

Module 1 : NetWorker Overview

Upon completion of this module, you should be able to explain:

- NetWorker hosts and their functions
- NetWorker control data and its uses
- Purpose of each NetWorker daemon/service
- Interprocess communications during backups
- EMC NetWorker functions and features
- NetWorker integration with Data Protection Advisor and deduplication technologies
- NetWorker backup terminology



This module focuses on NetWorker components including their roles, processes, and services. The module also includes a summary of NetWorker data protection functions and the backup process, an introduction to Data Protection Advisor and deduplication technologies, and an overview of NetWorker backup terms.

Module 1: NetWorker Overview

Lesson 1: NetWorker Hosts, Processes and Backup Flow

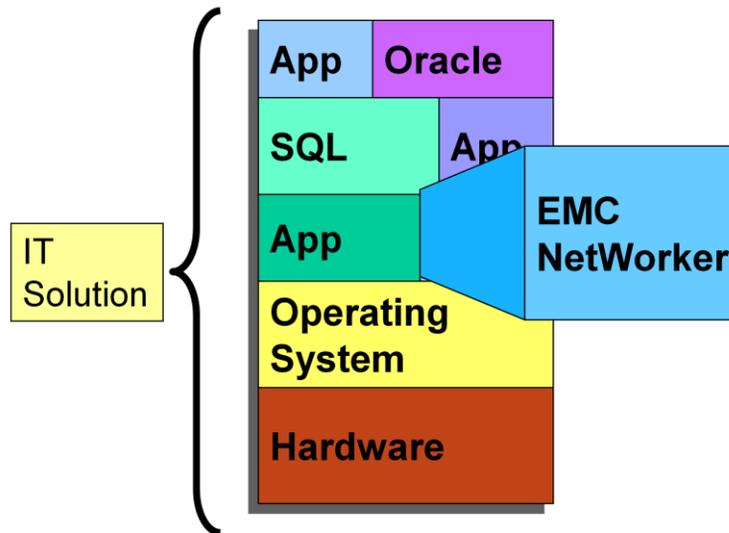
During this lesson the following topics are covered:

- NetWorker hosts and their functions
- NetWorker control data and its uses
- Purpose of each NetWorker daemon/service
- Interprocess communications during a backup



This lesson covers an introduction to NetWorker, including NetWorker hosts and their roles, NetWorker control data and processes, and an overview of the inter-process communications during a backup.

The NetWorker Solution



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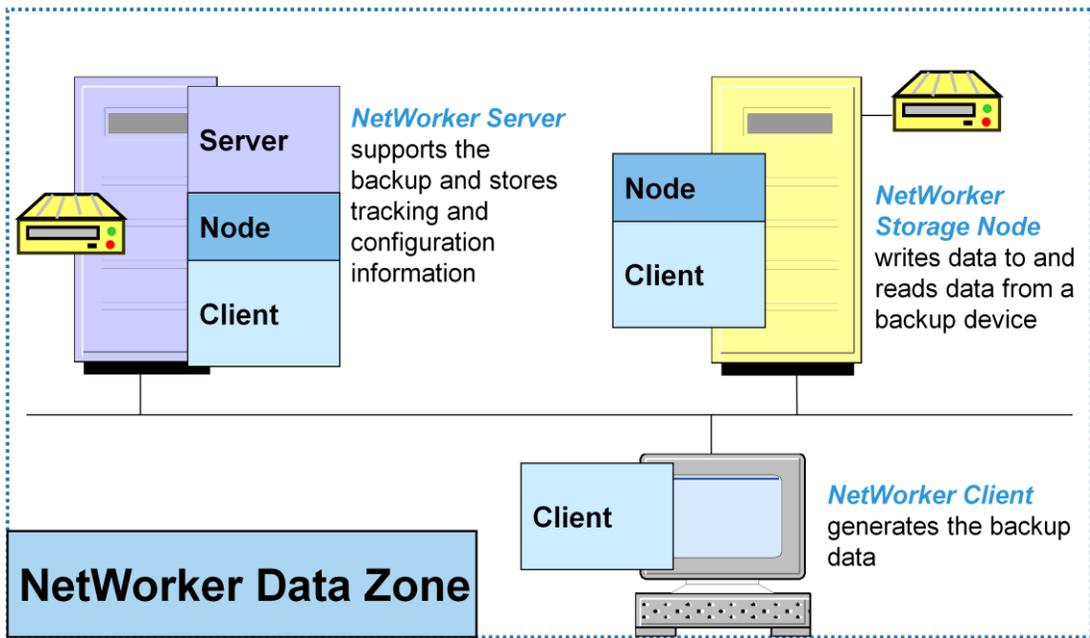
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There are many components in an IT solution with each component providing a specific functionality. EMC NetWorker works within the existing framework of hardware, operating system software, and network communication protocols to provide protection for the critical data within an IT environment.

NetWorker protects critical business data by centralizing, automating, and accelerating backup and recovery operations across an enterprise.

NetWorker provides support for the latest disk backup and snapshot technologies as well as deep integration with the latest databases and applications.

NetWorker Data Zone Components (1 of 2)



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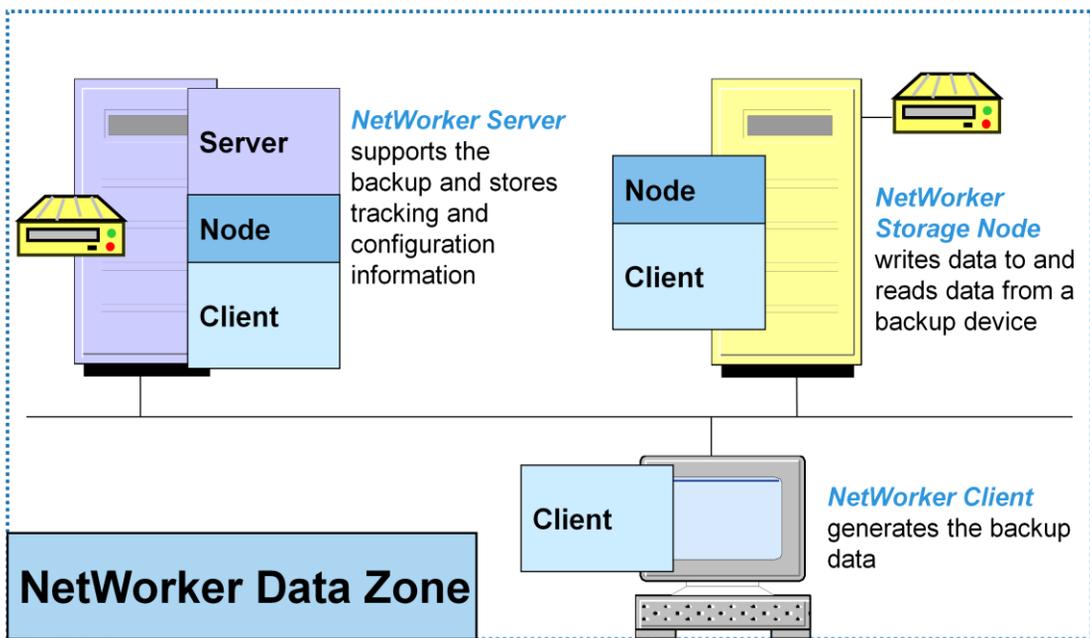
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A NetWorker Data Zone consists of a single NetWorker server and its storage node(s) and client(s). Another way to define a data zone is to say it is the set of hosts managed by a single NetWorker server. This includes all hosts that have backup devices controlled by the NetWorker server and all hosts who send their backup data to those devices.

