Installation Guide
Dynamic File Services 2.2

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Novell.

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Contents

About This Guide

This guide describes the installation requirements and how to install or update Novell Dynamic File Services (DynamicFS) 2.2 software in a Microsoft Windows Workgroup or Active Directory Domain environment.

Audience

This guide is designed to help storage solutions administrators install, update, modify, repair, or uninstall Novell Dynamic File Services.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation.

Documentation Updates

For the most recent version of the *Novell Dynamic File Services Installation Guide*, visit the Dynamic File Services documentation Web site (http://www.novell.com/documentation/dynamic_file_services/).

Additional Documentation

Additional documentation is available on the Dynamic File Services documentation Web site (http://www.novell.com/documentation/dynamic_file_services/):

- *Readme*
- *Administration Guide*

- *Client Commands and Utilities Reference*
- *Retention Review Quick Start*

1 What's New for the Dynamic File Services Installation and Upgrade

This section describes the new features and changes for the installation of Novell Dynamic File Services (DynamicFS).

1.1 What's New for Dynamic File Services 2.2

In addition to bug fixes, Novell Dynamic File Services 2.2 provides the following enhancements and changes for installation and upgrade:

1.1.1 Upgrade Support

You can perform an in-place upgrade from Dynamic File Services 2.1 to Dynamic File Services 2.2. A computer restart is required. For information, see Chapter 5, "Upgrading to Dynamic File Services 2.2," on page 63.

A computer restart is not required if you uninstall the old product (making sure to keep the existing program data files), then install the new product. The retained databases and configuration files are updated to the new format during the reinstallation. After the reinstallation, you must register a license key, and perform the verification tasks described in Section 5.5, "Post-Upgrade Changes and Tasks," on page 65. For information about uninstalling the product, see Appendix B, "Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services," on page 75.

1.1.2 Microsoft .NET 4.0.3?

Dynamic File Services 2.2 requires Microsoft .NET 4.0.3? to be installed before the product can be installed or upgraded. For information, see Section 2.3, "Software Requirements," on page 19.

1.2 What's New for Dynamic File Services 2.1

In addition to bug fixes, Novell Dynamic File Services 2.1 provides the following enhancements and changes for installation and upgrade:

- Section 1.2.1, "Upgrade Support," on page 12
- Section 1.2.2, "Microsoft .NET 4.0.2," on page 12
- Section 1.2.3, "Registration," on page 12
- Section 1.2.4, "Administration," on page 13
- Section 1.2.5, "Retention Pair Reviewers," on page 13
- Section 1.2.6, "Policy File Types Configuration File," on page 13
- Section 1.2.7, "Policy Database," on page 13
- Section 1.2.8, "Cloud Accounts Database," on page 13
- Section 1.2.9, "Cloud Events for Notification and Audit," on page 13
- Section 1.2.10, "Encryption for Storing Notification Credentials," on page 14
- Section 1.2.11, "SSL Certificate in a Cluster," on page 14
- Section 1.2.12, "Pair Check Utility," on page 14

1.2.1 Upgrade Support

You can perform an in-place upgrade from Dynamic File Services 2.0 to Dynamic File Services 2.1. A computer restart is required. For information, see Chapter 5, "Upgrading to Dynamic File Services 2.2," on page 63.

A computer restart is not required if you uninstall the old product (making sure to keep the existing program data files), then install the new product. The retained databases and configuration files are updated to the new format during the reinstallation. After the reinstallation, you must register a license key, and perform the verification tasks described in Section 5.5, "Post-Upgrade Changes and Tasks," on page 65. For information about uninstalling the product, see Appendix B, "Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services," on page 75.

1.2.2 Microsoft .NET 4.0.2

Dynamic File Services 2.1 requires Microsoft .NET 4.0.2 to be installed before the product can be installed or upgraded. For information, see Section 2.3, "Software Requirements," on page 19.

1.2.3 Registration

Dynamic File Services 2.1 requires a Registration License Key. For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

In a cluster, you add the Windows Registry entry for Dynamic File Services setup to the cluster resource so that the Service's *InstallID* value can be used to decrypt the license file from any active node. For information, see Section 4.1.5, "Dynamic File Services License Key," on page 32.

1.2.4 Administration

The user who installs Dynamic File Services is automatically added to the `Dynamic File Services` group. This allows the user to create and manage pairs, policies, schedules, and cloud accounts. Other user names can be added to the group after the installation is completed. For information, see "Configuring Administrators for Pair Management" in the *Dynamic File Services 2.2 Administration Guide*

1.2.5 Retention Pair Reviewers

Dynamic File Services 2.1 allows reviewers to be specified separately for each retention pair. When you upgrade to version 2.1, the `Dynamic File Services Retention Review` group is automatically added to the Reviewers list for each retention pair. Other users and groups can be added to the Reviewers list after the upgrade is completed. For information, see "Configuring Reviewers for a Retention Pair" in the *Dynamic File Services 2.2 Administration Guide*.

1.2.6 Policy File Types Configuration File

New file type definitions have been added to the `C:\Program Files\Dynamic File Services\DswFileTypes.cfg` file. When you upgrade to version 2.1, the old file is saved as `DswFileTypes_v2.0.cfg`. If you personalized the file type definitions, you should merge your additions or changes in the new file after the upgrade is completed.

1.2.7 Policy Database

The policy database definitions and associations are now managed in a single database file. The default location is:

`C:\ProgramData\Dynamic File Services\Policies\DswPolicyDatabase_v2.xml`

When you upgrade to version 2.1, your existing policy database files are consolidated into this single file. Any policies saved in the `Snapshots` folder are also converted to the new database format.

1.2.8 Cloud Accounts Database

The cloud engine executes policy tasks to move files in a retention pair from the primary path to the secondary path that resides in a cloud-based storage location. The cloud accounts database is stored in the `C:\ProgramData\Dynamic File Services\Clouds` folder.

1.2.9 Cloud Events for Notification and Audit

Dynamic File Services 2.1 provides Cloud events for notification and audit tracking. If you upgrade from an earlier version, these events are deselected by default. After an upgrade, you can use the Audit Configuration tool and Notification Configuration tool to enable these events. For information, see "Configuring Audit Tracking Events" and "Configuring the Notification Service" in the *Dynamic File Services 2.2 Administration Guide*.

1.2.10 Encryption for Storing Notification Credentials

The Dynamic File Services 2.1 Notification Service has changed the encryption of email and Twitter account credentials. When you upgrade to version 2.1, the credentials are decrypted, then re-encrypted. After an upgrade, you should verify that your notification setup for email and Twitter accounts are working as expected. For information, see Section 5.5, "Post-Upgrade Changes and Tasks," on page 65.

1.2.11 SSL Certificate in a Cluster

In a cluster, you add the Windows Registry entry for Dynamic File Services setup to the cluster resource so that the Service's SSL certificate can be used from any active node. Previously, the SSL certificate was server-centric in a cluster. For information, see Section 4.1.6, "Dynamic File Services SSL Certificates," on page 32.

1.2.12 Pair Check Utility

The SyncPair utility has been renamed as the Pair Check utility. For information, see "Dynamic File Services Pair Check Utility" in the *Dynamic File Services 2.2 Client Commands and Utilities Reference*.

1.3 What's New for Dynamic File Services 2.0

Dynamic File Services 2.0 provides the following changes for installation or upgrade:

- Section 1.3.1, "Data Location," on page 14
- Section 1.3.2, "Product Evaluation and License Key Registration," on page 15
- Section 1.3.3, "Policy Schedules," on page 15
- Section 1.3.4, "Notification Events," on page 15

1.3.1 Data Location

Dynamic File Services 2.0 stores program software and the data files it creates in the following locations by default when you accept the default install location:

Default Location	Description
`C:\Program Files\Dynamic File Services`	Program software, configuration files, log files, and documentation
`C:\ProgramData\Dynamic File Services`	Program data files and audit log files

The following data folders and their contents are now set up in the `C:\ProgramData\Dynamic File Services` folder:

```
audit
LocalDrives
Pairs
Policies
Schedules
SnapShot
```

For upgrades to version 2.0 from earlier releases, if the software is currently installed in the default location of `C:\Program Files\Dynamic File Services`, the program data files and audit log files are automatically relocated to the `C:\ProgramData\Dynamic File Services` folder.

You can use the Custom option during the install to specify a different location for the installation. Both the program files and program data are stored in the custom location. If you are installing Dynamic File Services in a cluster, you use the Custom option to specify the shared disk as the target location during the installation.

1.3.2   Product Evaluation and License Key Registration

Dynamic File Services 2.0 is installed in evaluation mode. Most product features will function normally. However, you are limited to one pair and one policy at a time until a key is registered on the system. You must register a key on each computer where the Service component is installed.

You can obtain a license key from the Novell Customer Center (http://www.novell.com/customercenter/). The license key code is delivered in an `.html` file that is named with a globally unique ID (GUID).

You can enter a license key at any time after you install Dynamic File Services. After a successful key registration, all features of the product are immediately available. You do not need to reinstall the product. The policy and pair created during evaluation remain in effect, as do any configuration settings you have made to the Service.

For information about registering a license key, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

1.3.3   Policy Schedules

Dynamic File Services 2.0 separates the Schedule function from the policy. If you upgrade to version 2.0 from an earlier version, the existing policies' schedules are automatically created and associated with their original policies. A policy can have only one schedule at a time associated with it.

For information about creating schedules, see "Creating and Managing Policy Schedules" in the *Dynamic File Services 2.2 Administration Guide*.

1.3.4   Notification Events

Dynamic File Services 2.0 allows you to set Notification events for each configured email address and Twitter account. Previously, events were set globally. If you upgrade from an earlier version, each user is automatically set to receive all events. For information about configuring events for each recipient, see "Configuring the Notification Service" in the *Dynamic File Services 2.2 Administration Guide*.

1.4   What's Next

For information about current installation requirements, see Chapter 2, "Planning the Installation," on page 17.

2 Planning the Installation

Before you install Novell Dynamic File Services (DynamicFS), ensure that you understand the supported configurations and installation requirements described in this section.

IMPORTANT: For general planning information, see "Planning for Pairs and Policies" in the *Dynamic File Services 2.2 Administration Guide*.

For information about installing in Windows clusters, also see Section 4.1, "Planning the Installation in a Windows Cluster," on page 29.

2.1 Supported Platforms

Dynamic File Services provides a Management component and a Service component to be installed. The Service component installs the main Service engine and utilities. The Management component installs the management tools.

2.1.1 Windows Servers

You can install the Service and Management components of Dynamic File Services on your Windows servers in a Workgroup environment or an Active Directory environment.

Dynamic File Services supports 64-bit architectures for the following Microsoft Windows Server operating systems with the latest service packs and patches applied:

- Windows Server 2008 Service Pack 2 or later

- Windows Server 2008 R2
- Windows Server 2012
- Windows Server 2012 R2

2.1.2   Windows Workstations

You can install the Management component of Dynamic File Services on a Windows workstation. This allows you to remotely manage pairs and policies on DynamicFS servers in the same domain.

DynamicFS supports 64-bit architectures for the following Windows client operating systems with the latest service packs and patches applied:

- Windows 7
- Windows 8
- Windows 8.1

Installation of the Service component is not supported on Windows workstations in a production environment. For testing purposes, you can install the Service component on the supported workstations. Some Service capabilities, such as those related to creating and managing pairs with remote shares, are unlikely to work when the Service is hosted on a workstation.

For information about configuration requirements for the Service on Windows XP, see "Disabling Simple File Sharing on Windows XP" (http://www.novell.com/documentation/dynamic_file_services/dynamic_readme/data/dynamic_readme.html#bltz17z) in the *Dynamic File Service: Readme* (http://www.novell.com/documentation/dynamic_file_services/dynamic_readme/data/dynamic_readme.html).

2.2   Supported Storage

- Section 2.2.1, "File Systems," on page 18
- Section 2.2.2, "Local Storage," on page 18
- Section 2.2.3, "Remote Storage," on page 19
- Section 2.2.4, "Cloud Storage," on page 19

2.2.1   File Systems

Dynamic File Services supports the NTFS file system for the primary and secondary locations in pairs.

2.2.2   Local Storage

Devices that the system considers to be native storage devices can be used for the primary path and secondary path in a pair. This includes Fibre Channel, iSCSI, and direct-attached storage devices (internal or external). The devices must be online and available to the Dynamic File Services server when you create, manage, and use the pair.

For iSCSI devices that are hosted in a cloud, we recommend that the device be used only for secondary paths.

The native storage devices used in a pair must have a static drive letter assigned so that the drive letter remains the same through computer restarts. If you plan to change the drive letters (or modify paths), you must unlink the paths by removing the pair definition, and create a new pair that uses the new locations.

Dynamic File Services does not support using CDs, DVDs, floppy drives, or flash drives in a pair. It also does not support using mapped drives.

2.2.3 Remote Storage

Remote storage is supported for the following pair configurations:

- **Standard Pair:** Secondary path. A local path is required for the primary in order to provide merged access to the files.
- **Retention Pair:** Primary path or secondary path.

The remote path can be a network share on either of the following target storage locations. It is not necessary for Dynamic File Services to be running on the target location.

- Any Windows Server running an operating system that is supported by DynamicFS
- Network attached storage or a network filer (such as NetApp and EMC)

IMPORTANT: To avoid potential data loss and conflicts, use only dedicated volumes when using remote paths.

A remote share must be online and available to the Dynamic File Services server when you create, manage, and use the pair.

For an Active Directory environment, the remote share must be published in Active Directory and must reside in the same domain/forest as the Dynamic File Services server. For information, see "Using Remote Shares in an Active Directory Domain" in the *Dynamic File Services 2.2 Administration Guide*.

For a Workgroup environment, the remote share must exist in the same workgroup as the Dynamic File Services server. For information, see "Using Remote Shares in a Workgroup" in the *Dynamic File Services 2.2 Administration Guide*.

2.2.4 Cloud Storage

Cloud storage is supported for the secondary path in a retention pair. For information, see "Using Cloud Storage as the Secondary Path in a Retention Pair" in the *Dynamic File Services 2.2 Administration Guide*.

2.3 Software Requirements

The following software should be installed and working properly before installing Dynamic File Services:

- Microsoft .NET 4.0.2

  If .NET is not already installed on the computer, the Dynamic File Services InstallShield Wizard automatically attempts to install the following Microsoft .NET 4.0 download:

An Internet connection is required. The download time varies based on your connection speed. A computer restart might be required on some platforms.

If the InstallShield Wizard is unable to install .NET, the wizard halts the installation and returns an error. Manually install .NET, then start the InstallShield Wizard to install Dynamic File Services.

- Microsoft Network Sharing
- Microsoft Event Logger

2.4 Server Configuration Requirements

The following server configuration should be set up and working properly before installing Dynamic File Services:

- Section 2.4.1, "SMB," on page 20
- Section 2.4.2, "UTF-8," on page 20

2.4.1 SMB

Dynamic File services supports SMB2 and SMB1. You should use the same SMB version on the server, clients, and remote file systems.

2.4.2 UTF-8

The servers and filers used with Dynamic File Services must be Unicode capable and set up for UTF-8 (8-bit Unicode Transformation Format) encoding and character sets.

2.5 Rights Needed for Installation in Active Directory Environments

In Active Directory domains, the installation must be done by a domain user that has local Administrator privileges on the computer and Active Directory Domain Administrator rights. This allows the Installation Wizard to set up a `Dynamic File Services` group for managing pairs and policies on DynamicFS servers in the domain, the `Dynamic File Services Storage Rights` group and an `NDFS-servername` proxy user in the domain that are used to access and manage data on remote secondary paths, and the `Dynamic File Services Retention Review` group.

For information about managing the group's membership, see "Active Directory Domain Configuration for Dynamic File Services" (http://www.novell.com/documentation/dynamic_file_services/dynamic_admin_win/data/plgroups.html) in the *Dynamic File Services Administration Guide* (http://www.novell.com/documentation/dynamic_file_services/dynamic_admin_win/data/bookinfo.html).

2.6 Installation Files

Novell Dynamic File Services is available in the Novell File Management Suite. On the Novell Downloads page (http://www.novell.com/downloads), search for the Novell File Management Suite, then download the Dynamic File Services software. Choose the install file based on the processor architecture of your computer:

Architecture	Install File
32-bit	`not supported`
64-bit	`DswSetup-x64-v2.2-<build>.exe`

2.7 Destination Location for the Dynamic File Services Software and Program Data

Dynamic File Services 2.2 stores program software and the program data files it creates in the following locations when you accept the default install location:

Default Location	Description
`C:\Program Files\Dynamic File Services`	Program software, configuration files, log files, and documentation
`C:\ProgramData\Dynamic File Services`	Program data files and audit log files

You can use the Custom option during the install to specify a different location for the installation. Both the program files and program data are stored in the custom location. If you are installing Dynamic File Services in a cluster, you use the Custom option to specify the shared disk as the target location during the installation.

2.8 Evaluation Mode and License Key

Dynamic File Services is installed in evaluation mode. Most product features will function normally. However, you are limited to one pair and one policy at a time until a key is registered on the system.

You can obtain a License Key from the Novell Customer Center (http://www.novell.com/customercenter/). The key code is delivered via a Web link in a file named `<GUID>.html`, such as `4add-adf2-62b8-4296-ab0e-ce6f-1234-1234.html`.

For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*

2.9 Checking for Issues in the Readme

The *Dynamic File Services Readme* (http://www.novell.com/documentation/dynamic_file_services/dynamic_readme/data/dynamic_readme.html) documents issues that Novell plans to address in a future release. Check the *Readme* to see if any installation or upgrade issues apply to your setup.

2.10 Silent Install Options

Dynamic File Services supports the InstallShield silent install options. For information, see Appendix A, "Silent Install Options for Dynamic File Services," on page 73.

2.11 Cluster Install Requirements

Dynamic File Services can be used in a Windows cluster environment, but it is not cluster aware. For information about the cluster install requirements, see Chapter 4, "Installing, Setting Up, and Using Dynamic File Services in a Windows Cluster," on page 29.

3 Installing and Setting Up Dynamic File Services

The Novell Dynamic File Services (DynamicFS) installation software provides separate files for 64-bit Windows platforms.

DynamicFS separates the features in two installation components: Service and Management. Install the Service component on the server where you want to create pairs and policies. Install the Management component any computer from which you want to manage the Dynamic File Services servers.

- Section 3.1, "Installing Dynamic File Services," on page 23
- Section 3.2, "Setting Up Administrators for Pair and Policy Management," on page 25
- Section 3.3, "Getting Started," on page 25
- Section 3.4, "Additional Information," on page 27
- Section 3.5, "What's Next," on page 27

3.1 Installing Dynamic File Services

1 Log in as the Administrator user or as a user with Administrators privileges.

In an Active Directory environment, log in as a Domain Admin user with Administrator rights in the domain and on the server.

2 Download the 64-bit (x64) architecture version of the `DswSetup-*.exe` file to a folder on the server or the client computer where you want to install it.

3 Double-click the file to start the InstallShield Wizard.

If you are prompted by the Windows User Account Control feature for permission, supply the necessary credentials and confirm.

