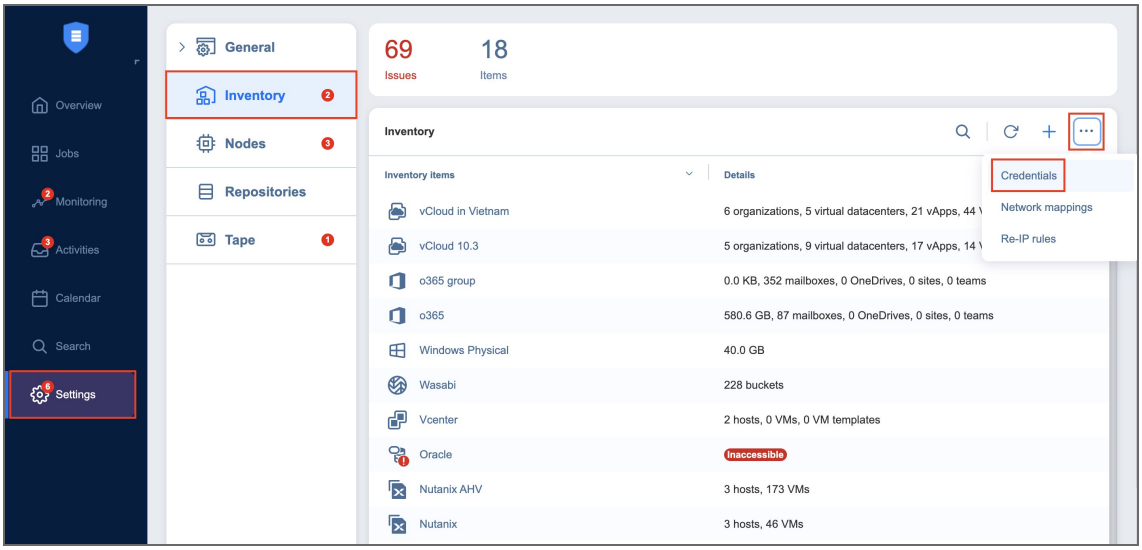


You can now assign the credentials while creating jobs or setting up VM agents.

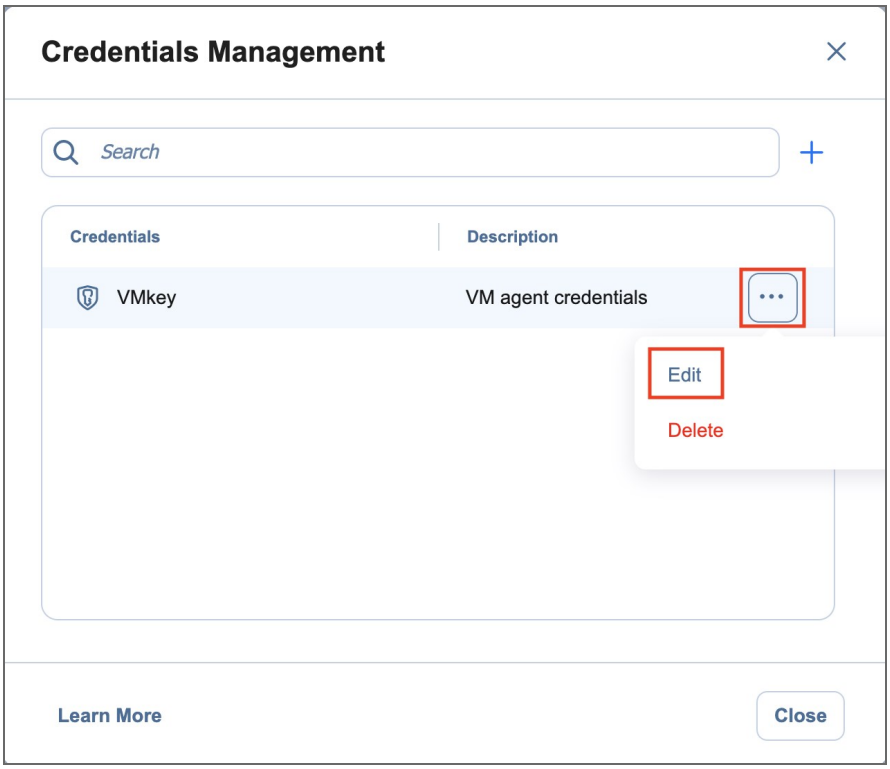
Editing Credentials

To edit credentials, do the following:

1. Click **Settings** in the left pane of the product.
2. Go to the **Inventory** tab.
3. Click **Manage**.
4. In the dialog that opens, click **Credentials**.



5. Hover over the record that you would like to edit and click **Manage > Edit**.

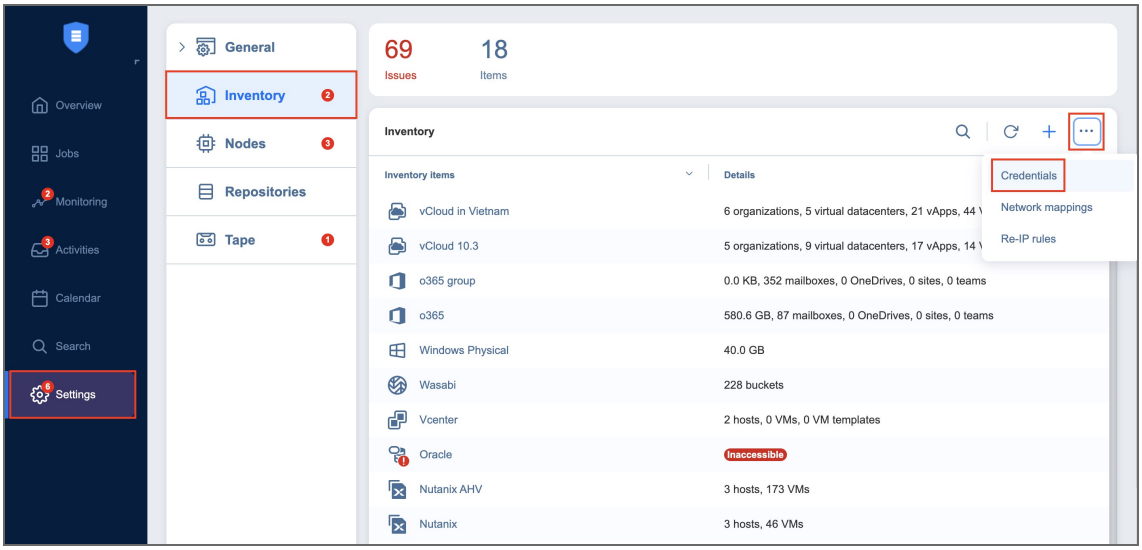


6. Make any required changes, and then click **Save**.

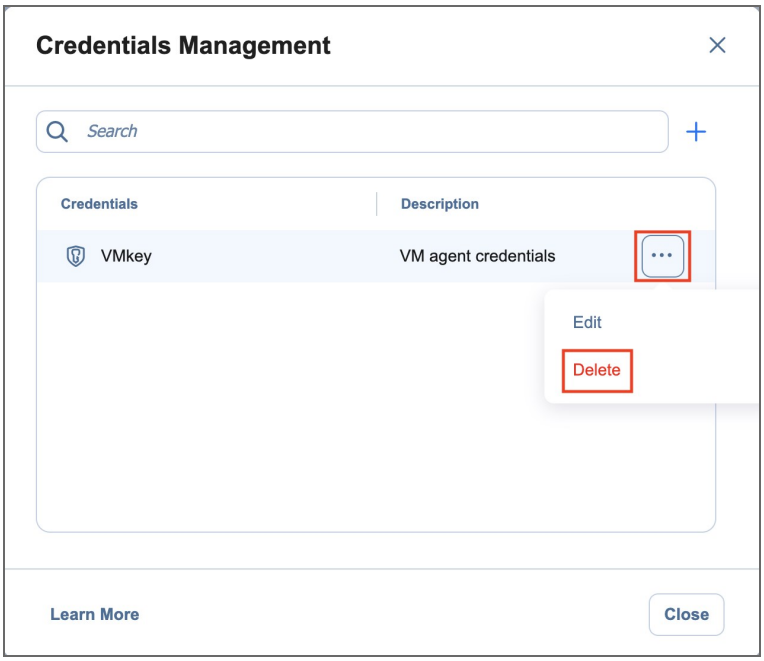
Deleting Credentials

To delete credentials, do the following:

1. Click **Settings** in the left pane of the product.
2. Go to the **Inventory** tab.
3. Click **Manage**.
4. In the dialog that opens, click **Credentials**.



5. Hover over the record that you would like to delete and click **Manage > Delete**.

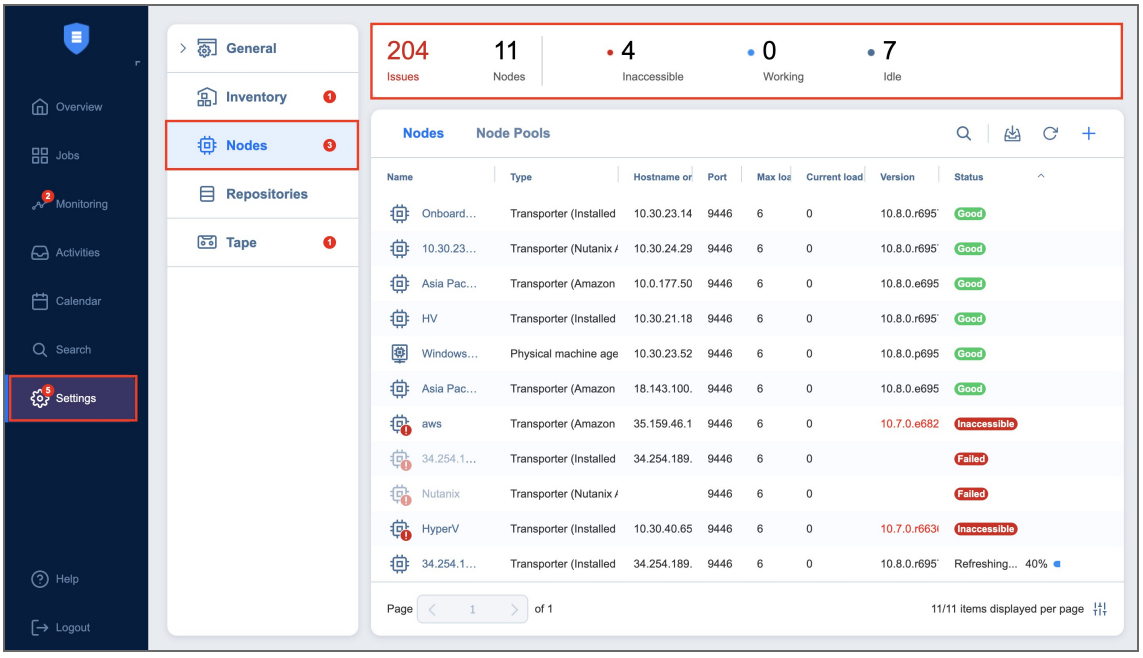


6. Click **Delete** in the confirmation dialog box that opens.

Nodes

Nodes are an essential component of NAKIVO Backup & Replication. They include Transporters, VM Agents, and Physical Machine Agents. The Transporter, for example, performs backup, replication, and recovery, as well as data compression, deduplication, and encryption. The **Nodes** tab contains a **Summary** bar, which offers an overview of all nodes. The data displayed is as follows:

- **Issues**: Total number of issues/alarms related to nodes
- **Nodes**: Total number of nodes
- **Inaccessible**: Total number of inaccessible nodes
- **Working**: Total number of working nodes
- **Idle**: Total number of idle nodes



To learn how to add nodes and manage them, refer to the topics below:

- “Configuring Nodes” below
- “Managing Nodes” on page 348

Configuring Nodes

Refer to the following topics:

- “Adding Existing Nodes” on the next page
- “Deploying Transporter as Nutanix AHV Appliance” on page 341
- “Deploying Transporter as VMware Appliance” on page 342
- “Deploying Transporters in Amazon EC2” on page 345

Adding Existing Nodes

After you have installed a Transporter or Agent, you need to add it to NAKIVO Backup & Replication so that the Transporter or Agent can be used for backup, replication, and recovery tasks.

Important

Before adding the existing Transporter to your NAKIVO Backup & Replication, make sure that this Transporter is not used by any other Director as it may lead to unforeseen errors.

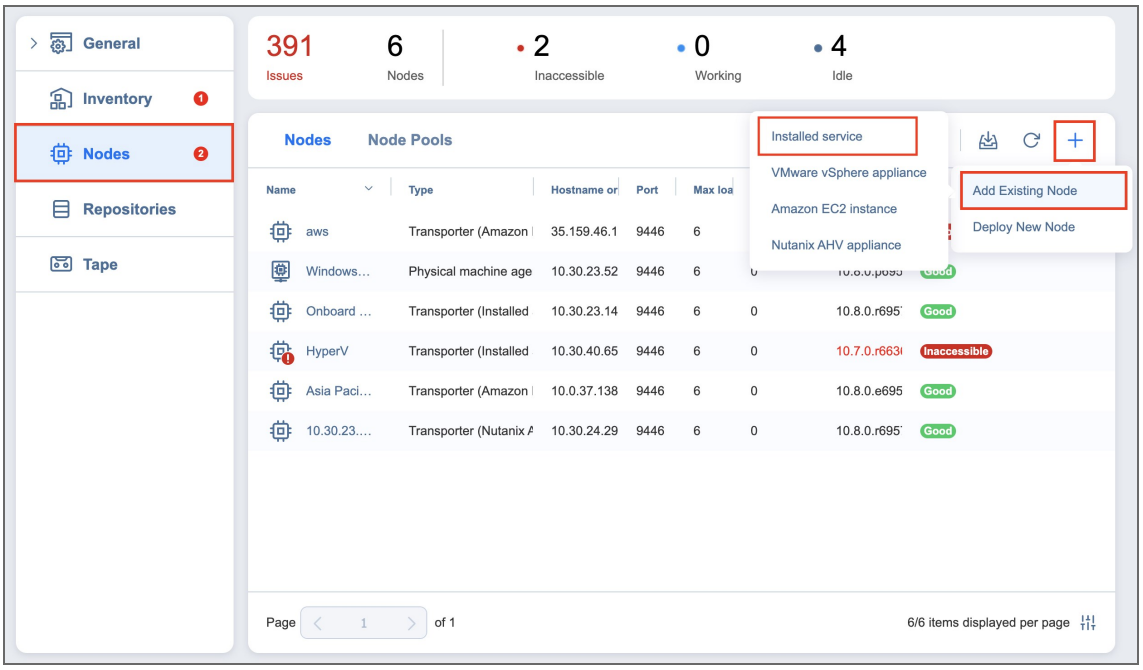
Refer to the following topics:

- Installed Service
- VMware Appliance
- Amazon EC2 Instance
- Nutanix AHV Appliance

Installed Service

Follow the steps below to add a node that is installed as a service:

1. Click **Settings** in the left pane of the product and go to the **Nodes** tab.
2. Click **Add Existing Node** and then click **Installed service**.



3. The **Add Existing Node - Installed Service** menu opens. In the **Hostname or IP** box, enter the IP address or hostname of the machine on which the node is installed.

   Note

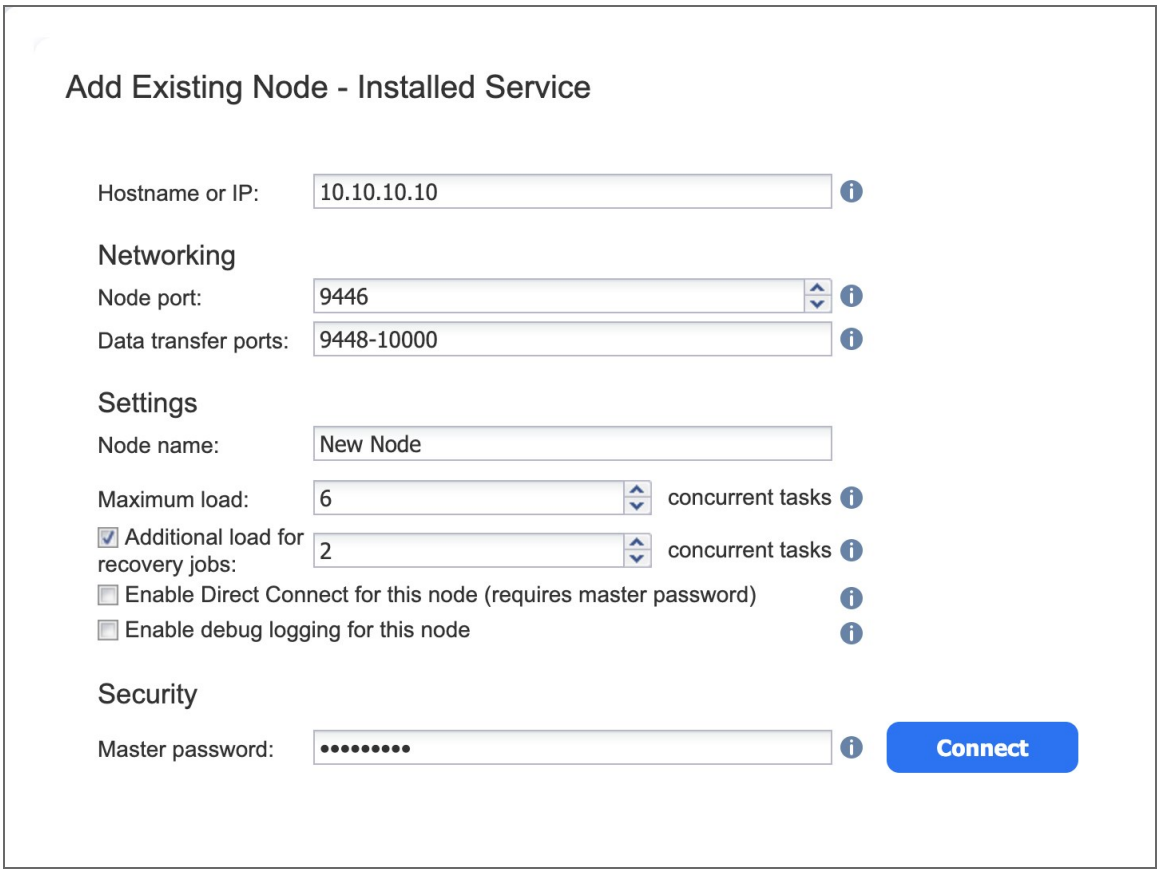
   If you are adding the node by a DNS name, make sure this DNS name can be resolved on the machines on which the Director and any other nodes (which you plan to use in conjunction with the current one) are installed.

4. Click **More options...** to reveal and edit the following fields:
   - In the *Networking* section:
     - **Node port**: Specify the port number that will be used to connect to the node.
     - **Data transfer ports**: Specify a range of port numbers (from 1 to 65535) that will be used to transfer data. The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.
   - In the *Settings* section:
     - **Node name**: Specify a display name for the node.
     - **Maximum load**: Specify the maximum number of tasks that the node should process simultaneously. A task, for example, is a backup or replication of a single VM disk, or one granular recovery session.
     - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to set maximum node load to be used for recovery jobs exclusively. This allows running the specified amount of concurrent recovery jobs along with other types of jobs without the need to wait for their completion.
     - **Enable Direct Connect for this node**: When this option is enabled, you can access remote resources via a single port connection without establishing a VPN connection. The following conditions must be met at the remote infrastructure to enable this feature:
       - A NAKIVO Transporter or Agent must be installed.
       - A master password must be set for security reasons. A pre-shared key is generated based on the entered master password.
       - The node port on the local machine must be exposed to external availability via the Internet.
     - **Enable debug logging for this node**: If needed, enable debug level logging for the current node. It is not recommended to use this option on a permanent basis.
   - In the *Security* section:

- **Master Password**: Optionally, you can set a password to secure the connection. The set password must match the one configured on the Transporter or Agent. Note that setting a master password is required when the **Enable Direct Connect for this node** option is enabled. Proceed as follows:
    a. After entering the password, click **Connect**.
    b. The **Certificate Details** dialog box appears. Verify the certificate details, and click **Accept**.

    Notes
    - The master password must adhere to the following requirements:
        - Minimal length - 5 characters.
        - Maximum length - 50 characters.
    - The master password can be set and re-set manually by running the command on the machine housing the Transporter or Agent. Follow these steps:
        - Enter the following command `bhsvc -b password`, replacing "password" with your master password.
        - Restart the Transporter or Agent.

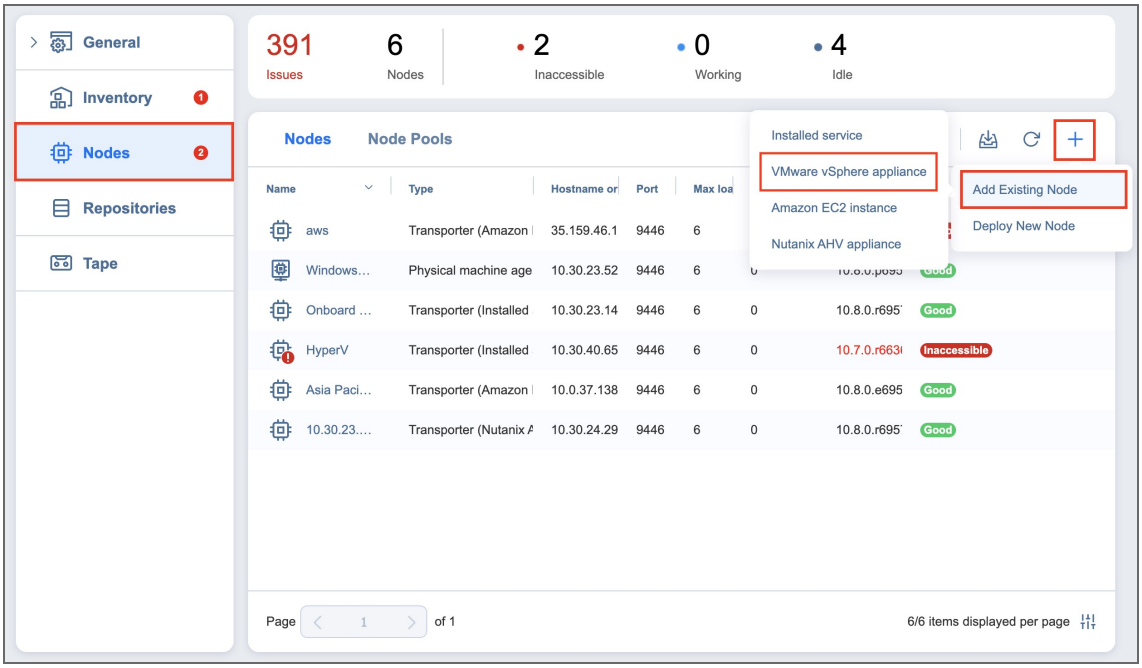
5. Click **Add**. The node is added to the product and can be used for backup, replication, and recovery jobs.



VMware Appliance

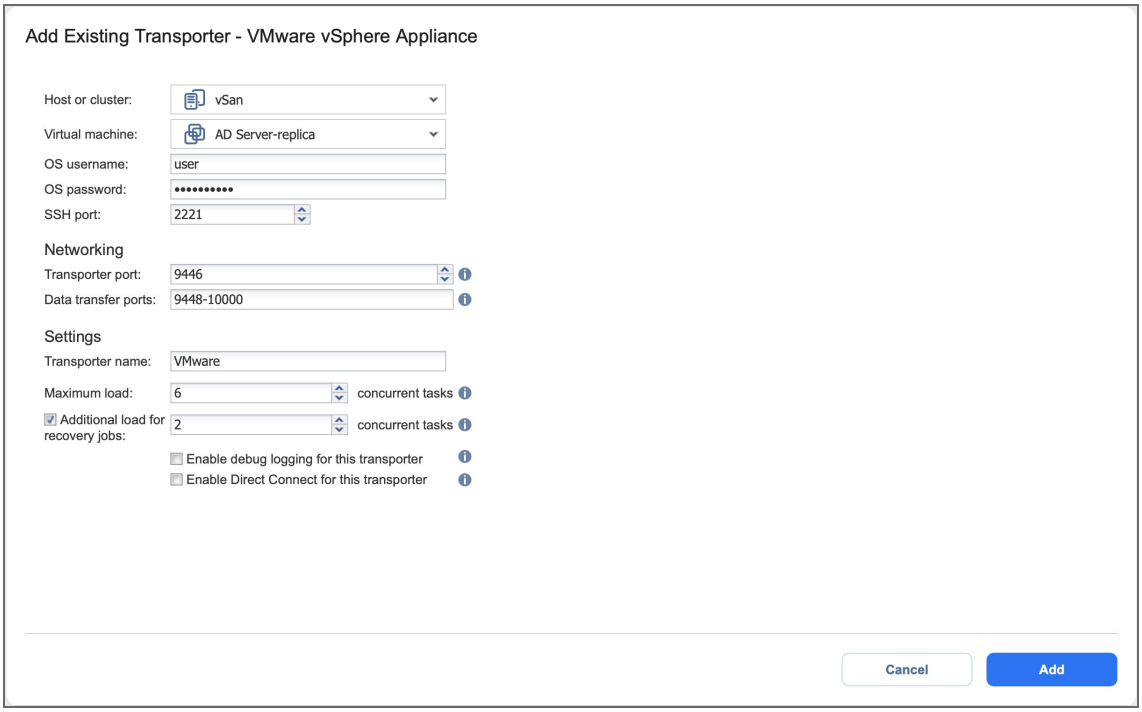
Follow the steps below to add a Transporter that is deployed as a VMware appliance:

1. Click **Settings** in the left pane of the product dashboard and go to the **Nodes** tab.
2. Click **Add Existing Node** and then click **VMware vSphere appliance** in the dialog that opens.



3. The **Add Existing Transporter - VMware vSphere Appliance** dialog opens. Fill out the fields as described below:
    - In the **Host or cluster** box, specify the location of the host or cluster where the corresponding virtual machine is deployed.
    - In the **Virtual machine** box, specify the virtual machine on which the Transporter is installed.
    - In the **OS Username** and **OS Password** fields, specify credentials for accessing the virtual machine.
    - In the **SSH port** box, enter the SSH port if needed.
    - Click **More options** to reveal and edit the following fields:
        - In the *Networking* section:
            - **Transporter port**: Specify the port number that will be used to connect to the Transporter.
            - **Data transfer ports**: Specify a range of port numbers (from 1 to 65535) that will be used to transfer data. The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.
        - In the *Settings* section:
            - **Transporter name**: Specify a display name for the Transporter.
            - **Maximum load**: Specify the maximum number of tasks that the Transporter should process simultaneously. A task, for example, is a backup or replication of a single VM disk, or one granular recovery session.
            - **Additional load for recovery jobs**: Selecting this option reserves the Transporter's resources exclusively for recovery jobs. This allows you to run recovery jobs concurrently with other types of jobs without the need to wait for their completion. The Transporter resources will be reserved according to the specified number.
            - **Enable debug logging for this transporter**: If needed, enable debug level logging for the current transporter. It is not recommended to use this option on a permanent basis.
            - **Enable Direct Connect for this transporter**: When this option is enabled, you can access remote resources via a single port connection without establishing a VPN connection. The following conditions must be met at the remote infrastructure to enable this feature:
                - A NAKIVO Transporter must be installed.
                - A master password must be set for security reasons. A pre-shared key is generated based on the entered master password.
                - The Transporter port on the local machine must be exposed to external availability via the Internet.

4. Click **Add**. The Transporter is added to the product and can be used for backup, replication, and recovery jobs.

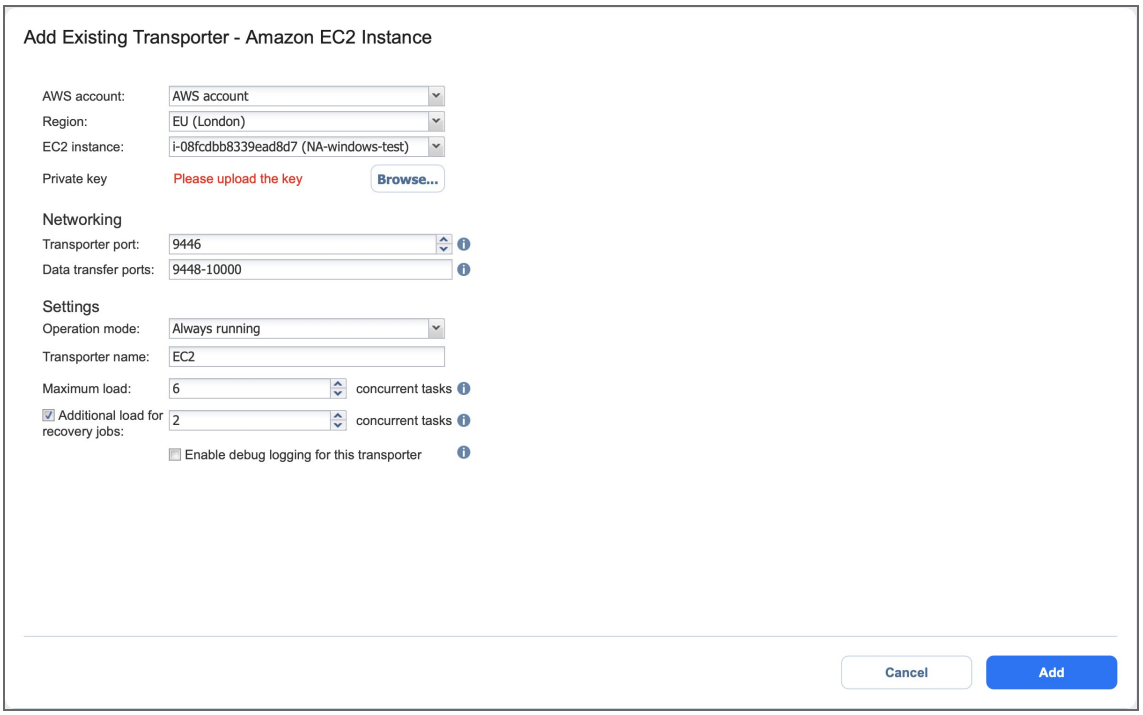


Amazon EC2 Instance

If you have already deployed a Transporter in Amazon EC2 and now wish to re-import the Transporter in a new instance of NAKIVO Backup & Replication, do the following:

1. Click **Settings** in the left pane of the product and go to the **Nodes** tab.
2. Click **Add Existing Node** and then click **Amazon EC2 instance** in the pop-up that opens.

3. The **Add Existing Transporter - Amazon EC2 Instance** dialog opens. Fill out the fields as described below:
    - **AWS account**: Choose an appropriate Amazon AWS Account from the list of Amazon AWS Accounts added to the Inventory.
    - **Region**: Choose a region in which an AWS EC2 instance with the Transporter is deployed.
    - **EC2 Instance**: Select the Amazon EC2 Instance with the Transporter that you wish to add to the product.
    - **Private key**: Click the **Browse** button to locate and upload the Private key for the Transporter Instance that was created when you deployed the Transporter in the cloud.
    - Click **More options** to reveal and edit the following fields:
        - In the *Networking* section:
            - **Transporter port**: Specify the port number that will be used to connect to the Transporter.
            - **Data transfer ports**: Specify a range of port numbers (from 1 to 65535) that will be used to transfer data. The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.
        - In the *Settings* section:
            - **Operation mode**: Choose one of the following Transporter operation modes:
                - **Always running**
                - **Running while required**
            - **Transporter name**: Specify a display name for the Transporter.
            - **Maximum load**: Specify the maximum number of tasks that the Transporter should process simultaneously. A task, for example, is a backup or replication of a single VM disk, or one granular recovery session.
            - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to set maximum transporter load to be used for recovery jobs exclusively.
            - **Enable debug logging for this Transporter**: If needed, enable debug level logging for the current transporter. It is not recommended that you use this option on a permanent basis.
4. Click **Add**. The Transporter is added to the product and can be used for backup, replication, and recovery jobs.



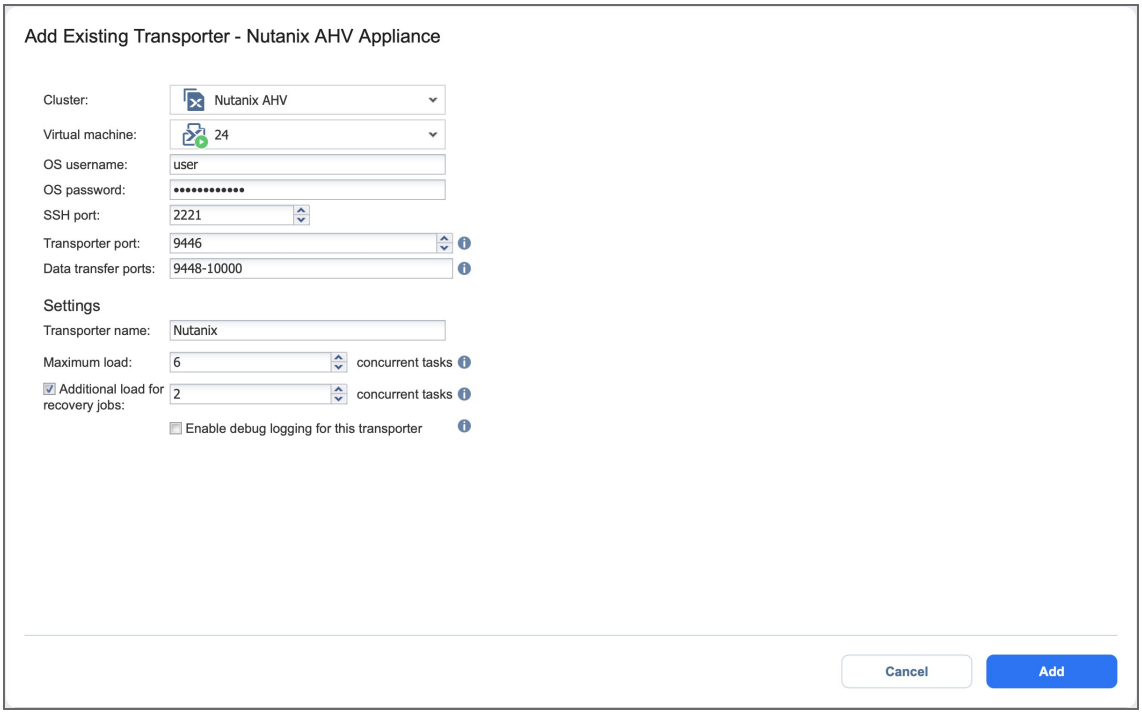
Nutanix AHV Appliance

Follow the steps below to add a Transporter that is deployed as a Nutanix AHV appliance:

1. Click **Settings** in the left pane of the product and go to the **Nodes** tab.
2. Click **Add Existing Node** and then select **Nutanix AHV appliance**.

3. In the **Add Existing Transporter - Nutanix AHV Appliance** dialog, enter the following options:
    - In the **Cluster** box, select the cluster where the corresponding virtual machine is deployed.
    - In the **Virtual machine** box, specify the virtual machine on which the Transporter is installed.

- In the **OS Username** and **OS Password** fields, specify credentials for accessing the virtual machine.
- In the **SSH port** box, enter the SSH port if needed.
- Click **More options** to reveal and edit the following fields:
    - In the *Networking* section:
        - **Transporter port**: Specify the port number that will be used to connect to the Transporter.
        - **Data transfer ports**: Specify a range of port numbers (from 1 to 65535) that will be used to transfer data. The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.
    - In the *Settings* section:
        - **Transporter name**: Specify a display name for the Transporter.
        - **Maximum load**: Specify the maximum number of tasks that the Transporter should process simultaneously. A task, for example, is a backup or replication of a single VM disk, or one granular recovery session.
        - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to set maximum transporter load to be used for recovery jobs exclusively.
        - **Enable debug logging for this Transporter**: If needed, enable debug level logging for the current transporter. It is not recommended that you use this option on a permanent basis.



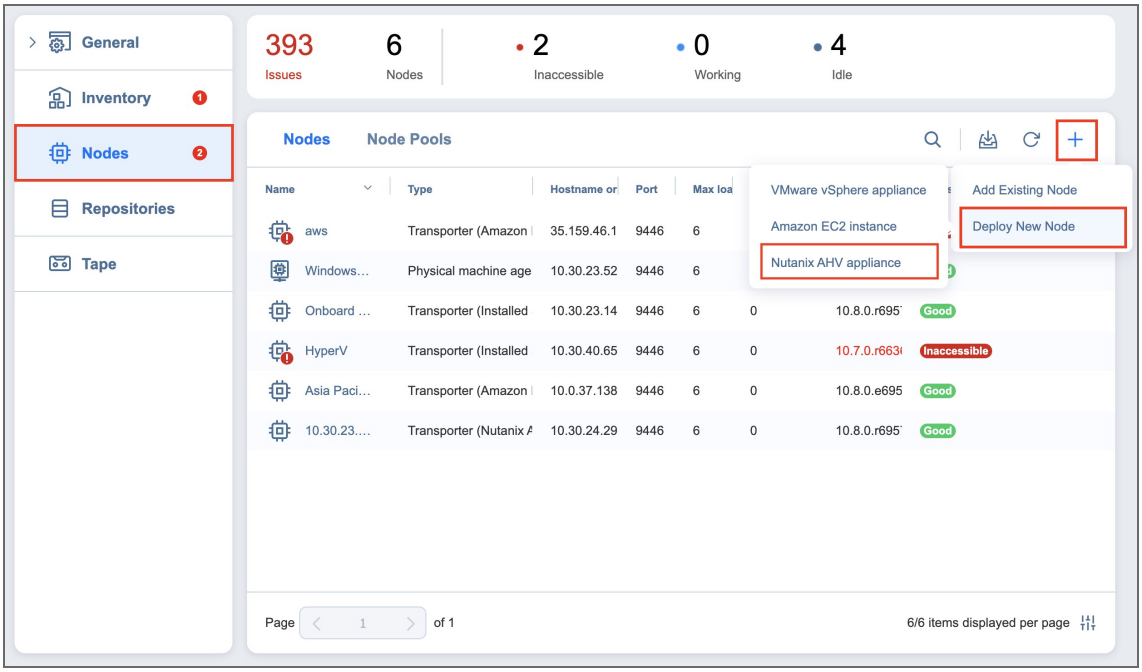
4. Click **Add**. The Transporter is added to the product and can be used for backup, replication, and recovery jobs.