NetWorker clients may be backed up by multiple NetWorker servers and therefore may belong to multiple data zones. NetWorker servers and storage nodes may belong to only one data zone.

NetWorker Data Zone Components (2 of 2)



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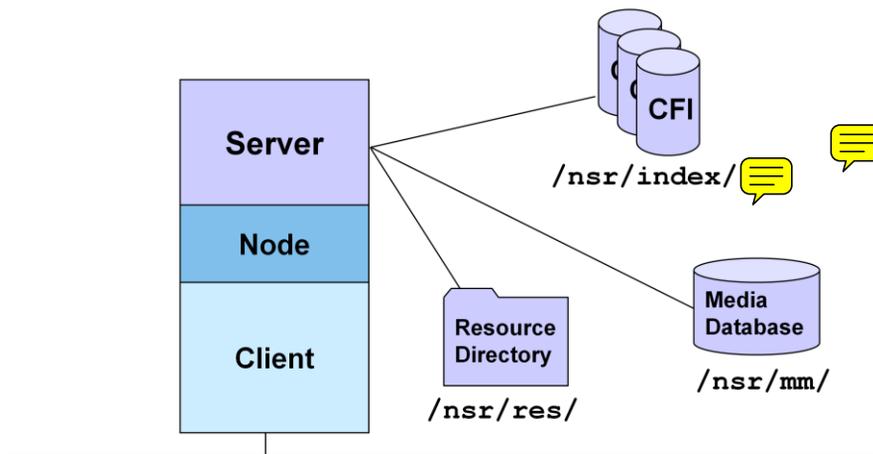
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The NetWorker Client is the largest NetWorker software component and the fundamental host. The client's most important functions are to generate backups, push them to a NetWorker storage node, and retrieve them during a recovery. While performing a backup, the client also generates tracking information. Every host in a NetWorker data zone is a NetWorker client.

A NetWorker Storage Node is the component that physically controls a backup device and responds to requests from the NetWorker server. Storage nodes also send tracking information to the NetWorker server. The NetWorker server is always a storage node and is the default storage node for backups. The device may be either a direct-attached or SAN-accessible device. If a device is controlled by a host other than a NetWorker server, it is considered a remote device and the storage node controlling the device is referred to as a remote storage node.

The NetWorker Server is the component that stores the configuration information, such as supported clients, backup device information, when to run the backups, what data to back up, and so on. The NetWorker server also maintains the NetWorker databases that track the save sets and volumes. These include the Client File Indexes (CFI) and Media Database. There is a single NetWorker server per data zone and it must be available for any NetWorker activity to take place in that data zone. NetWorker servers have NetWorker client, storage node, and server software installed.

NetWorker Control Data



NetWorker Control Data refers to the collection of configuration and tracking information stored on the NetWorker server.

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NetWorker control data is the collection of NetWorker configuration and backup tracking information stored on the NetWorker server.

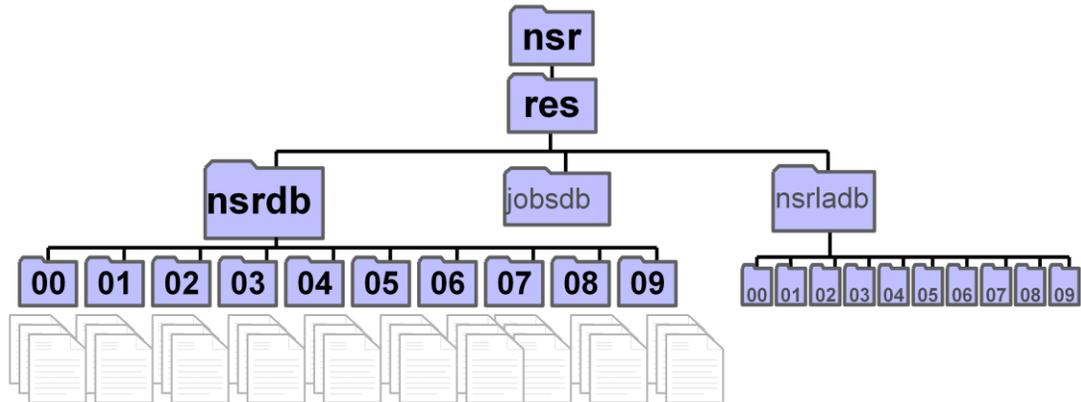
NetWorker control data includes three components:

- **Resource Database:** This directory (the *resource database*) contains the *resource* files that store the NetWorker configuration.
- **Media Database:** This database is used to track all volumes used by NetWorker and all save sets written to those volumes.
- **Client File Indexes (CFI):** These directories track each file (pathname) backed up by clients, allowing users to *browse* their backups for files from a particular point in time. The NetWorker server creates and maintains one CFI per physical client.

The next several pages provide more details on each NetWorker control data component.

Note: For a Microsoft Windows NetWorker server, replace `/nsr` with `<drive>:\Program Files\EMC Networker\nsr` for the directory paths shown on the slide.

Control Data - Resource Files



Sample contents of a resource file in `/nsr/res/nsrdb/*/`

```
action: full incr incr incr incr incr incr;
comment;;
name: Default;
override;;
period: Week;
type: NSR schedule;
resource identifier: 49.0.60.9.23.70.11.67.10.8.3.73(1)
```

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NetWorker stores and maintains configuration information as *resources*. Resource information is stored in resource files located below the `/nsr/res` directory. Subdirectories containing resource files include:

nsrdb - The files below this directory contain configuration information describing clients, devices, jukeboxes (autochanger, library, or silo), backup start times, backup schedules, licenses, etc. This directory exists only on the NetWorker server. The slide shows an example of a NetWorker *Schedule* resource which defines the backup level used each day of the week.

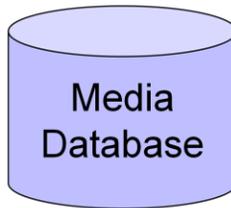
nsrladb - The files below this directory contain resource information used to determine the RPC port range used by this host when receiving connections from and making connections to other NetWorker hosts. All NetWorker hosts use this directory.

jobsdb - This directory houses the jobs database which contains statistics and information generated by operations such as backups, and is used by NMC for reporting.

Note: See Module 3, *NetWorker Resources and Administrative Interfaces*, and the *EMC NetWorker Command Reference Guide* for more information.

