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About This Guide

This guide describes the installation requirements and how to install or update Novell Dynamic File Services (DynamicFS) 2.1 software in a Microsoft Windows Workgroup or Active Directory Domain environment.

- Chapter 1, “What’s New for the Dynamic File Services Installation and Upgrade,” on page 11
- Chapter 2, “Planning the Installation,” on page 17
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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).

- Section 1.1, “What’s New for Dynamic File Services 2.1,” on page 11
- Section 1.2, “What’s New for Dynamic File Services 2.0,” on page 13
- Section 1.3, “What’s Next,” on page 15

1.1 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 1.1.1, “Upgrade Support,” on page 11
- Section 1.1.2, “Microsoft .NET 4.0.2,” on page 12
- Section 1.1.3, “Registration,” on page 12
- Section 1.1.4, “Administration,” on page 12
- Section 1.1.5, “Retention Pair Reviewers,” on page 12
- Section 1.1.6, “Policy File Types Configuration File,” on page 12
- Section 1.1.7, “Policy Database,” on page 12
- Section 1.1.8, “Cloud Accounts Database,” on page 13
- Section 1.1.9, “Cloud Events for Notification and Audit,” on page 13
- Section 1.1.10, “Encryption for Storing Notification Credentials,” on page 13
- Section 1.1.11, “SSL Certificate in a Cluster,” on page 13
- Section 1.1.12, “Pair Check Utility,” on page 13

1.1.1 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 2.1,” on page 53.

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 5.4, “Post-Upgrade Changes and Tasks,” on page 55. For information about uninstalling the product, see Appendix B, “Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services,” on page 67.

1.1.2 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 20.

1.1.3 Registration

Dynamic File Services 2.1 requires a Registration License Key. For information, see “Registering the License Key” in the Dynamic File Services 2.1 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 33.

1.1.4 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 2.1 Administration Guide.

1.1.5 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 2.1 Administration Guide.

1.1.6 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.

1.1.7 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.
1.1.8 **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.

1.1.9 **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 2.1 Administration Guide*.

1.1.10 **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 5.4, “Post-Upgrade Changes and Tasks,” on page 55.

1.1.11 **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 33.

1.1.12 **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 2.1 Client Commands and Utilities Reference*.

1.2 **What’s New for Dynamic File Services 2.0**

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

- Section 1.2.1, “Data Location,” on page 13
- Section 1.2.2, “Product Evaluation and License Key Registration,” on page 14
- Section 1.2.3, “Policy Schedules,” on page 14
- Section 1.2.4, “Notification Events,” on page 15

1.2.1 **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:
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.

1.2.2 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 2.1 Administration Guide.

1.2.3 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 2.1 Administration Guide.
1.2.4 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 2.1 Administration Guide.

1.3 What’s Next

For information about current installation requirements, see Chapter 2, “Planning the Installation,” on page 17.
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 2.1 Administration Guide.

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

- Section 2.1, “Supported Platforms,” on page 17
- Section 2.2, “Supported Storage,” on page 18
- Section 2.3, “Software Requirements,” on page 20
- Section 2.4, “Server Configuration Requirements,” on page 20
- Section 2.5, “Rights Needed for Installation in Active Directory Environments,” on page 20
- Section 2.6, “Installation Files,” on page 21
- Section 2.7, “Destination Location for the Dynamic File Services Software and Program Data,” on page 21
- Section 2.8, “Evaluation Mode and License Key,” on page 21
- Section 2.9, “Checking for Issues in the Readme,” on page 22
- Section 2.10, “Silent Install Options,” on page 22
- Section 2.11, “Cluster Install Requirements,” on page 22

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.

- Section 2.1.1, “Windows Servers,” on page 18
- Section 2.1.2, “Windows Workstations,” on page 18
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 both 32-bit and 64-bit architectures for the following Microsoft Windows Server operating systems with the latest service packs and patches applied:

- Windows Server 2008 R2
- Windows Server 2008 Service Pack 2 or later
- Windows Server 2003 R2
- Windows Server 2003 Service Pack 2 or later

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 both 32-bit and 64-bit architectures for the following Windows client operating systems with the latest service packs and patches applied:

- Windows 7
- Windows Vista Service Pack 1 or later
- Windows XP Service Pack 3 or later

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.


2.2 Supported Storage

- Section 2.2.1, “File Systems,” on page 18
- Section 2.2.2, “Local Storage,” on page 19
- 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 2.1 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 2.1 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 2.1 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:

  http://www.microsoft.com/net/download/version-4

  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.


### 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:

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Install File</th>
</tr>
</thead>
<tbody>
<tr>
<td>32-bit</td>
<td>DswSetup-x86-v2.10-&lt;build&gt;.exe</td>
</tr>
<tr>
<td>64-bit</td>
<td>DswSetup-x64-v2.10-&lt;build&gt;.exe</td>
</tr>
</tbody>
</table>

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

Dynamic File Services 2.1 stores program software and the program data files it creates in the following locations when you accept the default install location:

<table>
<thead>
<tr>
<th>Default Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:\Program Files\Dynamic File Services</td>
<td>Program software, configuration files, log files, and documentation</td>
</tr>
<tr>
<td>C:\ProgramData\Dynamic File Services</td>
<td>Program data files and audit log files</td>
</tr>
</tbody>
</table>

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 2.1 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 65.

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.
The Novell Dynamic File Services (DynamicFS) installation software provides separate files for 32-bit and 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 28

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 32-bit (x86) or 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:

<table>
<thead>
<tr>
<th>Wizard Page</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome</td>
<td>Click Next.</td>
</tr>
<tr>
<td>License Agreement</td>
<td>Read and accept the terms of the License Agreement, then click Next.</td>
</tr>
<tr>
<td></td>
<td>You can also click Print to output a copy of the License Agreement.</td>
</tr>
</tbody>
</table>
Dynamic File Services 2.1 Installation Guide

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 2.1 Administration Guide.

