

# **How Filr Works—Overview Guide**

## **Filr 1.0.1**

**November 2013**

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# About This Guide

This guide contains high-level overviews of Novell Filr and covers the following topics:

- ◆ Chapter 1, “Filr Overview,” on page 7
- ◆ Chapter 2, “Setting Up Filr,” on page 11
- ◆ Chapter 3, “Filr Administration,” on page 23
- ◆ Chapter 4, “Access Rights and Filr,” on page 31
- ◆ Chapter 5, “Filr Comments,” on page 41
- ◆ Chapter 6, “Filr Email Notifications,” on page 43
- ◆ Chapter 7, “Filr Indexing and Searching,” on page 45
- ◆ Chapter 8, “Filr Licensing,” on page 47
- ◆ Chapter 9, “My Files (Personal Storage),” on page 49
- ◆ Chapter 10, “Net Folders,” on page 53
- ◆ Chapter 11, “Protocols and Filr,” on page 59
- ◆ Chapter 12, “Sharing through Filr,” on page 61
- ◆ Chapter 13, “Filr Synchronization,” on page 69
- ◆ Chapter 14, “Network Time and Filr,” on page 73
- ◆ Chapter 15, “Viewing Files as HTML in Filr,” on page 75
- ◆ Chapter 16, “Users and Groups with Filr,” on page 77
- ◆ Appendix A, “Documentation Updates,” on page 81

## Audience

This guide is intended for Novell Filr administrators.

## Feedback

Please use the User Comments feature at the bottom of each online documentation page to comment and suggest improvements to this guide and the other documentation included with Novell Filr.

## Documentation Updates

The most recent version of this guide is available [here \(http://www.novell.com/documentation/novell-filr1/filr1\\_overvw/data/bookinfo.html\)](http://www.novell.com/documentation/novell-filr1/filr1_overvw/data/bookinfo.html) on the Novell Filr Web site.

## Additional Documentation

For other Novell Filr documentation, see the [Novell Filr Web site \(http://www.novell.com/documentation/novell-filr1/\)](http://www.novell.com/documentation/novell-filr1/).



# 1 Filr Overview

Work-related files used to live safely behind firewalls. Remote file access required VPN connections. Then cloud-based file sharing introduced anywhere-access to files.

Now many users expect the same access to their work files that they have to their other files. In some cases, they have begun moving work files to cloud-based services, a potentially risky practice.

Novell Filr works with existing file servers and network infrastructures, combining modern file access methods with the security that organizations already have in place.

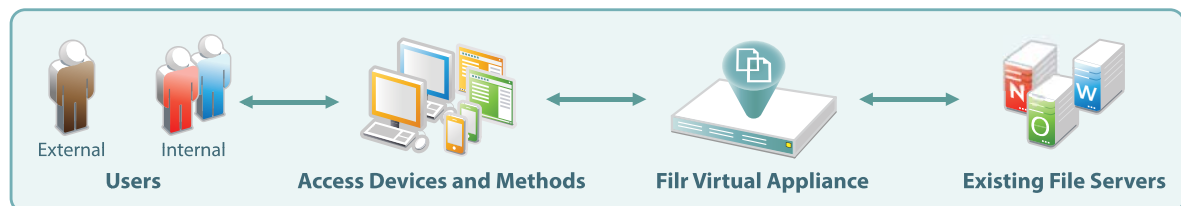
To learn more about Novell Filr, see the following:

- ◆ [Section 1.1, “What Is Novell Filr?,” on page 7](#)
- ◆ [Section 1.2, “Filr Features and Functionality,” on page 8](#)
- ◆ [Section 1.3, “Why Novell Appliances?,” on page 9](#)

## 1.1 What Is Novell Filr?

Novell Filr provides file access and sharing, and lets users access their home directories and network folders from mobile devices. Users can also synchronize their files to their PC and Mac computers. They can also share files internally and externally, and comment on files.

**Figure 1-1** Mobile Access to Enterprise Data



- ◆ **Users:** Filr lets you control the following:
  - ◆ User authentication inside and outside your organization’s firewall
  - ◆ Access to organization files and folders that were previously accessible only through mapped drives
  - ◆ Access to personal files and folders, including traditional home directories
  - ◆ Internal and external sharing of files and folders
- ◆ **Access Devices and Methods:** Filr provides multiple access methods.
  - ◆ A Web (browser-based) application
  - ◆ An app for Apple iOS 5.x (and later) personal devices
  - ◆ An app for Android 2.3 (and later) personal devices

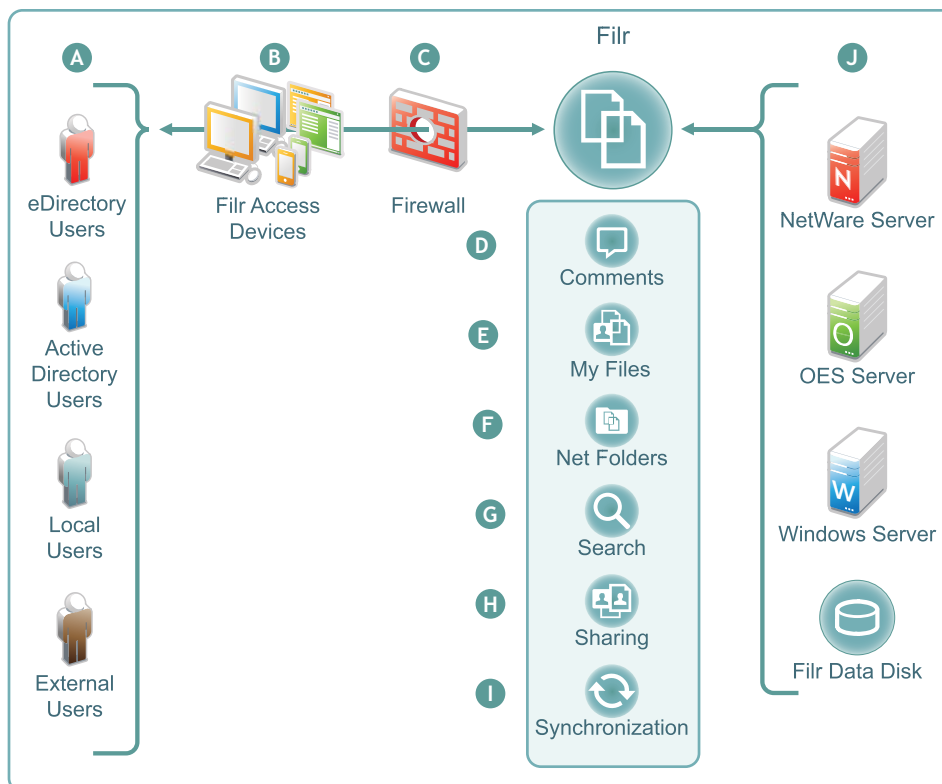
- ◆ Clients for Windows XP, Windows 7, and Windows 8 workstations
- ◆ A client for Macintosh OS X 10.7 and 10.8 workstations
- ◆ **Filr Virtual Appliance:**
  - ◆ This runs on VMware ESXi 4.1x and ESXi 5.x host servers.
  - ◆ It lets users authenticate using their standard network usernames and passwords.
  - ◆ It provides access to data on NetWare, OES, and Windows servers that use native file protocols (NCP and CIFS).
- ◆ **Existing File Servers:** Are not impacted because Filr does the following:
  - ◆ Requires no changes to file servers
  - ◆ Honors file system trustee rights and attributes

Your Novell and Windows file servers and directory services retain complete control over all file- and folder-related activity.

## 1.2 Filr Features and Functionality

Figure 1-2 shows Filr’s main features in the context of your existing network infrastructure. The table that follows the figure briefly describes each feature and how all of the components shown fit together to provide Filr services.

**Figure 1-2** What Filr Provides





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**Letter**   **Details**

---

- A**     ♦ **eDirectory and Active Directory:** You synchronize Filr with eDirectory and Active Directory identity stores through LDAP. See “[Synchronizing Users and Groups from an LDAP Directory](#)” in the *Novell Filr 1.0.1 Administration Guide*.
  - ♦ **Local Users:** You can create users on the Filr system independent of any LDAP source. For more information, see “[Creating a New Local User](#)” in the *Novell Filr 1.0.1 Administration Guide*.
  - ♦ **External Users:** When a user outside the organization responds to an invitation to share a file or folder, Filr creates a username using the invitation’s email address. When users accept these invitations, they can set their passwords. For more information, see “[Sharing Files and Folders](#)” in the *Novell Filr 1.0.1 Web Application User Guide*.
- 
- B**     Filr lets users access files and folders through the following:
  - ♦ A Web (browser-based) application
  - ♦ Apps for Apple iOS 5.x and later and Android 2.3 and later
  - ♦ Clients for Windows XP, Windows 7, Windows 8, Macintosh OS X 10.7 and 10.8 workstations
- 
- C**     Filr is designed to work with your security infrastructure. Your firewalls continue to protect your data while Filr provides access to it from practically anywhere. For more information, see “[Site Security](#)” in the *Novell Filr 1.0.1 Administration Guide*.
- 
- D**     Filr lets users collaborate by supporting user comments on files and folders. For more information, see “[Filr Comments](#).”
- 
- E**     Filr lets users access their personal files and folders on either or both traditional home directories and local Filr storage. For more information, see “[My Files \(Personal Storage\)](#).”
- 
- F**     Filr lets users access your organization’s files and folders that were previously available only through mapped drives. For more information, see “[Net Folders](#).”
- 
- G**     Filr lets users search for files and folders that they have rights to access. If indexing is enabled on a folder, they can search within the content of the folder’s files as well. For more information, see “[Filr Indexing and Searching](#).”
- 
- H**     Filr lets users share files in Net Folders, and files and folders in My Files, with internal and external users. For more information, see “[Sharing through Filr](#).”
- 
- I**     Filr lets you synchronize eDirectory and Active Directory users as well as files and folders according to your organization’s needs. For more information, see “[Filr Synchronization](#).”
- 
- J**     Filr provides access to storage on Novell file servers, Windows file servers, and personal storage on the Filr appliance.
- 

## 1.3 Why Novell Appliances?

Novell appliances simplify the Novell development and delivery model for Filr so that we can provide you with new services more quickly.

Novell appliance benefits include the following:

- ♦ **Simplified Deployment:** Filr appliances are built on specific and tuned operating systems (SLES 11 SP2 in the case of Filr 1.0). This means that you don’t have to install the operating system, select the packages, and so on because everything needed is included and ready to configure and run.

By the same token, packages and services that aren't needed aren't included, and therefore they don't consume system resources.

- ♦ **Simplified Management:** Appliances include the following:
  - ♦ Appliance-specific configuration wizards to configure exactly and only what is required.
  - ♦ Web-based administration tools for changing configurations, adding or provisioning users, and so on, from basically anywhere that you need to be
- ♦ **Simplified Maintenance:** Appliances don't require support packs or patches.

When there are enhancements or upgrades, you simply replace the system disk, connect it to the existing data disks, and start the service on the upgraded appliance.

# 2 Setting Up Filr

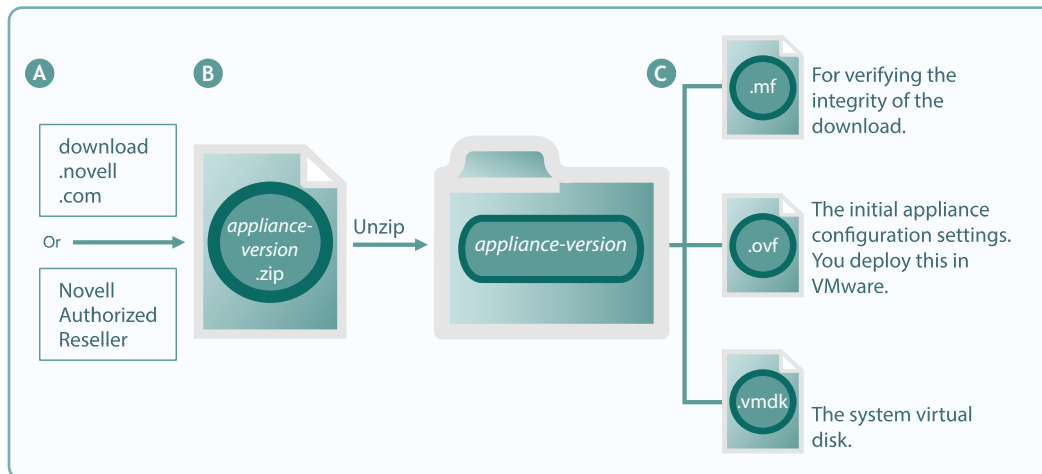
This section presents high-level overviews of the following setup tasks. For detailed setup information and instructions, see the *Novell Filr Installation and Configuration Guide*.

- Section 2.1, “Getting and Preparing Filr Software,” on page 11
- Section 2.2, “Deploying Filr Appliances,” on page 12
- Section 2.3, “Initial Configuration of Filr Appliances,” on page 14
- Section 2.4, “Filr Clustering,” on page 17
- Section 2.5, “Integrating Filr Inside Your Network Infrastructure,” on page 19
- Section 2.6, “Ports Used in Filr Deployments,” on page 21
- Section 2.7, “There Are No Impacts to Existing Servers or Systems,” on page 21

## 2.1 Getting and Preparing Filr Software

The process of getting and preparing Filr software is straightforward, as illustrated in [Figure 2-1](#) and explained in the table that follows it.

**Figure 2-1** Downloading and Unzipping Novell Appliances



Letter	Details
A	You can download the .zip archive files for the three Novell Filr appliances (Filr, Search, and MySQL) directly from the <a href="#">Novell Download Site</a> , or you can obtain them through your <a href="#">Novell Authorized Reseller</a> .

Letter	Details
B	Unzip the archives to expose a folder that contains the three files needed for deployment. For more information, see <a href="#">“Installing the Filr Appliance,”</a> <a href="#">“Installing the Search Index Appliance,”</a> and <a href="#">“Installing the MySQL Database Appliance”</a> in the <i>Novell Filr 1.0.1 Installation and Configuration Guide</i> .
C	<p>The <code>.mf</code> file contains an SHA1 digest that VMware uses to verify the integrity of the other two files.</p> <p>The <code>.ovf</code> file contains the virtual appliance's configuration settings. You deploy this file in VMware to create the Filr appliance. Its settings get modified during the initial deployment phase.</p> <p>The <code>.vmdk</code> file is the virtual appliance's (VA's) system virtual disk and contains all VA system files. It comes ready for the initial start-up and configuration.</p>

For more information, see [“Installing the Filr Appliance,”](#) [“Installing the Search Index Appliance,”](#) and [“Installing the MySQL Database Appliance”](#) in the *Novell Filr 1.0.1 Installation and Configuration Guide*.

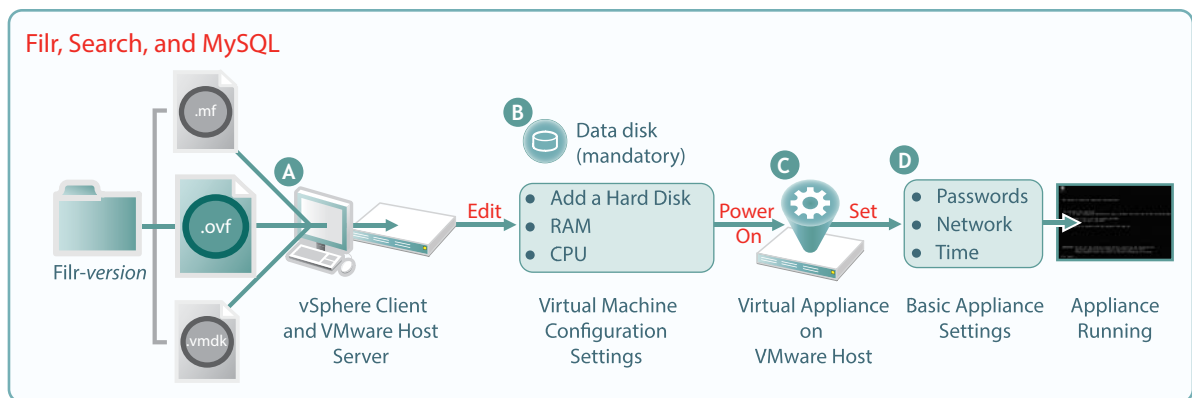
## 2.2 Deploying Filr Appliances

After you have obtained and extracted the appliance software, you need to deploy it on your VMware host server, as illustrated in [Figure 2-2](#) and [Figure 2-3](#) and as explained in the tables that follow them. For more specific information about the different deployment models, see [“Small Installation Vs. Large Installation”](#) in the *Novell Filr 1.0.1 Administration Guide*.