4 Follow the on-screen instructions to install the software:

Wizard Page	Action
Welcome	Click *Next*.
License Agreement	Read and accept the terms of the License Agreement, then click *Next*.
	You can also click *Print* to output a copy of the License Agreement.

Wizard Page	Action
Setup Type	Select one of the following setup options:
	Complete: Select *Complete* to accept the following default setup, then click *Next* to continue to the Ready to Install the Program page:
	◆ Service port: 8999
	◆ Allow an exception in the firewall for port 8999: Yes
	◆ Destination folder for software: `C:\Program Files\Dynamic File Services`. The program files are written to `C:\ProgramData\Dynamic File Services`.
	◆ Features installed: Service and Management
	Custom: Select *Custom*, then click *Next* to continue to the Installation Details page where you can view and modify the setup options.
Installation Details (Custom install only)	Modify the following options if desired, then click *Next* to continue to the Select Features page:
	Allow an exception for the Dynamic File Services port in the Windows Firewall: Enable this option in order to remotely manage pairs and policies on this server from another computer. It is enabled by default.
	Service port: Specify the port number (default 8999) to use for the remote management communications.
	Destination software folder: Click *Browse* to locate and select the destination folder where you want to install the software, then click *OK*.
	The new location contains both the software and any program files it creates.
Select Features (Custom install only)	Specify which components to install on this computer, then click *Next* to continue to the Ready to Install the Program page.
	Management: The management tools are automatically selected for installation. This option cannot be deselected.
	Service: Select the Service for computers where you want to use pairs and policies.
Ready to Install the Program	Click *Install* to begin the installation.
	The Setup Status page shows the installation progress.
	If the server is in a Microsoft Active Directory environment, a group and proxy user are created to support using remote shares in pairs that you create later. This can take several seconds, depending on the size of your Active Directory setup. For information, see "Active Directory Domain Configuration for Remote Shares" in the *Dynamic File Services 2.2 Administration Guide*.
	After the install, you can view information about the Active Directory setup events in the `install.log`. For information, see "Viewing Logged Events" in the *Dynamic File Services 2.2 Administration Guide*.
InstallShield Wizard Complete	Specify whether to open the Readme and DynamicFS Management Console now, then click *Finish* to exit the wizard.

5 (Optional) Verify the installation setup by inspecting the various Dynamic File Services components that are described in *"Key Components of Dynamic File Services"* in the *Dynamic File Services 2.2 Administration Guide*.

6 (Optional) Register a license key for Dynamic File Services.

For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

Dynamic File Services is installed in evaluation mode. Most product features will function normally. However, you are limited to one pair and one policy at a time until a key is registered on the system.

7 Continue with setting up administrators for Dynamic File Services as described in Section 3.2, "Setting Up Administrators for Pair and Policy Management," on page 25.

3.2 Setting Up Administrators for Pair and Policy Management

Pairs and policies can be managed by any user with sufficient rights to do so. Some administrators have rights automatically. For example, in a workgroup environment the Administrator user and local users with Administrator privileges can manage pairs and policies on the server. In an Active Directory environment, a Domain Admin user or a domain user with Domain Admin privileges can manage pairs and policies on Dynamic File Services services in the domain.

You can allow other users to manage pairs and policies by adding them as members of the `Dynamic File Services` group. For information about the group and setting up administrators, see "Configuring Administrators for Pair Management" in the *Dynamic File Services 2.2 Administration Guide*.

3.3 Getting Started

After the install and administrator setup, you can begin using Dynamic File Services to create pairs and policies. This section provides an overview of the key tasks. For planning and use information, see the *Dynamic File Services 2.2 Administration Guide*.

- Section 3.3.1, "Configuring Network and Remote Shares," on page 25
- Section 3.3.2, "Connecting to a Server," on page 26
- Section 3.3.3, "Creating the First Pair and Policy," on page 26
- Section 3.3.4, "Creating More Pairs and Policies," on page 26
- Section 3.3.5, "Running Policies," on page 27
- Section 3.3.6, "Accessing Files on a Standard Pair," on page 27

3.3.1 Configuring Network and Remote Shares

Use the Windows Network Sharing feature to set up a network share for each path that you plan to use as a primary location in a Dynamic File Services pair. After you set up a standard pair, users can map to the network share on its primary location to get a merged view of the data on the primary and secondary locations. For a retention pair, users see only the data on the primary path; they use the Web interface to the Retention Review Service to view data in the retention repository.

Remote shares that you want to use as secondary paths must be created and published in Active Directory before you attempt to create the pair that uses the remote location. Add the `Dynamic File Services Storage Rights` group to the share, and grant all permissions for the group. For requirements, see "Using Remote Shares in an Active Directory Domain" in the *Dynamic File Services 2.2 Administration Guide*.

Continue with Section 3.3.2, "Connecting to a Server," on page 26.

3.3.2 Connecting to a Server

Use the Dynamic File Services Management Console to connect to the server you want to manage.

1 Open the Management Console, then open the Server Wizard.

When no pairs or policies are defined on the target server, a Server Wizard opens automatically to help you set up a connection to the server you want to manage.

2 Provide the following information:

- IP address or DNS name of the DynamicFS server you want to manage.

  If you are managing the server locally (that is, you are logged in to the server), you can use `localhost` or the loopback IP address (`127.0.0.1`) to manage the server without enabling an exception in the firewall for the Service port.

- The Dynamic File Service port number (default 8999).

- The username and password credentials for a user that you added to the `Dynamic File Services` group or for the Administrator user on the target DynamicFS server.

3 Click *Connect*.

If you are connecting to a remote server, you are prompted to accept the Dynamic File Services SSL certificate. For information, see "Accepting a Dynamic File Services Certificate" in the *Dynamic File Services 2.2 Administration Guide*.

The server folder is created and appears in the left panel.

4 Continue with Section 3.3.3, "Creating the First Pair and Policy," on page 26.

3.3.3 Creating the First Pair and Policy

In the Dynamic File Services Management Console, use the Setup Wizard to create a pair and a policy. The pair and policy are automatically associated.

If no pairs or policies have been defined on that server, the Setup Wizard opens automatically to help you to create a pair, to create a policy for the pair, and to associate the policy to the pair.

For information, see the following sections in the *Dynamic File Services 2.2 Administration Guide*:

1. "Creating a Pair"
2. "Creating a Policy"
3. "Providing Users with a Merged View of the Files in a Standard Pair "

Continue with Section 3.3.4, "Creating More Pairs and Policies," on page 26.

3.3.4 Creating More Pairs and Policies

Use any of the following methods to create additional Dynamic File Services pairs and policies:

- **Pair:** Right-click *Pairs* under the server in the left panel, then select *Pair Wizard*.
- **Policy:** Right-click *Policies* under the server in the left panel, then select *Policy Wizard*.
- **Pair and Policy:** Right-click the server in the left panel, then select *Setup Wizard*.

For information, see the following sections *in the Dynamic File Services 2.2 Administration Guide:*

- "Creating a Pair"
- "Creating a Policy"

3.3.5 Running Policies

The policies for a Dynamic File Services pair run at their next scheduled time, but you can run a policy at any time by right-clicking a pair and selecting the *Execute Now* option.

Run a single policy at a time on a pair to enforce its rules for moving data. A file is moved if it meets all of the filter options specified in the rule.

Configure multiple policies to run at the same time on a pair to enforce alternative rules for moving data. When the group of policies moves files in both directions, the primary-to-secondary policies are grouped and enforced, then the secondary-to-primary policies are grouped and enforced. A file is moved if it meets the rules for any one of the policies.

3.3.6 Accessing Files on a Standard Pair

Dynamic File Services allows users to access data for both paths of a standard pair via a network share that you create on the primary path. They see files on the primary and secondary locations as if the files are all stored on a single device.

The native access control of the underlying file systems controls user access to the data. All user access to the secondary path is made via the merged view of the data. Dynamic File Services does not need to relocate the data to give the user access to data on the secondary path.

In order to set access control on data in the pair, you should access the merged view of the data via the network share on the primary path, then set the access control for files and directories as you normally would.

3.4 Additional Information

See the following resources for additional information about installing, modifying, and uninstalling Dynamic File Services:

- Appendix A, "Silent Install Options for Dynamic File Services," on page 73
- Appendix 4, "Installing, Setting Up, and Using Dynamic File Services in a Windows Cluster," on page 29
- Appendix B, "Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services," on page 75
- Appendix C, "Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services in a Windows Cluster," on page 79

3.5 What's Next

See the following sections in the *Dynamic File Services 2.2 Administration Guide*:

- "Setting Up a Server in the Management Console"
- "Creating a Pair"
- "Creating a Policy"

4 Installing, Setting Up, and Using Dynamic File Services in a Windows Cluster

Novell Dynamic File Services (DynamicFS) supports using pairs and policies in a Windows failover cluster. DynamicFS is not cluster aware.

This section provides general guidelines for installing, setting up, and using DynamicFS on servers in a Windows failover cluster.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster resources. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

- Section 4.1, "Planning the Installation in a Windows Cluster," on page 29
- Section 4.2, "Sample Values for the Cluster Resources," on page 33
- Section 4.3, "Installing and Setting Up Dynamic File Services in a Windows Server 2012 Cluster," on page 35
- Section 4.4, "Installing and Setting Up Dynamic File Services in a Windows Server 2008 Cluster," on page 51
- Section 4.5, "Creating Pairs and Policies in a Cluster," on page 59
- Section 4.6, "Using Dynamic File Services in a Windows Cluster," on page 59
- Section 4.7, "Additional Information," on page 61

4.1 Planning the Installation in a Windows Cluster

Ensure that your system meets the requirements for Dynamic File Services in Chapter 2, "Planning the Installation," on page 17.

Consider the additional clustering guidelines in this section when you install and set up DynamicFS in a Windows cluster.

- Section 4.1.1, "Windows Cluster," on page 30
- Section 4.1.2, "Shared Disks," on page 30
- Section 4.1.3, "Destination Folder for Installation," on page 32
- Section 4.1.4, "Active Directory Domain," on page 32
- Section 4.1.5, "Dynamic File Services License Key," on page 32

4.1.1 Windows Cluster

The operating system used in the Windows cluster must be one of the supported Windows Server operating systems listed in Section 2.1, "Supported Platforms," on page 17. All nodes should run the same version of the operating system.

IMPORTANT: For information about Windows Clustering requirements, refer to the Microsoft documentation in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/cc757731).

The Microsoft references listed below can be helpful in using the Windows cluster management tools in Windows 2008 to set up the Dynamic File Service resource:

- *Failover Clusters* (http://technet.microsoft.com/en-us/library/dd197477(WS.10).aspx)
- *Configure a Service or Application for High Availability* (http://technet.microsoft.com/en-us/library/dd197590(WS.10).aspx)
- *Add a Resource to a Clustered Service or Application* (http://technet.microsoft.com/en-us/library/dd197494(WS.10).aspx)
- *Create a Shared Folder in a Clustered File Server* (http://technet.microsoft.com/en-us/library/dd197480(WS.10).aspx)
- *Verify the Configuration and Failover of a Clustered Service or Application* (http://technet.microsoft.com/en-us/library/dd197543(WS.10).aspx)
- *<Resource> Properties: Dependencies Tab* (http://technet.microsoft.com/en-us/library/cc772430.aspx)
- *Managing a Failover Cluster* (http://technet.microsoft.com/en-us/library/cc731618.aspx)

4.1.2 Shared Disks

Your Windows cluster must provide shared disks to use for Dynamic File Services as follows:

- **Program, Data, and Log Files:** The Dynamic File Services software and its related program files, data files, and log files must be stored in a folder on a shared disk.
- **Standard Pair:** Consider the following guidelines for selecting paths for a standard pair in a cluster:

Standard Pair Data Location	Primary Path	Secondary Path
Shared disk that is hosted on the same node as the Dynamic File Services software	Specify the physical path, such as `F:\home`.	Specify the physical path, such as `T:\home_secondary`.
	Use the Windows Disk Management tool to bind the same drive letter to the primary shared disk on each node in turn.	You can use the Windows Disk Management tool to bind the same drive letter to the secondary shared disk on each node in turn.

Standard Pair Data Location	Primary Path	Secondary Path
Share on a shared disk that is hosted in the cluster	Not supported.	Add the share as a resource for Dynamic File Services, then select the share when you create the pair. You must use the virtual cluster server name in the share path instead of the physical server name. The shared disk can fail over in the same or different resource than the one used for Dynamic File Services and the primary shared disks. For example, it could be in a separate File Share type resource.
Remote share published in the same Active Directory domain	Not supported.	The remote share resides on a location that is not part of the cluster, but is in the same domain. The remote share can reside in a different cluster in the same domain if desired. You must use the virtual cluster server name in the UNC path.
Cloud path	Not supported.	Not supported.

- **Retention Pair:** Consider the following guidelines for selecting paths for a retention pair in a cluster:

Retention Pair Data Location	Primary Path	Secondary Path
Shared disk that is hosted on the same node as the Dynamic File Services software	Specify the physical path, such as `S:\home`. You can use the Windows Disk Management tool to bind the same drive letter to the primary shared disk on each node in turn.	Specify the physical path, such as `T:\home_secondary`. You can use the Windows Disk Management tool to bind the same drive letter to the secondary shared disk on each node in turn.
Share on a shared disk that is hosted in the cluster	Add the share as a resource for Dynamic File Services, then select the share when you create the pair. You must use the virtual cluster server name in the UNC share path instead of the physical server name. The shared disk must fail over in the same resource as the Dynamic File Services software.	Add the share as a resource for Dynamic File Services, then select the share when you create the pair. You must use the virtual cluster server name in the UNC share path instead of the physical server name. The shared disk can fail over in the same or different resource than the one used for Dynamic File Services and the primary shared disks. For example, it could be in a separate File Share type resource.

Retention Pair Data Location	Primary Path	Secondary Path
Remote share published in the same Active Directory domain	The remote share resides on a location that is not part of the cluster, but is in the same domain.	The remote share resides on a location that is not part of the cluster, but is in the same domain.
	The remote share can reside in a different cluster in the same domain if desired. You must use the virtual cluster server name in the UNC path.	The remote share can reside in a different cluster in the same domain if desired. You must use the virtual cluster server name in the UNC path.
Cloud path	Not supported.	The cloud account is defined in Dynamic File Services, and all nodes have access to the Internet.

4.1.3   Destination Folder for Installation

DynamicFS must be installed on each node of the cluster in turn. The destination folder for each installation uses the same path on a shared disk.

4.1.4   Active Directory Domain

In an Active Directory domain, the active cluster node uses its own `NDFS-servername` proxy user to access files on remote shares that are used in pairs. Each node has its own `NDFS-servername` proxy user; there is no special proxy user for the cluster resource.

4.1.5   Dynamic File Services License Key

In a cluster, you must add the Windows Registry entry for Dynamic File Services setup (`..\SOFTWARE\Novell\Dynamic File Services\Setup`) to the cluster resource so that it follows Dynamic File Services to each node. Dynamic File Services functions in Evaluation Mode until a product license key is registered for the product. Only one key is needed. After the product installation, a user with Administrator privileges can register the license key from any node where Dynamic File Services is active. The `InstallID` key value in the registry is used to decrypt the license file, so this value must be the same on all nodes.

4.1.6   Dynamic File Services SSL Certificates

When you install Dynamic File Services on a cluster node, a self-signed certificate is created for the Dynamic File Service and stored in the Windows Registry entry for Dynamic File Services setup (`..\SOFTWARE\Novell\Dynamic File Services\Setup`). You add the setup location to the cluster resource so that the certificate follows Dynamic File Services to each node. The `DswSSLCertThumbprint` key contains the Service's SSL certificate information that is used by any active node. You are prompted only once to accept the Dynamic File Services certificate, regardless of the node that is active in the cluster.

If you modify the certificate, the new thumbprint is stored in the registry where it is available to any active node. You are prompted to accept the new certificate when you next connect to the Service.

4.1.7 Cluster-Managed Network Shares

Use the Windows Cluster Administrator tool to configure cluster-managed network shares on the primary path of a pair. This allows users to connect to a single share for a standard pair and see the merged file-tree view regardless of the node where the shared primary disk currently resides.

Clients must be in the same Active Directory domain as the Dynamic File Services server in order to access the cluster-managed network shares.

4.1.8 Dynamic File Service

- The Dynamic File Service and other components run only on the active node in a cluster.
- Instead of using the Dynamic File Service Controller menu to start or stop the Service, use the Windows Cluster Administrator tool to take the Dynamic File Service cluster resource offline and to bring it online.

4.1.9 Dynamic File Service Cluster Resource

The Dynamic File Service cluster resource should include all of the resources that are needed for DynamicFS to run in a cluster, such as:

- A unique IP address for the cluster resource
- The Dynamic File Service application (`dswservice`)
- The shared disk resource that contains the `Dynamic File Services` folder, which contains the Dynamic File Services program files, data files, and log files
- The Windows Registry entry for the Dynamic File Services setup
- The domain-level unique name for the virtual cluster server on the network (such as NDFSCLR)
- The shared disk resources that contain the primary paths and secondary paths that will be used in pairs
- The cluster-managed network shares that you create for the paths in pairs

4.1.10 Dynamic File Service Dependencies

Specify dependencies for the Dynamic File Service so that it is not started until the related resources are started and available. The cluster group IP address, cluster disk drives, and shares must be mounted and available when the Dynamic File Service begins.

4.2 Sample Values for the Cluster Resources

It is beyond the scope of this guide to provide detailed instructions about Windows cluster resource configuration, management, and best practices. To illustrate the process, this section provides one possible scenario for installing Dynamic File Services in a Windows Server 2008 two-node failover cluster. Replace the sample values with actual values for your environment, and use the clustering tools available on your Windows servers.