<table>
<thead>
<tr>
<th>Wizard Page</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup Type</td>
<td>Select one of the following setup options:</td>
</tr>
<tr>
<td></td>
<td><strong>Complete</strong>: Select Complete to accept the following default setup, then click Next to continue to the Ready to Install the Program page:</td>
</tr>
<tr>
<td></td>
<td>- Service port: 8999</td>
</tr>
<tr>
<td></td>
<td>- Allow an exception in the firewall for port 8999: Yes</td>
</tr>
<tr>
<td></td>
<td>- Destination folder for software: C:\Program Files\Dynamic File Services. The program files are written to C:\ProgramData\Dynamic File Services.</td>
</tr>
<tr>
<td></td>
<td>- Features installed: Service and Management</td>
</tr>
<tr>
<td></td>
<td><strong>Custom</strong>: Select Custom, then click Next to continue to the Installation Details page where you can view and modify the setup options.</td>
</tr>
<tr>
<td>Installation Details</td>
<td>Modify the following options if desired, then click Next to continue to the Select Features page:</td>
</tr>
<tr>
<td>(Custom install only)</td>
<td><strong>Allow an exception for the Dynamic File Services port in the Windows Firewall</strong>: Enable this option in order to remotely manage pairs and policies on this server from another computer. It is enabled by default.</td>
</tr>
<tr>
<td></td>
<td><strong>Service port</strong>: Specify the port number (default 8999) to use for the remote management communications.</td>
</tr>
<tr>
<td></td>
<td><strong>Destination software folder</strong>: Click Browse to locate and select the destination folder where you want to install the software, then click OK.</td>
</tr>
<tr>
<td></td>
<td>The new location contains both the software and any program files it creates.</td>
</tr>
<tr>
<td>Select Features (Custom install only)</td>
<td>Specify which components to install on this computer, then click Next to continue to the Ready to Install the Program page.</td>
</tr>
<tr>
<td></td>
<td><strong>Management</strong>: The management tools are automatically selected for installation. This option cannot be deselected.</td>
</tr>
<tr>
<td></td>
<td><strong>Service</strong>: Select the Service for computers where you want to use pairs and policies.</td>
</tr>
<tr>
<td>Ready to Install the Program</td>
<td>Click Install to begin the installation.</td>
</tr>
<tr>
<td></td>
<td>The Setup Status page shows the installation progress.</td>
</tr>
<tr>
<td></td>
<td>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 2.1 Administration Guide.</td>
</tr>
<tr>
<td></td>
<td>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 2.1 Administration Guide.</td>
</tr>
<tr>
<td>InstallShield Wizard Complete</td>
<td>Specify whether to open the Readme and DynamicFS Management Console now, then click Finish to exit the wizard.</td>
</tr>
</tbody>
</table>
6 (Optional) Register a license key for Dynamic File Services.

For information, see “Registering the License Key” in the Dynamic File Services 2.1 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 2.1 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 2.1 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 2.1 Administration Guide.
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 2.1 Administration Guide.
   The server folder is created and appears in the left panel.


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 2.1 Administration Guide:

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


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 2.1 Administration Guide:

- “Creating a Pair”
- “Creating a Policy”

Continue with Section 3.3.5, “Running Policies,” on page 27.

### 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.

Continue with Section 3.3.6, “Accessing Files on a Standard Pair,” on page 27.

### 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 65
- Appendix B, “Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services,” on page 67
- Appendix C, “Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services in a Windows Cluster,” on page 71
3.5 What’s Next

See the following sections in the *Dynamic File Services 2.1 Administration Guide*:

- “Setting Up a Server in the Management Console”
- “Creating a Pair”
- “Creating a Policy”
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 34
- Section 4.5, “Creating Pairs and Policies in a Cluster,” on page 50
- Section 4.6, “Using Dynamic File Services in a Windows Cluster,” on page 50
- Section 4.7, “Additional Information,” on page 52

### 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 31
- Section 4.1.3, “Destination Folder for Installation,” on page 32
- Section 4.1.4, “Active Directory Domain,” 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 in this section can be helpful in using the Windows cluster management tools to set up the Dynamic File Service resource:

- “Windows Server 2008 Cluster Information” on page 30
- “Windows Server 2003 Cluster Information” on page 30

### Windows Server 2008 Cluster Information

- [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)

### Windows Server 2003 Cluster Information

- [Windows Clustering](http://technet.microsoft.com/en-us/library/cc757731%28WS.10%29.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:

<table>
<thead>
<tr>
<th>Standard Pair Data Location</th>
<th>Primary Path</th>
<th>Secondary Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared disk that is hosted on the same node as the Dynamic File Services software</td>
<td>Specify the physical path, such as F:\home. Use the Windows Disk Management tool to bind the same drive letter to the primary shared disk on each node in turn.</td>
<td>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.</td>
</tr>
<tr>
<td>Share on a shared disk that is hosted in the cluster</td>
<td>Not supported.</td>
<td>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.</td>
</tr>
<tr>
<td>Remote share published in the same Active Directory domain</td>
<td>Not supported.</td>
<td>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.</td>
</tr>
<tr>
<td>Cloud path</td>
<td>Not supported.</td>
<td>Not supported.</td>
</tr>
</tbody>
</table>
**Retention Pair**: Consider the following guidelines for selecting paths for a retention pair in a cluster:

<table>
<thead>
<tr>
<th>Retention Pair Data Location</th>
<th>Primary Path</th>
<th>Secondary Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared disk that is hosted on the same node as the Dynamic File Services software</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Share on a shared disk that is hosted in the cluster</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Remote share published in the same Active Directory domain</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Cloud path</td>
<td>Not supported.</td>
<td>The cloud account is defined in Dynamic File Services, and all nodes have access to the Internet.</td>
</tr>
</tbody>
</table>

### 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
DsSSLCertThumbprint 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, or installing Dynamic File Services in a Windows 2003 two-node cluster. Replace the sample values with actual values for your environment, and use the clustering tools available on your Windows servers.