- [Section 2.2.1, “Small Filr Deployment Overview,”](#) on page 12
- [Section 2.2.2, “Large Filr Deployment Overview,”](#) on page 13

### 2.2.1 Small Filr Deployment Overview

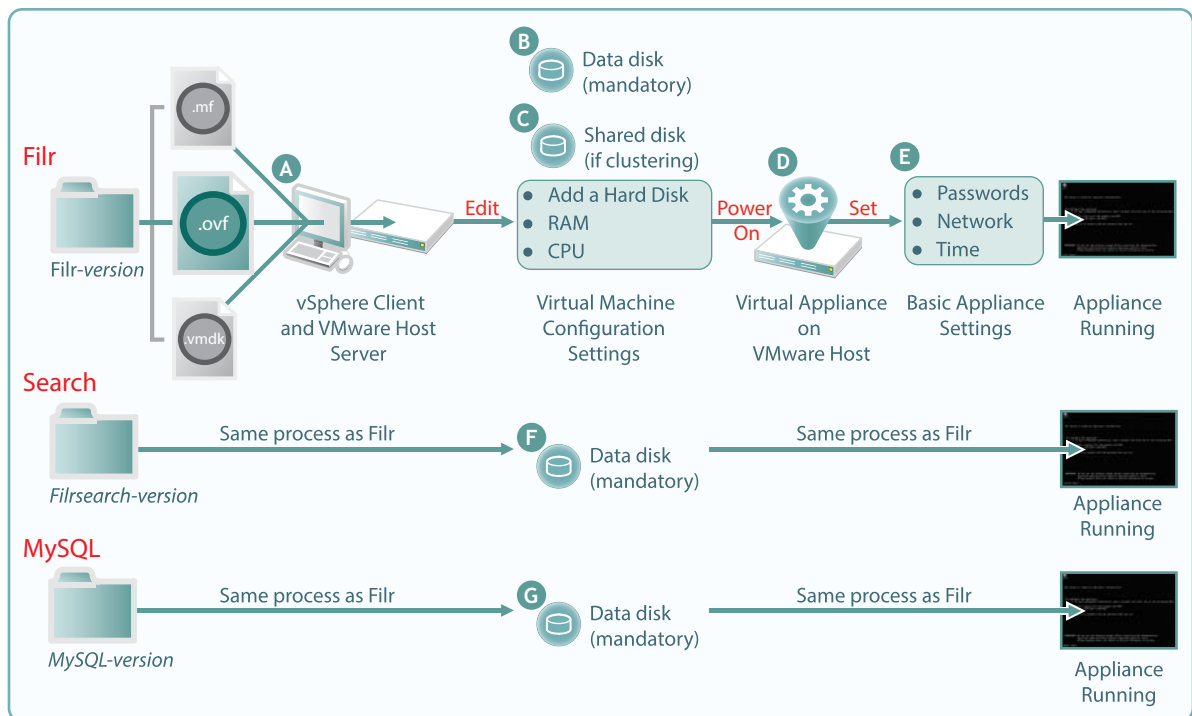
**Figure 2-2** A Small Deployment of Filr



Letter	Details
A	<p>Using the vSphere client, access the VMware host server and deploy the .ovf template file.</p> <p>Specify the hostname and IP address. If possible, the system determines the mask and gateway, and automatically populates those fields.</p> <p>The network interface is bridged by default. Make sure this setting matches the network configuration in your VMware environment.</p>
B	<p>A second disk is needed for the following reasons:</p> <ul style="list-style-type: none"> <li>◆ Adequate personal storage disk space—personal files are stored here.</li> <li>◆ Separation of system and data files to facilitate appliance updates—data files are stored here.</li> </ul> <p>You might want to also change the RAM allocation and the number of CPUs.</p>
C	Start the appliance.
D	<p>Specify the appliance's basic configuration, which includes administrative users' passwords, IP address settings, and the time zone and NTP time source.</p> <p>These settings are common to all Novell appliances.</p>

## 2.2.2 Large Filr Deployment Overview

**Figure 2-3** A Large Deployment of Filr



Letter	Details
A	<p>Using the vSphere client, access the VMware host server and deploy the .ovf template file.</p> <p>Specify the hostname and IP address. If possible, the system determines the mask and gateway, and automatically populates those fields.</p> <p>The network interface is bridged by default. Make sure this setting matches the network configuration in your VMware environment.</p>
B	<p>A second disk is needed for the following reasons:</p> <ul style="list-style-type: none"> <li>◆ Adequate personal storage disk space</li> <li>◆ Separation of system and data files to facilitate appliance updates</li> </ul> <p>You might want to also change the RAM allocation and the number of CPUs.</p>
C	<p>If you are clustering the Filr VA, add a shared disk for all members of the cluster to use.</p> <p>This only applies to the Filr VA, not to the Search or MySQL appliances.</p>
D	<p>Start the appliance.</p>
E	<p>Specify the appliance's basic configuration, which includes administrative users' passwords, IP address settings, and the time zone and NTP time source.</p> <p>These settings are common to all Novell appliances.</p>
F	<p>If you are installing separate appliances, you need to deploy a search appliance as well. The process is very similar to a Filr VA deployment, except that the search appliance doesn't use shared storage.</p>
G	<p>Installing separate appliances also requires configuring a MySQL database. Deploying the MySQL appliance that comes with Filr is very similar to the process for Filr and the search appliance.</p> <p>If you already have a MySQL database in your organization, you can use it instead of the MySQL appliance that comes with Filr.</p>

## 2.3 Initial Configuration of Filr Appliances

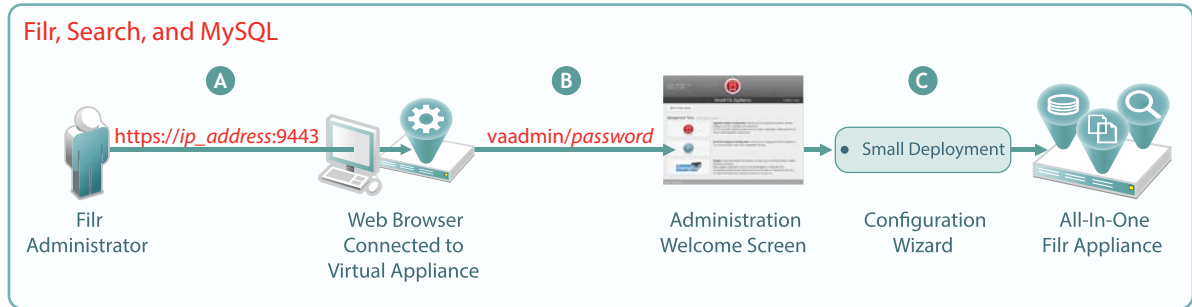
After you have deployed the appliances and set a few basic system settings, such as passwords, you must perform an initial appliance configuration. The process varies, depending on which deployment scenario you are implementing.

- ◆ [Section 2.3.1, “Small Filr Deployment Configuration,” on page 14](#)
- ◆ [Section 2.3.2, “Large Filr Deployment Configuration,” on page 15](#)

### 2.3.1 Small Filr Deployment Configuration

Starting and configuring an all-in-one Filr appliance is quite straightforward, as illustrated in [Figure 2-4](#) and explained in the table that follows it.

**Figure 2-4** Configuring an All-in-One Filr Appliance



Letter	Details
A	Access and configure the Filr appliance through a browser.
B	Log in to the administration console.
C	Run the configuration wizard. When you finish, your all-in-one appliance is running and ready to provide Novell Filr services.

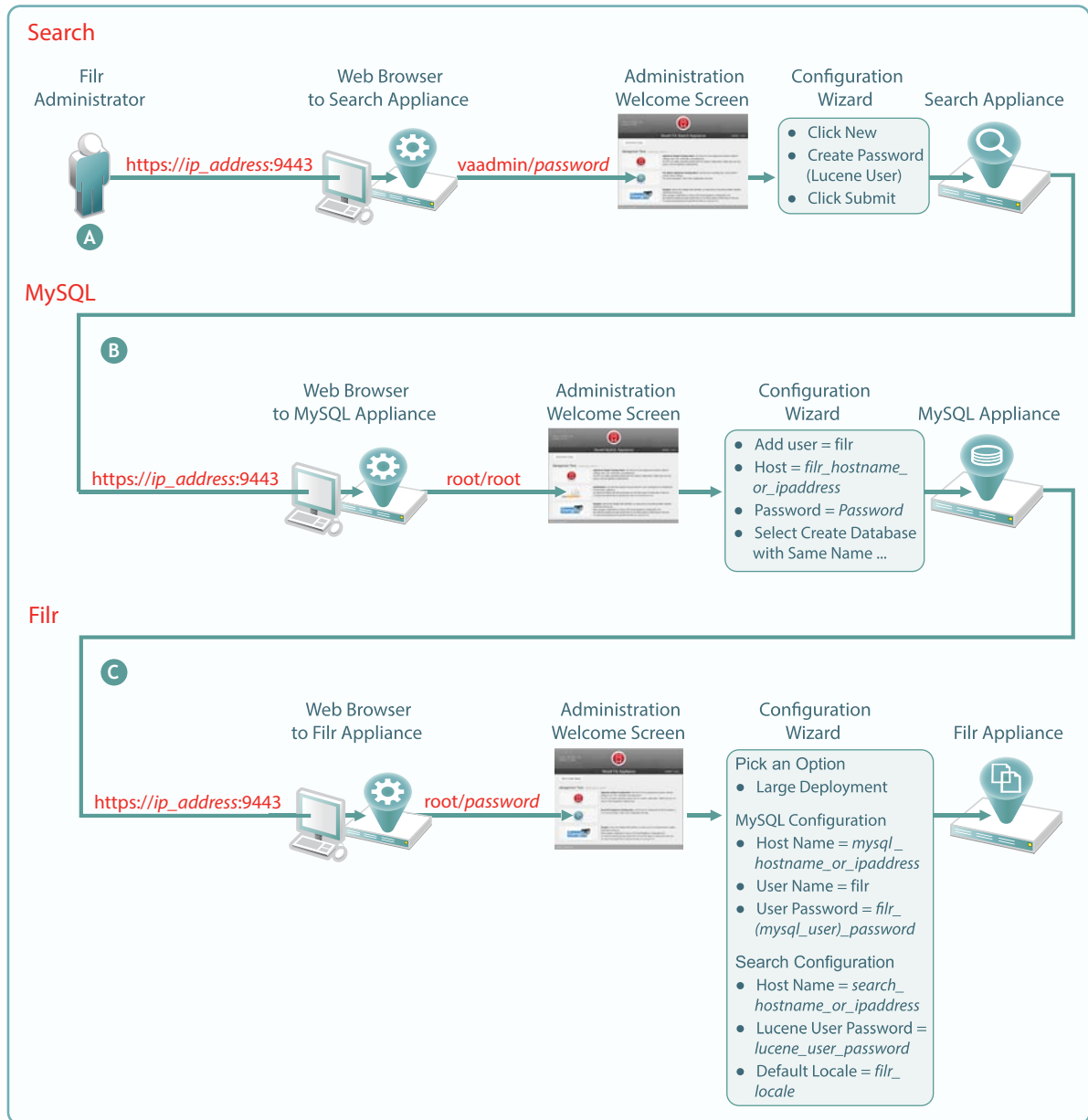
For more information, see “[Small Deployment Configuration](#)” in the *Novell Filr 1.0.1 Installation and Configuration Guide*.

## 2.3.2 Large Filr Deployment Configuration

Starting and configuring the appliances for a large deployment is obviously more involved than for a single appliance. However, the process is well documented and also very straightforward, as illustrated in [Figure 2-5](#) and explained in the table that follows it.

Notice that the order of working with the three appliance types is reversed from the order in [Figure 2-3](#) on page 13.

**Figure 2-5** Configuring Separate Appliances



Letter	Details
A	<p>First, access and configure the Search appliance through a browser, logging in to the administration console, and running the configuration wizard.</p> <p>When you finish this step, your Search appliance is running and ready to provide indexing services for Filr.</p> <p>For details, see “Installing the Search Index Appliance” in the <i>Novell Filr 1.0.1 Installation and Configuration Guide</i>.</p>



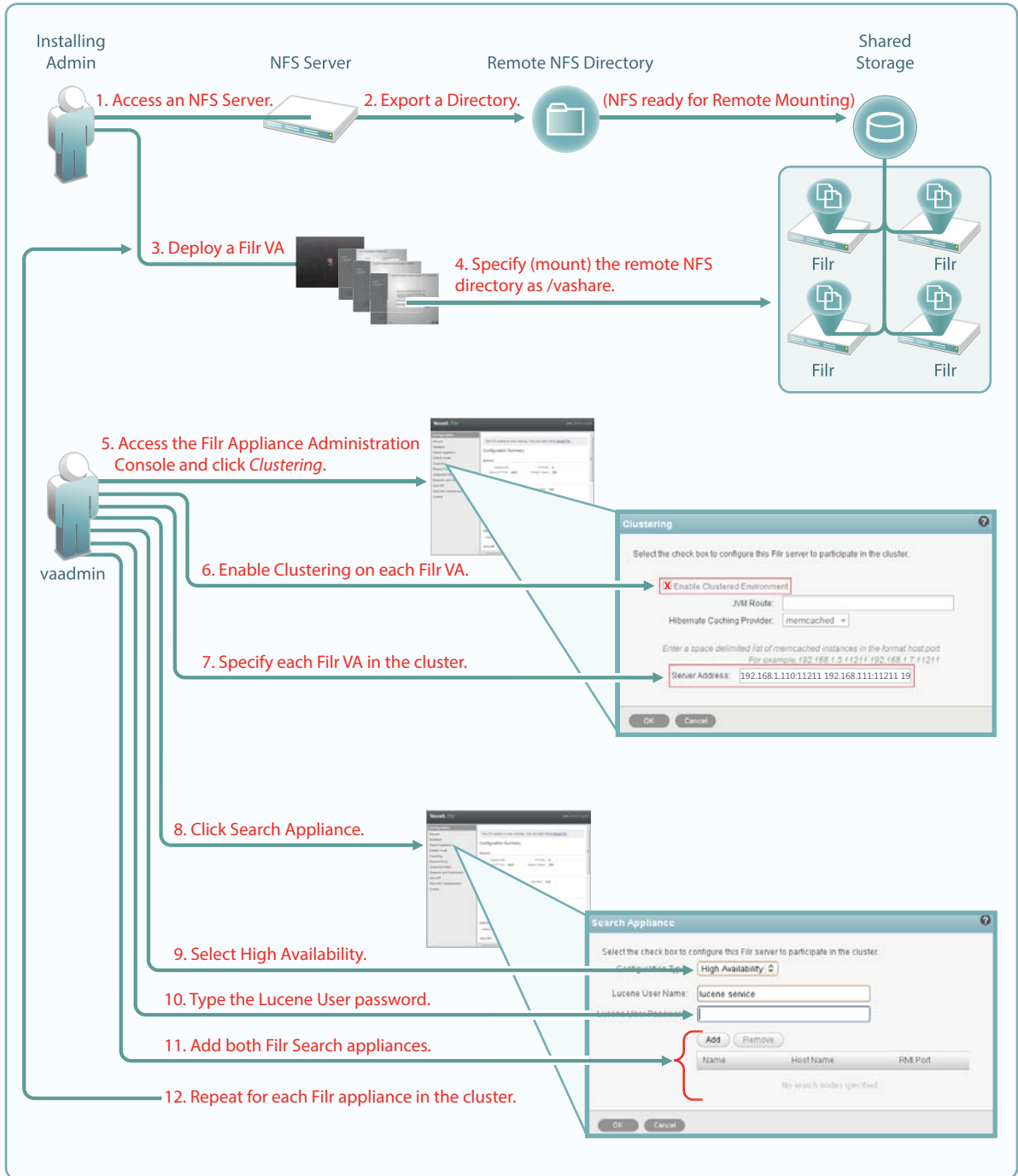
Letter	Details
B	<p>Second, access and configure the MySQL database appliance through a browser, or configure your database server.</p> <p>If using the MySQL database appliance, use the phpMyAdmin utility to configure the appliance, as instructed in “<a href="#">Installing the MySQL Database Appliance</a>” in the <i>Novell Filr 1.0.1 Installation and Configuration Guide</i>.</p> <p>When you finish this step, your MySQL appliance is running and ready to provide database services to the Filr appliance.</p>
C	<p>Finally, access and configure the Filr appliance through an administrative browser, logging in to the administrative console, and running the configuration wizard.</p> <p>For more information, see “<a href="#">Large Deployment Configuration</a>” in the <i>Novell Filr 1.0.1 Installation and Configuration Guide</i>.</p> <p>When you finish this step, your virtual appliances are all running and working with each other, providing your network with Filr services.</p>

For more information, see “[Installing Separate Appliances for a Large Installation](#)” and “[Large Deployment Configuration](#)” in the *Novell Filr 1.0.1 Installation and Configuration Guide*.

## 2.4 Filr Clustering

Filr clustering involves two or more Filr VAs sharing the same NFS data storage location (/vashare). Basic steps for setting up Filr clustering are included in [Figure 2-6](#).

**Figure 2-6** Clustered Filr VAs



For more information about clustering, see [Changing Clustering Configuration Settings](#) in the *Novell Filr Installation and Configuration Guide*.

## 2.5 Integrating Filr Inside Your Network Infrastructure

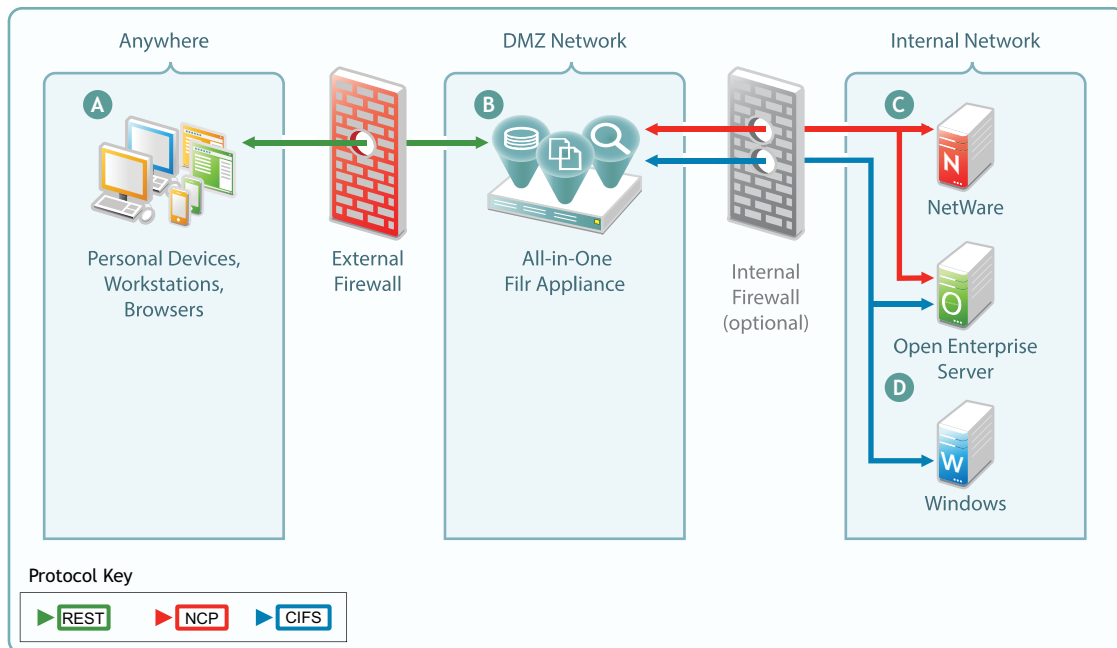
The following examples illustrate two possibilities out of many potential network configurations for deploying Filr.

- [Section 2.5.1, “A Small Filr Deployment,”](#) on page 19
- [Section 2.5.2, “A Large Filr Deployment,”](#) on page 20

### 2.5.1 A Small Filr Deployment

[Figure 2-7](#) illustrates a high-level view of how an all-in-one appliance might be integrated into a small organization’s network. Each letter is explained in the table that follows the figure.