Component	Sample Value
Node in the Windows cluster where you first install Dynamic File Services	Node1

Component	Sample Value
Second (or subsequent) node in the Windows cluster where you install Dynamic File Services	`Node2`
IP address of the virtual cluster resource	10.10.10.201
Cluster service	Dynamic File Services (`dswservice`)
Virtual cluster network name for the resource	`NDFSCLR`
Shared drive for Dynamic File Services program files, databases, and log files	`S:\`
Installation destination path on the shared drive	`S:\Dynamic File Services`

Share for the `S:\Dynamic File Services` path	`DYNAMICFS_SHARE`
	
	`\\NDFSCLR\DYNAMICFS_SHARE`

Shared drive cluster resource for a primary path. For the DATA_PAIR example, its primary path is on the same physical drive as the folder where you installed Dynamic File Services.	`S:\`
Shared drive cluster resource for a secondary path.	`T:\`
Primary path for `DATA_PAIR`	`S:\DATA`
Secondary path for `DATA_PAIR`	`T:\Secondary\DATA`

Share for `S:\DATA`, which is used to give users access to files in the `DATA_PAIR`	`DATA_SHARE`
	
	`\\NDFSCLR\DATA_SHARE`

Cluster drive resource for a primary path	`K:\`
Cluster drive resource for a secondary path	`M:\`
Primary path for `PROJECTS_PAIR`	`K:\PROJECTS`
Secondary path for `PROJECTS_PAIR`	`M:\Secondary\PROJECTS`

Share for `K:\PROJECTS`, which is used to give users access to files in the `PROJECTS_PAIR`	`PROJECTS_SHARE`
	
	`\\NDFSCLR\PROJECTS_SHARE`

For example, the Windows Server 2008 failover cluster setup might look like this in the Windows Failover Cluster Manager tool:
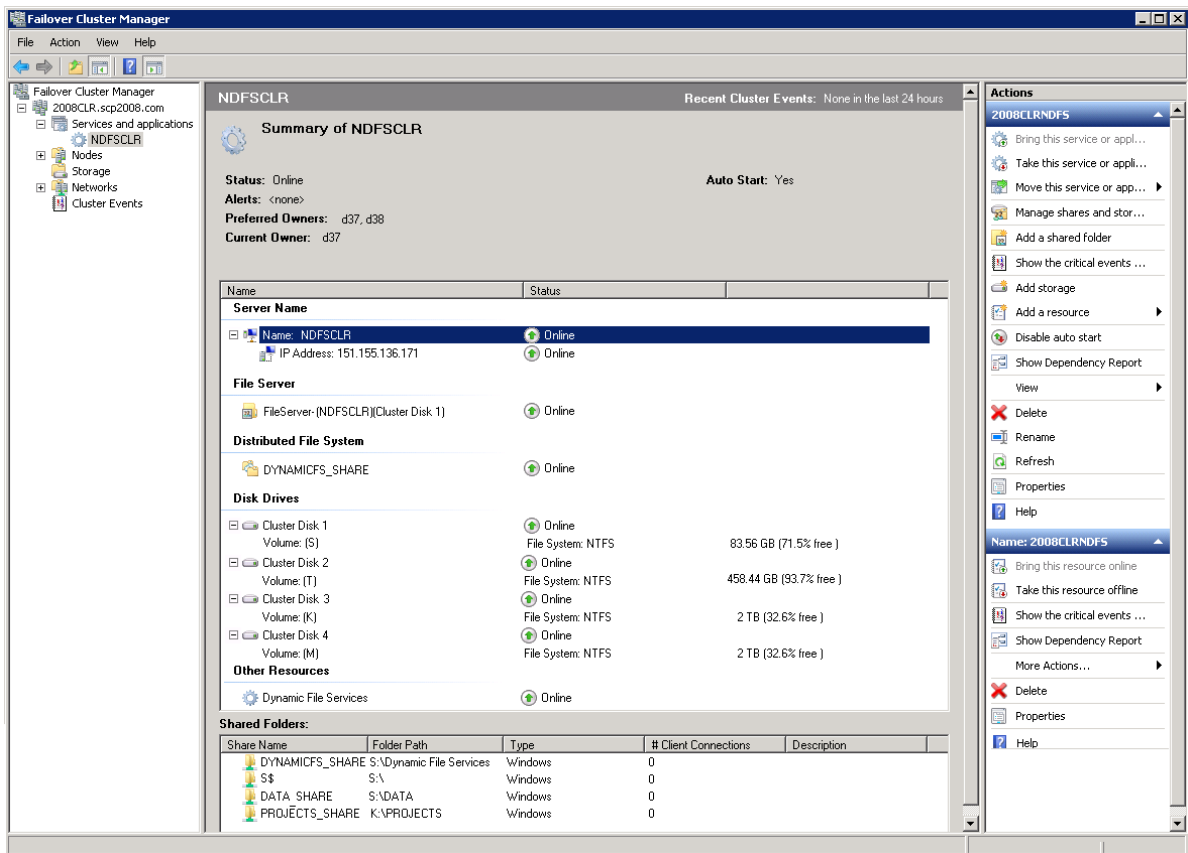
4.3 Installing and Setting Up Dynamic File Services in a Windows Server 2012 Cluster

You must install Dynamic File Services on each node in turn in order to lay down the information that is stored locally on each server. Specify the same path for the destination folder on a shared drive when you install on each node.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster roles. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

The following installation description assumes a failover cluster with two Windows Server 2012 nodes named Node1 and Node2. Modify the procedure as necessary if you have more nodes. Repeat the steps for Node2 on the additional nodes.

- Section 4.3.1, "Setting Up a Cluster Role for the Installation Destination Folder's Shared Disk," on page 36
- Section 4.3.2, "Installing and Setting Up Dynamic File Services on Node1," on page 40

4.3.1 Setting Up a Cluster Role for the Installation Destination Folder's Shared Disk

Before you install Dynamic File Services on Node1, set up the cluster and create a cluster role for the shared disk where you want to install Dynamic File Services. Use the guidelines in Section 4.1, "Planning the Installation in a Windows Cluster," on page 29.

IMPORTANT: It is beyond the scope of this guide to provide detailed instructions about Windows cluster roles configuration, management, and best practices. To illustrate the process, this section provides one possible scenario.

---

1 Use the Windows Failover Cluster Management tool to set up a two-node cluster.

2 In Windows Failover Cluster Manager, create a new File Server resource.

    2a Right-click the cluster container object, and select *Configure Role* to open the High Availability Wizard.
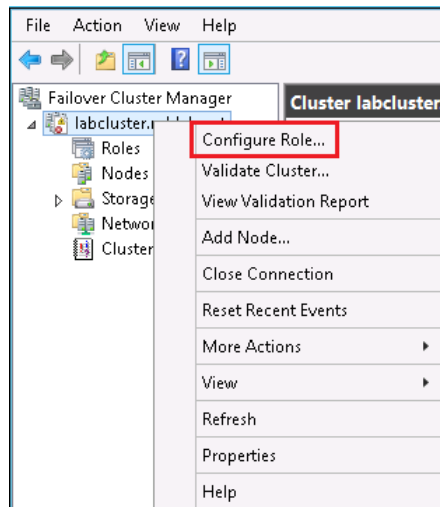
    2b Click *Next*.
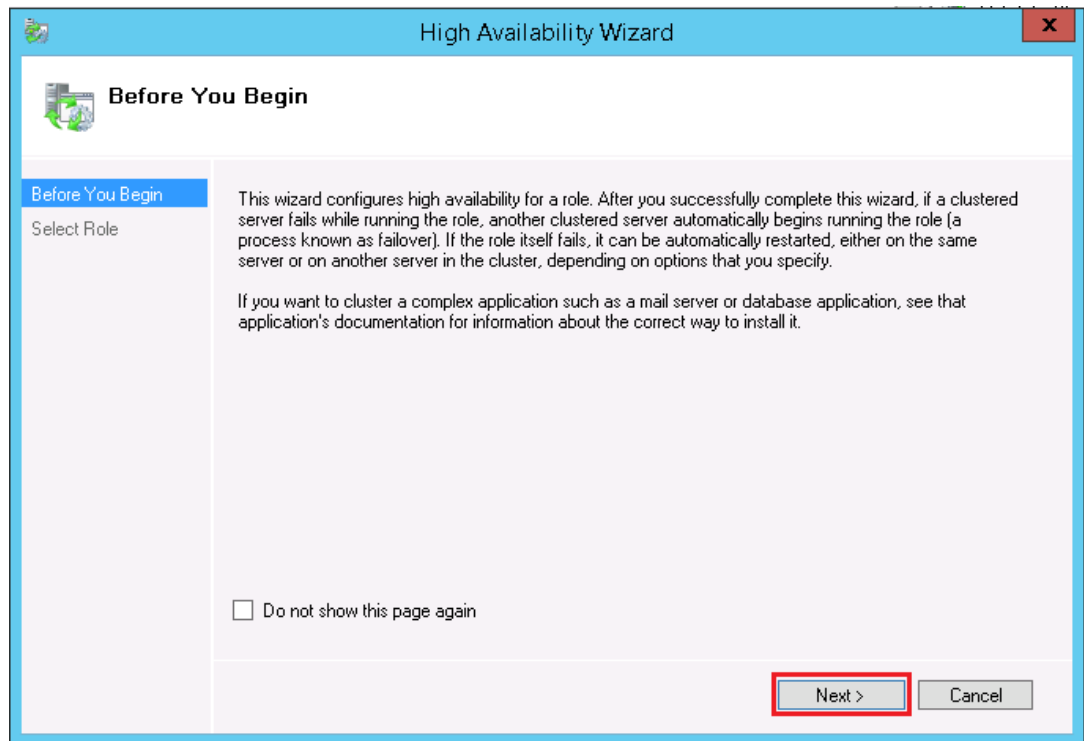
2c In the High Availability Wizard, select *File Server*, then click *Next*.
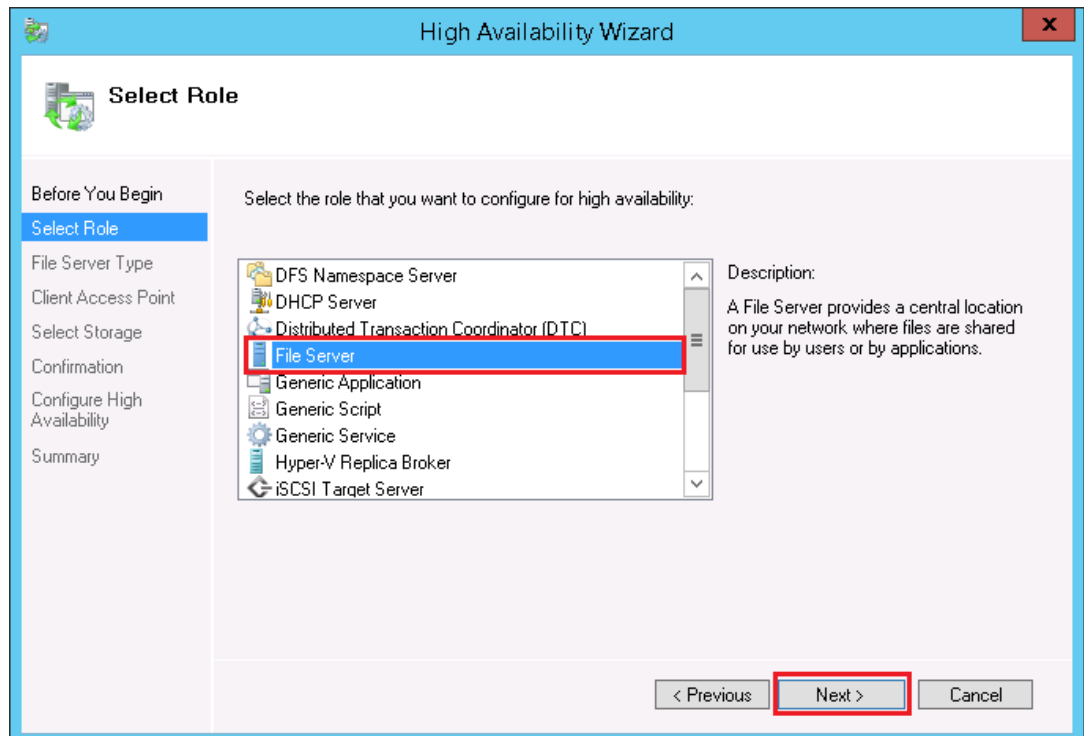
2d Select a *File Server Type*, then click *Next*.
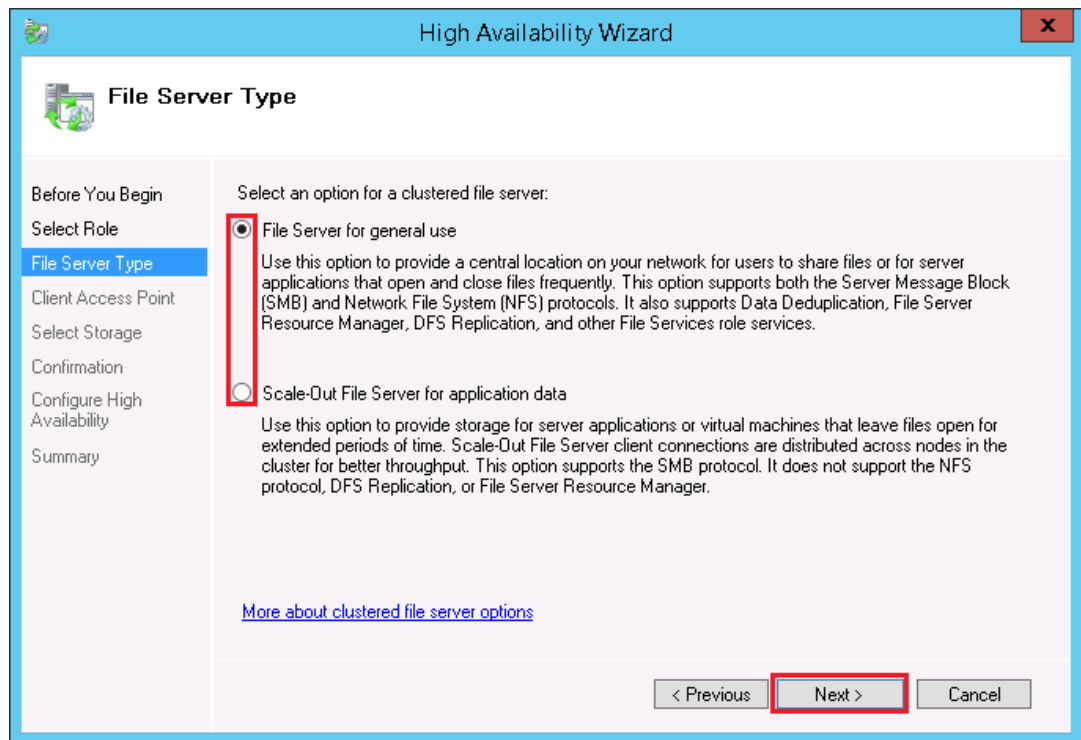
2e Specify a name for the resource and a unique cluster IP address, then click *Next*.

The name is used as the virtual server name for the resource, and the name is bound to its IP address. You use this name for accessing shares in the cluster role when you use the UNC path, such as \\<resource_name>\<share_name>.
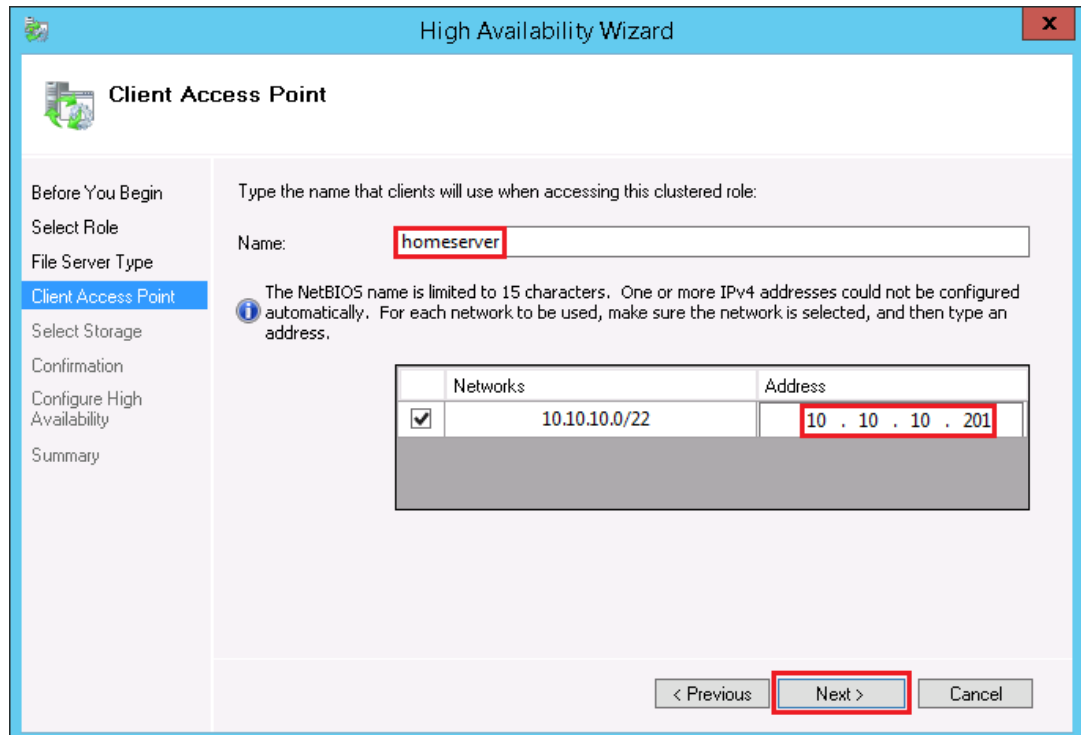
2f Add the shared disk where you want to install the Dynamic File Services software, such as Cluster Disk 1 (`S:\`).
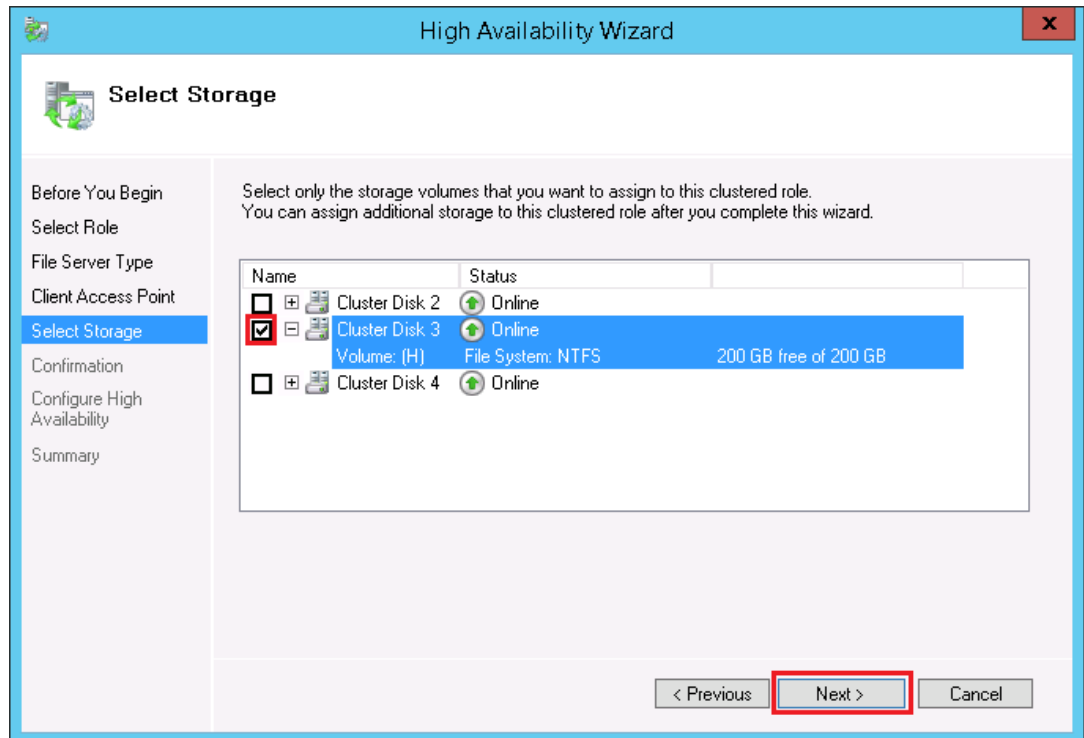
2g Follow the on-screen instructions to complete the setup.
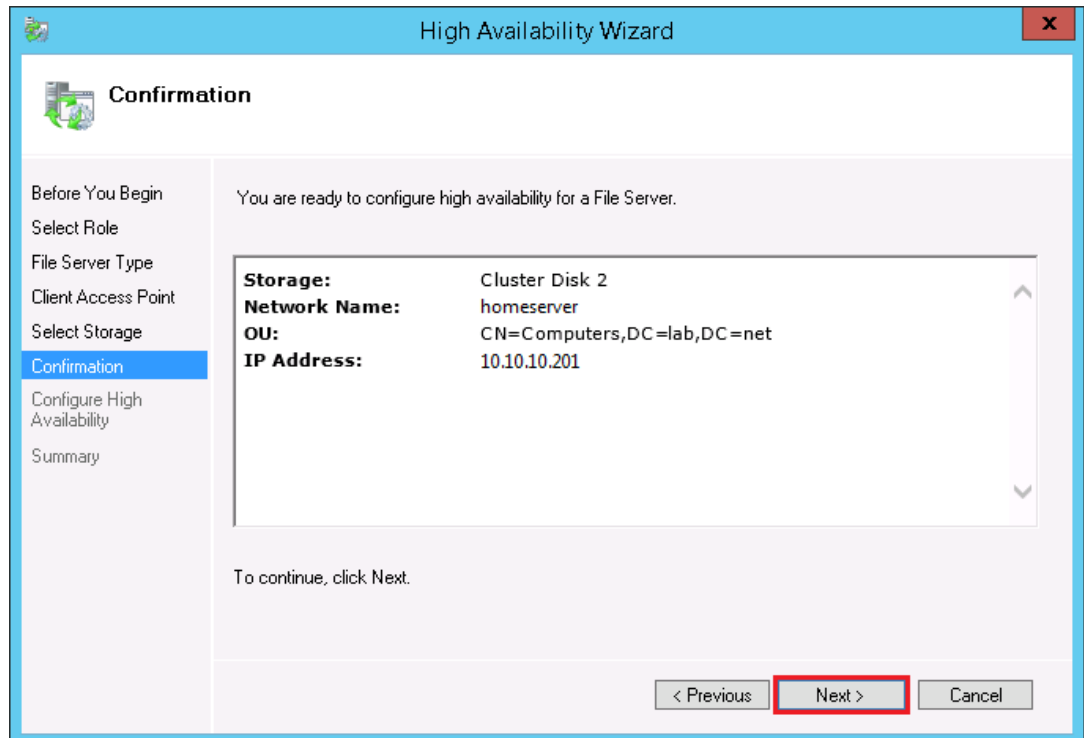
2h Click *Finish*.
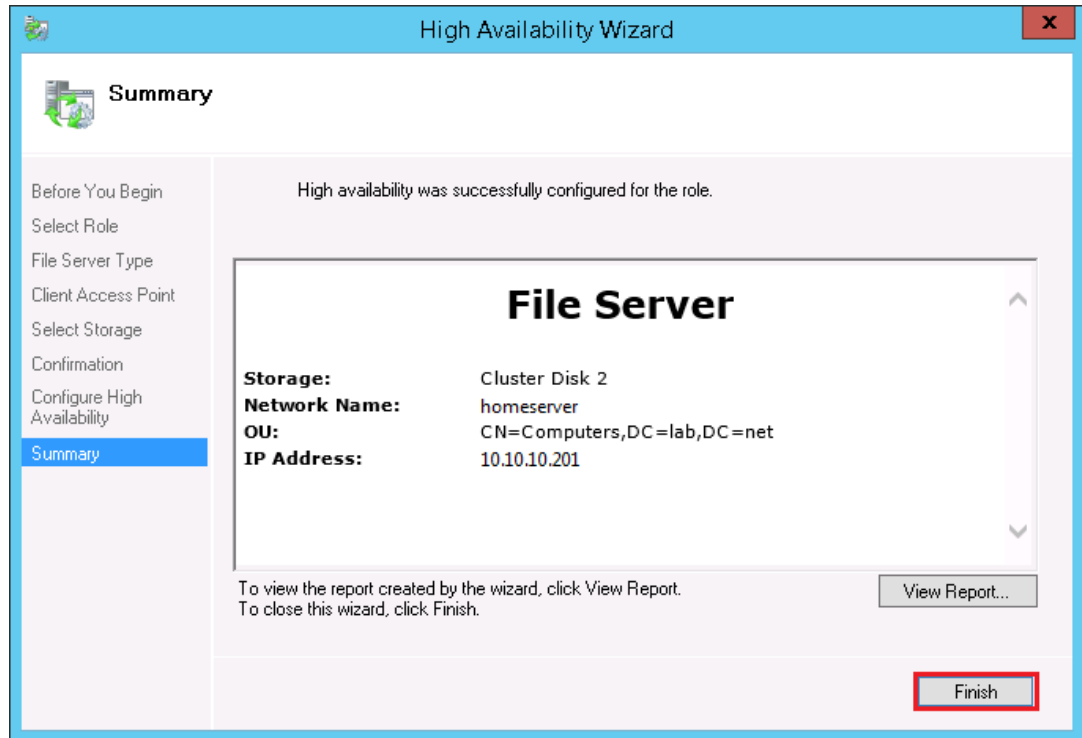
3 Continue with Section 4.4.2, "Installing and Setting Up Dynamic File Services on Node1," on page 53.