<table>
<thead>
<tr>
<th>Component</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node in the Windows cluster where you first install Dynamic File Services</td>
<td>Node1</td>
</tr>
<tr>
<td>Second (or subsequent) node in the Windows cluster where you install Dynamic File Services</td>
<td>Node2</td>
</tr>
<tr>
<td>IP address of the virtual cluster resource</td>
<td>10.10.10.201</td>
</tr>
<tr>
<td>Cluster service</td>
<td>Dynamic File Services (dswservice)</td>
</tr>
<tr>
<td>Virtual cluster network name for the resource</td>
<td>NDFSCLR</td>
</tr>
<tr>
<td>Shared drive for Dynamic File Services program files, databases, and log files</td>
<td>S:</td>
</tr>
<tr>
<td>Installation destination path on the shared drive</td>
<td>S:Dynamic File Services</td>
</tr>
<tr>
<td>Share for the S:Dynamic File Services path</td>
<td>DYNAMICFS_SHARE</td>
</tr>
<tr>
<td>\NDFSCLR\DYNAMICFS_SHARE</td>
<td></td>
</tr>
<tr>
<td>Shared drive cluster resource for a primary path.</td>
<td></td>
</tr>
<tr>
<td>For the DATA_PAIR example, its primary path is on the same physical drive as the folder where you installed Dynamic File Services.</td>
<td></td>
</tr>
<tr>
<td>S:</td>
<td></td>
</tr>
<tr>
<td>Shared drive cluster resource for a secondary path.</td>
<td>T:</td>
</tr>
<tr>
<td>Primary path for DATA_PAIR</td>
<td>S:\DATA</td>
</tr>
<tr>
<td>Secondary path for DATA_PAIR</td>
<td>T:\Secondary\DATA</td>
</tr>
<tr>
<td>Share for S:\DATA, which is used to give users access to files in the DATA_PAIR</td>
<td>DATA_SHARE</td>
</tr>
<tr>
<td>\NDFSCLR\DATA_SHARE</td>
<td></td>
</tr>
</tbody>
</table>
For example, the Windows Server 2008 failover cluster setup might look like this in the Windows Failover Cluster Manager tool:
The Windows Server 2003 cluster setup might look like this in the Windows Cluster Administrator tool:

![Cluster Administrator tool](image)

### 4.3 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 4.3.1, “Setting Up a Cluster Resource for the Installation Destination Folder’s Shared Disk,” on page 37
- Section 4.3.2, “Installing and Setting Up Dynamic File Services on Node1,” on page 38
- Section 4.3.3, “Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Resource,” on page 39
- Section 4.3.4, “Moving the Cluster Resource from Node1 to Node2,” on page 42
- Section 4.3.5, “Installing and Setting Up Dynamic File Services on Node2,” on page 43
4.3.1 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.

   ![High Availability Wizard](image)

   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>`.

   ![Client Access Point](image)
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 4.3.2, “Installing and Setting Up Dynamic File Services on Node1,” on page 38.

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 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 2.1 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 2.1 Administration Guide:

<table>
<thead>
<tr>
<th>IMPORTANT: You should assign the same users to the Dynamic File Services group on each node.</th>
</tr>
</thead>
</table>

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.


4.3.3 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 4.3.1, “Setting Up a Cluster Resource for the Installation Destination Folder’s Shared Disk,” on page 37:

- 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.

<table>
<thead>
<tr>
<th>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.</th>
</tr>
</thead>
</table>
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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share for the installation path (S:\Dynamic File Services)</td>
<td>DYNAMICFS_SHARE</td>
</tr>
<tr>
<td>Share for S:\DATA, which will be used as the primary path for DATA_PAIR</td>
<td>DATA_SHARE</td>
</tr>
<tr>
<td>Share for K:\PROJECTS, which will be used as the primary path for PROJECTS_PAIR</td>
<td>PROJECTS_SHARE</td>
</tr>
</tbody>
</table>

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*.

   ![New Resource Wizard](image)

   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:
6 Verify that the cluster resource works by right-clicking it, then selecting Bring Online.

7 Continue with Section 4.3.4, “Moving the Cluster Resource from Node1 to Node2,” on page 42.

4.3.4 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 49.
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 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.

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.


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 2003 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 Group and Resource for the Installation Destination Folder’s Shared Disk,” on page 44
- Section 4.4.2, “Installing and Setting Up Dynamic File Services on Node1,” on page 45
- Section 4.4.3, “Adding the Dynamic File Service, Shares, and Shared Disks to the Cluster Group,” on page 46
- Section 4.4.4, “Moving the Cluster Resource from Node1 to Node2,” on page 49
- Section 4.4.5, “Installing and Setting Up Dynamic File Services on Node2,” on page 49
4.4.1 Setting Up a Cluster Group and 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 group for
the shared disk where you want to install Dynamic File Services. Use the guidelines in Section 4.1,

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 Cluster Administrator tool to set up a two-node cluster.

2 In the Windows Cluster Administrator tool, select Groups > New > Group, then create a cluster
group.

   You can use any name for the cluster group.

3 In the cluster group, create an IP address resource, click Next, then assign a unique IP address
   for the group.

4 In the cluster group, create a resource for the shared physical disk where you want to install the
   Dynamic File Services software, such as S:\.

5 Continue with Section 4.4.2, “Installing and Setting Up Dynamic File Services on Node1,” on
   page 45.
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 Dynamic File Services software 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 2.1 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 2.1 Administration Guide.

**IMPORTANT**: You later 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.
Right-click the Service Controller icon in the notification area, then verify that the Dynamic File Service status is Service Disabled.