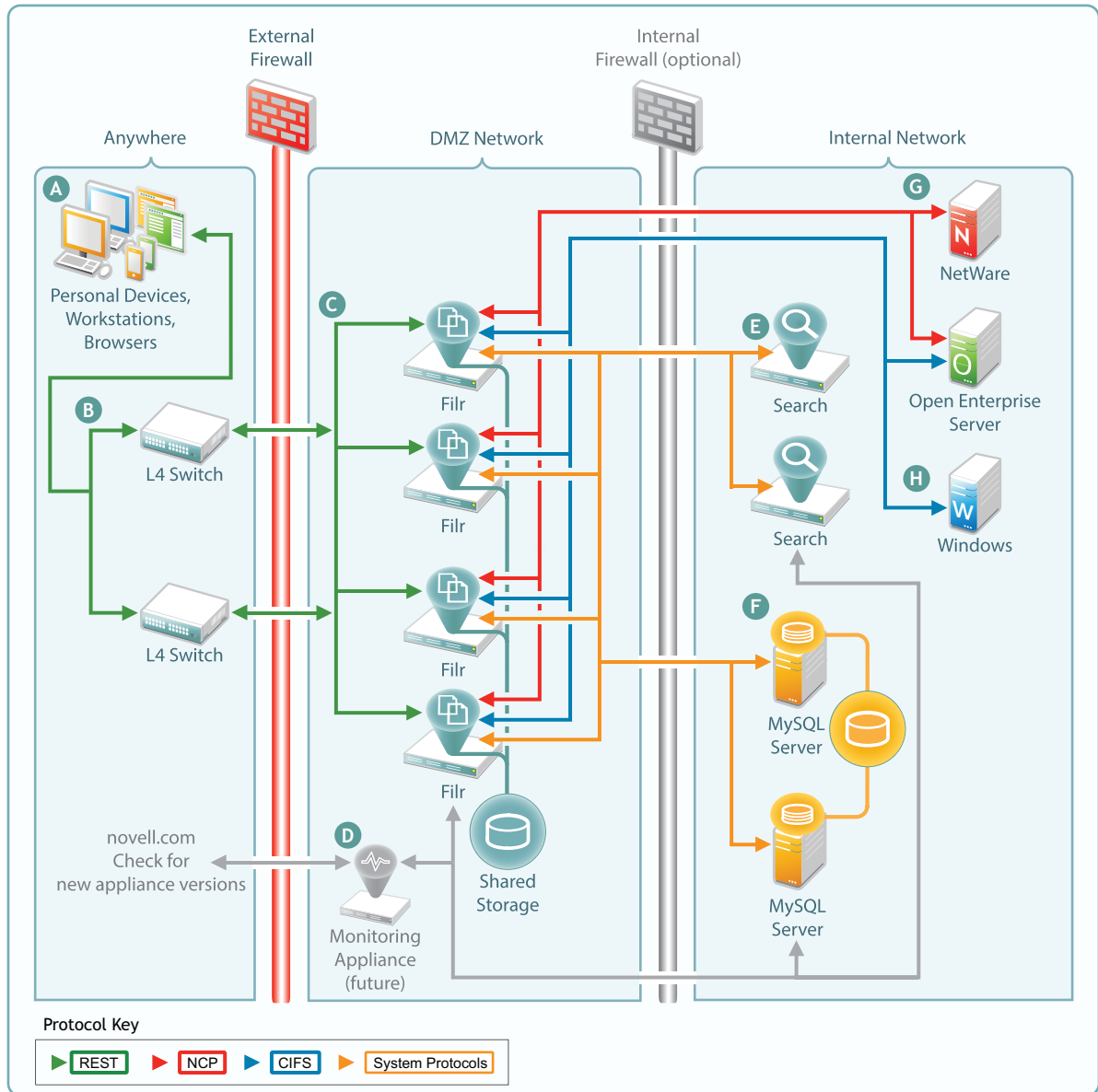
**Figure 2-7** Example of a Small Filr Deployment



Letter	Details
<b>A</b>	Filr brings Novell file services to personal devices, Macintosh and Windows workstations, and Web browsers.
<b>B</b>	Filr is built for fitting in with your security infrastructure and can be deployed in a DMZ network, allowing your organization’s data to remain safely inside your internal network.
<b>C</b>	Filr provides full NCP protocol support. Users have access to files stored on both NetWare and Open Enterprise Server file servers.
<b>D</b>	Filr provides full CIFS protocol support to servers providing CIFS file services, such as Windows file servers.

## 2.5.2 A Large Filr Deployment

Figure 2-8 Example of a Large Filr Deployment



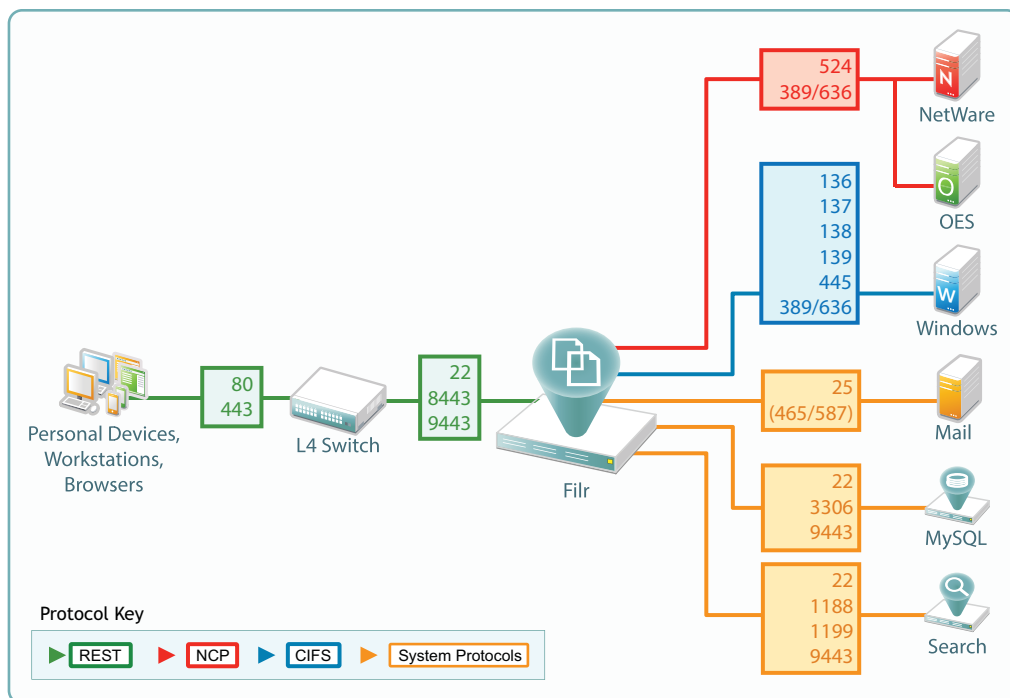
Letter	Details
A	Filr brings Novell file services to personal devices, Macintosh and Windows workstations, and Web browsers.
B	You can use L4 switches to provide load balancing of REST requests to your Filr appliances. Although not shown, you can, of course, also use Apache for this.
C	You can deploy Filr appliances inside a front-end DMZ and configure multiple Filr VAs to share NFS-based storage, thus providing scalability and high availability.

Letter	Details
D	Although not available in the first release, a future release could include a monitoring appliance that leverages Ganglia and Nagios monitoring and statistics.
E	You can deploy multiple search appliances in a back-end DMZ, each of which maintains indexes of Filr data to provide scalable response times to search and other requests coming through the Filr appliances.
F	Your organization's MySQL servers can be deployed in the back-end DMZ and configured to access the same database.
G	As with small deployments, this configuration provides NCP file services.
H	CIFS file services are also provided.

## 2.6 Ports Used in Filr Deployments

As you configure the firewalls in your deployment, allow traffic on the ports indicated in [Figure 2-9](#), as applicable on your network.

**Figure 2-9** Filr Port Usage



## 2.7 There Are No Impacts to Existing Servers or Systems

- ♦ **File Servers:** Filr requires no changes to existing file servers or directory services. There is no new software to install on existing file servers.
- ♦ **File Systems:** There are no changes to existing file systems. File system rights, trustee assignments, storage quotas, and so on are all honored. This is because all file access is controlled by the file systems just as it was before Filr was installed.

- ♦ **Directory Services:** There are no schema extensions or other changes required to existing directory services.

---

# 3 Filr Administration

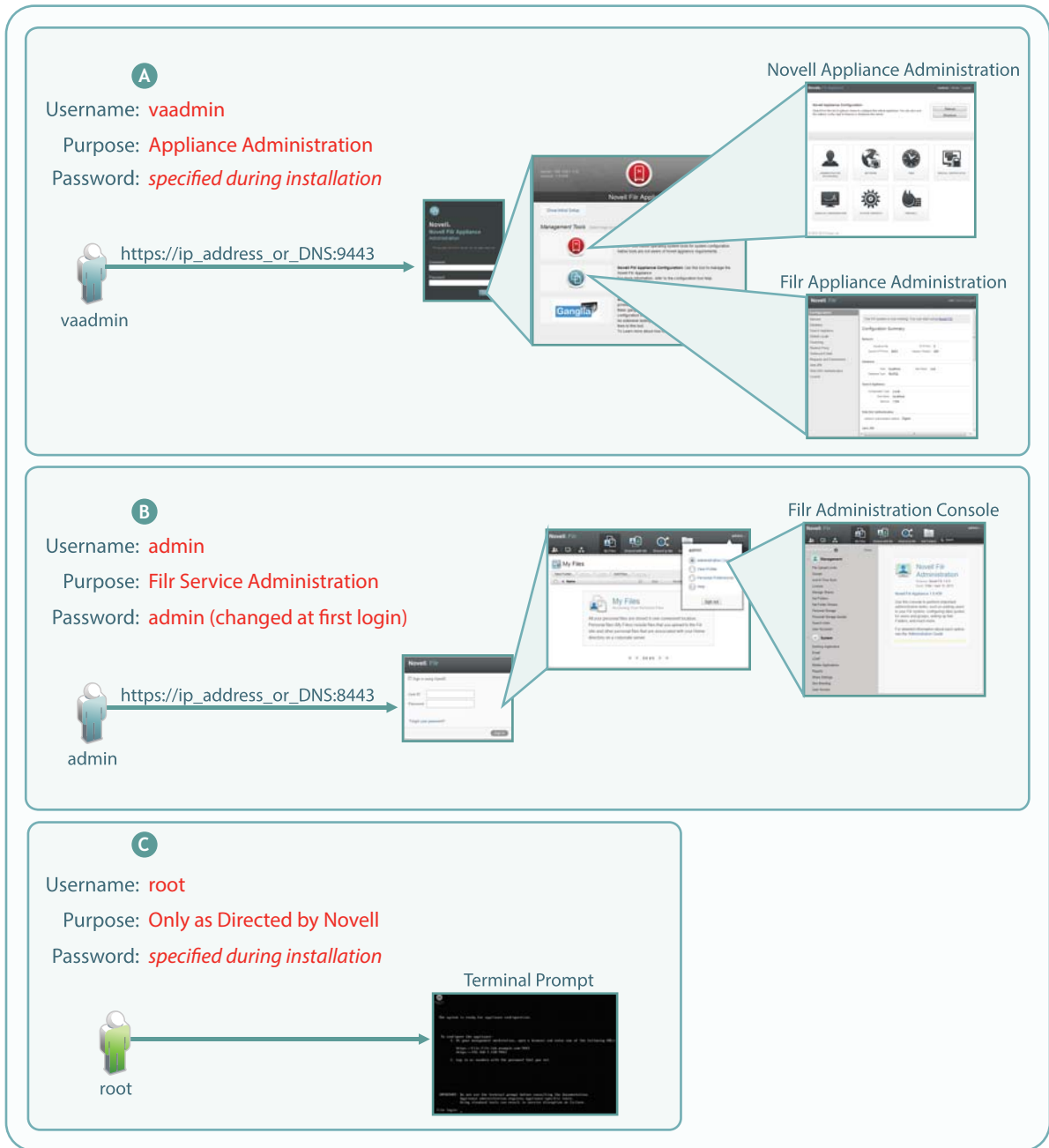
Filr administration is very straightforward as outlined in the following sections.

- ♦ [Section 3.1, “Filr Administrative Users,”](#) on page 23
- ♦ [Section 3.2, “Ganglia Appliance Monitoring,”](#) on page 25
- ♦ [Section 3.3, “Updating Appliances,”](#) on page 26
- ♦ [Section 3.4, “Certificate Management in Filr,”](#) on page 28
- ♦ [Section 3.5, “Filr Site Branding,”](#) on page 28

## 3.1 Filr Administrative Users

Because Filr is an appliance that is installed and administered in different phases, you install and then administer Filr using two different administrative users. Each user utilizes different Web-based administrative tools, as illustrated in [Figure 3-1](#) and explained in the table that follows it.

**Figure 3-1** Filr Administrators: Their Purposes, Passwords, and the Interfaces They Use



**Letter**

**Details**

**A**

vaadmin takes over the installation process after the initial deployment is finished. It then configures appliance services so that they are fully operational.

You use this administrative user whenever appliance settings need to be changed or adjusted. Installing certificates and licenses, adjusting the network configuration, and setting up Filr clustering are just a few of the tasks that you use vaadmin to perform.

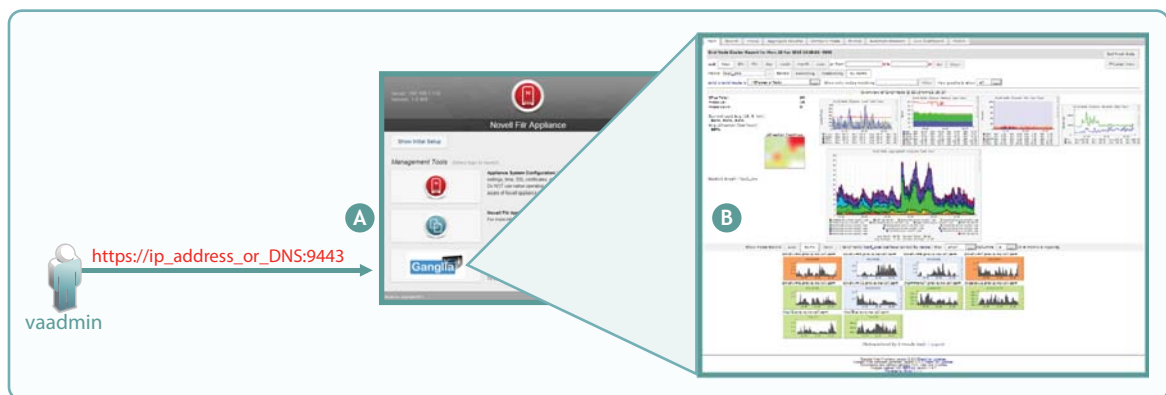


Letter	Details
B	<p>After the appliances are fully operational, most of the administrative work is accomplished using the Filr <code>admin</code> user account.</p> <p>The first time you log in, the username/password are <code>admin/admin</code>. You are prompted to change this. See “<a href="#">Resetting the Filr Administrator Password</a>” in the <i>Novell Filr Administration Guide</i>.</p> <p>You use this administrative user to do the following:</p> <ul style="list-style-type: none"> <li>◆ Import (synchronize) users and groups from LDAP identity stores</li> <li>◆ Create additional Filr users</li> <li>◆ Set up My Files personal storage</li> <li>◆ Set up Net Folders</li> <li>◆ Set synchronization schedules</li> </ul>
C	<p>Novell Filr and the appliances associated with it are special-purpose virtual machines. They are designed to be configured and managed using the Web-based management consoles (above). Although it is possible to access the appliance using the terminal prompt or through an SSH connection, Novell strongly discourages this practice because it can result in service disruption or more serious problems, including data loss.</p> <p>If you contact Novell Support with a Filr support incident, you might be asked to access the appliance’s terminal prompt as the <code>root</code> user. Otherwise, there are no Filr administrative tasks that involve <code>root</code> or the bash interface.</p>

## 3.2 Ganglia Appliance Monitoring

By launching the Ganglia monitoring page, as shown in [Figure 3-2](#), you can access various real-time monitoring statistics for all of the Ganglia-enabled machines on your network segment.

**Figure 3-2** Ganglia Appliance Monitoring



Letter	Details
A	<p>The <code>vaadmin</code> administrative user has access to Ganglia monitoring, via the Appliance Configuration and Maintenance Web page.</p>

---

Letter	Details
B	<p>At the top of the Ganglia Web page are graphs that represent an aggregation of all of the Ganglia-enabled machines that are being monitored on your network segment.</p> <p>At the bottom of the page are graphs for each machine that is being monitored. By clicking an individual machine's graph, you can get its details. For example, on a Filr appliance you see Filr metrics, <code>/vastorage</code> monitoring, CPU load, disk statistics, memory usage, and all of the standard Ganglia metrics.</p>

---

If you want to learn more about using and customizing Ganglia, you might consider investing in publications on the subject, such as the book [Monitoring with Ganglia](#), which was written by developers and others associated with the Ganglia project.

### 3.3 Updating Appliances

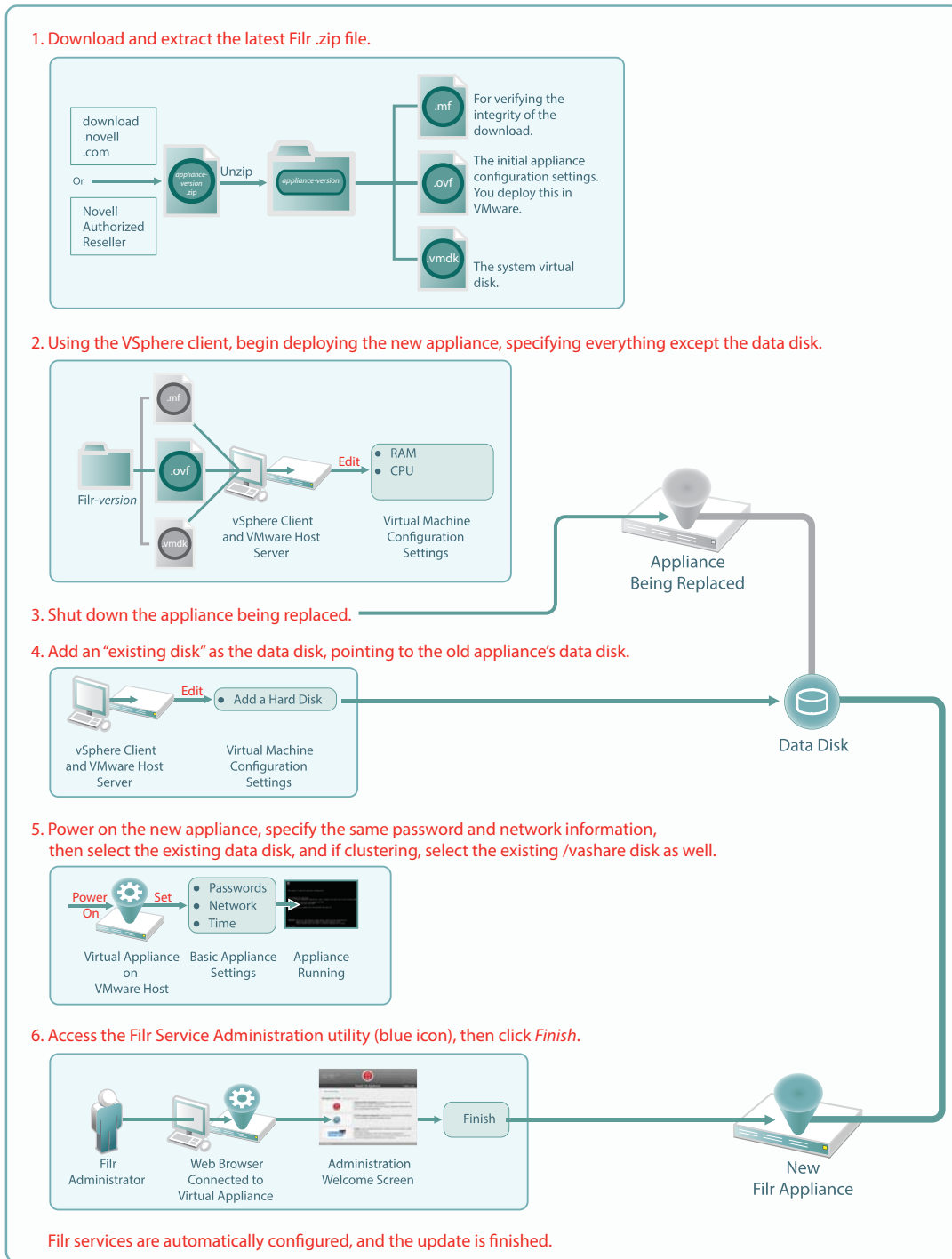
Filr and Search appliances are updated by simply installing a new appliance system disk and linking it to the existing data disk, as illustrated in [Figure 3-3](#).

---

**IMPORTANT:** While performing an upgrade, be sure to consult the detailed instructions in “[Updating Filr and Search Appliances](#)” in the *Novell Filr Installation and Configuration Guide*. A successful upgrade depends on following sub-tasks that are not illustrated here, such as the order in which appliances are shut down and then restarted.

