EMC® NetWorker®

Version 9.0.x

Release Notes

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These release notes contain supplemental information about the EMC NetWorker 9.0.x releases. All product-specific documentation is available at http://support.emc.com from the **Support by Product** > **NetWorker** page.

Note

The following EMC training link provides access to eLearning courses for understanding the technical differences between NetWorker 9.0.x and previous releases: https://education.emc.com/cust/training/find_training.aspx?c=NetWorker&m=Self-Paced&t=Data%20Protection.

Topics include:

- Revision history 2
- Product description 3
- New features and changes in NetWorker 9.0.1 4
- New features and changes in NetWorker 9.0 7
- Fixed problems 23
- Environment and system requirements 26
- Known issues 31
- Technical notes 49
- Documentation 55
- Installation and Upgrades 61
- Troubleshooting and getting help 64

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Revision history

The EMC® NetWorker® 9.0.x Release Notes was originally published in September, 2015. The following table presents the revision history of this document.

Table 1 Revision History

Revision	Date	Description
14	July 25, 2018	This revision includes the following changes: • Added 241586 and 238635 to NetWorker 9.0 Known Limitations. • Added "Correction to section "ERROR: web server exited unexpectedly" in the NetWorker Error Message Guide."
13	July 26, 2017	Added 280576 to NetWorker 9.0 Known Limitations.
12	March 16, 2017	Updated the NetWorker 9.0.1 known issues on page 31 section with 276501.
11	November 11, 2016	• Updated section NetWorker 9.0.1 known issues on page 31 with 270342 and 261573. • Added technical note "Filenames with multibyte characters saved with NetWorker 7.2.x or earlier may display incorrectly". • Added the Modifying the token expiration timeout interval in NMC on page 57 and Directed recover requirements on page 57 topics to the Documentation corrections and additions section.
10	August 19, 2016	Added section Customizing backups with the pre and post commands which replace the `savepnpc` command in NetWorker 9.0.1
09	Jun 29, 2016	Updated for the release of EMC NetWorker 9.0.1
08	May 30, 2016	Added ESC 26376 and ESC 25817 to NetWorker 9.0 Known Limitations
07	May 20, 2016	Restored localization support issue "filenames with multibyte characters may display incorrectly" to NetWorker 9.0 Known Limitations
06	April 22, 2016	Added limitation 240776, ESC 25843, and 251805 to the section NetWorker 9.0 Known Limitations

Table 1 Revision History (continued)

Revision	Date	Description
05	March 3, 2016	Added technical note Leap year retention policy considerations
04	December 16, 2015	• Updated the sections Fixed Problems in NetWorker 9.0 and NetWorker 9.0 Known Limitations • Revised the topic NMC may be blocked due to Java blocking self-signed certificates by default to include note about changing security from Very High to High • Added section Support for Ultrium LTO-7 • Added section NDMP Fast Incremental support
03	November 12, 2015	Updated the sections Fixed Problems in NetWorker 9.0 and NetWorker 9.0 Known Limitations
02	October 7, 2015	• Added limitations 243017 and 242385 to the section NetWorker 9.0 Known Limitations • Updated the topic Changes to EMC NetWorker and EMC Avamar integration
01	September 24, 2015	First release of this document for EMC NetWorker 9.0

Product description

The EMC NetWorker 9.0.x releases provides significant functional enhancements, including support for the following.

- CloudBoost devices.
- Automated multi-streaming for replication between Data Domain devices.
- A new method for protecting data in the environment - the creation of policies, which you can perform from the Protection window in NMC or by using the `nsrpolicy` command.
- Changes to the NetWorker Management Console and the NetWorker Administration window, with the addition of three new windows (Protection, Server, and Hosts) to manage the contents that are previously found in the no longer used Configuration window.
- A new authentication and authorization model, the Authentication Service, designed to improve NetWorker security by using token-based authentication and single sign on (SSO) support.
- The EMC Licensing Solution with capacity entitlement, which uses the new License Server and a license file.

- Media database and NMC database changes.
- Block based backups on Linux platforms.
- Changes to the handling of parallel save streams (PSS), including aggregated save set backup and stream reclaiming to dynamically increase the number of activated streams for already running save set backups.
  New features and changes in NetWorker 9.0 on page 7 provides more information on new features and identifies the release that these features were introduced.

  Before installing this release, review the *EMC NetWorker Installation Guide*, *EMC NetWorker Administration Guide*, and other documentation. Documentation on page 55 lists the complete NetWorker 9.0.x documentation set.

New features and changes in NetWorker 9.0.1

This section contains information on new features and enhancements in the NetWorker 9.0.1 release.

Customizing backups with the pre and post commands

In NetWorker 9.0.1, the `savepnpc` command is no longer supported. However, you can customize backup behavior by running preprocessing and postprocessing commands. These commands should only be run once during the client backup, instead of once for each save set.

Preprocessing and postprocessing scripts can be useful if the client is running a database or another program that should be stopped before the client is backed up, and then restarted after the backup has completed.

To set the preprocessing and postprocessing command attributes in the client resource and configure the scripts for use, perform the following in NMC's **Administration** window.

Procedure

1. In the **Administration** window, click **Protection**.
2. In the expanded left pane, select **Clients**.
3. Right-click the Client resource and select **Modify Client Properties**.

   The **Client Properties** dialog box appears.
4. On the **Apps and Modules** tab, in the **Pre command** attribute, specify the name of the script file that you require NetWorker to run before a backup.

   Note

   Do not specify the path to the file.
5. Optionally, in the **Post command** attribute, specify the name of the script file that you require NetWorker to run after a backup of all the save sets for the client completes.

   Note

   Do not specify the path to the file.

6. Click **OK**.

Results

The customized instructions are applied the next time that the client is backed up.

Enhancements to Data Domain support

NetWorker 9.0.1 includes the following Data Domain related enhancements:

Improved performance of NetWorker Clone Controlled Replication (CCR) for Data Domain due to Automated Multi-streaming
The Automated Multi-streaming (AMS) feature improves cloning performance for large save sets when you use high bandwidth networks. Previously when you replicated save sets between two Data Domain devices on different machines, the replication process used to take longer in NetWorker. AMS significantly speeds up replication between DDRs by splitting up large files (files whose sizes are roughly greater than 3.5 GB) into multiple smaller 2 GB slices, replicating the slices individually, and finally re-creating the original large file on the destination DDR using those slices.

NetWorker 8.2.3 and NetWorker 9.0.1 and later feature enhancements to clone controlled replication (CCR), also known as DD to DD Managed File Replication. Also, enhancements to load balancing so that the load (save sets to clone) is spread evenly across the multi-threaded `nsrclone` process were implemented. By default, the AMS feature is disabled. You can turn on the feature by changing the command to *ams_enabled=yes*.

Support for DD Boost Fibre Channel on Solaris 10 and 11
DD Boost Fibre Channel now supports Solaris versions 10 and 11 for the File System Client.

DDOS version 5.7.x high availability failover capabilities
NetWorker 9.0.1 allows you to make use of the Data Domain failover capabilities available in DDOS 5.7.x for both DD Boost and non-Boost devices, introducing the following enhancements:

- View status information and reports from NMC's **Monitoring** window.
- In the result of a failover, perform an unscheduled shutdown of the primary Data Domain device to ensure that NetWorker operations in progress (including backup, recovery and configuration options) are not interrupted.

Note

If you run an `inquire` during a Data Domain failover, the VTL output does not display. There is, however, no impact to the backup.

NDMP enhancements

Starting in NetWorker 9.0.1, NDMP now supports:

- Isilon Multi-Streaming
- Muting verbose log messages for successfully recovered files
- Token based backup for Hitachi NAS

NDMP token based backup support for Unity

NetWorker now adds support for token based backups (TBB) on Unity, in addition to the list of already supported devices.

To use token based backups, both the device and the NetWorker server must have token based backups enabled. To enable token based backups on the NetWorker server, edit the **Application Information** attribute on the **Apps and Modules** tab of the **NDMP Client Properties** window and add the following entry:

```
USE_TBB_IF_AVAILABLE=Y
```

The following devices are currently supported for token based backups:

- Isilon
- Celerra and VNX
- NetApp
- Hitachi NAS
- Unity

Added storage array support for snapshot management

NetWorker Snapshot Management now supports the following storage arrays:

- EMC ProtectPoint for VMAX3
- EMC ProtectPoint for RecoverPoint
- EMC XtremIO

A detailed description of configuring ProtectPoint on RecoverPoint with XtremIO and configuring Snapshots on XtremIO arrays is available in the *EMC NetWorker Snapshot Management Integration Guide*.

Support for CloudBoost devices

The NetWorker 9.0.1 release supports the use of a CloudBoost appliance to backup and clone data.

CloudBoost Virtual appliance support on Amazon Web Services

NetWorker 9.0.1 introduces support for ClouldBoost Virtual appliances on Amazon Web Services. By utilizing a virtual machine that is Amazon Machine Image (AMI) compatible, The CloudBoost Virtual appliance supports both long-term retention and backup to cloud, allowing you to benefit from Amazon's Simple Storage Service (S3) deduplication.

Note

Limit the number of overall NetWorker sessions to the Amazon Web Services S3 bucket to 100 streams. When you use more than 100 streams, intermittent backup failures occur with an error message similar to "503 slow down".

Jobs database changes

Improvements to the jobsdb were made inNetWorker 9.0.1, and the format of the jobsdb changed. Also, the default retention period of jobsdb is now 72 hours. You can modify the retention period by editing the variable *Jobsdb retention in hours*.

Previous versions of the jobsdb are not compatible with NetWorker 9.0.1 and the update process does not migrate the jobsdb data. When you update from a previous release to NetWorker 9.0.1, the updating process renames the jobsdb and the NetWorker server uses a new database.

Note

After you update the NetWorker server, all policy, workflow, and action resources will report a status of *never run*. This status also displays after a workflow has expired.

VMware Virtual Volumes (vVol) Support for VMAX3 and UNITY storage systems

Networker 9.0.1 allows backup and restore of virtual machines that are running on vVol datastores.

NetWorker REST API

The NetWorker REST API is an interface that allows you to access the NetWorker data protection service and to build client applications that automate NetWorker operations.

The *NetWorker REST API Getting Started Guide* describes how to use the NetWorker REST API, and the *NetWorker REST API Reference Guide* provides a full description of the API resources.

Highly-available NetWorker server support

The NetWorker 9.0.1 release supports a highly-available NetWorker server on supported Windows and RHEL operating systems.

New features and changes in NetWorker 9.0

This section contains information on new features and enhancements in the NetWorker 9.0 release.

Changes to NetWorker and Avamar integration

Beginning with NetWorker version 9.0, Avamar integration support is deprecated for new clients. However, older integrations continue to be supported, with the following considerations.

Considerations for installing the Avamar Client in NetWorker 9.0 and later
You can continue to install the Avamar client with NetWorker 9.0 and later. Installation of the Avamar client is not required until you want to recover data from backups performed to Avamar deduplication nodes. You can use either of the following methods to install the Avamar client:

- Install the Avamar client as part of the update to NetWorker 9.0 and later by using the WIX installer or UNIX package deployment.

  Note

  As of NetWorker 9.0.1, the Avamar client is no longer selected by default during the NetWorker install or upgrade. You must manually select the Avamar client in the Wizard options (WIX installer), or manually install the RPM package appropriate to your platform.

- After upgrading to NetWorker 9.0 and later, install the Avamar client package. The package names are `AvamarClient-windows-x86_64-7.2.100-401.msi` on Windows, `AvamarClient-linux-sles11-x86_64-7.2.100-401.rpm` on

SuSE Linux Enterprise Server (SLES) version 11, `AvamarClient-linux-rhel4-x86_64-7.2.100-401.rpm` on Red Heat Enterprise Linux, and `AvamarClient-debian4.0-x86_64-7.2.100-401.deb` on Debian.

Note

The NetWorker client no longer supports RedHat 4.0. You can still install Avamar 7.0 on RedHat 4.0, but if you install the NetWorker 9.0 and later client package on an Avamar server that is on RedHat 4.0, the installation fails. In this case, leave the current NetWorker client version as is. You can still upgrade the NetWorker server and NetWorker deduplication client to NetWorker 9.0 and later and continue performing backup and recovery using the Avamar server with a pre-NetWorker 9.0 client package installed.

When you install the Avamar client using either of these methods, make note of the following considerations:

- If you install the Avamar client during an upgrade to NetWorker 9.0 and later, you must activate the Avamar client with the Avamar server/deduplication node to ensure that the Avamar server can communicate with the Avamar client.
- After you upgrade the NetWorker server to version 9.0 and later, Avamar clients previous to NetWorker 9.0 can continue to perform deduplication backup and recovery.
- If the NetWorker server and the NetWorker client are the same hosts, and you upgrade to NetWorker 9.0 and later, then install the Avamar client to perform deduplication backups and recoveries.
- After you upgrade the NetWorker server to version 9.0 and later, you cannot configure a new Avamar deduplication node. As a result, you cannot configure any new NetWorker clients with deduplication enabled.
- Install the NetWorker client rpm on the Avamar server node. Do not install the Avamar client package on the Avamar node.
- This solution does not support IPv6.
- Avamar version 7.2 uses an encrypted port 29000 as the default port, as a result, the NetWorker and Avamar deduplication backup fails. Set the port to an unencrypted port 27000, for the NetWorker and Avamar deduplication to backup correctly. To make this port change, perform the following steps:

  1. On the Avamar server, create a file that is named `gsan-port` under the directory `/usr/local/avamar/lib/admin/security/` with the content as follows:

     ```
     <avamar server hostname>:~/#: cat /usr/local/avamar/lib/admin/
     security/gsan-port GSAN_PLAIN_TEXT="27000,"
     ```

  2. Type the following command to restart the Avamar firewall:

     ```
     service avfirewall stop
     service avfirewall start
     ```

  3. Type the following command to restart NetWorker:

     ```
     /etc/init.d/networker stop
     /etc/init.d/networker start
     ```

Existing users of this feature

Existing customers using this feature can continue to refer to the *EMC NetWorker and EMC Avamar Integration Guide* version 8.2 Service Pack 1.

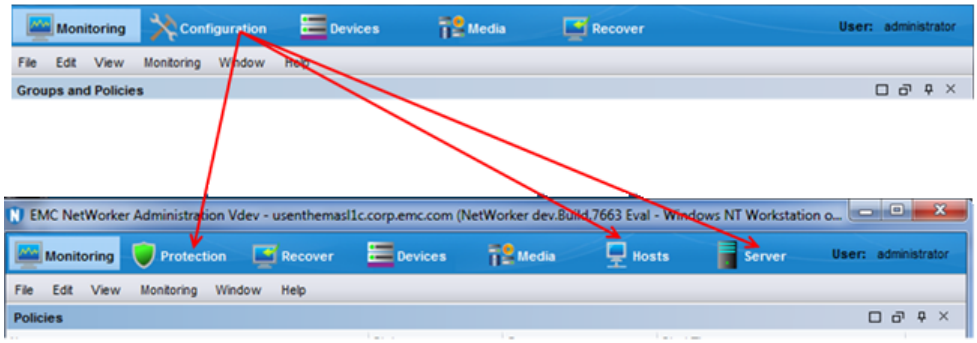
The NetWorker software installation packages includes the Avamar client software. The Avamar client software only provides support to NetWorker hosts that used an Avamar system as a data protection target with a previous release of NetWorker. You can only install the Avamar client software when you upgrade a NetWorker 8.2.x and earlier host. The *EMC NetWorker Updating from a Previous Release Guide* provides more information.

Visual representation of the NetWorker Management Console's Administration window

In NetWorker 9.0, the NetWorker Management Console's (NMC) **Administration** window features three new windows, including the **Protection**, **Hosts**, and **Server** windows, which replace the **Configuration** window from previous versions.

The following graphic shows the visual difference between the **Administration** window options for NetWorker 9.0 and previous versions.

Figure 1 Visual changes to Administration window between NetWorker 9.0 and previous releases



The three additional windows contain functionality and resources that were previously managed under the **Configuration** window:

- Protection—The main function of the **Protection** window is to create and manage policies that protect all the data in the environment. The data protection policy replaces the client backup configuration previously available from the **Configuration** window.
- Hosts—The **Hosts** window allows you to manage local host activities with easily visible repository and inventory details, and to manage all installed NetWorker packages across hosts, replacing the previous **Software Administration** wizard.
- Server—The **Server** window contains all resources (for example, User Groups information) that previously appeared in the **Configuration** window.

Data Protection Policies

NetWorker 9.0 introduces a new method for protecting data in the environment—the creation of policies, which you can perform from the **Protection** window in the NetWorker Management Console's **Administration** window, or by using the `nsrpolicy` command.

NetWorker 8.2 and earlier

NetWorker 8.2 and previous releases require you to create and configure Client and Group resources to perform backups, clones, and so on, using the **Configuration** window or by running `savegroup`.

NetWorker 9.0

In NetWorker 9.0, instead of creating a backup by using the **Client Backup Configuration** wizard under the Client tab, the **Protection** window allows you to create data protection policies and assign those policies to clients, virtual machines, and so on, across the environment.