4.3.2 Installing and Setting Up Dynamic File Services on Node1

Use the following procedure to install and set up DynamicFS on the currently active node (Node1).

1 Log in to Node1 as the Administrator user or as a user with Administrator privileges.

In an Active Directory environment, log in as a domain user who also has Active Directory Domain Administrator rights.

2 Install DynamicFS.
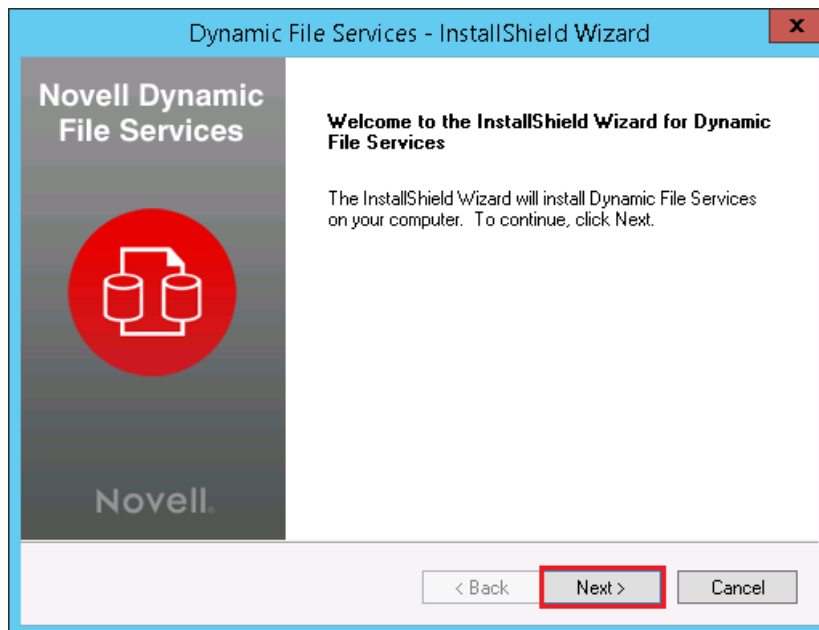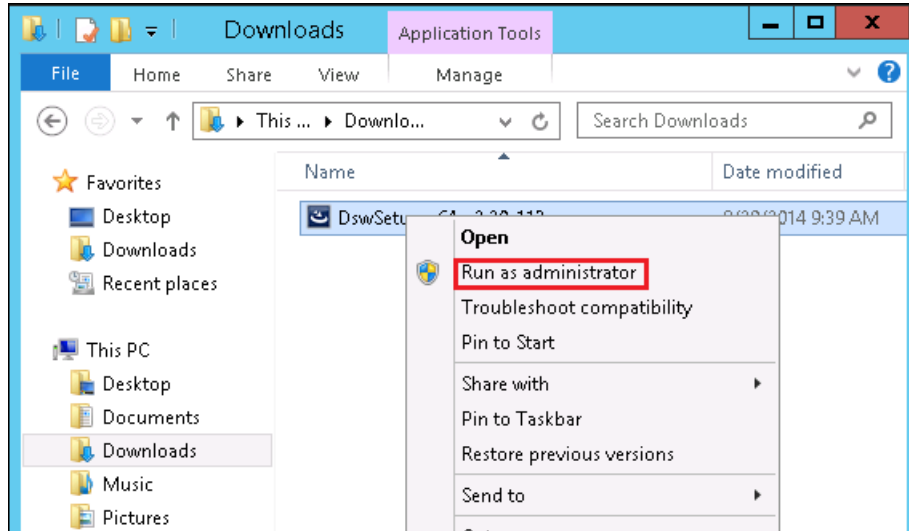
3 Accept the license agreement, select the *Custom* option, then click *Next*.

4 Specify the following settings:

- ◆ **Allow an exception for the Dynamic File Services port in the firewall:** Enable this option in order to remotely manage pairs and policies on this server from another computer. It is enabled by default.

- ◆ **Service port:** Specify the port number (default 8999) to use for the remote management communications.

- ◆ **Destination folder:** Click *Browse* to locate and select the destination folder on a shared device where you want to install the software, then click *OK*.

   For example, specify the *Destination folder* as `S:\Dynamic File Services`. The program files, data files, and log files are installed in the same folder.

For detailed installation instructions, see Section 3.1, "Installing Dynamic File Services," on page 23.

5 Verify that the Service Controller is started and that the Service is running.

The *Service Controller* icon appears in the notification area. Right-click the icon to view the Service status.
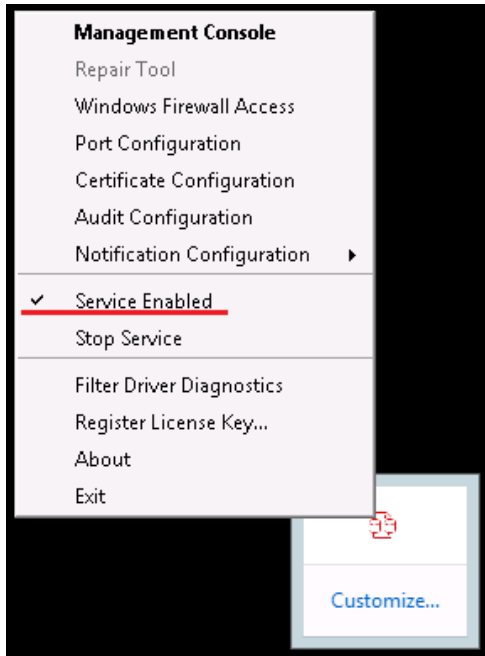
6 (Optional) Right-click the *Service Controller* icon, select *Register License Key*, then register the license key.

The Service operates in Evaluation Mode until you register a license key. You can apply the key now or later. After the product is installed in the cluster, a user with Administrator privileges can register the license key from any node where Dynamic File Services is active. You register the license key only once in the cluster. For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

7 Set up the DynamicFS administrator users for Node1 by adding their usernames as members of the `Dynamic File Services` group.

The user who installs Dynamic File Services is automatically added to the group. For information, see "Setting Up Administrators in a Domain" in the *Dynamic File Services 2.2 Administration Guide*:

IMPORTANT: You should assign the same users to the `Dynamic File Services` group on each node.

8 Stop the Dynamic File Service and exit the Service Controller:

8a Log in as the Administrator user or as a user with Administrator privileges.

8b Right-click the *Service Controller* icon in the notification area, then select *Stop service* to disable the Dynamic File Service.

8c Right-click the *Service Controller* icon in the notification area, then verify that the Dynamic File Service status is *Service Disabled*.

8d Right-click the Service Controller icon in the notification area, then select *Exit*.

9 Continue with Section 4.4.3, "Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Resource," on page 54.

4.3.3 Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Role

After you install Dynamic File Services on the shared cluster disk, you must add the following resources and dependencies to the cluster role that you created in Section 4.3.1, "Setting Up a Cluster Role for the Installation Destination Folder's Shared Disk," on page 36:

- ◆ The Dynamic File Service.
- ◆ Cluster shares for the primary paths in pairs.

  You can add shares for primary paths now or later as needed.
- ◆ Shared disks that you want to use for pairs and policies.

  You can add shared disks for pairs now or later as needed.

Use the guidelines in Section 4.1, "Planning the Installation in a Windows Cluster," on page 29.

IMPORTANT: It is beyond the scope of this guide to provide detailed instructions about Windows cluster roles configuration, management, and best practices. To illustrate the process, this section provides one possible scenario.

To add the Service, shared disks, and cluster shares to the Dynamic File Services cluster role for a Windows Server 2012failover cluster:

1 Use the Windows Failover Cluster Manager tool to create cluster-managed network shares for the `Dynamic File Services` folder on the shared disk and the folders that you plan to use as primary paths in pairs.

For example, set up the following shares:

Component	Sample Value
Share for the installation path (`S:\Dynamic File Services`)	DYNAMICFS_SHARE
Share for `S:\DATA`, which will be used as the primary path for `DATA_PAIR`	DATA_SHARE
Share for `K:\PROJECTS`, which will be used as the primary path for `PROJECTS_PAIR`	PROJECTS_SHARE

2 In the Windows Failover Cluster Manager tool, add a *Generic Service Resource* to the cluster resource where you installed the software:

  2a Right-click the resource, then select *Add Resource > Generic Service*.
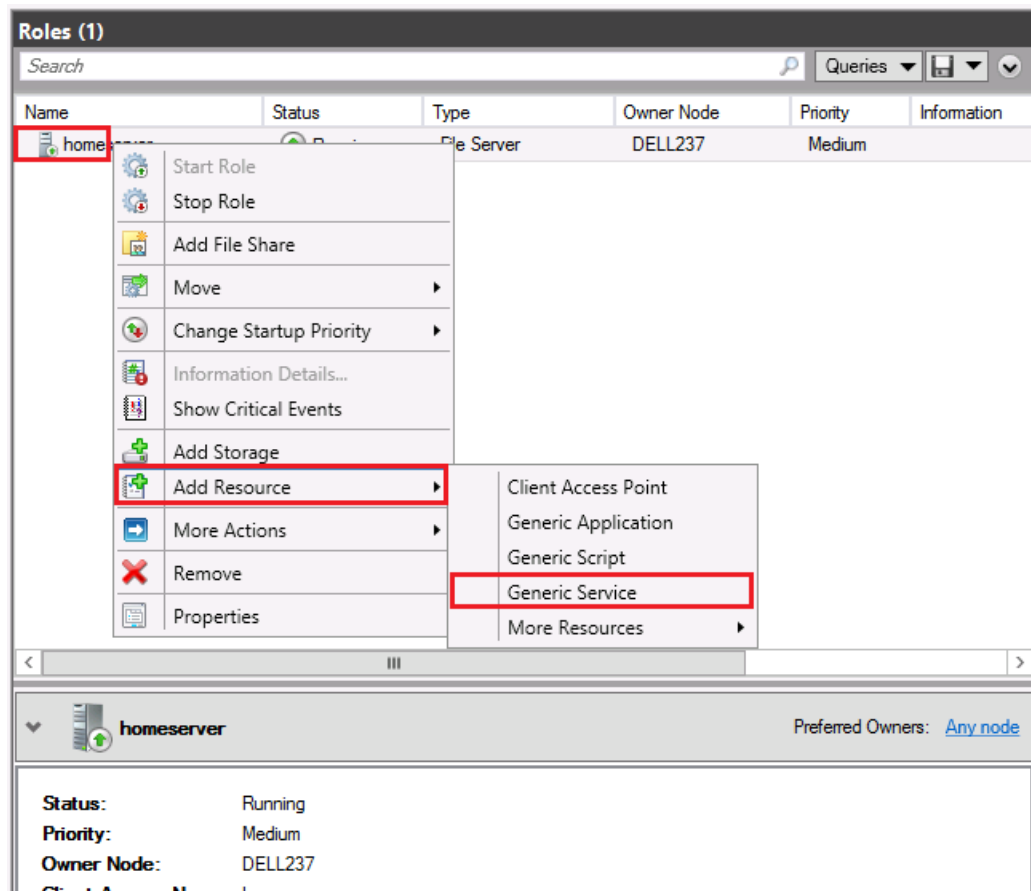
  2b On the New Resource Wizard page, select *Dynamic File Services*.
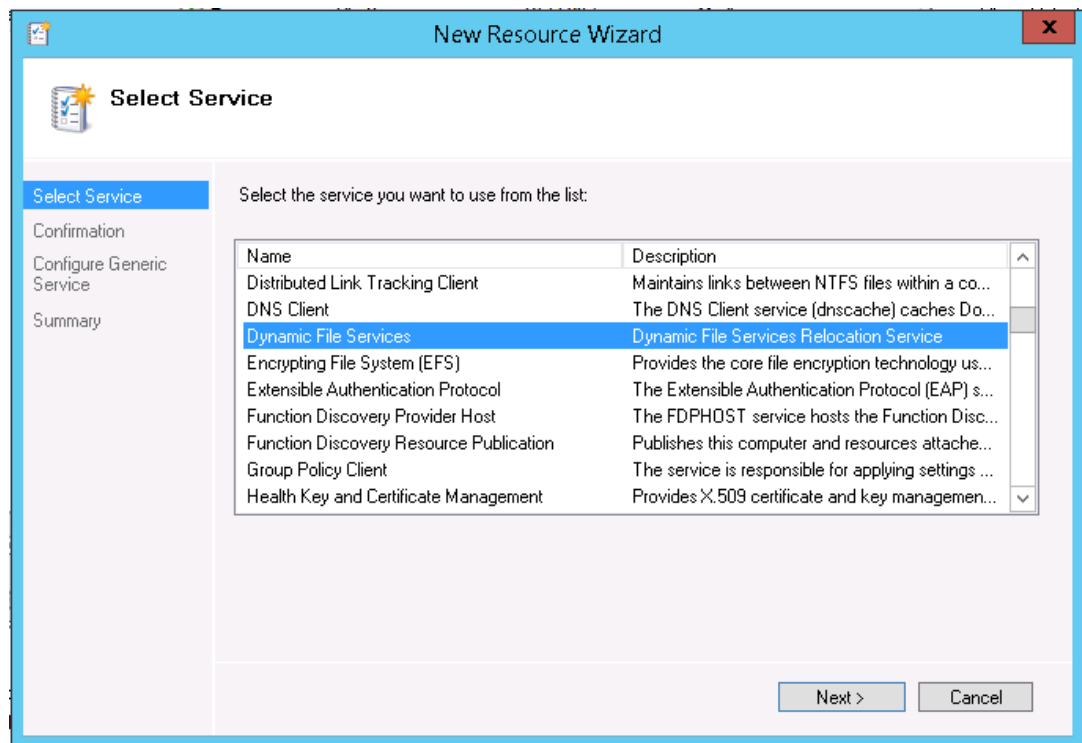
2c Click *Next > Next > Finish*.

3 Add dependencies to the service.

The Dynamic File Service resource is not started until all of the specified dependencies are started and are online.