Important: NetWorker resource files are text files and are to be managed only through NetWorker administrative interfaces. **Do not edit them directly!!**

Control Data - Media Database



```
ca Command Prompt
C:\Documents and Settings\Administrator>mminfo -v
volume      type      client      date      time      size      ssid      fl      lvl name
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 9:40:25 AM 5185 MB 4206284334 cb manual C:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:19:48 AM 2871 KB 4172731525 cb manual USS ASR DISK:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:20:11 AM 536 MB 4155954331 cb manual USS SYSTEM FILESET:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:22:10 AM 496 B 4139177235 cb manual USS USER DATA:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:22:19 AM 496 B 4122400028 cb manual USS OTHER:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:22:28 AM 28 MB 4105622821 cb manual USS SYSTEM SERVICES:\
DFE00L00    LTO      Ultrium    leg1-win2 4/26/2011 10:22:55 AM 18 MB 4088845631 cb manual USS SYSTEM BOOT:\
DFE00L00    LTO      Ultrium    leg1-win2 4/27/2011 2:16:42 AM 0 KB 4055348430 ci manual /
DFE00L00    LTO      Ultrium    leg1-win2 4/27/2011 2:48:07 AM 4946 KB 4021795879 cr full index:leg1-win2
DFE00L00    LTO      Ultrium    leg1-win2 4/27/2011 2:48:14 AM 219 KB 4005018670 cr full bootstrap
DFE02400    LTO      Ultrium    leg1-win2 4/27/2011 2:31:46 AM 4004 MB 4038572115 cb full C:\
```



The **Media Database** stores tracking information describing all save sets backed up within the data zone and all volumes labeled by NetWorker.

Save set information includes:

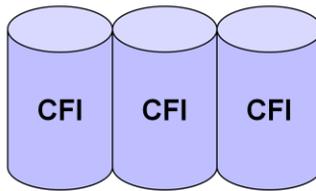
- Save set name
- Volume storing the save set
- NetWorker client that created the save set
- Date and time the save set was backed up
- Size of the save set
- **Unique save set identifier (SSID)**
- Aging status
- Backup level

Volume information includes:

- Volume name
- List of save sets on the volume
- Volume status
- Name of media pool that the volume belongs to

Note: Many more pieces of information are maintained in the media database. See information about `mminfo` in the *EMC NetWorker Command Reference Guide*.

Control Data - Client File Indexes



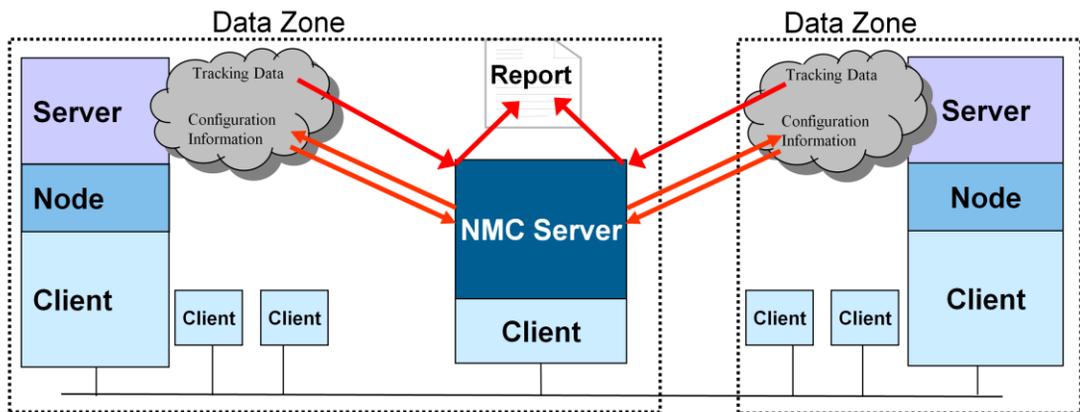
```
c:\ Command Prompt
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\aleabanr.gif', NSR size=8276, date=1303894935 4/27/2011 5:02:15 AM, file size=7830
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\amaizrul.gif', NSR size=2628, date=1303894935 4/27/2011 5:02:15 AM, file size=2184
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\anabnr2.gif', NSR size=15936, date=1303894935 4/27/2011 5:02:15 AM, file size=15492
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\asurule.gif', NSR size=2532, date=1303894935 4/27/2011 5:02:15 AM, file size=2086
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Blank Bkgrd.gif', NSR size=596, date=1303894935 4/27/2011 5:02:15 AM, file size=145
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Blank.htm', NSR size=852, date=1303894935 4/27/2011 5:02:15 AM, file size=412
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Btzhsepa.gif', NSR size=1424, date=1303894935 4/27/2011 5:02:15 AM, file size=978
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\cithanna.gif', NSR size=12404, date=1303894935 4/27/2011 5:02:15 AM, file size=11959
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Citrus Punch Bkgrd.gif', NSR size=2912, date=1303894935 4/27/2011 5:02:15 AM, file size=2454
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Citrus Punch.htm', NSR size=852, date=1303894935 4/27/2011 5:02:15 AM, file size=403
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Clear Day Bkgrd.jpg', NSR size=6128, date=1303894935 4/27/2011 5:02:15 AM, file size=5675
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Clear Day.htm', NSR size=720, date=1303894935 4/27/2011 5:02:15 AM, file size=276
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\fieruled.gif', NSR size=1772, date=1303894935 4/27/2011 5:02:15 AM, file size=1325
WIN ASDP v2 file 'C:\UUTemp\Common Files\Microsoft Shared\Stationery\Fiesta Bkgrd.jpg', NSR size=5496, date=1303894935 4/27/2011 5:02:15 AM, file size=5048
```



A Client File Index (CFI) stores client-generated information about a client's backed up files and directories. For each file and directory that is backed up, a CFI contains its pathname, file attributes such as permissions and ownership, and the time stamp of when the save set containing the file was backed up.

NetWorker clients send tracking information to their CFI, which resides on the NetWorker server. A single CFI exists for each physical client.

NetWorker Management Console (NMC) Server



- Java interface for configuration and management of NetWorker data zones.
- Backup tracking and reporting for multiple data zones.
- Detailed reporting on data zone and components.

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Administration of a NetWorker server is performed using the *NetWorker Management Console* (NMC) GUI, a Java-based interface accessible from any supported web browser.