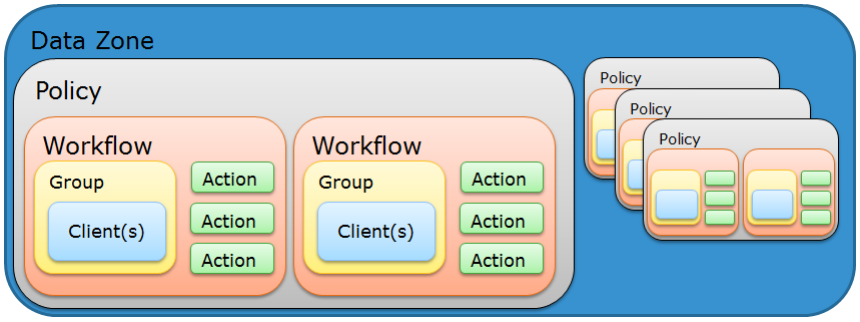
Policies are made up of actions (such as backup and cloning operations) that you can configure using action wizards in the **Administration** window, or by using the new command line tool `nsrpolicy`.

Setting up a policy includes creating the following resources:

- Client resource—Allows you to define the backup data for a host. By default, when you install NetWorker, the installation process creates two Client resources -- one to backup all local file systems on a NetWorker Server, and one to backup the NetWorker and NMC server databases.
- Policy resource—Provides a container for the workflows, actions, and groups that support and define the backup, management, and system maintenance actions that you want to perform.
- Workflow resource—Allows you to define the order of actions, concurrently or in sequence, and when to start the sequence. You can create multiple workflows in a single policy. However, each workflow can belong to only one policy.
- Group resource—Allows you to group a set of clients, virtual machines, and so on, for a specific workflow, which is based on the type of actions you plan to perform. You create one group for each workflow. You can create the group before you create the workflow, or you can create the group after you create the workflow and then assign the group to the workflow later.
- Action resource—Allows you to define a specific task (for example, backup), specify when to run the task, and how to run the task. Actions include backup operations, cloning operations, or user-defined actions. You can create multiple actions for a single workflow. However, each action applies to a single workflow and policy.

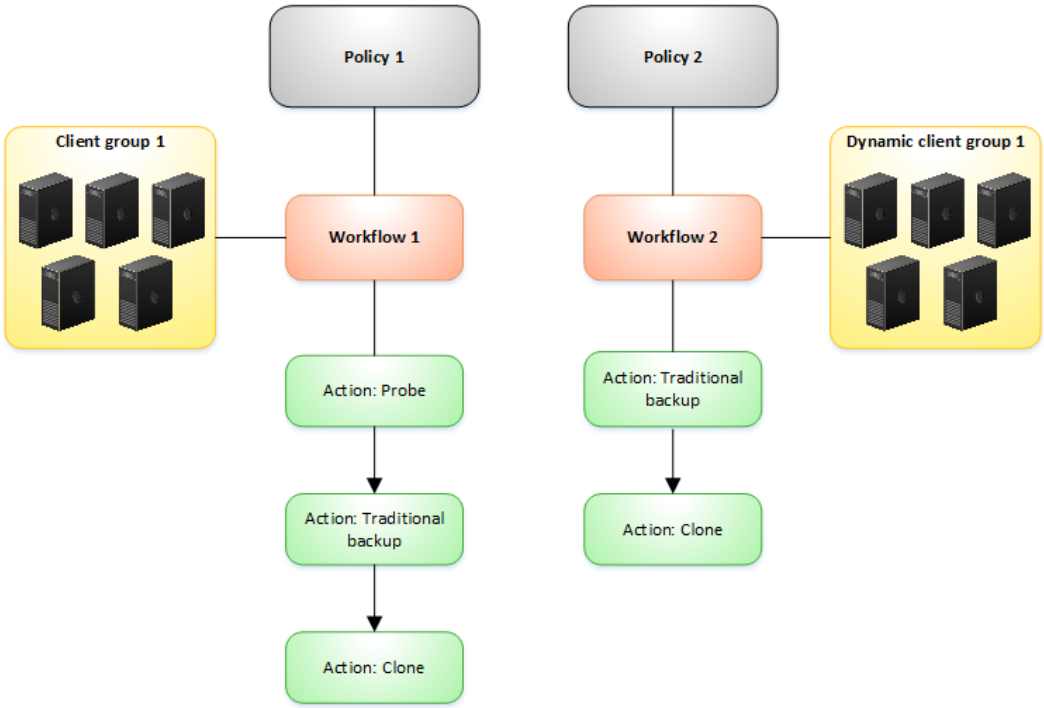
The following diagram shows how the policy acts as a container for the workflows, groups, and their associated actions.

Figure 2 Policy as a container



The following figure illustrates a policy with two different workflows. Workflow 1 performs a probe and then a backup of the Client resources in Client group 1, and then clones the save sets from the backups. Workflow 2 performs a backup of the Client resources in Dynamic client group 1, and then clones the save sets from the backups.

Figure 3 Data protection policy example



Server Protection policy and workflows

When you install or upgrade the NetWorker server, the installation or upgrade process creates a Server Protection policy with default workflows to support NetWorker and NMC backup and maintenance activities.

The Server Protection policy includes the following default workflows:

Server backup

The workflow performs two actions:

- Expiration—An expire action to mark expired save sets as recyclable.
- Server database backup—A backup of the NetWorker server media database, authentication service database, and the client file indexes. The data in this backup, also called a bootstrap backup, enables you to perform a disaster recovery of the NetWorker server.

The workflow is scheduled to start daily at 10 a.m. The workflow is assigned to the default Server Protection group, which contains a dynamically generated list of the Client resources for the NetWorker server.

NMC server backup

The workflow performs a traditional backup of the NMC database. The workflow is scheduled to start a full backup daily at 2 p.m. The workflow is assigned to the default NMC server group, which contains the NMC server.

Hosts window in the NMC GUI's Administration window

NetWorker 9.0 features a dedicated **Hosts** window for the management of NetWorker packages and local host activities.

NetWorker releases previous to NetWorker 9.0

In NetWorker releases previous to NetWorker 9.0, NMC provides a wizard for managing packages across hosts. From the **Configuration** window, you can launch the **Software Administration** wizard and choose a particular operation (for example, inventory of all local hosts), and continue to go through the wizard for each required operation.

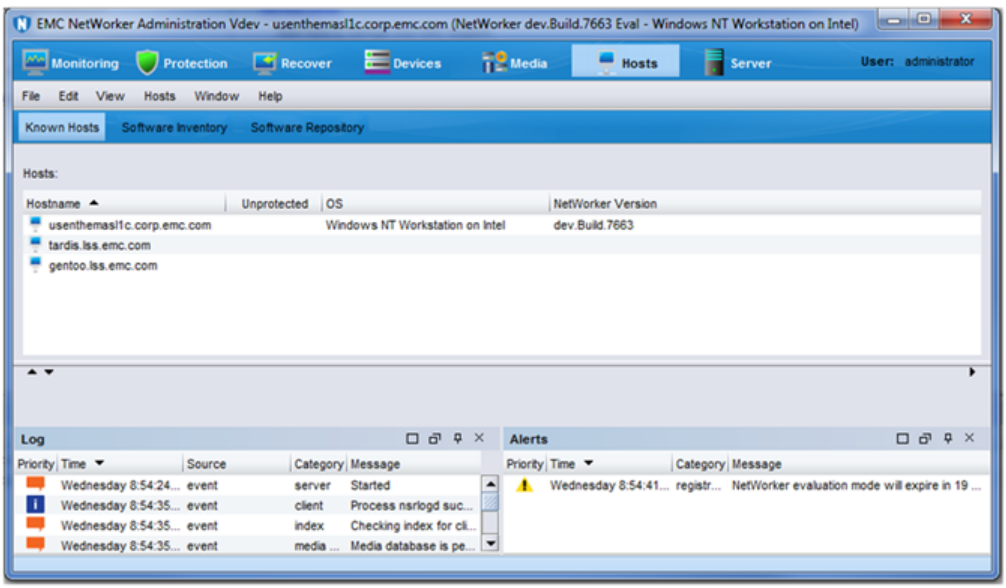
NetWorker 9.0

In NetWorker 9.0, you can perform package management by using the **Hosts** window, which provides you with more visibility upfront, such as the ability to view the host, the version of the software, and if the host is eligible for an upgrade.

The **Hosts** window is divided into three sub-tasks:

- Known Hosts—Provides information about the configured hosts and their certificates, NetWorker version, operating system, and performed software operations. You can also determine whether the host is eligible for an upgrade.
- Software Inventory—Displays information about the software packages that are installed on the host, and provides the option to upgrade the software and monitor the upgrade in the Software Operations pane.
- Software Repository—Displays a view of the NetWorker server's repository, providing version information for all products that are installed on the NetWorker host. You can also add to the repository from this view.

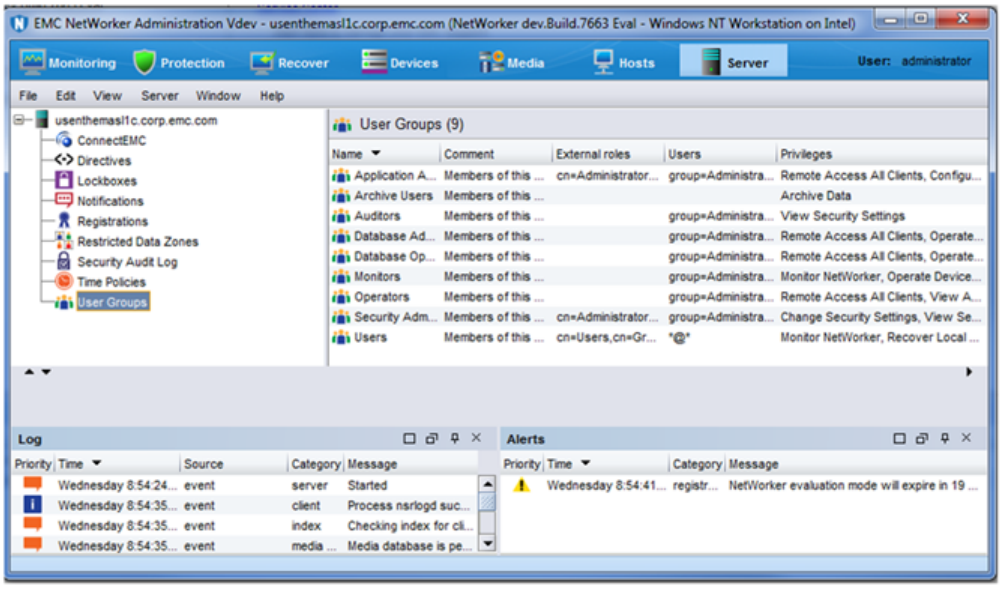
Figure 4 Hosts window



Server window in the NMC GUI's Administration window

The **Administration** window in NetWorker 9.0 features a **Server** window, which contains most of the resources that were previously located under the **Configuration** window, such as **Directives**, **Notifications**, and **User Groups**.

Figure 5 Server window



NetWorker VMware Protection changes

NetWorker VMware Protection is a NetWorker-integrated VMware solution that allows you to create backup and cloning actions for the VMware Backup Appliance. You can assign virtual machines/VMDKs to policies in NMC when you deploy a VMware Backup Appliance in the vSphere server and register the appliance with NetWorker and vCenter. The NetWorker 9.0 release introduces two important changes to the NetWorker VMware Protection solution—the integration of VMware Protection Policies within the main policy workflow, and a new interface for the **EMC Data Protection Restore Client** for file-level recoveries.

NetWorker releases previous to NetWorker 9.0

On deployment of the VMware Backup Appliance in NetWorker 8.2 SP1 and earlier, two resources appear in the left pane of the **Configuration** window in NMC:

- A default protection policy, which is created after NetWorker registers the first VMware Backup Appliance.
- A default device, which is based on the media type AFTD, to backup to the VMware Backup Appliance's internal storage.

NetWorker 9.0

In NetWorker 9.0, further integration of VMware protection policies within the data protection policy framework means that you no longer require a separate window to run VMware policies. Access to the same functionality is available in the NMC GUI's **Administration** window, under the **Protection** window.

Expanding **Policies** in the left pane of the **Protection** window displays all existing protection policies.

To protect virtual machines and VMDKs, add these items at the group level. Once you specify the group type as **VMware** and identify whether the group will contain virtual machines or VMDKs, you can associate the group with a workflow and policy.

To view the available VMware Backup appliances, select the **Devices** window. When you select **VMware Backup Appliances**, the deployed appliances appear in the right pane, which also allows you to monitor the state of the appliance.

VMware View remains the same, as well as the visual representation, which are now provided in the **Protection** window.

Also, the new interface for the **EMC Data Protection Restore Client** allows you to perform file-level recoveries in two modes:

- User, which allows a local user to restore folders or files to the original virtual machine.
- Admin, which allows an administrator to restore folders or files from a different virtual machine to any available destination client.

NetWorker Authentication Service

NetWorker 9.0 introduces a new authentication and authorization model, the Authentication Service, which is designed to improve NetWorker security by using token-based authentication and single sign on (SSO) support.

Token-based authentication enables users to securely connect to the NMC server, the NetWorker server, and to perform secure backup and recover operations.

NetWorker 8.2 and earlier

In versions of NetWorker up to NetWorker 8.2.x, user authentication is handled in one of two ways:

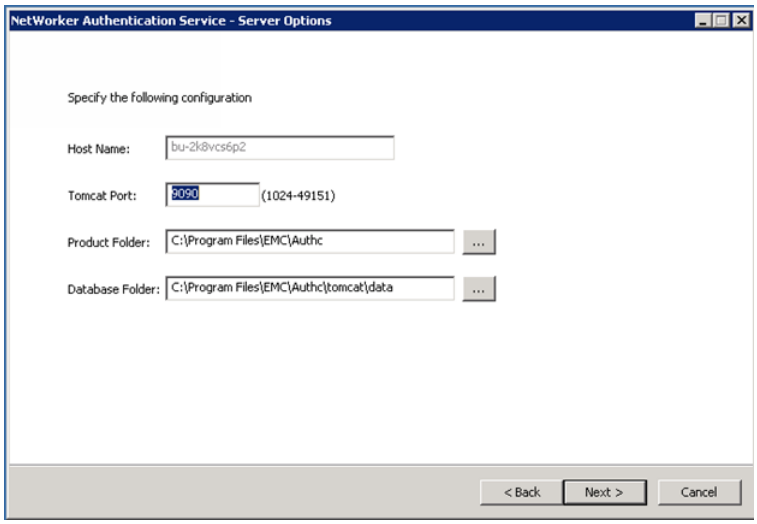
- By specifying privileges through NSR usergroup resources, or by using the NSR resource Administrators list, for operating system usernames, <user>@<host>, groups, and so on. Also, NMC maintained its own list of users and those users would be granted privileges by specifying "<user>@<NMC Server>."
- By using an external authority (LDAP or AD) to authenticate users. You configured the NetWorker and NMC servers to access the LDAP or AD server directly, and authenticate users against the server. LDAP or AD groups were specified in the **External Roles** field of NSR usergroup resources.

NetWorker 9.0

In NetWorker 9.0, installation and configuration of an authentication server allows you to authenticate all users for NMC and the command line interface. The authentication server maintains its own local database of users and groups independent from the operating system users and groups. The authentication server is installed automatically during a server install on Windows. On Linux, you must install the authentication server before the server install.

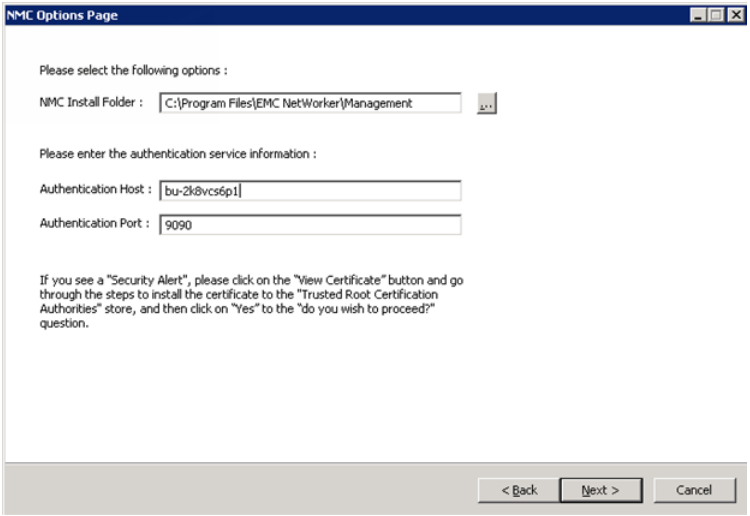
The authc service gets installed with the NetWorker server software. During the server installation, screens appear to configure and install authc.

Figure 6 NetWorker Authentication Server options



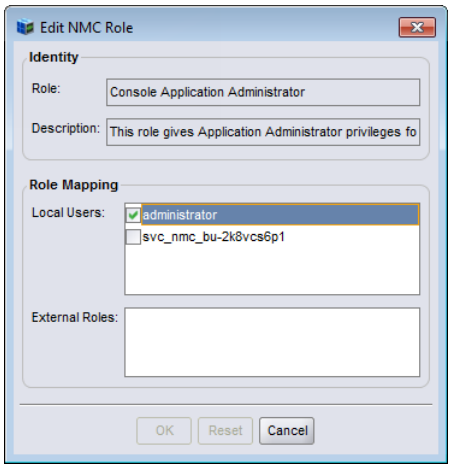
After specifying the configuration information, the **NMC Options** Page appears, where you type the name of the authentication host (the local hostname), and the authentication port that you selected during the authentication server install.