3a With the Resources bottom tab selected, right-click the service, then select *Properties*.
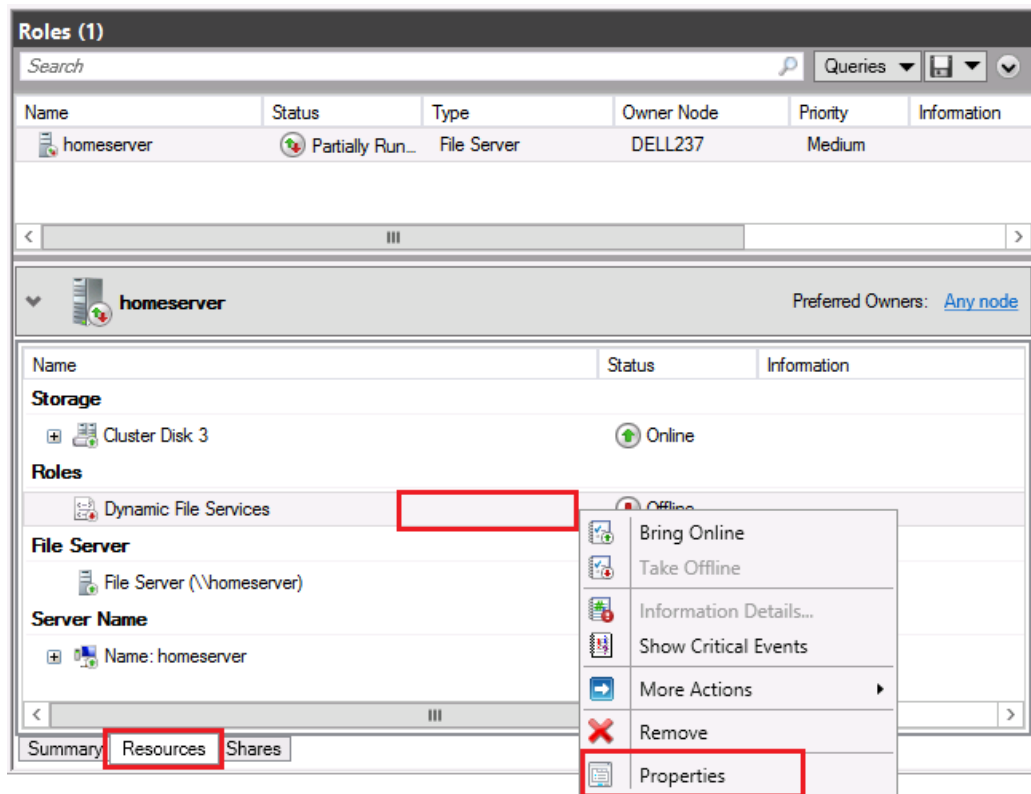
3b Click the *Dependencies* tab, then click *Insert* and add the File Server resource.
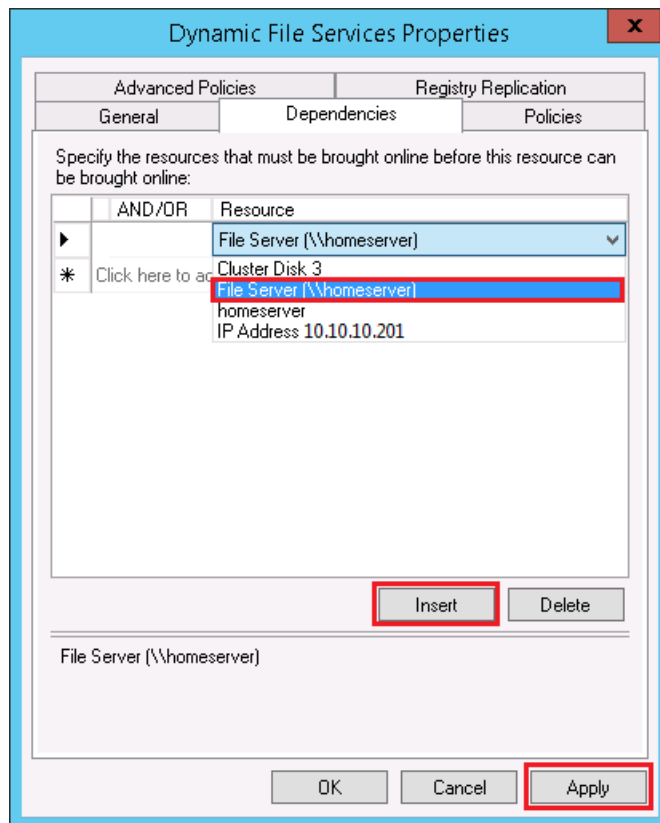
3c Click *Apply* to save your changes, or click *OK* to save and close the dialog box.

4 Add the registry entry for the Dynamic File Services setup as a resource. You must perform this step on the first node where you install Dynamic File Services.

4a Right-click the service, then select *Properties*.

4b Click the *Registry Replication* tab, then click *Add*.

4c Type `SOFTWARE\Novell\Dynamic File Services\Setup` as the *Root registry key*.
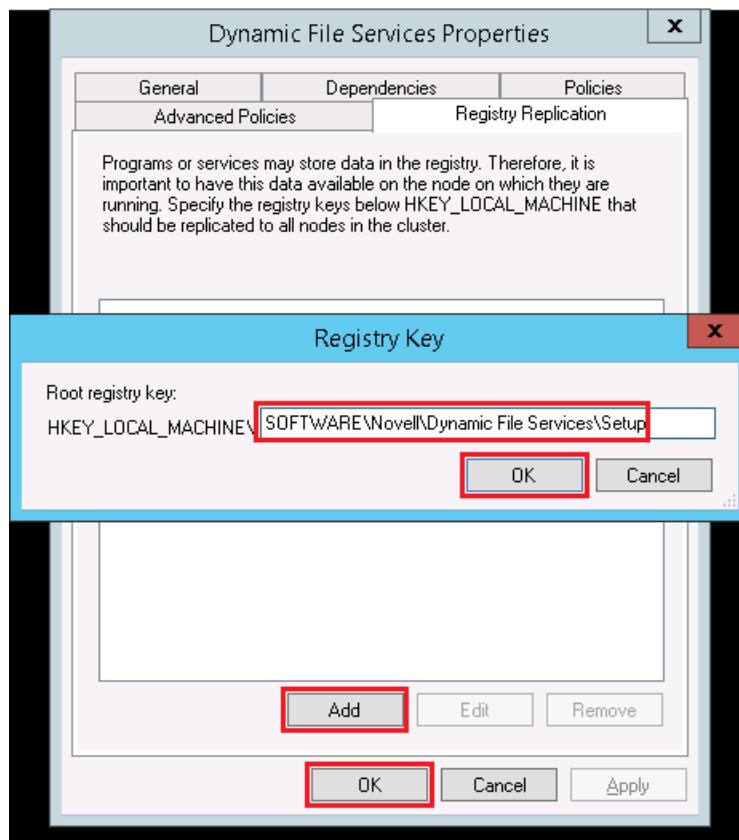
4d Click *OK* to apply the setting, then click *OK* to save your changes.

5 Right-click the cluster role and select *Add Storage*.
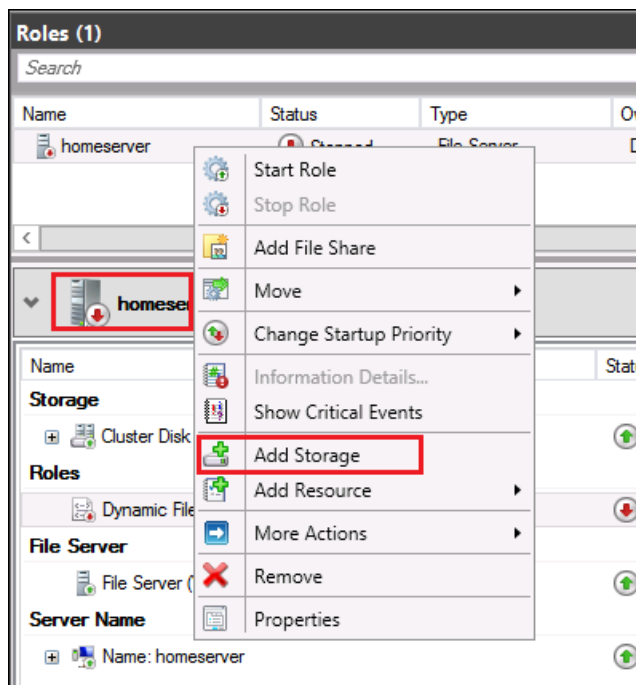
6 Add the secondary storage disk.
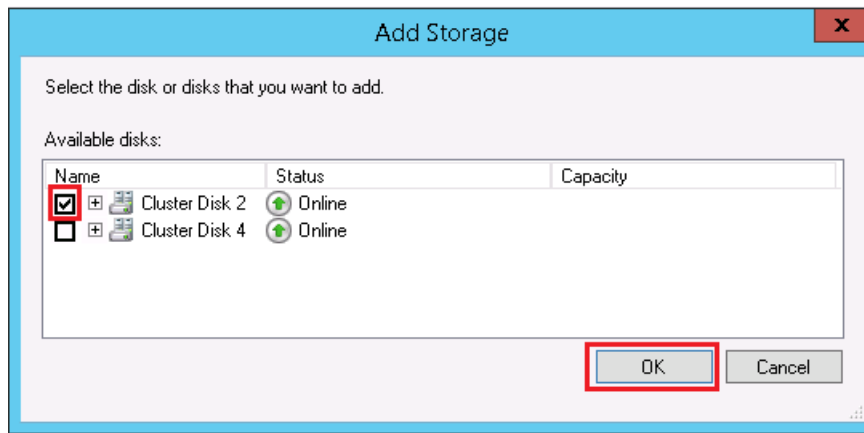
7 Verify that the cluster role works by right-clicking it, then selecting *Bring Online*.
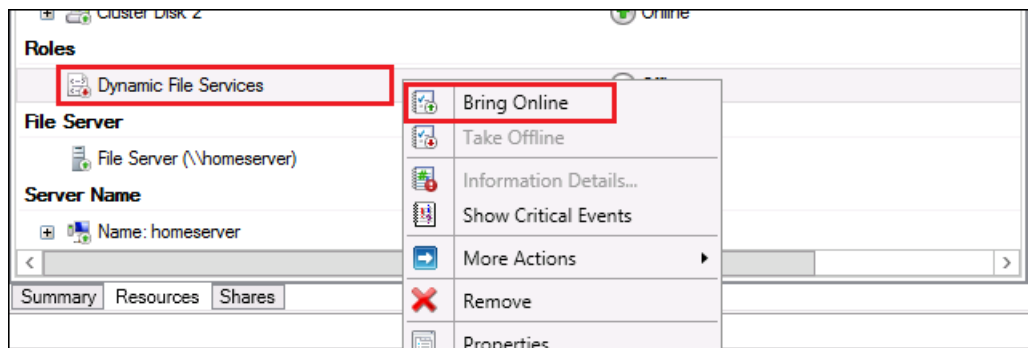
8 Continue with Section 4.4.4, "Moving the Cluster Resource from Node1 to Node2," on page 58.

4.3.4 Moving the Cluster Role from Node1 to Node2

1 On Node1, take the Service offline. In the Windows Failover Cluster Manager tool, right-click the *Dynamic File Services* cluster role, then select *Stop Role*.
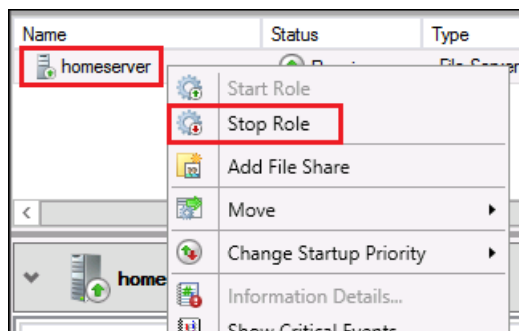
2 In the Windows Failover Cluster Manager tool, use the *Move* option to move the cluster role from Node1 to Node2.
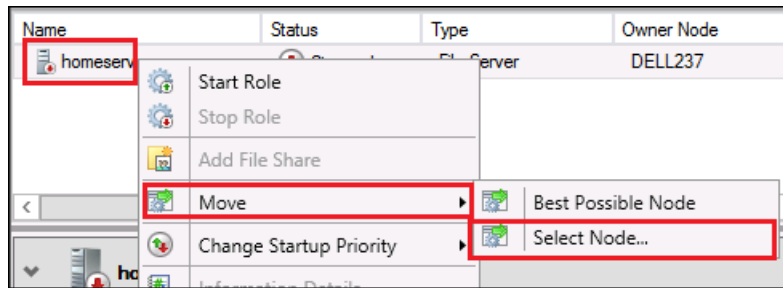
Do not bring the *Dynamic File Services* resource online on Node2 at this time.

3 Continue with "Installing and Setting Up Dynamic File Services on Node2" on page 58.

4.3.5 Installing and Setting Up Dynamic File Services on Node2

Use the following procedure to install Dynamic File Services software on the currently active node (Node2).

1 Log in to Node2 as the Administrator user or as a user with Administrator privileges.

In an Active Directory environment, log in as a domain user who also has Active Directory Domain Administrator rights.

2 Launch Filover Cluster Manager, then click *Roles*, select the *Resources* bottom tab, and bring the *File Server* resource online.

3 Install Dynamic File Services by using the *Custom* option and specify the destination folder as the same folder you installed Dynamic File Services to on Node 1.

The settings that were specified during the installation on Node1 are retrieved automatically from the Windows Registry on Node2, and are populated in the Custom fields. Do not modify the settings.

4 Set up the DynamicFS administrator users for Node2 by adding their usernames as members of the `Dynamic File Services` group for this node.

IMPORTANT: Assign the same users to the `Dynamic File Services` group that you used on Node1.

5 (Optional) On Node2, use the *Move* option of the Windows Cluster Administrator tool to move the shared drive from Node2 to Node1.

6 Click the Cluster Role and select *Start Role*.

All services are now running on Node2.

7 Continue with Section 4.5, "Creating Pairs and Policies in a Cluster," on page 59.

4.4 Installing and Setting Up Dynamic File Services in a Windows Server 2008 Cluster

You must install Dynamic File Services on each node in turn in order to lay down the information that is stored locally on each server. Specify the same path for the destination folder on a shared drive when you install on each node.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster resources. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

The following installation description assumes a failover cluster with two Windows Server 2008 nodes named Node1 and Node2. Modify the procedure as necessary if you have more nodes. Repeat the steps for Node2 on the additional nodes.

- Section 4.4.1, "Setting Up a Cluster Resource for the Installation Destination Folder's Shared Disk," on page 52
- Section 4.4.2, "Installing and Setting Up Dynamic File Services on Node1," on page 53
- Section 4.4.3, "Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Resource," on page 54
- Section 4.4.4, "Moving the Cluster Resource from Node1 to Node2," on page 58
- Section 4.4.5, "Installing and Setting Up Dynamic File Services on Node2," on page 58

4.4.1 Setting Up a Cluster Resource for the Installation Destination Folder's Shared Disk

Before you install Dynamic File Services on Node1, set up the cluster and create a cluster resource for the shared disk where you want to install Dynamic File Services. Use the guidelines in Section 4.1, "Planning the Installation in a Windows Cluster," on page 29.

IMPORTANT: It is beyond the scope of this guide to provide detailed instructions about Windows cluster resources configuration, management, and best practices. To illustrate the process, this section provides one possible scenario.

1 Use the Windows Failover Cluster Management tool to set up a two-node cluster.

2 In the Windows Failover Cluster Manager tool, create a new File Server resource.

  2a Right-click *Services and Applications*, then select *Configure a Service or Application* to open the High Availability Wizard.

  2b In the High Availability Wizard, select *File Server*, then click *Next*.
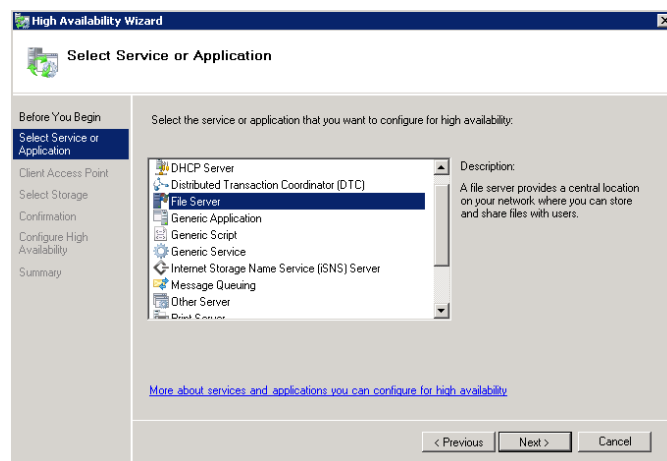
2c Specify a name for the resource and a unique cluster IP address, then click *Next*.

The name is used as the virtual server name for the resource, and the name is bound to its IP address. You use this name for accessing shares in the cluster resource when you use the UNC path, such as `\\<resource_name>\<share_name>`.
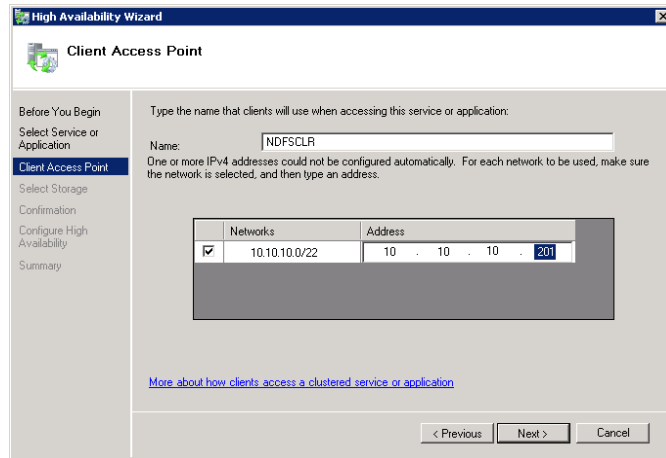
2d Add the shared disk where you want to install the Dynamic File Services software, such as Cluster Disk 1 (`S:\`), and follow the on-screen instructions to complete the setup.
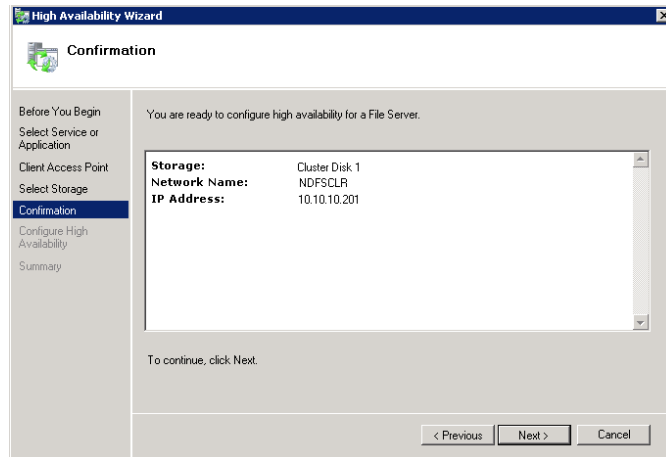
3 Continue with Section 4.4.2, "Installing and Setting Up Dynamic File Services on Node1," on page 53.