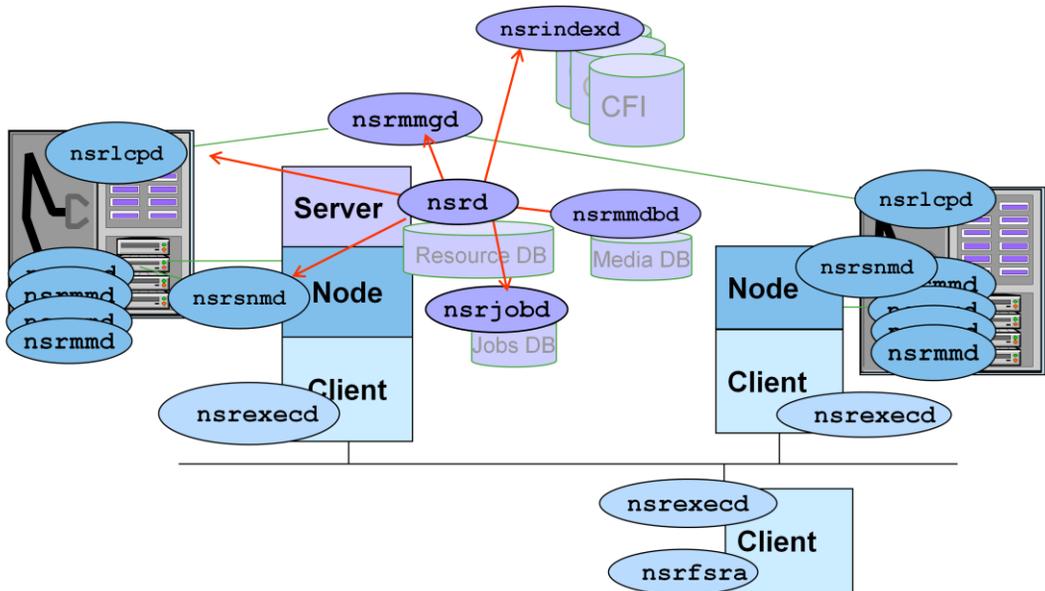
The Console server provides a global view of the NetWorker environment, allowing you to centrally manage one or more NetWorker data zones.

Only one Console server is required in a NetWorker enterprise environment, although multiple servers are allowed.

The NetWorker Management Console must have the NetWorker client software on it.

The Console server can generate a number of preconfigured reports using information gathered from any or all of the NetWorker servers.

Core NetWorker Daemons



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NetWorker *daemon* processes are involved in almost all NetWorker operations, including backups and recoveries. There are one or more NetWorker daemons to support each of the three NetWorker host functions:

- **Client**
- **Storage node**
- **Server**

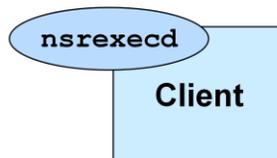
In a Microsoft Windows environment, the core NetWorker processes are started via two NetWorker services.

The following pages provide summary information about the main NetWorker daemons. For more detailed information, please see the *EMC NetWorker Command Reference Guide* or the UNIX man pages.

NetWorker Client Daemons

- **nsrexecd**

- ▶ Listens for, authenticates, and supports remote execution requests from the NetWorker server
- ▶ Determines which RPC ports to use to support and request NetWorker services over the network

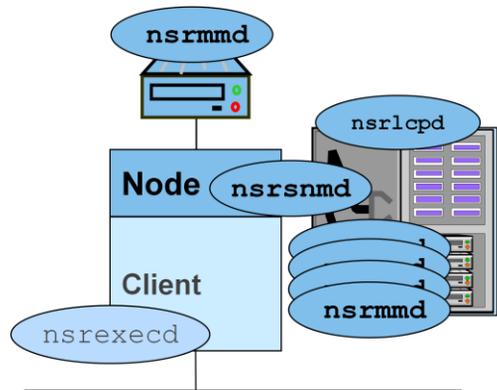


The NetWorker client daemon, **nsrexecd** (**network save and recover execution daemon**), runs on NetWorker clients to support remote execution requests from NetWorker servers. For example, **nsrexecd** executes a backup command at the request of the NetWorker server. The **nsrexecd** process also determines which RPC ports to use to support and request NetWorker services.

In a UNIX environment, **nsrexecd** is started automatically during system boot up. In a Windows environment, **nsrexecd** is started via the *NetWorker Remote Exec Service*, which is configured to start automatically during boot up.

NetWorker Storage Node Daemons

- **nsrsnmd**
 - ▶ Manages device operations and nsrmmd processes.
 - ▶ One nsrsnmd process runs on each configured storage node.
- **nsrmmd**
 - ▶ Receives backup data from the client.
 - ▶ Reads from and writes to NetWorker backup devices.
 - ▶ Organizes backup data.
 - ▶ Sends tracking information to the media database.
- **nsrlcpd**
 - ▶ Provides uniform library interface.
 - ▶ Controls library resources.



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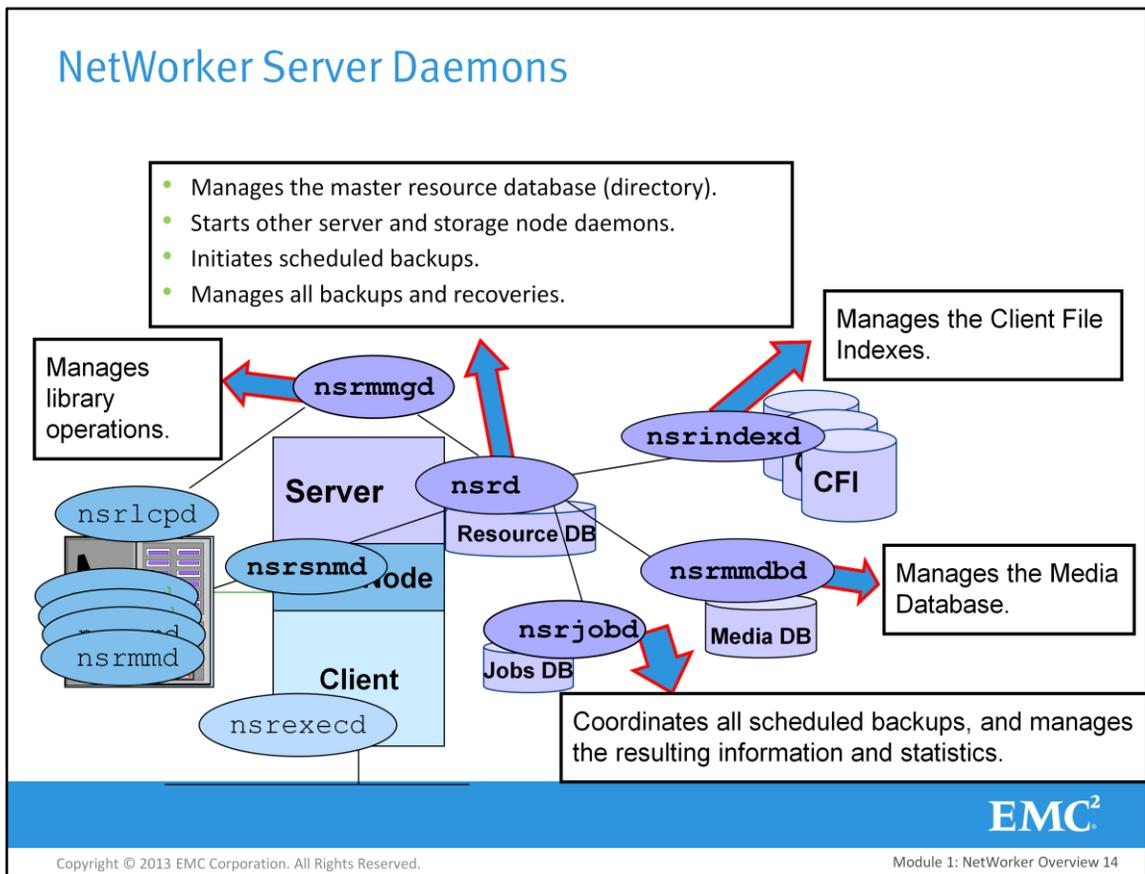
The **nsrsnmd** daemon provides an RPC-based service that manages all device operations and the **nsrmmd** processes on the storage node on behalf of the **nsrd** process on the NetWorker server. The **nsrsnmd** daemon is responsible for ensuring that the device operations get performed when needed by **nsrd**. There is one **nsrsnmd** process running on each configured storage node.