Figure 7 NMC Options



After launching NMC and completing the **Console Configuration** wizard, you can then create additional users and groups in the authentication server local database by using the **Edit Roles** dialog box.

Figure 8 Edit Roles dialog box



Note

You can still configure NetWorker to authenticate based on an operating system user.

The *EMC NetWorker Security Configuration Guide* provides complete details for installing and configuring the NetWorker Authentication Service.

EMC Licensing Solution

NetWorker 9.0 introduces the EMC Licensing Solution with capacity entitlement, which uses a License Server and a license file.

NetWorker releases previous to NetWorker 9.0

You could use either the traditional licensing model or the capacity licensing model to permanently license the NetWorker software, but only one method per NetWorker server or datazone.

With traditional licensing, you could use features of products once you purchased a base enabler.

With capacity licensing, you could deploy unlimited quantities of the NetWorker options and modules to protect, up to the amount of licensed capacity you purchased.

NetWorker 9.0

The EMC Licensing Solution introduced in NetWorker 9.0 stores the licenses for all installed EMC products in one file. This file must reside on a platform that is accessible to NetWorker and runs the EMC License Server. The License Server must be installed after the NetWorker software installation.

The license file can contain one of two types of licenses — a single capacity license, which enables all data zones in an installation, and an update license, if updating from a previous NetWorker release.

For new installations of NetWorker 9.0, you can only use the EMC Licensing Solution. When you upgrade from a NetWorker 8.2.x or earlier release, you can continue to use the traditional or legacy capacity model, or use the EMC Licensing Solution with capacity entitlement. If you previously used the capacity model, any unused storage is added to the capacity purchased for use of the EMC Licensing Solution.

Restricted Data Zone changes

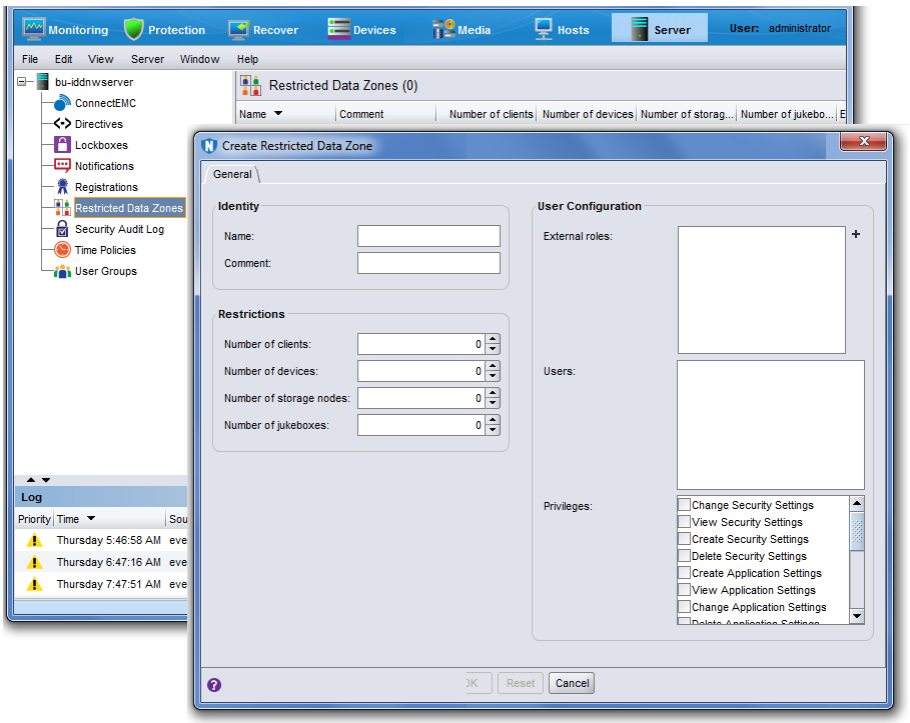
The Restricted Data Zone (RDZ) feature provides NetWorker administrators with an additional layer of privilege control that allows you to isolate access to resources, and separate these resources into specific groups.

NetWorker 9.0 introduces the following changes to RDZ:

- You can now associate an RDZ resource to an individual resource (for example, to a client, protection policy, protection group, and so on) from the resource itself. As a result, RDZ resources can no longer affect resource associations directly.
- Non-default resources that are previously associated to the global zone, and therefore unusable by an RDZ, are now shared resources that can be used by an RDZ. Although, these resources cannot be modified by restricted administrators.

Also, RDZ setup in the NMC GUI's **Administration** window is now located under the **Server** window, as shown in the following:

Figure 9 Create Restricted Data Zone in the Server window



Block based backup on Linux platforms

Block based backup (BBB) is a NetWorker solution that facilitates the backup of data by scanning a volume or a disk in a file system, and backing up all the blocks that are in use in the file system.

BBB uses the Change Block Tracking (CBT) driver to identify the changed blocks, and back up only the changed blocks. Previously, this backup option was only available on Windows. In NetWorker 9.0, Linux platforms can also use BBB.

On a Windows host, the NetWorker client software includes support for BBB. On Linux hosts, install the BBB software package to provide a NetWorker client with BBB support. The BBB software package for installation is `lgtobbb-9.0.x86_64.rpm`.

NMC database changes

In NetWorker 9.0, NMC uses a PostgreSQL database instead of Sybase. As a result, you must migrate existing databases if performing an upgrade.

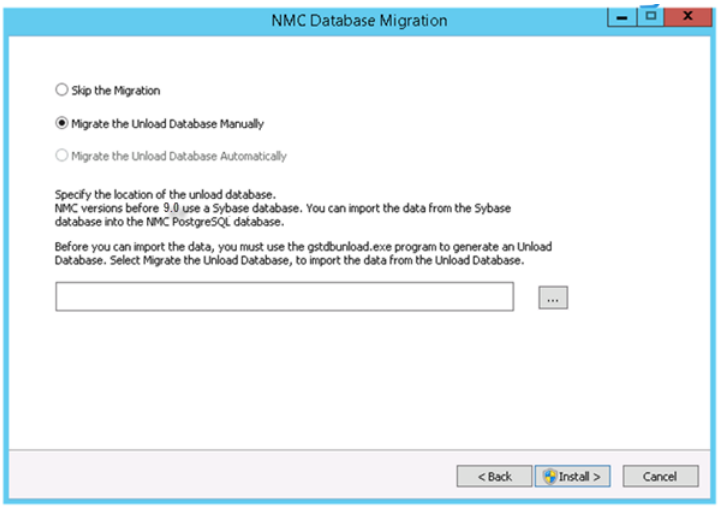
Migrating the database is a two-step process:

1. Unload the Sybase database before upgrading or uninstalling the previous version. You can unload the database manually by running the `gstdbunload` tool, or automatically.
2. Upgrade and then reload the SQL database to import the date from the Sybase database into the new PostreSQL database. You can perform this automatically, or you can manually reload the database by running the `gstdbupgrade` tool.

The upgrade on Linux platforms requires you to copy `gstdbunload` to the `/opt/lgtonmc/bin` directory before the upgrade, and then run `gstdbunload <path to unload directory>`. You can then install the NMC for NetWorker 9.0 rpm.

On Windows, you must use the `gstdbunload.exe` program to generate the unload database, and then select **Migrate the Unload Database** to import that data into the new database. The following dialog prompts you to perform the database migration on Windows.

Figure 10 NMC database migration on Windows platforms

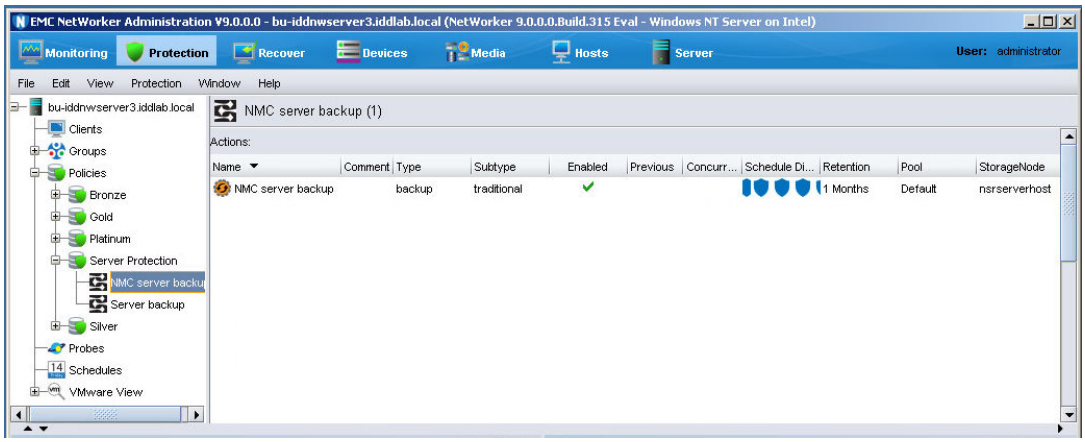


NetWorker 9.0 drops NMC support for AIX and Solaris. If you upgrade from one of those platforms you must copy `gstdbunload` to the unload directory, and then move the directory to a platform that NMC supports.

Database reloading typically takes less than 90 minutes but can take longer depending on several factors, including the number of NetWorker servers managed by NMC, and the size of the database. After database reloading, a prompt appears to specify an account for the new database server.

The NMC database now gets replicated to a staging area and backed up as part of the default Server Protection policy in NMC.

Figure 11 NMC database in Server Protection Policy



Media database changes

In NetWorker 9.0, SQLlite replaces WiSS as the media database.

The new database features the following advantages:

- Object caching—A targeted cache facility that operates independently of file system or database caching to maintain recently used objects in memory for subsequent requests.
- Parallel request processing (or multi-threading)—The database in previous versions of NetWorker was single-threaded, which means it could handle only one database request at a time. As a result, long transactions could delay the performance of any other transactions (for example, an operational request would have to wait until the bootstrap was completed). With multi-threading, the database can handle requests in parallel, so that the operational request would be picked up and handled immediately without requiring completion of the bootstrap.
- Request handling—Any request that takes multiple seconds gets logged. You can choose to log all requests by setting `dbgcommand` to level 1 or higher in debug mode.
- Bootstrap compatibility—The mechanism being used for SQLlite is the same as for the WiSS database. If a problem occurs after upgrading, you can use a bootstrap taken from the previous system and recover that information directly into the SQL database. If you must temporarily downgrade NetWorker but already performed backups using NetWorker 9.0 that you want to maintain, you can perform a bootstrap and recover the media database into NetWorker 8.2, and that data will be recovered into the WiSS database.

The `nsrmmdbd` process handles the migration automatically during NetWorker startup after the upgrade. The database migration does not require any user intervention, and occurs in three stages (clients, volumes, and then save set records), with the daemon log indicating the beginning of each stage and logging any errors that occur. Once all data has been moved to the new database, NetWorker performs a cross check to verify the success of the migration. The migration process typically takes between 1-3 minutes but can take longer for very large databases (1 GB or greater).

On successful migration, the `/nsr/mm/mmvolume6` directory gets appended with a timestamp to indicate that the directory is no longer active. You can keep this directory if you do not have a current bootstrap backup, otherwise it can be removed. The `mmvolrel` directory gets used as the new directory for the SQLlite database.

If the database migration does not complete, `nsrmmdbd` notifies you that migration has failed and the legacy WiSS database continues to run to process jobs until the migration is successful.

Note

EMC does not recommend hosting a media database on a remote file system, for example, an NFS file system. Not all systems handle file locking correctly, and this can also introduce access latency which degrades performance.

Enhancements to parallel save streams and client parallelism settings

NetWorker 9.0 enhancements to parallel save streams (PSS) provide additional backup performance gains for concurrent backup compared to previous NetWorker releases.

In NetWorker 9.0, the NetWorker server starts a single save process per PSS-enabled client, with all client save sets passed to the single process for processing optimizations. Enhancements to PSS in NetWorker 9.0 include:

- Four parallel streams started per save set, subject to any client parallelism limitations that might prevent all save sets from starting simultaneously.

  Note

  PSS and non-PSS backups currently ignore the policy workflow action's parallelism, previously known as the savegrp parallelism, and use the client parallelism value instead.

- The ability to modify the number of parallel streams per save set by defining the new **PSS:streams_per_ss** option in the selected Client resource's **save operations** attribute.
- Automatic stream reclaiming, which dynamically increases the number of active streams for an already running save set backup to maximize utilization of limited client parallelism conditions, also known as Dynamic PSS (or DPSS).

  Note

  The term DPSS can also refer to the overall enhancements to PSS in NetWorker 9.0.

- Performance gains for environments with a limited client parallelism, multiple save sets for concurrent backup, and significantly unbalanced save set sizes. A save set is a save point such as a Windows volume, UNIX file system mount point directory, or a Windows or UNIX directory.

Due to differences in the handling of save streams, the recommended value for client parallelism in NetWorker 9.0 changes. Unlike previous NetWorker releases, where PSS requires a sufficiently high client parallelism value due to the up-front static division of client parallelism among the client's save points which all get started at the same time, NetWorker 9.0 schedules the save points at four parallel save streams each by default, and handles in batches according to the client parallelism value. Therefore, you do not require a high value for client parallelism. For a single save set, you can obtain the best backup throughput at a configurable 4-8 parallel streams per save set.

Note

PSS is not supported for checkpoint restart backups in NetWorker 9.0.

EMC ProtectPoint

NetWorker 9.0 introduces support for the EMC® ProtectPoint™ solution, which allows for Data Domain vDisk snapshot creation within NetWorker's policy workflow. You can specify a snapshot backup type ProtectPoint Snapshot, where NetWorker creates the snapshot of specified files on the application host and retains the snapshot on the Data Domain system only.

The ProtectPoint solution integrates primary storage on an EMC VMAX3 array and protection storage for backups on a Data Domain system. ProtectPoint provides block movement of the data on application source LUNs to encapsulated Data Domain LUNs for full and incremental backups.

ProtectPoint operations require the following:

- Both IP network (LAN or WAN) and Fibre Channel (FC) storage area network (SAN) connectivity.
- A VMAX3 array with SnapVX and Federated Tiered Storage (FTS) software features enabled.
- Solutions Enabler 8.0.1 installed on the application host, data mover, optionally the recovery host and in some configurations on the NetWorker server.
- Data Domain systems (DD4500, DD7200, DD990) with the Data Domain Operating System (DDOS) 5.6 installed, with Vdisk service and DD Boost service enabled.

Note

NetWorker supports the backup of Oracle, SAP oracle, and DB2 databases using the ProtectPoint Workflow. Backup of file systems is not supported.

The *EMC NetWorker Snapshot Management Integration Guide* provides details for configuring ProtectPoint.

NetWorker Virtual Edition

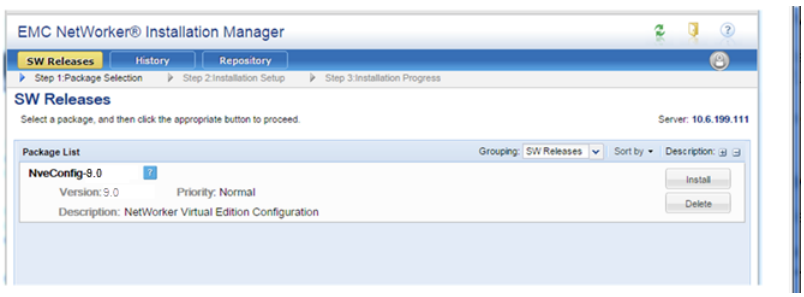
The NetWorker Virtual Edition (NVE), introduced in NetWorker 9.0, is a self-contained virtual appliance for VMware that integrates the latest version of the NetWorker server software with SUSE Linux as a VMware virtual machine.

The NVE appliance, compatible with vSphere versions 5.1 and later, is delivered as an OVA file that you deploy through the vCenter server.

After deployment and completing the configuration, run the **NetWorker Installation Manager** from a web browser to complete the NVE setup. To access the **NetWorker Installation Manager**, type a link in the following format:

```
https://<NVE_address>:7543/avi/avigui.html
```

Figure 12 NetWorker Installation Manager



The *EMC NetWorker Virtual Edition Installation Guide* provides more information.

NOTICE

Only new installations of NetWorker 9.0 can use NVE. If you upgrade to NetWorker 9.0 from a previous NetWorker releases, NVE will not be available.

Checkpoint restart feature not supported on Windows platforms, for block-based backups, or when using parallel save streams

NetWorker 9.0 does not support the checkpoint restart feature on Windows platforms, as the introduction of the save set aggregation feature in NetWorker 9.0 eliminates the need for checkpoint restart. Save set aggregation provides significant backup performance gains over previous NetWorker versions, as described in the section "Client parallelism and parallel save streams" in the *EMC NetWorker Administration Guide*.

Additionally, checkpoint restart is not supported for block-based backups, or when you enable parallel save streams. Backups enabled with checkpoint restart in these circumstances will revert to non-checkpoint restart, and a warning message appears in the log file indicating that checkpoint restart is disabled.