Deploying Transporter as Nutanix AHV Appliance

To enable NAKIVO Backup & Replication to create and run jobs within a Nutanix AHV cluster, a dedicated Transporter must be deployed as a Nutanix appliance in that cluster.

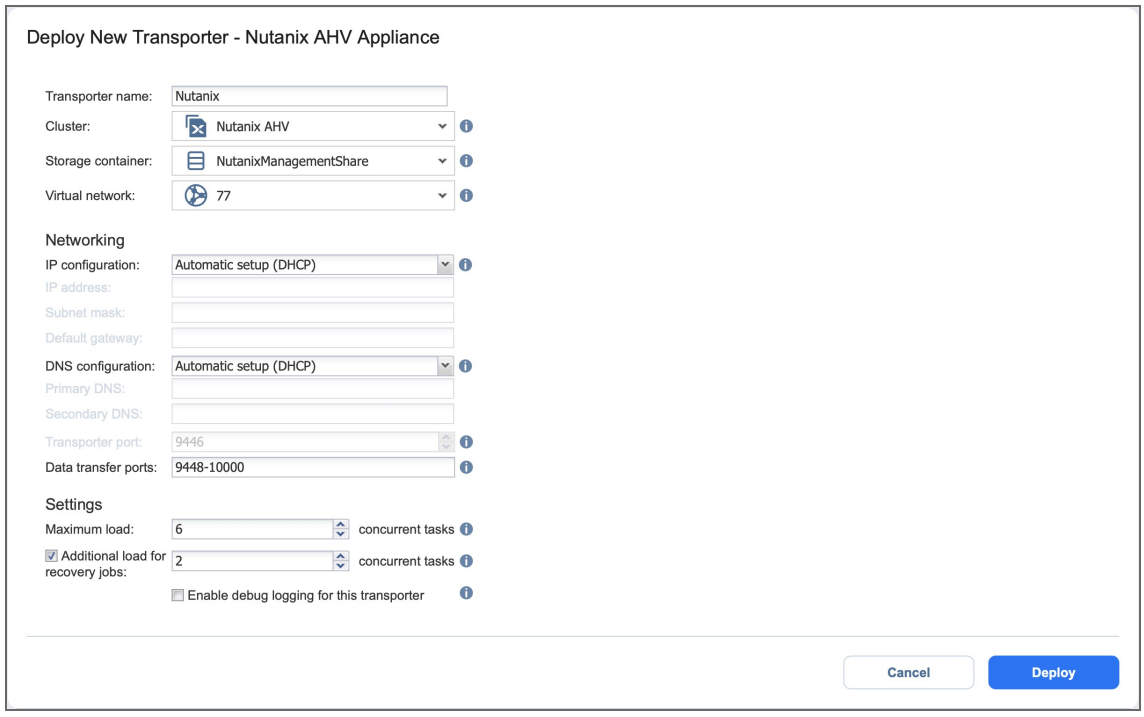
Please follow the steps below to add a transporter as a Nutanix appliance:

1. Go to the **Settings** > **Nodes** tab and click **Deploy New Node**.
2. In the dialog that opens, click **Nutanix AHV appliance**.



3. In the **Deploy New Transporter - Nutanix AHV Appliance** dialog, specify the following options:
   - **Transporter name**: Enter a name for the new Transporter.
   - **Cluster**: Select a cluster where the transporter VM will run.
   - **Storage container**: Select a storage container where the transporter VM will be located.
   - **Virtual network**: Select a virtual network where the transporter VM will be connected.
4. Click **Deploy** to proceed with the automatically selected networking options and default Transporter load configuration.
5. Alternatively, click **More options** if you wish to manually set the following options:
   - **IP configuration**: Can be either **Automatic setup (DHCP)** or **Manual setup**. With manual setup selected, specify an **IP address**, **Subnet mask** and **Default gateway**.
   - **DNS configuration**: Can be either **Automatic setup (DHCP)** or **Manual setup**. With manual setup selected, specify **Primary** and **Secondary DNS**.
   - **Transporter port**: Enter a communication port for your Transporter.

- **Data transfer ports**: Enter a port range that will be used by your Transporter for actual data transfer.
- **Maximum load**: Specify the maximum number of tasks that the Transporter should process simultaneously. A task, for example, is a backup or replication of a single VM disk, or one granular recovery session.
- **Additional load for recovery jobs**: If selected, the specified quantity of tasks will be added to set the maximum Transporter load to be used for recovery jobs exclusively. This allows for running the specified amount of concurrent recovery jobs along with other types of jobs without the need to wait for their completion.
- **Enable debug logging for this transporter**: If needed, enable debug level logging for the current transporter. Using this option on a permanent basis is not recommended.



6. Click **Deploy** to begin the deployment process. Successfully deployed Transporters are displayed in the **Transporters** tab.

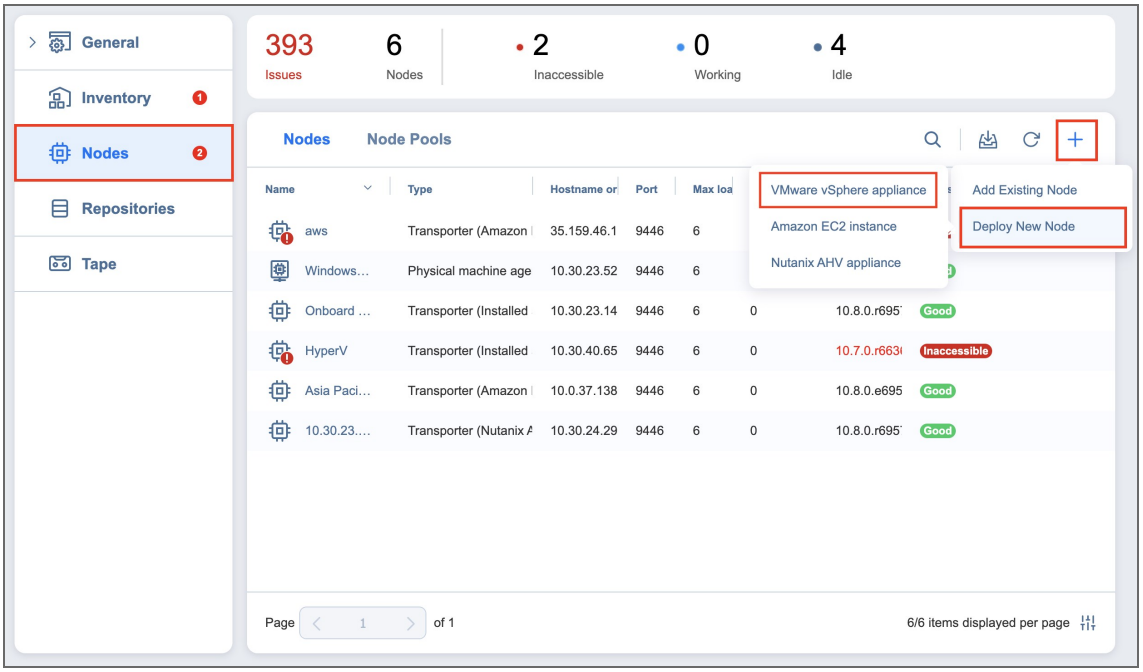
Deploying Transporter as VMware Appliance

Note

If your instance of NAKIVO Backup & Replication is installed on ARM-based NAS, an external Transporter needs to be deployed to work with VMware vCenters and ESXi hosts. This is because certain features are not supported by ARM-based NASes.

Please follow the steps below to deploy a Transporter that supports VMware vCenter:

1. Go to the **Settings** > **Nodes** tab and click **Deploy New Node**.
2. In the dialog that opens, click **VMware vSphere appliance**.



3. In the **Deploy New Transporter - VMware vSphere Appliance** dialog that opens, proceed as follows:
   - **Transporter name**: Enter a name for your Transporter.
   - **Host or cluster**: Select a target host or cluster.
   - **Datastore**: Select a target datastore.
   - **Virtual network**: Select a target virtual network.

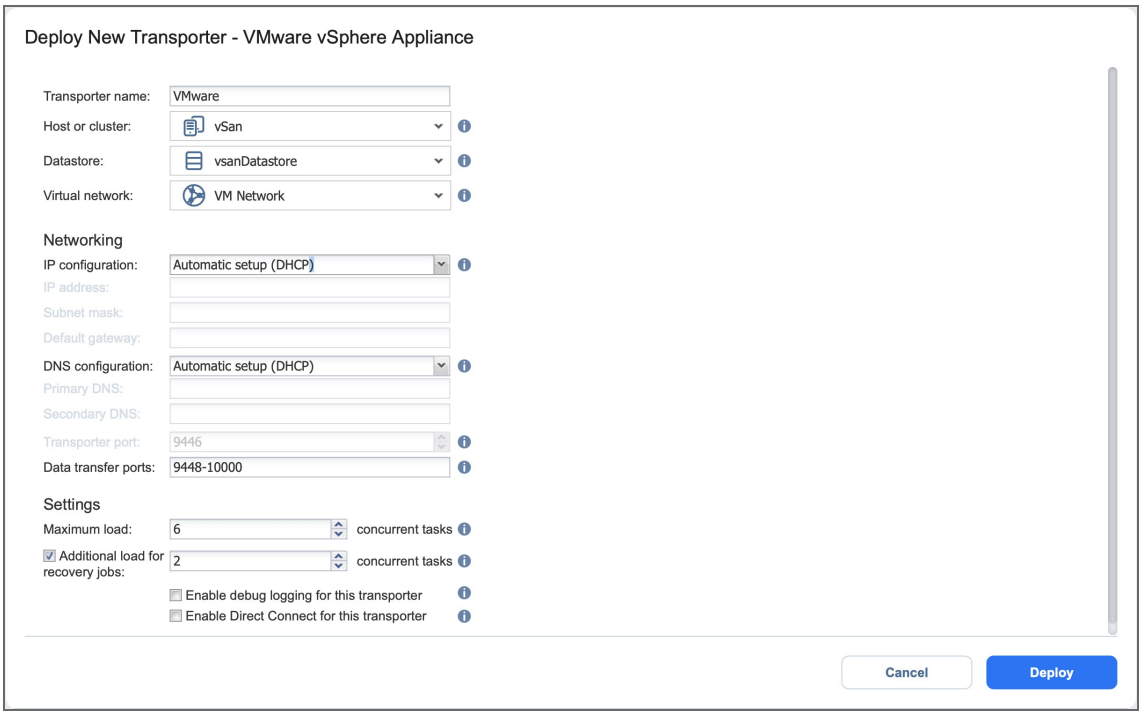
     Note

     An internet connection is required to deploy a new Transporter as a VMware appliance on the target host or cluster.
   - If necessary, access the advanced options for your Transporter by clicking **More options** and then entering data for the following parameters:
     - In the *Networking* section:
       - **IP configuration**: It can be either **Automatic setup (DHCP)**, or **Manual setup**.
       - **IP address**: If you have chosen **Manual setup** for the IP configuration, enter a Transporter IP address.
       - **Subnet mask**: If you have chosen **Manual setup** for the **IP configuration**, enter a subnet mask.
       - **Default gateway**: If you have chosen **Manual setup** for the **IP configuration**, enter a default gateway.
       - **DNS configuration**: It can be either **Automatic setup (DHCP)**, or **Manual setup**.

- **Primary DNS**: If you have chosen **Manual setup** for the **DNS configuration**, enter a primary DNS server IP address.
- **Secondary DNS**: If you have chosen **Manual setup** for the **DNS configuration**, enter a secondary DNS server IP address.
- **Transporter port**: Enter a communication port for your transporter.
- **Data transfer ports**: Enter a port range that will be used by your transporter for actual data transfer.

- In the *Settings* section:
  - **Maximum load**: A number of tasks concurrently processed by the Transporter.
  - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to set maximum transporter load to be used for recovery jobs exclusively. This allows for running the specified amount of concurrent recovery jobs along with other types of jobs without the need to wait for their completion.
  - **Enable debug logging for this transporter**: When selected, it enables debug level logging for the Transporter. It is not recommended to have this option selected on a permanent basis.
  - **Enable Direct Connect for this transporter**: When this option is enabled, you can access remote resources via a single port connection without establishing a VPN connection. The following conditions must be met at the remote infrastructure to enable this feature:
    - A NAKIVO Transporter must be installed.
    - A master password must be set for security reasons. A pre-shared key is generated based on the entered master password.
    - The Transporter port on the local machine must be exposed to external availability via the Internet.

4. Click **Deploy** to confirm deploying the Transporter.



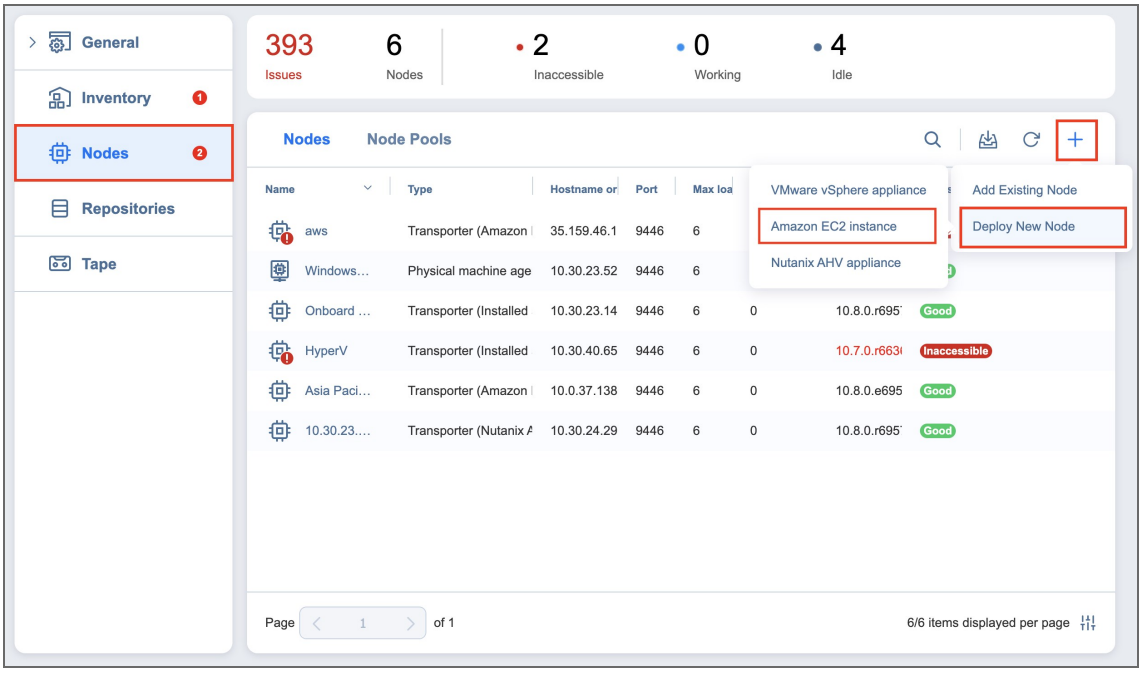
Deploying Transporters in Amazon EC2

You need to deploy a Transporter in Amazon EC2 to enable the following features:

- Backing up VMware VMs and/or Amazon EC2 Instances to a backup repository located in Amazon EC2.
- Backing up Amazon EC2 Instances in a particular Amazon EC2 Region.

NAKIVO Backup & Replication automates deploying a Transporter in Amazon EC2. To deploy a Transporter in Amazon EC2 within the product interface, follow the steps below:

1. Click **Settings** in the left pane of the product and go to the **Nodes** tab.
2. Click **Deploy New Node** and click **Amazon EC2 instance** in the resulting drop-down list.



3. The **Deploy New Transporter - Amazon EC2 Instance** dialog opens. Fill out the fields as described below:
    - **Transporter name**: Enter a name for the Transporter.
    - **Region**: Select an Amazon EC2 region where you wish to deploy the Transporter. This will enable you to create a backup repository in the region as well as back up Amazon EC2 Instances available in the region.
    - **Instance type**: Choose a type of Amazon EC2 Instance (for example, "t2.medium") that will be used to deploy the Transporter. Note that more powerful Instances may be able to process data faster, but will cost more to run on Amazon EC2.

      Note

      ARM-based instances cannot be selected if you have chosen **Windows** for the **Platform** option.

    - Click **More options** to reveal and edit the following options:
        - In the *Networking* section:
            - **Automatically configure VPC for this transporter**: If selected, a new VPC with a single public subnet will be created and used to deploy this transporter. If you want to deploy the Transporter into a different VPC and subnet, deselect this option.
                - **Network**: Select a network to which the Amazon EC2 instance with the Transporter will be connected.
                - **Subnet**: Select a subnet for the Amazon EC2 Instance with the Transporter.

- **Allowed traffic from**: Enter the IP addresses of the machines that can connect to the Amazon EC2 instance with the Transporter. Access from other IP addresses will be restricted.

  Important

  By default, the Amazon EC2 security group is not restricted; that is, the Transporter can be accessed by and receive tasks from any machine. For security purposes, restrict traffic to trusted IP addresses.
- **Transporter Port**: Specify the port number that will be used to connect to the Transporter.
- **Data transfer ports**: Specify a range of port numbers (from 1 to 65535) that will be used to transfer data. The range you specify should contain at least 100 ports. Make sure that the ports you specify are open in your firewall.

- In the *Settings* section:
  - **Operation mode**: If you select the **Running while required** option, the Amazon EC2 Instance with the Transporter will be powered on only when the Transporter is required to run a backup, replication, and recovery tasks.
  - **Platform**: Choose an OS for the instance where the Transporter will be deployed.

    Note

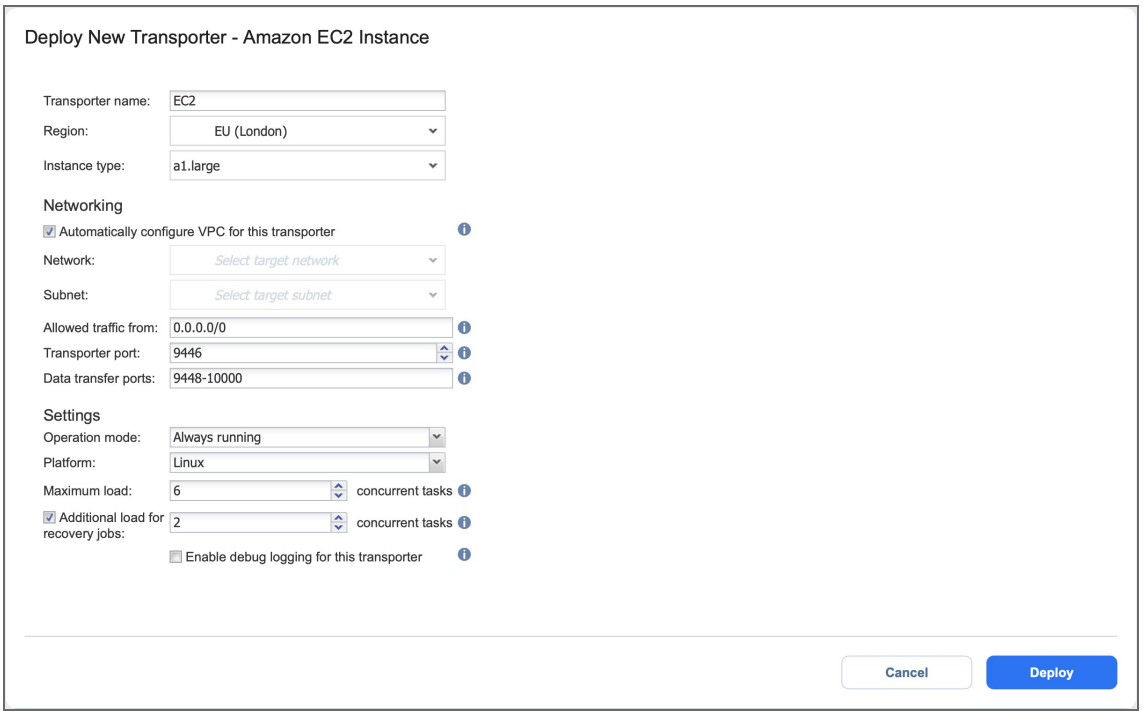
    Windows OS is not supported for ARM-based instances.

  - **Maximum load**: Specify the maximum number of tasks that the Transporter should process simultaneously. An example of a task is processing a single VM disk or a single file recovery session.
  - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to set the maximum Transporter load to be used for recovery jobs exclusively. This allows for running the specified quantity of concurrent recovery jobs along with other types of jobs without the need to wait for their completion.
  - **Enable debug logging for this Transporter**: Enables debug level logging for the current Transporter. Since this feature slows down Transporter performance, it is recommended that you enable debug logging only for the investigation of support issues.

Note

Refer to "Amazon EC2 Concepts" on page 20 for the definitions of Amazon EC2-related terms.

4. Click **Deploy**.



Note

- After deploying a Transporter in Amazon EC2, you need to download the Transporter Key. A Transporter Key is used by NAKIVO Backup & Replication to access and manage the Transporter in Amazon EC2. If you lose the current instance of NAKIVO Backup & Replication and install a new copy of the product, you will need to provide the Transporter Key to access the Transporter.
- You may be additionally charged for using a 3rd-party resource. Please refer to the 3rd-party resource provider documentation for details.

Managing Nodes

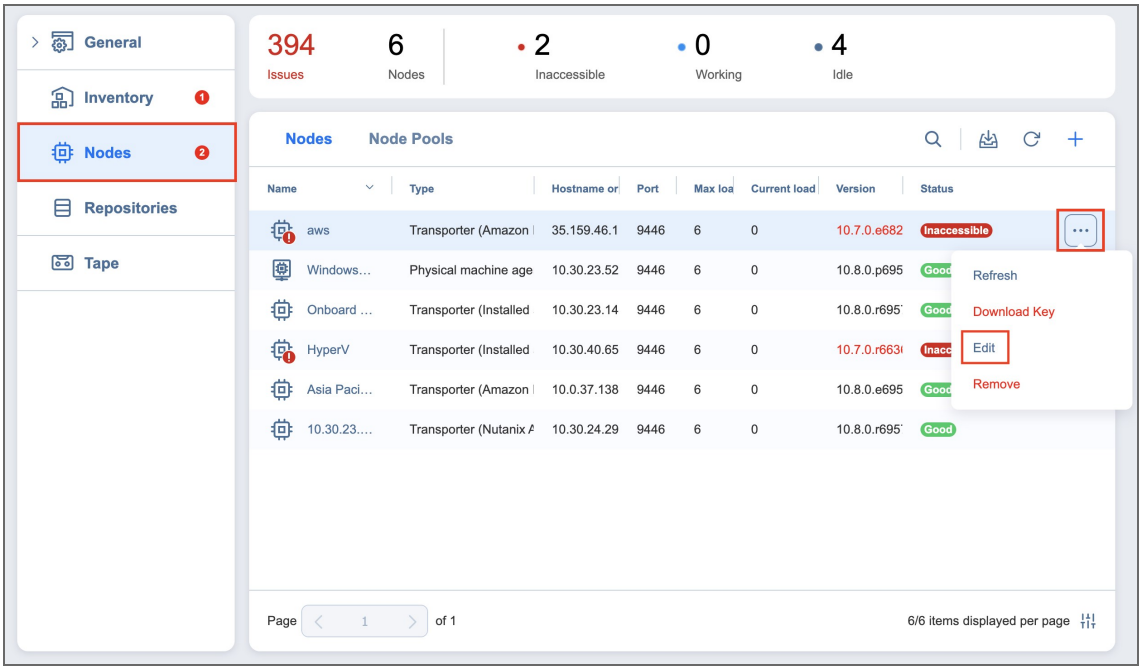
Refer to the following topics:

- “Editing Nodes” below
- “Downloading Transporter Credentials” on page 350
- “Managing Node Pools” on page 351
- “Refreshing Node Details” on page 352
- “Removing (Deleting) Nodes” on page 353

Editing Nodes

To modify the settings of an existing node, follow the steps below:

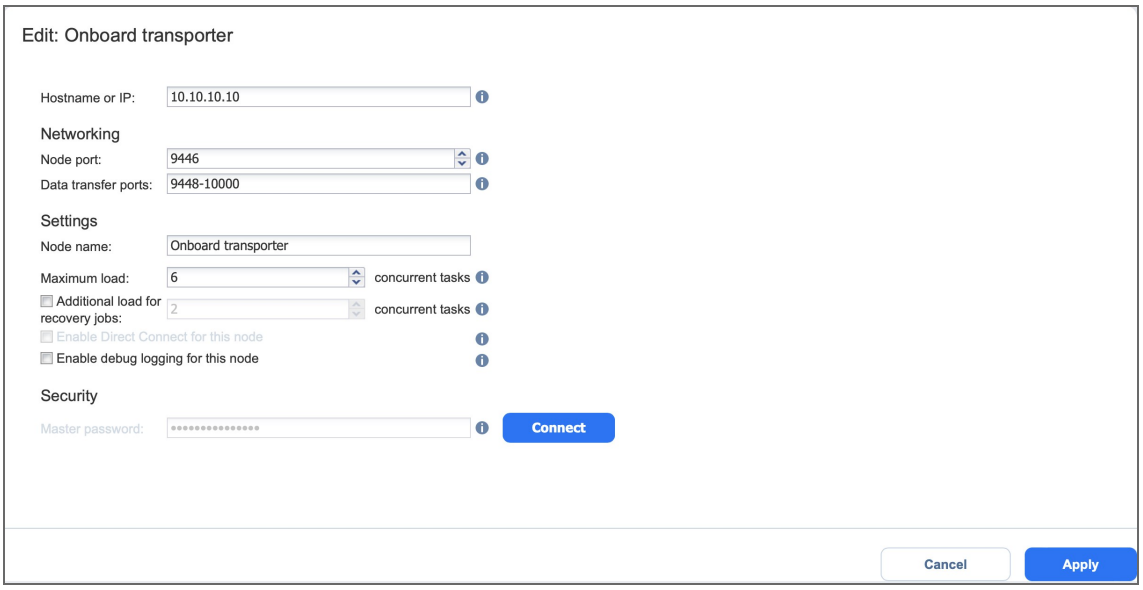
1. Click **Settings** in the left pane of the product.
2. Go to the **Nodes** tab and hover over the node you would like to edit.
3. On the right side, click the ellipsis **Manage** button and then click **Edit**.



4. A dialog opens for editing the node's settings. Edit the settings as required:
    - **Hostname or IP**: Here you can edit the IP address or hostname of the machine on which the node is installed. Not applicable to Nutanix AHV Appliances, VMware vSphere appliances, or Amazon EC2 instances.
        - In the *Networking* section:
            - If editing a Nutanix AHV Appliance, VMware vSphere appliance, or Amazon EC2 instance, you can edit the following options:
                - **OS username**: Enter the username used to access the virtual machine.
                - **OS password**: Enter the password for the username entered previously (not applicable to EC2 instances).
                - **SSH port**: Enter the SSH port if needed.
            - If editing other node types:
                - **Node port**: Enter a communication port for your node.
                - **Data transfer ports**: Enter a port range that will be used by your node for actual data transfer.
        - In the *Settings* section:
            - **Node name**: Edit the name of your node.
            - **Maximum load**: Edit the number of tasks concurrently processed by the node.
            - **Additional load for recovery jobs**: If selected, the specified amount of tasks will be added to the set maximum node load to be used for recovery jobs exclusively. This allows for running the specified amount of concurrent recovery jobs along with other types of jobs without the need to wait for their completion.

- **Enable Direct Connect for this node**: When this option is enabled, you can access remote resources via a single port connection without establishing a VPN connection. The following conditions must be met at the remote infrastructure to enable this feature:
  - A NAKIVO Transporter or Agent must be installed.
  - A master password must be set for security reasons. A pre-shared key is generated based on the entered master password.
  - The node port on the local machine must be exposed to external availability via the Internet.
- **Enable debug logging for this node**: Enable/disable debug level logging for the node. Having this option enabled on a permanent basis is not recommended.

5. Click **Apply** to save your changes.



Downloading Transporter Credentials

If you would like to import an Amazon EC2, Nutanix AHV, or VMware Transporter into another installation of NAKIVO Backup & Replication, you need to download the Transporter's credentials. To obtain the credentials, hover over the desired Transporter and click the ellipsis **Manage** button on the right side. In the dialog box, click **Download Key**. This begins the download of a ZIP file containing the Transporter's credentials.

Managing Node Pools

NAKIVO Backup & Replication allows you to group nodes into pools to optimize backup, replication, and recovery jobs. To create a node pool, do the following :

1. Navigate to **Settings**.
2. Click the **Nodes** tab.
3. Open the **Node Pools** tab, then click the plus **Add** button.
4. Complete the **Create Node Pool** wizard and click **Finish**.

A node pool can be selected in the *Data Transfer* section on the **Options** page of backup, replication, and recovery jobs. A node can be included in only one pool. To move a node from one pool to another, you need to remove it from the original pool first.

Refreshing Node Details

By default, NAKIVO Backup & Replication refreshes the information about Transporters every hour. During the refreshing process, the product collects all the required information about all Transporters. Only one Transporter can be refreshed at a time. If you have more than one Transporter, all others will remain in the queue until they are able to be refreshed.

Manually Refreshing All Nodes

To refresh all nodes, follow the steps below:

1. Click **Settings** in the left pane of the product and go to the **Nodes** tab.
2. Click the **Refresh** button above the **Nodes** table.

Manually Refreshing a Single Node

To refresh a single node, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Go to the **Nodes** tab.
3. Hover over the node you would like to refresh and click the ellipsis **Manage** button.

4. Click **Refresh**.

Removing (Deleting) Nodes

To remove a Transporter from NAKIVO Backup & Replication, follow the steps below:

1. Click **Settings** in the left pane of the product.
2. Go to the **Nodes** tab.
3. Hover over the node you would like to remove.
4. On the right side, click the ellipsis **Manage** button and then click **Remove**.

Note

The following nodes cannot be removed:

- The Onboard Transporter (which is installed with the “Director” on page 41 by default)
- Nodes manually assigned to a job
- Transporters assigned to backup repositories

Backup Repositories

A Backup Repository is one of the key components of NAKIVO Backup & Replication and is a regular folder where the product stores backups and backup metadata. For more detailed information, refer to “Backup Repository” on page 47.

This section covers repository-related topics such as creation, management, etc. of Backup Repositories and contains the following articles:

Adding Existing Backup Repositories

NAKIVO Backup & Replication allows you to add an existing Backup Repository to a new copy of the product.

Note

During the import process, NAKIVO Backup & Replication searches for the *NakivoBackup* folder in the specified location. If your Backup Repository is located in *E:\backup\NakivoBackup*, you should specify the following path: *E:\backup*

To import an existing Backup Repository, do the following:

1. In the main menu, click **Settings**.
2. Go to the **Repositories** tab and click **+**.
3. Click **Add existing backup repository** in the dialog box that opens.

4. The **Add Existing Backup Repository** wizard opens. On the **Type** page of the wizard, select the following Backup Repository :
    - **SaaS**
5. When you select **Cloud**, the **Vendor** page opens. Select the cloud storage vendor from the following options:
    - Amazon S3
    - Microsoft Azure
    - Wasabi
    - Backblaze

- Amazon EC2
- Generic S3-compatible storage

6. When you select **Deduplication Appliance**, the **Device** page opens. Select the device from the following options:
    - Dell EMC Data Domain Boost
    - HPE StoreOnce Catalyst
    - NEC HYDRAstor
7. On the **Name & Location** page of the wizard, fill out all the necessary fields as described in the article for the corresponding Backup Repository type.
8. On the **Options** page of the wizard, the following options can be available for configuration:
    - Backup verification is a time-consuming process and consumes CPU of the Transporter assigned to the Backup Repository. It is recommended to schedule backup verification during non-working hours.
    - **Detach this repository on schedule**: Select this option if you want to detach and then reattach the Backup Repository based on a schedule. Detaching a Backup Repository saves the Backup Repository data and metadata in a consistent state and stops the product interaction with the Backup Repository (so the Backup Repository can be copied or moved). You can use this feature, for example, for the disk-to-disk-to-tape (D2D2T) data protection approach: backups are stored on a disk for fast operational recovery and copied to a tape (while the repository is detached) for archiving and long-term storage.
        - **Delete and re-create the repository on attach**: When this option is selected, all data in the Backup Repository is erased prior to attaching it to the product. As a result, jobs that write to this Backup Repository create full VM backups. You can use this option, for example, to create full daily, weekly, or monthly VM backups and write them to tape or removable media.
9. Click **Finish**. The Backup Repository is imported to the list.

Creating Backup Repositories

NAKIVO Backup & Replication allows you to create additional Backup Repositories for storing backups. You can use a local folder, NFS share, CIFS share, public cloud, or deduplication appliance as a Backup Repository location. To create a new Backup Repository, follow the steps below.

Important

Do not create Backup Repositories inside NAKIVO Backup & Replication installation folders. The data inside **Director** and **Transporter** folders may be lost after a solution update.

1. In NAKIVO Backup & Replication, navigate to **Settings**.
2. Go to the **Repositories** tab and click **+**.
3. Click **Create new backup repository**.

Choose one of the locations for storing your backups by completing the **Create Backup Repository** wizard as described in the sections below:

- “SaaS Backup Repository” on page 359

SaaS Backup Repository

Choose this type of Backup Repository for all your Microsoft 365 related activities.

Note

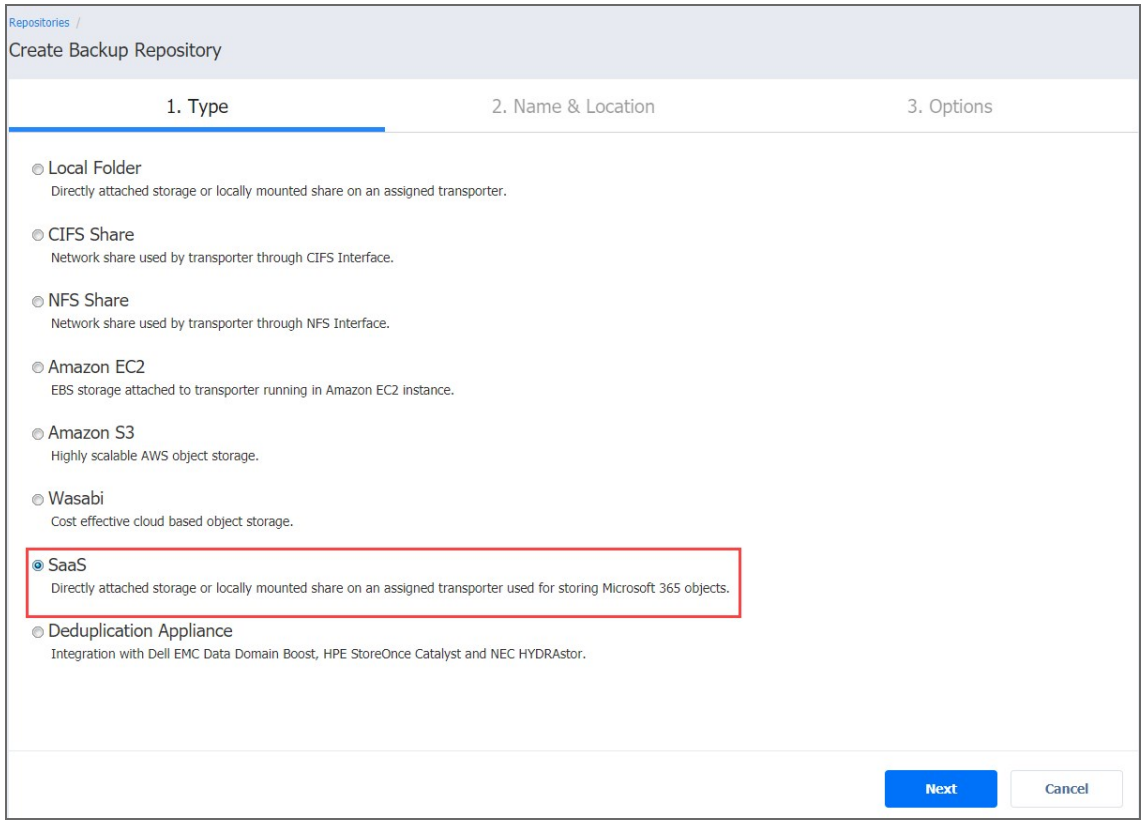
- For SaaS repositories, only local folders are supported as a location.
- Before creating a SaaS repository, provide read and write permissions to the local folder where the repository will be located.
- For Office 365 SaaS repositories, manual removal of backup data may not return space to the operating system correctly.
- Before creating SaaS Backup Repository on NAS device, sudo package must be installed on the device beforehand.

To create a SaaS Backup Repository, proceed as described in the following sections:

- Create Backup Repository: Type
- Create Backup Repository: Name and Location
- Create Backup Repository: Options

Create Backup Repository: Type

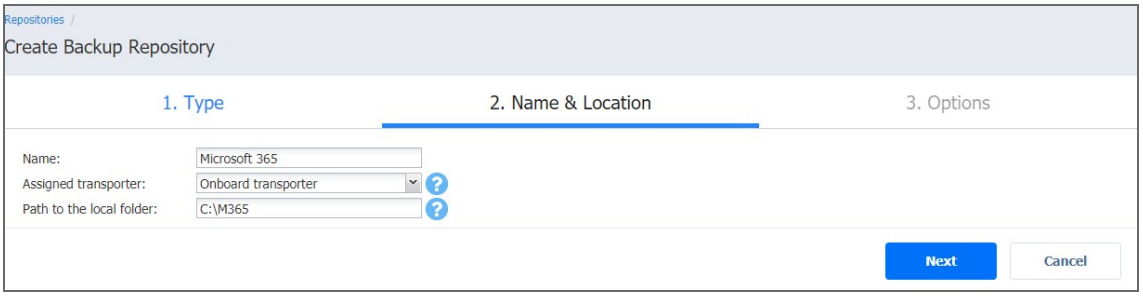
On the **Type** page of the **Create Backup Repository** wizard, select **SaaS** and click **Next** to go to the next page of the wizard.