---

**Figure 3-3** Updating a Filr or Search Appliance

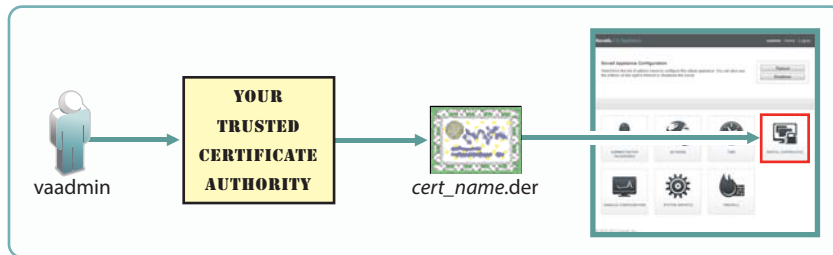


## 3.4 Certificate Management in Filr

So that your Web client users don't receive security warnings when accessing Filr, we recommend that you configure Filr with a certificate from your CA, as illustrated in [Figure 3-4](#). This will ensure that browsers will trust the Filr appliance as a valid server.

You can also set up Filr as a client to trust other servers. For example, if your LDAP identity store requires SSL communications (LDAPS), you can import the trusted CA certificate from your identity store server.

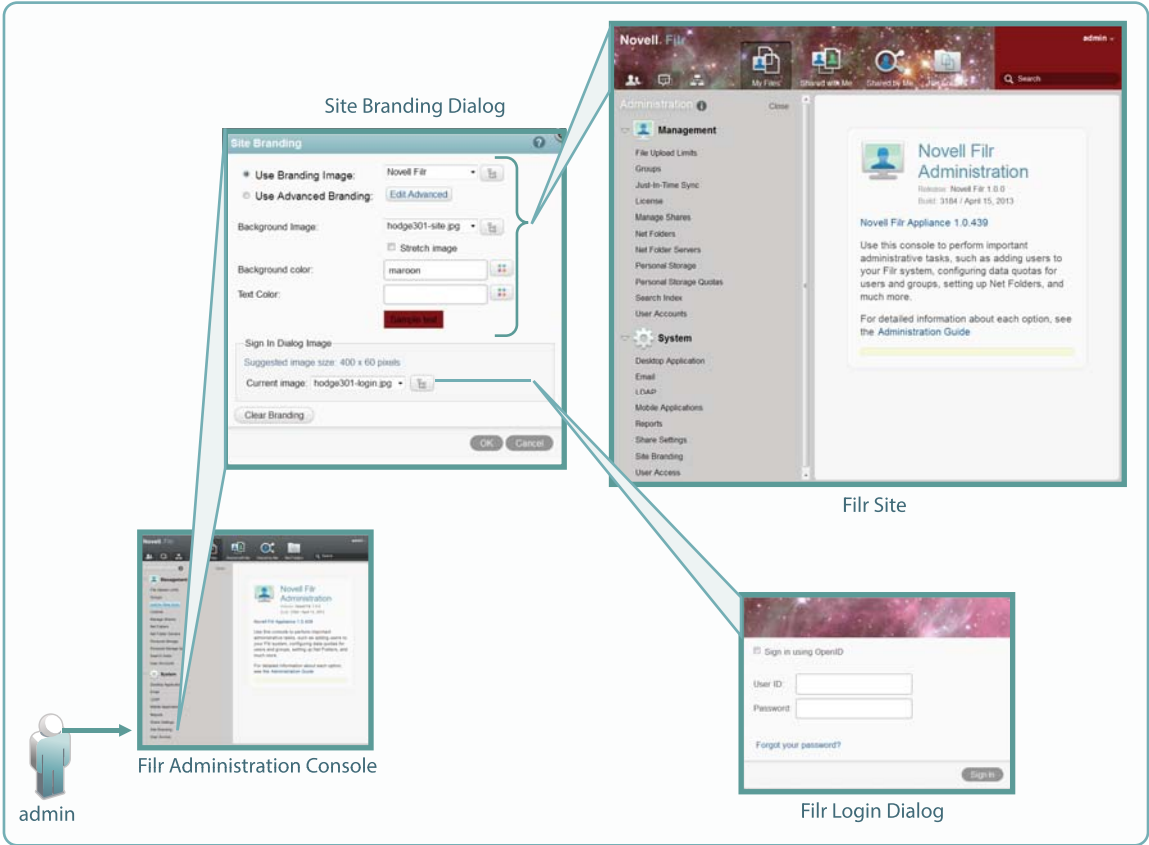
**Figure 3-4** Importing a CA certificate



## 3.5 Filr Site Branding

You can customize the colors and images displayed on the Filr site and the login dialog box, as illustrated in [Figure 3-5](#). For more information, see [“Setting Up Site Branding”](#) in the *Novell Filr 1.0 Administration Guide*.

Figure 3-5 Branding Filr





---

# 4 Access Rights and Filr

Filr administrators need to have a good understanding of how Filr leverages the file system and other rights that are already in place, and also how user rights to use Filr functionality are determined.

- ♦ [Section 4.1, “Filr Authentication,” on page 31](#)
- ♦ [Section 4.2, “Access to Files and Folders Is Controlled by the File System,” on page 32](#)
- ♦ [Section 4.3, “How Users Get the Required Access Permissions,” on page 32](#)
- ♦ [Section 4.4, “Access Through Filr Involves One of Four Possible Roles,” on page 33](#)
- ♦ [Section 4.5, “Rights to Files and Folders,” on page 33](#)
- ♦ [Section 4.6, “Sharing Rights,” on page 39](#)
- ♦ [Section 4.7, “Windows Share Rights,” on page 39](#)
- ♦ [Section 4.8, “Access-based Enumeration \(Windows\),” on page 39](#)

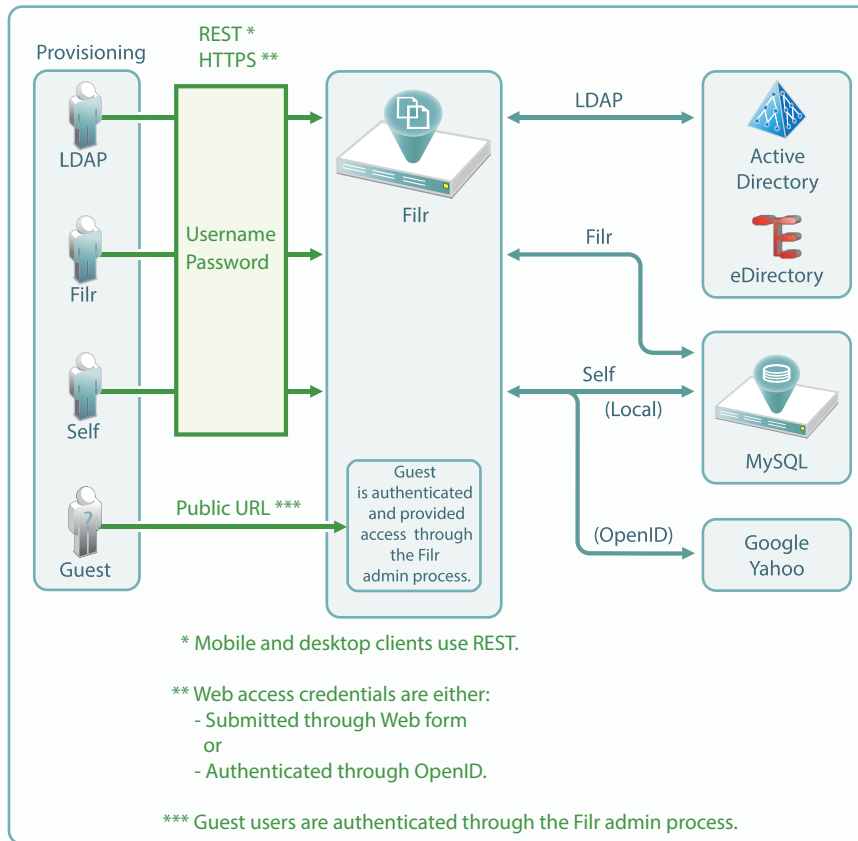
## 4.1 Filr Authentication

Filr clients for mobile devices and workstations use a REST protocol for Filr authentication. Inside the protocol are the user-supplied credentials. Filr validates these against the identity source (LDAP or local) or against the OpenID provider.

Web access is through either the Web form or OpenID. If the Web form is used, Filr takes the credentials supplied and validates them as with REST. If Open ID is used, Filr honors the authentication provided by the OpenID provider.

This is illustrated in [Figure 4-1](#).

Figure 4-1 User Authentication in Filr



## 4.2 Access to Files and Folders Is Controlled by the File System

The NSS and NTFS file systems on OES, NetWare, and Windows servers always control access to the files and folders they contain. Users seeking access through a file browser, such as Windows explorer, must generally have the required permissions on the file systems to gain access.

This is absolutely true when accessing files and folders through Filr. You cannot gain more access through Filr than the underlying file system allows.

Filr sharing is no exception. [Shared access through Filr](#) depends on the Net Folder proxy user having the required file system rights.

## 4.3 How Users Get the Required Access Permissions

From a Filr perspective, users can get the required permissions to access files and folders in one of three ways:

- ♦ **Directly:** Users are assigned permissions to the files and folders.
- ♦ **Group Membership:** Users inherit permissions to the files and folders through membership in a group that has been assigned the permissions.



- ♦ **Net Folder Proxy User:** Users receive and accept Filr share invitations. They can then access the shared files and folders through the assigned Net Folder proxy users that have the required file system rights.

## 4.4 Access Through Filr Involves One of Four Possible Roles

Depending on the rights that users have on the file system (see [How Users Get the Required Access Permissions](#)), Filr lets users function in one of four roles, as outlined in [Table 4-1](#).

**Table 4-1** *Filr Roles and the Rights That They Represent*

Role	Rights
None	No rights
Viewer	Read and Visibility rights
Editor	Read, Visibility, and Write rights
Contributor	Read, Visibility, and Write rights Create, Delete, Rename, Move, and Copy the contents of the folder

### 4.4.1 Roles and Net Folders

User roles relative to Net Folders are not assigned. They are automatically derived from users' permissions on the <NSS link to Table 4-2> and <NTFS link to Table 4.3> file system.

As explained in [How Users Get the Required Access Permissions](#), file system permissions can be directly assigned or inherited through group membership.

### 4.4.2 Roles and Shared with Me

User roles relative to Shares are assigned by the user sending the invitation.

Users sending invitations can only assign roles up to the level that they have.

Users receiving and accepting share invitations might or might not have direct rights on the file system, but that is irrelevant. Individual user rights on the file system do not affect Shared with Me functionality. Instead, Net Folder proxy users interface with the file system for everyone who is functioning in a sharing role.

If users access a folder through Shared with Me to which they also have file system rights, their functionality within Shared with Me is defined by the sharing role they were granted with the share invitation, even though that role might provide more or fewer access privileges than they would have through their Net Folder connection to the same folder.

## 4.5 Rights to Files and Folders

Filr users must [have the required rights](#) to access files and folders through Filr.

- ♦ [Section 4.5.1, "Access Is Always Controlled by the File System," on page 34](#)
- ♦ [Section 4.5.2, "My Files \(Personal Storage\)," on page 36](#)

- [Section 4.5.3, “Home Folders,” on page 37](#)
- [Section 4.5.4, “Net Folders,” on page 37](#)
- [Section 4.5.5, “Filtr Attributes Are Always Honored,” on page 38](#)

## 4.5.1 Access Is Always Controlled by the File System

As already explained, [access through Filr involves one of four possible roles](#).

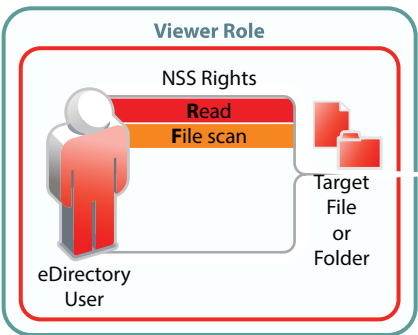
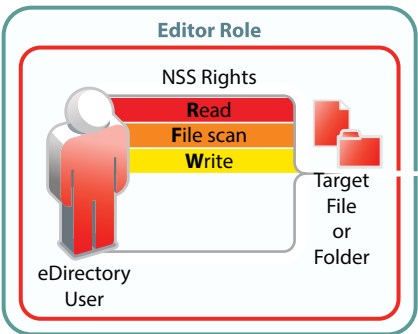
For users to have Viewer, Editor, or Contributor rights through Filr, they must have the minimum rights that those roles require, as outlined and illustrated in the following sections.

- [“Filtr Roles and NSS File System Trustee Rights” on page 34](#)
- [“Filtr Roles and NTFS Permissions” on page 35](#)
- [“Role Requirements Are Rigidly Enforced” on page 36](#)

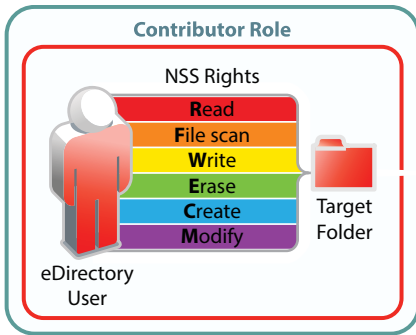
### Filtr Roles and NSS File System Trustee Rights

For eDirectory users to function in Filr roles, they must have the NSS rights illustrated and explained in [Table 4-2](#).

**Table 4-2** NSS File System Rights and Filr Roles

Role and Minimum NSS Rights Required	Comments
 <p>The diagram for the Viewer Role shows an eDirectory User icon on the left. To its right is a box titled 'NSS Rights' containing two stacked bars: a red bar labeled 'Read' and an orange bar labeled 'File scan'. A bracket on the right side of the box points to an icon of a folder and a file, labeled 'Target File or Folder'.</p>	<p>Read and File Scan are the minimum file system trustee rights that users must have to view files and folders.</p>
 <p>The diagram for the Editor Role shows an eDirectory User icon on the left. To its right is a box titled 'NSS Rights' containing three stacked bars: a red bar labeled 'Read', an orange bar labeled 'File scan', and a yellow bar labeled 'Write'. A bracket on the right side of the box points to an icon of a folder and a file, labeled 'Target File or Folder'.</p>	<p>If the Write file system trustee right is added to Read and File Scan, users can then modify file content.</p>

---

**Role and Minimum NSS Rights Required****Comments**

To perform contributor functions, users must either have all file system trustee rights to the file or folder (except for `Access Control`) or the `Supervisor` right to the file or folder.

You might ask why `Access Control` isn't listed. That is because it has no effect.

Although users can provide access for other users through Filr sharing, that functionality is enabled by the file system rights of Net Folder proxy users.

Filr shared access is independent of any file system rights that users have or do not have.

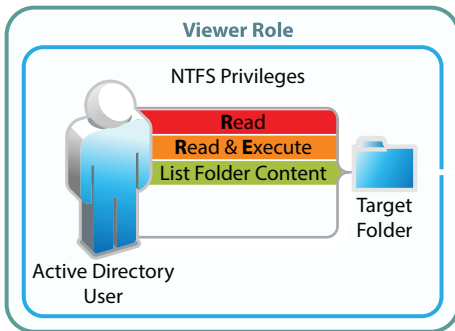
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## Filr Roles and NTFS Permissions

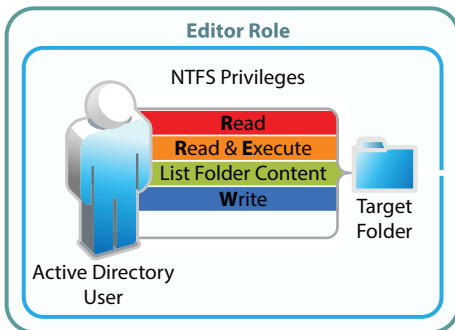
For Active Directory users to function in Filr roles, they must have the NTFS file system permissions illustrated and explained in [Table 4-3](#).

**Table 4-3** *NTFS Permissions and Filr Roles*

---

**Role and Minimum NTFS Permissions Required****Comments**

`Read`, `Read & Execute`, and `List Folder Content` are the minimum basic permissions that users must have in order to view files and folders. The default special permissions associated with these basic permissions are also required.



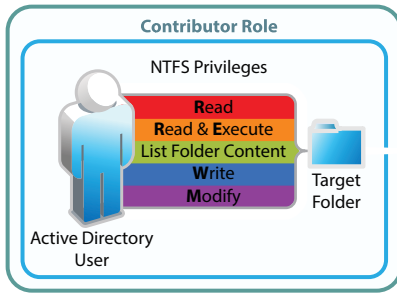
If the basic `Write` permission is added, users can then modify file content. The default special permissions associated with these basic permissions are also required.

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---

**Role and Minimum NTFS Permissions Required****Comments**

---



To perform contributor functions, users must either have the basic `Modify` permission added, or they must have the basic `Full Control` permission. The default special permissions associated with these basic permissions are also required.

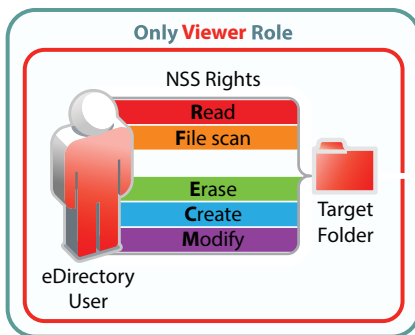
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**Role Requirements Are Rigidly Enforced**

The NSS and NTFS requirements set forth in [Table 4-2](#) and [Table 4-3](#) are very rigid.

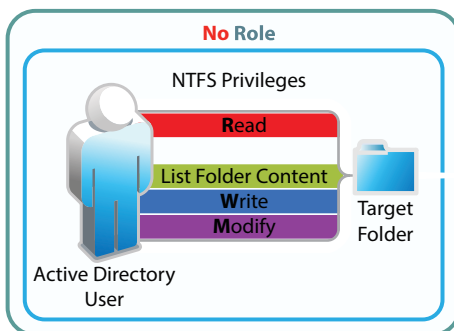
For example, [Figure 4-2](#) shows that if the NSS `write` right is missing, the user can only function as a viewer, even though all of the Contributor-specific rights are present.

**Figure 4-2** Missing `Write` right limits to only `Viewer` role



[Figure 4-3](#) shows that if the `Read & Execute` privilege is missing, the user has no Filr role, even though all of the other permissions are present.

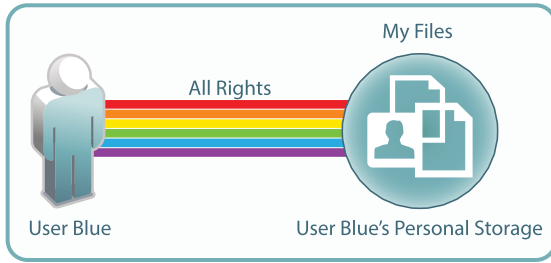
**Figure 4-3** Missing `Read & Execute` privilege prevents access through Filr



## 4.5.2 My Files (Personal Storage)

Users automatically have all access rights to the Filr-based personal storage assigned to them.

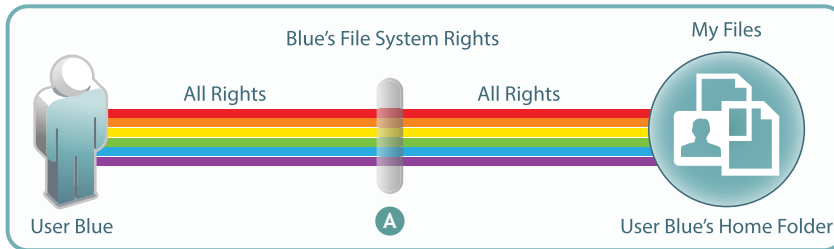
**Figure 4-4** Filr users have all rights to their personal storage through My Files



For more information regarding My Files, see [Chapter 9, “My Files \(Personal Storage\),”](#) on page 49.