Non-optimized backup recommended for Windows deduplication volumes

Due to recovery performance issues observed with optimized backup for Windows deduplication volumes, EMC recommends non-optimized backup.

When you set the backup to non-optimized, the deduplicated files get rehydrated in memory before they are backed up. This type of backup requires you to enable VSS. If you disabled VSS (for example, by specifying *VSS:*=off* in the **Save Operations** attribute), the backup will potentially back up the chunk stores unnecessarily.

To back up the deduplicated volume, EMC recommends using block based backup (BBB) instead. If you still require optimized backup, you can add *VSS:NSR_DEDUP_NON_OPTIMIZED=no* to the **Save Operations** attribute to restore settings to the traditional (non-BBB) optimized backup, however EMC does not recommend using this setting as the recovery performance issues may result in an unusable backup.

Data Protection Search support

NetWorker 9.0 introduces support for EMC Data Protection Search. You can leverage Data Protection Search for index and search capabilities across one or more NetWorker servers.

Data Protection Search provides two levels of indexing; metadata-only, and full content. Metadata-only indexing reads existing information from the NetWorker catalog and only minimally impacts existing processes. Full content Indexing requires you to recover full content to the Data Protection Search servers, and therefore can lead to more performance impact. You can control all indexing activity by using scheduling, blackout windows, and connection limits. The Data Protection Search documentation provides more details.

Use Package Manager to update NMM Client

In NetWorker 9.0, you must use Package Manager to update NMM clients. You cannot use the `nsrpush` command. The *EMC NetWorker Module for Microsoft Release Notes* provide information on any restrictions or limitations.

Isilon NDMP Fast Incremental backup support

Support for Isilon NDMP Fast Incremental backup is available in NetWorker 9.0.

When the level defined for a backup is incremental, specify the following variables to enable NetWorker to perform a Fast Incremental backup:

- BACKUP_MODE=SNAPSHOT
- BACKUP_OPTIONS=7

Support for Ultrium LTO-7

NetWorker 9.0 adds support for Ultrium LTO-7 tape drives.

Note

A low usage warning occurs when a tape is using less than 80% of its expected capacity. For LTO-7 volumes, NetWorker uses an expected capacity of 4.3 TB instead of 6 TB, which means the low capacity threshold gets exceeded sooner. Therefore, NetWorker will issue low usage warnings for LTO-7 volumes less frequently.

Fixed problems

This section provides details on fixed bugs for the NetWorker 9.0.x releases.

When a cumulative build is released, information on fixes included in the latest cumulative is provided in the NetWorker Cumulative Hotfixes document, available on the EMC Online Support site at http://support.emc.com.

Fixed in NetWorker 9.0.1

When a problem identified in the section NetWorker 9.0.1 known limitations is fixed, or a customer reported escalation is resolved, the following table will be updated with this information.

Table 2 Fixed in NetWorker 9.0.1

Issue number	Description
261282	NDMP backup fails when attempting to continue onto second tape
259029	Nsrwatch does not display correct save size information
257921	NMC does not display correct information regarding space utilization for Data Domain device
257773	Stale nsrmmd left behind after NetWorker Service stops, needs to be stopped manually
257079	For Virtual Synthetic Full backups, nsrrecopy ignores the server network interface setting

Table 2 Fixed in NetWorker 9.0.1 (continued)

Issue number	Description
256955	Source Storage node displays as read-only in action policy in NMC
255113	Operating system buffering of tape writes may result in out of order writes with writing filemarks with CDI
254786	Duplicated session info records created for session updates with rm_jobid of 0
254878	No updates from jobd over the message bus when conversion error occurs
252818	Nsrexecd may core dump when shssn_run_process_env() modifies passed in attrlist
252810	Scheduled NDMP cloning loops for 18 hours and hangs the system even though both source/destination clients are available
252745	Nsrexecd mutex hangs in msg_post()
252511	Client Push generates a core file during the inventory operation
252219	Support XtremIO in SMCC tool
251488	Restart workflows should display a confirmation dialog window similar to the Start option
250680	Disable policy auto-restart upon server restart
250654	Provide query filtering for save set attributes
250028	When a tape fills, the message "NetWorker media: (emergency) could not position to file , record" appears
249366	Improve performance for select file recovery from a Windows Deduplication Volume backup
248895	Add option to force IPv4 for index based recovery
248157	Implement iSCSI client code to work on Linux
247671	Implement iSCSI server to work on Linux
247484	NDMP backup fails with special character in save set only on Windows
247366	NMC in French reports successful clone status as Echec (Failed)
247305	Block-based backup recovery from NMC fails with error "unable to connect to Networker server"
246925	NetWorker server hangs after a Storage node does not respond before timeout
246787	Error in man pages for nsrpush
246661	Next button in NMC Recovery wizard should be disabled if there are no backup files in the file system
246578	NMC incorrectly displays group status as successful after Networker server daemons crash
246415	Add RESTAPI in NetWorker
244755	Allow running of policy actions from command line for debugging purposes

Table 2 Fixed in NetWorker 9.0.1 (continued)

Issue number	Description
244237	In a block-based backup recovery, file attributes and permissions are not recovered if the file content has not changed since backup, impacting overwrite recoveries
235215	Add DDBoost over IP support to MacOS clients
233596	Support Token Based Backup for Hitachi NAS
224144	Implement Automated multi-streaming when cloning from Data Domain device to another Data Domain device
185292	NSM Request Linux support with DM Multipath

Fixed in NetWorker 9.0

When a problem identified in the section NetWorker 9.0 Known Limitations is fixed, or a customer reported escalation is resolved, the following table will be updated with this information.

Table 3 Fixed in NetWorker 9.0

Issue number	Description
245173	NMC help files on Linux have non-root ownership
244864	NMC Recover wizard stalls at 5% progress when recovering from a clone volume
241509	Cross-sync does not occur automatically after VMware Backup Appliance rollback
241141	When you use nsrvbarecover to restore a virtual machine backup and select a cluster's resource pool as the destination, the list of datastores does not display
236088	One external proxy virtual machine backup within a VMware backup policy fails with an RPC error
232730	When trying to install the VMware Backup Appliance with NetWorker 9.0, the appliance may experience issues with Data Domain integration. If this occurs, the error "Unable to add trap host to Data Domain system" appears
237378	Nsrexecd killing nsrdasv by SIGKILL causes Domino server crash
243997	Nsrd crashes when Networker server is upgraded to NetWorker 9
243582	Gstclreport does not honor "-C Client name" switch in the Data Domain Statistics report
242999	Nsrjobd returns excessive error messages such as 'parent job not found'
242705	Nsrd coredumps due to "assert" in nsrsvc_run()
242410	Incorrect size reported for NDMP save sets spanning multiple tapes under the successfully completed section of the NMC Monitoring window's Group details pane

Table 3 Fixed in NetWorker 9.0 (continued)

Issue number	Description
241542	Networker does not show block-based backups in the NMC Recover wizard
241149	Percentage completion for successfully Cloned save sets display as less than 100%
240948	NSR Log maximum version not honored correctly
237019	Semaphore timeouts result in core dumps due to data being freed while still in use by another thread
241648	Show more details for nsrdr non-interactive mode
241199	Update NMC's Apache httpd to latest 2.4.x version

Environment and system requirements

This section describes specific environment and system requirements.

NetWorker client location and space requirements

This section specifies the location and space requirements for the NetWorker client software for NetWorker 9.0.

Microsoft Windows

The following table specifies the location and space requirements for the NetWorker client software in a Microsoft Windows environment.

Table 4 Microsoft Windows location and space requirements

NetWorker files	Location	Space		
		x86	x64	ia64
NetWorker client files and NetWorker catalog	EMC NetWorker \nsr\	264 MB	383 MB	383 MB

Linux

The following table specifies the location and space requirements for the NetWorker client software in a Linux environment.

Table 5 Linux location and space requirements

NetWorker files	Location	Space	
		x86	x64
NetWorker client files and	/usr/bin /usr/sbin	115 MB	160 MB

Table 5 Linux location and space requirements

NetWorker files	Location	Space	
		x86	x64
NetWorker catalog	/usr/lib/nsr /opt/nsr		

AIX

The following table specifies the location and space requirements for the NetWorker client software in an AIX environment.

Table 6 AIX location and space requirements

NetWorker files	Location	Space
NetWorker client files and NetWorker catalog	/usr/bin /usr/lib /usr/lpp /opt/nsr	300 MB

Solaris location and space requirements

The following table specifies the location and space requirements for the NetWorker client software in a Solaris environment.

Table 7 Solaris location and space requirements

NetWorker files	Location	Space		
		Sparc	x86	amd64
NetWorker client files and NetWorker catalog	/usr/bin /usr/sbin /usr/lib/nsr /opt/nsr	200 MB	200 MB	200 MB

Reviewing the OS-X requirements

Before you install the NetWorker software on the OS-X operating system, review the following information.

The NetWorker software:

- Supports only the NetWorker client on OS-X.
- Supports Mac OS Power PC and Mac OS Intel.
- Supports the following file systems:
  - HFS+ (including journaled)

  - HFS
  - UFS
- Requires 131 MB of free disk space for the software installation process.

Table 8 OS-X Directory and space requirements

Directory	Space required
/applications	8 MB
/usr/local/bin	51 MB
/usr/local/sbin	65 MB
/usr/local/lib/nsr	4 MB
/usr/local/share/man	2 MB

Memory requirements for the NetWorker Server and NMC

The NetWorker 9.0 software can consume a large amount of memory for the NetWorker server and NMC.

Also, the following services introduced in NetWorker 9.0 can be memory-intensive since these services use Java and Apache tomcat:

- Web-based authentication service
- Message Queue adapter
- Hyper-V FLR in NMM

NetWorker 9.0 requires an additional 2 GB, 4 GB and 16 GB memory for small, medium and large scale configurations respectively due to the addition of these features. Also, as a best practice EMC recommends that Java heap memory should typically consume no more than 25% of physical memory.

Note

EMC recommends that you avoid installing NMC on the NetWorker server. If you install NMC on the NetWorker server, then the memory requirements for the NetWorker server identified in the following tables will be in addition to the minimum NMC memory requirements specified in the section Minimum system requirements for the NMC server.

The following table lists the minimum memory requirements for the NetWorker Server.

Table 9 Memory requirements based on size of configuration

Size of configuration	Minimum CPU required	Minimum memory required
Small configuration (maximum 500 clients)	1 CPU, 3.0 GHz	8 GB RAM
Medium configuration (maximum 1000 clients)	1 CPU, 3.4 GHz	16 GB RAM
Large configuration (maximum 2000 clients)	2 CPU, 3.4 GHz	32 GB RAM

NMC server only supports Windows and Linux 64-bit

The NMC server software package can only be installed on a Linux or Microsoft Windows 64-bit host. The NMC server software requires the NetWorker client software.

Platforms no longer supported

NetWorker 9.0 no longer supports the Linux ia64 platform.

The NMC server software only supports Windows and Linux 64-bit platforms.

Minimum system requirements for the NMC server

Available disk space and JRE with Web Start must meet specific minimum requirements for the NMC server:

- Memory:
  A minimum 1 GHz with 512 MB of RAM is required. Add an additional 512 MB RAM to run reports.
- Available disk space:
  Dual core 2 GHz and 2 GB of RAM with a buffer of disk space for a large Console database with multiple users.
- JRE with Web Start:
  55 MB, and as the number of NetWorker monitored servers increases, increase the processor capabilities:
  - For 50 servers: Dual 1 GHz with no less than 2 GB RAM
  - For 100 servers: Dual 1 GHz with no less than 4 GB RAM
  - For 200 servers: Quad 1 GHz with no less than 8 GB RAM

System configuration requirements for a dedicated NetWorker server

The tables below outline the following:

- Minimum system configuration requirements to be met when running the NetWorker software on a dedicated NetWorker server.
- Tips when setting parameters at the operating system level.

Note

If the following system requirements are not met, the performance of the NetWorker software could be significantly affected or the NetWorker daemons might crash.

Table 10 Minimum system requirements for a dedicated NetWorker server

System component	Minimum recommended configuration
CPU	Dual Core with a minimum of 1.5 GHz speed for each CPU
RAM	2 GB

Table 10 Minimum system requirements for a dedicated NetWorker server (continued)

System component	Minimum recommended configuration
Swap space	4 GB minimum (at least twice RAM)

Table 11 Minimum system requirements for a dedicated NetWorker server

System component	Minimum recommended configuration		
Kernel parameters	The following plimit values for all NetWorker daemons should be set to maximum as follows:		
	Resource	Current	Maximum
	Time	Unlimited	Unlimited
	file(blocks)	Unlimited	Unlimited
	data(Kbytes)	Unlimited	Unlimited
	stack(Kbytes)	8192	Unlimited
	coredump(blocks)	Unlimited	Unlimited
	nofiles(descriptors)	65536	65536
	vmemory(Kbytes)	Unlimited	Unlimited

The *EMC NetWorker Performance Optimization Planning Guide* provides information on tuning the operating system and is available at https://support.emc.com/.

FQDN used to launch NMC may fail on Internet Explorer

The FQDN used to launch NMC does not always work in newer versions of Internet Explorer.

If FQDN is not working, disable (uncheck) "Enable Enhanced Protected Mode*" in Internet Explorer under **Tools** > **Internet Options** > **Advanced** > **Security**, and then close and re-open the browser.

The FQDN issue has not been observed using Mozilla Firefox.

Write access to temp folders required when using the NetWorker Software Administration wizard or nsrpush CLI for a Windows 2008 client

Microsoft Windows 2008 restricts write access to temp folders, including the folders defined in the Windows SYSTEM user's TEMP or TMP environment variable. Write permissions must be enabled when performing software updates, add to repository operations, and inventory operations using the Software Administration wizard or the nsrpush CLI.

On the Windows 2008 client, grant the Administrator and SYSTEM users write permissions to the temp folders defined in the SYSTEM user's TEMP and TMP environment variables.

QPK1123 and PHSS_37492 patches required to run NetWorker on HP-UX RISC 11.23

The NetWorker services cannot be started on an HP-UX RISC 11.23 system until the following patches are downloaded from the HP website:

- QPK1123(B.11.23.0712.070a) 1185010 Quality Pack Depot
- PHSS_37492

Go to http://itrc.hp.com and click patch database to obtain these patches. You must provide an appropriate username and login password to download the patches.

Linux st kernel max devices default configuration

By default, the Linux st kernel configures a maximum of 128 SCSI tape devices. As a result, the inquire command and the Scan for Devices operation might not detect more than 128 tape devices.

To resolve this issue, the st module of the Linux kernel must be modified and recompiled to increase the maximum number of allowable st devices created by the operating system to exceed the default value. Refer to Linux documentation for details about how to reconfigure, rebuild, and install the kernel.

Known issues

This section describes known issues found in the NetWorker 9.0 releases.

Unless the entry for a known issue indicates that it is resolved for a specific release, the issue applies to the release in which it is identified and all subsequent releases. If the issue is resolved, it will also be identified in the fixed issues table for the release in which it is resolved.

NetWorker 9.0.1 known issues

The following table identifies issues that are discovered in NetWorker 9.0.1. When a particular issue has been fixed, this table will be updated.

Table 12 Known Limitations in NetWorker 9.0.1

Issue number	Product feature	Description of issue	Workaround
276501	Installation	NetWorker fails to install on Windows Server 2008 R2 due to a certificate issue. NetWorker 9.0.1.6 and later require VeriSign Universal Root Certification Authority, which may be missing from Windows Server 2008 R2 hosts.	You can resume the NetWorker installation process after you import the required certificate to the Windows Server 2008 R2 host. Use the following steps to import the certificate: 1. On the Windows Server, download and save the VeriSign Universal Root certificate from the following website: https://www.symantec.com/theme/roots 2. Launch certmgr.msc. 3. In the certmgr GUI, click **Action** > **All Tasks** > **Import**. The Certificate Import wizard opens.

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround
			4. Use the Certificate Import wizard to import the certificate file that was saved in step 1.
270342	Snapshot Management	If you are using Java v1.8, the Snapshot Management Configuration Checker (SMCC) software does not launch. A Java security error displays.	To launch the SMCC you must use Java v1.7.x.
261719	VMware Backup Appliance	When you disable the VMware Backup Appliance Internal Proxy in NMC by selecting **VBA** > **Properties** > **VBA internal proxies** > **Disable**, you cannot re-enable the internal proxy appliance using the same method.	To re-enable the internal proxy appliance, you must manually start the appliance by running the following commands: 1. Remove the marker file by running `rm /usr/local/avamar/var/proxydisabled`. 2. Turn on the configuration by running `/sbin/chkconfig avagent-vmware on`. 3. Start the internal proxy by running `/etc/init.d/avagent-vmware start`. After running these commands, you can use NMC to both disable and enable the appliance. **Note** The VBA state in NMC will not automatically change to "Success" after changing the VBA properties. The appliance remains in "update pending" state until you click **Refresh**.
261585	CLI	When you log in to NetWorker as the root user by executing the `nsrlogin` command and do not run `nsrlogout` when completed with the session, the session expires and subsequent commands run by this user, such as NDMP backups, may fail with a "Security token has expired" error.	If you use `nsrlogin` to run NetWorker commands while logged in as an LDAP or authc local user, then EMC recommends always running `nsrlogout` when completed with the session. If subsequent operations fail with the error "Security token has expired" and the root login is enabled, then run `nsrlogout` as the root user on the server.
261573	NDMP/Data Domain	When you upgrade the Data Domain OS to 6.0 and above, NDMP backups to Data Domain as NDMP Tape Server fails.	To run successful NDMP backup or restore with DDOS 6.0, perform the following steps: 1. After you upgrade to DD 6.0, stop net filtering by running the `net filter stop` command while in SE mode. 2. Then start net filtering again by running the `net filter start` command in system administrator mode.