Create Backup Repository: Name and Location

On the **Name & Location** page of the wizard, do the following:

1. Enter the name of the Backup Repository in the **Name** box.
2. Select the Transporter from the **Assigned transporter** drop-down list.
3. Enter a path to the local folder in the corresponding box.
4. Click **Next** to go to the next page of the wizard.



Create Backup Repository: Options

On the **Options** page:

1. Schedule detaching of the Backup Repository
    - **Detach this repository on schedule:** Select this option if you want to detach and then attach the Backup Repository on a schedule. Detaching a Backup Repository saves the Backup Repository data and metadata in a consistent state and then stops the product's interaction with the Backup Repository (so that the Backup Repository can be copied or moved). You can use this feature, for example, for the disk-to-disk-to-tape (D2D2T) data protection approach, in which backups are stored on a disk for fast operational recovery, and copied to a tape (while the repository is detached) for archiving and long-term storage.
        - **Delete and re-create the repository on attach:** If this option is selected, all data in the Backup Repository will be erased prior to attaching it to the product. As a result, jobs that write to this Backup Repository will create full VM backups. You can use this option, for example, to create full daily, weekly, or monthly VM backups and write them to tape or removable media.
2. Click **Finish** to finish creating the Backup Repository.

Managing Backup Repositories

Refer to the following topics:

Attaching Backup Repositories

If you have detached a Backup Repository, you can reattach it to the product by following the steps below:

1. From the main menu of NAKIVO Backup & Replication, click **Settings**.
2. Go to the **Repositories** tab and hover over a Backup Repository.
3. On the right side, click ••• and then click **Attach.**

The Backup Repository is reattached to NAKIVO Backup & Replication. You can now back up to the attached Backup Repository.

Detaching Backup Repositories

Detaching a Backup Repository saves the Backup Repository data and metadata in a consistent state and stops the product's interaction with the repository (e.g. reading and writing of data or metadata). You may want to detach a Backup Repository in order to move it to a different location or to put the associated storage in maintenance.

Note
As the product does not interact with detached repositories, jobs with detached Backup Repositories as target storage will fail.

To detach a Backup Repository, follow the steps below:

1. From the main menu, click **Settings**.
2. Go to the **Repositories** tab and hover over a Backup Repository.
3. On the right side, click ••• and then click **Detach**.

Note
A Backup Repository cannot be detached if a job that backs up to this Backup Repository is running.

The Backup Repository is detached from the product. You can reattach the Backup Repository to NAKIVO Backup & Replication when needed.

Editing Backup Repositories

To modify the settings of an existing Backup Repository, follow the steps below:

1. From the main menu of NAKIVO Backup & Replication, click **Settings**.
2. Go to the **Repositories** tab and hover over a Backup Repository.
3. On the right side, click ••• and then click **Edit**.

Note

A Backup Repository cannot be edited while a job that backs up to this Backup Repository is running.

4. Update the fields as necessary.
5. Click **Apply**. Changes you have made are applied and the Backup Repository update starts.

Refreshing Backup Repositories

By default, NAKIVO Backup & Replication refreshes Backup Repository information hourly. During the refreshing process, the product collects all required information about Backup Repositories, such as the amount of free space, number of backups, and number of recovery points.

Only one Backup Repository is refreshed at a time. Therefore, if you attempt to refresh multiple Backup Repositories, all but one will be added to a queue.

Refreshing All Backup Repositories

To refresh all backup repositories, follow the steps below:

1. From the main menu of NAKIVO Backup & Replication, click **Settings**.
2. Go to the **Repositories** tab.
3. Click the **Refresh All** button.

The Backup Repository refresh process begins.

Refreshing a Single Backup Repository

To refresh a single Backup Repository, follow the steps below:

1. From the main menu of NAKIVO Backup & Replication, click **Settings**.
2. Go to the **Repositories** tab.
3. Hover over the Backup Repository that you wish to refresh and click •••.

4. Click **Refresh**.

The Backup Repository refresh begins.

Removing and Deleting Backup Repositories

In NAKIVO Backup & Replication, you can either permanently delete a Backup Repository and all of its data or remove only the Backup Repository from the product while maintaining all of its data. After removing a Backup Repository you will be able to import it into the same or a new instance of the product.

Note

You will not be able to remove a Backup Repository if there is a job that backs up to this Backup Repository. To remove such a Backup Repository, delete (or edit) the corresponding jobs so no items are backed up to the aforementioned repository.

To permanently delete or remove a Backup Repository from the product, follow the steps below:

1. From the main menu of NAKIVO Backup & Replication, click **Settings**.
2. Go to the **Repositories** tab.
3. Hover over a Backup Repository.
4. On the right side, click **Manage** and then click **Remove.**

5. Do the following when the confirmation message appears:
    - To remove the Backup Repository from NAKIVO Backup & Replication and keep the Backup Repository on a disk, select **Remove repository and keep backups**.

      Note

      You can import the removed Backup Repository back to the same instance or to a new installation.

- To permanently delete the Backup Repository and all its data, select **Remove repository and delete backups**.

Note

- This operation will permanently delete the Backup Repository and all its backups.

Viewing Backup Repository Details

The **Repositories** tab contains a **Summary** bar, which offers an overview of all backup repositories. The data displayed is as follows:

- **Issues**: Total number of issues/alarms related to repositories
- **Repositories**: Total number of repositories
- **Inaccessible**: Total number of inaccessible repositories
- **Out of Space**: Total number of repositories that are out of storage space
- **Detached**: Total number of detached repositories
- **In Maintenance**: Total number of repositories in maintenance
- **Good**: Total number of usable repositories

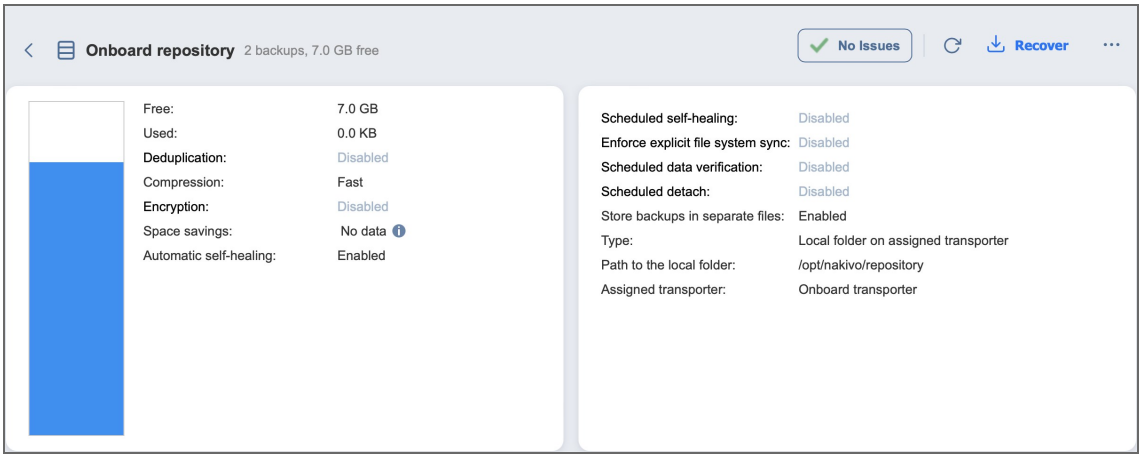
To see information about specific repositories, backups, and recovery points, see the sections below.

Viewing Backup Repository Details

To view Backup Repository details, follow the steps below:

1. Go to the main menu of NAKIVO Backup & Replication and click **Settings**.
2. Go to the **Repositories** tab.
3. Click a Backup Repository.
4. The following data is displayed:
    - **Free**: The amount of free space available for the Backup Repository
    - **Used**: The amount of space that the Backup Repository occupies on a disk. The amount of space that can be reclaimed is displayed in parentheses.
    - **Deduplication**: The status of deduplication in the Backup Repository
    - **Compression**: The compression level specified for the Backup Repository
    - **Encryption**: The status of encryption in the Backup Repository
    - **Space savings**: The estimated percentage and amount of space saved by compression and deduplication. For example, if 200 GB of data were backed up and the size of the backup was reduced to 50 GB, the ratio is calculated as 75%.
    - **Automatic self-healing**: The state of the automatic self-healing option for the Backup Repository
    - **Scheduled self-healing**: The state of the scheduled self-healing option for the Backup Repository
    - **Enforce explicit file system sync**: The state of the enforce explicit file system sync option for the Backup Repository

- **Scheduled data verification**: The state of the scheduled data verification option for the Backup Repository
- **Scheduled space reclaiming**: The state of the scheduled space reclaiming option for the Backup Repository
- **Scheduled detach**: The state of the scheduled detach option for the Backup Repository
- **Store backups in separate files**: The behavior of the Backup Repository on backup data storage
- **Type**: The location of the Backup Repository, which can be one of the following:
  - **Local folder on assigned Transporter**
  - **Remote CIFS Share**
  - **Remote NFS Share**
  - **Amazon EC2**
  - **Microsoft 365**
  - **Microsoft Azure Blob Storage**
  - **Amazon S3**
  - **Generic S3-Compatible Storage**
  - **Wasabi**
  - **Backblaze B2 Cloud Storage**
  - **Deduplication Appliance**
- **Path to the folder**: The path to the Backup Repository folder
- **Assigned transporter**: The Transporter that manages the Backup Repository (that is, the Transporter that reads data from and writes data to the Backup Repository)
- **Backups**: List of available backups in the Backup Repository



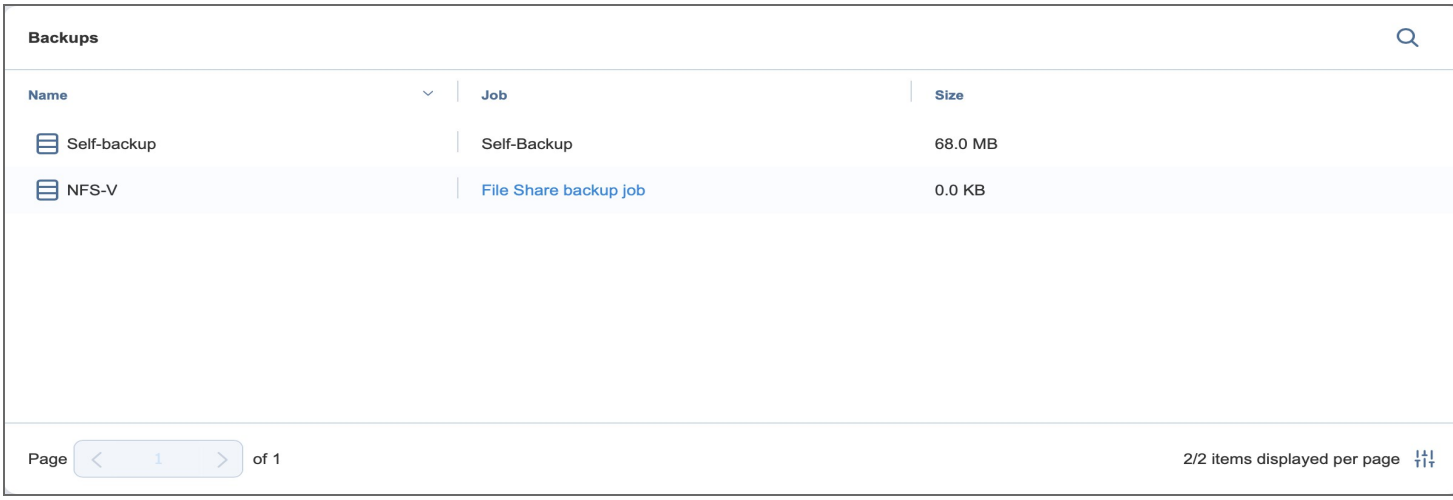
Viewing Backup Details

Below, you can view the details of the backups stored in the Backup Repository. The following information is displayed:

- **Name**: Name of the backup
- **Job**: The job type that created this backup
- **Size**: The total size of the backup

Large numbers of backups are separated into pages to reduce clutter. To find a specific backup, you can scroll through the pages manually or simply look it up via the **Search** bar. Hover over the name of a backup and click the ellipsis **Manage** button on the right side to select one of the following options:

- **Recover**: Select this option to proceed with recovery.
- **Verify**: Select this option to verify the backup.
- **Repair**: If the backup is corrupted, this option will attempt to restore it to an uncorrupted state.
- **Delete**: Select this option to delete the backup from the repository.



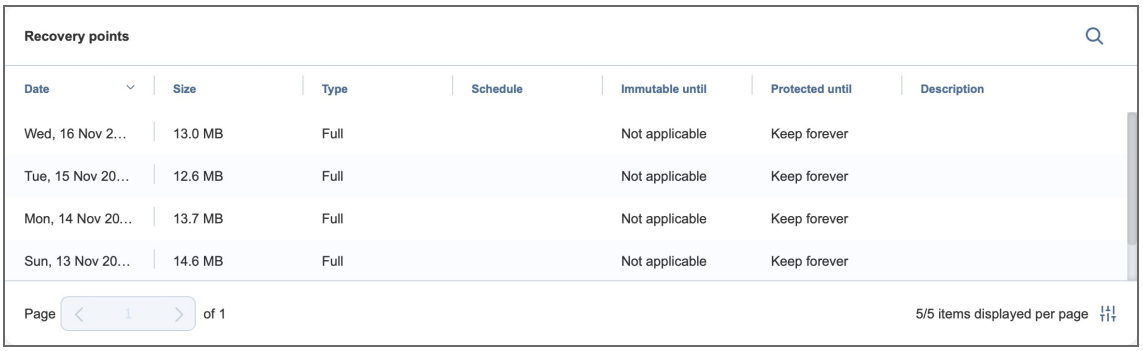
Click on a backup name to view more information about the backup and see the recovery points available. The following information is displayed:

- **Name**: Name of the backup item
- **Type**: Type of job
- **Points**: Number of recovery points available
- **Last point**: Date of the latest recovery point
- **Size**: The total size of the backup
- **Job name**: Name of the job

Viewing Recovery Point Details

You can view the details of a recovery point in the lower part of the screen. To find a recovery point for a specific date, you can use the **Search** bar on the right. The following information is displayed:

- **Date**: The date when the recovery point was created
- **Size**: The size of the recovery point
- **Type**: Type of backup used to create the recovery point
- **Schedule**: If applicable, the schedule that was used to create the recovery point
- **Immutable until**: If applicable, the date when the recovery point immutability expires
- **Protected until**: The date until which the recovery point is retained, displayed only for recovery points belonging to jobs that use the schedule retention approach
- **Description**: A description of the recovery point if one was provided



Note

- The **Size**, **Type**, and **Immutable until** details are displayed only if the **Store backups in separate files** option (under **Storage Savings & Encryption**) is selected when creating or editing a Backup Repository.
- For recovery points belonging to jobs using legacy retention settings, **Use job retention** is displayed under **Protected until** instead.

Date, **Type**, and **Description** can also be viewed when selecting recovery points in Recovery Job Wizard. Hover over the name of the recovery point and click the ellipsis **Manage** button on the right side to select one of the following options:

- **Recover**: Select this option to proceed with recovery.
- **Edit**: Select this option to edit the recovery point. Do the following:
  - Optionally, you can add a **Description** to your recovery point.
  - Choose the date until which the recovery point should be kept. The following options are available:
    - **Use job retention**: Choose this option to use the retention settings configured in the job for this recovery point.

    - **Keep forever**: Choose this option to keep this recovery point forever.
    - **Protect until**: Choose this option to keep this recovery point until a specific date. After selecting this option, choose the date in the calendar pop-up.
- **Delete**: Select this option to delete the recovery point from the repository.

Expert Mode

For advanced NAKIVO Backup & Replication configuration, you can enable the Expert mode.

To do this, take the following steps:

1. Log in to your NAKIVO Backup & Replication instance.
2. Add the word “expert” to the URL parameters of the **Settings** page.
   Examples:
   https://localhost:4443/c/configuration?expert or
   https://localhost:4443/c/configuration?action=&targetId=&backUrl=&wizard=false&expert
3. Click the **Expert** tab.

Configuring Settings

To configure advanced product settings, make the necessary changes in the following parameters:

Parameters	Description	Possible Values
system.email.smtp.localhost.mode	Specifies how to determine the name of the localhost that is used in the SMTP HELO or EHLO commands.	• Default • Use DNS • Provide custom hostname
system.email.smtp.localhost.name	Specifies the name of the localhost that is used in the SMTP HELO or EHLO commands. This setting is valid for custom hostname resolution mode only.	
system.email.smtp.tls.version	Specifies the TLS version to use for SMTP server communication when TLS is configured in the Email Settings.	• Default • TLS10 • TLS11 • TLS12 • TLS13

system.email.notifications.skip.event.list	List of event names to skip when creating an email digest. Use space or "," or ";" as separators. The event names can be found in events.log.	Event names (example: error60)
system.vmware.esxi.ssh.port	For VMware only. Specifies the SSH port to connect to ESXi (global setting).	• Default value: 22 • Minimum value: 1 • Maximum value: 65535
system.vmware.skip.outdated.tools.checking	For VMware only. When enabled, the system does not check VMware Tools outdated status when creating quiescing snapshot.	• Unchecked (default) • Checked
system.vmware.skip.tag.discovery	VMware only. When enabled, the system does not discover VMware Tags. This is applied to all tenants.	• Unchecked (default) • Checked
system.debug.mode.log.vmware.api.incoming.requests	VMware only. When enabled, the incoming message will be printed for VIJAVA API received response. The option only works if **system.debug.mode.enabled** is checked.	• Unchecked (default) • Checked
system.debug.mode.log.vmware.api.outgoing.requests	VMware only. When enabled, the outgoing message will be printed for VIJAVA API sent request. The option only works if **system.debug.mode.enabled** is checked.	• Unchecked (default) • Checked

http.max.upload.size	Specifies the max upload size for file upload operations, **bytes** (global setting). If multiple files are uploaded, this is the total size. Use -1 for unlimited. Example: 200MB: 200000000	• Default value: 10737 41824 • Minimum value: 1 • Maximum value: 99999 9999999
system.auth.use.lockout	Enables or disables the login lockout feature. When enabled, the offending IP address is not allowed to login after several failed attempts.	• Unchecked (default) • Checked
system.auth.max.login.attempt.count	Specifies the maximum number of failed login attempts to trigger the login lockout feature for the offending IP.	• Default value: 5 • Minimum value: 1 • Maximum value: 9999
system.auth.lockout.timeout	Specifies the timeout (minutes) for the login lockout feature. The offending IP is allowed to login again after the timeout expires.	• Default value: 15 • Minimum value: 1 • Maximum value: 9999
system.auth.login.history.period	Specifies the period (minutes) to calculate the maximum number of failed login attempts for the login lockout feature.	• Default value: 5 • Minimum value: 1 • Maximum value: 9999

system.auth.ad.integration.follow.referrals	Defines LDAP/Active Directory behavior for referrals. When set to follow, all referrals are resolved (can be slow); otherwise they are ignored. What are the implications of the ignore option? * If you only have one domain, there should be no effects. * If you have multiple domains joined in a forest, then any cross-domain memberships will not be resolved. More info: https://docs.oracle.com/javase/jndi/tutorial/ldap/referral/jndi.html	• follow (default) • ignore
system.auth.ad.integration.connect.timeout	Specifies the timeout (miliseconds) for connecting LDAP/Active Directory.	• Default value: 2000 • Minimum value: 2000 • Maximum value: 100000
system.auth.ad.integration.read.timeout	Specifies the timeout (miliseconds) for reading LDAP/Active Directory operations.	• Default value: 10000 • Minimum value: 10000 • Maximum value: 100000
system.auth.max.login.2fa.attempt.count	Specifies the attempts for the login lockout feature. The offending IP is allowed to login again after the timeout expires.	• Default value: 100 • Minimum value: 1 • Maximum value: 9999

system.auth.lockout.2fa.timeout	Specifies the timeout (minutes) for the login lockout feature. The offending IP is allowed to login again after the timeout expires.	• Default value: 5 • Minimum value: 1 • Maximum value: 9999
system.job.block.size	Select block size for processing data. **Notes** • Deduplication can only be efficient with recovery points using the same block size. • Once the value is changed, the existing backup jobs, previously using a different block size, will produce a full backup on the next run. • Mapping to a backup with a different block size will be skipped	• 4 MB (default) • 2 MB • 1 MB • 512 KB • 256 KB • 128 KB • 64 KB • 32 KB • 16 KB • 8 KB • 4 KB
system.job.map.new.source.item.scope	The scope to search for the existing backup when adding a new source item to the job.	• Default location (default) • Default transporter's locations • All locations
system.job.pool.queue.length	Specifies the length of the job queue. A job is placed in a queue before execution. Requires restart.	• Default value: 200 • Minimum value: 10 • Maximum value: 9999

system.job.pool.thread.min	Specifies the minimum thread pool size for jobs. A job requires 1 thread from the job pool to start running. Requires restart.	• Default value: 30 • Minimum value: 10 • Maximum value: 9999
system.job.pool.thread.max	Specifies the maximum thread pool size for jobs. A job requires 1 thread from the job pool to start running. When the pool thread limit is reached, the job is placed in the job queue. Requires restart. If using Linux and systemd, please add the following to the service startup script: TasksMax=infinity	• Default value: 200 • Minimum value: 10 • Maximum value: 9999
system.job.resolve.host.hostname.on.transporter	If set, sends the source and/or target host hostname as is to Transporter. Transporter will resolve the hostname to the IP address(es) and check if it is reachable. This is done during the Transporter to host checks on a job run. The default behavior is to do the resolution locally and send the IP addresses to Transporter. This can be a problem in complex network topologies (VPN, etc).	• Unchecked (default) • Checked

system.job.resolve.transporter.hostname.on.transporter	If set, sends the source and/or target Transporter hostname as is to Transporter. Transporter will resolve the hostname to the IP address(es) and check if it is reachable. This is done during Transporter to Transporter checks on job run. The default behavior is to do the resolution locally, get hostnames for all resolved IP addresses, and then send them to Transporter. This can be a problem in complex network topologies (VPN, etc).	• Unchecked (default) • Checked
system.job.bandwidth.throttling.source	If set, applies bandwidth throttling for data reading from source.	• Checked (default) • Unchecked
system.job.bandwidth.throttling.target	If set, applies bandwidth throttling for data writing to target.	• Checked (default) • Unchecked
system.job.bandwidth.throttling.network	If set, applies bandwidth throttling for data transfer between source and target.	• Checked (default) • Unchecked
system.job.ict.skip.new.disk	If set, new disks added to the source item will not be added to the job automatically.	• Checked (default) • Unchecked
system.job.replica.vm.suffix	The default suffix to append to replica VMs. This setting is global and can only be changed inside the master tenant.	Can be between 1 and 20 characters ("-replica" by default)

system.job.recovered.vm.suffix	The default suffix to append to recovered/flash-booted VMs. This setting is global and can only be changed inside the master tenant.	Can be between 1 and 20 characters ("-recovered" by default)
system.job.skip.manual.transporter.data.path.validation	If set, transporter data path validation will be skipped for manually configured transporters.	• Unchecked (default) • Checked
system.metadata.disable.ec2.instance.id.update	Disables EC2 instance ID detection on product startup. The detection is done via a HTTP request to http://169.254.169.254/latest/meta-data/instance-id This is required for proper product functioning in the AWS cloud.	• Unchecked (default) • Checked
system.task.pool.queue.length	Specifies the length of the task queue. A task is placed in the queue before execution. Requires restart.	• Default value: 200 • Minimum value: 10 • Maximum value: 9999
system.task.pool.thread.min	Specifies the minimum thread pool size for tasks. A task requires 1 thread from the task pool to start running. Task example: repository refresh, Transporter refresh, support bundle creation. Requires restart.	• Default value: 30 • Minimum value: 10 • Maximum value: 9999

system.task.pool.thread.max	Specifies the maximum thread pool size for tasks. A task requires 1 thread from the task pool to start running. When the pool thread limit is reached, the task is placed in the task queue. Task example: repository refresh, Transporter refresh, support bundle creation. Requires restart.	• Default value: 200 • Minimum value: 10 • Maximum value: 9999
system.repository.min.free.space.byte	Specifies the minimum free space (bytes) for the repository. If the free space goes below this value, an alarm is generated.	• Default value: 5368709120 • Minimum value: 1024 • Maximum value: 1099511627776
system.repository.min.free.space.percent	Specifies the minimum free space (percent) for the Backup repository. If the free space goes below this value, an alarm is generated.	• Default value: 5 • Minimum value: 1 • Maximum value: 99
system.repository.ec2.min.free.space.resize.percent	In case the free space is less than the set percentage of the total current storage, one minimum chunk will be added to the storage.	• Default value: 10 • Minimum value: 1 • Maximum value: 100

system.repository.ec2.max.free.space.resize.percent	In case the free space is more than the set percentage of the total current storage, one minimum chunk will be removed from the storage.	• Default value: 15 • Minimum value: 1 • Maximum value: 100
system.repository.maintenance.interrupt.timeout.seconds	Specifies the timeout (seconds) to wait for repository maintenance stop during job run.	• Default value: 300 • Minimum value: 1 • Maximum value: 86400
system.repository.refresh.backup.size.calculation	Specifies the backup size calculation on the repository refreshing. True: Always calculates backup size. False: Skips backup size calculation and only calculates backup size with necessary backups.	• Checked (default) • Unchecked
system.repository.refresh.timeout.seconds	Specifies the timeout (seconds) to wait for repository refresh.	• Default value: 600 • Minimum value: 1 • Maximum value: 86400
system.repository.remove.backups.used.by.job	The setting allows to remove backup objects associated with existing jobs, and remove the last RP of a backup object in case such RP is due to be removed according to the retention policy. If enabled, removal of the aforesaid objects can be done manually or automatically, in accordance with the configured retention policy.	• Unchecked (default) • Checked

system.product.skip.update.server.ssl.certificate.verification	The product update check process requires the remote server certificate to be trusted. This parameter disables such check. It can be useful when secure (SSL/TLS) connections are being intercepted by third-party software.A product restart is required to apply.	• Unchecked (default) • Checked
system.debug.mode.enabled	The debug mode prints more information into the logs, including some sensitive one (hardware UUIDs, MAC addresses, etc). The passwords are not printed unless they are present in raw communication dumps (e.g., SOAP/XML/JSON).	• Unchecked (default) • Checked
system.debug.mode.log.passwords	When debug mode is enabled, also log passwords. This can be a security risk.	• Unchecked (default) • Checked
system.debug.mode.log.api.requests	When debug mode is enabled, also log product API requests/responses. The data is logged as is and will contain plaintext passwords. This can be a security risk.	• Unchecked (default) • Checked
system.hyperv.optimize.queries	Hyper-V only. Instructs to use a faster query method to read VM and host information. This will speed up the refresh process in large environments.	• Checked (default) • Unchecked
system.hyperv.discovery.host.thread.count	Hyper-V only. Sets the max parallel threads to run when refreshing cluster hosts during discovery. Each cluster host can be refreshed separately. This will speed up the refresh process in large environments.	• Default value: 2 • Minimum value: 1 • Maximum value: 20

system.hyperv.discovery.vm.thread.count	Hyper-V only. Sets the max parallel threads to run when refreshing host VMs during discovery. When increasing the setting value, make sure to test its impact on host CPU usage during refresh. This will speed up the refresh process in large environments.	• Default value: 2 • Minimum value: 1 • Maximum value: 10
system.database.scheduled.backup.path	Specifies the target path for database backups. The tenant databases will be stored in subfolders, if present. The path can be local or absolute. The folder will be created automatically if it does not exist.	
system.database.scheduled.backup.max.count	Specifies the maximum number of files for periodic database backups. The number is applied separately to each tenant database. The master and tenants product databases are backed up each day.	• Default value: 5 • Minimum value: 0 • Maximum value: 365
system.logging.max.index	Specifies the maximum index of log files. This works globally for all log files. Set 0 to use default value (configured in log4j.xml).	• Default value: 0 • Minimum value: 0 • Maximum value: 999
system.product.min.free.space.byte	Specifies the minimum free space (bytes) for the product installation folder. If the free space goes below this value, an alarm is generated.	• Default value: 2147483648 • Minimum value: 10485760 • Maximum value: 10737418240

system.product.free.memory.threshold	Specifies the minimum ratio for JVM free memory. If the free JVM memory goes below this value, an alarm is generated.	• Default value: 0.1 • Minimum value: 0.01 • Maximum value: 0.9
system.nutanix.discovery.vm.thread.count	Nutanix AHV only. Sets the max parallel threads to run when refreshing host VMs during discovery. When increasing the setting value, make sure to test its impact on host CPU usage during refresh. This will speed up the refresh process in large environments.	• Default value: 2 • Minimum value: 1 • Maximum value: 10
system.aws.discovery.region.thread.count	AWS only. Sets the max parallel threads to run when refreshing the AWS Regions during discovery. When increasing the setting value, make sure to test its influence on host CPU usage during refresh. This will speed up the refresh process in large environments.	• Default value: 4 • Minimum value: 1 • Maximum value: 10
system.aws.discovery.other.thread.count	AWS only. Sets the max parallel threads to run when refreshing other AWS entities inside the Region during discovery. When increasing the setting value, make sure to test its influence on host CPU usage during refresh. This will speed up the refresh process in large environments.	• Default value: 4 • Minimum value: 1 • Maximum value: 10

system.plugin.flr.operation.timeout.seconds	Specifies the timeout (seconds) to wait for plugin session FLR/OLR. This is a low-level setting that is only sent to Transporter and used during iSCSI interaction.	• Default value: 900 • Minimum value: 1 • Maximum value: 86400
system.physical.skip.os.checking	Physical Windows host discovery only. When enabled, the system will not check the supported OS version.	• Checked • Unchecked (default)
system.transporter.agent.injection.skip.vc.redist	When enabled, the system will not automatically install VC redistributable during Transporter/agent injection.	• Checked • Unchecked (default)
system.transporter.load.max.time.created.state.hours	Specifies the timeout (hours) to wait for getting Transporter load request. Default is 5 hours.	• Default value: 5 • Minimum value: 1 • Maximum value: 72
system.transporter.modern.min.heap.size.megabyte	Megabytes. The -Xms option sets the initial and minimum Java heap size. The Java heap (the “heap”) is the part of the memory where blocks of memory are allocated to objects and freed during garbage collection. **Note**: Transporter restart is required to apply the setting.	• Default value: 512 • Minimum value: 256 • Maximum value: 65536

system.transporter.modern.max.heap.size.megabyte	Megabytes. This option sets the maximum Java heap size. The Java heap (the “heap”) is the part of the memory where blocks of memory are allocated to objects and freed during garbage collection. Depending on the kind of operating system you are running, the maximum value you can set for the Java heap can vary. **Notes**: -Xmx does not limit the total amount of memory that the JVM can use. Transporter restart is required to apply the setting.	• Default value: 3072 • Minimum value: 256 • Maximum value: 65536
system.transporter.modern.thread.stack.size.kilobyte	Kilobytes. -Xss sets the thread stack size. Thread stacks are memory areas allocated for each Java thread for their internal use. This is where the thread stores its local execution state. **Note**: Transporter restart is required to apply the setting.	• Default value: 512 • Minimum value: 64 • Maximum value: 2048
system.transporter.modern.job.handler.max.thread.count	Specifies the job thread count for modern Transporter. **Notes:** • 1 job thread equals ~200MB of memory, consider changing the related setting. • Transporter restart is required to apply the setting.	• Default value: 10 • Minimum value: 1 • Maximum value: 128

system.transporter.modern.service.handler.max.thread.count	Specifies the service thread count for modern Transporter. **Note**: Transporter restart is required to apply the setting.	• Default value: 10 • Minimum value: 1 • Maximum value: 128
system.transporter.jvm.ram.requirement	Bytes. For NASes only. Specifies the minimal ram required on NASes to create a SaaS repository.	• Default value: 4294967296 • Minimum value: 0 • Maximum value: 10995 11627776
system.transporter.modern.thread.pool.size	Specifies the session factory thread pool size for modern Transporter. **Note**: Transporter restart is required to apply the setting.	• Default value: 1000 • Minimum value: 100 • Maximum value: 1000
system.deleted.users.groups.remove.frequency	Specifies the scheduled time for removing unnecessary deleted users, groups (in second).	• Default value: 86400 • Minimum value: 300 • Maximum value: 1.797693134 8623157e+30 8
system.inventory.allow.duplicated	Microsoft 365 and physical machines only. When enabled, the system allows duplicated discovery items.	• Unchecked (default) • Checked

system.inventory.optimize.discovery.time	Microsoft 365 (SharePoint Online) only. When enabled, the system skips some attributes to optimize the discovery time.	• Unchecked (default) • Checked
system.o365.suppress.throttling.event	Suppress throttling warning.	• Unchecked (default) • Checked
system.event.skip.creating.event.list	List of event/alarm/notification names to skip when creating an event. The event is still logged and handled. Use space or , or ; as separators. The names can be found in events.log.	Event names (example: error60)
system.events.use.windows.event.integration	Use Windows Event log integration. Some product events will also be created in the Application log. This setting is global and can only be changed inside the master tenant.	• Unchecked (default) • Checked
system.exchange.enable.direct.recovery	When enabled, you can recover Exchange items without using a recovery server. For example, you can download items to the browser or forward them to a certain email. To do this, select **Download items or forward via email** on the **Destination** page of the job wizard and then select the appropriate recovery type on the **Options** page. Note that Google limits the total size of attachments within a message to 25 MB. Forwarding messages containing attachments that exceed this limit will fail.	• Unchecked (default) • Checked

system.olr.dsamain.mount.port	TCP port where DSAMAIN mounts NTDS.dit (AD database) for.	• Default value: 5000 • Minimum value: 1 • Maximum value: 65535
system.product.register.disable.periodic.data.collection	When enabled, the product will not send data bundles every 30 days.	• Unchecked (default) • Checked
system.repository.skip.periodic.refresh.on.transporter.busy.with.job	When enabled and any Transporter repository is locked by a running job, the product skips periodic refresh for this Transporter repository.	• Unchecked (default) • Checked
system.pql.custom.file.name	PQL file name in the userdata folder. Empty by default. If empty, the file will be downloaded from web.	
system.pql.cache.ttl.hours	Time to keep PQL file cache, in hours. Use 0 to disable the cache.	• Default value: 8 • Minimum value: 0 • Maximum value: 72
system.transporter.allow.new	Allows using newer Transporter versions.	• Unchecked (default) • Checked
system.transporter.allow.old	Allows using older (outdated) Transporter versions.	• Unchecked (default) • Checked

system.transporter.modern.idle.timeout	Specifies the timeout (milliseconds) for modern Transporter IDLE. If you set it to 0, it will be an unlimited timeout, meaning the transporter can only be stopped manually. **Note**: Transporter restart is required to apply the setting.	• Default value: 3600000 • Minimum value: 0 • Maximum value: 86400000
system.volatile.object.processing.type	**Default**: try to remove the volatile objects periodically until their time to live (fixed) is reached. **Alternative**: fine-tune the settings. See the other system.volatile.object variables. The setting is global and can be changed inside the master tenant only.	• Default (default option) • Alternative
system.volatile.object.retry.count	Alternative processing type only. The maximum number of retries for volatile objects removal. 0 means no retries, so only one removal attempt will happen. The setting is global and can be changed inside the master tenant only.	• Default value: 7 • Minimum value: 0 • Maximum value: 256
system.volatile.object.retry.interval	Alternative processing type only. Minutes. The desired delay between each removal retry. The real delay depends on the queue and on the exponential retry factor (configurable). The setting is global and can be changed inside the master tenant only.	• Default value: 60 • Minimum value: 5 • Maximum value: 14400

system.volatile.object.exponential.retry.interval.factor	Alternative processing type only. The ratio to use when calculating the delay time for the next retry. The next delay equals interval * (factor^retry). Example: the interval is 60 minutes, the factor is 2. The first retry will happen in +60 minutes, the second in +240 minutes , ... The setting is global and can be changed inside the master tenant only.	• Default value: 2 • Minimum value: 1 • Maximum value: 10
system.visual.notification.service.disable	Disables the visual notification service. This can speed up the UI when the database contains many event entries. This setting is global and can be changed inside the master tenant only.	• Unchecked (default) • Checked
system.msp.console.listening.port	TCP port used by the MSP product for listening to remote tenants. Port 6702 is used by default.	• Default: 6702 • Minimum value: 1 • Maximum value: 65535
system.events.use.windows.event.integration	Use Windows Event log integration. Some product events will also be created in the Application log. The setting is global and can be changed inside the master tenant only.	• Unchecked (default) • Checked

system.transporter.load.path.cost.variation.percent	Percent. Specifies the allowed data path cost variation. During the job run, automatic transporter selection may happen. The first step is to choose the top N (by cost) data paths. The second step is to choose the best data path based on the lowest transporter load. For example, if the setting is 10% and the best path cost is 1.5, then only paths with cost=1.5 ... (1.5+0.15) will be chosen on the first step. The setting is global and can be changed inside the master tenant only.	• Default value: 10 • Minimum value: 1 • Maximum value: 10000
system.vmware.discovery.vm.detect.ipaddress.by.dns.skip	The setting is applicable only to VMware vSphere infrastructure. If enabled, the detection of VM IP address via DNS resolution will be skipped. Note: Detection of VM IP address via DNS resolution is applied in case VMware Tools are not installed on the VM.	• Checked (default) • Unchecked
system.job.default.retention.approach	Schedule-retention fusion: New backup and backup copy jobs will use the new schedule-retention step. Legacy: New backup and backup copy jobs will use the legacy schedule and retention steps.	• Schedule-retention fusion • Legacy

Configuring Actions View

Click the **Actions** tab to configure the following actions:

- **Remove all events**: By clicking the link, you can remove all events/alarms/etc for the current tenant.
- **Forget all passwords (except users)**: By clicking the link, you can set the stored passwords to “” for the current tenant items. The only exception is user passwords; they must be set manually.