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


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

After you install Dynamic File Services on the shared cluster disk, you must add the following resources and dependencies to the cluster group that you created in Section 4.4.1, “Setting Up a Cluster Group and Resource for the Installation Destination Folder’s Shared Disk,” on page 44:

- 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 group for a Windows Server 2003 cluster:

1. Use the Windows Cluster Administrator 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 DynamicFS pairs.

   For example, set up the following shares:

<table>
<thead>
<tr>
<th>Cluster-Managed Network Shares</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share for the S:\Dynamic File Services path</td>
<td>DYNAMICFS_SHARE</td>
</tr>
<tr>
<td>Share for S:\DATA, which will be used as the primary path for DATA_PAIR</td>
<td>DATA_SHARE</td>
</tr>
<tr>
<td>Share for K:\PROJECTS, which will be used as the primary path for PROJECTS_PAIR</td>
<td>PROJECTS_SHARE</td>
</tr>
</tbody>
</table>

2. In the Windows Cluster Administrator tool, add a Resource to the cluster Group where you installed the software:

   2a Right-click the Dynamic File Services group that you have created, then select Add a Resource.

   2b On the New Resource page, specify the following values:

   - Name: Type the name of this service resource, such as Dynamic File Service.
- **Resource type:** From the Resource type drop-down list, select Generic Service.
- **Group:** From the Group drop-down list, select the cluster group that you created for the shared disk in Section 4.4.2, “Installing and Setting Up Dynamic File Services on Node1,” on page 45.

2c Click Next.

2d On the Possible Owners page in the Available nodes list, select the cluster nodes where you want to use this resource, click Add to move them to the Possible owners list, then click Next.

2e On the Dependencies page in the Available resources list, select the IP address and the physical shared disk resource where you installed Dynamic File Services, click Add to move them to the Resource dependencies list, then click Next.

You can also add other shared disks that you plan to use for pair paths.
2f On the General Service Parameters page, type the filename of the Dynamic File Service executable program without the file extension (`dwservice`), then click `Next`.

![Dynamic File Services 2.1 Installation Guide](image)

2g On the Registry Replication page, click `Add`, type `SOFTWARE\Novell\Dynamic File Services\Setup` as the `Root registry key`, then click `OK`.

The `InstallID` key value allows the license to be decrypted on any active node.

![Dynamic File Services 2.1 Installation Guide](image)

2h Click `Finish`.

3 Use the Windows Cluster Administrator tool to add the following resources in the `Dynamic File Services Group` cluster resource:

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
<th>Sample Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Share</td>
<td>A share for the <code>S:\Dynamic File Services</code> path</td>
<td><code>DYNAMICFS_SHARE</code></td>
</tr>
<tr>
<td>Domain Share</td>
<td>The domain-level cluster share for the virtual cluster server</td>
<td><code>NDFSCLR</code></td>
</tr>
<tr>
<td>File Share</td>
<td>Share for <code>S:\DATA</code>, which will be used as the primary path for <code>DATA_PAIR</code></td>
<td><code>DATA_SHARE</code></td>
</tr>
<tr>
<td>File Share</td>
<td>Share for <code>K:\PROJECTS</code>, which will be used as the primary path for <code>PROJECTS_PAIR</code></td>
<td><code>PROJECTS_SHARE</code></td>
</tr>
</tbody>
</table>
4 Verify that the cluster resource works by right-clicking it, then selecting *Bring Online.*

5 Use the Windows Cluster Administrator tool to specify dependencies for the Dynamic File Service cluster resource:
   5a In the DynamicFS Group cluster resource, take the Dynamic File Service resource offline.
   5b Open the Properties page for the Dynamic File Service cluster resource, then select the Dependencies tab.
   5c Specify the other resources in the DynamicFS Group as dependencies for the Dynamic File Service resource.
      The Dynamic File Service resource is not started until all of the other resources in the DynamicFS Group are started and are online.
   5d Click OK or Apply to save your changes.
   5e In the DynamicFS Group cluster resource, bring the Dynamic File Service resource online.

6 Continue with Section 4.4.4, “Moving the Cluster Resource from Node1 to Node2,” on page 49.

4.4.4 Moving the Cluster Resource from Node1 to Node2

1 On Node1, take the resource offline. In the Windows Cluster Administrator tool, right-click the cluster Dynamic Files Services group, then select *Take Offline.*

2 In the Windows Cluster Administrator tool, use the Move Group option to move the cluster Dynamic File Services group from Node1 to Node2.

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 for Node1, such as \S:\.

4 Continue with Section 4.4.5, “Installing and Setting Up Dynamic File Services on Node2,” on page 49.

4.4.5 Installing and Setting Up Dynamic File Services on Node2

Use the following procedure to install 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 who also has Active Directory Domain Administrator rights.
2 Install DynamicFS 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.

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

5 Bring the Service resource online.


### 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 2.1 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 51
- Section 4.6.2, “Dynamic File Service Controller,” on page 51
- Section 4.6.3, “Dynamic File Service and Executable Files,” on page 51
- Section 4.6.4, “Moving the Dynamic File Service Cluster Resource Between Nodes,” on page 51
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 31.

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#reqstopser) 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 2.1 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

- Chapter 3, “Installing and Setting Up Dynamic File Services,” on page 23
- Appendix A, “Silent Install Options for Dynamic File Services,” on page 65
- Appendix C, “Using the Uninstall Tool to Modify, Repair, or Remove Dynamic File Services in a Windows Cluster,” on page 71
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, “Supported Upgrade Paths,” on page 53
- Section 5.2, “Planning for the Upgrade,” on page 54
- Section 5.3, “Upgrading Dynamic File Services with the InstallShield Wizard,” on page 55
- Section 5.4, “Post-Upgrade Changes and Tasks,” on page 55

5.1 Supported Upgrade Paths

Novell supports upgrading between all minor version releases, such as from 2.0 to 2.1. Novell supports upgrades between major versions only from most current version. If you keep your computer current with the new releases, you will be always able to upgrade in place instead of uninstalling and reinstalling the product. A computer restart is required after the upgrade is complete.