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround

			3. Run `net filter show kernel`. You must list port 10000 in IPv4 and IPv6 as follows:
			`IPv4`
			`63 0 0 dd_accept tcp -- * * 0.0.0.0/0 0.0.0.0/0 tcp dpt:10000 /* Func 63 Default rule */`
			`64 0 0 dd_accept udp -- * * 0.0.0.0/0 0.0.0.0/0 udp dpt:10000 /* Func 64 Default rule */`
			`IPv6`
			`63 0 0 dd_accept tcp * * ::/0 ::/0 tcp dpt:10000`
			`64 0 0 dd_accept udp * * ::/0 ::/0 udp dpt:10000`
			4. Now you can configure any jukebox from Data Domain to the NetWorker Server.
			5. Run the `net filter add operation allow clients <NAS-Client>` command to add the NAS client to the net filter to allow NDMP backups. For example: sysadmin@blrv071d116# net filter add operation allow clients 10.31.77.252
			6. NDMP backup and restore from Jukebox is now successful.

261256	Block based recovery	If you perform a block based clone recovery on a remote client by using the **`-l <pool_name>`** option, the operation fails and displays the following error: `nsrclone: Command not found`	Perform the recovery by using either a GUI or the NetWorker server CLI.
260204	Upgrading GUI	After upgrading to NetWorker 9.0.x from a NetWorker 8.1.x release, any save set query under the **Media** window in NMC will not display save sets backed up with the previously installed NetWorker release. This occurs because these save sets have no policy or workflow association, concepts that were introduced in NetWorker 9.0. Therefore, you cannot search for save sets that were created in releases prior to NetWorker 9.0.	
ESC 25993	VMware Backup Appliance	The **EMC Backup and Recovery Configuration Utility** now requires that you create a password with at	

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround
		least one special character, in addition to the other password requirements. You can no longer use the default password `8RttoTriz` unless you apply a hotfix to OVA version 1.5.1.7.	
259560	GUI	The NMC **Administration** window does not return an appropriate error when you cannot launch the Console due to insufficient disk space. While the Java Console log correctly indicates `There is not enough space on the disk`, NMC returns an error similar to the following: `Unable to connect to server: Unable to authenticate with server.`	If you see a similar error when you launch NMC, check the Java Console log to ensure this not actually an issue with low disk space. If low disk space is the cause of the error, clean up disk space and then re-launch the NMC **Administration** window.
259046	GUI	When you delete a policy from the Protection window in NMC after completing a successful backup, the policy displays as "never run" in the Monitoring window.	
258985	Snapshot Management	The NSM RecoverPoint backup or restore may fail during a snapshot validation or mount operation with the following file system consistency check (FSCK) error: `FileSystem inconsistent error` This issue may occur when the storage array is busy and not responsive to RecoverPoint. In this unresponsive state, RecoverPoint might leave the target device where snapshot data is in READ ONLY state, and the FSCK fails.	Retry the backup or recover operation.
258042	GUI	If you perform a save set query immediately after upgrading or migrating from a NetWorker 8.1.x or 8.2.x release to NetWorker 9.0, NMC does not display Action, Workflow and Group details when you click on Save Sets in the Media window. This occurs due to changes in the database between NetWorker 9.0 and previous releases, where the concept of workflow, action, group, and policy did not exist.	The migrated settings and associations do not take effect until you run the workflow for the first time after upgrading or migrating to NetWorker 9.0.

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround
257299	GUI	When you use the **Protection** window in NMC to create a new policy, the policy does not get listed in a save set query under the **Media** window until you close and relaunch NMC.	
256642	GUI	After starting a workflow from the **Protection** window in NMC, you can start the same workflow multiple times while the first instance is still running, with each instance displaying in the **Monitoring** window.	
253328	GUI	The default Server Protection policy in NMC is a policy that you cannot remove. However, when you right click the policy from the context menu, a delete option displays.	
252785	Snapshot Management	Linux LVM snapshots fail with an error indicating "Failed to get status of import operation."	Perform the following steps: 1. Create a soft link ln -s /sbin/lvm /bin/lvm on proxy. 2. Login to NMC as Administrator. 3. Launch NetWorker Administrator and then browse to the Protection window and select Clients. 4. Create client of mirror type SnapVX. 5. Select the item to be included in backup, for example /Check, and then click Create. 6. Click on group tab and create group. 7. Under Policy create one policy 8. Create workflow add group created in step 6. 9. Create backup action and subtype snapshot. Leave the defaults for all other values and click Finish.
251839	GUI	You can no longer start a policy from NMC's Protection window to run a workflow. Instead, you must start the workflow.	
251486	Command line	If you run an inquire during a DD failover, the VTL output does not display. However, there is no impact to the backup.	
251483	GUI	A flicker of the backup sessions details displayed in the Action and Workflow Status windows of NMC may occur	

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround
		due to a delay in reading the Message Bus. These details go offline for a short duration while nsrjobd publishes updates on the msgbus, but return after approximately 10 seconds once the details are fetched from the jobs database.	
251425	Command line	You can only use the `nsrpolicy start`, `nsrpolicy stop` and `nsrpolicy restart` options when you also include the workflow name. For example, `nsrpolicy start -p` *policy_name* `-w` *workflow_name*.	
251305	GUI	When running a large number of policies with multiple workflows and actions, a delay occurs in scrolling and expanding the policies in NMC's **Monitoring** window.	
249428	Block based backup	On Windows Server 2008 R2, incremental backups always shift to full backups. Also, the following error message appears when you start and stop the **nsrbbb** service multiple times: `System error 577 has occurred.`	1. Check the operating system version of Windows Server 2008 R2 by running the following command: **`wmic OS get Caption,CSDVersion,OSArchitecture,Version`** 2. If the operating system version is earlier than 6.1.7601, start the Windows update application on the host to upgrade the operating system version to 6.1.7601 or later. 3. Install the Windows security patch from the following link: https://www.microsoft.com/en-us/download/details.aspx?id=46148 4. Start and stop the **nsrbbb** service multiple times by running the following commands to ensure that the error message does not appear: • **`net start nsrbbb`** • **`net stop nsrbbb`** 5. Perform incremental backups.
249131	Command line	The Groups window is disabled in the `nsrwatch` command for NetWorker 9.0 and later servers.	
247933	Devices	For a Cloud Boost device, a resurrection restore can take more than an hour depending on the virtual	

Table 12 Known Limitations in NetWorker 9.0.1 (continued)

Issue number	Product feature	Description of issue	Workaround
		machine size, during which time no status appears in NMC and the only progress that displays is message within `ebrserver.log` showing a save set copy is in progress.	
245742	Configuration	When you install NMC for NetWorker 9.0 on a system other than the NetWorker server, and you configure the Windows firewall with default values on the Networker server, the NMC installation fails.	The *EMC NetWorker Security Configuration Guide* provides information on configuring Windows firewall with the correct values so that you do not need to disable firewall on the NetWorker server in order to install NMC.
240160	Recovery	When browsing a very large number of files for recovery on an Isilon filer, the Isilon system fails with a timeout error and runs out of memory.	Do not perform a DAR recover when recovering a very large number of files (for example, 4 million or more files).
142741	NDMP	NDMP backups can fail due to `nsrdmpix` being unable to handle indexing of a very large number of files. For example, a save set that contains 100 million or more files. Also, with less than 100 million files, if the file path is long, the backup can fail.	

NetWorker 9.0 known issues

The following table identifies issues discovered in NetWorker 9.0. When a particular issue has been fixed, this table will be updated.

Table 13 Known issues in NetWorker 9.0

Issue number	Product feature	Description of limitation	Workaround
241586	Logs	When the daemon.raw log file on the NetWorker Server exceeds the maximum size specified in the NSRLA NSR log resource (the default is 2 MB) and you do not have the "runtime rollover by size" option enabled, the file does not get renamed and a new one does not get created upon nsrexecd startup. This issue occurs in Windows environments only.	Enable the "runtime rollover by size" option for the daemon.raw NSR log resource, or rename the file manually.
238635	ProtectPoint	When you create a clone pool using NMC, the device creation wizard does not show the permissions of the clone pool. If you configure clone controlled replication (CCR) using a clone pool with read-only permissions, the CCR	Before you configure a CCR operation, verify that you have read and write permissions to the clone pool.

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
		operation fails with a `permission denied` error.	
280576	Upgrading/ Client Push	When you click on the **Software Inventory** or **Software Repository** tabs on the **Hosts** window, and the NetWorker Server and NMC Server are on different hosts, the following error message appears: `Unable to connect to client push daemon`	To resolve this issue, provide the admin user on the NMC Server access to the NetWorker Server by typing the following command from a command prompt on the NetWorker Server: **`nsraddadmin -u "user=`*`username`*`, host=`*`NMC_server_hostname`***
ESC 26376	Command line	When you run `savefs` to backup a file system and specify a trailing forward slash "/" in the path, as in `/DSE/mnt/`, NetWorker does not list the file system.	Remove the "/" at the end of the path. For example, specify `/DSE/mnt` instead of `/DSE/mnt/`.
ESC 25817	Devices	When you create a NetWorker AFTD on an Isilon share and back up save sets that contain very large individual files (4 TB or more), the backup hangs and an alert displays indicating "Waiting for more available space on filesystem". This is due to an Isilon file size limitation	If this is a file system backup only, then you can still use multiple AFTDs from Isilon. However, ensure that you enable NetWorker's parallel save streams (PSS) feature, also known as DPSS. This feature allows you to split a single large save set into multiple streams and store the streams separately. The NetWorker Administration Guide and Performance Optimization Planning Guide provide more information on parallel save streams. If this backup includes non-file system data as well, then use a file-type device (FTD) instead. Note, however, that you may encounter some restrictions when using FTDs similar to using tape-based devices and FTDs do not feature any major enhancements.
ESC 25843	Command line	When you install NetWorker in a HP Serviceguard cluster environment with legacy mode, you cannot execute NetWorker commands. When you attempt to execute commands, the following error occurs: `/opt/networker/bin/nsr_mk_cluinfo[19]: /etc/cmcluster/.nsr_cluinfo: Cannot create the specified file.`	
260021	Devices	In NetWorker 9.0, if you are using ProtectPoint with VMAX you cannot restore a ProtectPoint snapshot when the originating VMAX is down.	
251805	Snapshot Management	When file systems under the junction path are mapped to multiple export policies, the snapshot	All file systems under the junction path should have the same export policy. To

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
		mount fails. This issue is seen during point in time restore.	avoid this issue, modify the export policy on each file system under the junction path to be the same.
247510	GUI	When you create new actions in an existing policy, the status of the new action appears in the Monitoring pane as failed, instead of Never run.	This status does not indicate that the action was attempted. NetWorker will update the status correctly after the action runs for the first time.
247713	GUI/VMware Protection	If you enable or disable internal proxies in NMC while backup and restore operations are in progress, NetWorker returns an exception and the VMware Backup Appliance enters an error state. No data loss or disruption to activities in progress occurs during the error state. After several minutes, the VMware Backup Appliance returns to Success state.	
247505	GUI	After a successful VMware policy backup, a green checkbox does not display in NMC. Instead, a greyed out checkbox and occasionally a red dot appear next to the backup action. The red dot disappears after running subsequent actions, but the grey checkbox remains.	These symbols do not indicate any problems with the backup action and can be ignored.
247504	VMware Protection	If you perform a VMware Backup Appliance checkpoint backup, the backup requires a local storage node device. The checkpoint backup fails if the backup device is configured on the remote storage node.	Use a device on the local storage node for performing checkpoint backups of the VMware Backup Appliance.
247477	VMware Protection	When you perform a disaster recovery for a newly installed or upgraded VMware Backup appliance in NetWorker 9.0, cross sync fails with an error indicating "cross sync failed for the configuration but successful for backup."	This error does not impact the disaster recovery and can be ignored.
247177	VMware Protection	Performing image-level (FULLVM) recovery by using the `nsrvbarecover` command fails if the NetWorker server is on a Windows system and the vCenter used for the recovery is vCenter 6.0.	Use the Restore tab in the **EMC Backup and Recovery** user interface of the **vSphere Web Client**, as described in the *EMC NetWorker VMware Integration Guide*.
247039	VMware Protection	Emergency restore, also referred to as Direct to host recovery, is currently unavailable in an IPv6 environment.	
247035	VMware Protection	The IPv6 static address tab in the **EMC Backup and Recovery Configuration Utility** displays additional zeros in the address.	Remove the additional zeros, or re-type the correct IPv6 address prior to clicking Next.
247007	Upgrading/ messaging	When upgrading the NetWorker 9.0 Extended Client, instead of an Upgrade button the Wizard Options window displays an Install button.	

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
		Additionally, progress messages displayed during the upgrade of the NetWorker Extended Client incorrectly use the word "install" instead of "upgrade."	
246761	Cloning	NetWorker does not honor the Data Domain device target sessions/max sessions values for clone actions.	
246760	GUI/VMware	Dragging and dropping a workflow from one VMware policy to another does not work when the policy is in "update pending" state. If you perform this action before the update completes, the workflow disappears and you cannot recreate the workflow with the same name.	Wait for the policy update to complete before dragging and dropping workflows.
244961	Installation	Uninstallation of Networker by using the WMIC command (for example, `c:\>wmic product where name="NetWorker" uninstall`) does not uninstall NMC, and therefore processes such as GST services do not get removed from `Services.msc`. If these processes remain, you cannot re-install NetWorker.	If you used the WMIC command to uninstall NetWorker, manually remove all Networker entries from the Registry Editor (regedit) and restart the machine. You can then re-install the Networker software.
244893	VMware Protection	Flags passed through the avtar.cmd are not taken into account by the CDSF export process run by avtar.	
244891	VMware Protection	Backup to a Data Domain device with encrypted authentication fails if the device is connected across the network.	
244814	Netapp/ Snapshot management	A PIT fbf restore fails with the error "nsrsnapadmin: Could not find or mount NAS snapshot" in a clustered mode (c-mode) environment if the export path on the filer is configured incorrectly.	After creating the volume, create the export path on the filer under ***/mount point***, not under **/vol/*mount point***. For example, if the mount point is **vol1**, the export path should be **/vol1**, not **/vol/vol1**.
244497	Upgrading/ VMware Protection	After upgrading to NetWorker 9.0, when you change the destination pool for the default VMware policy to a Data Domain system, the backup incorrectly displays as a primary backup (backup to internal storage) in the **EMC Backup and Recovery** user interface of the **vSphere Web Client**. Additionally, adding a clone action to this VMware policy fails with the error `GSAN Saveset, Skipping it`.	
244427	Upgrading	Upgrading the NetWorker Client by using the Package Manager's **Add to Repository** functionality in NMC fails.	Upgrade the NetWorker Client manually.