- **Clean up job history**: By clicking the link, you can immediately apply the configured **Store job history for the last** setting.

In the text box, you can see the report on the actions.

Example 1

Request 1: sending (Remove all events)...

Request 1: success=true (Remove all events).

Example 2

Request 1: sending (Forget all passwords (except users))...

Request 1: success=true (Forget all passwords (except users)).

Example 3

Request 1: sending (Clean up job history)...

Request 1: success=true (Clean up job history).

Packages

By clicking the **Packages** tab, you can see the following information:

- **Base local path:** packages. Location of packages in product installation directory
- List of **Existing packages**
- List of **Supported packages**

Virtual Appliance Configuration

This section covers the following topics:

Configuring Network Settings of Virtual Appliance

To configure networking on the Virtual Appliance (VA), follow the steps below:

1. Open the VA console.
2. On the main menu, select the **Network Settings** option and press **Enter**.
3. Do either of the following:
    - To change the Virtual Appliance hostname, select the **Hostname** option, press **Enter**, enter a new hostname, and press **Enter** again.
    - To configure a network card, select it and press **Enter**. Press **Enter** to switch between DHCP and manual network settings. If you set the **DHCP** option to **disabled**, you can manually set up network settings by selecting an option, pressing **Enter**, entering a new value, and pressing **Enter** again. Press **F10** to save your changes and exit.

Increasing Backup Repository Size on Virtual Appliance

A Backup Repository on a Virtual Appliance (VA) is located in a logical volume (that can spread across multiple physical volumes). To extend the Backup Repository size on the VA, you need to add a new disk to the VA and then use the VA console to extend the Backup Repository to the new disk.

The Backup Repository size on the VA cannot be increased by extending existing VA disks.

The backup repository size on the VA cannot be increased by extending existing VA disks. To increase the size of the backup repository on the Virtual Appliance, follow the steps below:

1. Attach a new disk to the VA.
2. Open the VA console in your hypervisor's client.
3. Run the following commands in the VA console depending on the NAKIVO Backup & Replication version you use:
    - For the product Version 8.1 and higher:
        a. Select **Manage NAKIVO services** in the main menu and press **Enter**.
        b. Select **Onboard repository storage** and press **Enter**.
    - For earlier product versions, select **Backup storage** in the main menu and press **Enter**.
4. Refresh the list of disks by pressing **F5**.
5. Select the disk that you have created and press **Enter**.
6. Press **Enter** again to confirm the procedure. The disk is formatted and added to the Backup Repository on the VA.

Removing the Disk with Backup Repository from Virtual Appliance

The Virtual Appliance (VA) comes with a 500 GB disk on which a Backup Repository is created. If you have deployed the Virtual Appliance disks using the **Thin Provision** option, then the disk does not consume 500 GB of space on your datastore – only the space occupied by VM backups is consumed.

If you still would like to delete the 500GB disk after you have deployed the Virtual Appliance, follow the steps below:

1. Log in to NAKIVO Backup & Replication.
2. Go to the **Configuration** > **Repositories** tab.
3. Click **Onboard repository**
4. Click **Manage** and choose **Remove** from the menu.
5. In the message that opens, click the **Remove Repository and Delete Backups** button.
6. Click **Remove** to confirm that you wish to remove the Backup Repository.
7. Open the vSphere client and launch the console of the VA.
8. In the Virtual Appliance interface, select the **Exit to system console** option and press **Enter**.
9. Enter a login and password (default are `root/root`).
10. Run the following command to unmount the volume on which the Backup Repository is located: `umount /opt/nakivo/repository`
11. Open the configuration file with the `nano` editor by running the following command: `nano/etc/fstab`
12. In the editor, delete the line: `dev/mapper/Volume_Group_Backup_Repository_500GB/Logical_Volume_Backup_Repository_500GB /opt/nakivo ext4 defaults 0 2`
13. Save changes by pressing **Ctrl+O**, and then pressing **Enter**.
14. Exit the editor by pressing **Ctrl+X**.
15. Power off the VA and delete the 500 GB disk.

Multi-Tenant Mode Configuration

This section covers the following topics:

Changing Login and Password in Multi-Tenant Mode

To change the login and password of the Master Admin, follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Configuration** in the upper right corner of the product.
3. Go to the **General** tab and click **Users and Roles**.
4. In the list of users that opens, click the Master Admin user.
5. For the Master Admin, enter data in the **Login, Password**, **Confirm Password**, and **Admin email** boxes and click **Apply.**

Configuring Branding Settings in Multi-Tenant Mode

In the multi-tenant mode, you can change the product branding settings such as product name, logo, background, and so on. To configure the system settings, follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Settings** in the left pane of the product.
3. Go to the **General** tab and click **Branding**.

4. Do the following:
    - To change the product title, company name, website URL, contact email, support email, and contact phone, type a new value in the appropriate field

- To change the product logo, background, and default tenant logo, click **Change** click on the appropriate box, select a new image, and click **Open**.

5. Click **Apply**.

NOTE: During upload, the logo and bookmark icon images are resized internally while preserving the aspect ratio. The background image is used as it is. To get the best image quality, follow the recommendations below:

Image	Best format	Best resolution
Global logo	.png	40x40
Page background	.jpeg	1920x1440
Bookmark icon	.png	16x16
Default tent logo	.png	120x95

Configuring Email Notifications in Multi-Tenant Mode

NAKIVO Backup & Replication can send notifications and reports over email. To configure the email notifications, follow the steps below:

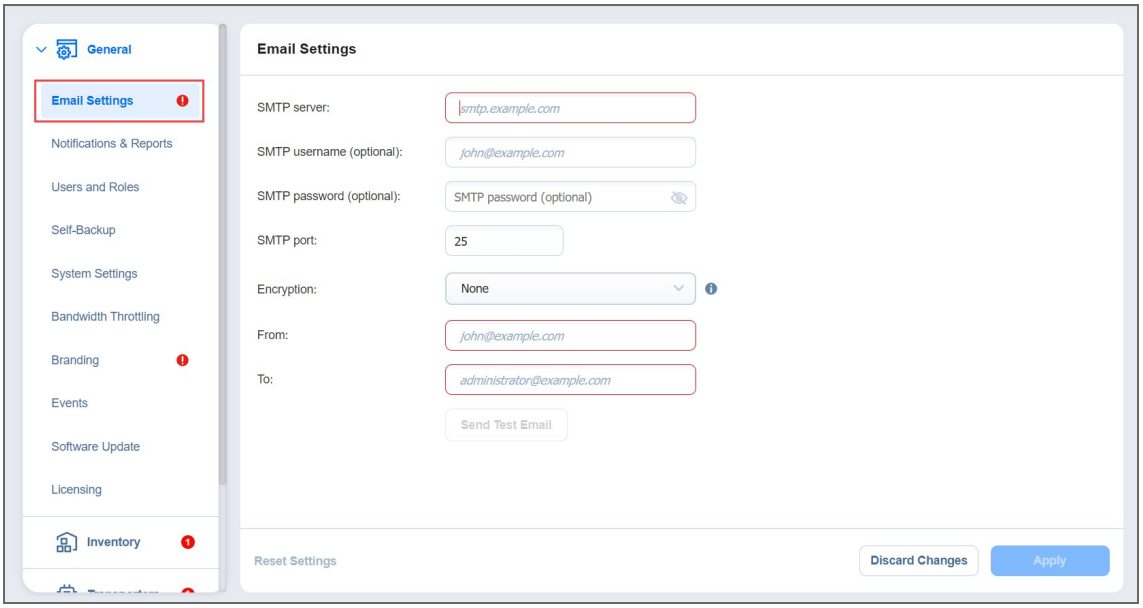
1. Make sure you have configured your email settings.
2. Log in to NAKIVO Backup & Replication as a Master Admin.
3. Click **Settings** in the left pane of the product and go to the **General** tab.
4. Click **Email settings**.
5. In the **Email Notifications** section, select the options as appropriate:
    a. **Send alarm (error) notifications**: If selected, this will send notifications about a job, repository, infrastructure, connection, and other failures to email addresses specified in the text field. Use a semicolon to separate multiple email addresses.
    b. **Send warning notifications**: If selected, this will send warning notifications on non-critical events, such as infrastructure change, to email addresses specified in the text field. Use a semicolon to separate multiple email addresses.
    c. **Limit email notification frequency to**: Set a limit to how often email notifications are sent.
6. In the **Automatic Reports** section, select or deselect the following automatic reports options:
    - **Attach PDF copy to automatic reports**: Specify whether you wish to include a copy of the PDF report with notifications.
    - **Send tenant Overview reports on schedule to**: If this option is selected, NAKIVO Backup & Replication will generate an Overview report (which includes information about all jobs and groups in the product) on the date and time specified in the scheduler and will send the report to the recipients specified in the text field. Use a semicolon to separate multiple email addresses.
    - **Send tenant Protection Coverage reports on schedule to**: If this option is selected, NAKIVO Backup & Replication will generate the Protection Coverage report (which includes information about all VMs & instances protected by backup and/or replication jobs as well as the information about all unprotected VMs & instances) on the date and time specified in the scheduler and will send the report to the recipients specified in the text field. Use a semicolon to separate multiple email addresses.
    - Click **Apply**.

Configuring Email Settings in Multi-Tenant Mode

Configure email settings so that NAKIVO Backup & Replication can send email notifications as well as reports over email. If email settings are not configured, tenants will not be able to configure email notifications for their jobs. To configure email settings**,** follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Settings** in the left pane of the product.
3. Go to the **General** tab and click **Email notifications**.
4. In the **Email Settings** section, enter data in the boxes, and click **Send Test Email** to verify the settings are correct.

After the email settings are configured, you can configure the product email notifications.



Configuring System Settings in Multi-Tenant Mode

To configure the system settings, follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Settings** in the left pane of the product.
3. Go to the **General** tab and click **System settings**.
4. Select or deselect the following options:
    - **Store system events for the last X days**: This option specifies the time period (from 10 to 365 days) during which the application events will be kept. Older events are automatically deleted.
    - **Auto log out after X minutes of inactivity**: If this option is selected, the current user will be automatically logged out of the product after the specified period of inactivity.
    - **Auto upload support bundles to support team server**: If this option is enabled, NAKIVO Backup & Replication will automatically create, encrypt, and upload support bundles once a day to a NAKIVO support server during the evaluation period. The NAKIVO Support team may use this information to improve the product experience and will be able to identify and resolve product issues faster.
    - **Enable built-in support chat:** If selected, this will allow you to chat with the NAKIVO support team.
    - **Display special offers**: If selected, this will show a toolbar with special offers in the GUI.
    - **Continue product update if self-backup fails**: If selected, product update will proceed even if automatic self-backup cannot be performed.
    - **Tape options**: These present you with setting options for tape devices:
        - **Auto erase expired tapes**: If selected, expired tape cartridges will be erased automatically.
        - **Wait for next tape for**: Specify for how long the system needs to wait for the next tape cartridge if there is no appropriate one. Select the **Send email notification** checkbox to allow you to receive email notifications.
        - **Auto refresh tapes every**: Select how often the contents of tape cartridges are to be refreshed in minutes or hours. Deselect if no refreshing is required.
    - **Regional options**: Set the clock format, short date format, long date format, first day of the week, decimal symbol, and default time zone in the corresponding fields.
- In the **Web Interface TLS/SSL Certificate** section, you can either**:**
    - **View current certificate**: A dialog containing the current certificate information opens.
    - **Install new certificate**: A dialog opens, allowing you to install a new TLS/SSL certificate for the NAKIVO Backup & Replication web interface. Certificates are generated either internally or through certification authorities. Proceed as follows to install a new certificate:

- Click **Browse** and navigate to the location of either of the following certificate file types:
  - **Private key**: A file in the *.key format.
  - **Private key password (optional)**: A password for your private key.
  - **Certificate file**: A file in the *.pem, *.crt, *.cer, *.p7b, or *.p7s format.
  - **Intermediate certificate (optional)**: A file in the *.pem, *.crt, *.cer, *.p7b, *.p7s format.
- Click Install.

Note

In the Web Interface TLS/SSL Certificate section, you can see a notification about imminent TLS/SSL certificate expiration in 30 days and onwards. If your certificate has expired, you will be asked to install a valid certificate.

Exporting and Importing Configuration in Multi-Tenant Mode

System configuration export and import are recommended for easy migration to new product deployment. System configuration, such as jobs, user credentials, inventory items, Transporter and Backup Repository settings, is all exported into a single export bundle.

The export bundle can be applied to a new deployment.

To export system configuration from the old deployment, follow the steps below:

1. Open **Settings** in the old deployment.
2. Go to the **General** tab and click **System migration**.
3. Click **Export system configuration**.
4. In the dialog box that opens, click **Export**.
5. Click **Proceed** to confirm the operation.

   Note

   All activities in the old deployment (such as jobs and recovery sessions) will be automatically stopped and disabled.

6. Wait until the export is completed, and download the export bundle.

To import system configuration into the new deployment, follow the steps below:

1. Open **Settings** in the new deployment.
2. Go to the **General** tab and click **System migration**.
3. Click **Import system configuration**.
4. In the dialog window that appears, locate the export bundle using the **Browse** button.
5. Click **Import**.
6. Click **Proceed** to confirm the operation.

   Note

   If there is any existing data in the new deployment, it will be overwritten with the import operation.
7. Wait until the import is completed, and close the dialog box.

Notes

- Data contained in backup repositories is not migrated to the new location automatically. If you are using a locally attached Backup Repository, the physical data must be copied or moved to the new location manually.

  After moving the files you may need to edit the Backup Repository settings in the new deployment so that the new settings refer to the actual Backup Repository location.

- If a custom TLS/SSL certificate of the Web server was used in the old deployment, a manual service restart will be required in the new deployment.

Support Bundles

NAKIVO Backup & Replication provides you with the ability to create support bundles – a zipped collection of the product logs and system information. Sending a support bundle to the NAKIVO Support Team allows them to quickly identify the root cause of issues and suggest a proper solution.

Creating Support Bundles

Before creating a support bundle, make sure Email settings are configured. To create a support bundle, follow these steps:

1. Click the **"?" (Help)** icon in the lower-left corner of the web UI.
2. Select and click **Request support**. The dialog box will appear.
3. Enter a description of your problem in the **Please describe the problem you're experiencing** box.
4. Enter your email address in the **Contact email** box.
5. If necessary, upload an attachment by clicking **Browse**.
6. Select **Include logs of all tenants** if you wish to include log files of all tenants to the support bundle.
7. Select **Include main database** if you want to include your main database.
8. Select **Include tenant databases** if you wish to include tenant databases containing most of the tenant configuration, including inventory, transporters, repositories, and jobs.
9. Click **Create & Send Support Bundle** to send the support bundle to NAKIVO Support Team. You will receive an answer from the NAKIVO Support Team within one business day.

10. Optionally, click **Download** to save the support bundle on your machine.

Sending Support Bundles Manually

Some support bundles may become overly large in size. This can occur due to large log files or file dumps. In such cases, it is recommended to upload these files manually.

To do this, follow these steps:

1. Open the **Upload Files to NAKIVO Support** page.
2. In the *Files* section, click **Browse** and select up to three files. You can select more than three files by clicking **Add Another File**.

   Note

   You can upload any files relevant to your issue: logs, file dumps, or the support bundles that you have manually downloaded from the product's UI.

3. Enter your email address in the **Contact email** field.
4. You can also enter the ID of your support ticket in the **Ticket ID** field if you have one opened.
5. Optionally, enter a description in the **Description** field.
6. Click **Upload** when you're done uploading the file(s).

   Note

   Wait for a successful upload notification before closing the page.

Built-in Support Chat

You have the possibility to contact a NAKIVO representative via chat in the NAKIVO Backup & Replication interface.

Opening Built-in Support Chat

To open Built-in Support Chat, follow the steps below:

1. In the lower right corner of the NAKIVO Backup & Replication interface, click the chat button.

2. The **NAKIVO Support** dialog box opens. Introduce yourself by providing the following information:
    a. In the upper box of the dialog box, enter your name.
    b. In the box below, enter your email address.
3. Choose a department from the list of available departments.

4. Enter your message text and click **Start Chatting**.

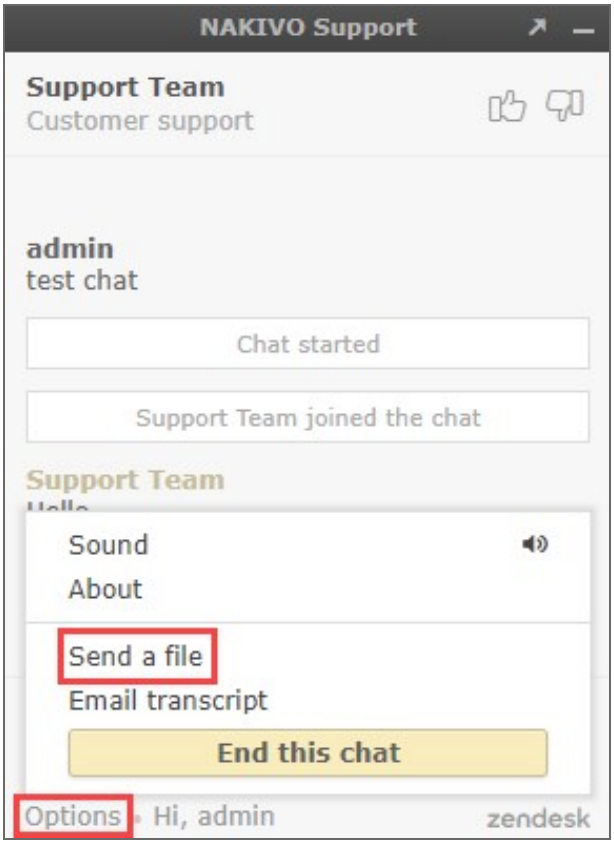
5. Your message is sent to a NAKIVO representative and will be processed as soon as possible. If needed, click the **Send Another** button to proceed with sending another chat message.

Sending Files in Built-in Support Chat

Please use either of the following ways to send your files in Built-in Support Chat:

- Drag and drop: open **Windows File Explorer**, select necessary files, and then drag them and drop to the chat dialog.
- Built-in Support Chat interface:
    1. In the upper left corner of the Built-in Support Chat dialog, click **Options**.
    2. In the dialog that opens, click **Send a file**.

3. The **Open** dialog opens. Navigate to the location of your files, select them and then click **Open**.



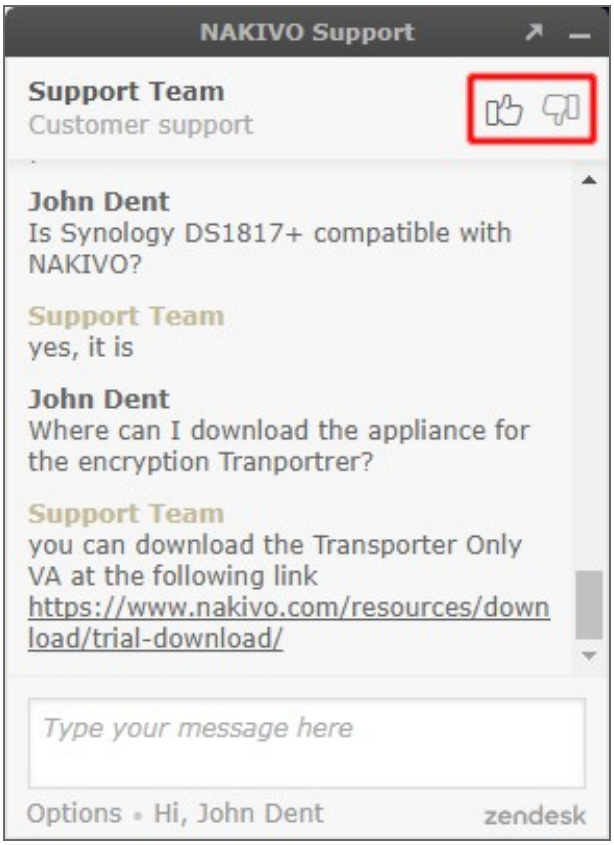
Note

The following file formats are allowed: `.pdf, .png, .jpeg, .gif, .txt`. The maximum file size is 20 MB.

Sending Feedback to Built-in Support Chat

You have the possibility of sending feedback to Built-in Support Chat: in the upper right corner of the dialog, click **Good** or **Bad**, as you deem appropriate.

If appropriate, leave a comment for NAKIVO Support Team: click **Leave a comment** and in the text box that opens, enter your comment about the chat service. Then click **Send**.

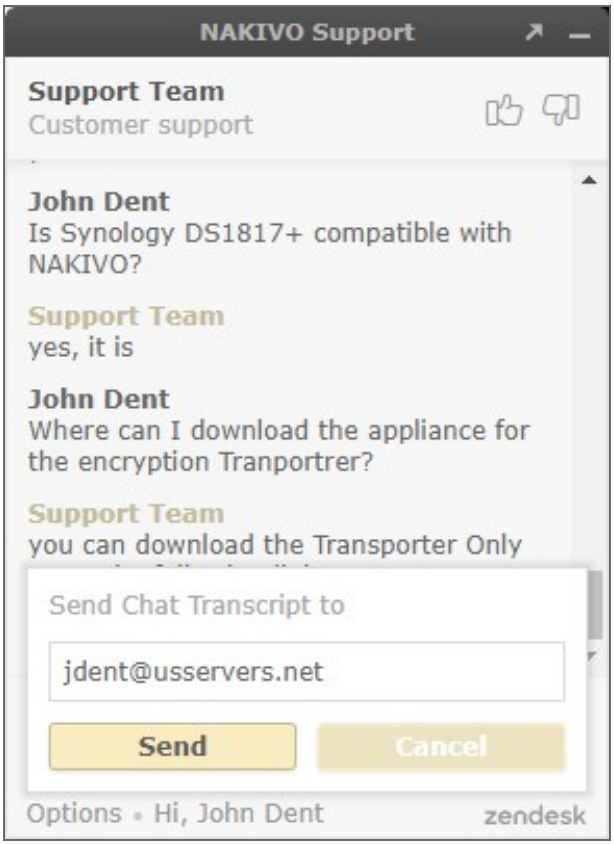


Sending Email Transcript of Built-in Support Chat

Follow the steps below to send the transcript of your Built-in Support Chat session:

1. In the upper left corner of the Built-in Support Chat dialog, click **Options**.
2. In the dialog that opens, click **Email transcript**.
3. In the dialog that opens, make sure the email address of the recipient is correct, and then click **Send**.

Your Built-in Support Chat transcript will be sent to the specified email recipient.



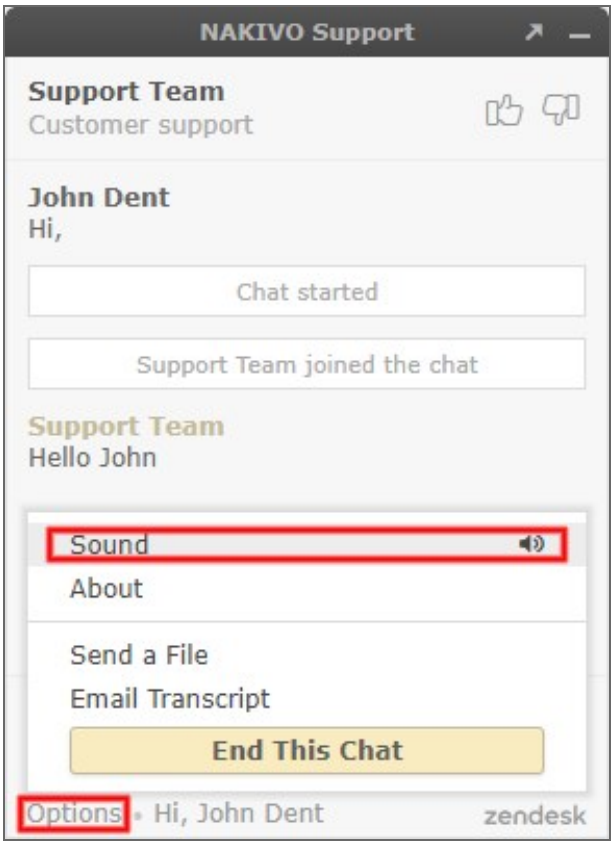
Disabling/Enabling Sound Notifications

By default, sound notifications are enabled for Built-in Support Chat.

Do the following to disable sound notifications in Built-in Support Chat:

1. In the upper left corner of the Built-in Support Chat dialog, click **Options**.
2. In the dialog that opens, click **Sound**.
3. Close the options dialog.

Sound notifications will be disabled for Built-in Support Chat.



Disabling Built-in Support Chat

By default, the built-in support chat is enabled in your instance of NAKIVO Backup & Replication.

Do the following to disable built-in support chat:

1. Go to **Settings** > **General** > **System settings**.
2. Click **Edit** to make system settings editable and then deselect the **Enable built-in support chat** checkbox.

3. Click the **Apply** button.

Note

When disabled, the Built-in Support Chat will not be available in all tenants of the NAKIVO Backup & Replication instance in multi-tenant mode.

Backup

This section contains the following topics:

Creating Microsoft 365 Backup Jobs

With NAKIVO Backup & Replication, you can back up an entire Microsoft 365 account or individual mailboxes, drives, sites, and Teams within that account. When creating a backup job for your Microsoft 365 account(s), you can specify which items to back up, where to store the backups, how often the backup job will run, and other backup options. To create a backup job, click the plus **Create** button in the **Jobs** menu, and then click **Microsoft 365 backup job**.

Note

- Before creating a Microsoft 365 backup job, you must add a "SaaS Backup Repository" on page 359.
- Refer to Required API Permissions for Microsoft 365 to see the list of required permissions for backing up Microsoft 365 objects.
- Refer to Microsoft 365 Platform Limitations of the latest Release Notes for the full list of Microsoft 365 items that are not supported.
- For mailbox backups, the size displayed in the Transferred Raw Data widget shows the amount of data that was actually transferred during backup. This size may differ from the total mailbox size displayed in the Job Info widget. Refer to "Backup Job Wizard for Microsoft 365: Source" on page 422 for a list of items that are skipped during the backup process.

The **New Backup Job Wizard for Microsoft 365** opens. Complete the wizard as described in the sections below:

- "Backup Job Wizard for Microsoft 365: Source" on page 422
- "Backup Job Wizard for Microsoft 365: Destination" on page 424

- “Backup Job Wizard for Microsoft 365: Schedule” on page 426
- “Backup Job Wizard for Microsoft 365: Retention” on page 435
- “Backup Job Wizard for Microsoft 365: Options” on page 436

Backup Job Wizard for Microsoft 365: Source

On the **Source** page of the wizard, add the Microsoft 365 account(s) or separate user, shared, or group mailboxes, user drives, sites, and Teams to your backup job. Proceed as follows:

1. In the left pane of the page, select the items you want to back up.
2. To quickly find an item, use the **Search** functionality. You can enter a part of or the full name of the item. Selected items are displayed in the right pane. You can remove items from the pane if necessary or change the priority of the item by dragging and dropping it in the required position. The priority determines the order in which the item will be processed during the job run.
3. Click **Next** to confirm the selection and go to the next page of the wizard.

Notes

- If you select a Microsoft 365 account, all mailboxes, SharePoint sites, OneDrives, and Teams contained in that account are added to the backup job.
- If you select a group mailbox, only the group mailbox data is backed up. This does not include the data of the group members, such as user mailbox, user OneDrive, or personal site.
- If you select a group site, only the group site data is backed up. This does not include the data of the group members, such as user mailbox, user OneDrive, or personal site.
- The following mailbox items are **not** backed up:
    - Outbox folders
    - Calendar event messages
    - Event request messages
    - ReadOnly folders in calendars
- Backing up a Team will **not** back up the connected team members' mailboxes, OneDrives, or personal sites. Teams backups include the following:
    - Team metadata, including team settings, team members roles & permissions, channels, tabs, applications, etc.
    - Team document library
    - Messages from posts
- Only the following types of channel tabs are included in a Teams backup:
    - Website
    - Word
    - Excel
    - PowerPoint
    - Visio
    - PDF

- Document Library
- SharePoint
- SharePoint Pages
- SharePoint Lists

Backup Job Wizard for Microsoft 365: Destination

On the **Destination** page of the wizard, you can specify the storage location for the backup. You can specify a single location for all items in the backup or select different Backup Repositories for different items.

Setting a Single Backup Repository for All Items

To back up all items selected on the **Sources** page to a single Backup Repository, choose a Backup Repository from the **Destination** drop-down list.

Setting a Different Backup Repository for Each Item

To back up the items to different Backup Repositories, follow the steps below:

1. Click **Advanced setup** and do one of the following:
    - If you have selected a Microsoft 365 account(s) on the **Source** page, the account block is displayed.
        a. Click the Microsoft 365 name to expand it and view all of the mailboxes, OneDrive instances, and SharePoint sites.
        b. In the **Default Destination** drop-down list, select the Backup Repository for storing the backups of all services within the Microsoft account(s).

- If you need a specific mailbox(es), OneDrive instance or SharePoint site to be stored in a different Backup Repository, click the name of the service and select a different location from the **Destination** drop-down list.

2. Click **Next** to go to the next page of the wizard.

Backup Job Wizard for Microsoft 365: Schedule

On the **Schedule** page of the wizard, select to run the backup job manually or schedule the job to run on a regular basis.

Proceed as described in the sections below:

Switching to Improved Retention Approach

NAKIVO Backup & Replication offers two approaches to retention and scheduling: the legacy or the improved approach. To learn more about how the legacy and improved approaches work, go here. If you create a new job or edit the existing one that uses the legacy approach, a popup appears offering that you to switch to the improved retention approach in the following cases:

- You have updated your instance of the product to v10.8 or later from an older version.
- You have imported a configuration to an instance of NAKIVO Backup & Replication v10.8 or later from an older version.

Note

If you install NAKIVO Backup & Replication v10.8 or higher, the new approach is enabled by default.

After the popup appears, do one of the following actions:

- If you do not want to switch to the new scheduler, click **Hide** to close the popup. You can later click **Use New Scheduler** on the **Schedule** page to proceed with the change if you change your mind.
- Alternatively, click **Use New Scheduler** in the popup. Next, choose one of the following options:
  - **MIGRATE SETTINGS**: When you select this option, the existing schedules are automatically converted to new schedules and the existing retention settings are mapped to the new schedules.
  - **CREATE NEW SCHEDULES**: When you select this option, you can create new schedules using the existing retention settings. Old schedules will be deleted.
  - **CONFIGURE SETTINGS ANEW**: Select this option to reset all existing schedules and retention settings and configure them from scratch.

Notes

- After switching to the new scheduler, the legacy schedule and retention settings are displayed on the right side of the page.
- After switching to the new scheduler, reverting to the legacy schedule and retention settings is impossible.
- You can learn how expiration dates are assigned to recovery points after migration here.

Creating New Schedules

Before creating a new schedule, you can optionally enable the following settings:

- **Do not schedule, run on demand**: Enable this option if you want to start the job manually.
- **Prioritize schedules**: When this option is selected, NAKIVO Backup & Replication starts treating schedules based on their priority. The **Yearly** schedule will have higher priority than the **Monthly** schedule, etc. In case 2 or more schedules overlap, the schedules with lower priority will be skipped.
- Optionally, when creating any type of schedule, click **Show Calendar** to show the calendar or **Hide Calendar** to hide it.

When creating the schedules, you can create schedules of the following types:

Weekly

You can configure the following options for this schedule type:

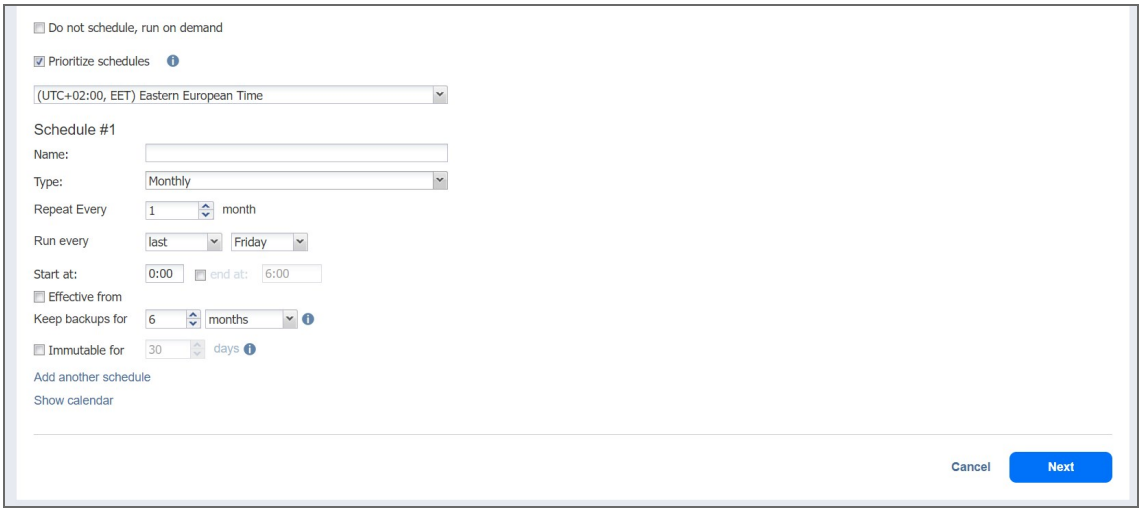
- **Schedule title**: Designates the number of a schedule.
- **Name**: Enter the name of your schedule.
- **Repeat every X weeks**: Indicates how often the schedule is repeated.
- **Days**: Select specific days when the schedule executes the job.
- **Start at**: Specify the time when the job should start.
- **End at**: Specify the time when the job should end.
- Optionally, select the **Effective from** checkbox and choose the date when the schedule should come into effect.
- **Keep backups for**: Specify how many days, months, or years NAKIVO Backup & Replication should retain the backups.
- Optionally, click **Add another schedule** if you want to add more than one schedule.

Monthly

You can configure the following options for this schedule type:

- **Schedule title**: Designates the number of a schedule.
- **Name**: Enter the name of your schedule.

- **Repeat every X months**: Indicates how often the schedule is repeated.
- **Run every**: Select specific days of the month when NAKIVO Backup & Replication executes the job.
- **Start at**: Specify the time when the job should start.
- **End at**: Specify the time when the job should end.
- Optionally, select the **Effective from** checkbox and choose the date when the schedule should come into effect.
- **Keep backups for**: Specify how many days, months, or years NAKIVO Backup & Replication should keep the backups.
- Optionally, click **Add another schedule** if you want to add more than one schedule.

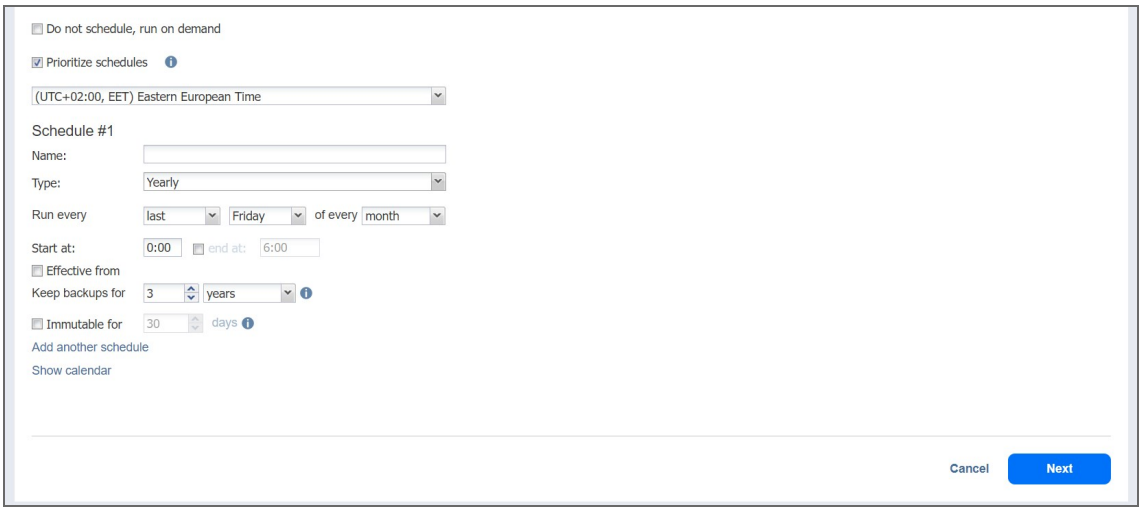


Yearly

You can configure the following options for this schedule type:

- **Schedule title**: Designates the number of a schedule.
- **Name**: Enter the name of your schedule.
- **Run every**: Select specific days of the specific month when NAKIVO Backup & Replication executes the job.
- Optionally, select the **Effective from** checkbox and choose the date when the schedule should come into effect.
- **Keep backups for**: Specify how many days, months, or years NAKIVO Backup & Replication should keep the backups.

- Optionally, click **Add another schedule** if you want to add more than one schedule.



Periodical

You can configure the following options for this schedule type:

- **Schedule title**: Designates the number of a schedule.
- **Name**: Enter the name of your schedule.
- **Run every**: Select the period measured in minutes, hours, or days when NAKIVO Backup & Replication executes the job.
- **Start at**: Specify the time when the job should start.
- **End at**: Specify the time when the job should end.
- **Days**: Select specific days when the schedule executes the job.
- Optionally, select the **Effective from** checkbox and choose the date when the schedule should come into effect.
- **Keep backups for**: Specify how many days, months, or years NAKIVO Backup & Replication should keep the backups.
- Optionally, click **Add another schedule** if you want to add more than one schedule.
- Optionally, when creating any type of schedule, click **Show Calendar** to show the calendar or **Hide**

Calendar to hide it.