### 4.5.3 Home Folders

Users should have all rights to their server-based home folders.

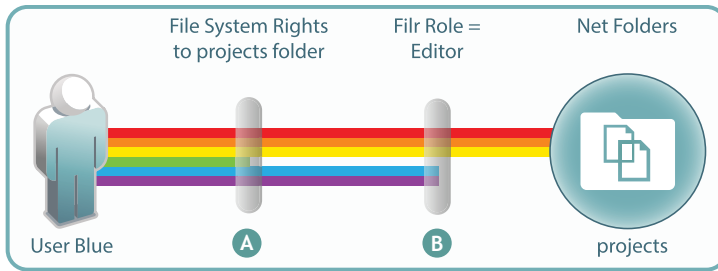


Letter	Details
A	<p>Although it is certainly possible that an administrator might choose to limit the file system rights to a home folder, that would seem to defeat the whole purpose behind providing home directories in the first place.</p> <p>Of course, rights restrictions are completely separate from limiting the available file storage space.</p> <p>In all cases, if there are file system restrictions, Filr always honors them.</p>

### 4.5.4 Net Folders

Users who are granted access to a Net Folder are not restricted by Filr. The file system of the target folder retains complete access control. The level of rights that users have through Filr depends on the role they have, as explained in, “[Access Through Filr Involves One of Four Possible Roles \(page 33\).](#)”

**Figure 4-5** Users' effective rights to Net Folders are controlled by the file system where the Net Folder resides and the Filr role that these rights qualify them for

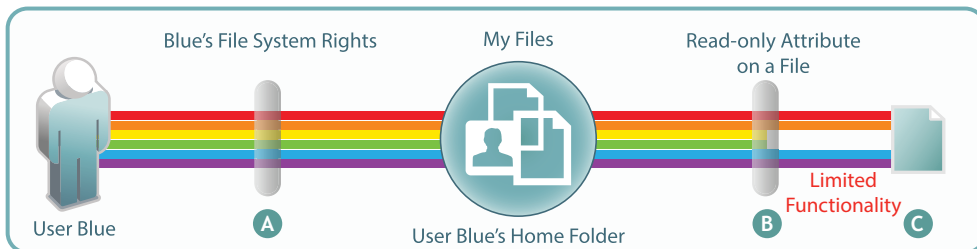


Letter	Details
A	User Blue is granted all rights to the NSS-based <code>projects</code> folder, except the <code>Erase</code> right (green bar).
B	Because User Blue doesn't have the <code>Erase</code> right, Filr assigns the <code>Editor</code> role.  This means that even though Blue has <code>Create</code> (blue) and <code>Modify</code> (purple) rights on the file system, and could exercise them through a file browser, such as Windows Explorer, Filr functionality is limited to editing files within the <code>projects</code> folder.

For more information, see [Section 10.5, "Granting Access to Net Folders,"](#) on page 58.

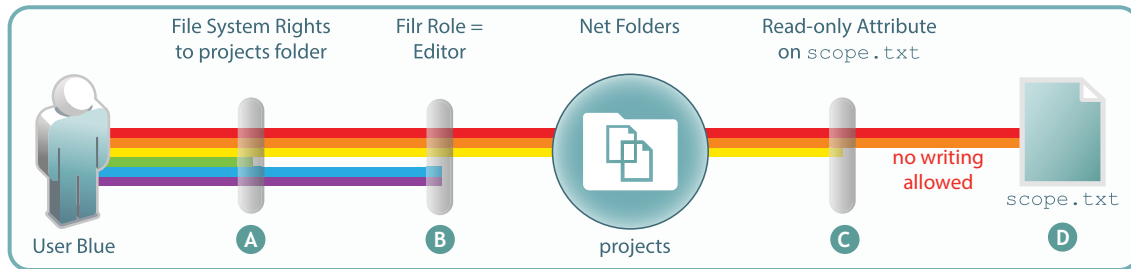
## 4.5.5 Filr Attributes Are Always Honored

**Figure 4-6** File attributes affect functionality in home folders



Letter	Details
A	User Blue is granted all rights to an NSS-based home folder.
B	User Blue applies the <code>Read-only</code> attribute to one of the files in the home folder to ensure that it doesn't get modified by mistake.
C	A few weeks later, Blue opens the file and tries to change it.  The file system doesn't allow this because of the file's <code>Read-only</code> attribute.  Of course, Blue could remove the attribute using a file browser, such as Windows Explorer, and then modify the file.  Filr always honors the file system. As long as the file is <code>Read-only</code> , it cannot be modified through Filr.

**Figure 4-7** File attributes also affect functionality in Net Folders



Letter	Details
A	As shown in <a href="#">Figure 4-5 on page 38</a> , Blue doesn't have Erase rights on the <code>projects</code> folder.
B	Therefore, Blue only qualifies for the Filr Editor role.
C	The project leader maintains strict control of the <code>scope.txt</code> file by using the Read-only attribute.
D	This means that, even though Blue is an Editor in the <code>projects</code> folder, the <code>scope.txt</code> file is off-limits for making any changes.

## 4.6 Sharing Rights

In contrast to file and folder rights, which are controlled by the file system, Filr controls all My Files and Net Folder sharing.

For more information about sharing, how it is managed, and how it works, see [Chapter 12, "Sharing through Filr," on page 61](#).

## 4.7 Windows Share Rights

Windows Shares are leveraged by Filr to create [Net Folders](#). It might seem logical, therefore, that the rights settings exposed on the *Sharing* tab in Windows would affect Filr functionality. That is not the case.

Setting Windows Share rights on a Windows Share has no effect on Filr. This is in keeping with the best practice recommendation from Microsoft that Share rights not be used to grant or control file access.

Remember, Filr Sharing is only enabled through the Net Folder proxy user and the file system privileges assigned to it.

## 4.8 Access-based Enumeration (Windows)

Access-based Enumeration settings on an NTFS file system have no effect on Filr.

For example, a Windows administrator might disable Access-based Enumeration so that the files in a shared folder always display in Windows Explorer no matter what the user's rights.

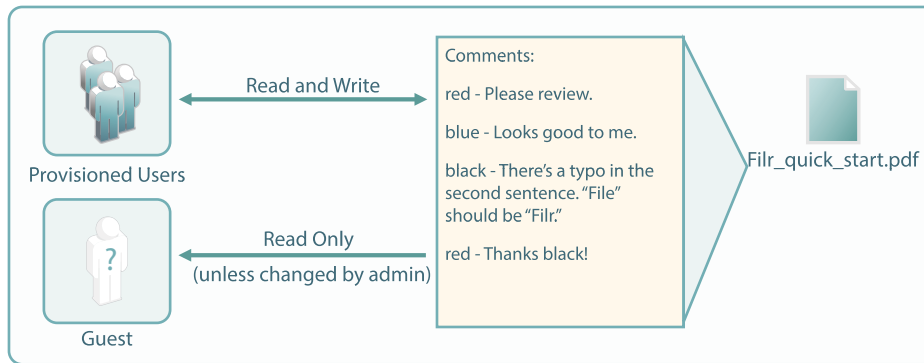
The administrator might then expect that users would also be able to see the files through Filr. That is not the case. Disabling Access-based Enumeration has no effect on Filr. Only those users who have all of the NTFS permissions required for the Viewer role (Read, Read & Execute, and List Folder Content) can see the files.



# 5 Filr Comments

Comments are linked to the files that are commented on. All users, except Guest, have read/write access to comments on the files and folders that they are allowed to see. Guest can be granted rights to write comments as well, as indicated in [Figure 5-1](#).

**Figure 5-1** Who Can Log Comments in Filr



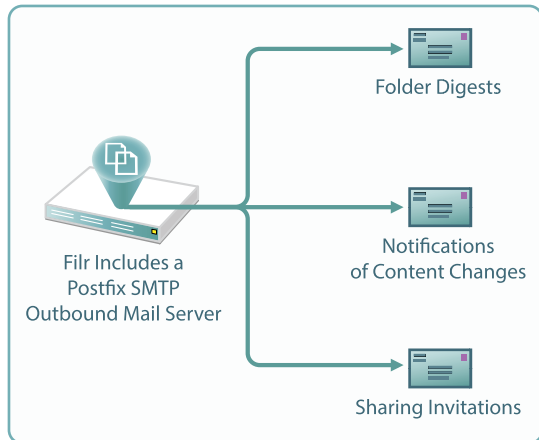
For more information about Filr comments, see ["Comments"](#) in the *Novell Filr 1.0 Administration Guide*.



# 6 Filr Email Notifications

Filr includes a Postfix mail server for outbound email notifications, as illustrated in [Figure 6-1](#).

**Figure 6-1** *Filr Outbound Email Functionality*



Although the default mail server should work well for most Filr installations, you can configure Filr to use your outbound SMTP mail server. For more information, see [“Changing Outbound Email Configuration Settings”](#) in the *Novell Filr Installation and Configuration Guide*.



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# 7 Filr Indexing and Searching

All Filr searching involves the Index server (Lucene). Everything that is searchable is in the index, including users and groups. All synchronized files and folders have their metadata synchronized automatically, so that their basic information (in contrast with actual content) is searchable.

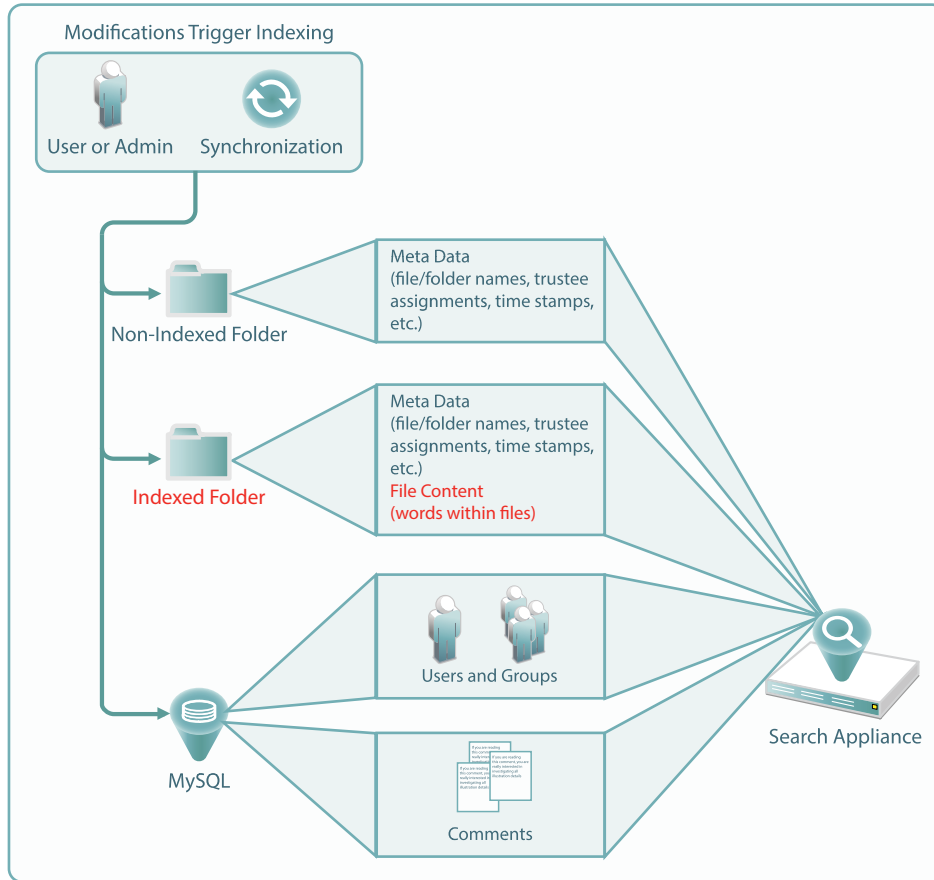
- ♦ [Section 7.1, “What Is Indexed and When,” on page 45](#)
- ♦ [Section 7.2, “About Filr Content Indexing,” on page 46](#)

## 7.1 What Is Indexed and When

As illustrated in [Figure 7-1](#), indexing occurs each time that data is modified. Index triggers include the following:

- ♦ Modifications made by a user or administrator
- ♦ Synchronization of files and folders  
When a folder is indexed, the only files re-indexed are those whose time stamps or hash sums have changed since the last index was performed.
- ♦ Synchronization of users and groups

**Figure 7-1** When Indexing Occurs



## 7.2 About Filr Content Indexing

Only files that live in folders that are specifically enabled for indexing have their content indexed. After the files have been synchronized to Filr, the indexing process can begin.

Content indexing is performed as a background process. Depending on the number of files that need to be indexed, it can take several hours or even days before all of the content is indexed and searchable in the Filr system. Therefore, it is important to consider which files need to have their content be searchable.

For more information about Filr indexing, see [“Managing the Lucene Index”](#) in the *Novell Filr 1.0 Administration Guide*.

---

# 8 Filr Licensing

Filr comes with a 90-day evaluation license pre-installed. You must install a full license in order for Filr to continue functioning beyond the 90-day evaluation period.

For instructions on viewing and installing Filr licenses, see [“Viewing and Updating the Filr License”](#) in the *Novell Filr 1.0 Administration Guide*.





# 9 My Files (Personal Storage)

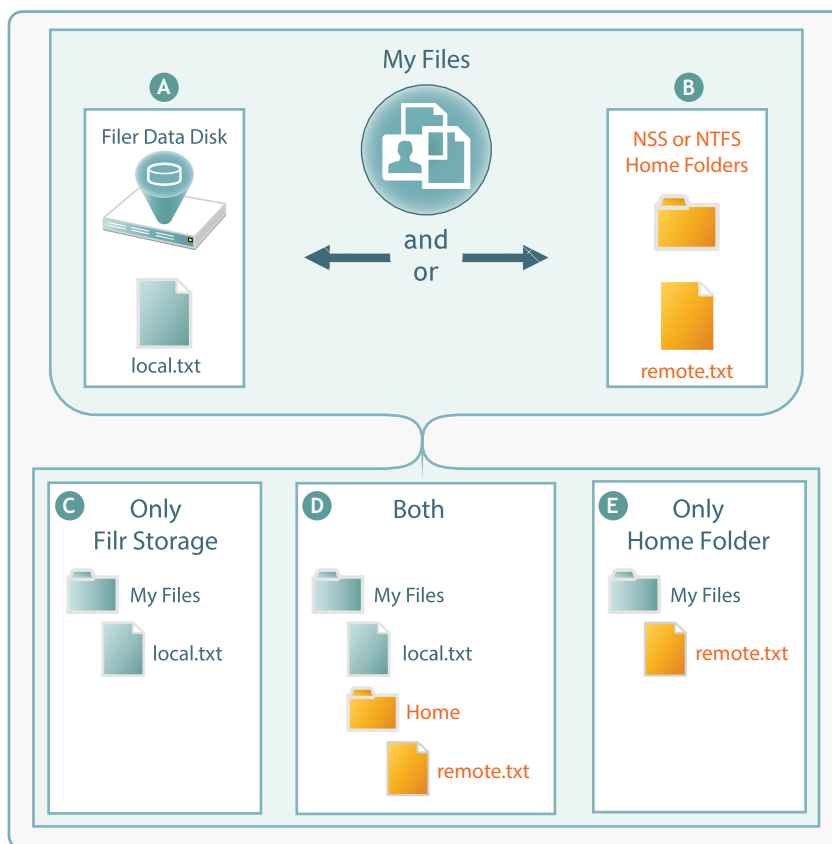
Many organizations let their network users store personal files on organization file servers. Filr supports this practice through My Files, which can include access to personal storage on Filr as well as to traditional home directories.

- ♦ Section 9.1, “Understanding My Files,” on page 49
- ♦ Section 9.2, “Enabling Personal Storage,” on page 50
- ♦ Section 9.3, “How Home Folders Differ from Net Folders,” on page 51
- ♦ Section 9.4, “My Files Sharing Rights,” on page 51

## 9.1 Understanding My Files

*My Files* is an optional personal storage area that you can make available to your Filr users. It can include two possible data storage locations, as illustrated in [Figure 9-1](#) and explained in the table that follows it.

**Figure 9-1** *My Files’ Possible Storage Locations*



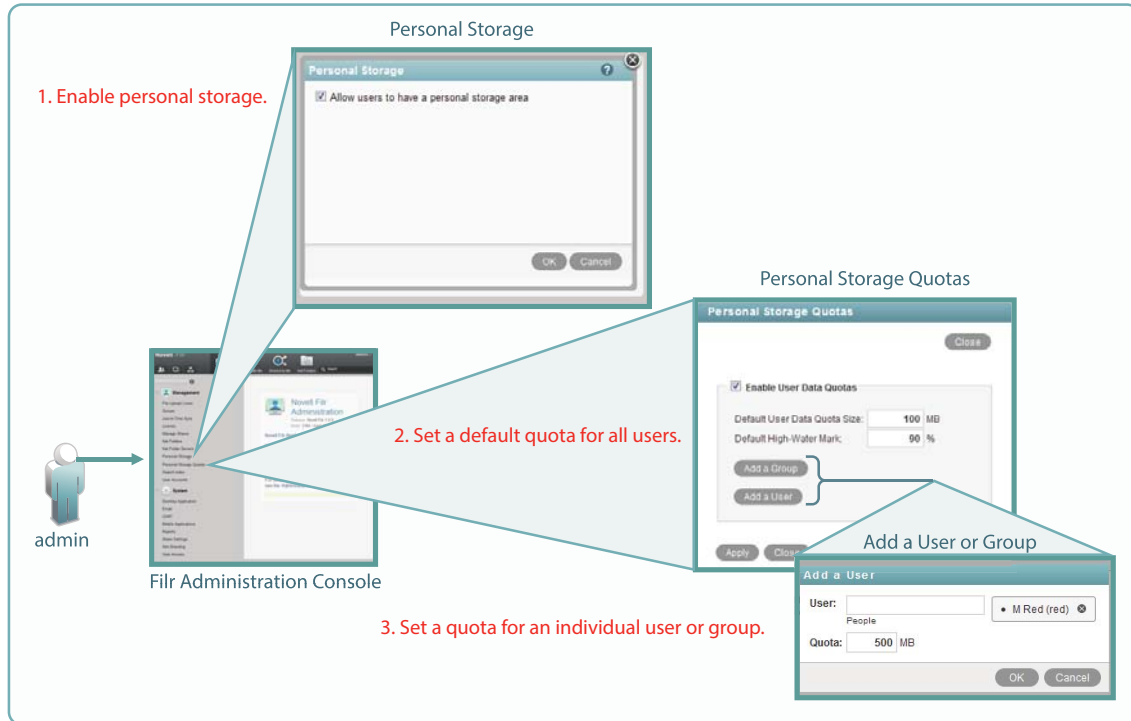
Letter	Details
A	If you enable personal storage for users as outlined in <a href="#">Figure 9-2 on page 51</a> , then Filr automatically creates a personal storage directory on its data disk.
B	If your LDAP users have home directory attributes associated with them in the identity store (eDirectory or Active Directory), then when their users accounts are synced, Filr creates special Net Folders that link to their home directories.
C	If you have enabled personal storage for users who do not have home directories as described on the previous row, then those users see only what is stored in the Filr data store in their <i>My Files</i> .
D	If you have enabled personal storage for users, and those users also have home directories associated with them in the identity store, they see what is stored in the Filr data store and a folder named <i>Home</i> under <i>My Files</i> . The <i>Home</i> folder provides a distinction between files and folders in the Filr data store and those in Home directories on the file server.
E	If you haven't enabled personal storage, but your users have home directories, then the files and folders in their home directory display as direct entries within <i>My Files</i> .