4.4.2 Installing and Setting Up Dynamic File Services on Node1

Use the following procedure to install and set up DynamicFS on the currently active node (Node1).

1 Log in to Node1 as the Administrator user or as a user with Administrator privileges.

In an Active Directory environment, log in as a domain user who also has Active Directory Domain Administrator rights.

2 Install DynamicFS by using the *Custom* option, and specify the following settings:

- **Allow an exception for the Dynamic File Services port in the firewall:** Enable this option in order to remotely manage pairs and policies on this server from another computer. It is enabled by default.

- **Service port:** Specify the port number (default 8999) to use for the remote management communications.

- **Destination folder:** Click *Browse* to locate and select the destination folder on a shared device where you want to install the software, then click *OK*.

  For example, specify the *Destination folder* as `S:\Dynamic File Services`. The program files, data files, and log files are installed in the same folder.

For detailed installation instructions, see Section 3.1, "Installing Dynamic File Services," on page 23.

3 Verify that the Service Controller is started and that the Service is running.

The *Service Controller* icon appears in the notification area. Right-click the icon to view the Service status.

4 (Optional) Right-click the *Service Controller* icon, select *Register License Key*, then register the license key.

The Service operates in Evaluation Mode until you register a license key. You can apply the key now or later. After the product is installed in the cluster, a user with Administrator privileges can register the license key from any node where Dynamic File Services is active. You register the license key only once in the cluster. For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

5 Set up the DynamicFS administrator users for Node1 by adding their usernames as members of the `Dynamic File Services` group.

The user who installs Dynamic File Services is automatically added to the group. For information, see "Setting Up Administrators in a Domain" in the *Dynamic File Services 2.2 Administration Guide*:

IMPORTANT: You should assign the same users to the `Dynamic File Services` group on each node.

6 Stop the Dynamic File Service and exit the Service Controller:

6a Log in as the Administrator user or as a user with Administrator privileges.

6b Right-click the *Service Controller* icon in the notification area, then select *Stop service* to disable the Dynamic File Service.

6c Right-click the *Service Controller* icon in the notification area, then verify that the Dynamic File Service status is *Service Disabled*.

6d Right-click the Service Controller icon in the notification area, then select *Exit*.

7 Continue with Section 4.4.3, "Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Resource," on page 54.

4.4.3 Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Resource

After you install Dynamic File Services on the shared cluster disk, you must add the following resources and dependencies to the cluster resource that you created in Section 4.4.1, "Setting Up a Cluster Resource for the Installation Destination Folder's Shared Disk," on page 52:

- The Dynamic File Service.

- Cluster shares for the primary paths in pairs.

  You can add shares for primary paths now or later as needed.

◆ Shared disks that you want to use for pairs and policies.

You can add shared disks for pairs now or later as needed.

Use the guidelines in Section 4.1, "Planning the Installation in a Windows Cluster," on page 29.


IMPORTANT: It is beyond the scope of this guide to provide detailed instructions about Windows cluster resources configuration, management, and best practices. To illustrate the process, this section provides one possible scenario.

To add the Service, shared disks, and cluster shares to the Dynamic File Services cluster resource for a Windows Server 2008 failover cluster:

1 Use the Windows Failover Cluster Manager tool to create cluster-managed network shares for the `Dynamic File Services` folder on the shared disk and the folders that you plan to use as primary paths in pairs.

For example, set up the following shares:

Component	Sample Value
Share for the installation path (`S:\Dynamic File Services`)	DYNAMICFS_SHARE
Share for `S:\DATA`, which will be used as the primary path for `DATA_PAIR`	DATA_SHARE
Share for `K:\PROJECTS`, which will be used as the primary path for `PROJECTS_PAIR`	PROJECTS_SHARE

2 In the Windows Failover Cluster Manager tool, add a *Generic Service Resource* to the cluster resource where you installed the software:

2a Right-click the resource, then select *Add a Generic Service Resource*.

2b On the New Resource Wizard page, select *Dynamic File Services*.
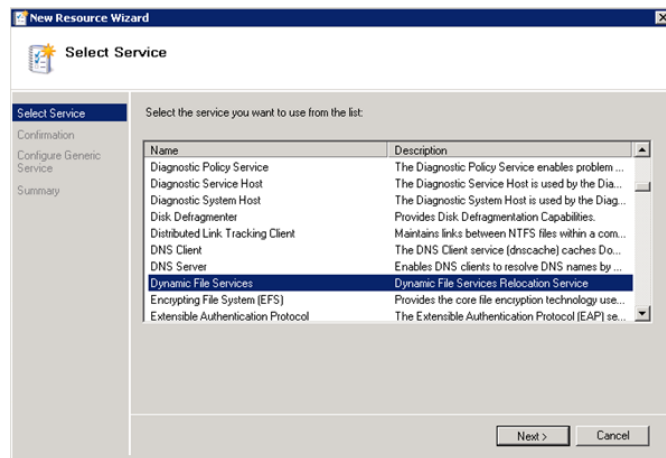
2c Click *Next*, then click *Finish*.

3 Add dependencies to the service.

The Dynamic File Service resource is not started until all of the specified dependencies are started and are online.

3a Right-click the service, then select *Properties*.

3b Click the *Dependencies* tab, then click *Insert*.

3c Select the shared disk resource. You can also specify other shared disk resources.
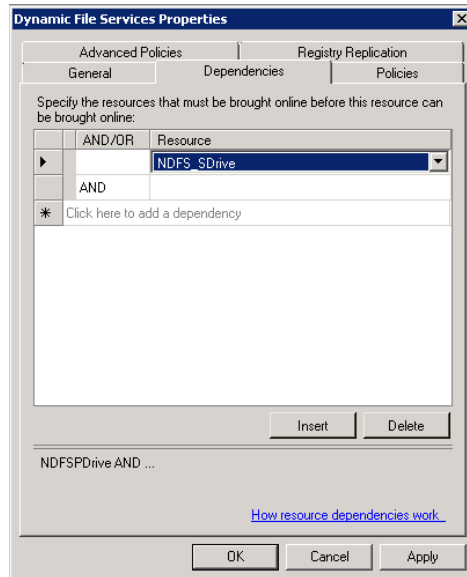
3d Click *Apply* to save your changes, or click *OK* to save and close the dialog box.

4 Add the registry entry for the Dynamic File Services setup as a resource. You must perform this step on the first node where you install Dynamic File Services.

4a Right-click the service, then select *Properties*.

4b Click the *Registry Replication* tab, then click *Add*.

4c Type SOFTWARE\Novell\Dynamic File Services\Setup as the *Root registry key*.
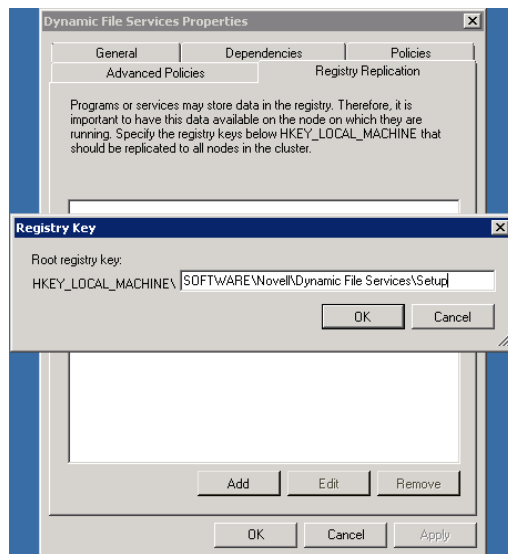
4d Click *OK* to apply the setting, then click *OK* to save your changes.

5 Use the Windows Failover Cluster Manager tool to add the following resources in the *Dynamic File Services Group* cluster resource:

Resource Type	Description
File Share	A cluster share for the `Dynamic File Services` folder
Network Share	The domain-level virtual cluster server name for the resource
File Share	The shares that you create for the primary path in each of the DynamicFS pairs

6 Verify that the cluster resource works by right-clicking it, then selecting *Bring Online*.
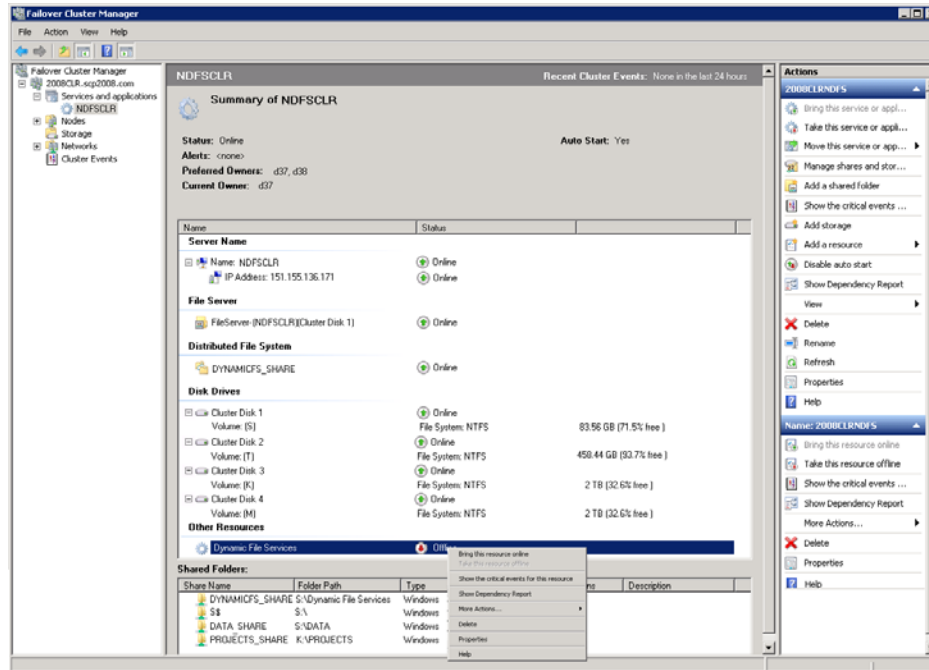
7 Continue with Section 4.4.4, "Moving the Cluster Resource from Node1 to Node2," on page 58.

4.4.4 Moving the Cluster Resource from Node1 to Node2

1 On Node1, take the Service offline. In the Windows Failover Cluster Manager tool, right-click the *Dynamic File Services* cluster resource, then select *Take Offline*.

2 In the Windows Failover Cluster Manager tool, use the *Move* option to move the cluster resource from Node1 to Node2.

Do not bring the *Dynamic File Services* resource online on Node2 at this time.

3 On Node2, ensure that the same drive letters are used to mount the shared disks for software and program data on Node2 that were used by the resource on Node1, such as `S:\`.

You can use the Windows Disk Management tool to bind the same drive letters to the shared disks.

4 Continue with "Installing and Setting Up Dynamic File Services on Node2" on page 58.

4.4.5 Installing and Setting Up Dynamic File Services on Node2

Use the following procedure to install Dynamic File Services software on the currently active node (Node2).

1 Log in to Node2 as the Administrator user or as a user with Administrator privileges.

In an Active Directory environment, log in as a domain user who also has Active Directory Domain Administrator rights.

2 Install Dynamic File Services by using the *Custom* option.

The settings that were specified during the installation on Node1 are retrieved automatically from the Windows Registry on Node2, and are populated in the Custom fields. Do not modify the settings.

3 Set up the DynamicFS administrator users for Node2 by adding their usernames as members of the `Dynamic File Services` group for this node.

IMPORTANT: Assign the same users to the `Dynamic File Services` group that you used on Node1.

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4 (Optional) On Node2, use the *Move* option of the Windows Cluster Administrator tool to move the shared drive from Node2 to Node1.

5 Bring the Service resource online.

6 Continue with Section 4.5, "Creating Pairs and Policies in a Cluster," on page 59.

4.5 Creating Pairs and Policies in a Cluster

After the Dynamic File Service has been set up as a cluster resource, use the Management Console to connect to its cluster resource IP address to create pairs and policies. Ensure that local paths reside on shared storage that can be failed over together with the Dynamic File Services resource between the cluster nodes. Ensure that remote share paths and cloud paths can be accessed when the resource is active on the node.

For information about creating DynamicFS pairs and policies, see the following sections in the *Dynamic File Services 2.2 Administration Guide*:

- "Setting Up a Server in the Management Console"
- "Creating a Pair"
- "Creating a Policy"

4.6 Using Dynamic File Services in a Windows Cluster

Dynamic File Services supports using pairs and policies in a Windows failover cluster. However, DynamicFS is not cluster aware.

This section describes known issues for using DynamicFS in a Windows cluster.

- Section 4.6.1, "Dynamic File Services Management Console," on page 59
- Section 4.6.2, "Dynamic File Service Controller," on page 60
- Section 4.6.3, "Dynamic File Service and Executable Files," on page 60
- Section 4.6.4, "Moving the Dynamic File Service Cluster Resource Between Nodes," on page 60

4.6.1 Dynamic File Services Management Console

When you use the Management Console to manage the Dynamic File Service in a cluster, use the cluster resource IP address of the Service to connect to the cluster instead of the server node's IP address.

When you create pairs and policies, ensure that the primary path and secondary path meet the requirements specified in Section 4.1.2, "Shared Disks," on page 30.

4.6.2 Dynamic File Service Controller

The Dynamic File Service Controller starts automatically at the beginning of each session when you log in to the active node where the disk that contains the `Dynamic File Services` folder is currently mounted. The controller does not start if you log in to the failover node because the shared disk is not mounted there.

4.6.3 Dynamic File Service and Executable Files

The Dynamic File Service is started automatically by the Windows cluster management tool when it brings the Dynamic File Service cluster resource online. The Dynamic File Service is stopped when the Windows cluster management tool brings the resource offline. Ensure that you use the Windows cluster management tool to start and stop the Service, not the Dynamic File Service controller.

Other DynamicFS executable files are called from the Dynamic File Service, or can be started manually when you are logged in as a user with Administrator privileges on the active node. Conversely, you cannot start the executable files on the failover node because the cluster drive resource that contains the files is not attached to it.

4.6.4 Moving the Dynamic File Service Cluster Resource Between Nodes

Before initiating a non-failover move of the Dynamic File Service cluster resource from the active node to a failover node, you must quiesce the Service as described in "Prerequisites for Stopping or Restarting the Service" (http://www.novell.com/documentation/dynamic_file_services/ dynamic_admin_win/data/serviceconfig.html#reqstopserv) in the *Dynamic File Services Administration Guide* (http://www.novell.com/documentation/dynamic_file_services/ dynamic_admin_win/data/bookinfo.html).

You should not issue a cluster move while a policy run is in progress. If a policy is running when the move is initiated, the resource enters an *Offline Pending* state until DynamicFS can gracefully complete the in-progress file copies, shut down the policy run, and go offline for the move. This process can take up to 10 minutes. During this time, the failover cluster File Server and IP address for the Dynamic File Service are unavailable, and users cannot access the files.

If the active node crashes when a policy run is in progress, the Dynamic File Service also crashes. The Dynamic File Service cluster resource immediately goes offline and fails over to the failover node. The following issues must be addressed after the Dynamic File Service cluster resource is back online:

- The policy run does not automatically resume or start over after the failover.
- There is no ability to gracefully complete any file copies that are in progress for the policy run.

  There is no data loss, but duplicate files might exist, where the original file is good but the copy of the file that was being moved by a policy is only a sparse file in the target location.

  To resolve this problem:

  1. Run the Pair Check utility on each pair to check for duplicate files in the pairs where the policy was running. For information, see "Reporting Conflicts for Duplicate Files" in the *Dynamic File Services 2.2 Administration Guide*.

  2. For each reported duplicate file conflict, delete the copy of the file in the target location of the policy move.

  3. After all duplicate file conflicts have been resolved, you can start the policy run manually, or let the policy run at its next scheduled time.

4.7 Additional Information

5 Upgrading to Dynamic File Services 2.2

Novell Dynamic File Services (DynamicFS) provides the option of upgrading an existing system to the new version without uninstalling and reinstalling it. A computer restart is required. Existing configuration files are retained, such as the configuration for the Service, the pairs database, and the policies database. The format of the pair and policy databases and log files is automatically updated to include any new or modified fields.

- Section 5.1, "Platform Changes Require a Manual Upgrade," on page 63
- Section 5.2, "Upgrading to Version 2.2," on page 64
- Section 5.3, "Planning for the Upgrade," on page 64
- Section 5.4, "Upgrading Dynamic File Services with the InstallShield Wizard," on page 65
- Section 5.5, "Post-Upgrade Changes and Tasks," on page 65

NOTE: A computer restart is required after an upgrade is complete.

5.1 Platform Changes Require a Manual Upgrade

The following require a manual upgrade process for moving to Dynamic File Services 2.2:

- **32-bit Servers:** Version 2.2 is 64-bit only; it is not supported on Windows servers that are running on 32-bit (X86) hardware.
- **Windows 2003 Servers:** Version 2.2 is not supported on Windows 2003.

   NOTE: Even if the server hardware is 64-bit and supports Windows 2008 or 2012, a manual upgrade process is still required due to the Windows server operating system change.

To upgrade from Windows 2003 or a 32-bit server installation, we recommend the following as *minimal steps* for transitioning to Dynamic File Services 2.2. Of course you will also need to follow your organization's policies and best practices for upgrading or replacing file servers.

1. Record the following information for your current installation:
   - **Server Pair Details:** Everything you need to recreate the server pairs in your current installation.
   - **Policy Details:** Everything you need to recreate the policies that govern each pair of your current installation.
   - **Schedule Details:** Everything you need to recreate the schedules that you use to manage your current installation.

2. Run the dswdump command on your installation to generate a text file containing server pair, policy, and schedule configuration information (see "Dynamic File Services Configuration Dump Utility" in the *Dynamic File Services 2.2 Client Commands and Utilities Reference*).

   The text generated by dswdump can be useful if you happen to miss something while doing Step 1.

3 Install Dynamic File Services 2.2.

4 Configure the new installation using the configuration details that you recorded in Step 1.

5.2 Upgrading to Version 2.2

NOTE: Novell Dynamic File Services (DynamicFS) version 2.2 is 64-bit only. There is no upgrade path from a 32-bit installation to a 64-bit installation.

The following paths are supported for upgrading the Management and Service components to Novell Dynamic File Services 2.2:

Source	Destination
Dynamic File Services 2.1 (32-bit)	Not supported
Dynamic File Services 2.1 (64-bit)	Dynamic File Services 2.2 (64-bit)

NOTE: Information about upgrading to previous versions is available in the documentation for previous releases on the DynamicFS online documentation site (https://www.novell.com/documentation/dynamic_file_services/).

5.3 Planning for the Upgrade

In addition to the requirements described in Chapter 2, "Planning the Installation," on page 17, ensure that your system meets the requirements in this section.

◆ Section 5.3.1, "Administrator Permissions," on page 64
◆ Section 5.3.2, "Stopping the Service," on page 65

5.3.1 Administrator Permissions

To update Dynamic File Services software, you need Administrator user privileges on the computer that is being updated.

In an Active Directory environment, you also need to be a domain user with Domain Admin rights. This allows the installation to set up the following domain groups and user:

◆ `Dynamic File Services` group
◆ `Dynamic File Services Retention Review` group
◆ `Dynamic File Services Storage Rights` group
◆ `NDFS-`*servername* user

5.3.2 Stopping the Service

Before you begin an upgrade, stop the Novell Dynamic File Service and exit the Service Controller. A computer restart is required after the upgrade is complete. During the service outage, users cannot access the merged file tree view of their files.