After Another Job

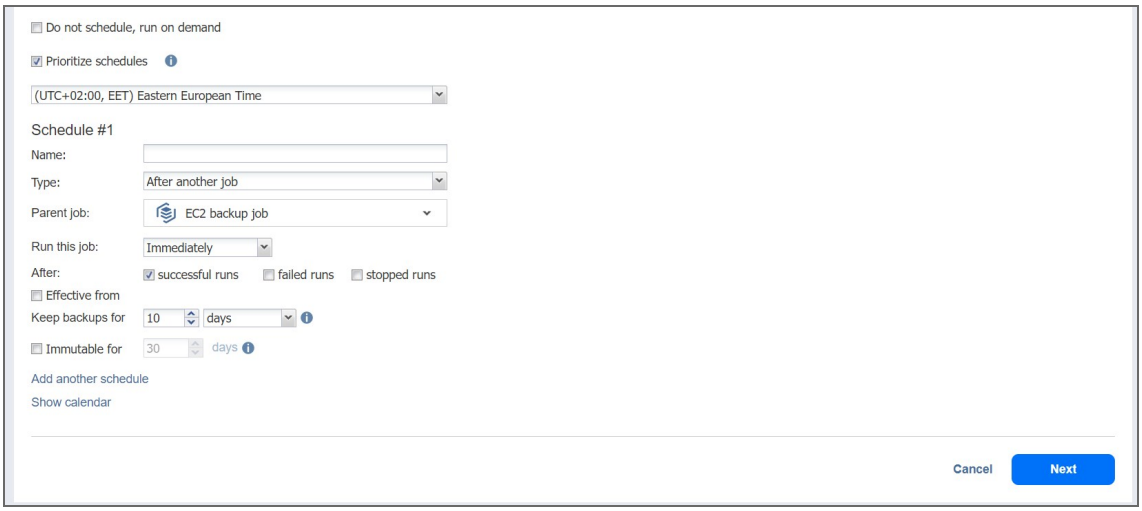
You can configure the following options for this schedule type:

Note

This option is disabled if there are no other jobs.

- **Schedule title**: Designates the number of a schedule.
- **Name**: Enter the name of your schedule.
- **Parent job**: Select the job after which this job starts running.
- **Run this job**: Select one of the following options:
  - **Immediately**: The schedule starts right after the parent job is completed.
  - **Delayed**: The schedule starts after the specified number of **minutes** or **hours** following parent job completion.
- Optionally, select the **Effective from** checkbox and choose the date when the schedule should come into effect.
- **Keep backups for**: Specify how many days, months, or years NAKIVO Backup & Replication should keep the backups.
- Optionally, click **Add another schedule** if you want to add more than one schedule.

- Optionally, click **Show Calendar** to show the calendar or **Hide Calendar** to hide it.



Creating Legacy Schedules

Before creating a new schedule, you can optionally enable the following settings:

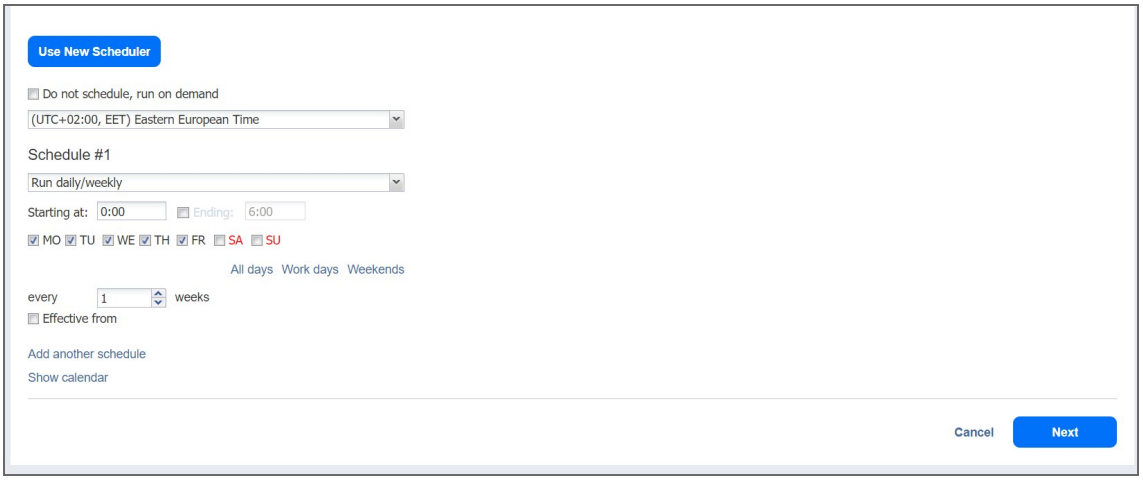
- Click **Use New Scheduler** to switch to the Improved retention approach.
- **Do not schedule, run on demand**: Enable this option if you want to start the job manually.
- Optionally, when creating any type of schedule, click **Show Calendar** to show the calendar or **Hide Calendar** to hide it.
- Optionally, click **Add another schedule** if you want to add more than one schedule.

Daily or Weekly Backup

To run the job once a day, choose **Run daily/weekly** from the schedule drop-down list and do the following:

- Specify the time when the job should be started in the **Starting** box.
- Specify the end time for the job in the **Ending** box. If the job has not completed by the time specified, the job will be stopped.
- Choose a time zone that should be used for the job start and end times from the time zone drop-down list.
- Select the days of the week during which the job will be started.

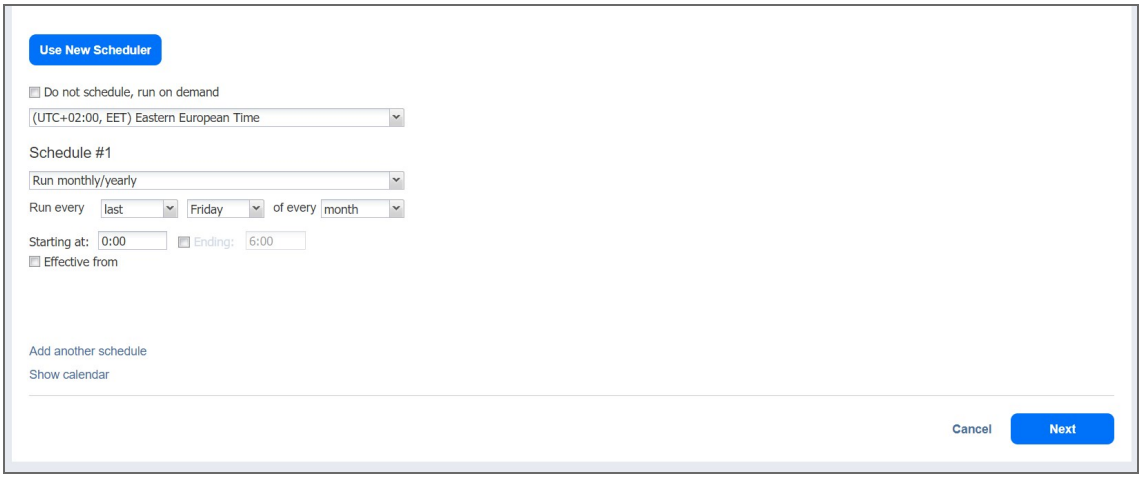
- If necessary, select the **Effective from** checkbox and pick the date when the schedule comes into effect.



Monthly or Yearly Backup

To run the job monthly or yearly, choose **Monthly/yearly** from the schedule drop-down list and do the following:

- Specify the job start schedule in the appropriate boxes.
- Specify the day and month when the job should be started in the **Run every** boxes.
- Specify the time when the job should be started in the **Starting** box.
- Specify the end time for the job in the **Ending** box. If the job has not completed by the time specified, the job will be stopped.
- If necessary, select the **Effective from** checkbox and pick the date when the schedule comes into effect.



Periodic Backup

To run the job multiple times per day, choose **Run periodically** from the schedule drop-down list and then choose a time period from the appropriate boxes:

- Specify the time when the job should be started in the **Starting** box.
- Specify the end time for the job in the **Ending** box. If the job has not completed by the time specified, the job will be stopped.
- Select the days of the week during which the job will be started.
- If necessary, select the **Effective from** checkbox and pick the date when the schedule comes into effect.

Chained Job

To run the job after a previous one has completed, choose **Run after another job** from the schedule drop-down list and set the options as follows:

- **After the job**: Select a job after which the current job will be started.
- **Run this job**: Choose whether to run the current job immediately after the previous one has completed or within a delay.
- **After successful runs**: If selected, the job will run if the previous one has completed successfully.
- **After failed runs**: If selected, the job will run if the previous one has failed.
- **After stopped runs**: If selected, the job will run if the previous one has been stopped.
- **Effective from**: If selected, the schedule will come into effect on the date picked.

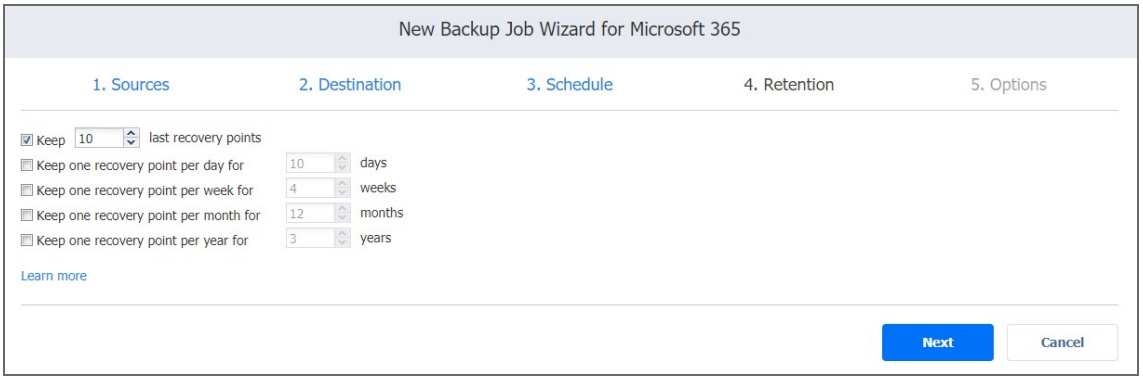
Backup Job Wizard for Microsoft 365: Retention

Important

This page is not displayed if the new scheduler is enabled.

After each job run, NAKIVO Backup & Replication creates a recovery point for each item in the Backup Repository. A recovery point represents the backed up Microsoft 365 account or mailboxes as of a particular moment in time and allows you to recover individual objects or the entire account from the Backup Repository. You can specify how many recovery points should be preserved in the Backup Repository using the Grandfather-Father-Son (GFS) backup rotation scheme. Use the following options:

- **Keep X last recovery points**: Keeps the specified number of last recovery points for each item in the job.
- **Keep one recovery point per day for X days**: Keeps one last recovery point per day for the specified number of days.
- **Keep one recovery point per week for X weeks**: Keeps the last available backup of every week for the specified number of weeks.
- **Keep one recovery point per month for X months**: Keeps the last available backup of every month for the specified number of months.
- **Keep one recovery point per year for X years**: Keeps the last available backup of every year for the specified number of years.



Backup Job Wizard for Microsoft 365: Options

On the **Options** page, you can specify the job's name, define pre- and post-job actions, and limit the Transporter load. Proceed as described in these sections:

Job Options

Here you can do the following:

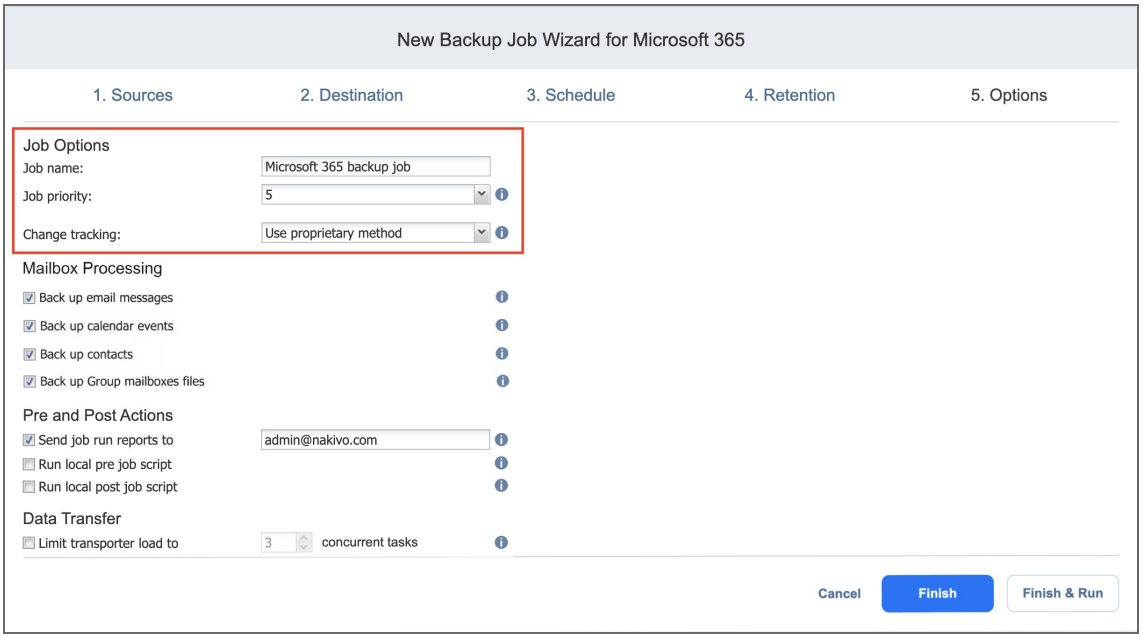
- Enter a name for the job to the **Job name** field.
- Select a **Job priority** level between 1 and 5, with 1 being the highest priority. Jobs with higher priority levels are prioritized by Transporters during job processing.

  Note
  This option is only available in the Enterprise, Enterprise Essentials, Enterprise Plus, MSP Enterprise, and MSP Enterprise Plus editions.

- Configure **Change tracking**. Do the following:
    - Choose from the following options in the dropdown menu:
        - **Use Microsoft change tracking**: With this option selected, after the initial job run, NAKIVO Backup & Replication uses Microsoft APIs to process exclusively the changed data from the last job run. This allows for a significant increase in processing speed.
        - **Use proprietary method**: With this option selected, NAKIVO Backup & Replication performs an incremental backup using the NAKIVO proprietary change tracking technology.
        - **No change tracking (always full)**: When change tracking is disabled, the full data set is transferred on every job run.
    - Optionally, click **Settings** to select one of the following job behaviors in relation to the Microsoft change tracking error:

- **switch to proprietary method**: If Microsoft change tracking fails to provide information on changed data for an object and this option is selected, NAKIVO Backup & Replication performs an incremental backup of the object using the NAKIVO proprietary change tracking technology.
- **fail object processing**: If Microsoft change tracking fails to provide information on changed data for an object and this option is selected, NAKIVO Backup & Replication does not process the object and the job is failed.

- Optionally, select **Back up group mailbox files** to back up the files connected to the Microsoft 365 Group. Note that doing this may cause some files to be duplicated if you are also backing up the connected Group Site.



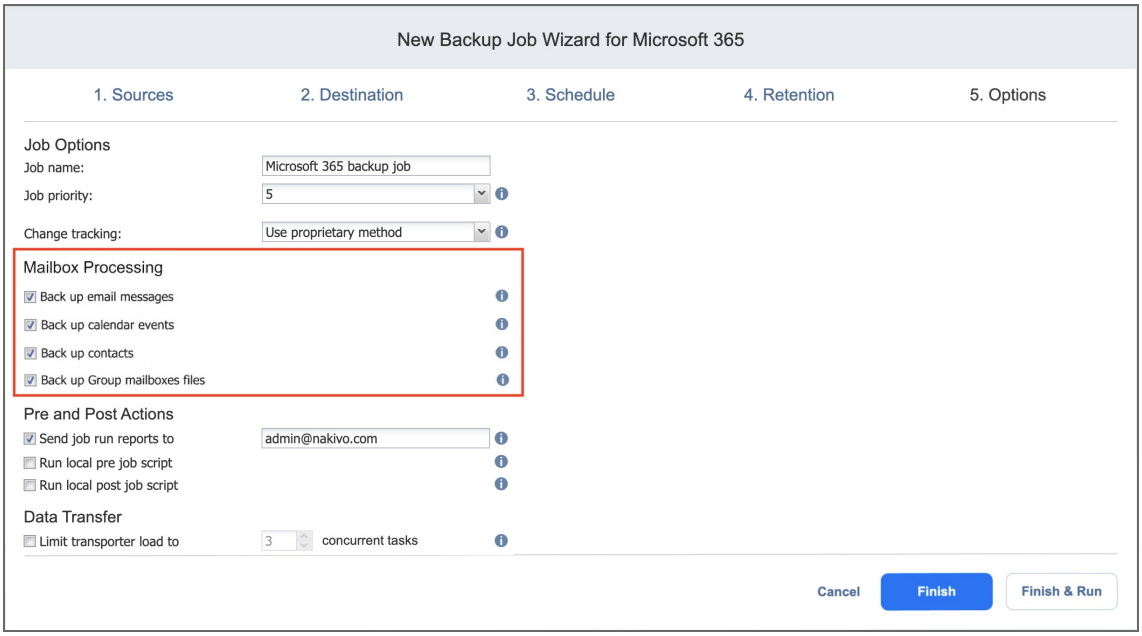
Note

- The **Change tracking** option is only displayed if at least one non-group mailbox or Team is selected in the Source step.
- If the **Use Microsoft change tracking** option is selected, the product uses delta queries in Microsoft Graph API to process only the changed data from the last run for the following objects:
  - Messages (for non-group mailboxes only)
  - Contacts (for non-group mailboxes only)
  - Calendar events (for non-group mailboxes only)
  - Teams chat messages
- The first backup run after switching to **Use Microsoft change tracking** may take longer to process, as it re-scans all source data using Microsoft change tracking.

Mailbox Processing

If you selected a mailbox on the **Source** page of the wizard, select at least one of the following mailbox items for backup by checking the respective option(s):

- Email messages
- Calendar events
- Contacts
- Group mailbox files

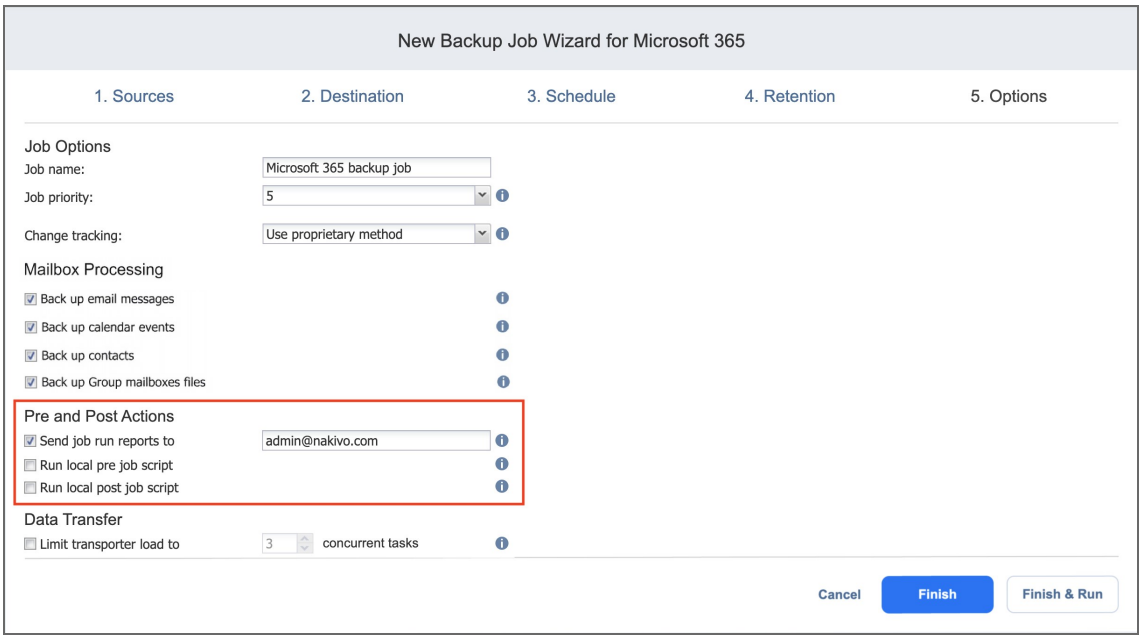


Note

- Selecting **Back up Group mailboxes files** may cause some files to be duplicated if you are also backing up the connected Group Site.
- If NAKIVO Backup & Replication is updated from a version that did not include support for Microsoft 365 Groups to a version that does, the **Back up Group mailboxes files** option is not selected automatically.
- If other Microsoft 365 items were selected in addition to Exchange Online Group mailboxes, the **Backup Group mailboxes files** option can still be selected and applies only to group mailboxes.

Pre and Post Job Actions

With NAKIVO Backup & Replication, you can enable certain actions before a backup job begins and after it is completed. You can choose to send job run reports and run local pre- and post-job scripts. For more information, refer to “Pre and Post Job Scripts” on page 16.



Email Notifications

NAKIVO Backup & Replication can send email notifications on job completion status to specified recipients. This feature complements global notification and allows you to configure notifications on a per-job level.

Note

To enable this option, configure your email settings. For details, refer to "Email Settings" on page 248.

To send email notifications, select **Send job run reports to** and specify one or more email addresses in the text box. Use the semi-colon character (;) to separate multiple email addresses.

Pre Job Script

To run a script before the product begins backing up your items, do the following:

1. Place a script file on the machine on which the Director is installed.
2. Select the **Run local pre job script** option.
3. Specify the following parameters in the dialog box that opens:
    - **Script path**: Specify a local path to the script on the machine on which the Director is installed. The script interpreter should be specified.
      Example (Windows): *cmd.exe /c D:\script.bat*
      Example (Linux): *bash /root/script.sh*
    - **Job behavior**: Choose one of the following job behaviors in relation to script completion:
        - **Wait for the script to finish**: When this option is selected, the backup is started only after the script is completed.

        - **Do not wait for the script to finish**: When this option is selected, the product runs the script and starts backing up your items at the same time.
    - **Error handling**: Choose one of the following job behaviors in relation to script failure:
        - **Continue the job on script failure**: When this option is selected, the product performs the backup job even if the script has failed.
        - **Fail the job on script failure**: When this option is selected and the script fails, the job fails and the backup is not performed.

Post Job Script

To run a script after the product has finished backing up all items, do the following:

1. Place a script file on the machine on which the Director is installed.
2. Select the **Run local post job script** option.
3. Specify the following parameters in the dialog box that opens:
    - **Script path**: Specify a local path to the script on the machine on which the Director is installed. The script interpreter should be specified.
      Example (Windows): *cmd.exe /c D:\script.bat*
      Example (Linux): *bash /root/script.sh*
    - **Job behavior**: Choose one of the following job behaviors in relation to script completion:
        - **Wait for the script to finish**: When this option is selected, the job remains in the “running” state until the script is completed.
        - **Do not wait for the script to finish**: When this option is selected, the job is completed even if the script execution is still in progress.
    - **Error handling**: Choose one of the following job behaviors in relation to script failure:
        - **Continue the job on script failure**: When this option is selected, script failure does not influence the status of the job.
        - **Fail the job on script failure**: When this option is selected and the script fails, the job status is set to “failed” even if backup is successful.

Note

Pre- and post-job scripts can be executed only on the machine on which the Director is installed.

Data Transfer

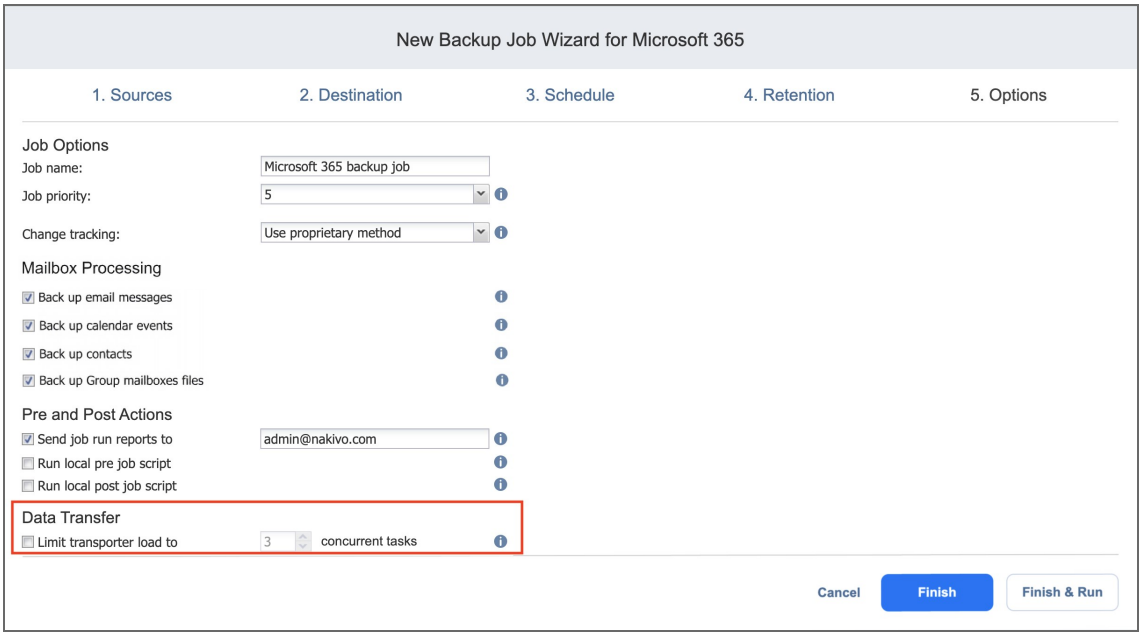
In the *Data Transfer* section, you can specify the Transporter load.

Transporter Load

You can limit the maximum number of Transporter tasks used by a job. By default, the number is set to 3 concurrent tasks. For a Microsoft 365 backup job, one task is equal to processing one mailbox or one OneDrive instance.

To change the default number of tasks, do the following:

1. In the *Data Transfer* section, select the **Limit transporter load to** checkbox.
2. Specify the number of concurrent tasks in the corresponding box.



Completing the New Backup Job Wizard for Microsoft 365

Click **Finish** or **Finish & Run** to complete the job creation.

Note

If you click **Finish & Run**, you will have to define the scope of your job.

Deleting Backups

With NAKIVO Backup & Replication, you can permanently delete a backup with all of its recovery points if this backup is available in a Backup Repository. You can also delete specific recovery points in a backup without affecting any of the other recovery points. The option to delete a specific recovery point can be used if you get an alert about corrupted recovery points in a backup.

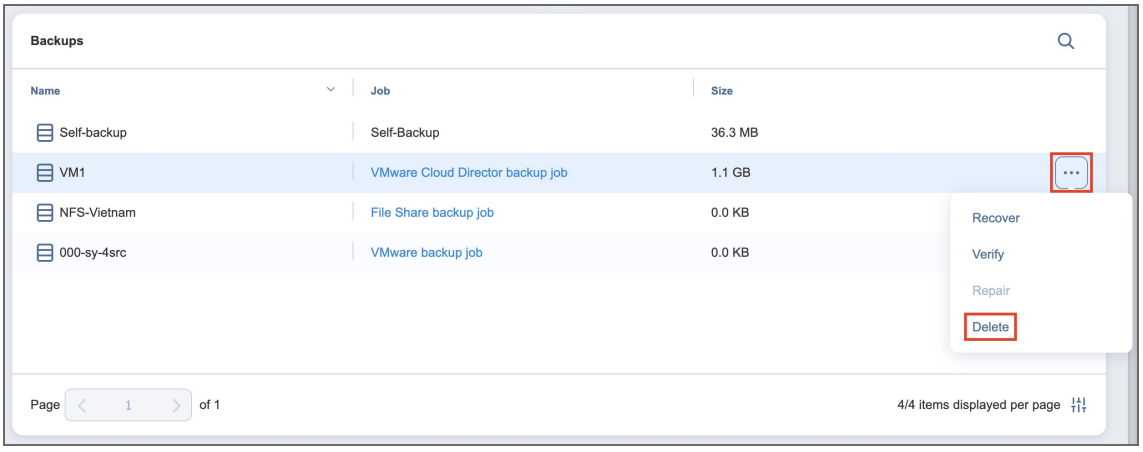
Refer to one of the following sections:

Deleting a Single Backup

To delete a backup permanently, follow the steps below:

1. In the main menu, click **Settings**.
2. Go to the **Repositories** tab and click the Backup Repository you need.
3. Hover over the backup you want to delete, and on the right side, click **Delete**.
4. Click **Delete** in the dialog box that opens.

For SaaS Backup Repositories, manually removing backup data may not return space to the operating system correctly.

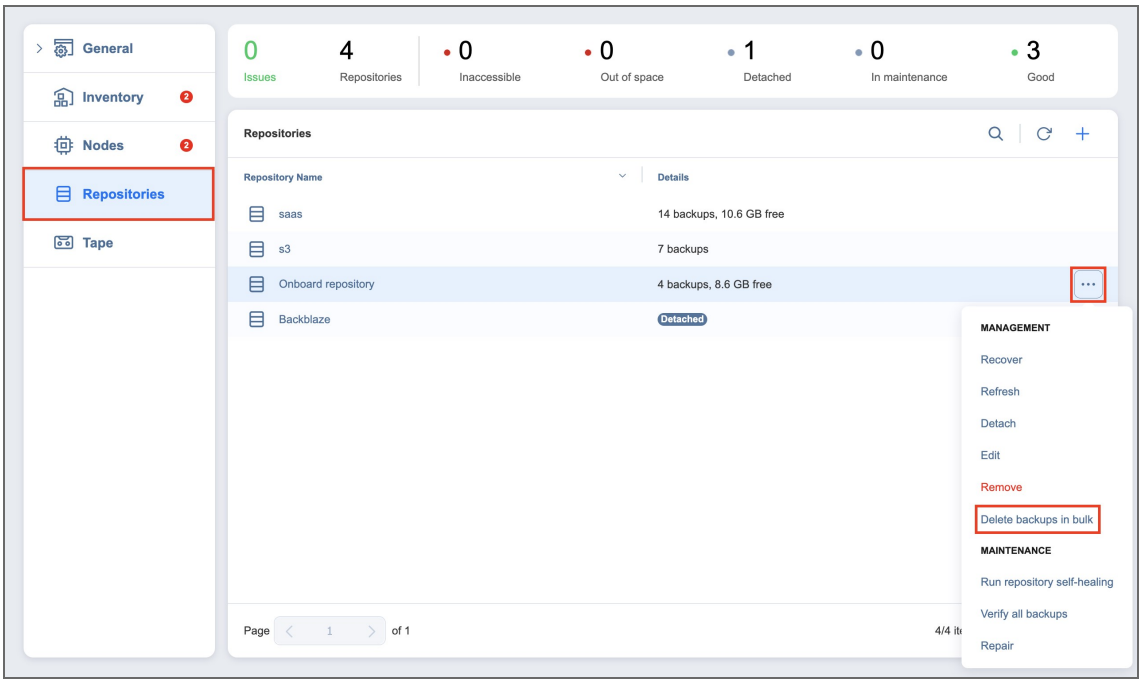


Deleting Backups in Bulk

To permanently delete several backups that match specific criteria, follow the steps below:

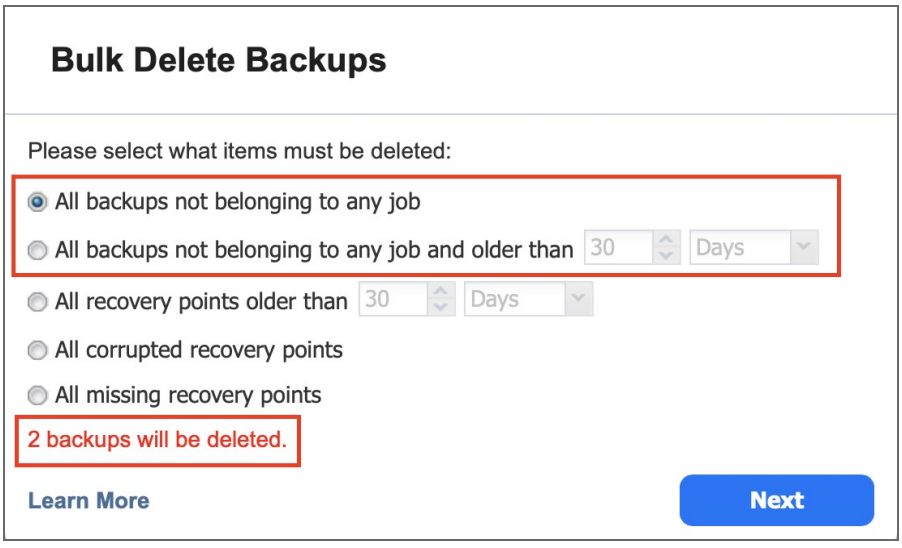
1. In the main menu, click **Settings**.
2. Go to the **Repositories** tab and hover over the Backup Repository you need.

3. Click the ellipsis **Manage** button and then click **Delete backups in bulk**.

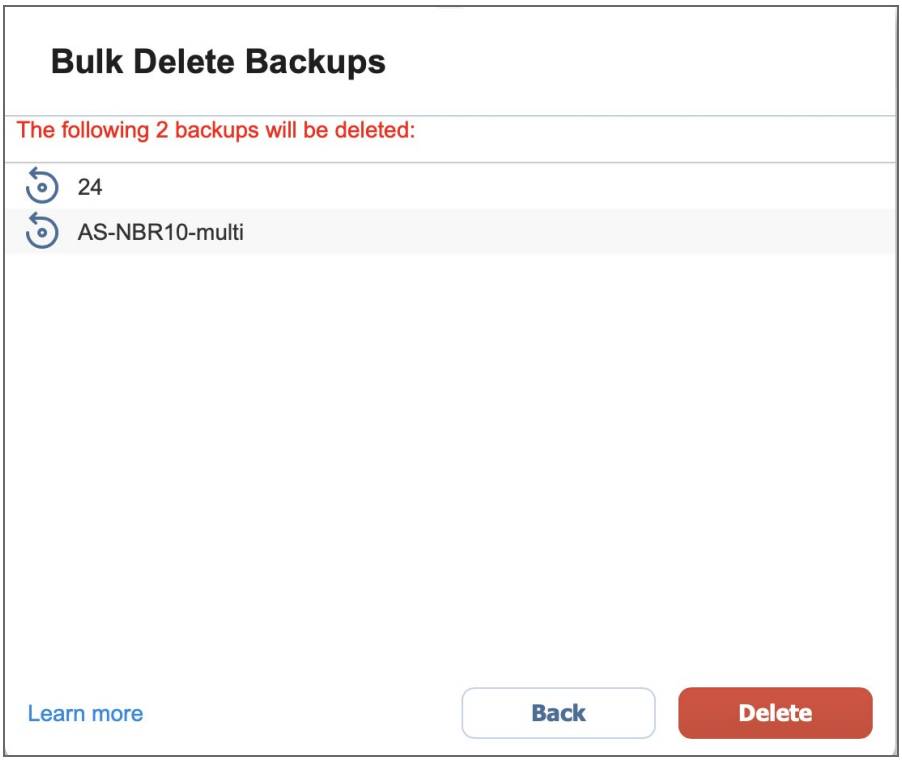


4. In the **Bulk Delete Backup** dialog box that opens, select one of the available options:
   - **All backups not belonging to any job**
   - **All backups not belonging to any job and older than** X <time_units>, where X is an integer and <time_units> is either days, weeks, or months

   The dialog shows the number of backups to be deleted.



5. Click **Next**.
6. The **Bulk Delete Backups** dialog box opens displaying the list of backups to be deleted. Click **Delete** to confirm the deletion of backups.



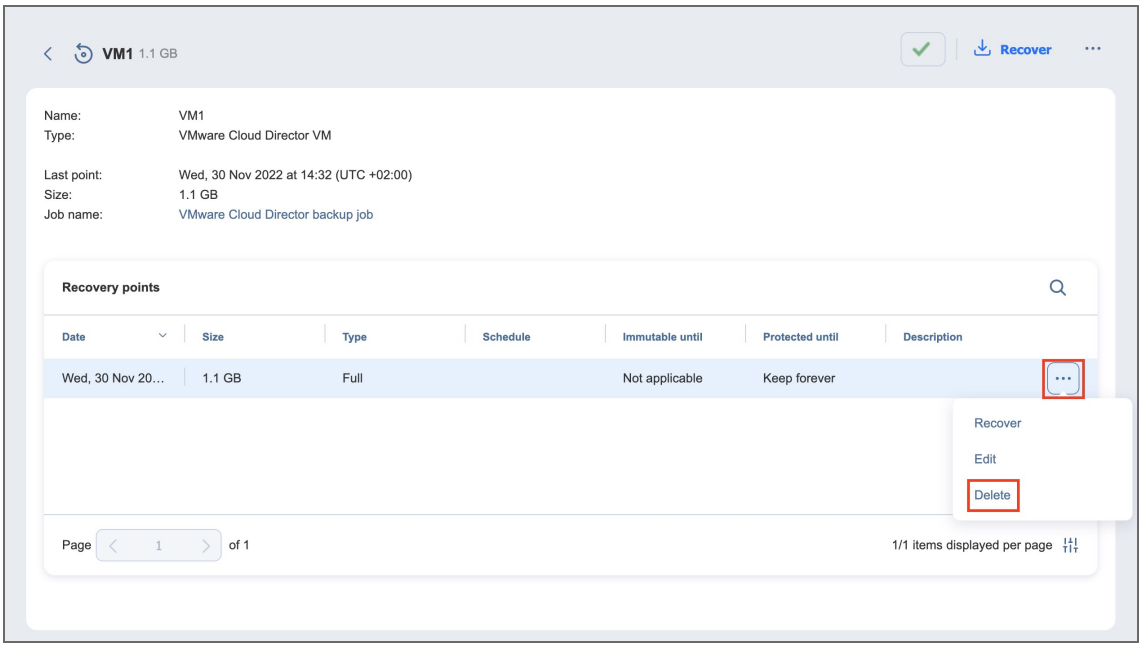
Deleting Recovery Points

You can delete a single recovery point, all corrupted recovery points, or all recovery points older than a specified number of days.