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
243608	VMware	When you click **Help** in the **EMC Backup and Recovery** user interface of the **vSphere Web Client**, the following error appears: `HTTP Status 404 - /ebr-help/WebHelp-en_US/VDP_Online_Help.htm`.	The file extension for the online help should be .html. For example, `VDP_Online_Help.html`. This issue will be fixed in the next refresh.
243017	Recovery	Recovery to a destination other than the original location using the NMC **Recover** wizard fails if the destination path contains spaces.	If the destination path contains spaces, use **Winworkr** or the command line to perform a redirected recovery.
242385	Configuration	You cannot automatically configure a stand-alone drive by using NMC.	Configure the stand-alone drive manually by following the instructions outlined in the "Backup Storage" chapter of the *EMC NetWorker Administration Guide*.
241988	Messaging	When you select a folder/directory for recovery using the **EMC Data Protection Restore Client**, the "loading..." message may be followed by an "empty directory" message before the GUI displays the list of subfolder(s)/file(s).	Ignore the "empty directory" message.
241866	VMware Protection	The NetWorker VMware Protection solution is not currently supported in an IPv6 environment.	Use only IPv4 until IPv6 has been fully tested and qualified with the NetWorker VMware Protection solution.
241802	Snapshot Management/ GUI	When you select rollback for a snapshot in the "Select Snapshot" page of the NMC **Recover** wizard, the **Next** button is grayed out and the message "Remote Agent returned empty list" displays. This issue is only observed on Windows platforms.	On Windows platforms,, use the `nsrsnapadmin` utility to perform the snapshot rollback recovery.
241799	Block Based Backup/ Recovery	When you perform a Block Based File Level Recovery of a CSV volume, the recovery succeeds, but the recovered data is in the hidden state	To view the hidden recovered data, run the following command: `dir /ah`
241757	GUI	NMC's NetWorker Administration **Monitoring** window may display multiple instances of the same completed workflow.	Restart the GSTD daemons from the command line. • On Linux, run `/etc/init.d/gst stop` and then `/etc/init.d/gst start`. • On Windows, run `net stop gstd` and then `net start gstd`.
241752	Upgrading/ VMware Protection	After upgrading the VMware Backup Appliance from a NetWorker 8.1 or 8.2 release to NetWorker 9.0, you cannot use the Mozilla Firefox browser to launch the **EMC Backup and Recovery Configuration Utility** window or the **EMC Data Protection Restore Client**.	To resolve this issue, execute the following commands on the VMware Backup Appliance as the root user: • `/usr/java/latest/bin/keytool -delete -alias tomcat -storepass changeit`

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
			• `/usr/java/latest/bin/keytool -genkeypair -v -alias tomcat -keyalg RSA -sigalg SHA256withRSA -keystore /root/.keystore -storepass changeit -keypass changeit -validity 3650 -dname "CN=localhost.localdom, OU=Avamar, O=EMC, L=Irvine, S=California, C=US"` • `emwebapp.sh --restart`
241657	Reporting	Reporting data shown in NMC is only provided for the period that GSTD is running. If the NetWorker server is running but GSTD is not, when GSTD is started again NMC will not fetch reporting data for policies run during the period that GSTD was down.	
241611	Data Domain	DFC does not work when encryption strength is set to **`High`**	Set the encryption strength for the client "*" on the DD OS to **`None`**: • From the CLI, display the current configuration by running `ddboost clients show config`, and then change the configuration by running `ddboost clients modify encryption-strength none *`. • From the Data Domain system manager GUI, navigate to **Data Management** > **DD Boost** > **Settings** and edit the settings for client "*"
241479	Data Domain	The Data Domain Boost version does not display during normal save operations for backups with Data Domain as the destination target.	To display the Data Domain Boost version, run the save operation in debug mode.
241430	Snapshot Management	NSM_NAS: Index action does not populate the work item list (WIL) output	Do not chain the index action to another action. If an action chain looks like this: backup -> index -> clone, the clone action will not receive any work items
241361	VMware Protection	A delay may occur displaying the latest list of virtual machine backups available for recovery when using the `nsrvbaflr` command.	The list will refresh if you log off from the client and then log back in.
241044	NDMP	When you perform an NDMP backup of a NetApp filer's data, if the volumes containing the save set/	Manually clean up the data/snapshot in the volume, or increase the size of the volume.

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
		data set are full, then the backups fail with errors similar to the following: `nsrndmp_save: NDMP Service Error: DUMP: could not create snapshot "backup"`	
240874	Cloning	When you create a backup that contains a save set with an non-ASCII name, cloning of this save set will fail if the protection group resource contains the name of this save set in the query.	Do not create a protection group resource with a query that includes this save set name, or avoid using non-ASCII characters in save set names.
240869	Installation	Services such as GST related services that should run automatically after NetWorker installation on Windows may not start automatically if you install the NetWorker server on a single core system, due to the execution of post-install Java services overwhelming the system. This issue does not occur on a dual-core system.	If the GSTD service does not start automatically, start the service manually by running `net start gstd`.
240776	Backup	Backups can fail on Windows platforms with the following error when too many save sets are selected: `Cannot run savefs: The program issued a command but the command length is incorrect. (Win32 error 0x18)` This is due to a Windows limitation where the backup command cannot exceed 32,000 characters.	View the backup log to check the length of the `savefs` command. If the command is over 32,000 characters, select fewer savesets for the backup.
239682	VMware Protection	When a virtual machine is removed from vCenter after a backup, the VMDKs for that virtual machine still appear in the **EMC Backup and Recovery** user interface of the **vSphere Web Client** with a historic label. Note that even though you can browse these VMDKs, you cannot select any of these disks for recovery.	
238708	NMC/Java	When you launch NMC, an error appears indicating "Invalid characters in hostname" if the hostname contains an underscore. This issue only occurs with JRE version 8 update 51 or later.	This is a Java defect. If using JRE version 8 update 51 or later, ensure that hostnames do not contain invalid characters such as underscores. The following link provides more information: https://bugs.openjdk.java.net/browse/JDK-8029354.
239044	NMC	For both block-basked backup (BBB) and non-BBB, the NMC **Recover** wizard cannot display folder contents if the folder contains more than 200,000 files.	There is no workaround for non-BBB. For BBB, browse to the folder that contains the VHDx mount (for example, `C:\Program Files\EMC NetWorker`

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
			`\nsr\tmp\BBB\<clientname>\<ssid>`) and copy the data manually.
239318	Backup	After performing the NetWorker installation on Windows platforms, the Server Disaster Recovery backup may fail.	Restart NetWorker and the backup should complete successfully.
238863	Upgrading	Upgrading between NetWorker builds using the uninstall/install procedure may fail on Windows platforms.	If the upgrade fails, delete the `EMC Networker\nsr\bin` directory and retry the installation.
238844	Cloning	A degradation in Clone controlled replication (CCR) performance on Windows platforms is observed when cloning a large number of smaller save sets.	
236655	Upgrading	After upgrading to NetWorker 9.0, if you plan to perform backups to an AFTD, the AFTD device you create must use a UNC path.	
236348	Upgrading/ VMware Protection	After upgrading the VMware Backup Appliance, the virtual machine Console continues to display the version of the previously deployed OVA.	Log in and log out from the VM console, and the correct OVA version displays.
236313	Licensing	The NetWorker License Manager (lgtolmd) fails to start when installed on the NetWorker server.	The EMC Licensing Solution does not require the NetWorker License Manager. EMC recommends you do not install the NetWorker License Manager when installing the NetWorker 9.0 server.
232610	ProtectPoint	After a Linux system is upgraded to RHEL 6.6, a restore of a ProtectPoint backup might fail if the files are located on an LVM2 system. The restore failure produces the following type of error message in the ddbmsd trace file: `Failed to find physical volume "/dev/sdr"` The failure is caused by a Linux RHEL 6.6 bug: https://bugzilla.redhat.com/show_bug.cgi?id=1202785	Contact RHEL Support to obtain the LVM2 patch.
231585	Upgrading	After upgrading from the initial beta release to the beta refresh, you cannot make changes to the Server Protection Policy.	If you performed this upgrade and plan to change the Server Protection Policy (for example, to test server disaster recovery), you must perform a fresh install.
231399	Upgrading	After migration, the backup of the bootstrap/ indexes may not be directed to the preferred pool.	Edit the **Server db** backup action in the **Server Protection Policy** and change the **Destination Pool** to the pool that you want. This can be done from NMC's

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
			Administration window or the `nsrpolicy` command line interface. To change the destination pool using nsrpolicy: `nsrpolicy action update server-backup -p "Server Protection" -w "Server backup" -A "Server db backup" --destination_pool <your pool>`
229705	Installation	NetWorker does not start due to an error starting Hyper-V FLR, caused by the FLR binary starting at the time as the server start.	
229660	Messaging	WIX upgrades result in email notifications of the version change. Library/tool versions should be defined in the makefile system so they can be modified without sending out notifications.	
229440	ProtectPoint	In a VMAX replication environment with primary and secondary VMAX systems connected by an SRDF link, a roll back restore of a ProtectPoint backup might fail with a SYMAPI error message. For example, the symapi log contains the following error message: `Failure during initial sync. sts: SYMAPI_C_FAILED_REMOTE_LOAD` After the roll back restore failure, the RDF device pairs might remain in the SyncInProg state and might need to be manually synchronized.	For more information about the issue, contact EMC Technical Support and reference OPT 472718 and the VMAX fix 82392.
228839	Config Checker/ messaging	When you select **Run System Configuration Checker** from the **Configuration Checks Options** window, and then click **Open Detailed Report...**, a warning in the **Results of Configuration Checks** window incorrectly reports that Windows deduplication volumes are not supported.	Ignore this message.
228833	VMware Protection	Changing the vCenter by using EMC Backup and Recovery in the vSphere Web Client cleans up the policy mappings from plug-in but not from **NMC > Protection > Policy**.	Delete and re-create.
227103	Configuration	Creating a domain/configuration using the authc_config script fails if the name contains non-ASCII characters.	Avoid using non-ASCII characters in your domain name/configuration.
226760	Block based backup	When you perform a block based clone recovery from a tape, the save sets that you manually backed up do not appear for selection.	

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
		If you performed a scheduled backup, the cloned block based backup save sets correctly appear for selection in the recovery UI.	
226409	Installation	Installation wizard does not prompt for cc report during install of NetWorker client if installed through the NetWorker-0.0.0.0 binary.	
225064	Block based backup	Linux enables you to exit a block based recovery session while you are accessing the same mounted recovery from either terminal or NMC, but stale entries remain after you exit the recovery session.	Restart the host to remove the stale entries.
224941	Block based backup	On Linux, block based backups fail during live Input/Output operations.	When you perform live Input/Output operations on a volume, and simultaneously perform a block based backup of the same volume, the backup fails.
224734	Installation	Upgrade fails and removes all the existing installed versions from NetWorker 8.2.	
224579	GUI	Two or more instances of the same workflow appear under a policy in NMC's NetWorker Administration **Monitoring** window.	Restart the GSTD daemons/services.
224293	Parallel save streams	When you enable parallel save streams and set a high client parallelism value, backing up a large number of save sets (>1000) creates an overload on NetWorker server resources due to the number of save sessions, and the backup times out.	Set the client parallelism to a lower value. The default value is 4, and you can increase this value as recommended in the "Parallel save streams considerations" section of the *EMC NetWorker Performance Optimization Planning Guide*, but note that a significantly higher value increases the chances of the backup timing out. You can also increase the default timeouts in the client resource's *Save operations* attribute `PSS:timeout_mins=25` and the NetWorker Server Policy Action's inactivity timeout of 30 minutes to higher values respectively.
222707	Recover	Assertion failed: /disks/nasbld/nas10/nw/dev/nsr/browser/retrieve.c	
222326	VSS	Running nsrpolicy stop does not create checkpoints on Windows systems.	
207211	Licensing	If you create DSN during the evaluation period and apply the Base enabler later, the DSN feature works without a DSN license.	

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
204977	Backup	CSV volumes do not get moved back to the original node when you cancel a backup.	Manually move the node back to the original owner.
204724	Block Based Backup	NMC Recovery timeout occurs on folder having close to 3 million files.	
204291	Block based backup	On Linux, the block based incremental backups consistently fail and display a message similar to the following: `save: Block Based Error subsystem error while performing Block Based Backup. Check if any other process is already accessing the snapshot or delete the snapshot manually and try again`	On RHEL, open the /lib/udev/rules.d/80-udisks.rules file and comment out the following line: KERNEL=="dm-*", OPTIONS+="watch On SLES, open the /lib/udev/rules.d/64-device-mapper.rules file and comment out the following line: OPTIONS +="watch"" which gets enabled for "KERNEL=dm-*
202795	Parallel save streams	NetWorker does not honor the client parallelism value provided for the virtual client, and uses the active node value instead if the client parallelism value is less than the user defined value, resulting in backup failure.	
201045	Winworkr	When performing a manual/winworkr backup, if you select all the volumes and drives including the CD drive, winworkr returns a VSS error.	This error does not impact the backup and can be ignored.
200457	Backup	When you specify a cluster shared volume (CSV) as a save set for the virtual client and run a backup policy for the virtual client, the backup completes successfully even if one of the specified CSV save sets is offline.	Ensure that all save sets are online before running the policy.
200205	Recovery	BMR recovery requires a system reboot on the newly recovered NetWorker client, but you cannot initially access any of the desktop icons, applications or utilities from the Windows server desktop, as these are not visible after the client is first recovered with the BMR feature.	Perform an additional system reboot of the newly recovered NetWorker client. It is only after the second reboot that all access to the previously available applications and utilities is available again.
200091	GUI	NMC does not display save streams while performing an NMM backup.	
196867	Configuration	Cloning a virtual machine or host from an existing host where the NetWorker client is configured on the NetWorker server creates an ESTABLISHED TCP connection permanently, even if the host is not configured as a NetWorker client on the NetWorker server. If the port connections continue to get created, errors appear indicating that NetWorker is unable to accept the client connection due to "Connection limit reached.	Stop NetWorker services on all NetWorker clients, and then delete the contents of the /nsr directory and restart NetWorker services.

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
193731	Cloning	Nsrclone parent job does not wait for completion of child jobs before exiting, resulting in error message.	
191346	Security	NSM backup fails on Linux at BSAFE SSL init after 'fb_dev_bsafe4x' merge to main.	
184056	Snapshot Management	If you select the mount host as the destination host for an out of place restore using NMC's **Administration** window, the window incorrectly allows you to browse to the mounted snapshot and select a location on the snapshot as the destination. The restore will complete without error.	
180538	Memory	Nsrd memory leak reported for staging operations during pureSAT.	
174354	Block based backup	In NMC, the New destination path field on the **Select the Recovery Options** page lists the block based backup save set mount points also. However, to perform a redirected file level recovery, you must not select the mount points that exist in the following locations: • `\nsr\tmp\bbb` on Windows • `/nsr/tmp/bbb` on Linux	
184803	Block based backup	Performance of the block based File Level Recovery is lower than the traditional NetWorker recovery.	
186372	Block based backup	When you perform the block based backups on Windows 2012 client with a non-Windows NFS Data Domain device as a remote storage node, the performance of the backups reduces.	
182642	Command line	Using the `recover` command with the -a option to recover all files backed up in a mount point does not recover all files when you also specify a "/" after -a. For example, `recover -a / -d /home`	
	Internationalization	Filenames with multibyte characters saved by using a NetWorker 7.2.x or earlier client might be displayed incorrectly. This affects filenames from both UNIX and NDMP backups.	Temporarily change the LANG parameter prior to recovery. For example, for Japanese filenames, setting LANG=ja_JP.UTF-8 temporarily prior to the recovery will recover the Japanese files with the correct filenames. Ensure that the variable is restored to the original setting (for example, LANG=ja) when the recovery is complete. Note that changing the parameter back to the original LANG

Table 13 Known issues in NetWorker 9.0 (continued)

Issue number	Product feature	Description of limitation	Workaround
			setting after recovery does not alter the encoding of the filenames.

Technical notes

This section describes important notes and tips for using the NetWorker software.

Filenames with multibyte characters saved with NetWorker 7.2.x or earlier may display incorrectly

Filenames with multibyte characters saved by using a NetWorker 7.2.x or earlier client might be displayed incorrectly. This affects filenames from both UNIX and NDMP backups.

Workaround

Temporarily change the LANG parameter prior to recovery.

For example, for Japanese filenames, setting `LANG=ja_JP.UTF-8` temporarily prior to the recovery will recover the Japanese files with the correct filenames. Ensure that the variable is restored to the original setting (for example, `LANG=ja`) when the recovery is complete. Note that changing the parameter back to the original LANG setting after recovery does not alter the encoding of the filenames.

Apache configuration file modules

NMC currently embeds the Apache httpd server software. When you install NMC, the Apache software gets installed to a NetWorker directory, along with an NMC-specific Apache configuration file. This configuration file defines specific modules within Apache which are disabled and are therefore not loaded. Modules which are not loaded will not be exposed to any associated vulnerabilities.

To determine which modules are loaded, run the command httpd -M. The following lists show which modules are loaded on Windows and Linux. "Static" indicates that the module has been linked statically to httpd, and "shared" indicates that the module is dynamically loaded at start time.

Windows: httpd -M D:\emc\nmc\GST\apache\bin>httpd -M

- core_module (static)
- win32_module (static)
- mpm_winnt_module (static)
- http_module (static)
- so_module (static)
- actions_module (shared)
- alias_module (shared)
- auth_basic_module (shared)
- authn_default_module (shared)

- authn_file_module (shared)
- authz_default_module (shared)
- authz_groupfile_module (shared)
- authz_host_module (shared)
- authz_user_module (shared)
- cgi_module (shared)
- dir_module (shared)
- env_module (shared)
- imagemap_module (shared)
- include_module (shared)
- log_config_module (shared)
- mime_module (shared)
- userdir_module (shared)
- reqtimeout_module (shared)

Linux: httpd -M -f /opt/lgtonmc/apache/conf/httpd.conf

- core_module (static)
- authz_host_module (static)
- reqtimeout_module (static)
- log_config_module (static)
- mpm_prefork_module (static)
- http_module (static)
- mime_module (static)
- cgi_module (static)
- dir_module (static)
- actions_module (static)
- alias_module (static)
- so_module (static)

NetWorker cloud backup option and network connectivity

Cloud backups are highly dependent on the network connection that is used to access the service. Any disruption in connectivity or a slowdown in network access speed may adversely affect cloud backups or recoveries.

Additionally, if you define large Network Write Sizes for the cloud device, make sure to set the Send/Receive Timeout attribute proportionally high to avoid read/write timeouts. Optimal values for send/receive timeouts vary depending on the network speed and bandwidth.

VMware qualification

NetWorker is qualified with VMware, which includes support for NetWorker VMware Protection in NMC. The *EMC NetWorker Administration Guide* and the *EMC NetWorker VMware Integration Guide* provide more information on support for VMware.

Note

You must install VMware Tools in order to use VMware with NetWorker. VMware Tools is included as part of the NetWorker installation.