- Section 5.1.1, “Upgrading to Version 2.1,” on page 53
- Section 5.1.2, “Upgrading to Version 2.0,” on page 54

5.1.1 Upgrading to Version 2.1

The following paths are supported for upgrading the Management and Service components to Novell Dynamic File Services 2.1:

<table>
<thead>
<tr>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic File Services 2.0 (32-bit)</td>
<td>Dynamic File Services 2.1 (32-bit)</td>
</tr>
<tr>
<td>Dynamic File Services 2.0 (64-bit)</td>
<td>Dynamic File Services 2.1 (64-bit)</td>
</tr>
</tbody>
</table>
5.1.2 Upgrading to Version 2.0

The following paths are supported for upgrading the Management and Service components to Novell Dynamic File Services 2.0 from earlier versions:

<table>
<thead>
<tr>
<th>Source</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic File Services 1.6 (32-bit)</td>
<td>Dynamic File Services 2.0 (32-bit)</td>
</tr>
<tr>
<td>Dynamic File Services 1.6 (64-bit)</td>
<td>Dynamic File Services 2.0 (64-bit)</td>
</tr>
</tbody>
</table>

5.2 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 5.2.1, “Administrator Permissions,” on page 54
- Section 5.2.2, “Stopping the Service,” on page 54

5.2.1 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

5.2.2 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 2.1 Administration Guide.
5.3 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 32-bit (x86) or 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 5.2, “Planning for the Upgrade,” on page 54.
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 5.4, “Post-Upgrade Changes and Tasks,” on page 55.
   Do not allow users to resume access to files that are managed by pairs until the post-upgrade tasks are completed.

5.4 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.

- Section 5.4.1, “After Upgrading from Version 2.0 to 2.1,” on page 55
- Section 5.4.2, “After Upgrading from Version 1.6 to 2.0,” on page 57

5.4.1 After Upgrading from Version 2.0 to 2.1

This section identifies changes that were made to Dynamic File Services features during an upgrade from version 2.0 to version 2.1.

- “Registration License Key” on page 56
- “Retention Pair Reviewers” on page 56
- “Policy File Types Configuration File” on page 56
- “Policy Database” on page 56
- “Notification and Audit Tracking Events” on page 56
- “Email Notification” on page 56
- “Twitter Notification” on page 57
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 2.1 Administration Guide.

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 2.1 Administration Guide.

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.

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.

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 2.1 Administration Guide.

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 2.1 Administration Guide. If needed, re-enter the outgoing mail password, then click OK.
Twitter Notification

If you have Twitter accounts set up for notifications, each Twitter account’s credentials were decrypted, then re-encrypted during the upgrade. Verify that all accounts appear in the Twitter Accounts list. Right-click the Service Controller icon, select Notifications > Twitter, then verify that Twitter accounts appear as expected. You can re-add any accounts that are missing.

5.4.2 After Upgrading from Version 1.6 to 2.0

This section identifies changes that were made to Dynamic File Services features during an upgrade from version 1.6 to version 2.0.

- “Default Data Location” on page 57
- “Notification and Audit Tracking Events” on page 57

Default Data Location

Beginning in version 2.0, database files are stored by default in the C:\ProgramData\Dynamic File Services folder. Software files are stored by default in C:\Program Files\Dynamic File Services folder.

- If the software is currently located in the default installation location, the upgrade relocates program database files, audit log files, and the snapshot files to C:\ProgramData\Dynamic File Services.
- If the software is located in a custom location, the upgraded files are written to the custom location.

Notification and Audit Tracking Events

Beginning in version 2.0, email notification events are managed separately for each email address. All events are assigned by default for each configured email address. You can use the Notification Configuration tool to modify the events assigned for each address. For information, see “Configuring the Notification Service” in the Dynamic File Services 2.1 Administration Guide.
Upgrading to Dynamic File Services 2.1 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 59
- Section 6.2, “Upgrading Dynamic File Services in a Cluster,” on page 60

### 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 5.2, “Planning for the Upgrade,” on page 54

You can expect some changes with the upgrade. For information, see Section 5.4, “Post-Upgrade Changes and Tasks,” on page 55.

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

- Section 6.1.1, “Quiescing the Service,” on page 59
- Section 6.1.2, “Windows Cluster,” on page 60
- Section 6.1.3, “Active Directory Domain,” on page 60

### 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 2.1 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.


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 60
- Section 6.2.2, “Moving the Shared Drive from Node1 to Node2,” on page 61
- Section 6.2.3, “Upgrading Dynamic File Services on Node2,” on page 61

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 32-bit (x86) or 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 49.

### 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 49.

### 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 45.

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 5.4, “Post-Upgrade Changes and Tasks,” on page 55.
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 63

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 68.
   This cleans up the files and folders that prevent the Service from starting.
The Novell Dynamic File Services (DynamicFS) InstallShield Wizard application supports InstallShield silent install options.