Deleting a Single Recovery Point

To delete a single recovery point in response to a corruption alert or for functional requirements, do the following:

1. In the main menu, click **Settings**.
2. Go to the **Repositories** tab and click the Backup Repository you need.
3. Click the backup with the recovery point you want to delete.
4. Hover over the recovery point that you want to delete, and on the right side, click **Delete**.



5. Click **Delete Recovery Point** in the message box that opens.

For SaaS Backup Repositories, manually removing backup data may not return space to the operating system correctly.

Bulk Recovery Points Deletion

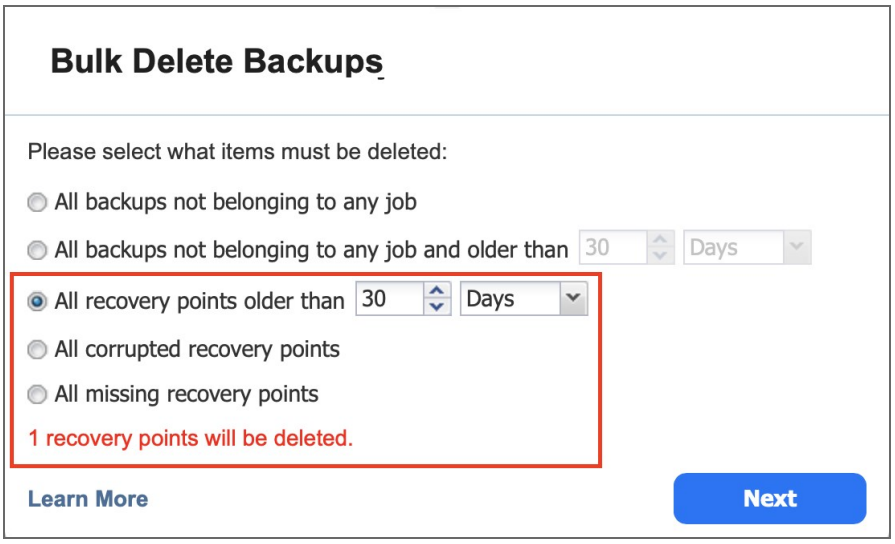
1. In the main menu, click **Settings**.
2. Go to the **Repositories** tab and click the Backup Repository you need.
3. Click **Manage** and then click **Delete backups in bulk**.
4. In the **Bulk Delete Backups** dialog box that opens, select criteria for recovery points to be deleted:
    - **All recovery points older than** X <time_units>, where X is an integer and <time_units> is either days, weeks, or months. When selected, the recovery points that are older than the specified time interval are deleted.
        - For **Forever-incremental** repositories (that is, when the **Store backups in separate files** option is not selected): If all recovery points of a backup match the deletion criteria, the latest recovery point – whether corrupted or not – is not deleted.
        - For **Incremental-with-full-backups** repositories (that is, when the **Store backups in separate files** option is selected):
            - Recovery points that are older than the end of the time interval that have dependent recovery points that are newer than the beginning of the time interval are not deleted.
    - **All corrupted recovery points**: When this option is selected, all recovery points that are corrupted are deleted. Recovery point selection criteria include the following:

- For **Forever-incremental** repositories (that is, when the **Store backups in separate files** option is not selected), if a backup is used by a backup job and all its recovery points are corrupted, the latest recovery point is not deleted.
- For **Incremental-with-full-backups** repositories (that is, when the **Store backups in separate files** option is selected), this option also deletes all recovery points that are dependent on corrupted recovery points. If all recovery points in a backup are corrupted or depend on a corrupted recovery point and match the deletion criteria, the latest full recovery point is not deleted.

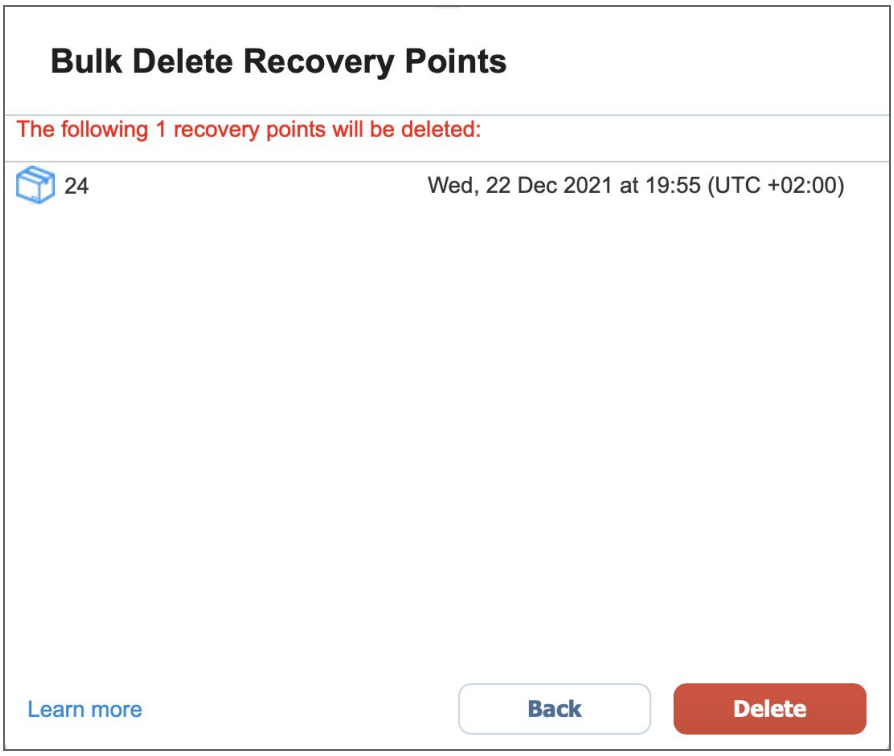
  Note
  This option is not available for Microsoft 365 backups.

- **All missing recovery points**: When selected, all missing recovery points are deleted. Recovery point selection criteria include the following:
  - For **Forever-incremental** repositories (that is, when the **Store backups in separate files** option is not selected), this option deletes all missing recovery points. If all recovery points in a backup are missing, the latest recovery point is not deleted.
  - For **Incremental-with-full-backups** repositories (that is, when the **Store backups in separate files** option is selected), this option deletes all missing recovery points and any recovery points that are dependent on them. If all recovery points in a backup are missing or depend on missing recovery points, the latest full recovery point is not deleted.

The dialog box shows the number of recovery points to be deleted.



5. The **Bulk Delete Recovery Points** dialog box opens displaying the list of recovery points to be deleted. Click **Delete** to confirm deleting the recovery points.



Note

For SaaS Backup Repositories, manual removal of backup data may not return space to the operating system correctly.

Object Recovery for Microsoft 365

The Object Recovery for Microsoft 365 feature enables browsing, searching, and recovering mailboxes, OneDrives, sites, and Teams directly from backups. This feature is agentless, works right out of the box, and does not require creating a special lab or running a special backup type.

Important

- Refer to Microsoft 365 Platform Limitations of the latest Release Notes for the full list of Microsoft 365 items that are not supported.
- Refer to Required API Permissions for Microsoft 365 to see the list of required permissions for recovering Microsoft 365 objects.

Refer to the following topics for more information:

- "Starting Object Recovery for Microsoft 365" on page 449
- "Microsoft 365 Object Recovery Wizard: Backup" on page 451
- "Microsoft 365 Object Recovery Wizard: Recovery Account" on page 452
- "Microsoft 365 Object Recovery Wizard: Objects" on page 453
- "Microsoft 365 Object Recovery Wizard: Options" on page 456

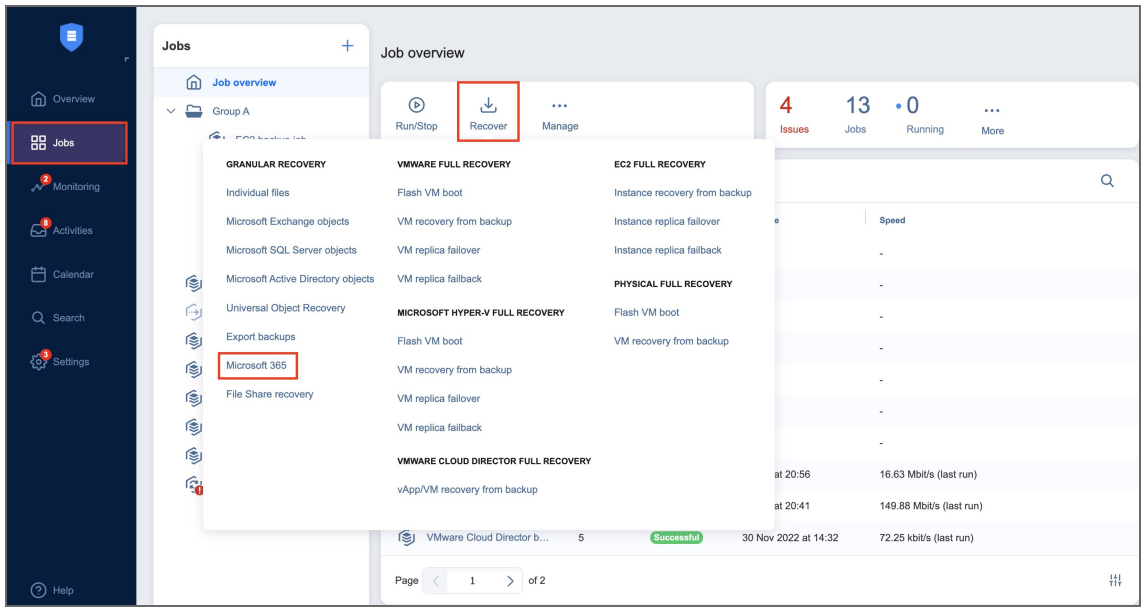
Starting Object Recovery for Microsoft 365

You can start the recovery process either from the **Jobs** menu, by using the search function or from the **Repositories** page in Settings (for example, if you no longer have a backup job, but still have the backup). Refer to the following sections for more details:

- Starting Object Recovery for Microsoft 365 from Jobs Menu
- Starting Object Recovery for Microsoft 365 from a Backup Repository

Starting Object Recovery for Microsoft 365 from Jobs Menu

To start object recovery for Microsoft 365 from the **Jobs** menu, click **Recover** and then click **Microsoft 365**.

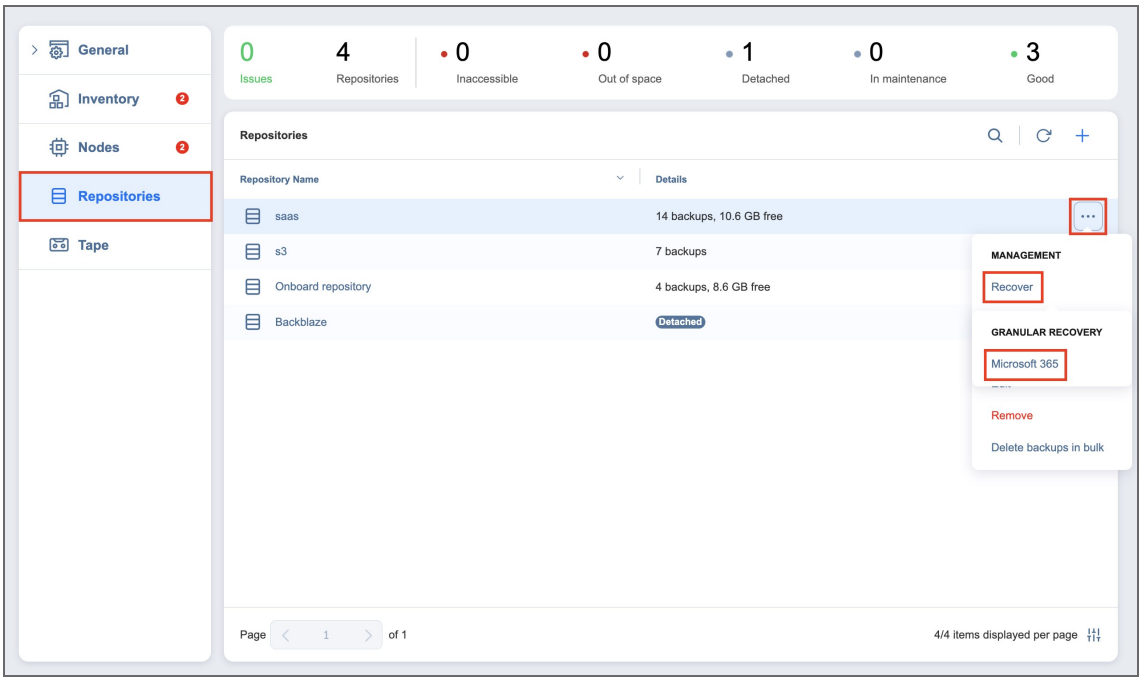


Starting Object Recovery for Microsoft 365 from a Backup Repository

To start object recovery for Microsoft 365 from a Backup Repository, do the following:

1. Go to the main menu of NAKIVO Backup & Replication and click **Settings**.
2. Go to the **Repositories** tab and hover the cursor over the Backup Repository containing the required backup.

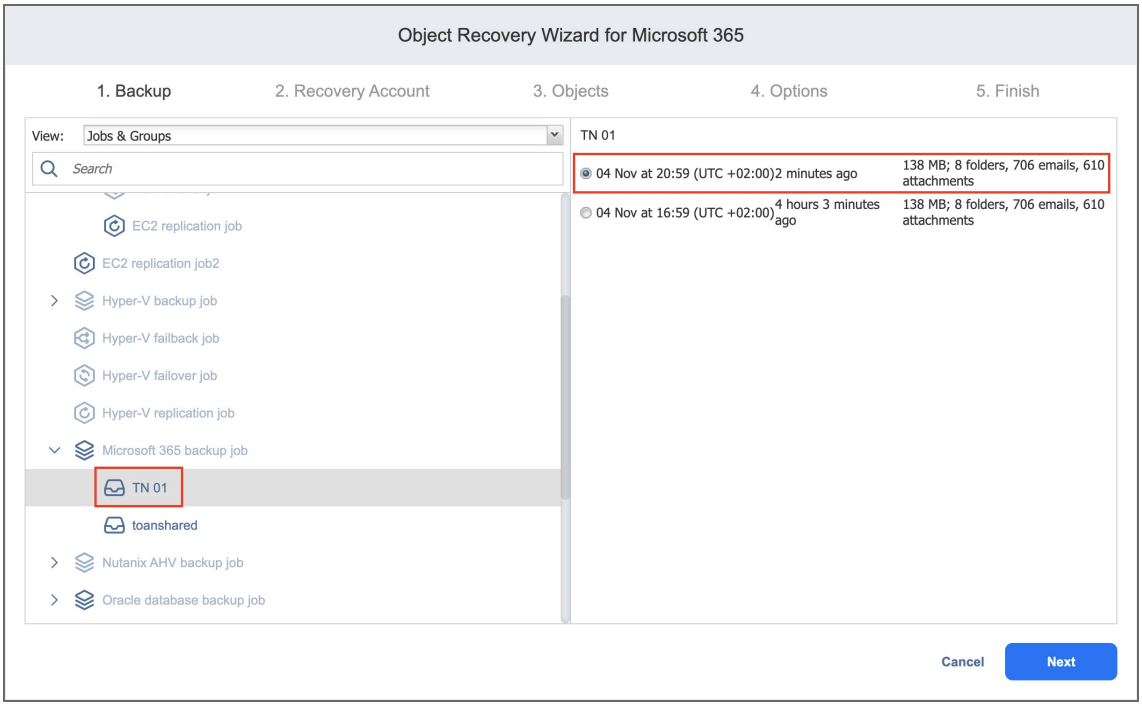
3. Click the ellipsis Manage button, click **Recover**, and select **Microsoft 365**.



The **Object Recovery Wizard for Microsoft 365** opens.

Microsoft 365 Object Recovery Wizard: Backup

On the **Backup** page of the Object Recovery Wizard for Microsoft 365, select a backed up mailbox, OneDrive, site, or Team using either a **Backup Repository** or **Jobs & Groups** view in the left pane. Then select a recovery point in the right pane. Note, that only one backup can be selected at a time.



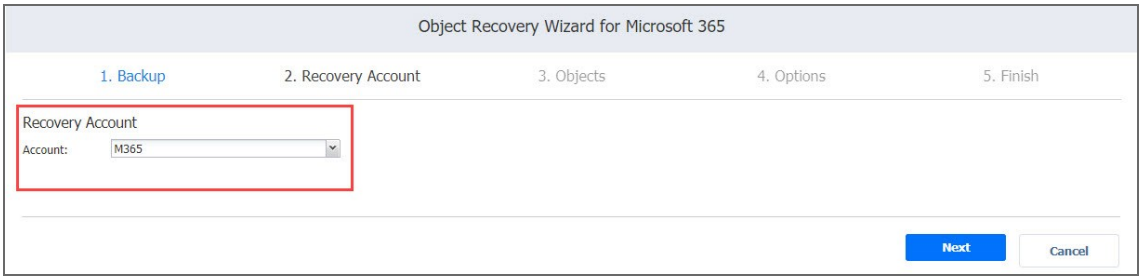
Click **Next** to proceed to the next page of the wizard.

Microsoft 365 Object Recovery Wizard: Recovery Account

On the **Recovery Account** page, specify the Microsoft 365 account to which you want to recover your items. You can choose to recover to a specific Online Exchange mailbox, OneDrive for Business, or a SharePoint site later in the wizard. Select the required account from the **Account** drop-down list. The list contains all Microsoft 365 accounts added to the inventory. Refer to "Adding Microsoft 365 Accounts" on page 310 for details.

Note

Recovering to a different Microsoft 365 account may be blocked in case the user has insufficient permissions.



Click **Next** to proceed to the next page of the wizard.

Microsoft 365 Object Recovery Wizard: Objects

On the **Objects** page, the following items can be selected for recovery:

- Mailboxes, folders, contacts, contact lists, calendar events, files, OneNote items, and emails
- Drives, folders, and files
- Sites, subsites, document libraries, lists, list items, individual files, and folders.
- Teams, channels, tabs, posts, and files.

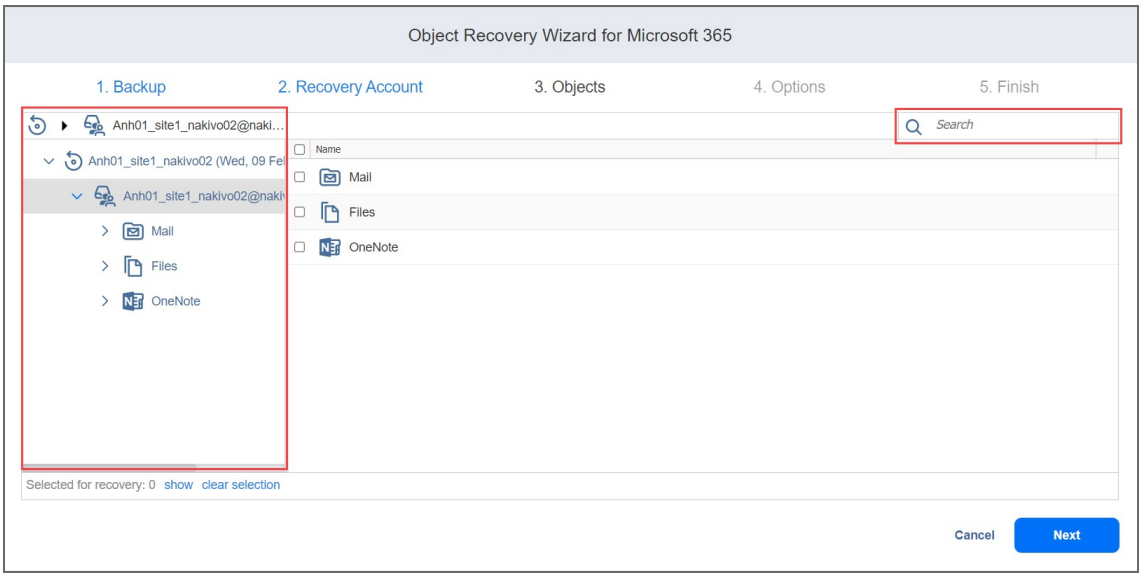
Notes

- Linked contacts are displayed as separate contact items.
- The lookup data of SharePoint Online lists displayed in the recovery wizard is inaccurate, and this data can't be recovered.
- Read-only calendars and calendars added from the directory can't be recovered.
- The following Teams tabs are not supported for recovery: Planner, OneNote, Stream, Forms, Power BI, Flow, Azure DevOps
- If you are only recovering a tab to a different team and the tab contains a link to a document library, the recovery will fail with the error message: "Cannot recover a tab to a different team if the tab links to a document library."
- If recovering a team or channel to a different team and the team or channel includes a tab that links to a document library, the tab will be skipped for recovery and the recovery will be considered successful.
- If recovering files/folders that belong to the Team SharePoint document library (and do not belong to a specific channel) to a different channel, the files/folders will be recovered to the root "General" channel folder.
- If recovering files (regardless of whether they're linked to a tab or message) to a different location, the files will be recovered to the target channel following the selected overwrite behavior (skip/overwrite/rename). No additional folders will be created.
- Messages that were backed up but have the "This message has been deleted" tag cannot be recovered.
- Refer to the Microsoft 365 Platform Limitations of the latest Release Notes for the full list of Microsoft 365 items that are not supported.

The **Objects** page contains:

- **Navigation**: Use the Navigation pane on the left to locate the items you need to restore. Selecting the container in the Navigation pane loads the container contents in the right pane. If a container has sub-folders, they are also displayed in the right pane.
- **Search**: The search box allows you to search for the objects that you want to recover. The search is performed within:
    - Mailboxes, folders, contacts, calendar items, files, OneNote items, and emails;
    - Drives, folders, and individual files;
    - Sites, document libraries, folders, files, lists, and list items.
    - Teams, channels, tabs, posts, and files.

  Enter the word or a part of the word into the search box and hit Enter on the keyboard. All items matching the criteria will be displayed in the Contents pane on the right.

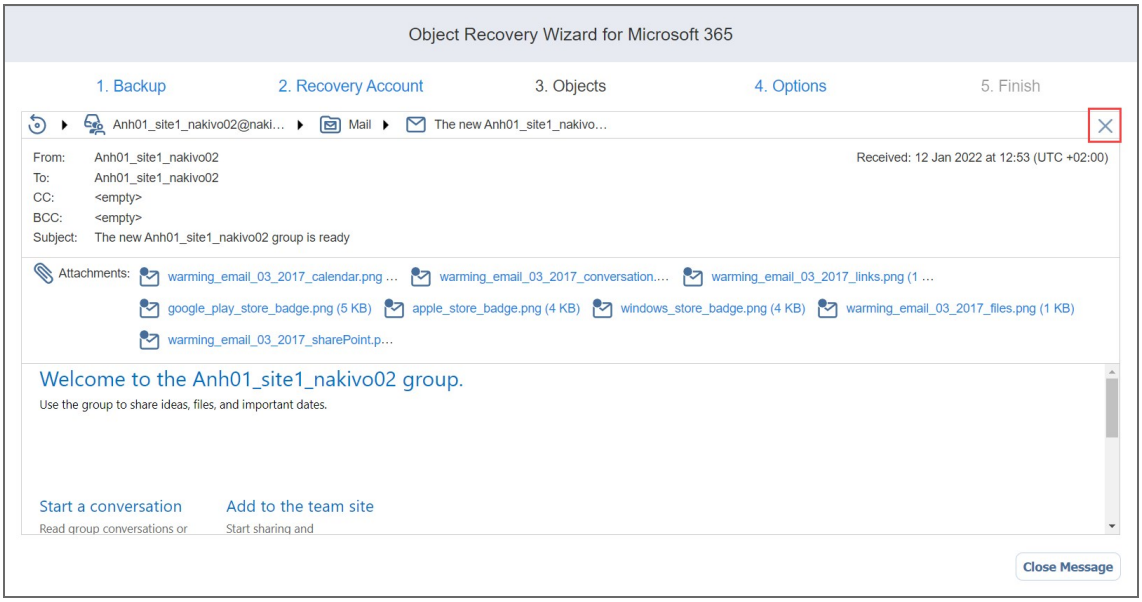


When recovering emails, contacts, or calendar events, you can also preview the contents of these items by clicking the item name in the right pane.

Note

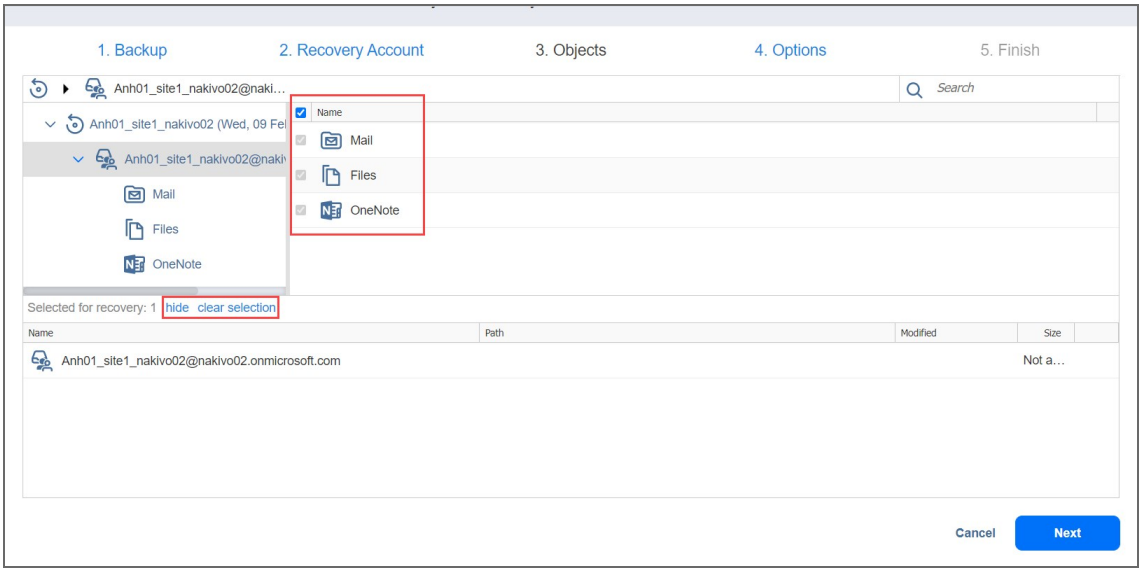
Emails may be blocked from reading in case the user has insufficient permissions.

To close the email message, contact, or calendar event preview, click the “Close” button at the bottom or click the ”X” button above the item body.



After locating the items you need to recover, select the checkboxes next to their names. You can select different object types for recovery at the same time. The number of items selected for recovery is displayed at the bottom of the wizard page. You can also:

- Click **show** to view the list of all items selected for recovery.
- Click **clear selection** to clear the list of items selected for recovery.
- Click **hide** to hide the list of items selected for recovery.



Click **Next** to proceed to the next page of the wizard.

Microsoft 365 Object Recovery Wizard: Options

On the **Options** page, specify the location to which the items will be restored and overwrite behavior for folders. Proceed as described in the sections below:

- Recovering to the Original Location
- Recovering to Mailbox or to Group
- Recovering to OneDrive
- Recovering to Site
- Recovering to Team

Recovering to the Original Location

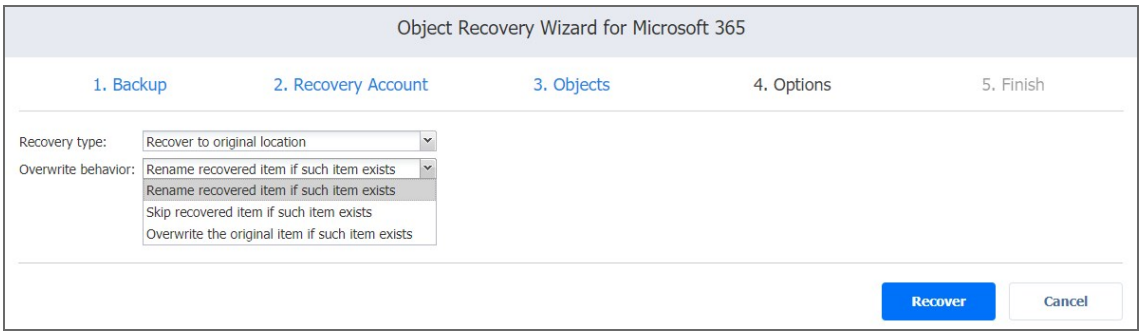
To recover Microsoft 365 items to the original location, take the following steps:

Note

- Group mailboxes can only be recovered to the original location or other group mailbox types.
- User mailboxes can be recovered to the original location or other group mailbox types and cannot be recovered to the group mailbox type.
- Personal site non-personal site items can be recovered to group site type and vice versa.

1. Select **Recover to original location** from the **Recovery type** drop-down list. All selected items will be recovered to their original locations within the Microsoft 365 account. This option is disabled if a mailbox, OneDrive, or site no longer exists (deleted from the product, for example) or if you have selected a recovery account on the **Recovery Account** page of the wizard that is different from the original account.
2. Choose the naming convention for the recovered items by selecting one of the following **Overwrite behavior** options:
    - **Rename recovered item if such item exists**
    - **Skip recovered item if such item exists**
    - **Overwrite the original item if such item exists**

3. Click **Recover**.



Recovering to Mailbox or to Group

If you want to recover items to a group or to a specific mailbox, take the following steps:

Note

Recovering to a different mailbox or group mailbox may be blocked in case the user has insufficient permissions.

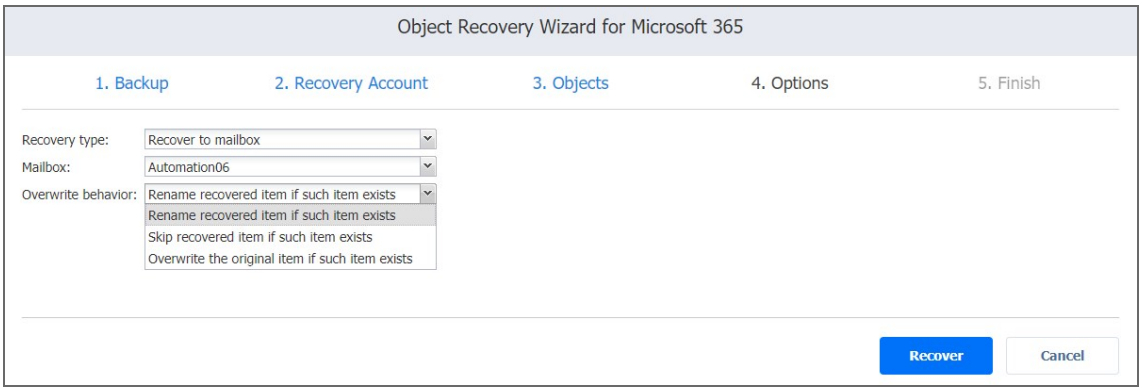
1. Select **Recover to mailbox** from the **Recovery type** drop-down list. Note that **Recover to group** is displayed if group mailbox items were selected.
2. Select the required mailbox from the **Mailbox** drop-down list. You may also search for the required mailbox by typing its name or part of its name into the search bar.

   Note

   - **Group** is displayed if group mailbox items were selected.
   - The following may occur if recovering Group messages to a different Group mailbox:
     - The original sender of the message may be changed to the name of the user used for account discovery.
     - The original receiver of the message may be changed to the target user group mailbox name.
     - The timestamp of the message may be changed.

3. Choose the overwrite behavior for the recovered items by selecting one of the following **Overwrite behavior** options:
   - **Rename recovered item if such item exists**
   - **Skip recovered item if such item exists**
   - **Overwrite the original item if such item exists**

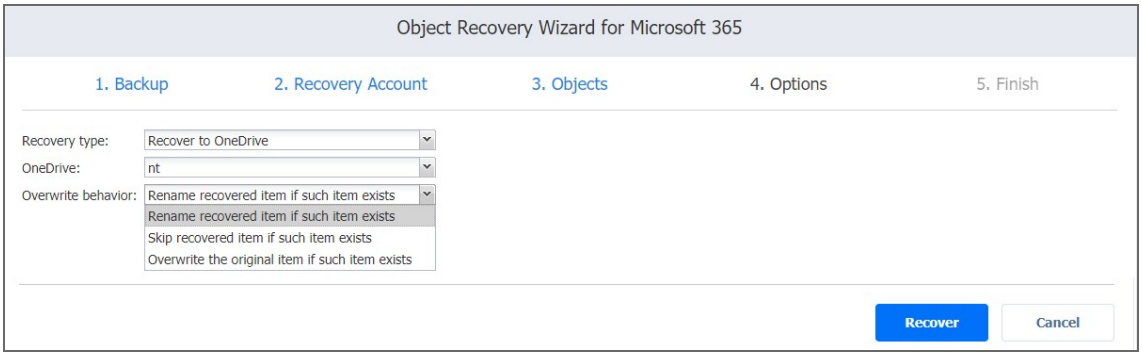
4. Click **Recover**.



Recovering to OneDrive

To recover OneDrive items to a specific OneDrive account, take the following steps:

1. Select **Recover to OneDrive** from the **Recovery type** drop-down list.
2. Select the required OneDrive from the **OneDrive** drop-down list. You may also search for the required OneDrive by typing its name or part of its name into the search bar.
3. Choose the overwrite behavior for the recovered items by selecting one of the following **Overwrite behavior** options:
    - **Rename recovered item if such item exists**
    - **Skip recovered item if such item exists**
    - **Overwrite the original item if such item exists**
4. Click **Recover**.

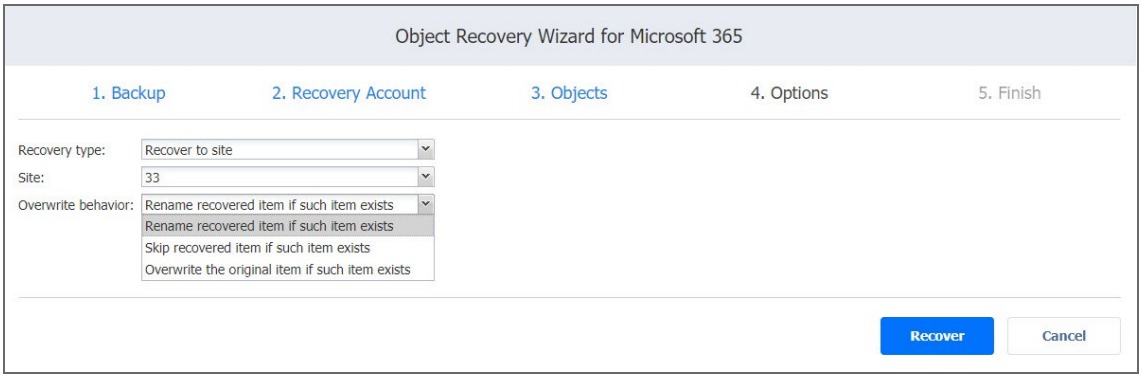


Recovering to Site

To recover SharePoint objects to a specific site, take the following steps:

1. Select **Recover to site** from the **Recovery type** drop-down list.
2. Select the required site from the **Site** drop-down list. You may also search for the required site by typing its name or part of its name into the search bar.

3. Choose the overwrite behavior for the recovered items by selecting one of the following **Overwrite behavior** options:
    - **Rename recovered item if such item exists**
    - **Skip recovered item if such item exists**
    - **Overwrite the original item if such item exists**
4. Click **Recover**.



When the recovery process is completed, the **Finish** page is displayed. You cannot return to the previous pages at this point; however, you can check the progress of the job by clicking the **Activities** link.

Recovering to Team

If an **entire team** was selected in the **Objects** step, do the following:

1. Select **Recover to team** from the **Recovery type** drop-down list.
2. Select the required team from the **Team** drop-down list. You may also search for the required team by typing its name or part of its name into the search bar.
3. Choose the overwrite behavior for the recovered items by selecting one of the following **Overwrite behavior** options:
    - **Rename recovered item if such item exists**
    - **Skip recovered item if such item exists**
    - **Overwrite the original item if such item exists**
4. To revert your team's settings (including member permissions, @mentions, fun stuff, etc.) to those in the chosen backup, check the **Restore team settings** option.