The NetWorker Storage Node daemon, **nsrmmd** (network save and recover media multiplexing daemon), runs on NetWorker storage nodes to support reading and writing of data to devices. The **nsrmmd** daemon writes the backup data sent by **save** to a volume in the backup device it is controlling, sends information to the NetWorker server to track data written to the volume, and reads data from the volume during operations such as recoveries and cloning. One **nsrmmd** is started for each device configured as a NetWorker resource.

Note: For disk-type devices there may be more than one **nsrmmd** per device.

For each enabled library (jukebox) in a data zone, **nsrmmd** on the NetWorker server spawns a **nsrlcpd** (network save and recover library control daemon) to control the actual jukebox resources, such as media, slots, drives, and access ports. After performing a task, **nsrlcpd** returns status information to **nsrmmd**, which in turn provides it to **nsrd**.

NetWorker Server Daemons



The NetWorker server daemons provide access to NetWorker services such as configuration information, support for backup and recovery requests, and access to the media database, client file indexes, and jobs database. NetWorker server daemons include:

nsrd (network save and recover daemon) is the *master daemon*. nsrd manages the NetWorker resource database which contains almost all NetWorker configuration information. It monitors active save and recover sessions. nsrd is started automatically at system startup. Once started, it starts the nsrmmdbd and nsrindexd processes. It automatically invokes nsrsnmd on a storage node when needed.

nsrmmdbd (network save and recover media management database daemon) provides the read and write service for the media database.

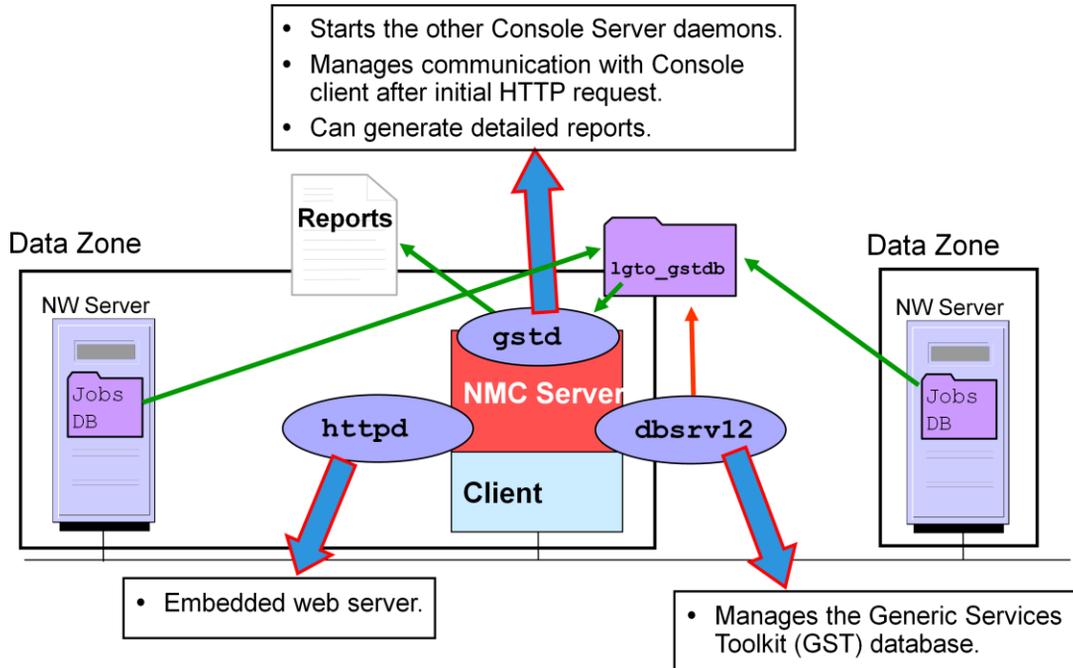
nsrindexd (network save and recover index daemon) provides the read and write service for the client file index databases.

nsrjobd (network save and recover job daemon) is responsible for coordinating all scheduled backups. It stores information about these operations and provides it to the NetWorker server and the NMC server for reporting purposes.

nsrmmgd – Manages all library operations. It is started on the NetWorker server by nsrd when the NetWorker services are started or when the first jukebox resource is configured and enabled.

In a Windows environment, these processes are started via the *NetWorker Backup and Recover Server* service.

Console Server Daemons



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The three NetWorker Management Console server daemons are:

httpd – Apache httpd is the embedded web server.

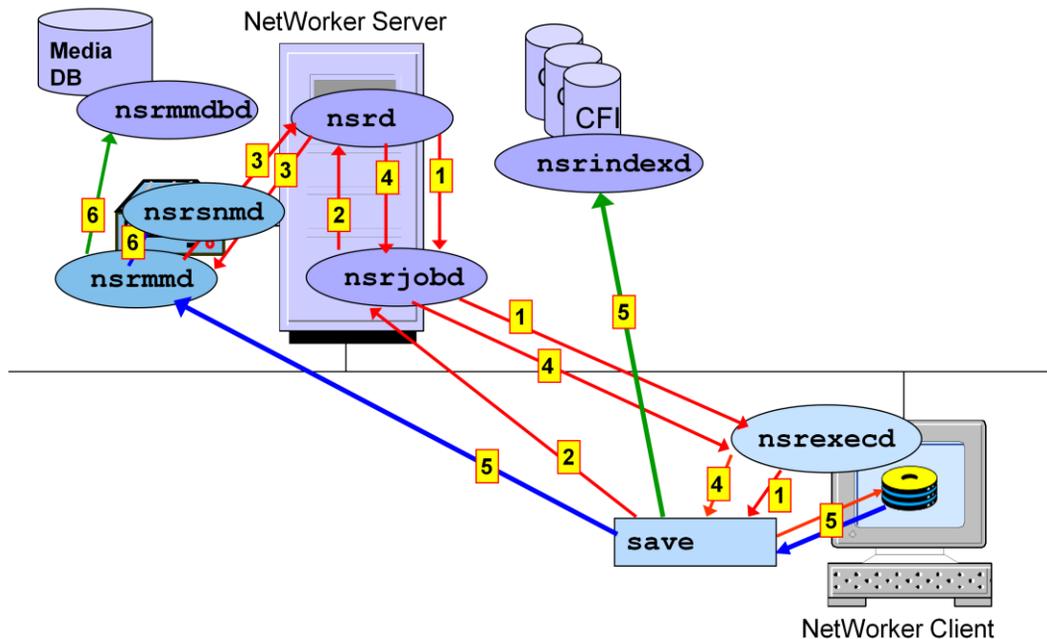
gstd – This process is the master Console process and is responsible for starting the `gsttclsh` and `dbrsv12` processes. After a Console client has established communication with the Console server, all further communication is performed through `gstd`.

dbrsv12 – This process manages the Generic Services Toolkit (GST) database. This database is also referred to as the Console server database and contains information concerning all backup, recover, and cloning operations performed on NetWorker servers managed by the Console server. This information is used by `gstd` to generate reports.