- Section A.1, “InstallShield Silent Install Options,” on page 65
- Section A.2, “Creating the Silent Install Answer File for Dynamic File Services,” on page 65
- Section A.3, “Silently Installing Dynamic File Services,” on page 66

### A.1 InstallShield Silent Install Options

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

<table>
<thead>
<tr>
<th>InstallShield Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/r</td>
<td>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.</td>
</tr>
<tr>
<td>/s</td>
<td>Silently installs the application.</td>
</tr>
<tr>
<td>/sms</td>
<td>Causes the installer to pause until the installation finishes.</td>
</tr>
<tr>
<td>/f1&quot;answer_file_filename.iss&quot;</td>
<td>Specifies the filename of the answer file.</td>
</tr>
</tbody>
</table>


### 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.
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-<platform>-v2.1-<build>.exe /s /f1"answer_file_filename"
```

Replace platform with x86 (for 32-bit platforms) or x64 (for 64-bit platforms). Replace answer_file_filename with the InstallShield answer file, such as setup.iss.

For example, to install DynamicFS on a 32-bit platform, use the DswSetup-x86-v2.1-<build>.exe file, and specify the answer file that you want to use, enter the following at the command prompt:

```
DswSetup-x86-v2.1-<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-x86-v2.1-<build>.exe /s
```

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