    Note

    This option restores the following settings:

    - Description
    - isMembershipLimitedToOwners
    - funSettings (allowGiphy, giphyContentRating, allowStickersAndMemes, allowCustomMemes)
    - guestSettings (allowCreateUpdateChannels, allowDeleteChannels)

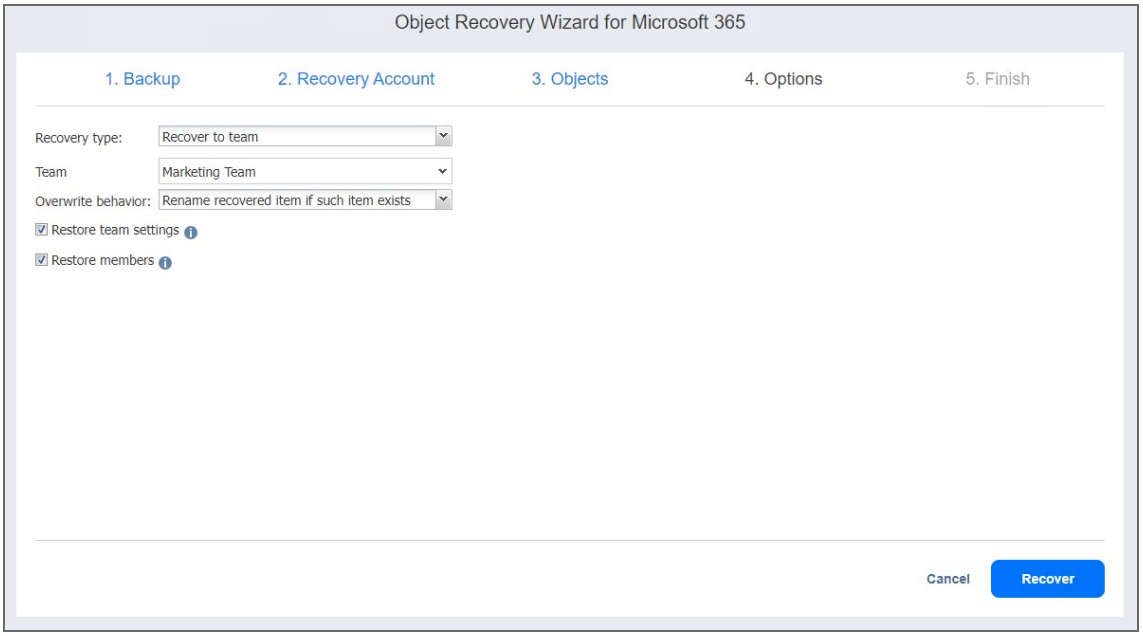
- memberSettings (allowCreateUpdateChannels, allowCreatePrivateChannels, allowDeleteChannels, allowAddRemoveApps, allowCreateUpdateRemoveTabs, allowCreateUpdateRemoveConnectors)
- messagingSettings (allowUserEditMessages, allowUserDeleteMessages, allowOwnerDeleteMessages, allowTeamMentions, allowChannelMentions)
- specialization (none, education_standard, healthcare_standard, etc)
- visibility (private, public, hidden_membership)
- discoverySettings (showInTeamsSearchAndSuggestions)
- team photo (may not always be restored due to an internal error on Microsoft's side, same as for Groups)

5. To revert your list of team members (including tags related to team members) to those in the chosen backup, check the **Restore members** option.

   Note

   If a user does not belong to the target account, that user is not added as a member to the target team. Recovery of member permissions for this user is skipped.

6. Click **Recover**.



If **team items** (channels, tabs, posts, etc.) were chosen in the **Objects** step, do the following:

1. Select **Recover to team** from the **Recovery type** drop-down list.
2. Select the required team from the **Team** drop-down list. You may also search for the required team by typing its name or part of its name into the search bar.

3. Select the required channel from the **Channel** drop-down list.
4. Choose the overwrite behavior for the recovered items by selecting one of the following **Overwrite behavior** options:
    - **Rename recovered item if such item exists**
    - **Skip recovered item if such item exists**
    - **Overwrite the original item if such item exists**
5. Click **Recover**.

Note

Depending on the selected overwrite behavior, the following channel settings are recovered if a Team or channel is selected for recovery:

- Name
- Description
- membershipType: standard, private, shared
- isFavoriteByDefault
- channel moderation settings (allowNewMessageFromBots, allowNewMessageFromConnectors, replyRestriction (everyone, authorAndModerators), userNewMessageRestriction (everyone, everyoneExceptGuests, moderators))

If multiple channels are selected for recovery to a different team:

- Posts and tabs in selected channels are recovered to the target channel.
- Files in selected channels are recovered to newly created folders in the target channel.

Multi-Tenant Mode

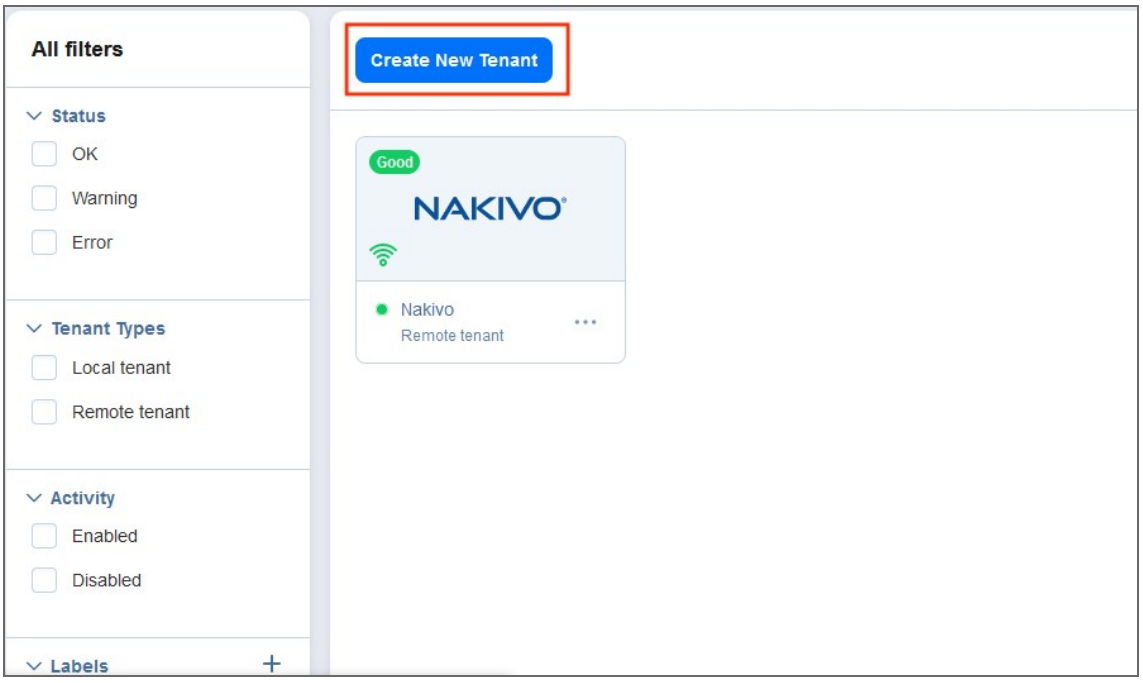
This section covers the following topics:

Creating a Local Tenant

This section covers the topics describing the local tenant creation process in NAKIVO Backup & Replication. The data protection resources (Inventory items, Backup Repositories, and Nodes) of a local tenant account can only be added and edited by the master tenant.

To create a new local tenant, follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Create New Tenant**.



3. In the popup, select **New local tenant**.
4. Complete the wizard as described in the topics below to finish the tenant creation process.
   - "Local Tenant Creation Wizard: Tenant" on the next page
   - "Local Tenant Creation Wizard: Inventory" on page 464
   - "Local Tenant Creation Wizard: Transporters" on page 465

Local Tenant Creation Wizard: Tenant

On this page of the wizard, you can provide a name for the local tenant, assign licenses to the local tenant, and enter contact information for the local tenant. Additionally, the master tenant can enable VM Limitation for the new local tenant. When this option is enabled, the tenant cannot exceed the number of allocated VMs for the purpose of backup and replication. Tenants can see the number of allocated and used VMs in the licensing tab and in the job creation wizard.

Proceed as follows:

1. To add a tenant logo, click **Change tenant logo**, navigate to a new image, select it, and click **Open**. The uploaded image is resized and displayed on the right side of the page.
2. In the **Tenant name** field, enter a name for the local tenant. By default, the tenant name is displayed under the tenant logo. If you do not want the tenant name to be displayed, deselect the **Display tenant name** checkbox.
3. Optionally, in the **Labels** field, select the tags you want to assign to the tenant. Additionally, you can enter the name of the new label in the field and click **Create new label** to create and add it to the **Labels** field automatically.
4. In case the Trial or Subscription license is installed, do the following:
    a. In the **Workloads allocated** field, enter the number of workloads you want to assign to the local tenant.
    b. In the **Microsoft 365 users allocated** field, enter the number of Microsoft 365 users you want to assign to the local tenant.
5. In case a Perpetual license is installed, do the following:
    a. In the **Sockets allocated** field, enter the number of sockets you want to assign to the local tenant.
        i. Optionally, enable the **Limit number of protected VMs** option.

        Note
        In case the option is not available, make sure that the feature requirements are met.

        ii. Enter the number of protected VMs for the tenant.

        Note
        Even with VM limitation enabled, licenses are counted on a per-socket basis.

b. In the **Physical servers allocated** field, enter the number of physical server licenses you want to assign to the local tenant.
c. In the **Physical workstations allocated** field, enter the number of physical workstation licenses you want to assign to the local tenant.
d. In the **Microsoft 365 users** allocated field, enter the number of Microsoft 365 users you want to assign to the local tenant.
e. In the **Oracle databases** allocated field, enter the number of Oracle Database licenses you want to assign to the local tenant.

6. Optionally, in the **Contact email** field, enter the email address of the local tenant.
7. Optionally, in the **Contact phone** field, enter the phone number of the local tenant.
8. Optionally, in the **Website field**, enter the website URL of the local tenant.
9. Optionally, in the **Address** field, enter the address of the local tenant.
10. Click **Next** to proceed to the **Inventory** page.

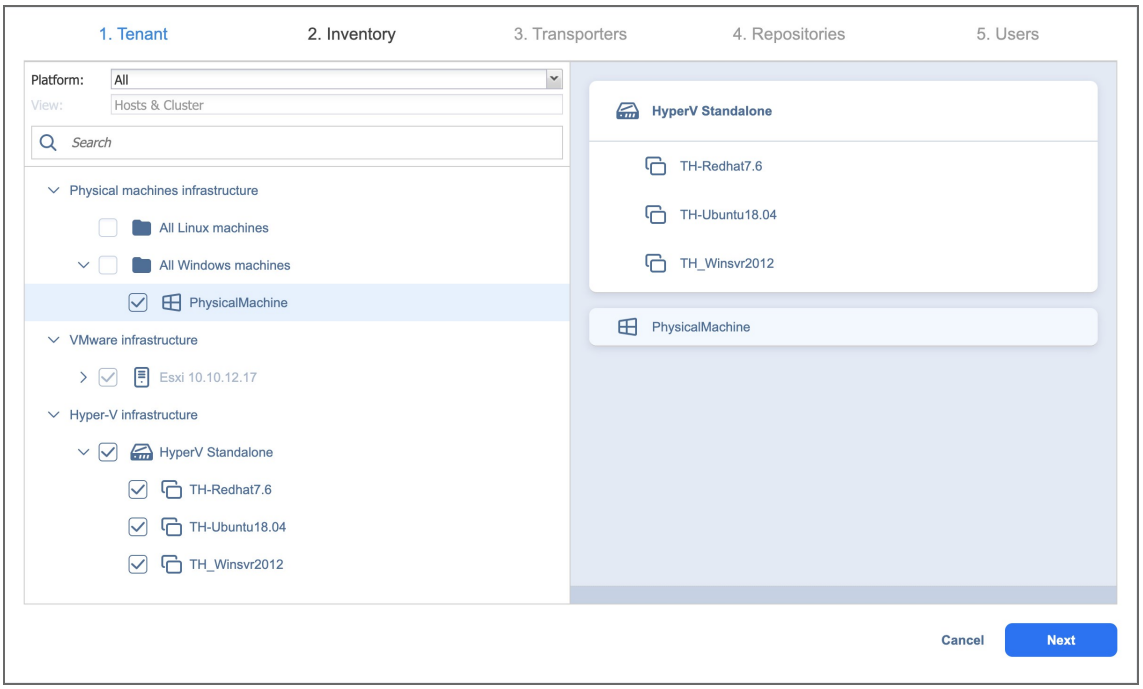
Local Tenant Creation Wizard: Inventory

On this page, you can assign inventory items to the local tenant. Proceed as follows:

1. Choose the platform to display the items added to the inventory. **All** is selected by default.

   Note
   Items that are assigned to other tenants are visible, but cannot be selected.

2. Optionally, you can filter the Inventory tree by entering a string into the **Search** box. You can enter either a part or the entire name of the item.
3. Select the items you want to assign to the local tenant. The selected items appear in the right pane.



4. Click **Next** to proceed to the **Transporters** page.

Local Tenant Creation Wizard: Transporters

On this page of the wizard, you can assign the Transporters that the local tenant will be able to use for backup, recovery, and replication jobs. Proceed as follows:

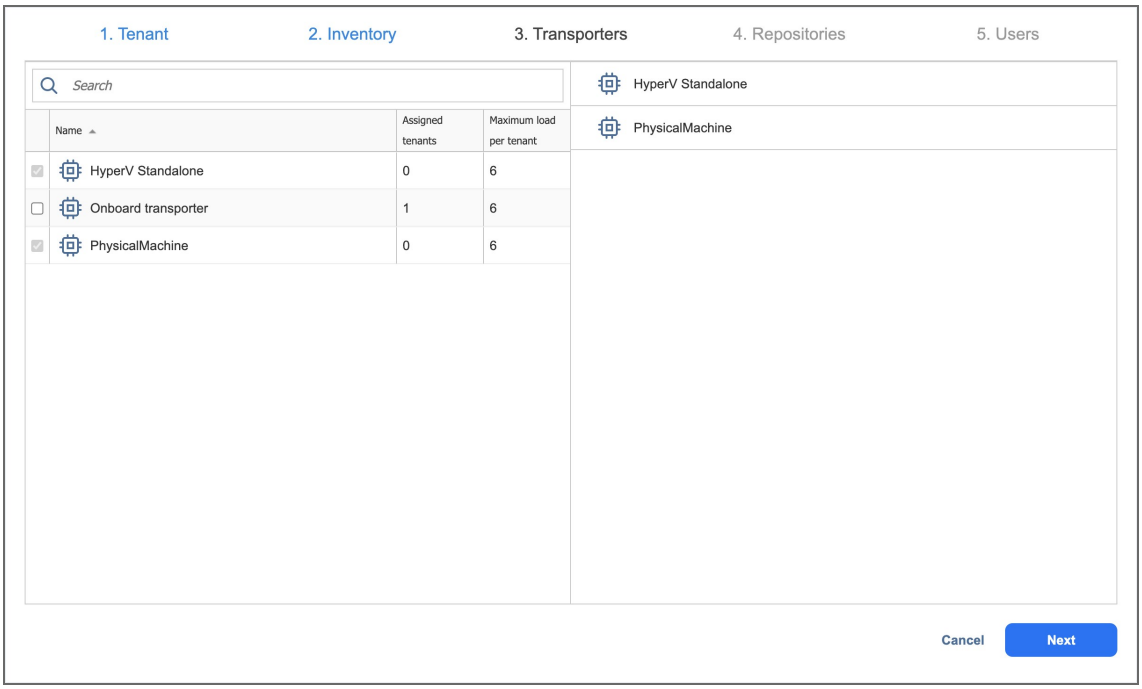
1. In the **Search** field, you can enter the name or part of the name of the Transporter to find the specific ones you need.

   Notes

   - When you assign an Inventory item with a dependent Transporter to the local tenant on the Inventory page of the wizard, that Transporter is selected automatically and cannot be deselected. If an Inventory item with a dependent Transporter was not assigned to the local tenant, that Transporter cannot be selected on this page.
   - The transporter deployed in the virtual appliance cannot be assigned to multiple tenants.

2. On the left pane of the screen, you can select the Transporters to be assigned to the tenant. The following information is available:
   - **Name**: Name of the Transporter.
   - **Assigned tenants**: The number of tenants assigned to the Transporter. Multiple tenants can use the same Transporter without accessing each other's data.
   - **Maximum load per tenant**: The maximum number of tasks that the Transporter is able to perform at the same time per each assigned tenant.

3. The selected Transporters appear in the right pane. Click **Next** to proceed.



Local Tenant Creation Wizard: Repositories

On this page of the wizard, you can assign Backup Repositories that the local tenant will be able to use for backup, recovery, and replication jobs. Note that a single repository cannot be used by multiple tenants. Proceed as follows:

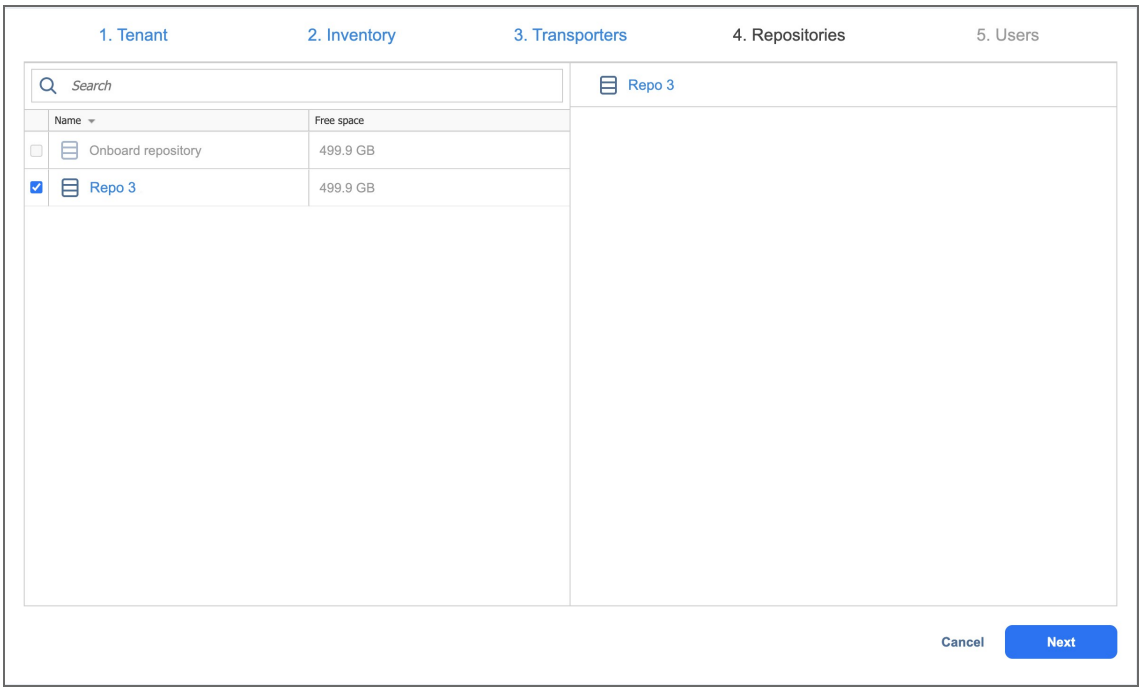
1. In the **Search** field, you can enter either a part or the entire name of the Backup Repository to find the specific ones you need.

   Note

   If the dependent Transporter was not chosen on the Transporters page of the wizard, the Backup Repositories assigned to this Transporter would not be available for selection.

2. On the left pane of the screen, you can select the Backup Repositories to be assigned to the local tenant. The following information is available
   - **Name**: Name of the Backup Repository.
   - **Free Space**: The amount of free space available on the Backup Repository.

The selected Backup Repositories appear in the right pane.



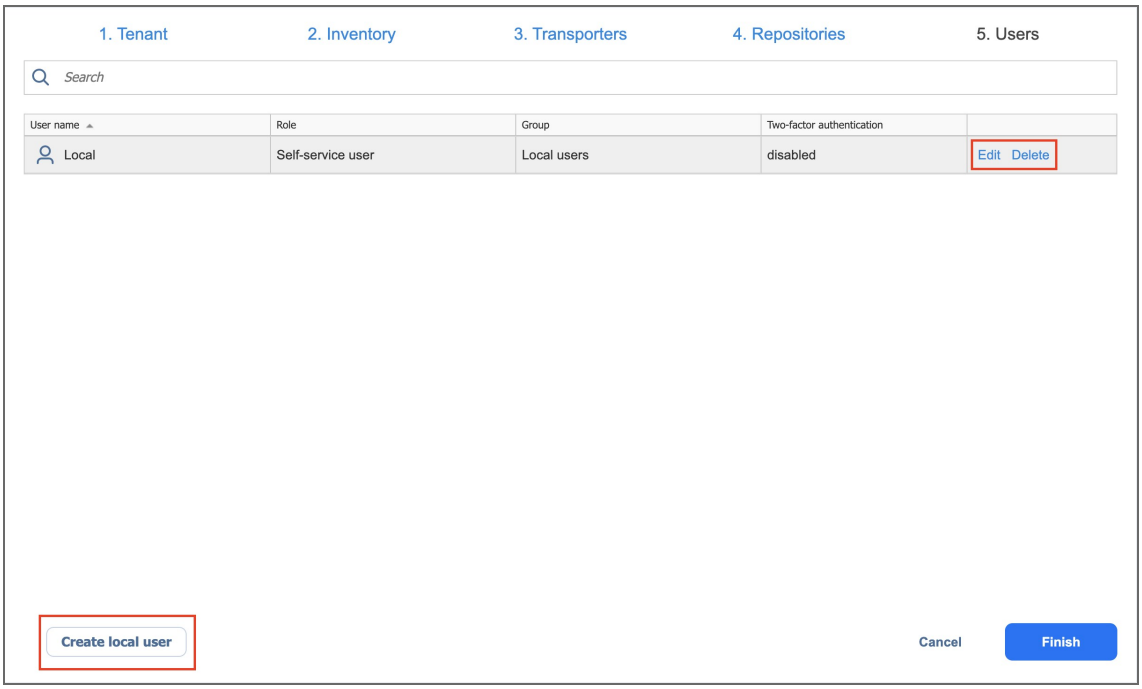
3. Click **Next** to proceed to the next page of the wizard.

Local Tenant Creation Wizard: Users

On this page of the wizard, you can create local users or import Active Directory users for the tenant. The added users can use the product and have access to the allocated resources. Do the following:

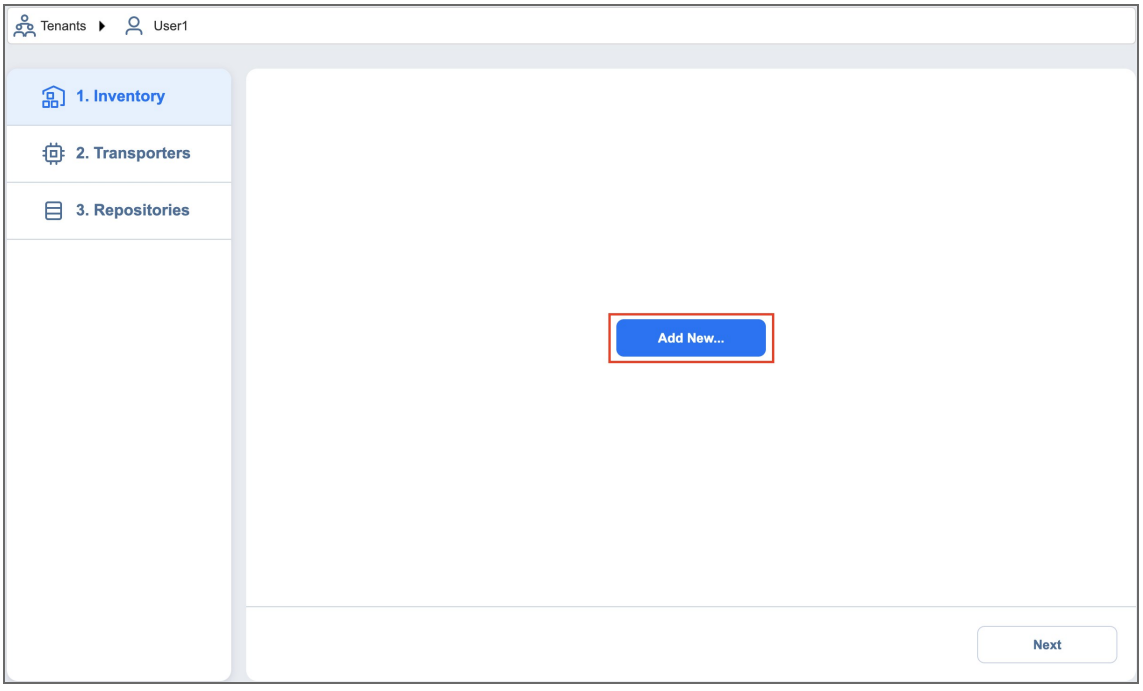
1. In the lower-left pane of the screen, click **Create local user** to create a new local user for the tenant.
2. If you have successfully configured AD integration, you can click **Add AD user** to import AD user for the tenant.

3. Once you're done, click **Finish** to complete the Local Tenant Creation Wizard.



Local Tenant Configuration

After creating a new tenant, click the tenant to open the initial Tenant Configuration Wizard which will guide you through the tenant setup process. Refer to "First Steps with NAKIVO Backup & Replication" on page 191 for a description of the initial configuration wizard.

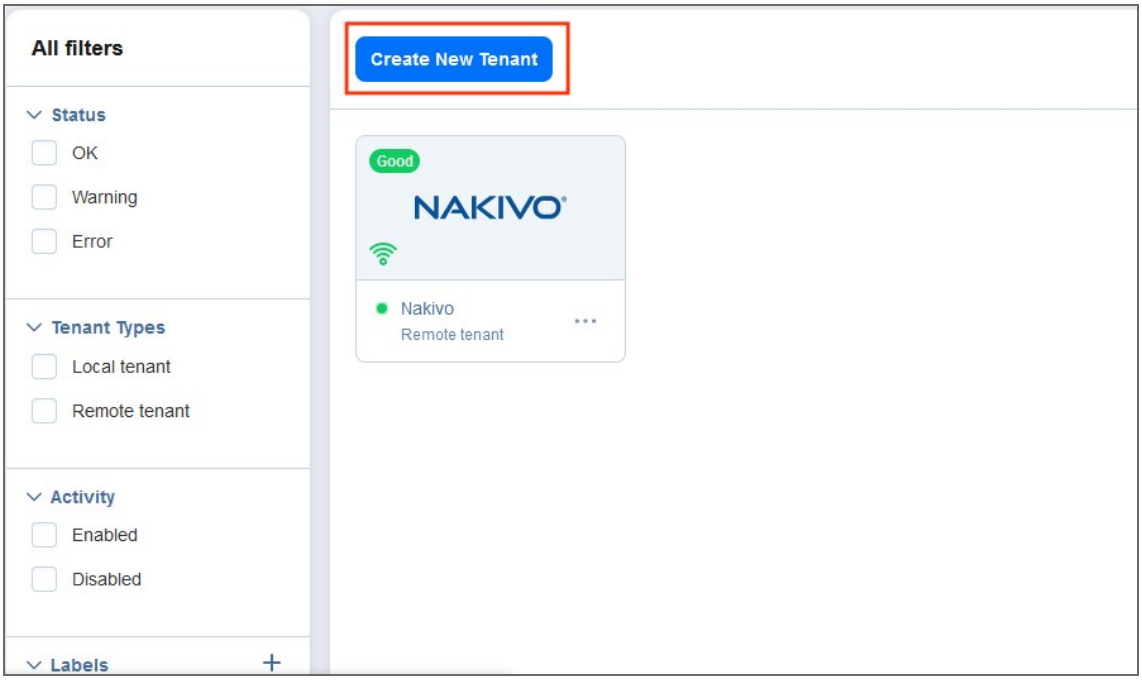


Creating a Remote Tenant

This section covers the topics describing the remote tenant creation process. Creating and configuring a remote tenant allows a master tenant to monitor a standalone instance of NAKIVO Backup & Replication via the **MSP Console**. The remote tenant account retains the ability to manage the resources in their data protection infrastructure.

To create a new remote tenant, follow the steps below:

1. Log in to NAKIVO Backup & Replication as a Master Admin.
2. Click **Create New Tenant**.



3. In the popup, select **New remote tenant**.
4. Complete the remote tenant creation process as described in the topics below:
   - “Remote Tenant Creation Wizard: Tenant” below
   - “Remote Tenant Creation Wizard: User” on the next page
   - “Remote Tenant Configuration” on page 471

Remote Tenant Creation Wizard: Tenant

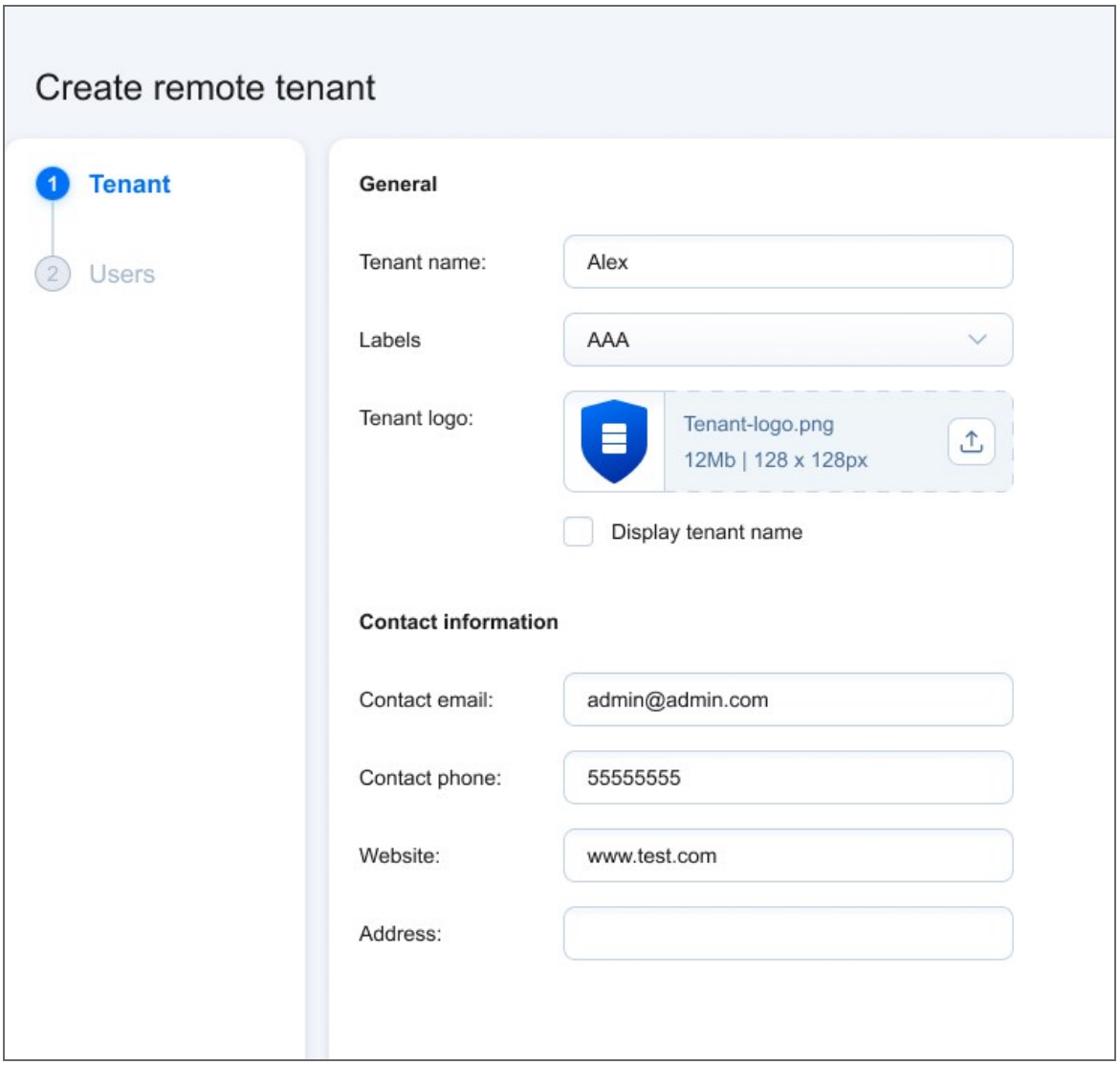
Complete the **Tenant** section of the **Remote Tenant Creation** wizard by configuring the following fields:

1. **Tenant name**: Specify the name of the remote tenant.
2. **Labels**: Optionally, you can create a new tag or assign existing tags to the remote tenant using the drop-down menu.
3. **Tenant logo**: Upload a logo to be displayed for the remote tenant in the multi-tenancy Dashboard. The photo is automatically resized and a preview is generated.

4. **Display tenant name**: Enable this option if you want the tenant name to be displayed in the **Master Tenant Dashboard**.

Optionally, add contact information for the remote tenant by filling in the following fields:

- **Contact email**
- **Contact phone**
- **Website**
- **Address**



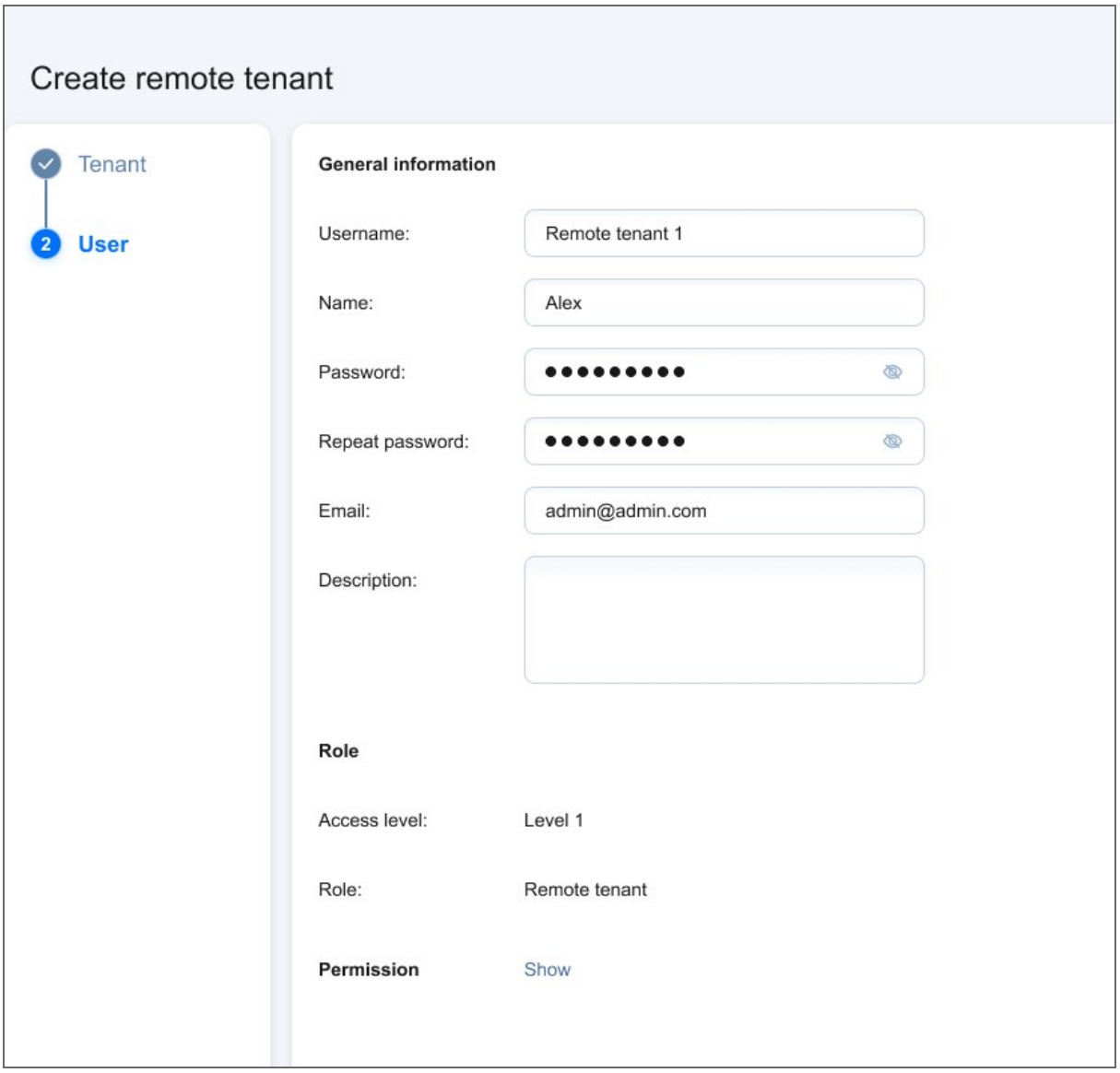
When you're done, click **Next** to move to the next page of the wizard.

Remote Tenant Creation Wizard: User

Complete the **User** section of the **Remote Tenant Creation** wizard by configuring the following fields:

1. **Username**: Specify a username for the remote tenant **User**.
2. **Name**: Specify the remote tenant display name.

3. **Password**: Create a password for this user and repeat it in the **Repeat Password** field below.
4. **Email**: Enter the user's email address.
5. **Description**: Optionally, you can add a description for this **User**.



The **Remote tenant** role and its permissions are added to the **User** automatically. Click **Finish** to confirm the creation of the remote tenant.

Remote Tenant Configuration

When a remote tenant is created, it is automatically added to the list of tenants in the **Master Tenant Dashboard**. To connect a remote tenant to your multi-tenant installation of NAKIVO Backup & Replication, follow the steps below:

1. Provide the remote tenant with the credentials created for the remote tenant user, as well as your hostname/IP address and Director port number (4443 by default). In addition, you will need to open a separate listening port for communication with the remote tenant's instance (port 6702 is used by default). For more information on the required TCP ports, see the **MSP Console** section in "Feature Requirements" on page 89.
2. The remote tenant must go to **Settings** > **MSP** in their own instance of NAKIVO Backup & Replication and add the MSP using the above information, and then click **Add**.
3. A popup with certificate details appears. The remote tenant should click **Apply** to add the MSP to the **MSP** tab.
4. In your **Master Tenant Dashboard**, the remote tenant should now have a green Connected icon on the tenant card. Clicking on the remote tenant's name allows you to drill down and monitor their instance.

For more information on tenant-side **MSP Console** configuration, refer to "Adding an MSP" on page 250.