For information about stopping the Service, see "Prerequisites for Stopping or Restarting the Service" in the *Dynamic File Services 2.2 Administration Guide*.

5.4 Upgrading Dynamic File Services with the InstallShield Wizard

1 Log in as the Administrator user or as a user with Administrator privileges.

  In an Active Directory environment, log in as a domain user with Domain Admin rights.

2 In a Web browser, go to the Novell Downloads Web site (http://download.novell.com), then download the 64-bit (x64) architecture version of the DswSetup-*.exe file to a folder on the server or the client computer where you want to install it.

3 Ensure that the Dynamic File Service and the Service Controller are not running, as explained in Section 5.3, "Planning for the Upgrade," on page 64.

4 Double-click the DswSetup-*.exe file to start the InstallShield Wizard, then click *Yes* to permit the upgrade.

5 In the InstallShield Wizard, click *Next* to begin the upgrade.

6 If you are notified that files are in use for the Dynamic File Service and Service Controller, click *OK* to allow them to be automatically closed.

7 After the upgrade is complete, click *Finish* to exit the InstallShield Wizard.

  Dynamic File Services has automatically modified the format of the database files and log files to accommodate any new or modified fields.

8 Click *Yes* when you are prompted to restart the computer.

9 After the restart is complete, continue with Section 5.5, "Post-Upgrade Changes and Tasks," on page 65.

  Do not allow users to resume access to files that are managed by pairs until the post-upgrade tasks are completed.

5.5 Post-Upgrade Changes and Tasks

The Dynamic File Services Upgrade Wizard makes the following changes that you need to be aware of as you administer the upgraded product. Verify the changes before you allow access to the data managed by pairs.

This section identifies changes that were made to Dynamic File Services features during an upgrade from version 2.1 to version 2.2.

- Section 5.5.1, "Registration License Key," on page 66
- Section 5.5.2, "Retention Pair Reviewers," on page 66
- Section 5.5.3, "Policy File Types Configuration File," on page 66
- Section 5.5.4, "Policy Database," on page 66

5.5.1 Registration License Key

After the upgrade, your existing license key is automatically registered. The `NDFS.lic` file is added to the folder where you install Dynamic File Services.

If you uninstall the product and reinstall the product, you must register the key by using the *Register License Key* option in *Service Controller* menu. For information, see "Registering the License Key" in the *Dynamic File Services 2.2 Administration Guide*.

5.5.2 Retention Pair Reviewers

A Reviewers list was created for each existing retention pair. The `Dynamic File Services Retention Review` group was automatically added to the list. Other users and groups can be added to the Reviewers list after the upgrade is completed. For information, see "Configuring Reviewers for a Retention Pair" in the *Dynamic File Services 2.2 Administration Guide*.

5.5.3 Policy File Types Configuration File

New file type definitions have been added to the `C:\Program Files\Dynamic File Services\DswFileTypes.cfg` file. When you upgrade to version 2.1, the old file is saved as `DswFileTypes_v2.0.cfg`. If you have personalized the file type definitions, you should merge your additions or changes from the old file to the new file.

5.5.4 Policy Database

Your existing policy database files are consolidated into a single file:

`C:\ProgramData\Dynamic File Services\Policies\DswPolicyDatabase_v2.xml`

In the Management Console, view the list of policies to verify that they are available as expected.

When you upgrade to version 2.1, your existing policy database files are consolidated into the single file. Any policies saved in the `Snapshots` folder are also converted to the new database format. Verify by visual inspection of the existing snapshot files.

5.5.5 Notification and Audit Tracking Events

Cloud events are added for notification and audit tracking. The events are deselected by default. You can use the Audit Configuration tool and Notification Configuration tool to enable these events. For information, see "Configuring Audit Tracking Events" and "Configuring the Notification Service" in the *Dynamic File Services 2.2 Administration Guide*.

5.5.6 Email Notification

If you use authenticated mail relay for email notifications, the outgoing email password was decrypted, then re-encrypted during the upgrade. Verify that the outgoing email name and password are working as expected. Send a test message to an email address as described in "Setting Up the Email Address and Events to Send" in the *Dynamic File Services 2.2 Administration Guide*. If needed, re-enter the outgoing mail password, then click *OK*.

6 Upgrading to Dynamic File Services 2.2 in a Windows Cluster

Novell Dynamic File Services (DynamicFS) supports upgrading in a Windows failover cluster.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster resources. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

- Section 6.1, "Planning the Upgrade in a Windows Cluster," on page 67
- Section 6.2, "Upgrading Dynamic File Services in a Cluster," on page 68

6.1 Planning the Upgrade in a Windows Cluster

Before upgrading Dynamic File Services in a cluster environment, ensure that your system meets the requirements in the following sections:

- Chapter 2, "Planning the Installation," on page 17
- Section 4.1, "Planning the Installation in a Windows Cluster," on page 29
- Section 5.3, "Planning for the Upgrade," on page 64

You can expect some changes with the upgrade. For information, see Section 5.5, "Post-Upgrade Changes and Tasks," on page 65.

In addition, your setup must meet the following prerequisites that are discussed below:

- Section 6.1.1, "Quiescing the Service," on page 67
- Section 6.1.2, "Windows Cluster," on page 68
- Section 6.1.3, "Active Directory Domain," on page 68

6.1.1 Quiescing the Service

A computer restart is required after an upgrade is performed by using the InstallShield Wizard. Before you begin the upgrade process, ensure that you quiesce the Service as described in see "Prerequisites for Stopping or Restarting the Service" in the *Dynamic File Services 2.2 Administration Guide*.

IMPORTANT: Do not allow users to access the files again until the upgrade process is completed.

6.1.2 Windows Cluster

The operating system used in the Windows cluster must be one of the supported Windows Server operating systems listed in Section 2.1, "Supported Platforms," on page 17. All server nodes in the cluster should be running the same operating system version and architecture.

IMPORTANT: For information about Windows cluster requirements, refer to the Microsoft documentation in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

6.1.3 Active Directory Domain

In an Active Directory domain, the active cluster node uses its own NDFS-*servername* proxy user to access files on remote shares that are used in pairs.

6.2 Upgrading Dynamic File Services in a Cluster

You must upgrade Dynamic File Services on each node in turn in order to lay down the information that is stored locally on each server. Specify the same path for the destination folder on a shared drive when you install on each node.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster resources. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

The following installation description assumes a two-node failover cluster with servers named Node1 and Node2. Modify the procedure as necessary if you have more nodes.

- Section 6.2.1, "Upgrading Dynamic File Services on Node1," on page 68
- Section 6.2.2, "Moving the Shared Drive from Node1 to Node2," on page 69
- Section 6.2.3, "Upgrading Dynamic File Services on Node2," on page 69

6.2.1 Upgrading Dynamic File Services on Node1

Use the following procedure to upgrade DynamicFS on the currently active node (Node1):

1. Log in to Node 1 as the Administrator user or as a user with Administrator privileges.

   In an Active Directory environment, log in as a domain user with Domain Admin rights.

2. Download the 64-bit (x64) architecture version of the DswSetup-*.exe file to a folder on the server or the client computer where you want to install it.

3. Double-click the file to start the InstallShield Wizard, then click *Yes* to permit the upgrade.

4. In the InstallShield Wizard, click *Next* to begin the upgrade.

5. If you are notified that files are in use for the Dynamic File Service and Service Controller, click *OK* to allow them to be automatically closed and restarted.

6. Click *Finish*.

Dynamic File Services automatically modifies the format of the pair and policy databases and log files to use any new or modified fields.

7 Click *Yes* to automatically restart the computer now.

8 Use the Windows Cluster Administrator tool to stop the Dynamic File Service by taking its cluster resource offline.

9 Continue with Section 4.4.4, "Moving the Cluster Resource from Node1 to Node2," on page 58.

6.2.2   Moving the Shared Drive from Node1 to Node2

1 On Node1, use the Windows Cluster Administrator tool to move the following cluster resources from Node1 to Node2:

  ◆ The shared disk that contains the Dynamic File Services software

  ◆ The Dynamic File Service

2 Ensure that the same drive letter is used to mount the shared disk on Node2 that was used for Node1, such as `S:\`.

3 Continue with "Installing and Setting Up Dynamic File Services on Node2" on page 58.

6.2.3   Upgrading Dynamic File Services on Node2

Use the following procedure to upgrade DynamicFS on the currently active node (Node2):

1 Log in to Node2 as the Administrator user or as a user with Administrator privileges.

In an Active Directory environment, log in as a domain user with Domain Admin rights.

2 Upgrade DynamicFS on Node2 as described in Step 2 to Step 8 in Section 4.4.2, "Installing and Setting Up Dynamic File Services on Node1," on page 53.

3 (Optional) On Node2, use the Windows Cluster Administrator tool to move the Dynamic File Service and disk resources from Node2 to Node1.

4 Log in to the active cluster node as the Administrator user or as a user with Administrator privileges.

5 Use the Windows Cluster Administrator tool to start the Dynamic File Service by bringing its cluster resource online.

6 Perform the steps described in Section 5.5, "Post-Upgrade Changes and Tasks," on page 65.

7 FAQs and Troubleshooting Install and Uninstall Issues

This section answers frequently asked questions about Novell Dynamic File Services (DynamicFS) install and uninstall issues. It also describes workarounds for known issues.

◆ Section 7.1, "Error 1923 Occurs During a Reinstallation," on page 71

7.1 Error 1923 Occurs During a Reinstallation

If the Dynamic File Service is running when you attempt to uninstall the software and the Uninstall tool cannot stop the Service, the Service and related files might not be removed. This can cause a 1923 error when a reinstall is attempted.

Because of the 1923 error, the Service does not start automatically and it cannot be started manually by using the Service Controller. The Windows Event Viewer shows a Warning message: `Service not running`.

1 Click *Ignore* and continue with the installation.

The installation appears to finish with no further errors.

2 If you are prompted to do so, restart the computer.

3 After the restart, check to see if the Service is running.

4 If the Service does not start automatically and cannot be started manually by using the Service Controller, uninstall Dynamic File Services as described in Section B.4, "Removing Dynamic File Services," on page 76.

This cleans up the files and folders that prevent the Service from starting.

5 Reinstall Dynamic File Services as described in Chapter 3, "Installing and Setting Up Dynamic File Services," on page 23.

A Silent Install Options for Dynamic File Services

The Novell Dynamic File Services (DynamicFS) InstallShield Wizard application supports InstallShield silent install options.

A.1 InstallShield Silent Install Options

The following table identifies commonly used silent install options for InstallShield:

InstallShield Option	Description
`/r`	Records installation responses in an answer file.
	Use this option with the graphical installer to create the answer file (such as `C:\Windows\setup.iss`) that is needed to perform a silent install.
`/s`	Silently installs the application.
`/sms`	Causes the installer to pause until the installation finishes.
`/f1"answer_file_filename.iss"`	Specifies the filename of the answer file.

For information about other InstallShield silent and unattended install options, see *Unattended/Silent Installation Switches* (http://unattended.sourceforge.net/installers.php) on the SourceForge.Net Web site.

A.2 Creating the Silent Install Answer File for Dynamic File Services

1 Log in as the Administrator user or as a user with Administrator privileges.

2 Create the InstallShield answer file on the same platform and hardware setup where you plan to use the silent install.

   2a In a *Command Prompt* console, start the GUI install and use the `/r` option to record your responses.

Architecture	Enter
32-bit	`Not supported`
64-bit	`DswSetup-x64-v2.2-<build>.exe /r`

The answer file is saved to the Windows System root folder, such as
`C:\Windows\setup.iss`.

2b Use the InstallShield GUI to install Dynamic File Services as described in Section 3.1, "Installing Dynamic File Services," on page 23.

Your responses to the install options in the GUI are captured to the answer file, such as
`C:\Windows\setup.iss`.

2c Copy `setup.iss` to the same location as the DynamicFS GUI install executable file.

You can rename the answer file to a name that indicates the install scenario.

2d Repeat the process for each additional install scenario you need to create for the current platform and hardware setup.

A.3 Silently Installing Dynamic File Services

1 On the machine where you want to silently install Dynamic File Services, copy the DynamicFS setup file and answer file into a folder.

2 In a Windows Command Prompt console on the machine, enter

`DswSetup-x64-v2.2-<build>.exe /s /f1"answer_file_filename"`

Replace `answer_file_filename` with the InstallShield answer file, such as `setup.iss`.

For example, to install DynamicFS, use the `DswSetup-x64-v2.2-<build>.exe` file, and specify the answer file that you want to use, enter the following at the command prompt:

`DswSetup-x64-v2.2-<build>.exe /s /f1"setup.iss"`

The following command assumes the file is named `setup.iss` and is in the `C:\Windows` directory or in the same directory as the install executable:

`DswSetup-x64-v2.2-<build>.exe /s`

You can also use the `/sms` option to cause the installer to pause until the installation completes:

`DswSetup-x64-v2.2-<build>.exe /s /sms`

B Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services

You can use the Uninstall tool to modify, repair, or uninstall Novell Dynamic File Services (DynamicFS).

- Section B.1, "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software," on page 75
- Section B.2, "Modifying Dynamic File Services," on page 75
- Section B.3, "Repairing Dynamic File Services," on page 76
- Section B.4, "Removing Dynamic File Services," on page 76

B.1 Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software

Before you use the Uninstall tool, ensure that you meet the following requirements:

- The Service must be stopped before you attempt to modify, repair, or remove the Dynamic File Services software. Before you disable the Service, you must quiesce the Service as described in "Prerequisites for Stopping or Restarting the Service" in the *Dynamic File Services 2.2 Administration Guide*.
- In an Active Directory environment, the user who runs the Uninstall tool must be a domain user with local Administrator privileges and Active Directory Domain Administrator rights.

B.2 Modifying Dynamic File Services

The *Modify* option in the Dynamic File Services Uninstall tool allows you to add or remove the Service component of the Dynamic File Services software on a computer. The Service component is typically installed only on those servers where you want to create pairs and policies.

IMPORTANT: Before you begin, ensure that you meet the "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software" on page 75.

1 Log in as the Administrator user or as a user with Administrator privileges.

2 Disable the Dynamic File Service as described in "Stopping the Dynamic File Service" in the *Dynamic File Services 2.2 Administration Guide*.

3 Select *Start > Programs > Dynamic File Services > Uninstall Dynamic File Services.*

If you are prompted by the Windows User Account Control feature for permission, supply the necessary credentials and confirm. The InstallShield Wizard opens.

4 Select *Modify*, then click *Next*:

5 Select *Custom*, then do one of the following:

- ◆ Select the *Service* check box to add the Service to the computer.
- ◆ Deselect (clear) the *Service* check box to remove the Service from the computer.

6 Click *Next* and follow the on-screen instructions to complete the software change.

7 After the change is complete, click *Finish* to close the wizard.

8 Enable the Dynamic File Service as described in "Starting the Dynamic File Service" in the *Dynamic File Services 2.2 Administration Guide*.

B.3 Repairing Dynamic File Services

The *Repair* option in the Dynamic File Services Uninstall tool allows you to reinstall the currently installed components of the Dynamic File Services software on a computer.

IMPORTANT: Before you begin, ensure that you meet the "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software" on page 75.

1 Log in as the Administrator user or as a user with Administrator privileges.

2 Disable the Dynamic File Service as described in "Stopping the Dynamic File Service" in the *Dynamic File Services 2.2 Administration Guide*.

3 Select *Start > Programs > DynamicFS > Uninstall DynamicFS.*

If you are prompted by the Windows User Account Control feature for permission, supply the necessary credentials and confirm. The InstallShield Wizard opens.

4 Select *Repair*, then click *Next* and follow the on-screen instructions to complete the software repair.

If a valid certificate exists, a new certificate is not created and an error message on the creation is returned. Click *OK* to dismiss the message.

5 After the repair is complete, click *Finish* to close the wizard.

6 Enable the Dynamic File Service as described in "Starting the Dynamic File Service" in the *Dynamic File Services 2.2 Administration Guide*.

B.4 Removing Dynamic File Services

The *Remove* option in the Dynamic File Services Uninstall tool automatically does the following:

- ◆ Removes the Dynamic File Services program files.
- ◆ Clears the Dynamic File Services entries in the computer registry.
- ◆ Removes the SSL certificate from the local personal computer store.
- ◆ Removes the local `Dynamic File Services` group.
- ◆ In an Active Directory environment, it removes the domain user `NDFS-servername` from the domain. If this is the only proxy user in the Dynamic File Services Storage Rights (`DFSStorageRights`) group, it also removes the domain group.

You can separately specify whether you want to also remove all of the files in the `Dynamic File Services` folder that were created since the install, which includes the pair and policy database files. The files on the primary paths and secondary paths are untouched.

- Section B.4.1, "Planning to Uninstall Dynamic File Services," on page 77
- Section B.4.2, "Uninstalling Dynamic File Services," on page 78

B.4.1 Planning to Uninstall Dynamic File Services

In addition to the requirements in Section B.1, "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software," on page 75, ensure that your system meets the uninstall guidelines in this section.

- "Locating Files on the Two Paths" on page 77
- "Keeping the Pair and Policy Database Configuration Files" on page 77
- "Notifying Users" on page 78

Locating Files on the Two Paths

Before uninstalling Dynamic File Services, you should verify that the primary path and secondary path contain the files that you intend. You can create policies or use the *Move Files* option on a pair to move the files to their desired final destinations.

Keeping the Pair and Policy Database Configuration Files

If you plan to reinstall Dynamic File Services, you can reuse the existing pair and policy databases if you specify that you want to keep them during the uninstall.

When you uninstall the Dynamic File Services software, you are prompted with an option to *Remove all files created by Dynamic File Services*. The option is disabled by default. Use the option to achieve either of the following outcomes:

- **Keep Pair and Policy Database Files:** To keep the existing pair and policy database files, deselect the *Remove all files created by Dynamic File Services* check box. You typically retain the files if you plan to reinstall the software.

  The pair and policy database files are not removed from the computer. The files in a pair remain on the two paths.

- **Discard Pair and Policy Database Files:** To discard the existing pair and policy database files, select the *Remove all files created by Dynamic File Services* check box. You typically discard the files if you do not plan to reinstall the software on the computer, or if you plan to create all new pairs and policies after reinstalling the software.

  The two paths in a pair are automatically unlinked, and the pair and policy database files are deleted. The files in a pair remain on the two paths.

  If you reinstall the software, you can create pairs and policies again. If you previously exported a policy, you can also use the *Import policy* option to add it.

Notifying Users

After you uninstall the software, the merged view of files is no longer available to users. When users access a network share on a primary path, they see only the files on the primary location. The data on a secondary path remains on its disk, but the users can no longer access the files via the share. You should notify the users of the changes you are making to assure them that their files are not lost.

B.4.2   Uninstalling Dynamic File Services

Before you begin an uninstall, ensure that you have prepared the system as described in Section B.4.1, "Planning to Uninstall Dynamic File Services," on page 77.