Single clients or archive requests resource for UNIX non-ASCII paths support only one locale

A single Clients or Archive Requests resource supports non-ASCII UNIX paths belonging to only one locale. If you have paths in multiple locales, you must create multiple Clients or Archive Requests resource. A Clients or Archive Requests resource supports paths only from a single locale on UNIX.

Note

This limitation does not apply to Microsoft Windows paths.

Symbolic links are not restored during DAR recovery with NetApp

During a DAR recovery, symbolic links for files, directories, and other specific files, such as device files or named pipes, cannot be recovered. To recover these files, use the NetApp restore command with the -x option. The Network Appliance documentation has more information about the NetApp restore command.

SYSTEM save set archive unsupported on Microsoft Windows

Archiving of SYSTEM or VSS SYSTEM save sets is not currently supported.

NetWorker connections through a firewall

The NSR_KEEPALIVE_WAIT variable sets the timeout limit that the nsrexecd daemon uses to keep messages active once a connection to the NetWorker server has been established through a firewall. The period that nsrexecd will send keep-alive messages to nsrexec is adjustable by the NSR_KEEPALIVE_WAIT environment variable. Set this environment variable to the desired number of seconds between keep-alive wait messages. If the NSR_KEEPALIVE_WAIT variable is not set or is set to an invalid value, (0, a negative number, or a nonnumeric string) then no keep-alive message is sent.

Pause recommended between file creation and backup with EMC IP4700

If a level 1 to 9 backup is run on an EMC IP4700 filer within five minutes of creating a file, more files than expected may be saved. For example, if a level 1 backup is run, followed by a level 2 backup, and both of these backups complete within five minutes of the file being created, the newly created file might appear on both the level 1 and level 2 backups, even though the files should only be added to the level 1 backup. To avoid this problem, wait at least five minutes after creating a file to run a backup.

Bus reset can rewind tape on Microsoft Windows

Tape devices shared by more than one computer can experience unpredictable bus resets from any of the computers. These reset commands can cause a tape on a shared bus (such as SCSI or Fibre Channel) to rewind. The results can include:

- Tapes that are prematurely treated as full.
- Corrupted data on tapes.

System configurations that do not properly protect tape devices shared by more than one computer can experience these bus resets. Some switching hardware can be configured to protect tape devices from resets. Certain operating systems include built-in protection (that can be turned on by the user) against stray bus resets.

To determine whether the switch or operating system includes such protection, and to learn how to use it, refer to the manufacturer's documentation or contact the manufacturer.

Note

Whatever solution you select must block the reset command from the tape drives, but must not block it from certain cluster-controlled disks. The reset is a necessary part of the disk arbitration process in some cluster environments. To determine whether this applies in your environment, refer to the cluster documentation.

The NetWorker software does not support configuring a tape device in a shared SCSI or Fibre Channel environment without using either a hardware switch or an appropriate operating system solution to handle the bus reset issue.

Microsoft does not support attaching any tape drive to any shared SCSI bus that also hosts cluster-controlled disks because of this issue.

Older versions of Intel unsupported on NetWorker software on Linux

To take advantage of IA-32 586 and 686 optimizations in the compiler, as well as the new instructions provided on these architectures, NetWorker for Linux does not support older versions of Intel, such as 486.

Considerations when using an advanced file type device

The AFTD device can be deployed in varying environments with local disks, NFS and CIFS mounted/mapped disks. Operation of this feature is affected by the configuration. Ensure that the AFTD is fully operational in the production environment before you deploy it as part of regularly scheduled operations.

As part of the validation process, include these tests:

- Backup
- Recover
- Staging
- Cloning
- Maximum file-size compatibility between the operating system and a disk device
- Device behavior when the disk is full

Some versions of NFS or CIFS drop data blocks when a file system becomes full. Use versions of NFS, CIFS, and operating systems that fully interoperate and handle a full file system in a robust manner.

On some disk devices, the volume labelling process may take longer than expected. This extended labelling time depends on the type of disk device being used and does not indicate a limitation of the NetWorker software.

The upper limits of save set size depend on the upper limits supported by the operating system or the file size specified by the disk device vendor.

Configuration options to send write error alert if NFS mount of AFTD device fails silently while writing to AFTD

It is possible for the NFS mount of an AFTD device to fail silently during large writes to the AFTD, which can result in write operations in progress continuing on the underlying mount point in the local file system. To prevent this from occurring, use one of the following configurations which will send a write error at the point in time when the NFS mount fails:

- Ensure the local mount point permissions do not have local write permissions.
- Use the overlay mount option for operating systems that support this option (for example, -O on Solaris), so the local file system mount point is considered read-only.
- Create a sub-directory structure for the AFTD below the top-level mounted directory. This will result in the path becoming invalid if the NFS mount fails, producing a write error.

Adjusting client parallelism to decrease VSS backup failures on Microsoft Windows

If VSS is licensed and enabled and timeout failures occur when backing up save sets, try decreasing the value of the client Parallelism setting.

During a VSS backup, a snapshot is taken of each specified save set. The client Parallelism setting determines how many snapshots are taken concurrently. Since snapshots consume system resources, the more snapshots that are taken concurrently, the more likely it is that a snapshot will fail.

After a failed attempt, NetWorker software waits ten minutes before attempting another snapshot, as recommended by Microsoft. After three unsuccessful snapshot attempts, the backup of the save set fails.

When backing up a large number of save sets, decreasing the value of the client Parallelism helps to ensure successful snapshots.

Using the NSR_NDMP_RESTORE_LIMIT environment variable on Microsoft Windows

The *NSR_NDMP_RESTORE_LIMIT* environment variable is used to limit memory consumption during recoveries involving a large number of index entries (millions). This is specifically useful if there is not enough swap space or memory for the number of index entries selected for the recovery. If the variable is not set, the recovery might fail with an “out of memory” error message.

To avoid a failure:

1. In the NetWorker startup script, set the *NSR_NDMP_RESTORE_LIMIT* environment variable to an appropriate value.
2. The value of the *NSR_NDMP_RESTORE_LIMIT* environment variable determines the maximum number of entries that the **recover** program can allocate memory to. For example, if the total number of entries is 3 million, then the

NSR_NDMP_RESTORE_LIMIT can be set to 50,000 or 1,000,000, but less than 3,000,000.

3. In the **NetWorker Administration** window, select **Recover**.
4. Select the files to recover, and click **OK**.

The recovery is divided into multiple recoveries, where each has the *NSR_NDMP_RESTORE_LIMIT* entries successfully recovered in their respective sessions.

Manually removing data left behind from a partial uninstall of NetWorker software on Microsoft Windows

When performing a partial uninstall of the NetWorker software by using the Add/Remove Programs option in the Windows Control Panel, if Change is selected, certain folders, files, and registry keys remain on the system. This occurs when the Remove NetWorker Metadata checkbox was left unselected.

To remove this data:

1. Open Windows Explorer, and delete `%SystemDrive%\Program Files\EMC NetWorker\nsr`.
2. Open the Windows Registry Editor, and delete `<\\HKEY_CURRENT_USER\Software\EMC NetWorker>`.

If Remove is selected, the checkbox will not appear and a partial uninstall is performed.

Change to save set expiration time

When a save set reaches its scheduled browse or retention policy deadline (the day when the save set expires or becomes no longer browsable), the time of expiration on that day is 23:59:59 (11:59:59 P.M.).

For example, if a save set was backed up on May 1, 2005 at 1:00 P.M. and the browse or retention policy is set to 5 years, the save set will expire on May 1, 2010 at 11:59:59 P.M.

Leap year retention policy considerations

If you set a retention policy on February 29 of a leap year, the last day in which the policy applied is 1 day earlier than you might expect. For example, if you set a retention policy to 1 year on March 3, 2015, the save set will expire on March 3, 2016 as expected, which is 366 days. If you set a retention policy to 1 year on February 29, 2016, you might expect that the policy will expire March 1, 2017. However, the policy will actually expire on February 28, 2017, which is 365 days. This behavior is only seen when a retention policy is set on February 29 for one or more years.

Documentation

This section describes the documentation available for NetWorker.

NetWorker product documentation

This section describes the additional documentation and information products that are available with NetWorker.

EMC NetWorker Release Notes
Contains information on new features and changes, fixed problems, known limitations, environment, and system requirements for the latest NetWorker software release.

EMC NetWorker Differences between NetWorker 9.0 and Previous Releases
Identifies the most significant changes to the NetWorker software for the NetWorker 9.0 release by comparing NetWorker 9.0 with the previous major release, NetWorker 8.2, and providing information important to migrating between releases.

EMC NetWorker Administration Guide
Describes how to configure and maintain the NetWorker software.

EMC NetWorker Installation Guide
Provides instructions for installing or updating the NetWorker software for clients, console, and server on all supported platforms.

EMC NetWorker Cluster Integration Guide
Contains information related to integration of the NetWorker software on cluster server and clients.

NetWorker Command Reference Guide
Provides reference information for NetWorker commands and options.

NetWorker Data Domain Deduplication Devices Integration Guide
Provides planning and configuration information on the use of Data Domain devices for data deduplication backup and storage in a NetWorker environment.

NetWorker Error Message Guide
Provides information on common NetWorker error messages.

EMC NetWorker Licensing Guide
Provides information about licensing NetWorker products and features.

NetWorker Network Data Management Protocol (NDMP) User Guide
Describes how to use the NetWorker software to provide data protection for NDMP filers.

NetWorker Performance Optimization Planning Guide (delivered for beta refresh)
Contains basic performance planning, tuning, and optimization information for NetWorker environments.

NetWorker Security Configuration Guide
Provides an overview of security configuration settings available in NetWorker, secure deployment, and physical security controls needed to ensure the secure operation of the product.

NetWorker Server Disaster Recovery and Availability Best Practices Guide
Describes how to design and plan for a NetWorker disaster recovery.

NetWorker Snapshot Management for NAS Devices Integration Guide
Describes how to catalog and manage snapshot copies of production data that are created by using replication technologies on NAS devices.

NetWorker Snapshot Management Integration Guide
Provides the ability to catalog and manage snapshot copies of production data that are created by using mirror technologies on EMC storage arrays.

NetWorker Updating Guide
Describes how to update the NetWorker software from a previously installed release.

NetWorker VMware Integration Guide
Provides planning and configuration information on the use of VMware within a NetWorker backup and storage management environment.

NetWorker Management Console Online Help
Describes the day-to-day administration tasks performed in the NetWorker Management Console and the NetWorker Administration window. To view Help, click Help in the main menu.

NetWorker User Online Help
The NetWorker User program is the Windows client interface. Describes how to use the NetWorker User program which is the Windows client interface connect to a NetWorker server to back up, recover, archive, and retrieve files over a network.

NetWorker related documentation

For more information about NetWorker software, refer to this documentation:

EMC NetWorker Online Software Compatibility Guide
A list of supported client, server, and storage node operating systems for NetWorker and NetWorker Modules and options, AlphaStor, and EMC Backup and Recovery Manager.

You can access the Online Software Compatibility Guide on the EMC Online Support site at https://support.emc.com. From the Support by Product pages, search for NetWorker using “Find a Product”, and then select the Install, License, and Configure link.

Technical Notes and White Papers
Provides an in-depth technical perspective of a product or products as applied to critical business issues or requirements. Technical Notes and White paper types include technology and business considerations, applied technologies, detailed reviews, and best practices planning.

Documentation corrections and additions

This section describes any corrections and additions made in the documentation available with NetWorker.

NetWorker Security Configuration Guide

The following topic is updated to include information about restarting the `gstd` service.

Modifying the token expiration timeout interval in NMC

NMC provides you with the ability to change the token expiration timeout interval. NetWorker enforces the new interval after the current token expires.

Before you begin

Log in to the NMC server as a Console Security Administrator. The NetWorker Authentication Service administrator account is a Console Security Administrator.

Procedure

1. On the toolbar, click **Setup**.
2. From the **Setup** menu, select **Configure Authentication Service Token Timeout**.
3. In the **Token Timeout** box, specify a period in hours or days.
4. Click **OK**.

Note

If you change the **Token Timeout** value, you must restart the `gstd` service.

NetWorker Administration Guide

The following topic is revised with platform and file system details the Destination and Source rows.

Directed recover requirements

The following table summarizes the requirements for each host in a directed recover session.

Table 14 General recover requirements

Host	Requirements
Destination	Ensure that the destination host: • Is the same platform as the source host, for example, Linux to Linux, AIX to AIX, or Windows to Windows. • Uses the same file system as the source host, for example, XFS to XFS, UFS to UFS, or NTFS to NTFS. • Contains an entry for the administering host in the `servers` file. The *EMC NetWorker Security Configuration Guide* provides more information about client-tasking rights and how to modify the `servers` file.

Table 14 General recover requirements (continued)

Host	Requirements
	• Is configured to accept directed recoveries from a remote host. Ensure that the Disable Directed Recover attribute is set to the default value No, in the NSRLA database. Editing a client NSRLA database on page 59 describes how to edit the NSRLA database. • Has the required access rights to receive data. ▪ If you run the `nsrlogin` command on the administering host to create an authenticated recover session, ensure that the External Roles attribute of a user group with Remote Access All Clients privileges contains one of the following entries: – User DN for the authenticated user – Group DN for a group that contains the authenticated user ▪ If you do not run the `nsrlogin` command on the administering host to create an authenticated session, the root user or the Administrator user on the destination host must appear in one of the following configurations: – A member of a NetWorker User Group with Remote Access All Clients privileges. Add an entry to the User attributes for the Root or Admin account in this format. – Added to the **Remote Access** attribute of the source host. For example: The source client is mars. The destination client, venus, is a Windows host. The Remote Access attribute for the client mars contains: Administrator@venus
Source	Ensure that the source host: • Is the same platform as the destination host, for example, Linux to Linux, AIX to AIX, or Windows to Windows. • Uses the same file system as the destination host, for example, XFS to XFS, UFS to UFS, or NTFS to NTFS. • Has the required access rights to enable the administering host to browse the data. ▪ If you run `nsrlogin` on the administering host to create an authenticated recover session, ensure that the Remote access attribute on the source host contains one of the following entries: – User DN for the authenticated user – Group DN for a group that contains the authenticated user ▪ If you do not perform a `nsrlogin` on the administering host to create an authenticated session, ensure that Remote access attribute on the source host contains the root user or the Administrator user of the administering host. For example: The source client is mars and the administering client is venus. The Administrator account on venus starts the recover program. The value in the Remote Access attribute for the client mars is:

Table 14 General recover requirements (continued)

Host	Requirements
	Administrator@venus
Administering	Ensure that the administering host: • Is a client of the NetWorker server that contains the backup information. The administering client can be a different platform from the source and destination clients. • Has the required access rights to perform the recover operation. ▪ If you run the `nsrlogin` command on the administering host to create an authenticated recover session, ensure that the External Roles attribute of the Operators, the Application Administrators, the Database Administrators, or the Database Operators user group contains one of the following entries: – User DN for the authenticated user – Group DN for a group that contains the authenticated user ▪ If you do not perform a `nsrlogin` on the administering host to create an authenticated session, ensure that Users attribute of the Operators, the Application Administrators, the Database Administrators, or the Database Operators user group contains the root user or the Administrator user of the administering host in the Users attribute. **Note** If you do not use the Operators, the Application Administrators, the Database Administrators, or the Database Operators user group, ensure that you add the required user information to a user group that has the following privileges: ▪ Remote Access All Clients ▪ Operate NetWorker ▪ Monitor NetWorker ▪ Operate Devices and Jukeboxes ▪ Backup Local Data ▪ Recover Local Data ▪ Recover Remote Data You must have operator privileges in the Operators user group to perform a selective file restore from a Microsoft Windows deduplication backup. Microsoft provides complete documentation for working with the Windows deduplication functionality.

Editing a client NSRLA database

The NetWorker client database, `nsrexec` contains a NetWorker resource, called the NSRLA resource. The NSRLA resource contains information about the client and attributes that you can modify. Use the character-based `nsradmin` program to modify the NSRLA resource.

Procedure

1. Log in as root or as Windows Administrator on the NetWorker client.
2. Type the following at the command prompt:

```
nsradmin -p nsrexec
```

The `nsradmin` prompt appears.

3. To determine the current settings for attributes in the NSRLA resource, perform the following two steps:

   a. To determine the current settings for any hidden attributes (such as the Disable Directed Recover attribute), type the following at the `nsradmin` prompt:

   ```
   option Hidden
   ```

   b. To display attributes, type the following:

   ```
   print type:NSRLA
   ```

4. To change the value of attributes in the NSRLA resource, type the following line at the `nsradmin` prompt:

   ```
   update attribute:value;
   ```

   For example, to update the Disable Directed Recover attribute, type the following:

   ```
   update disable directed recover:Yes
   ```

5. Type **Yes** when prompted to confirm the change.

Results

NOTICE

When you modify an attribute with the `nsradmin` program, you must specify the attribute name and value correctly. If you do not specify the attribute name and value correctly, the `nsradmin` program does not update the attribute and `nsradmin` does not provide an error message.

The *EMC NetWorker Security Configuration Guide* provides more information about the `nsrexec` database and how to modify attributes in the `nsrexec` database.

