

# ESN 1.0

## Understanding How ESN Works

January 2017

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# Contents

<b>About This Guide</b>	<b>7</b>
<b>1 ESN Overview</b>	<b>9</b>
What Is Micro Focus ESN? . . . . .	9
ESN Storage Overview . . . . .	10
ESN Features and Functionality . . . . .	11
Why Appliances? . . . . .	13
<b>2 Setting Up ESN</b>	<b>15</b>
Getting and Preparing ESN Software . . . . .	15
Hyper-V . . . . .	15
VMware . . . . .	16
Xen and Citrix Xen . . . . .	17
Appliance Storage Illustrated . . . . .	18
Deploying ESN Appliances . . . . .	19
Small ESN Deployment Overview . . . . .	20
Expandable ESN Deployment Overview . . . . .	21
Initial Configuration of ESN Appliances . . . . .	22
Small ESN Deployment Configuration . . . . .	22
Large ESN Deployment Configuration . . . . .	23
ESN Clustering (Expanding a Deployment) . . . . .	25
Integrating ESN Inside Your Network Infrastructure . . . . .	27
A Small ESN Deployment . . . . .	27
A Large ESN Deployment . . . . .	29
Ports Used in ESN Deployments . . . . .	30
There Are No Changes to Existing File Servers or Directory Services . . . . .	31
<b>3 ESN Administration</b>	<b>33</b>
ESN Administrative Users . . . . .	33
vaadmin . . . . .	33
admin (the Built-in Port 8443 Administrator) . . . . .	34
“Direct” Port 8443 Administrators . . . . .	34
root . . . . .	35
Ganglia Appliance Monitoring . . . . .	35
Updating Appliances . . . . .	36
Certificate Management in ESN . . . . .	37
ESN Site Branding . . . . .	38
<b>4 Access Roles and Rights in ESN</b>	<b>39</b>
ESN Authentication . . . . .	39
Access to Files and Folders Is Controlled by the File System . . . . .	40
Access Permissions and ESN . . . . .	40
Access Permissions to Net Folders . . . . .	41
Access Permissions to My Files . . . . .	41
Net Folder Access Involves Four Roles . . . . .	41
Net Folder Roles are Derived, Not Assigned . . . . .	43

Net Folder Role Requirements on NSS File Systems . . . . .	43
Net Folder Roles on NTFS File Systems . . . . .	44
Net Folder Roles on SharePoint . . . . .	45
User Access Inside ESN . . . . .	47
Net Folders. . . . .	47
My Files (Home Folders) . . . . .	48
My Files (Personal Storage). . . . .	48
Shared with Me . . . . .	49
File Attributes Are Always Honored. . . . .	49
Net Folder Role Requirements Are Rigidly Enforced . . . . .	50
NSS Example. . . . .	51
NTFS Example. . . . .	51
SharePoint Example . . . . .	51
ESN Roles and NSS File System Rights Might Not Match. . . . .	52
Sharing Rights . . . . .	53
Windows Share Rights Don't Affect ESN . . . . .	53
Access-based Enumeration (Windows) Doesn't Affect ESN. . . . .	53
 <b>5 ESN Comments</b>	 <b>55</b>
 <b>6 ESN Email Notifications</b>	 <b>57</b>
 <b>7 ESN Search Appliance—Accessibility, and Searchability</b>	 <b>59</b>
“Indexing” Refers to Two Linked but Separate Processes . . . . .	59
Object Accessibility Requires Search Appliances . . . . .	59
Only Objects That Have Their Metadata Indexed Are Accessible . . . . .	59
Both Metadata Indexing and Content Indexing Require Planning . . . . .	60
Having Two Search Servers Is Critical. . . . .	60
What Is Indexed and When. . . . .	60
Net Folder File Content Indexing Overview . . . . .	62
About File-Content Searchability . . . . .	62
FAQs . . . . .	63
Content Indexing Is Resource-Intensive . . . . .	63
More Information . . . . .	63
 <b>8 ESN Licensing</b>	 <b>65</b>
 <b>9 My Files (Personal Storage)</b>	 <b>67</b>
Understanding My Files . . . . .	67
Enabling Personal Storage . . . . .	68
Personal Storage for All LDAP Users. . . . .	68
Personal Storage for Individual Users and/or Groups . . . . .	69
Restricting Disk Space Usage . . . . .	70
Home Folders Vs. Net Folders . . . . .	70
My Files Sharing Rights . . . . .	70
 <b>10 Net Folders</b>	 <b>71</b>
Overview . . . . .	71
Specifying Net Folder Servers . . . . .	73
Specifying Net Folders . . . . .	75
Net Folder Proxy Users. . . . .	77
Net Folder Proxy Identities. . . . .	77