In a UNIX environment, the processes are started automatically during system boot up. On a Microsoft Windows host, the processes are started via the *EMC GST Service* which is configured to start automatically during boot up; `httpd` is registered as the *EMC GST Web Service*.

Note: GST stands for Generic Services Toolkit.

NetWorker Backup Process Flow



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The slide shows a high-level process and data flow of a typical NetWorker scheduled backup.

1. The server's `nsrd` starts a scheduled backup. `nsrd` asks `nsrjobd` to send a remote execution request to the client's `nsrexecd` requesting that it execute the NetWorker `save` command to perform the backup.
2. The `save` command started on the client communicates with the server's `nsrd` (through `nsrjobd`) to request backup support.
3. `nsrd` matches the backup to a storage node's `nsrmmmd` based on configuration information and save request attributes.
4. Once the volume has been mounted on the backup device, `nsrd` directs the client to push its data to the storage node.
5. The client:
 - Pushes the data to the storage node's `nsrmmmd`.
 - Sends tracking information to its client file index (CFI) via the server's `nsrindexd`.
6. `nsrmmmd` on the storage node:
 - Writes the data sent by the `save` command to the volume.
 - Sends tracking information to the media database via the server's `nsrmdbd`.

Module 1: NetWorker Overview

Lesson 1 Summary

During this lesson the following topics were covered:

- NetWorker hosts and their functions
- NetWorker control data and its uses
- Purpose of each NetWorker daemon/service
- Interprocess communications during a backup

The EMC logo is located in the bottom right corner of the slide. It consists of the letters "EMC" in a bold, sans-serif font, with a small superscript "2" to the right of the "C".

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This lesson covered an introduction to NetWorker, including NetWorker hosts and their roles, NetWorker control data and processes, and an overview of the interprocess communications during a backup.

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Lesson 2: NetWorker Features and Functions

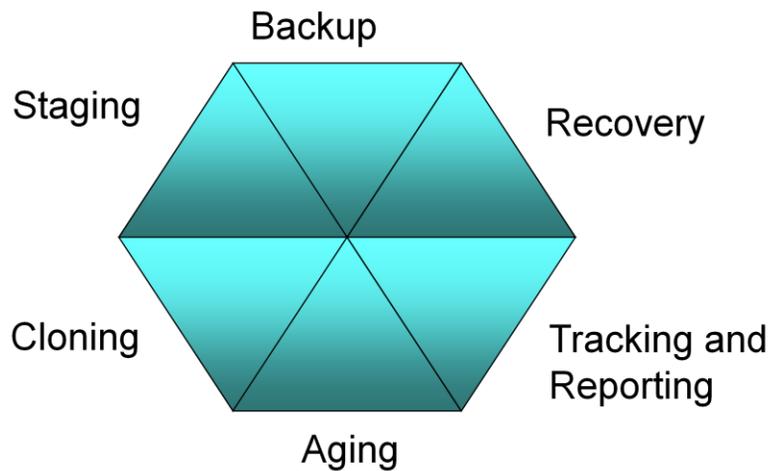
During this lesson the following topics are covered:

- NetWorker data protection functions
- NetWorker integration with deduplication technologies
- New performance features



This lesson covers an overview of the data protection functions and new performance features provided by NetWorker, NetWorker integration with deduplication backups.

Data Protection Functions



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In addition to backup and recovery, NetWorker provides a full range of data protection functions including tracking and reporting, aging, cloning, and staging.

Tracking and Reporting

Tracking is the process of storing information about save sets. NetWorker maintains information such as the save set's location on a volume, the save set creation date and time, the level of backup, and which client generated the save set.

The Console Server uses information about backups to generate reports.

Aging

Aging determines the length of time that backup data is available for recovery. NetWorker allows you to specify:

- How long to keep the file-level tracking information available (browsable).
- How long to protect each volume from recycling (overwriting).

Cloning



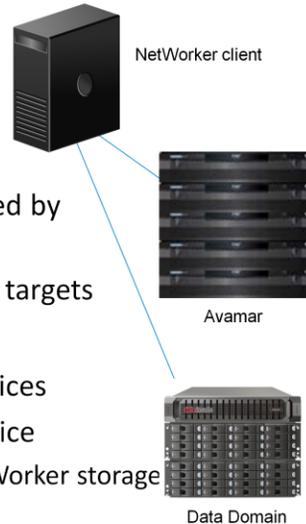
Cloning is the process of copying a save set from one NetWorker volume to another.

Staging

Staging is the process of moving a save set from one volume to another.

NetWorker Deduplication Backups

- Deduplication with Avamar
 - ▶ Source based deduplication
 - ▶ Avamar server is the backup storage device
 - ▶ Backup and restores are defined and managed by NetWorker
 - ▶ Supports seamless recovery from replication targets
- Deduplication with Data Domain
 - ▶ Target based dedupe with AFTD and VTL devices
 - ▶ Source based dedupe with Data Domain Device
 - ▶▶ Distributes deduplication processing to NetWorker storage node or client
 - ▶▶ Manages Data Domain replication via NetWorker cloning
 - ▶▶ Supported over IP or FC



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Storing backup data on deduplication devices significantly reduces the amount of storage capacity that is required for backups. Two primary options are available for leveraging deduplication in a NetWorker environment.

NetWorker deduplication with Avamar takes advantage of Avamar source based deduplication technologies where the Avamar server is the target for NetWorker backup data in the form of a NetWorker deduplication node. A separate NetWorker AFTD is used to store backup metadata. Backups and restores are configured and managed in NetWorker. When backup data is replicated in Avamar, NetWorker supports seamless recovery from the replication target in the event that the primary Avamar server is not available.

Data Domain can be used for target based deduplicated backup storage when configured as a virtual tape or a disk type device. In this environment, NetWorker and the Data Domain system are each managed separately. Additionally, Data Domain devices can be configured in NetWorker that provide source based deduplication. When integrated with Data Domain through the use of the NetWorker Data Domain device type, Data Domain Boost technology is used. This significantly increases backup performance by performing the deduplication process either at the storage node or the backup client. With DD Boost, backups and restores are configured and managed in NetWorker. Through the use of DD Boost and clone controlled replication, NetWorker is fully aware of clone copies of save sets on replication target Data Domain systems.

NetWorker Management Console is used to monitor Avamar server system events and Data Domain system status. NetWorker Management Console also provides pre-configured reports for deduplication backup activity.