Correction to section "ERROR: web server exited unexpectedly" in the NetWorker Error Message Guide

The section titled "ERROR: web server exited unexpectedly. Possible reasons include: previous instance of %s is still running. Please see 'web_output' file in this product's logs directory for the web server's output messages" in the *NetWorker Error Message Guide* has an incorrect description and resolution for the error message.

The following information is correct for this error message:

Description

This error appears when the httpd process is not running on the Console server. Common reasons for httpd start-up failures include:

- The httpd web service port, 9000 by default is in use by another process.
- On UNIX, an orphaned httpd process is running on the console server.
- On Windows, another application is using the Apache server and the httpd daemon requires more time to start up.

Resolution

On UNIX, if the error is a result of an orphaned httpd process running on the console server, end the process by sending the **SIGTERM** signal, `kill -TERM`. Do not use the `kill -9` command.

On Windows, if the error is a result of another application using the Apache server, use the following procedure to enable the delayed start option for the GSTD process.

1. In the Services applet, right-click the **EMC GSTD** service and select **Properties**.
2. On the **General** tab, change the **Startup type** to **Automatic (delayed start)**, and then click **OK**.
3. Stop the GSTD service, and then start the GSTD service.

Note

When you update the NetWorker software, ensure that you re-enable the delayed start setting.

Installation and Upgrades

This section provides information on installing and updating the NetWorker software. More information on installation and updating procedures is provided in the *EMC NetWorker Installation Guide*.

NetWorker installation changes

NetWorker 9.0.x introduces separate packages for installation. When you install NetWorker 9.0.x, you can choose to install the full package, base package, or extended package, depending on which software and features you plan to use.

The core NetWorker software consists of the following packages:

- The NetWorker full installation package (for example, `NetWorker-9.0.1.0.exe` on Windows) installs the client, server, and NMC software. You have the option to install only the client from this installer, but EMC recommends using `lgtoclnt-9.0.1.0.exe` when you only need to install the base client. NetWorker 9.0.x no longer uses the InstallSheild `setup.exe` file.
- The Base client package (for example, `lgtoclnt-9.0.1.0.exe`) provides you with the ability to perform file system backup and recovery operations. These must be installed on each NetWorker client, except for NDMP Clients.
- The Extended client package (for example, `lgtoxtdclnt-9.0.1.0.exe`) provides additional feature support for NetWorker clients, such as snapshot backup support, command line utility support including server reporting and administration, cloning and staging support, and so on. This package is also required if using the NMDA, NMMedi or SCVMM modules. When you install the NetWorker server or storage node software on Windows, the installation process automatically installs the Extended Client package. You should install the Extended client package when upgrading to ensure that functionality that was available with the previously installed NetWorker version is available.

The following sections provide more information about other installation changes in NetWorker 9.0.x.

NetWorker Extended Client package

The NetWorker software includes an NetWorker Extended Client package, which provides NetWorker hosts with additional feature support.

Install the NetWorker Extended Client package if you require the following functionality on the host:

- NetWorker Snapshot Management (NSM)
- Network Attached Storage (NAS) snapshot
- CLI utilities for server reporting and administration, for example `mminfo`, `nsradmin`, and `nsrinfo`
- Firewall tunneling tools
- Cluster integration scripts
- Custom script integration tools (pre/post save)
- Audit log
- NetWorker Module for Meditech
- SCVMM Data Protection Add-in for NMM
- Recovery of NetWorker Module for Microsfot (NMM) 8.2.x backups by using NMM
- Cloning and staging
- ProtectPoint for VMAX
- ProtectPoint for Recoverpoint

On Windows hosts, the NetWorker Server or NetWorker Storage Node installation automatically installs the NetWorker Extended Client package. The NetWorker Base Client installation does not install the NetWorker Extended Client package.

On UNIX hosts, install a separate NetWorker Extended Client package to enable additional feature support.

NetWorker Authentication Service installation

NetWorker 9.0 and later uses the NetWorker Authentication Service to authenticate NMC and CLI users.

Authentication and authorization provides more information.

To use a Linux NetWorker server, you must install NetWorker Authentication Service on the NetWorker server host before you install the NetWorker server or NMC server software.

When you use a Windows NetWorker server host, the NetWorker server installation process automatically installs the NetWorker Authentication Service software on the NetWorker host.

The NetWorker Authentication Service requires a minimum Java version of 64-bit Java 7 update 60. If the installation process does not detect a 64-bit Java 7 or a later version on the host, the installation process will not continue. EMC recommends that you use the latest version of Java 7 or 8 on the host.

EMC License Server installation

After you complete the NetWorker install, you must install the EMC License Server to use the EMC Licensing Solution. You can download install packages for the License Server in the same location as the NetWorker software.

EMC Licensing Solution provides more information about the new licensing model.

Change option does not work for NetWorker installations on Windows

You cannot use the **Change** option to change the NetWorker software that is installed on a Windows machine.

To change the NetWorker software installed, you must uninstall the software and then install the components you want to use.

Supported Java versions

Java is not included with the NetWorker install. When installing the Console server software, you must install the minimum required Java version. You cannot start NMC until the appropriate JRE version is installed.

The minimum required version is different for NetWorker 9.0.1 and NetWorker 9.0:

- NetWorker 9.0.1 requires a minimum of 64-bit Java 8 update 60.
- NetWorker 9.0 requires a minimum of 64-bit Java 7 update 60.

On Windows, the NetWorker server installation processes performs a check to ensure that the minimum required Java version is installed on the host. If you complete the installation without the minimum required Java version installed, NetWorker daemons will not start correctly.

EMC recommends that you install the latest version of the 64-bit Java 8 software on the NetWorker server host before you install the NetWorker server or NetWorker Authentication Service software. Ensure that you stop NMC and the NetWorker server daemons prior to updating Java.

NMC may be blocked due to Java blocking self-signed certificates by default

Starting with Java 7 Update 55, Java has enhanced its security model to make user system less vulnerable to the external exploits.

As a result, the NMC application may be blocked because self-signed certificates are now blocked by default.

After updating Java, open the **Java Control Panel** and perform the following:

- Change the security level from **Very High** to **High**.
- Add the system's IP address to the Exception Site list. Steps to add the NMC URL to the Exception Site list can be found at: http://www.java.com/en/download/help/java_blocked.xml

Add Java environment variables and modify PATH variable

On Windows, you must create the following Java environment variables in `Control Panel\System and Security\System\Advanced System Settings \Advanced tab\Environment Variables button\System Variables` in order for NetWorker to install and start correctly:

- JAVA_HOME

- JRE_HOME

For their values, specify the path to the Java JRE folder. The default location for Java 7 versions is `C:\Program Files\Java\jre7`. The default location for Java 8 versions is `C:\Program Files\Java\jre1.8.0_51`.

Also, you must modify the PATH environment variable to add this value.

VMware tools required when performing backups on a virtual machine

When performing backup operations on a virtual machine, VMware tools must be installed in order for the backups to complete.

Installing the NetWorker client in a failover zone

The NetWorker software supports installation of the NetWorker client in a failover zone.

Note

A NetWorker server or storage node cannot be installed in a failover zone. Also, an active/active configuration is not supported.

To make the NetWorker client highly available, use the following steps.

Procedure

1. After the zone has been set up as a failover zone with the SUNWsczone tool **sczbt**, install the NetWorker Client.
2. When setting up the **sczsh_config** configuration file, ensure that the following parameters are specified with these values:

```
"ServiceStartCommand="/etc/init.d/networker start"
"ServiceStopCommand="/usr/sbin/nsr_shutdown"
"ServiceProbeCommand="/usr/sbin/nsrzoneprobe"
```

3. Run **sczsh_register** to register.

   Note

   You must have Solaris 10 or later installed to use any zone functionality, and the SUN cluster must be installed to use the failover functionality.

Troubleshooting and getting help

The EMC support page provides access to licensing information, product documentation, advisories, and downloads, as well as how-to and troubleshooting information. This information may enable you to resolve a product issue before you contact EMC Customer Support.

Support page

To access the support page:

1. Go to https://support.emc.com/products.
2. In the **Find a Product by Name** area, type a product name in the **Lookup a Product by Name** box.

3. Select the product from the list that appears.
4. Click the arrow next to the **Lookup a Product by Name** box.
5. (Optional) Once you are on the product page, add the product to the **My Saved Products** list by clicking **Add to My Saved Products** in the upper corner of the page.

Knowledgebase
The EMC Knowledgebase contains applicable solutions that you can search for either by solution number (for example, ######) or by keyword.

To search the EMC Knowledgebase:

1. Click the **Search** link at the top of the page.
2. Type either the solution number or keywords in the search box.
3. (Optional) Limit the search to specific products by typing a product name in the **Scope by product** box and then selecting the product from the list that appears.
4. Select **Knowledgebase** from the **Scope by resource** list.
5. (Optional) Specify advanced options by clicking **Advanced options** and specifying values in the available fields.
6. Click the **Search** icon.

Online communities
Go to the EMC Community Network at https://community.emc.com for peer contacts, conversations, and content on product support and solutions. Interactively engage online with customers, partners, and certified professionals for all EMC products.

Live chat
To engage EMC Customer Support by using live interactive chat, click **Join Live Chat** on the **Service Center** panel of the support page.

Service requests
For in-depth help from EMC Customer Support, submit a service request by clicking **Create Service Request** on the **Service Center** panel of the support page.

Note

To open a service request, you must have a valid support agreement. Contact the EMC sales representative for details about obtaining a valid support agreement or with questions about the account.

To review an open service request, click the **Service Center** link on the **Service Center** panel, and then click **View and manage service requests**.

"Failed in callgstdbinit" error during installation of NMC

If you see a "Failed in callgstdbinit" error during the installation of NMC, then the user performing the installation has not been granted the requested **Allow log on locally** privilege, found at `Local Security Policy\Security Settings\Local Policies\User Rights Assignment`.

After you grant the "Users" group the **Allow log on locally** privilege and then try the installation again, this error should not display.

If the **Add User of Group** button is grayed out, then you must add the privilege by using the **Group Policy Management Editor**.

1. Browse to `Group Policy Management\<forest_name>\Domains \<domain_name>\Domain Controllers`.
2. Right-click **Default Domain Controllers Policy** and choose the **Edit menu** option.
3. In the **Group Policy Management Editor**, browse to `Default Domain Controllers Policy [<Domain_Controller_FQDN>] Policy \Computer Configuration\Policies\Windows Settings\Security Settings\Local Policies\User Rights Assignment` and grant the requested **Allow log on locally**.

Facilitating support

NetWorker provides two different methods of sending configuration information to EMC Support to troubleshoot issues in your NetWorker environment—ConnectEMC, and Report home.

Report home is enabled by default during the installation of the NetWorker server and requires email capability on the NetWorker server. ConnectEMC is disabled by default and you can enable this feature by using NMC or the `nsradmin` command line program.

EMC Support only receives configuration information, and does not receive any of the following:

- Log data.
- Backup summary information and backup data.
- Configuration information unrelated to NetWorker (for example, the /etc/* or /var/log/* data).
- Passwords, or other information that would be considered a security risk.
- Resources configured as excluded from the report.

Note

You can use Report home or ConnectEMC but should only enable one of these features since they provide different delivery methods of the same information. EMC recommends using ConnectEMC in NetWorker releases 9.0 and later. The configuration information provided by ConnectEMC can be helpful for support engineers to resolve an escalation.

Enabling ConnectEMC in NMC

NetWorker does not enable ConnectEMC by default. You can enable ConnectEMC in NMC by launching **NetWorker Administration** and browsing to the **Server** window.

Before you begin

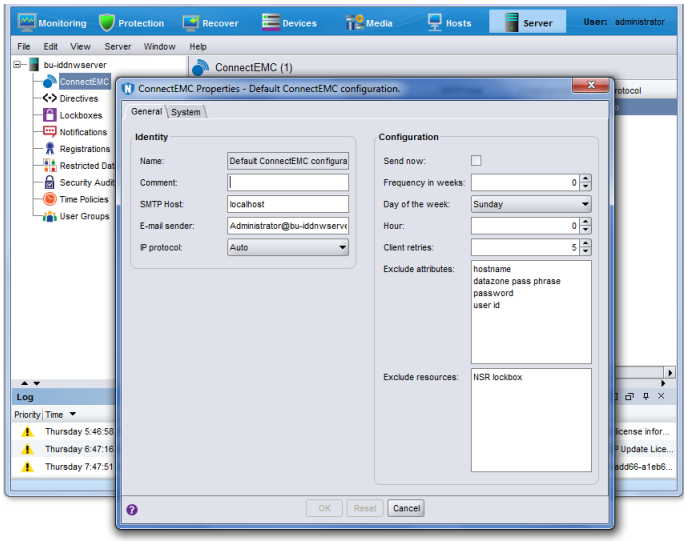
For SMTP Host, EMC recommends that you use an existing host rather than setting up a NetWorker server to also be an email server.

Procedure

1. Click **Server** to browse to the **Server** window in NMC.
2. Highlight **ConnectEMC** in the left navigation pane. An entry for **Default ConnectEMC Configuration** appears in the right pane.
3. Right-click **Default ConnectEMC Configuration**, and select **Properties**.

   The **ConnectEMC Properties** window displays.

Figure 13 ConnectEMC Properties in NMC



4. In the **General** tab, specify a value for **Frequency in weeks**. By default, this value is set to `0`, which indicates that automatic reporting is disabled. Setting frequency in weeks to a value greater than `0` enables the schedule. An administrator can then set the hour of transmission, as well as the day of the week, and the interval.
5. (Optional) Alternatively, you can select **Send now** to send the information immediately. On clicking **OK**, this pushes a copy of the NetWorker RAP database to EMC's SYR database. When communicating with support engineers, this option can help reduce issue resolution times.
6. The **SMTP host** is set by default to **localhost**. If the NetWorker server does not have email capability, you can configure another SMTP host to handle the email.
7. Click **OK**.

   The default configuration displays the updates in the **Server** window.

Note

NetWorker fills in some of the configuration fields by default, such as **Exclude attributes** and **Exclude resources**. To protect the password security, EMC automatically excludes `datazone pass phrase` and `password` from the information you send, regardless of whether you specify those attributes in the exclusion fields.

Enabling ConnectEMC by using nsradmin

NetWorker creates the ConnectEMC resource automatically on installation, although ConnectEMC is not enabled by default. The following procedure shows how to enable ConnectEMC by using `nsradmin`.

Before you begin

For SMTP Host, EMC recommends that you use an existing host rather than setting up a NetWorker server to also be an email server.

Procedure

1. From the NetWorker server, start the `nsradmin` program:

   ```
   nsradmin
   ```

2. At the `nsradmin` prompt, type:

   `. NSR ConnectEMC`

3. The **SMTP host** is set by default to **`localhost`**. If the NetWorker server does not have email capability, you can configure another SMTP host to handle the email.

   For example, to change the SMTP host in `nsradmin` to the hostname **`mailhub.mynetwork.com`**, type: **`update SMTP Host: mailhub.mynetwork.com`**

4. Set a value for *frequency in weeks*. For example:

   `update frequency in weeks: 2` By default, this value is set to `0`, which indicates that automatic reporting is disabled. Setting *frequency in weeks* to a value greater than `0` enables the schedule. An administrator can then set the hour of transmission, as well as the day of the week, and the interval.

5. (Optional) Alternatively, you can type the following to send the information immediately:

   `update send now: Yes`This pushes a copy of the NetWorker RAP database to EMC's SYR database. When communicating with support engineers, this option can help reduce issue resolution times.

6. To review the resource configuration, type:

   `print NSR ConnectEMC`

   The following shows a sample ConnectEMC configuration when you execute `print NSR ConnectEMC`:

   Figure 14 ConnectEMC resource configuration in nsradmin

```
nsradmin> print NSR ConnectEMC
                        type: NSR ConnectEMC;
                        name: Default ConnectEMC configuration.;
               administrator: "user=root,host=vm-mw10a",
                              "user=administrator,host=vm-mw10a",
                              "user=system,host=vm-mw10a";
                     comment: ;
                   SMTP Host: localhost;
               e-mail sender: Administrator@vm-mw10a;
                 IP protocol: Auto;
                    send now: No;
          frequency in weeks: 0;
                        hour: 0;
             day of the week: Sunday;
              client retries: 5;
          exclude attributes: hostname, datazone pass phrase, password,
                              user id;
           exclude resources: NSR lockbox;
```

7. To exit the `nsradmin` program, type:

   `quit`

8. (Optional) To generate copies of the database, use the `nsrdump` command line tool .

   On Windows, the default path for the RAP database output file is located in *`NetWorker_install_path`*`\nsr\applogs\rh`. On Linux, the path is `/nsr/applogs/rh`.

Enabling the report home feature

To enable the report home feature, use the nsradmin interface to specify a mail server that supports SMTP relay.

Procedure

1. From the NetWorker server, start the `nsradmin` program:

   ```
   nsradmin
   ```

2. At the `nsradmin` prompt, type:

   ```
   print type: nsr report home
   ```

3. Edit the mail program attribute of the report home resource and type the name of the default mail server. For example, type:

   ```
   update mail program: smtpmail -h mailserver
   ```

4. To review the resource configuration, type:

   ```
   print
   ```

5. To exit the `nsradmin`. program, type:

   ```
   quit
   ```

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