The Functions Facilitated by Net Folder Proxy Users .....	79
Rights Required for Net Folder Proxy Users .....	79
Net Folder Proxy User Passwords .....	80
Granting Access to Net Folders .....	81
<b>11 Protocols and ESN</b>	<b>83</b>
<b>12 Sharing through ESN</b>	<b>85</b>
Setting Up Sharing for Users and Groups .....	86
Do Not Enable Sharing for All Internal Users and All External Users .....	86
System-Level Sharing Must Be Configured First .....	87
My Files Sharing Is Automatic .....	87
Net Folder Sharing Must Be Explicitly Allowed At Two Levels .....	88
Understanding Sharing .....	89
Sharing and Shared-access Roles .....	90
Shared Access to Net Folders Is Always through a Proxy User .....	90
Folder Sharing .....	90
How ESN Determines Roles for Files .....	90
Folder Role Determination Is More Complex .....	91
Working Around Shared-Role Limitations .....	94
A Caution Regarding the Re-sharing Feature .....	94
<b>13 ESN Synchronization</b>	<b>95</b>
What Synchronization Provides .....	95
Synchronization Process Overview .....	97
Net Folder Synchronization Detail Overview .....	99
<b>14 File and Folder Access in ESN</b>	<b>103</b>
How ESN Makes Files and Folders Visible to Users .....	103
Web Application for Browsers .....	104
Mobile Apps .....	105
Desktop Applications .....	105
How the ESN 2.0 and Later Desktops Work .....	105
Net Folder Synchronization Is Crucial .....	108
Desktop Browsing Triggers JITS .....	109
Files on Demand .....	109
A Good Replacement for Mapped Drives .....	110
<b>15 Network Time and ESN</b>	<b>111</b>
<b>16 Users and Groups in ESN</b>	<b>113</b>
Leveraging the Built-in Security of eDirectory and Active Directory .....	113
Provisioning Users and Groups .....	113
User Provisioning Overview .....	113
LDAP Proxy User Role and Rights .....	115
Types of ESN Users .....	116
The Role of Groups in ESN .....	117
User Visibility .....	117
How ESN Makes LDAP Users and Groups Visible .....	118
Key Points About User Visibility in ESN .....	119
How User-Visibility Limitations Work .....	119



# About This Guide

This guide contains high-level overviews of Micro Focus ESN and covers the following topics:

- ♦ Chapter 1, “ESN Overview,” on page 9
- ♦ Chapter 2, “Setting Up ESN,” on page 15
- ♦ Chapter 3, “ESN Administration,” on page 33
- ♦ Chapter 4, “Access Roles and Rights in ESN,” on page 39
- ♦ Chapter 5, “ESN Comments,” on page 55
- ♦ Chapter 6, “ESN Email Notifications,” on page 57
- ♦ Chapter 7, “ESN Search Appliance—Accessibility, and Searchability,” on page 59
- ♦ Chapter 8, “ESN Licensing,” on page 65
- ♦ Chapter 9, “My Files (Personal Storage),” on page 67
- ♦ Chapter 10, “Net Folders,” on page 71
- ♦ Chapter 11, “Protocols and ESN,” on page 83
- ♦ Chapter 12, “Sharing through ESN,” on page 85
- ♦ Chapter 13, “ESN Synchronization,” on page 95
- ♦ Chapter 14, “File and Folder Access in ESN,” on page 103
- ♦ Chapter 15, “Network Time and ESN,” on page 111
- ♦ Chapter 16, “Users and Groups in ESN,” on page 113

## Audience

This guide is intended for Micro Focus ESN 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 Micro Focus ESN.

## Documentation Updates

The most recent version of this guide is available [here](http://www.novell.com/documentation/filr-3/esn-overvw/data/bookinfo.html) (<http://www.novell.com/documentation/filr-3/esn-overvw/data/bookinfo.html>) on the ESN Web site.

## Additional Documentation

For other ESN documentation, see the [ESN Web site](http://www.novell.com/documentation/filr-3/) (<http://www.novell.com/documentation/filr-3/>).



# 1 ESN Overview

Today's workers expect to access work files like they do personal files.

Some of them are moving work files to cloud-based services, which causes the risk managers in their organizations to lose sleep.