```
DswSetup-x86-v2.1-<build>.exe /s /sms
```
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 67
- Section B.2, “Modifying Dynamic File Services,” on page 67
- Section B.3, “Repairing Dynamic File Services,” on page 68
- Section B.4, “Removing Dynamic File Services,” on page 68

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 2.1 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 67.

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 2.1 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 2.1 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 67.

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 2.1 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 2.1 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 69
• Section B.4.2, “Uninstalling Dynamic File Services,” on page 70

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 67, ensure that your system meets the uninstall guidelines in this section.

• “Locating Files on the Two Paths” on page 69
• “Keeping the Pair and Policy Database Configuration Files” on page 69
• “Notifying Users” on page 70

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 69.

**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.

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 2.1 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).

- Section C.1, “Prerequisites for Modifying, Repairing, or Removing Dynamic File Services Software,” on page 71
- Section C.2, “Modifying Dynamic File Services in a Cluster,” on page 72
- Section C.3, “Repairing Dynamic File Services in a Cluster,” on page 72
- Section C.4, “Removing Dynamic File Services in a Cluster,” on page 73

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 2.1 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 71.

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 67.

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 71.

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 68.

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 74
- Section C.4.2, “Uninstalling Dynamic File Services in a Cluster,” on page 74
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 69.

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 71.

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 70.
   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 70.

4 (Optional) Use the Windows Cluster Administrator tool to move shared disk back to the first node.
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 75
- Table D-2, “Dynamic File Services Program Data Components,” on page 79
- Table D-3, “Open Source and Third-Party Components,” on page 80

Table D-1 Dynamic File Services Program Components

<table>
<thead>
<tr>
<th>Component File or Folder</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation folder</td>
<td>Contains the product license, Readme, and help files.</td>
</tr>
<tr>
<td>dswflt folder</td>
<td>Contains information used by the DynamicFS Filter Driver. Provides the merged file tree view to users via the primary share on a standard pair.</td>
</tr>
<tr>
<td>&lt;platform&gt;\dswflt.inf</td>
<td></td>
</tr>
<tr>
<td>&lt;platform&gt;\dswflt.sys</td>
<td></td>
</tr>
<tr>
<td>Plugins folder</td>
<td>Contains the plug-in files for the notification system.</td>
</tr>
<tr>
<td>DswEmailNotificationPlugin.dll</td>
<td></td>
</tr>
<tr>
<td>DswTwitterNotificationPlugin.dll</td>
<td></td>
</tr>
<tr>
<td>EmailConfig.xml</td>
<td></td>
</tr>
<tr>
<td>Microsoft.CSharp.dll</td>
<td></td>
</tr>
<tr>
<td>System.Dynamic.dll</td>
<td></td>
</tr>
<tr>
<td>Twitter.config.xml</td>
<td></td>
</tr>
<tr>
<td>AuditAndNotificationControl.xml</td>
<td>Configuration settings that control which DynamicFS management events are logged.</td>
</tr>
<tr>
<td>DswApi.dll</td>
<td>Web Services API.</td>
</tr>
<tr>
<td>DswBuiltInRules.dll</td>
<td>Policy rules engine.</td>
</tr>
<tr>
<td>DswCert.exe</td>
<td>Manages the DynamicFS SSL certificate.</td>
</tr>
<tr>
<td>DswCertificateLib.dll</td>
<td>DynamicFS SSL certificate handling library.</td>
</tr>
<tr>
<td>DswCli.exe</td>
<td>DynamicFS command line interface management utility for pairs and policies.</td>
</tr>
<tr>
<td>Component File or Folder</td>
<td>Used for</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DswCloudEngine.config.xml</td>
<td>Configuration for logging events for the DynamicFS Cloud Engine.</td>
</tr>
<tr>
<td></td>
<td>This file is not created until the DswCloudEngine.exe application first runs.</td>
</tr>
<tr>
<td>DswCloudEngine.exe</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>This file is not created until the DswCloudEngine.exe application first runs.</td>
</tr>
<tr>
<td>DswCloudLib.dll</td>
<td>Library of APIs for the Cloud Engine.</td>
</tr>
<tr>
<td>DswCommonEngineLib.dll</td>
<td>Contains common code used by the following engines:</td>
</tr>
<tr>
<td></td>
<td>- DswCloudEngine.exe</td>
</tr>
<tr>
<td></td>
<td>- DswStandardEngine.exe</td>
</tr>
<tr>
<td></td>
<td>- DswReplicationEngine.exe</td>
</tr>
<tr>
<td>DswCore.xml</td>
<td>DynamicFS configuration information.</td>
</tr>
<tr>
<td>DswDump.exe</td>
<td>Configuration Dump utility for use when working with Novell Support.</td>
</tr>
<tr>
<td>DswFileTypes.cfg</td>
<td>Contains a list of well-known file types that are considered in addition to file types in the server’s registry.</td>
</tr>
<tr>
<td>DswFileTypes_v2.0.cfg</td>
<td>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.</td>
</tr>
<tr>
<td>DswFTypes.dll</td>
<td>Discovers the file types defined in the server’s registry.</td>
</tr>
<tr>
<td>DswFunctions.dll</td>
<td>Miscellaneous libraries.</td>
</tr>
<tr>
<td>DswInventory.config.xml</td>
<td>Configuration for logging events for the DynamicFS file system inventory.</td>
</tr>
<tr>
<td></td>
<td>This file is not created until the DswInventory.exe application first runs.</td>
</tr>
<tr>
<td>DswInventory.exe</td>
<td>File System Inventory application.</td>
</tr>
<tr>
<td>DswInventory.log</td>
<td>Event log for the DynamicFS file system inventory.</td>
</tr>
<tr>
<td></td>
<td>This file is not created until the DswInventory.exe application first runs.</td>
</tr>
<tr>
<td>DswIoctlLib.dll</td>
<td>Win32 Ioclt to Filter Driver communication.</td>
</tr>
<tr>
<td>Component File or Folder</td>
<td>Used for</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DswIpcClient.dll</td>
<td>Local IPC client.</td>
</tr>
<tr>
<td>DswIpcCore.dll</td>
<td>Local IPC core engine.</td>
</tr>
<tr>
<td>DswIpcListener.dll</td>
<td>Local IPC server.</td>
</tr>
<tr>
<td>DswLib.dll</td>
<td>DynamicFS Common Library.</td>
</tr>
<tr>
<td>DswLogger.dll</td>
<td>Logs events.</td>
</tr>
<tr>
<td>DswMcpCore.config.xml</td>
<td>Configuration for logging events for the Dynamic File Service.</td>
</tr>
<tr>
<td>DswMcpCore.dll</td>
<td>Dynamic File Service engine.</td>
</tr>
<tr>
<td>DswMcpCore.log</td>
<td>Event log for the Dynamic File Service.</td>
</tr>
<tr>
<td>DswMcpDatabase.dll</td>
<td>Pair and policy database engine.</td>
</tr>
<tr>
<td>DswMgmtConsole.exe</td>
<td>DynamicFS Management Console for creating and managing pairs and policies.</td>
</tr>
<tr>
<td>DswMimeTypes.cfg</td>
<td>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.</td>
</tr>
<tr>
<td>DswPairCheck.config.xml</td>
<td>Configuration for the DynamicFS Pair Check application.</td>
</tr>
<tr>
<td>DswPairCheck.exe</td>
<td>Detects and reports duplicate files or mismatched attributes and ACL permissions for folders on the DynamicFS pair.</td>
</tr>
<tr>
<td>DswPairCheck.log</td>
<td>Event log for the DynamicFS Pair Check application.</td>
</tr>
<tr>
<td>DswPairsLib.dll</td>
<td>Pair libraries.</td>
</tr>
<tr>
<td>DswPluginsLib.dll</td>
<td>Notification plug-ins libraries.</td>
</tr>
<tr>
<td>DswPolicyLib.dll</td>
<td>Policy libraries.</td>
</tr>
<tr>
<td>DswReg.dll</td>
<td>Registers a license key for the product.</td>
</tr>
<tr>
<td>DswRepair.exe</td>
<td>Repairs DynamicFS database files.</td>
</tr>
<tr>
<td>DswResources.dll</td>
<td>Strings for localization.</td>
</tr>
<tr>
<td>DswRetentionEngine.config.xml</td>
<td>Configuration for logging events for the DynamicFS Retention Engine.</td>
</tr>
<tr>
<td></td>
<td>This file is not created until the DswRetentionEngine.exe application first runs.</td>