Tenant Management

This section covers the following topics:

Using Filters

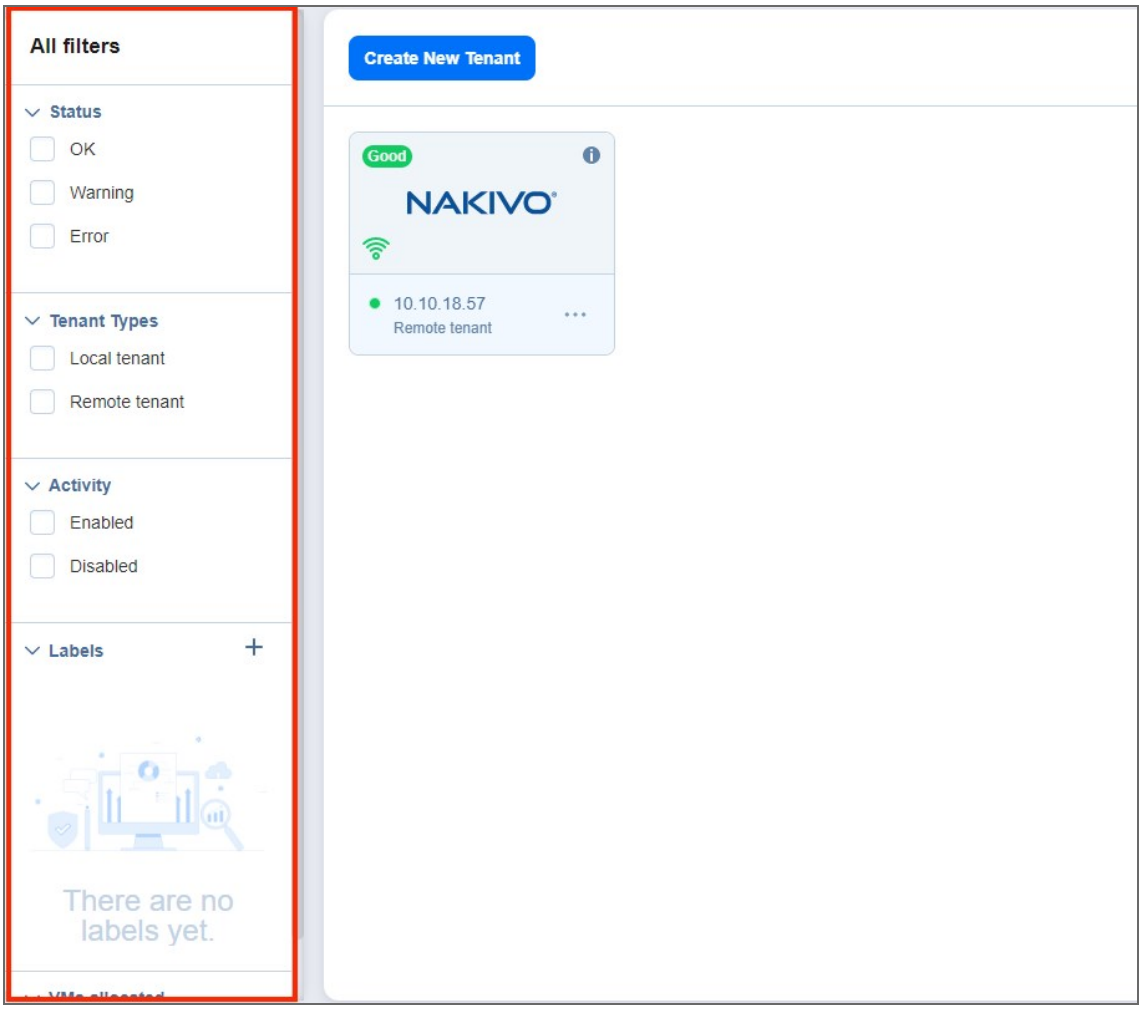
About Filters

The **Master Tenant Dashboard** has 5 filter categories, which allow you to quickly display tenants based on their characteristics. The following filters are available:

- **Status**:
  - **OK**: Displays tenants that have no errors and notifications
  - **Warning**: Displays only tenants that have notifications
  - **Error**: Displays only tenants that have errors
- **Type**:
  - **Local**: Displays only local tenants
  - **Remote**: Displays only remote tenants
- **Activity**:
  - **Enabled**: Displays only enabled tenants
  - **Disabled**: Displays only disabled tenants
- **Labels**: Filters tenants by labels assigned to them
- **VMs Allocated**: Filters tenants by the number of VMs allocated to them

Applying Filters

To apply a filter, check the box to the left of a filter name.



To dismiss a filter, simply uncheck the box to the left of the name of an active filter.

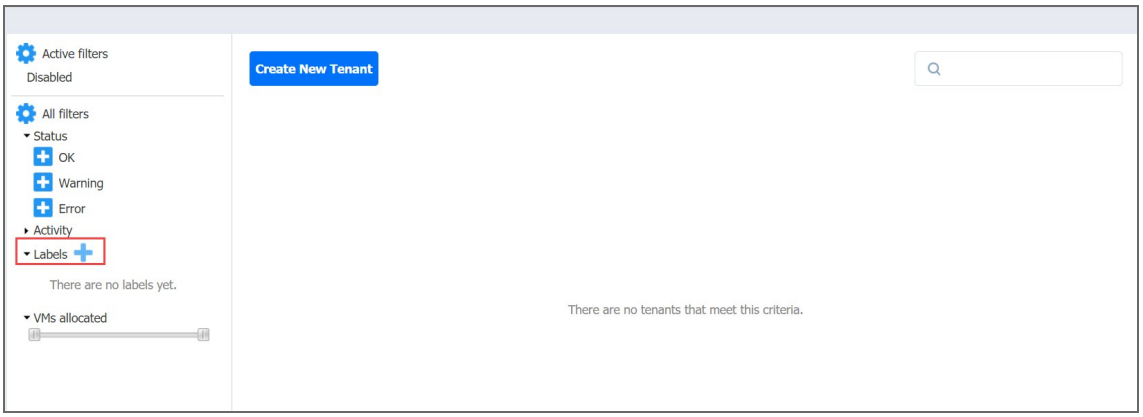
Using Labels

About Labels

With NAKIVO Backup & Replication, you can create custom labels and assign them to tenants. Assigning a label to a tenant allows you to quickly sort existing tenants into different categories, such as location, SLA level, etc.

Creating Labels

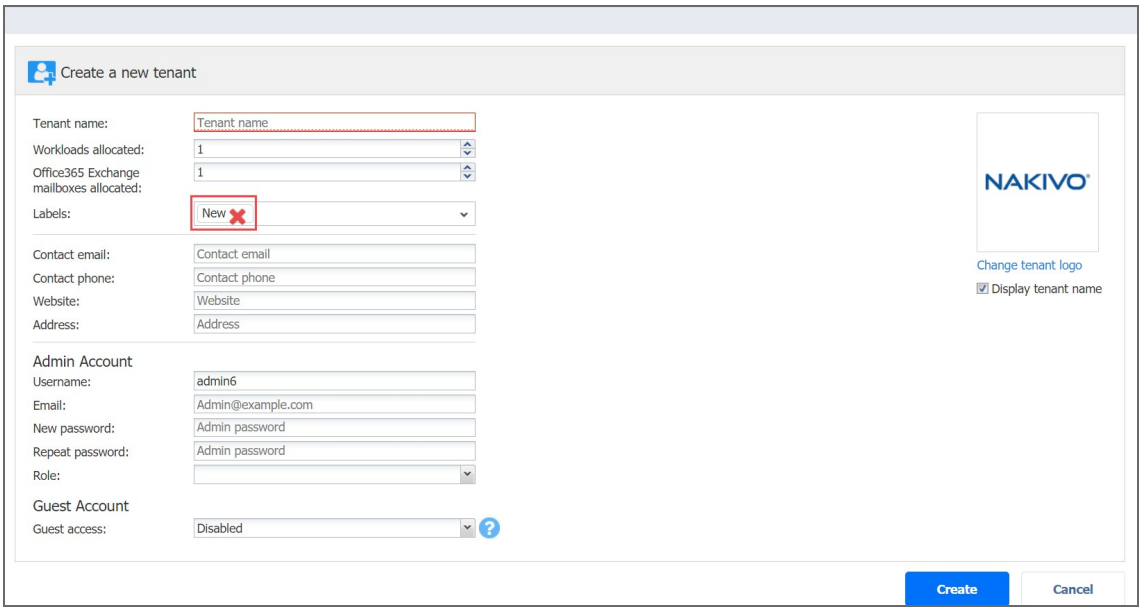
To create a new label, click the **Plus** icon next to **Labels** and enter a name for the new label, and press the **Enter** key.



You can also create a new label when creating a new tenant.

Assigning Labels to Tenants

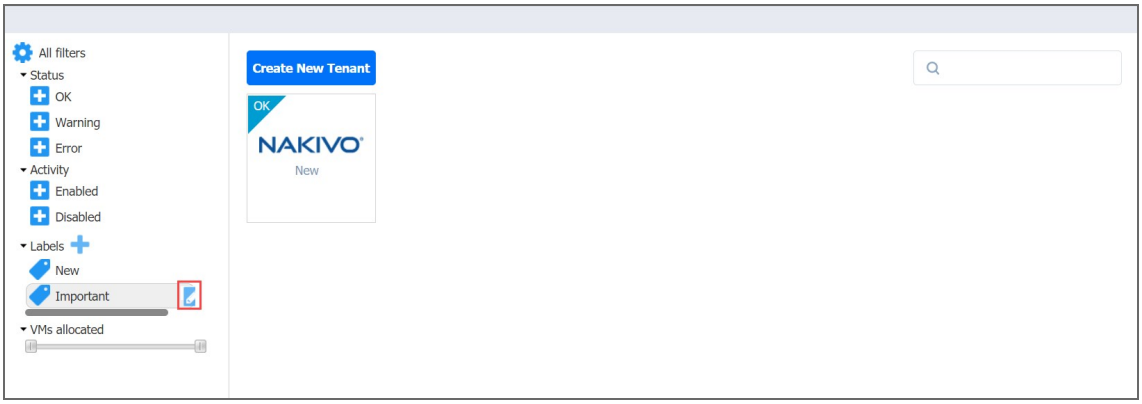
You can assign a label to a tenant either during the tenant creation or by editing the tenant.



Editing Label Names

To change a label name, do the following:

1. Hover over the label.
2. Click the **Edit** icon.



3. Enter the new label name and press the **Enter** key.

Deleting Labels

To permanently delete a label, do the following:

1. Hover the mouse pointer over a label.
2. Click the **Delete** icon.

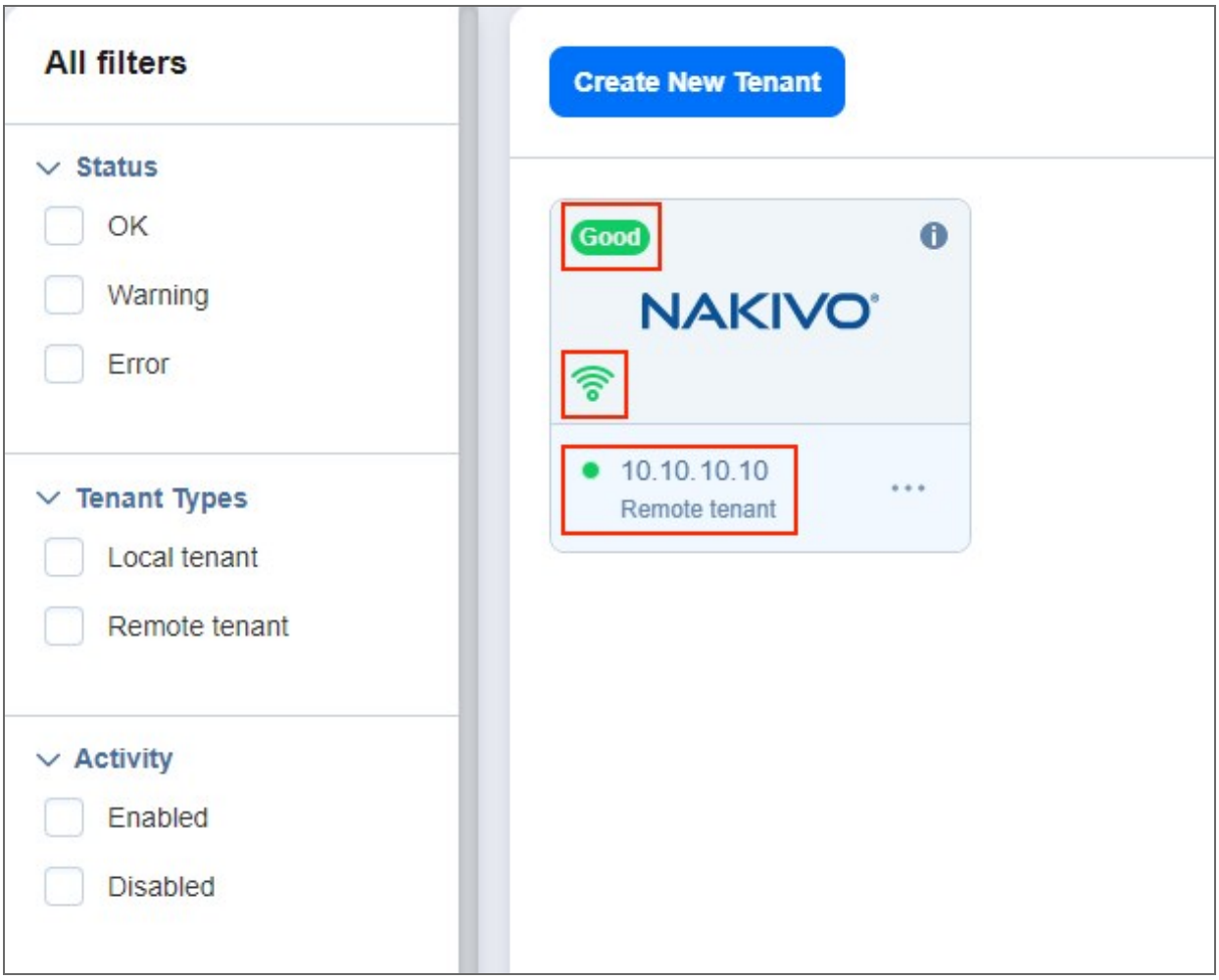
3. In the dialog box that opens, click **Delete** to confirm that you wish to permanently delete the label

Viewing Tenant Information

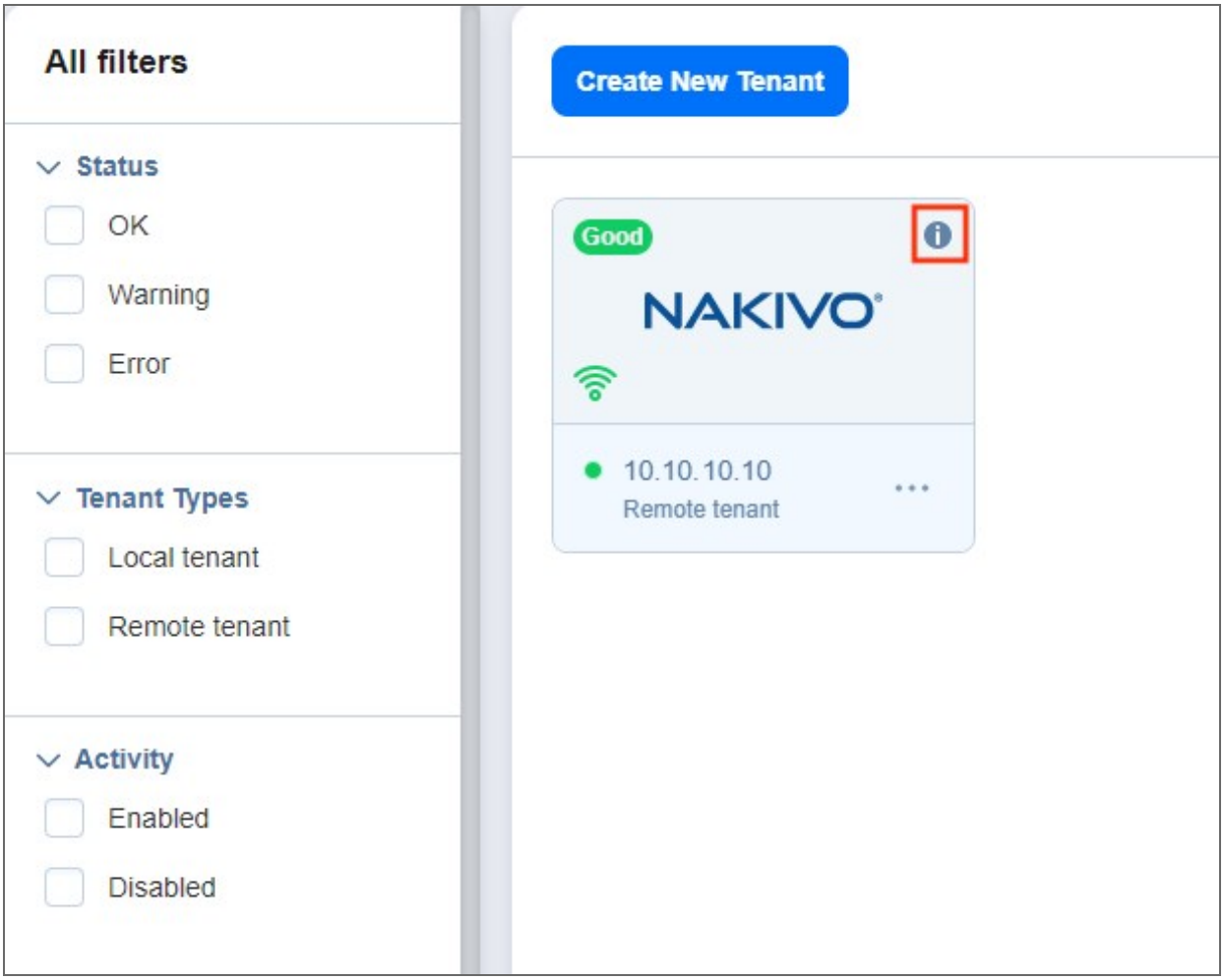
On the **Master Tenant Dashboard**, you can view information about each tenant's instance of NAKIVO Backup & Replication. The information readily displayed on a tenant's card is as follows:

- **Tenant status**: The color and content of this indicator gives an overview of the tenant instance's alarms and notifications status. The given number reflects the number of alarms and/or notifications present at the remote tenant. A green **Good** indicator means there are no outstanding alarms and notifications. Other colors represent the following:
  - **Yellow**: There are outstanding notifications.
  - **Red**: There are outstanding alarms.
  - **Grey**: The tenant is disabled.
- **Connection** (remote tenants only): A green signal icon on a remote tenant's card indicates that a connection has been established between the remote tenant and Master Tenant instances; that is to say, a green signal icon will appear on the remote tenant's card once they have successfully added the MSP. A red signal icon means the connection could not be established or has been interrupted.
- **Accessibility**: A green circle icon next to the tenant's name indicates that the tenant is currently accessible by the Master Tenant.

- **Tenant name and type**: Lastly, the tenant card indicates the name and type of a given tenant.

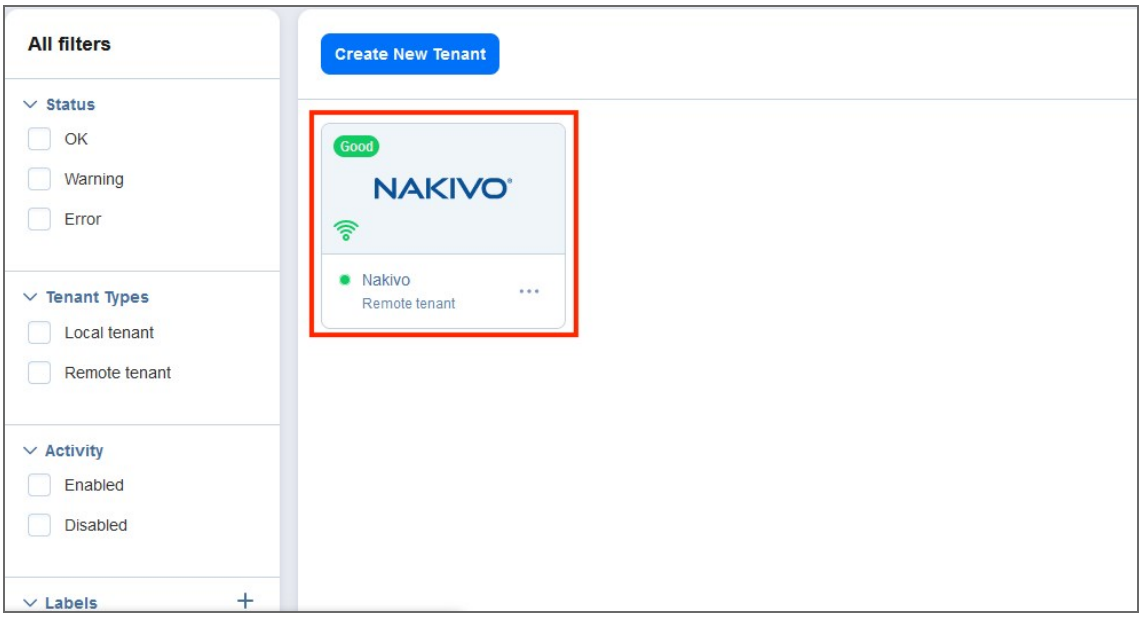


For more tenant information, hover over the tenant card and click on the **Info** button. A pop-up window opens with general tenant details and usage statistics.


All filters
Status
OK
Warning
Error
Tenant Types
Local tenant
Remote tenant
Activity
Enabled
Disabled
Create New Tenant
Good
NAKIVO
10.10.10.10
Remote tenant

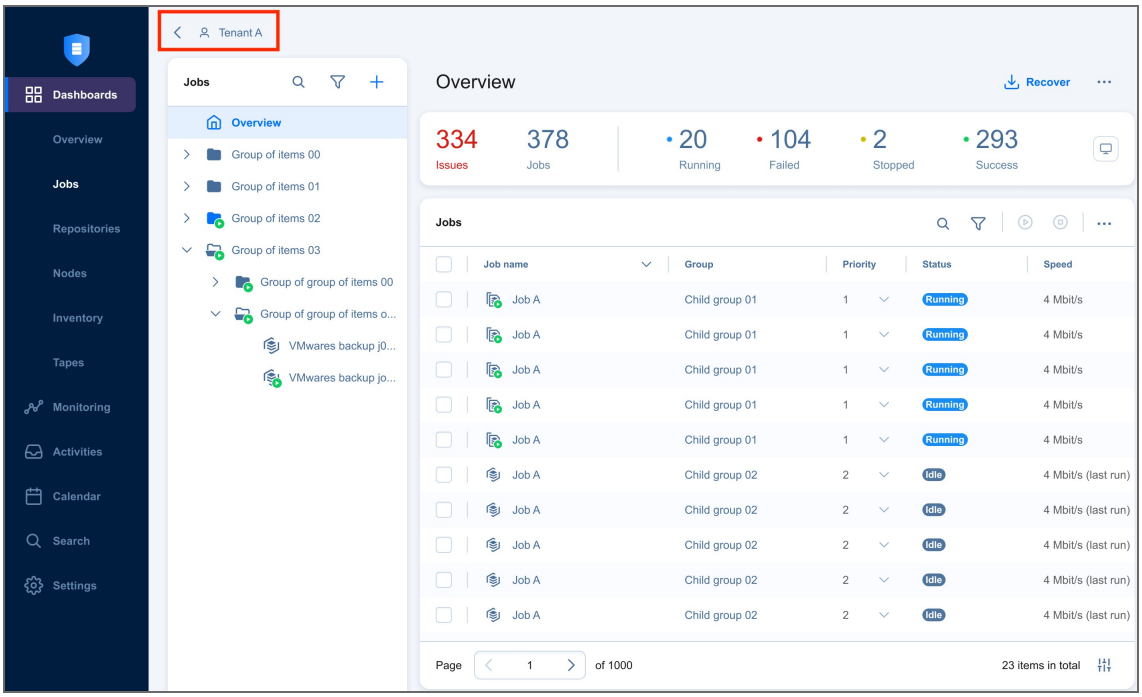
Opening Tenant Dashboard

In order to work with a tenant's instance, you should open the tenant's **Dashboard**. For local tenants, this allows you to configure the tenant, create jobs and groups, and perform recovery. For remote tenants, this allows you to monitor their instance of NAKIVO Backup & Replication. To open a tenant's **Dashboard**, simply click the tenant.



Returning to Master Admin Dashboard

To return to the **Master Tenant Dashboard** from a local tenant's instance, click **Tenants** in the navigation bar. To return from a remote tenant's instance, click the arrow to the left of the tenant name.

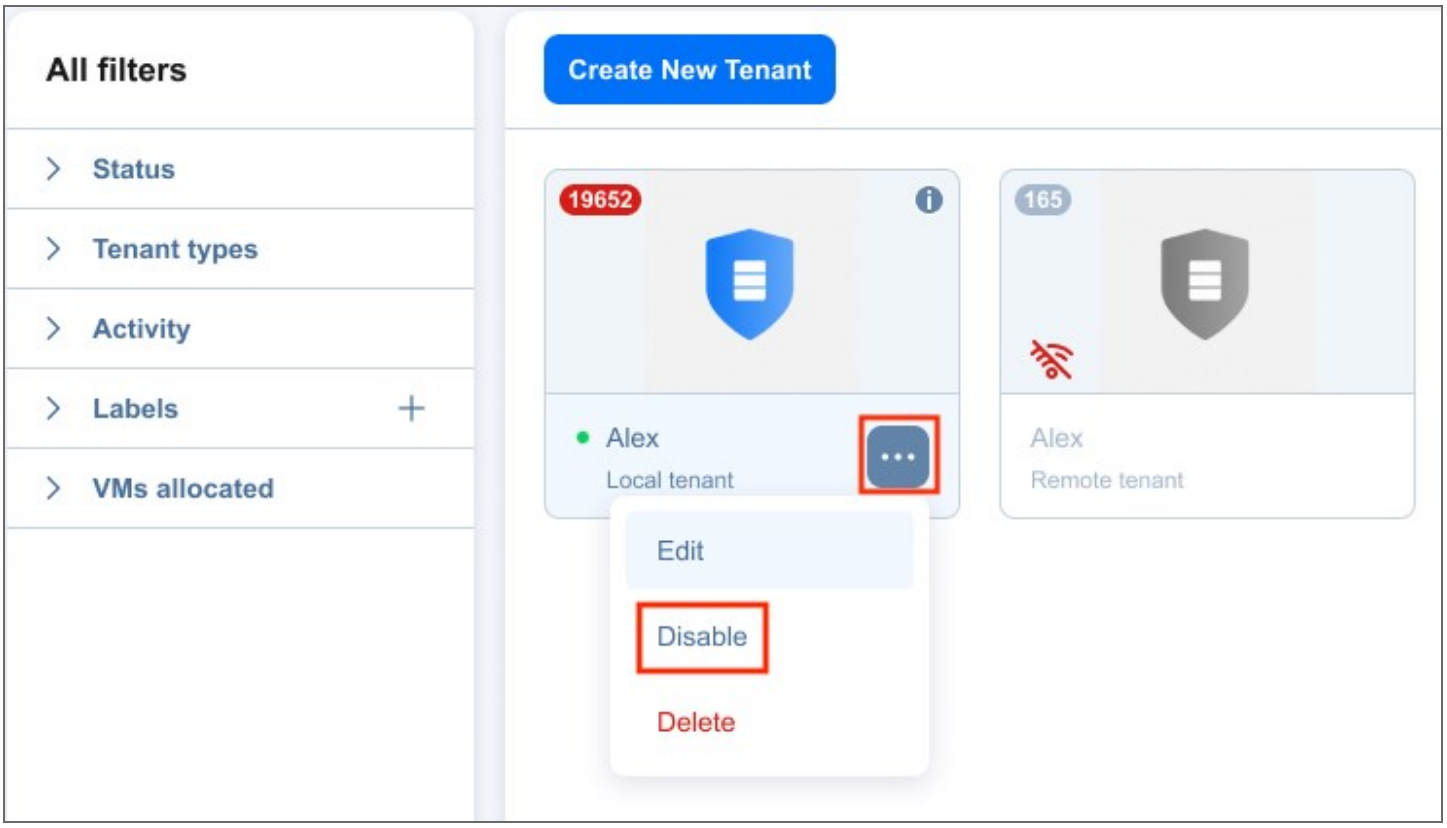

Tenant A
Dashboards
Overview
Jobs
Repositories
Nodes
Inventory
Tapes
Monitoring
Activities
Calendar
Search
Settings
Jobs
Overview
Group of items 00
Group of items 01
Group of items 02
Group of items 03
Group of group of items 00
Group of group of items o...
VMwares backup j0...
VMwares backup jo...
Overview
Recover
334
Issues
378
Jobs
20
Running
104
Failed
2
Stopped
293
Success
Jobs
Job name
Group
Priority
Status
Speed
Job A
Child group 01
1
Running
4 Mbit/s
Job A
Child group 01
1
Running
4 Mbit/s
Job A
Child group 01
1
Running
4 Mbit/s
Job A
Child group 01
1
Running
4 Mbit/s
Job A
Child group 01
1
Running
4 Mbit/s
Job A
Child group 02
2
Idle
4 Mbit/s (last run)
Job A
Child group 02
2
Idle
4 Mbit/s (last run)
Job A
Child group 02
2
Idle
4 Mbit/s (last run)
Job A
Child group 02
2
Idle
4 Mbit/s (last run)
Job A
Child group 02
2
Idle
4 Mbit/s (last run)
Page
1
of 1000
23 items in total

Disabling Tenants

In multi-tenant mode, you can disable a tenant to temporarily stop delivering backup, replication, and recovery services for that tenant. After disabling a tenant:

- Tenant admin and tenant guest will not be able to log in to the self-service interface. A message saying that the service has been disabled will be displayed after login attempts.
- Existing jobs will not be run on schedule.
- All currently running jobs will be allowed to complete.

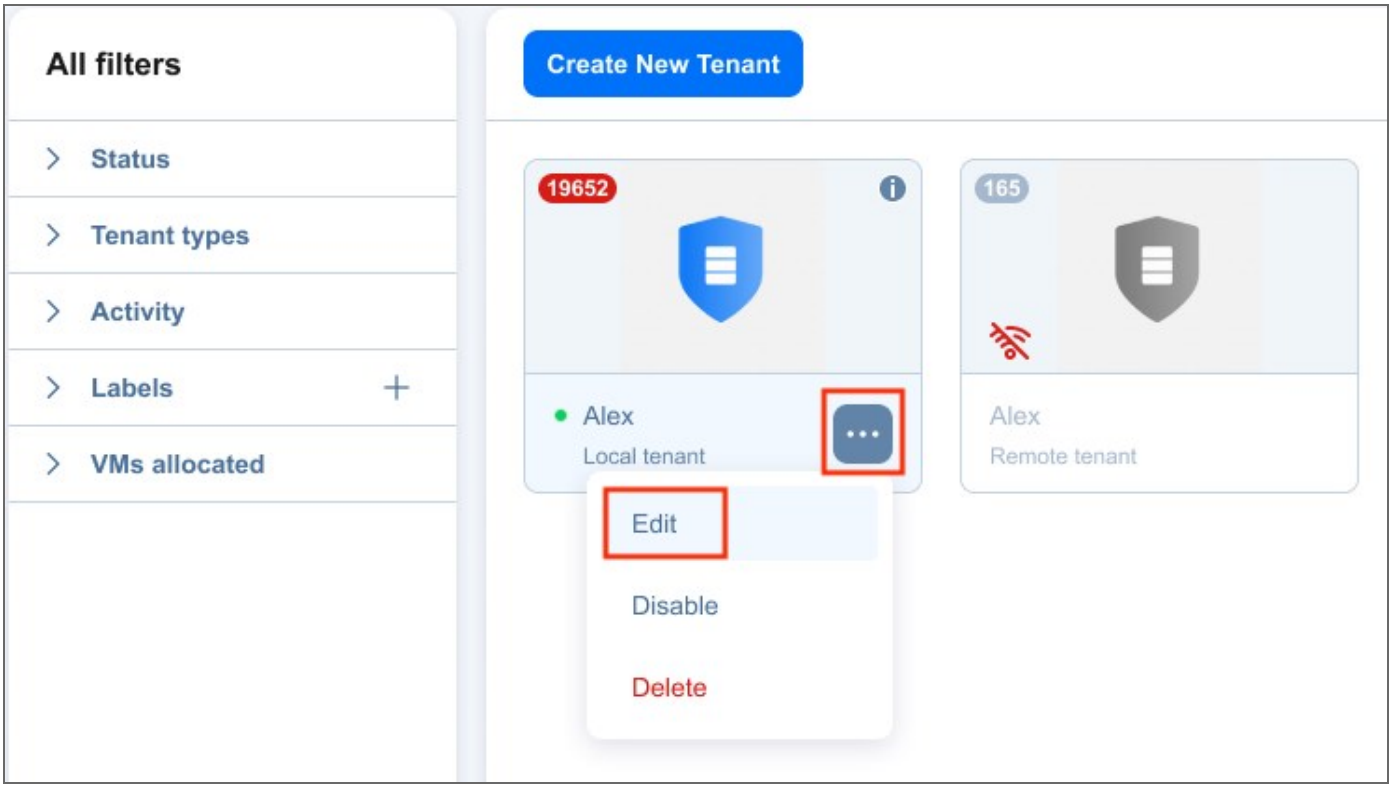
To disable a tenant, hover over the tenant card and click the ellipsis **Manage** button, then click **Disable**.



Editing Tenants

To edit a tenant, do the following:

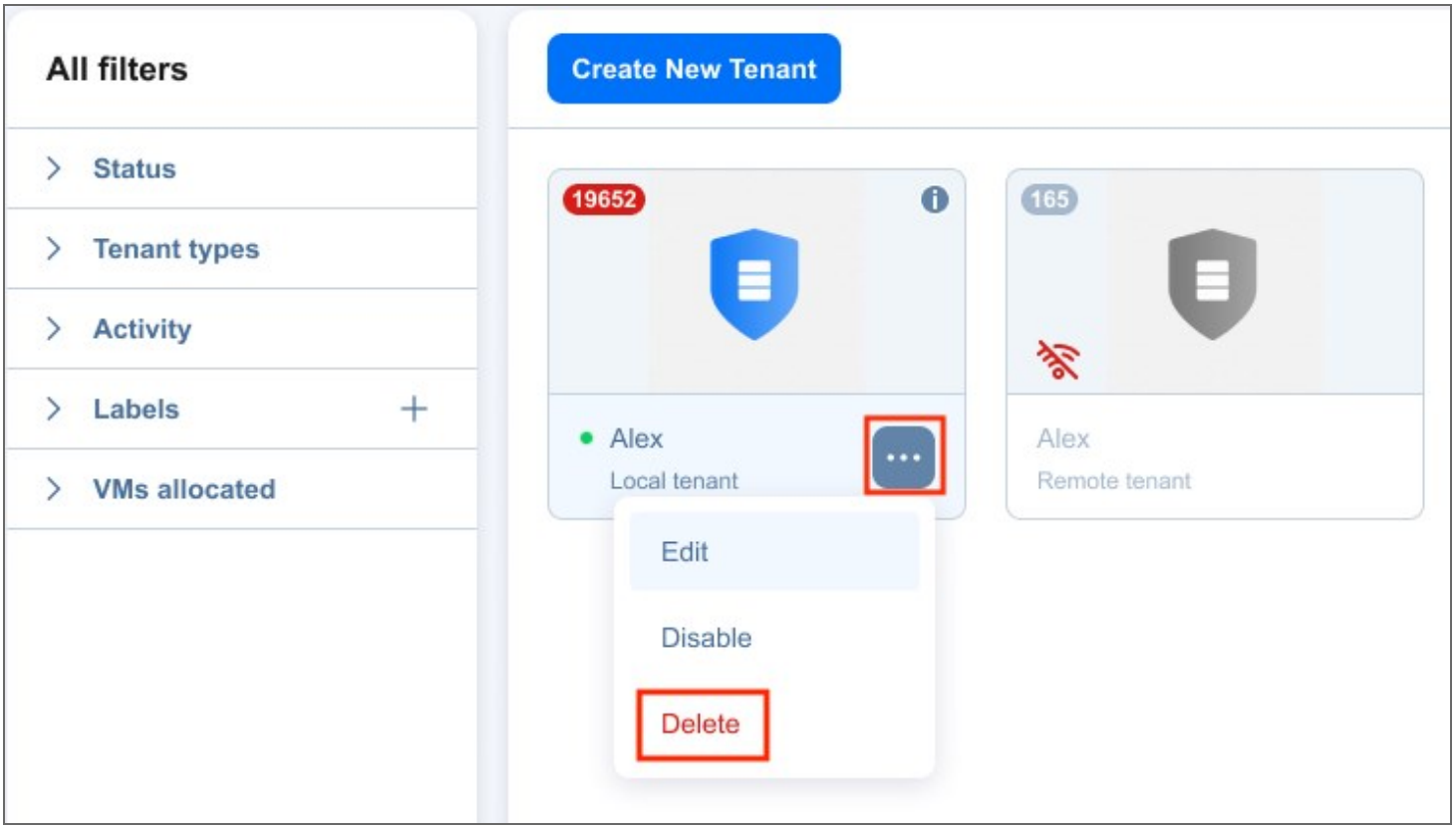
1. Hover over the tenant card and click the ellipsis **Manage** button, then click **Edit**.



2. In the **Edit** dialog box that opens, make the required changes and click **Save**.

Deleting Tenants

To permanently delete a tenant from the product, hover over the tenant card and click the ellipsis **Manage** button, then click **Delete**.



The tenant will be permanently deleted from NAKIVO Backup & Replication.

Tenant Transporters are not uninstalled and the Tenant Backup Repositories are not removed.

Granting Self-Service Access

In the multi-tenant mode, you can provide local tenants with access to their dashboards. By default, a tenant admin account is automatically created when you create a new local tenant. The tenant admin has full control over the product features inside the tenant dashboard (such as the ability to edit and update tenant inventory, Transporters, and Backup Repositories, and create and manage jobs and groups). For each local tenant, one guest account can also be created. The tenant guest has limited permissions inside the tenant instance and can only generate job and group reports by default. To provide a local tenant with access to the self-service interface, send the following information to the tenant:

- Link to NAKIVO Backup & Replication Director
- Tenant login
- Tenant password