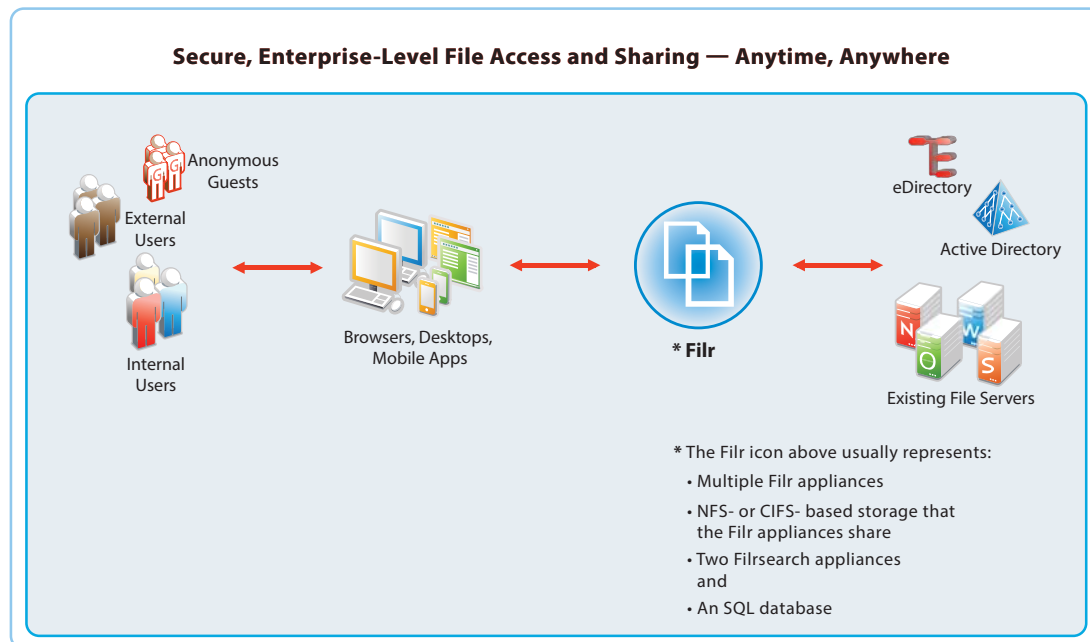
Micro Focus ESN offers modern file access without compromising existing security systems.

- ♦ [“What Is Micro Focus ESN?” on page 9](#)
- ♦ [“ESN Storage Overview” on page 10](#)
- ♦ [“ESN Features and Functionality” on page 11](#)
- ♦ [“Why Appliances?” on page 13](#)

## What Is Micro Focus ESN?

Micro Focus ESN provides file access and sharing, and lets users access their home directories and network folders from desktops, mobile devices, and the Web. Users can also synchronize their files to their PC or Mac. Changes that they make to downloaded copies are kept in sync with the originals on their network file servers. And finally, users can also share files internally and externally, and those with the share can collaborate with each other by commenting on the files.

*Figure 1-1 State-of-the-Art Access to Enterprise Data*



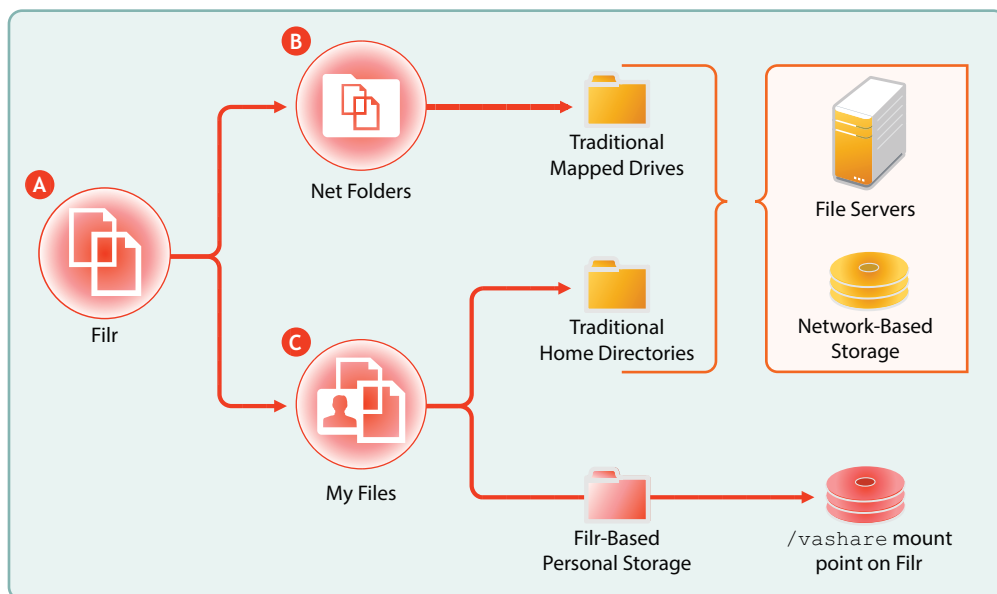
- ♦ **Users:** ESN lets you control the following:
  - ♦ User authentication inside and outside your organization