**NOTE:** Of course, if you don't enable personal storage, and users don't have home directories, then their *My Files* is empty and not usable.

## 9.2 Enabling Personal Storage

If personal storage is enabled, then space is allocated to users for personal storage. [Figure 9-2](#) illustrates how you can set a default usage quota for all users and also set individual quotas as required.

**Figure 9-2** Setting Default and Individual Storage Quotas



## 9.3 How Home Folders Differ from Net Folders

A home folder is a special kind of Net Folder that is included in *My Files*.

Home folders allow for the sharing of files and sub-folders, while Net Folders only allow for the sharing of files, not sub-folders.

## 9.4 My Files Sharing Rights

See [Section 12.1.2, “My Files Sharing Is Automatic,”](#) on page 63.



# 10 Net Folders

Filr introduces a new way of accessing file server data—Net Folders—a new file access method that shares some similarities with Novell’s long-standing concept of mapped network drives.

- ♦ Section 10.1, “Overview,” on page 53
- ♦ Section 10.2, “Specifying Net Folder Servers,” on page 55
- ♦ Section 10.3, “Specifying Net Folders,” on page 56
- ♦ Section 10.4, “Net Folder Proxy Users,” on page 57
- ♦ Section 10.5, “Granting Access to Net Folders,” on page 58

## 10.1 Overview

To understand Net Folders, it is useful to see the similarities and differences between them and the mapped drives that you probably have on your current network. [Figure 10-1](#) and [Figure 10-2](#) illustrate such a comparison.

**Figure 10-1** File Servers and Mapped Drives

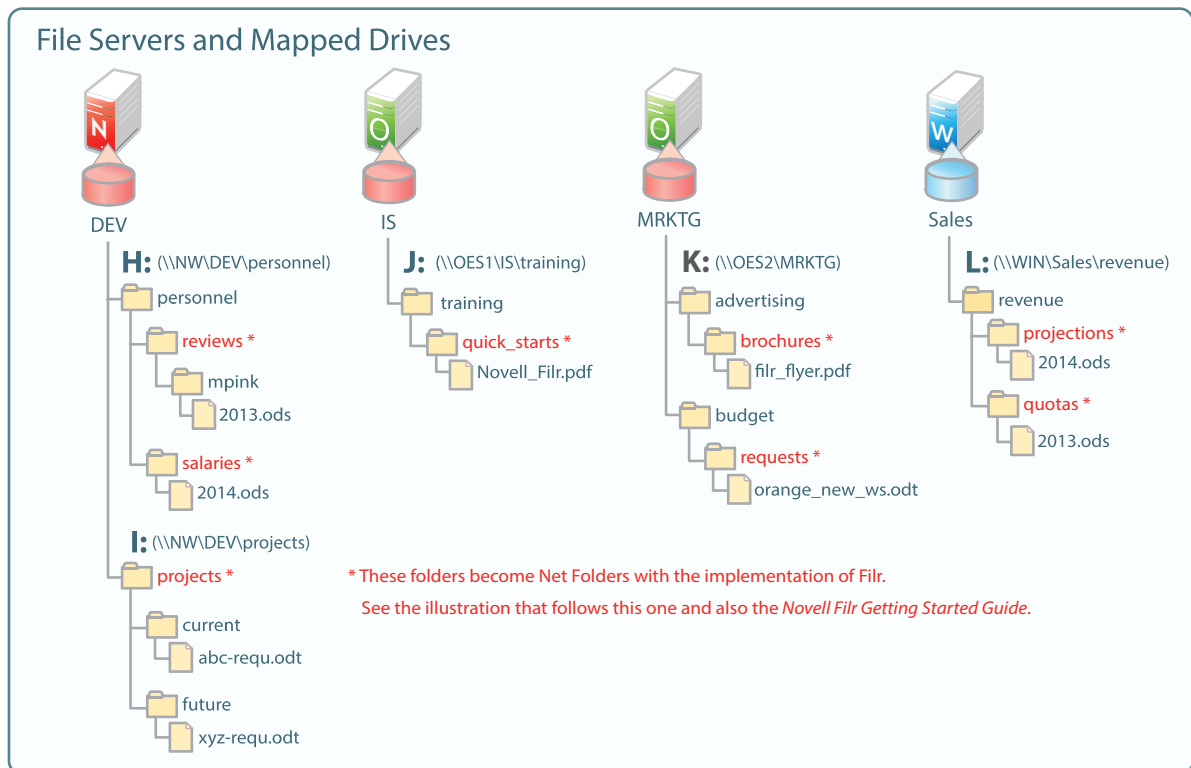
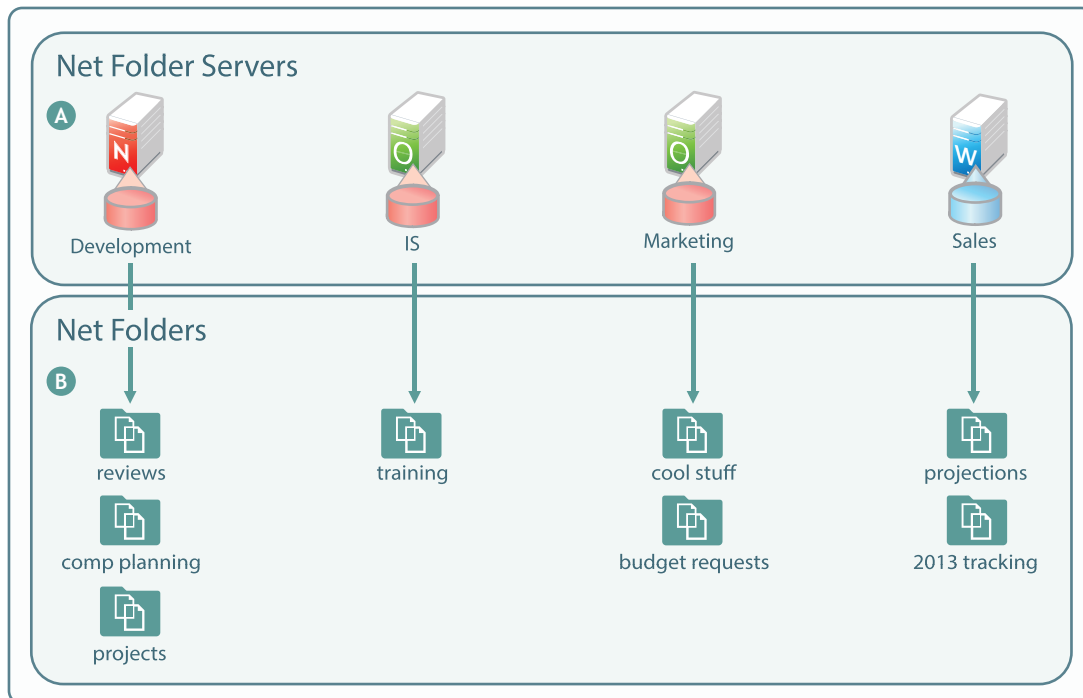


Figure 10-2 shows the same servers as in Figure 10-1, with their volumes defined as Net Folder Servers. Notice that the Net Folder Server names do not need to match the volume names, which can sometimes be rather cryptic.

The asterisk-marked folders in Figure 10-1 are shown as Net Folders here.

As with the Net Folder Server names, some of the Net Folder names in Figure 10-2 are different from the Figure 10-1 volume and folder names that they represent. This illustrates that Net Folder names are not tied to their corresponding actual folder names. Instead, you can name them whatever best communicates their purpose and content to those who access them.

**Figure 10-2** Net Folder Servers and Net Folders



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### Letter Information

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- A** A Net Folder Server represents a volume or share on a NetWare, OES, or Windows file server. Net Folder Servers for OES servers point to the root of an NSS volume on the server. Net Folder Servers for Windows servers point to a Windows share, which is usually defined at a folder level other than at the root of the file system. Therefore, it is common for a Net Folder Server for Windows to point to the same folder as an associated Net Folder does. There is usually one Net Folder Server per volume or share, but you can create multiple Net Folder Servers to the same volume or share if needed.
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## Letter Information

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**B** A Net Folder is a pointer or reference to a specific folder within a Net Folder Server.

Often there is just one Net Folder for every Net Folder Server, but you can create multiple Net Folders that point to a single Net Folder Server. You can even create multiple Net Folders that point to the same relative path.

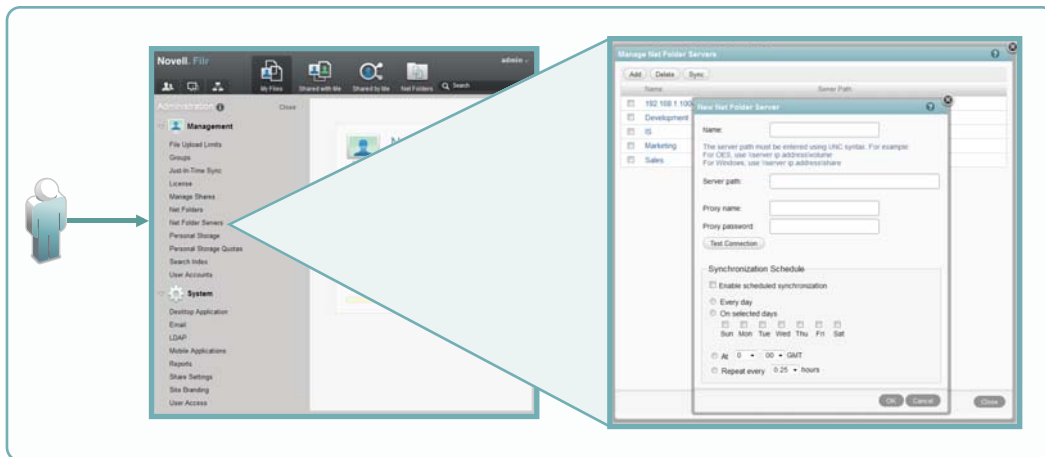
Why might you want to duplicate Net Folders? Possibilities include the following:

- ◆ Different synchronization schedule requirements
  - ◆ Different access rights requirements
  - ◆ Different usage patterns
  - ◆ Different access loads
- 

## 10.2 Specifying Net Folder Servers

The first step in creating Net Folder is to set up Net Folder Servers.

**Figure 10-3** Net Folder Server Creation



As illustrated in [Figure 10-3](#), adding a Net Folder Server includes the following:

- ◆ **Name:** Net Folder users don't see this name, so use a name that makes sense from an administrative perspective. For example, you might include the IP address or DNS name of the server, or you could use a location name, such as `Third_Floor_Server`.
- ◆ **Server Path:** This is the full UNC path to the root of the NSS volume or NTFS share where your Net Folders are located.
- ◆ **Proxy Name:** This is the name of the Net Folder proxy user that provides access to this volume. For more information, see [Section 10.4, "Net Folder Proxy Users,"](#) on page 57.

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**IMPORTANT:** When specifying the proxy user for a Net Folder Server that points to an OES server, always use a fully qualified name, such as `cn=admin,o=myorganization`.

If you specify only a simple name, such as `admin`, then Filr accesses the Net Folders for the server using CIFS rather than NCP.

When you test the connection, the test succeeds and data synchronizes using CIFS.

Unfortunately, when Filr attempts to determine a user's effective rights, the request fails because that function requires NCP and the simple name doesn't provide enough information to the NCP process.

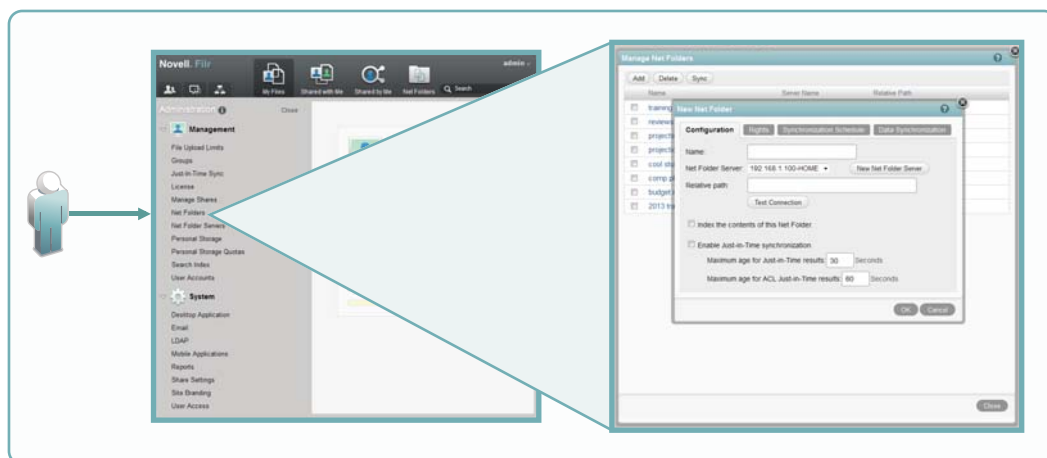
- ◆ **Proxy Password:** This is the password of the Net Folder proxy user. If the password changes in the identity store, it must be updated here.
- ◆ **Test Connection:** This lets you test the path and the credentials of the proxy user that you have specified.
- ◆ **Synchronization Schedule:** This lets you create a synchronization schedule for this Net Folder Server. Any Net Folders for this server that don't have their own synchronization schedules will be synchronized according to this schedule.

For more information about Net Folder Server creation, see [“Configuring and Managing Net Folder Servers”](#) in the *Novell Filr 1.0 Administration Guide*.

## 10.3 Specifying Net Folders

After creating Net Folder Servers, you can create Net Folders for users to access.

**Figure 10-4** Net Folder Creation



As illustrated in [Figure 10-4](#), adding a Net Folder includes the following:

- ◆ **Name:** Filr users with rights to the Net Folder see this name, so you should use a name that they will recognize and that will help them to understand what the Net Folder contains.
- ◆ **Net Folder Server:** The Net Folder Servers you have created appear in a drop-down list. You also have the option to create an additional Net Folder Server from within the Net Folder creation dialog.
- ◆ **Relative Path:** This is the path to the folder relative to the UNC path entered for the Net Folder Server. A blank path creates a Net Folder that points to the Net Folder Server's UNC path.
- ◆ **Test Connection:** This lets you verify that you have typed the path correctly.
- ◆ **Index Contents:** Enabling this option causes the contents of files within the Net Folder to be indexed for content searching. For more information, see [Chapter 7, “Filr Indexing and Searching,”](#) on page 45.
- ◆ **Just-in-Time Synchronization:** Enabling this option causes the folder to be synchronized each time a user accesses it.



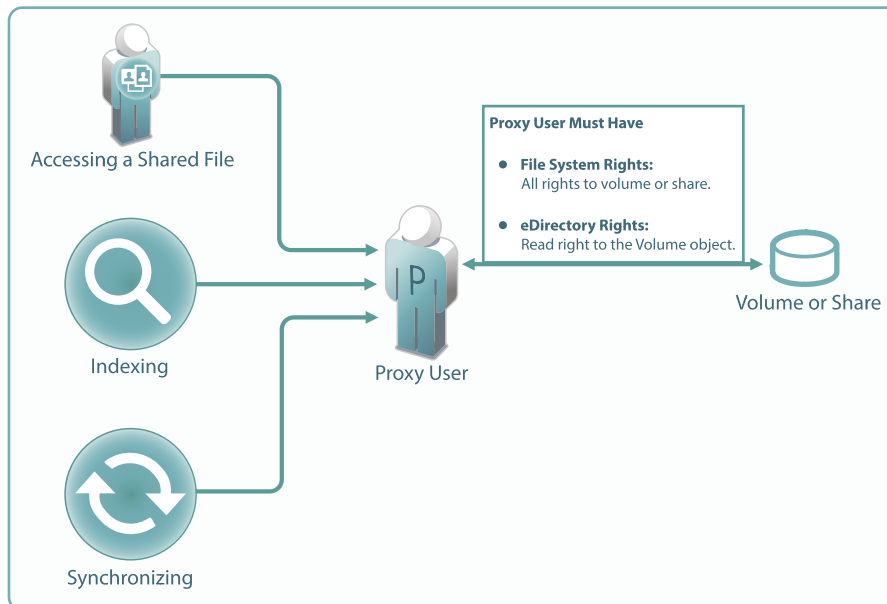
- ♦ **Rights Tab:** Clicking this opens a dialog for specifying who has which rights to the Net Folder.
- ♦ **Synchronization Schedule Tab:** Clicking this opens a dialog for specifying a Net Folder-specific synchronization schedule. Creating a synchronization schedule overrides the Net Folder Server schedule if one exists.
- ♦ **Data Synchronization:** Clicking this opens a dialog for specifying that Windows and Macintosh desktops can download files from this Net Folder. In version Filr 1.0, the desktops can see only the files they have downloaded, so deselecting this option effectively hides the Net Folder's files, even if the user has rights to see them.

For more information about Net Folder creation, see [“Configuring and Managing Net Folders”](#) in the *Novell Filr 1.0 Administration Guide*.

## 10.4 Net Folder Proxy Users

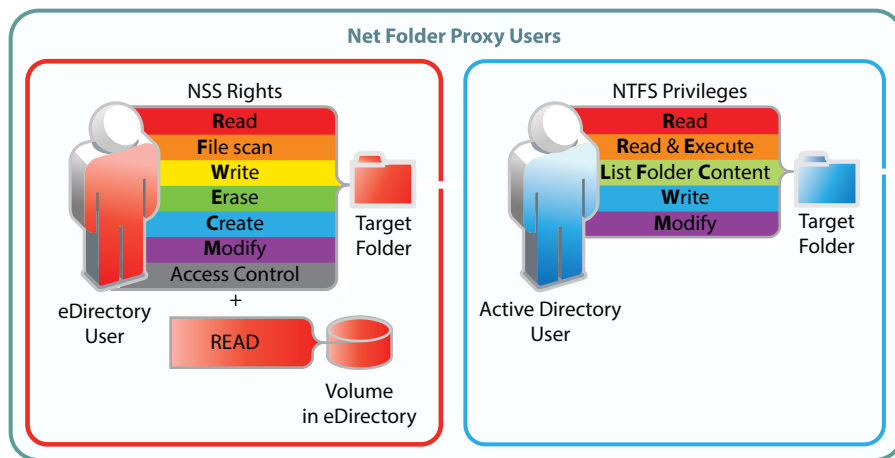
Net Folder proxy users provide Net Folder access for three Filr functions: file sharing, indexing, and synchronization, as illustrated in [Figure 10-5](#).

**Figure 10-5** Functions of a Net Folder Proxy User



Here are some pointers regarding proxy users.

- ♦ Proxy users must have all rights at each Net Folder Server volume or share, and in the case of NSS volumes, they must have READ rights to the volume objects in eDirectory.