NetWorker Performance Enhancements – 8.1

- NetWorker Recovery Wizard
 - Most recovery operations are now supported directly from NMC
- DDBoost over Fibre Channel
 - Provides client-side deduplication of backup data over FC
 - Alternative to VTL in environments with large FC investments
- Virtual Synthetic Full backups
 - Allows for creation of “virtual” synthetic full backups when all save sets are on Data Domain
- Parallel Save Streams
 - Can be used by Unix/Linux clients to automatically break up large save sets into smaller ones
- Storage Node load balancing
 - Load balance across storage nodes globally or for specific clients



NetWorker 8.1 introduces a new feature called the NetWorker Recovery Wizard. This wizard allows for most recovery operations to be performed directly through the NetWorker Management Console, alleviating the need to log into multiple recovery interfaces for different operating systems on different servers. Additionally it supports the ability for a recovery to be configured and scheduled to be automatically performed at a later time.

Also with NetWorker 8.1, a new feature is introduced which allows DDBoost devices to be configured over Fibre Channel. This not only provides an alternative option for customers with large FC investments, but also allows for client-side deduplication for clients backing up over FC.

Another new feature is the ability to perform Virtual synthetic full backups when all save sets needed for the backup reside on the same Data Domain system. This greatly reduces the processing overhead and backup time, provide up to a 90% reduction in full backup requirements on the production servers.

Two other features introduced with NetWorker 8.1 that are discussed in further detail in later sections are: **Parallel Save Streams** which allow Unix and Linux clients to automatically break up large save sets into smaller ones, and the newly added **ability to have clients load balance across storage nodes.**

For more information on these features, please refer to later lessons in the course or to the **EMC NetWorker Release 8.1 Release Notes.**

Module 1: NetWorker Overview

Lesson 2 Summary

During this lesson the following topics were covered:

- NetWorker data protection functions
- NetWorker integration with Data Protection Advisor and deduplication technologies
- New performance features



This lesson covered an overview of the data protection functions and new performance features provided by NetWorker as well as integration with deduplication backups.

Module 1: NetWorker Overview

Lesson 3: NetWorker Backup Terminology

During this lesson the following topic is covered:

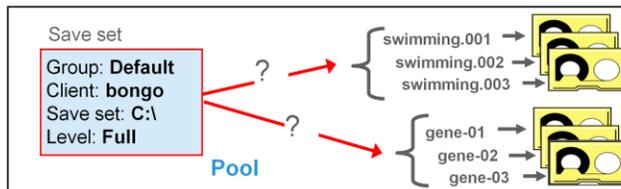
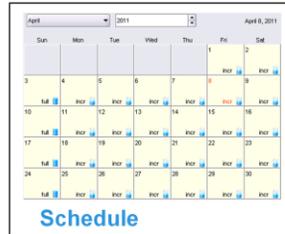
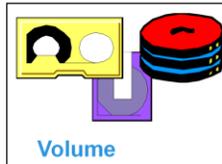
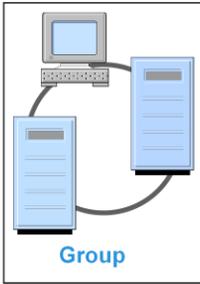
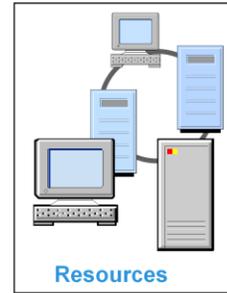
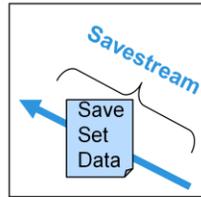
- NetWorker backup terminology
- NetWorker documentation
- Additional training resources



This lesson covers an overview of NetWorker backup terms, documentation as well as a review of some additional training resources.

NetWorker Backup Terms

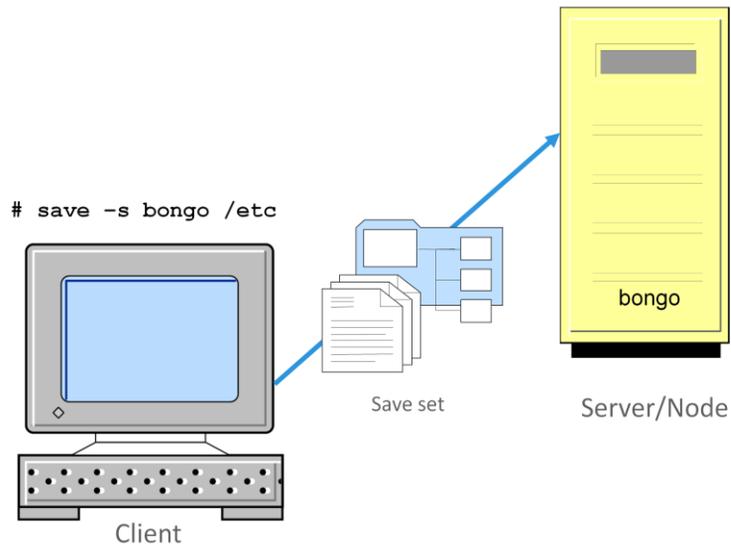
```
save -s bongo /etc
```



To understand the backup process, you need to understand these backup terms associated with the NetWorker product. Each term is covered in more detail later in this course.

NetWorker Backup Terms – save

The `save` program runs on the NetWorker client and is used to back up a save set.



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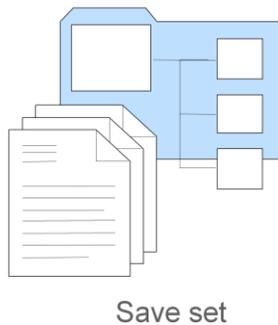
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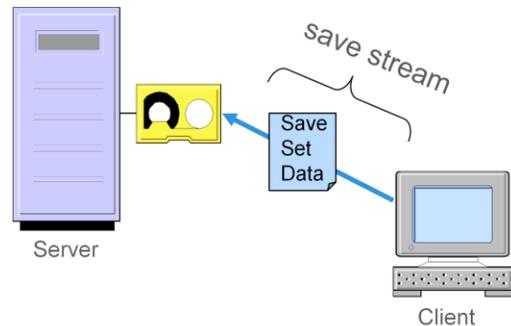
The **save** program runs on the NetWorker client and is used to back up a save set.

NetWorker Backup Terms – Save Set and Save Stream

A **save set** is one or more files, directories, and/or file systems, or application-generated data, residing on a NetWorker client, that is backed up as a unit to a NetWorker storage node and written to a volume.



A **save stream** is a single save set in the process of being backed up.



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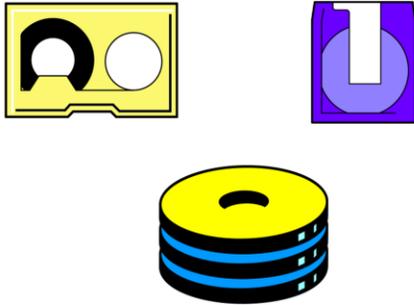
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A save set is one or more files, directories, and/or file systems, or application-generated data, residing on a NetWorker client, that is backed up as a unit to a NetWorker storage node and written to a volume.