IMPORTANT: On some Windows platforms, a computer restart is required after the uninstall if you have not stopped the Service and did not exit the Service Controller.

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1 Log in as the Administrator user or as a user with Administrator privileges.

2 Stop the Dynamic File Service.

    2a Disable the Dynamic File Service as described in "Stopping the Dynamic File Service" in the *Dynamic File Services 2.2 Administration Guide*.

    2b Right-click the Service Controller icon in the Windows notification area, and verify that the Service state is *Service Disabled*.

3 Stop the Service Controller by right-clicking the Service Controller icon, then selecting *Exit*.

4 Select *Start > All Programs > Dynamic File Services > Uninstall Dynamic File Services*.

If you are prompted by the Windows User Account Control feature for permission, supply the necessary credentials and confirm. The InstallShield Wizard opens.

5 Select *Remove*, then click *Next*.

6 In the confirmation dialog box, specify whether you want to *Remove all files created by Dynamic File Services*. These are files in the `Dynamic File Services` folder that were created since the install, which includes the pair and policy database files.

Do one of the following:

- Deselect the check box to keep the files. This is the default.
- Select the check box to remove the files.

7 Click *OK* to confirm the uninstall.

8 After the uninstall is complete, click *Finish* to close the Uninstall tool.

9 If you are prompted to do so, restart the computer.

C Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services in a Windows Cluster

You can use the Novell Dynamic File Services (DynamicFS) Uninstall tool to modify, repair, or remove the software components. This section provides general guidelines for modifying, repairing, or removing DynamicFS on servers in a Windows cluster.

IMPORTANT: The Windows cluster configuration, management, terminology, and tools can vary depending on the version of Windows Server you are running and on how you set up your cluster and cluster resources. Adjust the instructions in this section as needed for your cluster environment.

For all issues related to Windows cluster configuration and management, see the Microsoft documentation for your Windows Server operating system in the Microsoft TechNet Library (http://technet.microsoft.com/en-us/library/default.aspx).

C.1 Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software

Before you use the Uninstall tool, ensure that you meet the following requirements:

- The Service must be stopped before you attempt to modify, repair, or remove the Dynamic File Services software. Before you take the Service cluster resource offline, you must quiesce the Service as described in "Prerequisites for Stopping or Restarting the Service" in the *Dynamic File Services 2.2 Administration Guide*.
- In an Active Directory environment, the user who runs the Uninstall tool must be a domain user with local Administrator privileges and Active Directory Administrator rights.

C.2 Modifying Dynamic File Services in a Cluster

The *Modify* option in the Dynamic File Services Uninstall tool allows you to add or remove the Dynamic File Service component on a computer. The Dynamic File Service is typically installed only on those servers where you want to create pairs and policies.

In a cluster, you must modify the software on each node in turn in order to update the information stored locally on each server. The following procedure assumes a two-node failover cluster. Modify the steps as necessary if you have more nodes.

IMPORTANT: Before you begin, ensure that you meet the "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software" on page 79.

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1 Modify the installation setup on the active node:

    1a Log in as the Administrator user or as a user with Administrator privileges.

    1b Use the Windows Cluster Administrator tool to stop the Dynamic File Service by taking its cluster resource offline.

    1c Modify the installed components as described in Step 3 through Step 7 in Section B.2, "Modifying Dynamic File Services," on page 75.

2 Use the Windows Cluster Administrator tool to move the following cluster resources to the second node:

    ◆ The shared disk that contains the Dynamic File Services software

    ◆ The shared disk that contains the Dynamic File Services program data

    ◆ The Dynamic File Service

3 Repeat Step 1 for the second cluster node, then continue with Step 4.

4 (Optional) Use the Windows Cluster Administrator tool to move the Dynamic File Service and disk resources back to the first node.

5 Log in to the active cluster node as the Administrator user or as a user with Administrator privileges.

6 Use the Windows Cluster Administrator tool to start the Dynamic File Service by bringing its cluster resource online.

C.3 Repairing Dynamic File Services in a Cluster

The *Repair* option in the Dynamic File Services Uninstall tool allows you to reinstall the currently installed components of the Dynamic File Services software on a computer.

In a cluster, you must repair the software on each node in turn to update the information stored locally on each server. The following procedure assumes a two-node failover cluster. Modify the steps as necessary if you have more nodes.

IMPORTANT: Before you begin, ensure that you meet the "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software" on page 79.

1 Repair the currently installed components on the active node:

   1a Log in as the Administrator user or as a user with Administrator privileges.

   1b Use the Windows Cluster Administrator tool to stop the Dynamic File Service by taking its cluster resource offline.

   1c Repair the installed components as described in Step 3 through Step 5 in Section B.3, "Repairing Dynamic File Services," on page 76.

2 Use Windows Cluster Administrator tool to move the following cluster resources to the second node:

   ◆ The shared disk that contains the Dynamic File Services software

   ◆ The shared disk that contains the Dynamic File Services program data

   ◆ The Dynamic File Service

3 Repeat Step 1 for the second node, then continue with Step 4.

4 (Optional) Use the Windows Cluster Administrator tool to move the Dynamic File Service and disk resources back to the first node.

5 Log in to the active cluster node as the Administrator user or a user with Administrator privileges.

6 Use the Windows Cluster Administrator tool to start the Dynamic File Service by bringing its cluster resource online.

C.4 Removing Dynamic File Services in a Cluster

The *Remove* option in the Dynamic File Services Uninstall tool automatically does the following:

◆ Removes the Dynamic File Services program files.

◆ Clears the Dynamic File Services entries in the computer registry.

◆ Removes the SSL certificate from the local personal computer store.

◆ Removes the local `Dynamic File Services` group.

◆ In an Active Directory environment, it removes the domain user `NDFS-`*`servername`* from the domain. If this is the only proxy user in the Dynamic File Services Storage Rights (`NDFS Storage Rights`) group, it also removes the domain group.

You can separately specify whether you want to also remove all of the files in the `\ProgramData\Dynamic File Services` folder that were created since the installation, which includes the pair, policy, and schedule database files. The files on the primary paths and secondary paths are untouched.

◆ Section C.4.1, "Planning to Uninstall Dynamic File Services in a Cluster," on page 82

◆ Section C.4.2, "Uninstalling Dynamic File Services in a Cluster," on page 82

C.4.1 Planning to Uninstall Dynamic File Services in a Cluster

For general uninstall guidelines, see Section B.4.1, "Planning to Uninstall Dynamic File Services," on page 77.

In a cluster, you must remove the software on each node in turn. Before you attempt to uninstall, make a copy of the DynamicFS installation folder (default is `C:\Program Files\Dynamic File Services`) and store it in a temporary location on the server. After the uninstall is complete, copy the files back to the installation location on the shared disk, then move the shared disk and the Dynamic File Service to the next node. This rolling uninstall approach allows the Uninstall tool to successfully clean up the registry and other information that is stored locally on each server in the cluster.

C.4.2 Uninstalling Dynamic File Services in a Cluster

The following procedure assumes a two-node failover cluster. Modify the steps as necessary if you have more nodes.

IMPORTANT: Before you begin, ensure that you meet the "Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software" on page 79.

1 Uninstall Dynamic File Services on the active node:

   1a Log in as the Administrator user or as a user with Administrator privileges.

   1b Make a copy of the `Dynamic File Services` folder.

   For example, copy `S:\Dynamic File Services` to `S:\Copy of Dynamic File Services`.

   1c Use the Windows Cluster Administrator tool to stop the Dynamic File Service by taking its cluster resource offline.

   1d Uninstall DynamicFS on the first node as described in Section B.4.2, "Uninstalling Dynamic File Services," on page 78.

   1e Move the copy of the `Dynamic File Services` folder back to the shared disk installation location.

   For example, rename `S:\Copy of Dynamic File Services` to `S:\Dynamic File Services`.

2 Use Windows Cluster Administrator tool to move the following cluster resources to the second node:

   ◆ The shared disk that contains the Dynamic File Services software

   ◆ The shared disk that contains the Dynamic File Services program data

   ◆ The Dynamic File Service

3 Uninstall DynamicFS on the second cluster node:

   3a Log in as the Administrator user or as a user with Administrator privileges.

   3b Use the Windows Cluster Administrator tool to stop the Dynamic File Service by taking its cluster resource offline.

   3c Uninstall DynamicFS on the second node as described in Section B.4.2, "Uninstalling Dynamic File Services," on page 78.

4 (Optional) Use the Windows Cluster Administrator tool to move shared disk back to the first node.

D Dynamic File Services Components

This section identifies the various components for Novell Dynamic File Services (DynamicFS) and their primary use. The software files are located in the folder where you installed the software. The default installation location is `C:\Program Files\Dynamic File Services`. On platforms where program data is stored separately from the program files, the default program data location is `C:\ProgramData\Dynamic File Services`. If you specify an installation location, both the program files and data files are located at the specified location.

- Table D-1, "Dynamic File Services Program Components," on page 83
- Table D-2, "Dynamic File Services Program Data Components," on page 87
- Table D-3, "Open Source and Third-Party Components," on page 88

Table D-1 *Dynamic File Services Program Components*

Component File or Folder	Used for
`Documentation` folder	Contains the product license, Readme, and help files.

`dswflt` folder
 	
`<platform>\dswflt.inf`
`<platform>\dswflt.sys`
	Contains information used by the DynamicFS Filter Driver. Provides the merged file tree view to users via the primary share on a standard pair.

`Plugins` folder
 	
`DswEmailNotificationPlugin.dll`
`EmailConfig.xml`
`Microsoft.CSharp.dll`
`System.Dynamic.dll`
	Contains the plug-in files for the notification system.

`AuditAndNotificationControl.xml`	Configuration settings that control which DynamicFS management events are logged.
`DswApi.dll`	Web Services API.
`DswBuiltInRules.dll`	Policy rules engine.
`DswCert.exe`	Manages the DynamicFS SSL certificate.
`DswCertificateLib.dll`	DynamicFS SSL certificate handling library.
`DswCli.exe`	DynamicFS command line interface management utility for pairs and policies.

Component File or Folder	Used for
DswCloudEngine.config.xml	Configuration for logging events for the DynamicFS Cloud Engine. This file is not created until the DswCloudEngine.exe application first runs.
DswCloudEngine.exe	Executes policy tasks to move files in a retention pair from the primary path to the secondary path that resides in a cloud-based storage location.
DswCloudEngine.log	Event log for the DynamicFS Cloud Engine application. This file is not created until the DswCloudEngine.exe application first runs.
DswCloudLib.dll	Library of APIs for the Cloud Engine.
DswCommonEngineLib.dll	Contains common code used by the following engines: DswCloudEngine.exe DswStandardEngine.exe DswReplicationEngine.exe
DswCore.xml	DynamicFS configuration information.
DswDump.exe	Configuration Dump utility for use when working with Novell Support.
DswFileTypes.cfg	Contains a list of well-known file types that are considered in addition to file types in the server's registry.
DswFileTypes_v2.0.cfg	If you upgrade from version 2.0 to version 2.1, this is the 2.0 copy of the file. Merge any changes that you made to it in the new file.
DswFTypes.dll	Discovers the file types defined in the server's registry.
DswFunctions.dll	Miscellaneous libraries.
DswInventory.config.xml	Configuration for logging events for the DynamicFS file system inventory. This file is not created until the DswInventory.exe application first runs.
DswInventory.exe	File System Inventory application.

Component File or Folder	Used for
DswInventory.log	Event log for the DynamicFS file system inventory. This file is not created until the DswInventory.exe application first runs.
DswIoctlsLib.dll	Win32 Ioctl to Filter Driver communication.
DswIpcClient.dll	Local IPC client.
DswIpcCore.dll	Local IPC core engine.
DswIpcListener.dll	Local IPC server.
DswLib.dll	DynamicFS Common Library.
DswLogger.dll	Logs events.
DswMcpCore.config.xml	Configuration for logging events for the Dynamic File Service.
DswMcpCore.dll	Dynamic File Service engine.
DswMcpCore.log	Event log for the Dynamic File Service.
DswMcpDatabase.dll	Pair and policy database engine.
DswMgmtConsole.exe	DynamicFS Management Console for creating and managing pairs and policies.
DswMimeTypes.cfg	Contains a list of well-known MIME types that are considered by the *Use content to determine file type* option in the File Types policy filter.
DswPairCheck.config.xml	Configuration for the DynamicFS Pair Check application. This file is not created until you use the DswPairCheck.exe application.
DswPairCheck.exe	Detects and reports duplicate files or mismatched attributes and ACL permissions for folders on the DynamicFS pair.
DswPairCheck.log	Event log for the DynamicFS Pair Check application. This file is not created until you use the DswPairCheck.exe application.
DswPairsLib.dll	Pair libraries.
DswPluginsLib.dll	Notification plug-ins libraries.
DswPolicyLib.dll	Policy libraries.
DswReg.dll	Registers a license key for the product.
DswRepair.exe	Repairs DynamicFS database files.

Component File or Folder	Used for
DswResources.dll	Strings for localization.
DswRetentionEngine.config.xml	Configuration for logging events for the DynamicFS Retention Engine.
	This file is not created until the DswRetentionEngine.exe application first runs.
DswRetentionEngine.exe	For a retention pair, executes policy tasks to move files from the primary path to the retention repository on the secondary path.
DswRetentionEngine.log	Event log for the DynamicFS Retention Engine application that enforces policies.
	This file is not created until the DswRetentionEngine.exe application first runs.
DswServers.xml	Configuration information about the servers set up in the DynamicFS Management Console on this computer.
	This file is created when you first set up a server for management.
DswService.exe	Dynamic File Service application.
DswServiceController.exe	DynamicFS applet for the Windows notification area:
	◆ Launches the DynamicFS Management Console
	◆ Launches the Repair tool
	◆ Starts or stops the Dynamic File Service
	◆ Enables or disables the Windows Firewall access
	◆ Configures the Dynamic File Service port
	◆ Configures the DynamicFS SSL certificate
	◆ Registers a license key on the server
	◆ Configures the events to be audited
	◆ Configures the notification service, notification plug-ins for email events that trigger a notification
	◆ Launches the Filter Driver Diagnostics tool
	◆ Provides product and version information

Component File or Folder	Used for
DswStandardEngine.config.xml	Configuration for logging events for the DynamicFS Standard Engine.
	This file is not created until the DswStandardEngine.exe application first runs.
DswStandardEngine.exe	For a standard pair, executes policy tasks to move files from the primary path to the secondary path, or from the secondary path to the primary path.
DswStandardEngine.log	Event log for the DynamicFS Standard Engine application that enforces policies.
	This file is not created until the DswStandardEngine.exe application first runs.
DswStrings.dll	Contains strings for messages.
DswUpgrade.exe	Upgrades the software.
DswUsb.dll	USB.
DswWinApi.dll	C# .NET wrappers for native Windows APIs.
install.log	Event log for the DynamicFS installation.
NDFS.lic	The license that is created when you register a Dynamic File Services License Key.
RetentionReview.css	The style sheet for the Retention Review Web service.
System.DirectoryServices.AccountManagement.dll	Manages the Dynamic File Services groups that are created in Active Directory environments.
upgrade.log	Event log for the DynamicFS upgrade.

Table D-2 *Dynamic File Services Program Data Components*

Component File or Folder	Used for
audit folder DswAuditLog.xml	Contains the audit log file for DynamicFS management events.
Clouds folder DswCloudDatabase.xml	Contains the cloud account database files.
LocalDrives folder DswLocalDriveInfoControlTable.xml	Contains information about local drives on the DynamicFS server.

Component File or Folder	Used for
`Pairs` folder `DswPairDatabase.xml`	Contains the pairs database file and history files for each pair.
`Policies` folder `DswPolicyDatabase_v2.xml`	Contains the policies database file.
`Schedules` folder `DswScheduleDatabase.xml`	Contains the schedules database file.

`SnapShot` folder
  `Friday`
  `Monday`
  `Saturday`
  `Sunday`
  `Thursday`
  `Tuesday`
  `Wednesday`
	Contains the daily backup copies of the pair, policies, schedule, and cloud databases for use by the Repair tool.

Table D-3 *Open Source and Third-Party Components*

Component File	Used for
`AppLimit.CloudComputing.SharpBox.dll`	APIs that abstract the application interfaces for different cloud storage providers.
`ASWSDK.dll`	Cloud storage APIs from Amazon Simple Storage Service (Amazon S3).
`GlacialList.dll`	Glacial ListView by the Glacial Components Software and the C# ListView open source project. It is a .NET based ListView control that allows you to customize your controls.
`Hammock.ClientProfile.dll`	Hammock open source project. A Web API library for .NET that simplifies consuming and wrapping RESTful services.

Component File	Used for

`IKVM.AWT.WinForms.dll`
`IKVM.OpenJDK.Beans.dll`
`IKVM.OpenJDK.Charsets.dll`
`IKVM.OpenJDK.Corba.dll`
`IKVM.OpenJDK.Core.dll`
`IKVM.OpenJDK.Management.dll`
`IKVM.OpenJDK.Media.dll`
`IKVM.OpenJDK.Misc.dll`
`IKVM.OpenJDK.Naming.dll`
`IKVM.OpenJDK.Remoting.dll`
`IKVM.OpenJDK.Security.dll`
`IKVM.OpenJDK.SwingAWT.dll`
`IKVM.OpenJDK.Text.dll`
`IKVM.OpenJDK.Util.dll`
`IKVM.OpenJDK.XML.API.dll`
`IKVM.OpenJDK.XML.Parse.dll`
`IKVM.OpenJDK.XML.Transform.dll`
`IKVM.OpenJDK.XML.XPath.dll`
`IKVM.Runtime.dll`
`IKVM.Runtime.JNI.dll`
`ikvm-native-win32-x86.dll`
	IKVM.NET open source project. It is an implementation of Java for Mono and the Microsoft .NET framework. It can dynamically run Java classes and can be used to convert Java `.jar` files to .NET assemblies. It also includes a port of the OpenJDK class libraries to .NET.

InstallShield 20013	Flexera Software (formerly Acresso Software). Provides the install, modify, repair, and uninstall features for the DynamicFS software.
`Ionic.Zip.dll`	DotNetZip Library open source project. Allows .NET applications to read, create, extract, and modify ZIP files.
`log4net.dll`	Apache Logging Services open source project. Provides cross-language logging services for application debugging and auditing.
`Microsoft.CSharp.dll` `System.Dynamic.dll`	.NET libraries that support the C# runtime binder for the dynamic keyword.
`Microsoft.WindowsAPICodePack.dll` `Microsoft.WindowsAPICodePack.Shell.dll`	Windows API Code Pack for Microsoft .NET Framework provides a source code library that can be used to access some features of Windows 7, 8, and 8.1 from managed code.
`Newtonsoft.Json.dll`	Json.NET open source project. Provides a high-performance JSON framework for the Microsoft .NET framework.
`Plossum.dll` `C5.dll`	Plossum open source project. A class library collection written in C# to provide functionality for writing and communicating with console applications.

Component File	Used for
`tika-app-1.1.dll`	Apache Tika 1.1 open source project. A toolkit that detects and extracts metadata and structured text content from various files by using parser libraries.
`ZedGraph.dll`	ZedGraph open source project. Uses the Plossum library for creating two-dimensional line and bar graphics.