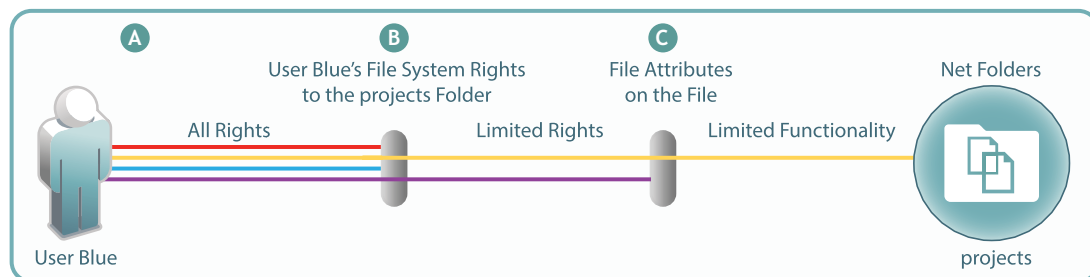


- ◆ If the proxy user password changes in the LDAP identity store, it must also be changed in the Net Folder Server configuration dialog.
- ◆ Access to shared files always involves the proxy user, even for users who have file system rights to the shared files.
- ◆ Proxy users have no role when users with Net Folder rights access Net Folders directly.

For more information about Net Folder Server proxy users, see “[Planning the Net Folder Server Proxy User](#)” in the *Novell Filr 1.0 Administration Guide*.

## 10.5 Granting Access to Net Folders

**Figure 10-6** Net Folder Access Involves Filr and the File System



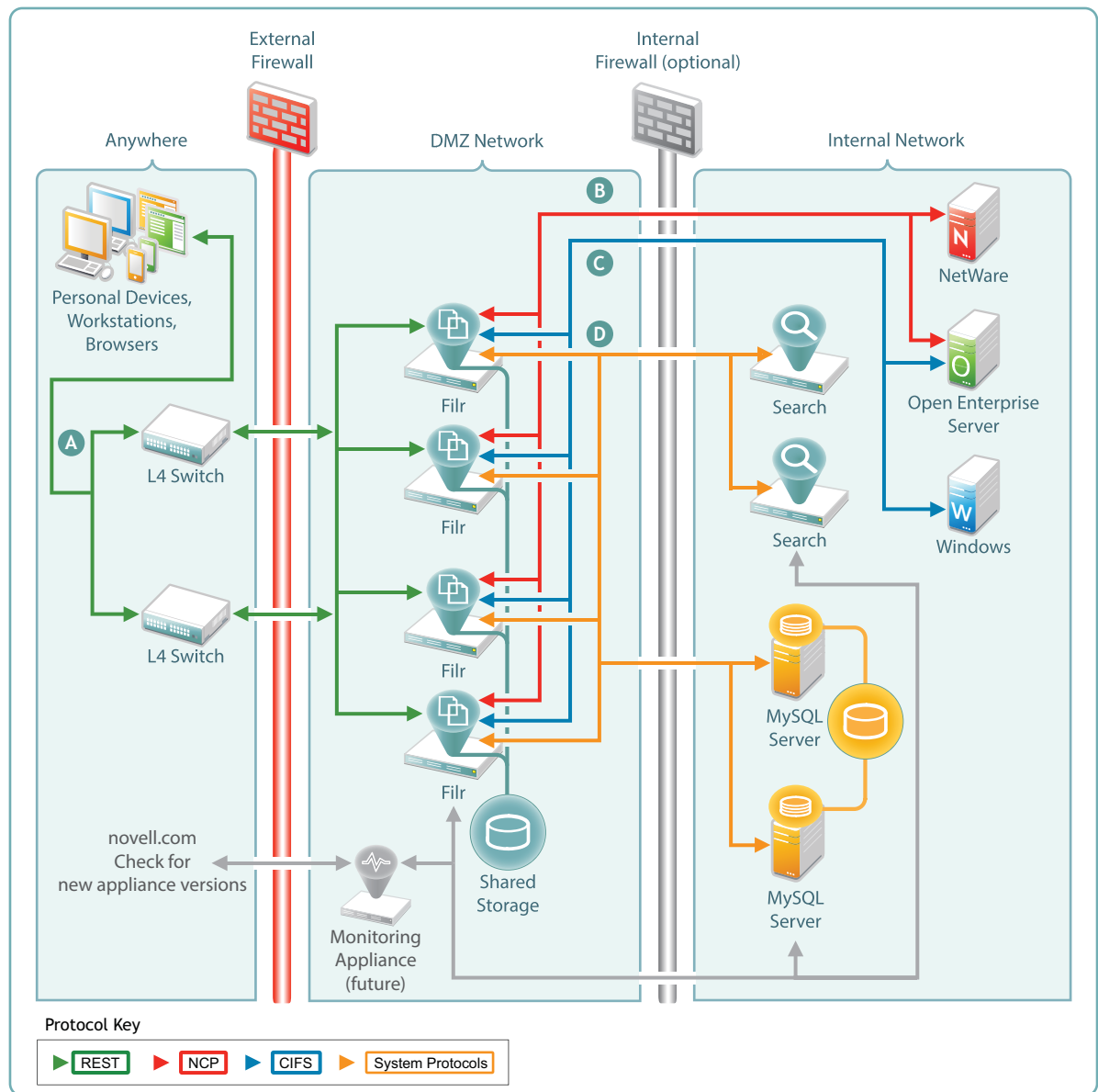
Letter	Explanation
A	When you grant a user access to a Net Folder, either individually or as a member of the group by using the Rights tab (see the explanation for <a href="#">Figure 10-4</a> ), then from a Filr perspective, the user has all rights to that folder. However, the file system is the access master controller.
B	The user must have file system trustee rights that allow the file to be viewed and accessed. For example, if the user has Read, Write, and File Scan rights to a file on an NSS volume, then the file is not only visible, but can, in theory, be modified. However, there’s one more part to the access equation.
C	Files can have attributes that prevent them from being modified, such as Read Only. They might also be hidden, in which case they would not be visible to the Filr user.

For more information about Net Folders, see “[Setting Up Net Folders](#)” in the *Novell Filr 1.0 Administration Guide*.

# 11 Protocols and Filr

The components in a Filr deployment use a number of different protocols to communicate and provide Filr services, as shown in Figure 11-1. The optional internal firewall is shown to facilitate the illustration of a separate (and also optional) DMZ network.

Figure 11-1 Protocols Used in Filr Installations



Letter	Details
A	Workstations and devices running Filr software access Filr using REST protocols that facilitate authentication and other access requests.  Browsers use HTTPS to communicate with Filr.
B	Filr communicates with Novell file servers using NetWare Core Protocol (NCP) requests.
C	Filr communicates with Windows servers using the Common Internet File System (CIFS) protocol.
D	Other system protocols handle communication between Filr and the MySQL and Search appliances.

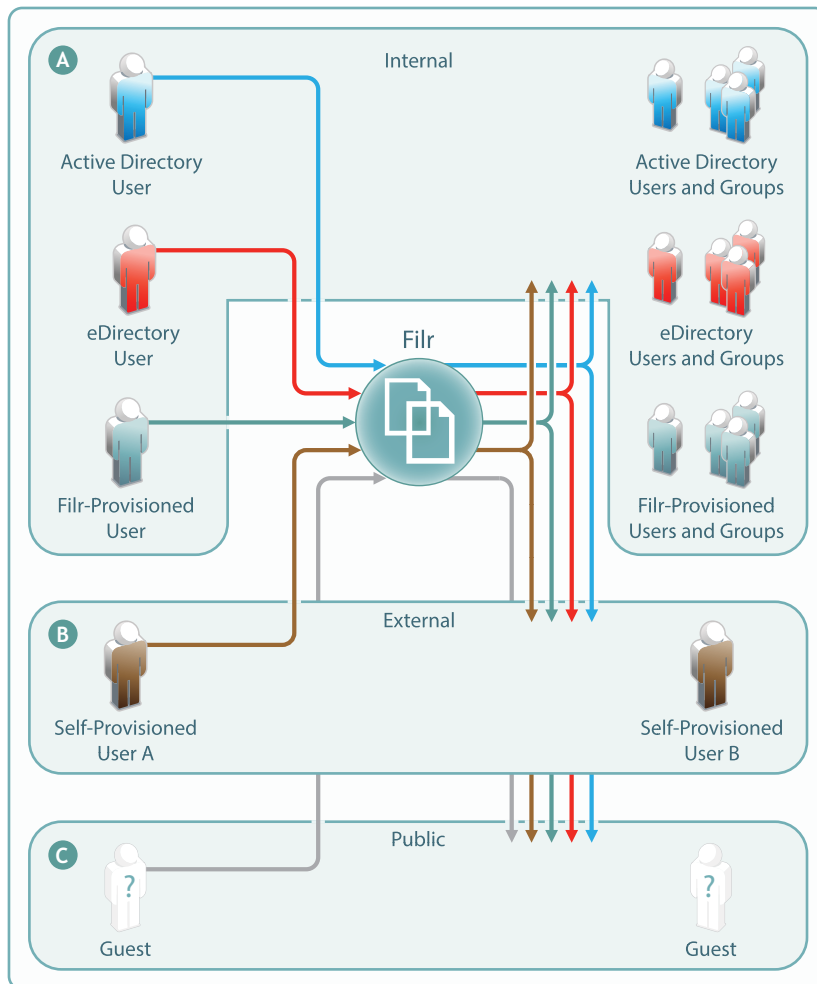
# 12 Sharing through Filr

Sharing lets users grant other users (internal or external) access to files that they own. If allowed, users can also share files that they have received share invitations for.

Figure 12-1 presents a high-level overview of the sharing functionality available in Filr. The sections that follow provide more detail.

- ♦ Section 12.1, “Setting Up Sharing,” on page 62
- ♦ Section 12.2, “Understanding Roles and Sharing,” on page 65

Figure 12-1 Sharing through Filr



Letter	Explanation
A	<p>Depending on the sharing privileges they are granted, internal users can share and collaborate with each other, with external users who have been invited to self-provision into the Filr system, and with the public. If re-sharing items is allowed, those who receive share invitations can also share.</p> <p>This means that eDirectory users can share files with Active Directory users and groups, that the reverse is also true, and that both of them can invite external partners or others to join the Filr system for collaboration and other purposes.</p>
B	<p>When External Sharing is enabled in Filr, external users who receive share invitations can self-provision into the Filr system and collaborate with internal and external users, using the Comments feature.</p> <p>If Filr is configured to allow it, external users can also share with internal users, with each other, and with the public.</p>
C	<p>If Filr is configured to allow public sharing, and if a file is shared publicly through a system-generated URL, then anyone with that URL can access the file as a guest user and share it with any other user, including other public users. This re-sharing is not a function of Filr but a function of sharing the URL through email, social networking, and so on.</p>

## 12.1 Setting Up Sharing

Before any sharing can happen, it must first be enabled at the Filr system level. After that, the system-level settings define the upper limit of sharing that can be enabled at lower levels.

After sharing is enabled for the system, sharing of My Files is automatically available up to the limits granted at the system level. Sharing files from Net Folders must be enabled on an individual Net Folder basis.

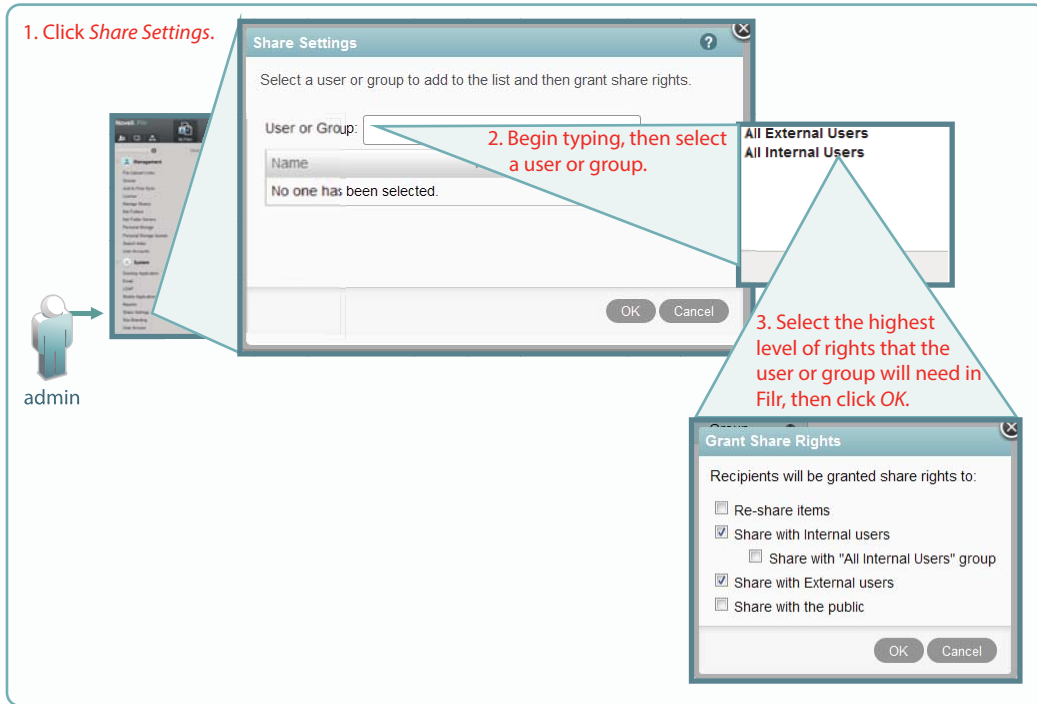
### 12.1.1 System-Level Sharing Must Be Set Up First

The Filr Administrative Console provides access the Share Settings dialog. Some Filr administrators prefer to enable sharing and set its upper limits on an individual-user and individual-group basis. Others prefer to enable sharing at a global level by leveraging the `All Internal Users` and `All External Users` groups.

In the first case, My Files sharing will be limited to only those users and groups that have sharing enabled at the system level. In the second case, all internal and external users will have My Files sharing enabled.

In both cases, Net Folder sharing must be configured for each Net Folder individually.

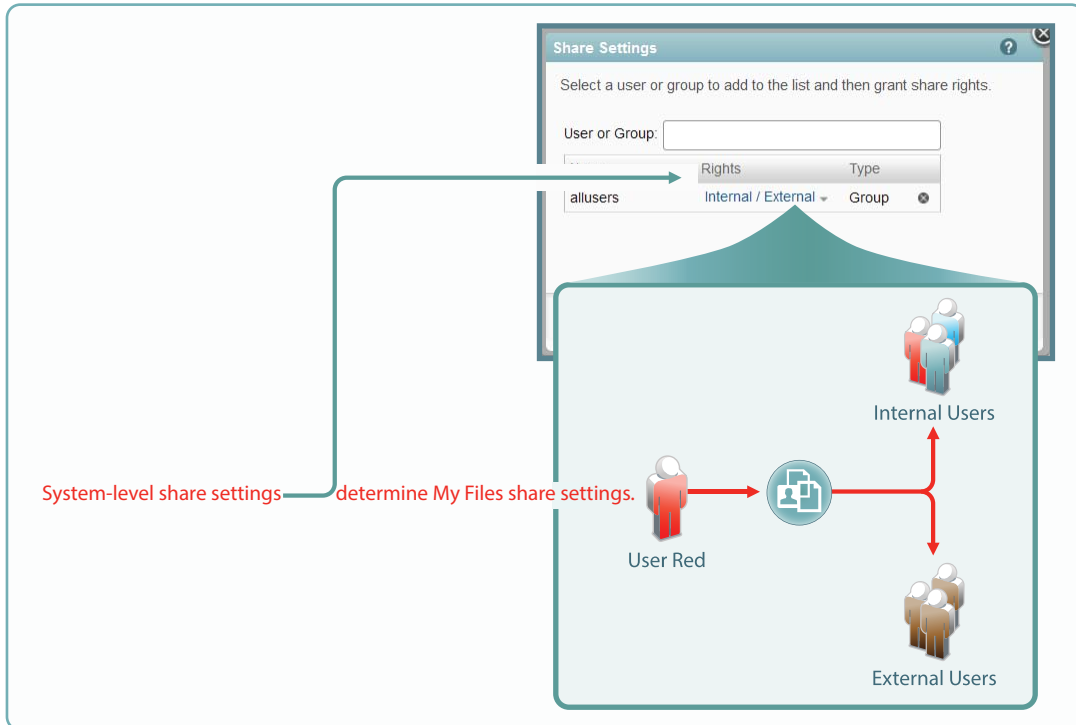
**Figure 12-2** Setting Up System-Level Sharing Rights



## 12.1.2 My Files Sharing Is Automatic

After sharing is enabled at the system level for users individually or as members of groups, then if those users have personal storage enabled, they can share their files and folders within the limitations set for the system.

**Figure 12-3** My Files Share Settings

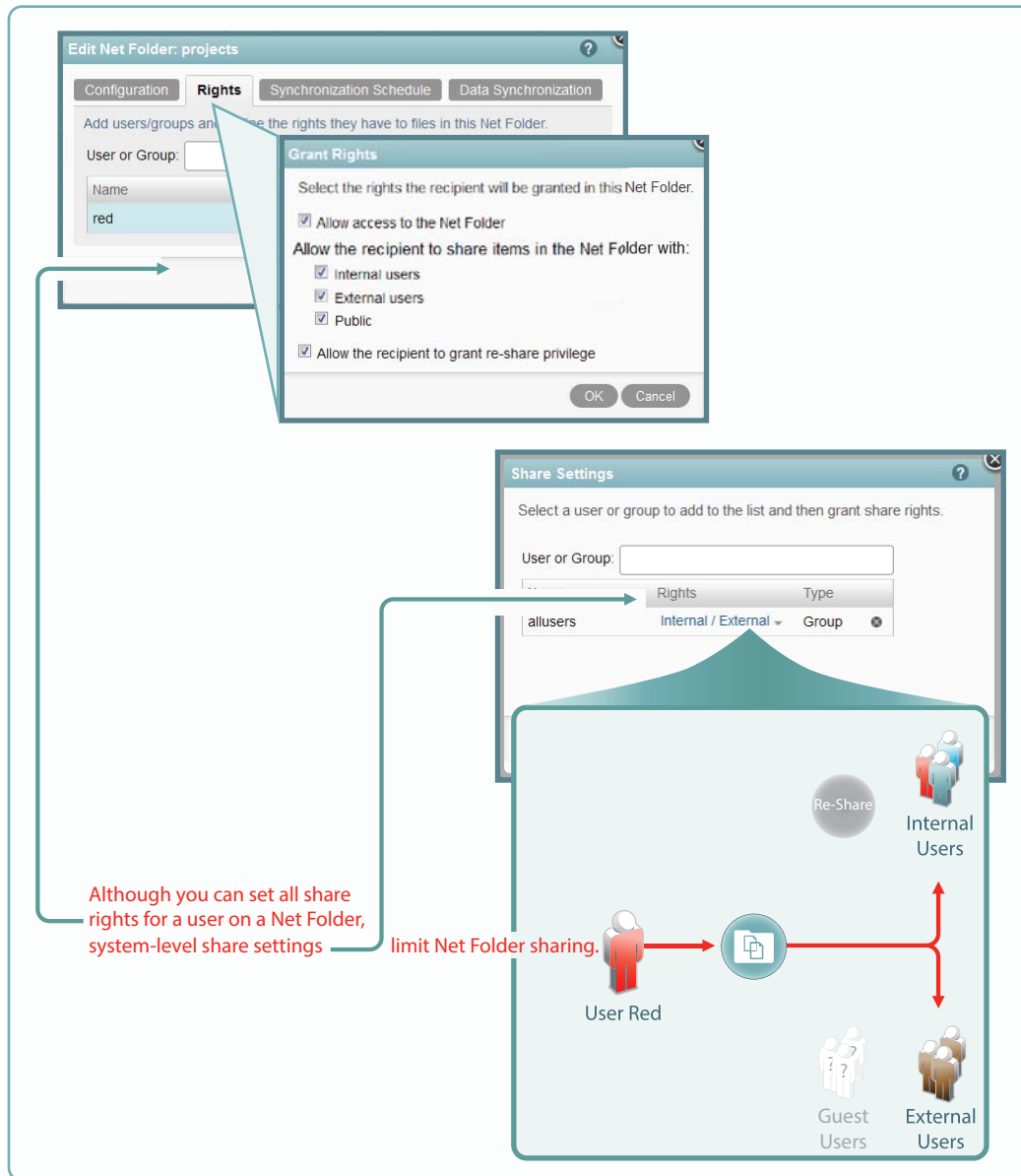


### 12.1.3 Net Folder Sharing Must Be Explicitly Allowed

After sharing is enabled at the system level for users individually or as members of groups, then before they can share files in their assigned Net Folders, they must have sharing enabled on those Net Folders. A Filr administrator can assign any or all sharing rights when setting up Net Folder access, but the effective rights will not exceed those set at the system level, as illustrated in [Figure 12-4](#). Note that although Public sharing and re-sharing were enabled for user red, red's effective sharing rights do not include those privileges.