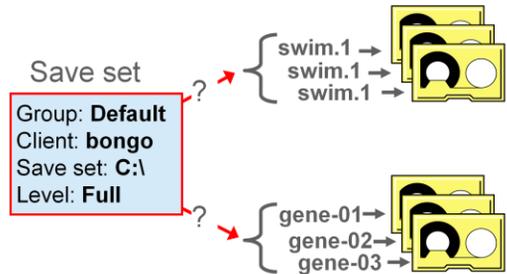
A save stream is a single save set in the process of being backed up or recovered.

NetWorker Backup Terms – Volume and Pool

A **volume** is a physical piece of media, such as a magnetic tape or a file system directory, to which backup data is written.



A **pool** contains a collection of NetWorker-labeled volumes. The NetWorker server matches pool attributes to save set characteristics to determine which set of volumes a save set should be written to.



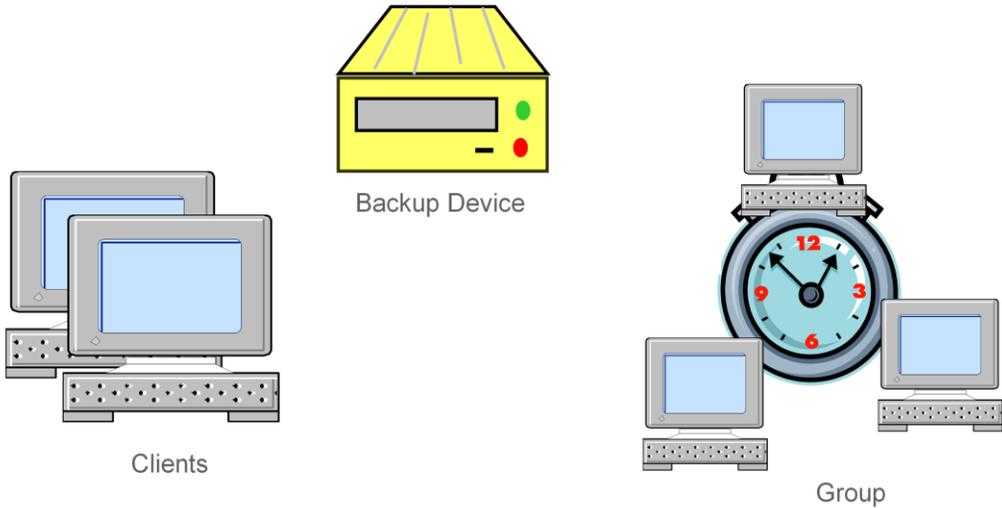
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A **volume** is a physical piece of storage media, such as a magnetic tape or a file system directory, to which backup data is written.

A **pool** is a NetWorker resource that represents a collection of NetWorker-labeled volumes. Pools are configured with attributes that match save set characteristics, allowing the NetWorker server to determine which set of volumes a save set should be written to during a backup.

NetWorker Backup Terms – Resource

A **resource** is any configurable NetWorker component such as a client, backup device, or group.



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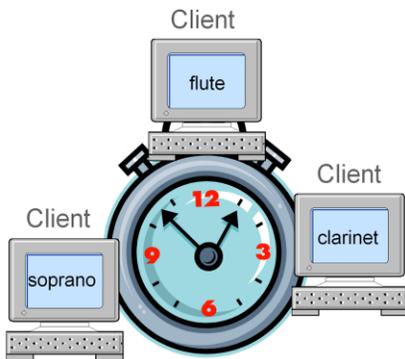
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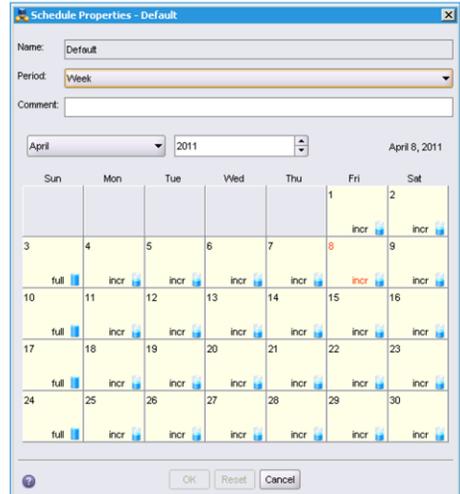
A resource is any configurable NetWorker component such as a client, backup device, or group.

NetWorker Backup Terms – Group and Schedule

A **group** is a resource to which one or more clients are assigned. Groups specify the time of day that the set of clients start backing up, or, with probe-based groups, the time of day when probing occurs.



A **schedule** is a NetWorker resource that specifies the level of client backup to perform on any given day.



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A **group** is a resource to which one or more clients are assigned. Groups specify the time of day that the set of clients start backing up, or, with probe-based groups, the time of day when probing occurs. With a probe-based group, the backup is triggered by successful execution of one or more user-defined client probes.

A **schedule** is a NetWorker resource that specifies the level of client backup to perform on any given day.



NetWorker 8.1 Documentation

- NetWorker documentation includes:

- ▶ EMC NetWorker Release Notes
- ▶ EMC NetWorker Installation Guide
- ▶ EMC NetWorker Administration Guide
- ▶ EMC NetWorker Command Reference Guide
- ▶ EMC Error Message Guide 
- ▶ EMC NetWorker Licensing Guide
- ▶ EMC NetWorker Performance Optimization Planning Guide



- Compatibility Guides:

- ▶ NetWorker Hardware Compatibility Guide
- ▶ NetWorker Software Compatibility Guide



- Current documentation is available at support.emc.com.

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Documentation resources related to the use of NetWorker include the guides and release notes listed on the slide.

For a complete set of product information and documentation for NetWorker, go to the EMC Support web site, <https://support.emc.com>.

Additional Training Resources for NetWorker

Training courses related to NetWorker include:

- EMC NetWorker Microsoft Applications Implementation and Management (online).
- EMC NetWorker Module for Database and Applications (online).
- Backup Recovery Solutions curriculum:
 - ▶ Backup and Recovery Solutions Design (ILT, VILT)
 - ▶ eLearning courses on integration with Lotus Notes, Microsoft Exchange, Microsoft SharePoint, Microsoft SQL, NDMP, Oracle, VMware, Avamar and Data Domain.
- NetWorker Device Integration Workshop (ILT,OILT).



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Training resources related to NetWorker include the training courses listed on the slide. To find out more about these courses, access the EMC Education Services website for course descriptions. You can also register for EMC Education Services training courses on the web site.

Module 1: NetWorker Overview

Lesson 3 Summary

During this lesson the following topic was covered:

- NetWorker backup terminology
- NetWorker documentation
- Additional training resources



This lesson covered an overview of NetWorker backup terminology, documentation, as well as a review of additional training resources.

Module 1: Summary

Key topics covered in this module include:

- EMC NetWorker hosts and their functions
- NetWorker control data and its uses
- Purpose of each NetWorker daemon/service
- Interprocess communications during a backup
- NetWorker features and functions
- NetWorker integration with deduplication technologies
- Common NetWorker backup terminology



This module focused on NetWorker components including their roles, processes, and services. We also discussed the NetWorker data protection functions and the backup process, introduced Data Protection Advisor and deduplication technologies, and explained NetWorker backup terms.

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