</tr>
<tr>
<td>Component File or Folder</td>
<td>Used for</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DswRetentionEngine.exe</td>
<td>For a retention pair, executes policy tasks to move files from the primary path to the retention repository on the secondary path.</td>
</tr>
<tr>
<td>DswRetentionEngine.log</td>
<td>Event log for the DynamicFS Retention Engine application that enforces policies. This file is not created until the DswRetentionEngine.exe application first runs.</td>
</tr>
<tr>
<td>DswServers.xml</td>
<td>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.</td>
</tr>
<tr>
<td>DswService.exe</td>
<td>Dynamic File Service application.</td>
</tr>
<tr>
<td>DswServiceController.exe</td>
<td>DynamicFS applet for the Windows notification area:</td>
</tr>
<tr>
<td></td>
<td>🟦 Launches the DynamicFS Management Console</td>
</tr>
<tr>
<td></td>
<td>🟦 Launches the Repair tool</td>
</tr>
<tr>
<td></td>
<td>🟦 Starts or stops the Dynamic File Service</td>
</tr>
<tr>
<td></td>
<td>🟦 Enables or disables the Windows Firewall access</td>
</tr>
<tr>
<td></td>
<td>🟦 Configures the Dynamic File Service port</td>
</tr>
<tr>
<td></td>
<td>🟦 Configures the DynamicFS SSL certificate</td>
</tr>
<tr>
<td></td>
<td>🟦 Registers a license key on the server</td>
</tr>
<tr>
<td></td>
<td>🟦 Configures the events to be audited</td>
</tr>
<tr>
<td></td>
<td>🟦 Configures the notification service, notification plug-ins for email and Twitter, and events that trigger a notification</td>
</tr>
<tr>
<td></td>
<td>🟦 Launches the Filter Driver Diagnostics tool</td>
</tr>
<tr>
<td></td>
<td>🟦 Provides product and version information</td>
</tr>
<tr>
<td>DswStandardEngine.config.xml</td>
<td>Configuration for logging events for the DynamicFS Standard Engine. This file is not created until the DswStandardEngine.exe application first runs.</td>
</tr>
<tr>
<td>DswStandardEngine.exe</td>
<td>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.</td>
</tr>
</tbody>
</table>
## Table D-2  Dynamic File Services Program Data Components

<table>
<thead>
<tr>
<th>Component File or Folder</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>DswStandardEngine.log</code></td>
<td>Event log for the DynamicFS Standard Engine application that enforces policies. This file is not created until the <code>DswStandardEngine.exe</code> application first runs.</td>
</tr>
<tr>
<td><code>DswStrings.dll</code></td>
<td>Contains strings for messages.</td>
</tr>
<tr>
<td><code>DswUpgrade.exe</code></td>
<td>Upgrades the software.</td>
</tr>
<tr>
<td><code>DswUsb.dll</code></td>
<td>USB.</td>
</tr>
<tr>
<td><code>DswWinApi.dll</code></td>
<td>C# .NET wrappers for native Windows APIs.</td>
</tr>
<tr>
<td><code>install.log</code></td>
<td>Event log for the DynamicFS installation.</td>
</tr>
<tr>
<td><code>NDFS.lic</code></td>
<td>The license that is created when you register a Dynamic File Services License Key.</td>
</tr>
<tr>
<td><code>RetentionReview.css</code></td>
<td>The style sheet for the Retention Review Web service.</td>
</tr>
<tr>
<td><code>upgrade.log</code></td>
<td>Event log for the DynamicFS upgrade.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component File or Folder</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>audit</code> folder</td>
<td>Contains the audit log file for DynamicFS management events.</td>
</tr>
<tr>
<td><code>DswAuditLog.xml</code></td>
<td></td>
</tr>
<tr>
<td><code>Clouds</code> folder</td>
<td>Contains the cloud account database files.</td>
</tr>
<tr>
<td><code>DswCloudDatabase.xml</code></td>
<td></td>
</tr>
<tr>
<td><code>LocalDrives</code> folder</td>
<td>Contains information about local drives on the DynamicFS server.</td>
</tr>
<tr>
<td><code>DswLocalDriveInfoControlTable.xml</code></td>
<td></td>
</tr>
<tr>
<td><code>Pairs</code> folder</td>
<td>Contains the pairs database file and history files for each pair.</td>
</tr>
<tr>
<td><code>DswPairDatabase.xml</code></td>
<td></td>
</tr>
<tr>
<td><code>Policies</code> folder</td>
<td>Contains the policies database file.</td>
</tr>
<tr>
<td><code>DswPolicyDatabase_v2.xml</code></td>
<td></td>
</tr>
<tr>
<td><code>Schedules</code> folder</td>
<td>Contains the schedules database file.</td>
</tr>
<tr>
<td><code>DswScheduleDatabase.xml</code></td>
<td></td>
</tr>
</tbody>
</table>
## Component File or Folder

<table>
<thead>
<tr>
<th>Component File or Folder</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>SnapShot folder</td>
<td>Contains the daily backup copies of the pair, policies, schedule, and cloud databases for use by the Repair tool.</td>
</tr>
<tr>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component File</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>AppLimit.CloudComputing.SharpBox.dll</td>
<td>APIs that abstract the application interfaces for different cloud storage providers.</td>
</tr>
<tr>
<td>ASWSDK.dll</td>
<td>Cloud storage APIs from Amazon Simple Storage Service (Amazon S3).</td>
</tr>
<tr>
<td>GlacialList.dll</td>
<td>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.</td>
</tr>
<tr>
<td>Hammock.ClientProfile.dll</td>
<td>Hammock open source project. A Web API library for .NET that simplifies consuming and wrapping RESTful services.</td>
</tr>
<tr>
<td>IKVM.AWT.WinForms.dll</td>
<td>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.</td>
</tr>
<tr>
<td>IKVM.OpenJDK.BeanLibrary.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Charsets.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Core.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Management.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Media.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Misc.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Naming.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Remoting.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Security.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.SwingAWT.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Text.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.Util.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.XML.API.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.XML.Parse.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.XML.Transform.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.OpenJDK.XPath.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.Runtime.dll</td>
<td></td>
</tr>
<tr>
<td>IKVM.Runtime.JNI.dll</td>
<td></td>
</tr>
<tr>
<td>ikvm-native-win32-x86.dll</td>
<td></td>
</tr>
<tr>
<td>Component File</td>
<td>Used for</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>InstallShield 2009</td>
<td>Flexera Software (formerly Acresso Software). Provides the install, modify, repair, and uninstall features for the DynamicFS software.</td>
</tr>
<tr>
<td>Ionic.Zip.dll</td>
<td>DotNetZip Library open source project. Allows .NET applications to read, create, extract, and modify ZIP files.</td>
</tr>
<tr>
<td>log4net.dll</td>
<td>Apache Logging Services open source project. Provides cross-language logging services for application debugging and auditing.</td>
</tr>
<tr>
<td>Microsoft.CSharp.dll</td>
<td>.NET libraries that support the C# runtime binder for the dynamic keyword.</td>
</tr>
<tr>
<td>System.Dynamic.dll</td>
<td></td>
</tr>
<tr>
<td>Microsoft.WindowsAPICodePack.dll</td>
<td>Windows API Code Pack for Microsoft .NET Framework provides a source code library that can be used to access some features of Windows 7 and Windows Vista from managed code.</td>
</tr>
<tr>
<td>Microsoft.WindowsAPICodePack.Shell.dll</td>
<td></td>
</tr>
<tr>
<td>Plossum.dll</td>
<td>Plossum open source project. A class library collection written in C# to provide functionality for writing and communicating with console applications.</td>
</tr>
<tr>
<td>C5.dll</td>
<td></td>
</tr>
<tr>
<td>tika-app-1.1.dll</td>
<td>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.</td>
</tr>
<tr>
<td>TweetSharp.dll</td>
<td>TweetSharp open source project. Provides functionality for sending Tweets to a Twitter account that has been configured with OAuth credentials.</td>
</tr>
<tr>
<td>ZedGraph.dll</td>
<td>ZedGraph open source project. Uses the Plossum library for creating two-dimensional line and bar graphics.</td>
</tr>
</tbody>
</table>