Figure 12-4 An Example of Net Folder Sharing



## 12.2 Understanding Roles and Sharing

Users can share both files and folders in their *My Files* area, but *Net Folders* restrict sharing to only files.

When users send share invitations, they must designate the role that they want the user receiving the share to have for the file they are sharing. For more information about user roles, see [Section 4.4, "Access Through Filr Involves One of Four Possible Roles,"](#) on page 33.

The following are a few foundational concepts that Filr administrators should understand regarding user roles and sharing.

- ♦ [Section 12.2.1, “User Roles and Sharing,” on page 66](#)
- ♦ [Section 12.2.2, “Users Can’t Grant Share Roles That They Don’t Have,” on page 66](#)
- ♦ [Section 12.2.3, “File System Rights Also Affect the Ability to Assign Share Roles,” on page 66](#)

## 12.2.1 User Roles and Sharing

When users receive invitations to share, they also receive one of three user roles: Viewer, Editor, or Contributor. For more information, see [Section 4.4, “Access Through Filr Involves One of Four Possible Roles,” on page 33](#).

Users who receive and accept share invitations can then access shared files through the proxy user assigned to the Net Folder where the file lives.

If multiple users share the same item with a single user, the user receiving the share has the highest role that was shared. For example, if User B shares a file with User A and grants User A Viewer rights to the file, and then User C shares the same file with User A and grants Editor rights to the file, User A has Editor rights to the file.

## 12.2.2 Users Can’t Grant Share Roles That They Don’t Have

Users with Contributor rights on folders can grant Viewer, Editor, and Contributor rights to other users as Filr system share and Net Folder share settings allow.

On the other hand, Users with Viewer rights on folders can only grant Viewer rights to other users with whom they are allowed to share.

## 12.2.3 File System Rights Also Affect the Ability to Assign Share Roles

Sharing of files and directories involves an additional layer that provides access and manages what those who are granted rights to share files can actually do.

For users to grant Viewer, Editor, or Contributor rights to another user, they must have the minimum rights that those roles require, as outlined in the following tables.

**Table 12-1** NSS File System Rights and Filr Roles

Role	Minimum NSS Rights Required	Comments
Viewer	Read (R), File Scan (F)	These are the minimum file system trustee rights that users must have to view files and folders.
Editor	Read (R), Write (R), File Scan (F)	If the Write file system trustee right is added to Read and File Scan, users can then modify file content.

Role	Minimum NSS Rights Required	Comments
Contributor	Read (R), Write (W), Erase (E), Create (C), Modify, File Scan (F)  or  Supervisor	To perform contributor functions, users must either have all file system trustee rights to the file or folder (except for Access Control) or the Supervisor right to the file or folder.  The presence or absence of Access Control has no meaning in Filr because Filr cannot modify file system trustee rights. A Filr user with the Access Control right on the file system cannot grant <i>file system</i> access to another user through Filr.  It is true that Filr users with sufficient Filr permissions can <i>share</i> access to files and folders with other users, but this is a Filr function that leverages the file system rights of Net Folder proxy users. Access to shared files and folders is independent of any file system rights that individual users have or do not have.

**Table 12-2** NTFS Permissions and Filr Roles

Role	Minimum NTFS Permissions Required	Comments
Viewer	Read, Read & Execute, List Folder Content	These are the minimum basic permissions that users must have in order to view files and folders. The default special permissions associated with these basic permissions are also required.
Editor	Read, Read & Execute, List Folder Content, Write	If the basic Write permission is added, users can then modify file content. The default special permissions associated with these basic permissions are also required.
Contributor	Read, Read & Execute, List Folder Content, Write, Modify  or  Full Control	To perform contributor functions, users must either have the basic Modify permission added or they must have the basic Full Control permission. The default special permissions associated with these basic permissions are also required.

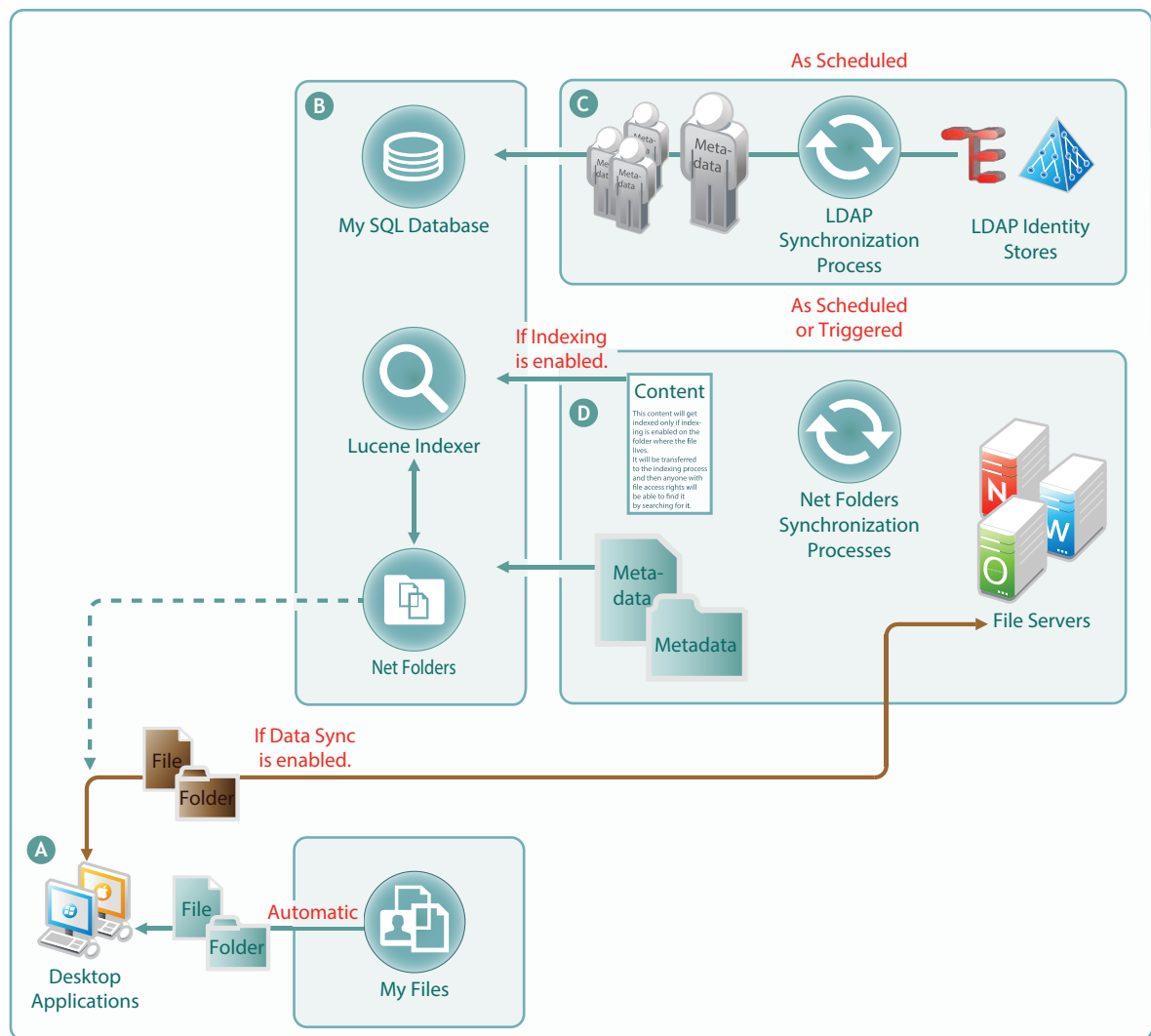


# 13 Filr Synchronization

Figure 13-1 illustrates at a high level the information and content that get synchronized in Filr. The table that follows the figure describes some of the results and implications of the processes that take place.

The figure does not illustrate functional details. For example, it does not attempt to show the flow of LDAP metadata and file/folder metadata to Filr services for storage and indexing.

Figure 13-1 What Gets Synchronized



Letter	Details
A	<p>Desktop applications for Windows and Macintosh workstations must download local copies of files and folders before accessing them.</p> <p>Before the files and folders in Net Folders (including in Home folders) can be downloaded, their metadata must be synchronized with Filr. (See the metadata synchronization process indicated in letter D.) For this reason, many Filr administrators perform a manual synchronization when initially setting up a Net Folder so that when users access it from their desktops, they can download the files and folders as expected.</p> <p>Note that the arrow that shows files and folders being synchronized from file servers to desktops, passes through the Net Folders icon. This is because Net Folder files and folders are not stored in Filr. Only their metadata is synced. The files and folders that are synchronized to the desktops come directly from the file servers. Net Folders only facilitate the transfer process.</p> <p>Files and folders in Filr-based personal storage are automatically synchronized to the workstation's file system. Net Folders are also configured by default to allow data synchronization with desktop applications.</p> <p>After data is synchronized with the desktops, then as long as the desktops are connected with the network, changes to local copies are immediately synchronized with the file server. If the workstation is disconnected, then when the connection is restored, synchronization is automatic.</p> <p>However, Net Folder download functionality can be disabled. If this occurs, then desktop application users will not be able to view or access the files and sub-folders in their assigned Net Folders from their workstations. (Unlike Web and mobile access, Desktop applications do not provide Net Folder browsing. Browsing within the desktop applications is limited to local downloaded copies of Net Folder files.)</p> <p>One reason that Filr administrators might disable the download functionality would be to prevent anyone from getting a local copy of sensitive files must be stored only on the organization's file servers.</p>
B	<p>The MySQL database, the Lucene indexer, and Net Folders work together to provide access to data through Filr. MySQL houses the Filr database. The Lucene indexer indexes all of the LDAP and file storage metadata so that search functionality is available. It also indexes file content for searching in folders that have indexing enabled. And Net Folders provide users who have authenticated with proper credentials, access to files and folders on the network through the file storage metadata that is associated with them.</p>
C	<p>Regular LDAP synchronization is essential to timely user access to their files and folders. Some organizations find it sufficient to synchronize LDAP once a day. Others require more frequent synchronization to keep Filr abreast of changes in their identity stores.</p>

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Letter	Details
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Because file and folder activity on network file servers can be in constant flux, and because synchronization needs vary greatly from server to server, Net Folder synchronization is multi-faceted and very flexible.

You can set synchronization schedules for each Net Folder Server. The Net Folders associated with that server are then synchronized according to the general nature of the volume or share where they reside.

You can also set synchronization schedules for individual Net Folders that will override the server schedules and synchronize the folders either more or less frequently than the server schedule dictates.

You can perform manual synchronizations, which is a very useful feature when creating Net Folders to ensure that desktop application users can download local copies for access.

You can enable Just-in-Time Synchronization (JITS) so that each time a folder is accessed from the Web or a mobile device, its content is synchronized with Filr. (The desktop applications do not trigger JITS.)

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# 14 Network Time and Filr

Filr 1 appliances and the file servers that they point to should be in the same time zone and they should use the same reliable NTP time source.

Browsers and access devices can be in different time zones than the appliances and servers that they access because all time-stamp-associated actions are handled using UTC. However, if the desktop is not synced to a reliable time source, there could be some confusion. For example, a time stamp on the server might appear to be “in the future” when compared with the time on the desktop.



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# 15 Viewing Files as HTML in Filr

Many files that are accessible through Filr can be viewed as HTML through the same Oracle Outside In technology that is included with Novell Vibe and GroupWise.

To learn more about this technology, see [a PDF document available on Oracle's Web site](#).



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# 16 Users and Groups with Filr

For users to access Filr, they must generally be provisioned on the Filr system in one of the following ways:

- ♦ They can be synchronized from an internal LDAP identity store.
- ♦ They can be created by Filr administrators.
- ♦ They can be invited to participate through share invitations.

When they respond to the invitations, they are given the opportunity to either

- ♦ Self-provision an account on the Filr server.
- or
- ♦ Access Filr using a Google or Yahoo OpenID account.

After they are provisioned, they can then be granted personal storage and other permissions similar to those enjoyed by internal users.

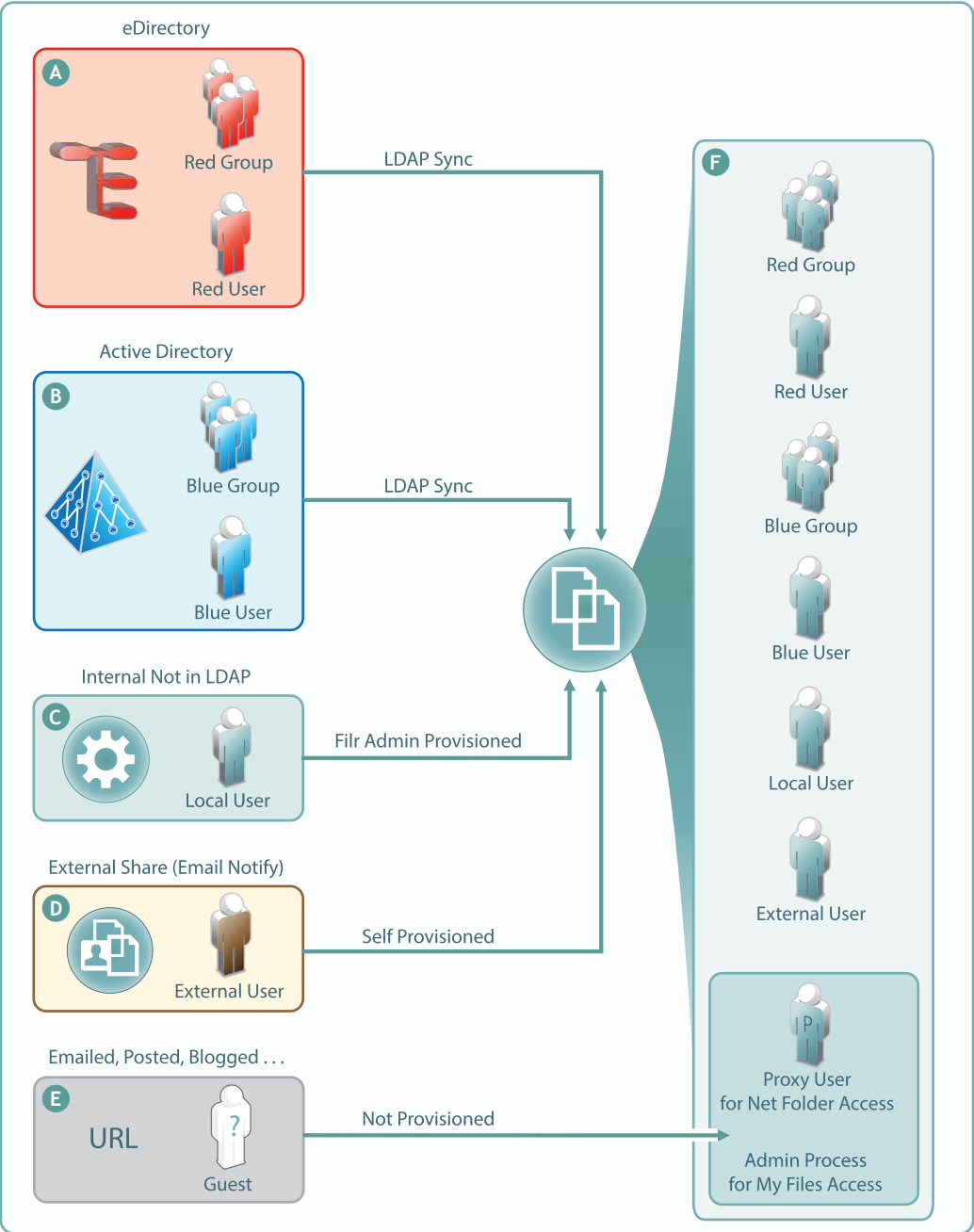
Users can be assigned rights on Filr as members of groups, including as members of either the `All Internal Users` group or the `All External Users` group, which includes those whose accounts were created as a result of an email share invitation.

After users and groups are provisioned, they have accounts in Filr that correspond to their original identities, but in the case of LDAP, these are only secondary. Filr synchronizes regularly with LDAP to verify authentication credentials, the status of home directories, updates on file system rights, and so on.

Finally, when Filr administrators allow it, “Guest” users are able to access publicly available files and folders through Filr.

[Figure 16-1](#) provides a high-level overview of the provisioning process that allows users and groups to access an organization’s internal data through Filr.

Figure 16-1 Provisioning Users and Groups



Letter	Details
A	<p>eDirectory users are provisioned on Filr through LDAP/LDAPS synchronization. Synchronization is one-way.</p> <p>Password and other changes on the eDirectory side are handled in Filr without additional configuration.</p> <p>Password and other changes can be made to a user's Filr configuration. However, they are not synchronized back to eDirectory. Instead, they are overwritten by the configuration in eDirectory with each synchronization.</p>
B	<p>Active Directory (AD) users are provisioned on Filr through LDAP/LDAPS synchronization. Synchronization is one-way.</p> <p>Password and other changes on the AD side are handled in Filr without additional configuration.</p> <p>Password and other changes can be made to a user's Filr configuration. However, they are not synchronized back to AD. Instead, they are overwritten by the configuration in AD with each synchronization.</p>
C	<p>Filr administrators can also provision users on the Filr appliance. These are referred to as Local users in the documentation and Filr interfaces.</p>
D	<p>External User accounts are created when share invitations are issued through email from Filr. The users provision themselves with a password, and so on when they log in to Filr.</p>
E	<p>Public users (Guests) aren't provisioned with accounts on Filr. Public users are anonymous to Filr and are allowed access to shared files in Net Folders through the Proxy User assigned to the Net Folder they are accessing. For shared files and folders in My Files, Public users gain access through the Filr admin process.</p>





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# A Documentation Updates

This section summarizes the changes made to the guide since the initial release of Novell Filr 1.0.

## November 2013

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Chapter or Section Changed	Summary of Changes
<a href="#">Section 4.5, "Rights to Files and Folders," on page 33</a>	Updated section to include information about how Filr roles map to NSS and NTFS file system rights, as well as information about Home folders and file attributes.

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## May 2013

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Chapter or Section Changed	Summary of Changes
<a href="#">Figure 3-3 on page 27</a>	Changed to more accurately reflect the process.
Various	Minor editing changes.

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