- ♦ Access to organization files and folders that were previously accessible only through mapped drives
- ♦ Access to personal files and folders in ESN-based storage and/or in traditional Windows, OES, and NetWare home directories
- ♦ Internal and external sharing of files and folders
- ♦ **Access Devices and Methods:** ESN provides multiple access methods.
  - ♦ A Web (browser-based) application
  - ♦ Apps for Apple iOS 8 and later, Android 2.3 and later, Windows phones 8.0 and 8.1, and BlackBerry PlayBook and Z10 personal devices
  - ♦ Clients for Windows 7 (x86 and x64) and 8 and later (x64 only) workstations
  - ♦ A client for Macintosh OS X 10.9 and later workstations
- ♦ **ESN Virtual Appliances:**
  - ♦ These run on VMware, Xen, Citrix Xen, and Hyper-V hypervisors.
  - ♦ They lets users authenticate using their eDirectory and Active Directory usernames and passwords.
  - ♦ They provides access to data on NetWare, OES, Windows, and SharePoint servers that use their native file protocols (NCP and CIFS).
- ♦ **Existing Directory Services and File Servers:** Are not impacted because ESN does the following:
  - ♦ Requires no changes to file servers
  - ♦ Honors file system trustee rights and attributes

Your Micro Focus and Microsoft file servers and directory services retain complete control over all file- and folder-related activity.

## ESN Storage Overview

Figure 1-2 ESN and Its Potential Targets

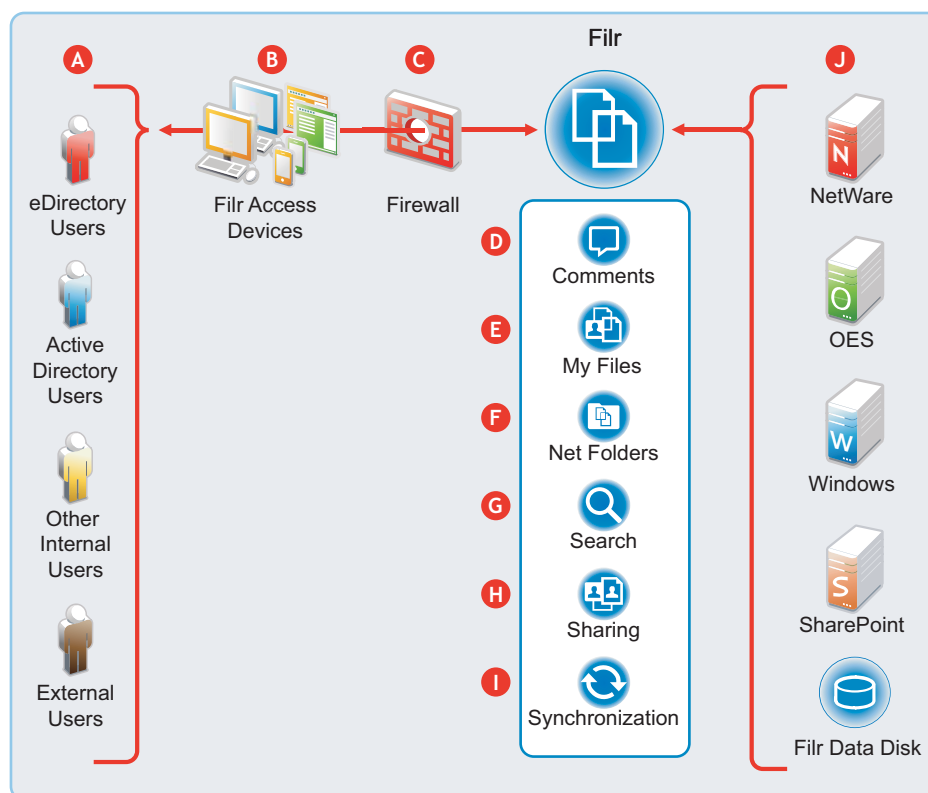


Letter	Details
A	ESN provides its users with file access through <ul style="list-style-type: none"> <li>♦ Net Folders, which are similar to traditional network mapped drives</li> <li>And</li> <li>♦ My Files, which can include both traditional home directories and also ESN-based storage.</li> </ul>
B	Net Folders point to file servers and/or network-based storage.
C	My Files can also point to file servers and/or network-based storage when these include traditional home directories.  If the Personal Storage feature is enabled, My Files also provides access to personal files and folders that are stored in ESN itself.
<b>NOTE:</b> Supported file servers and network storage devices are listed on Worksheet 6 and in “ <a href="#">File Servers (Backend Storage)</a> ” in the <i>ESN 1.0: Installation, Deployment, and Upgrade Guide</i> .	

## ESN Features and Functionality

Figure 1-3 shows ESN'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 ESN services.

**Figure 1-3** What ESN Provides



Letter	Details
A	<ul style="list-style-type: none"> <li>♦ <b>eDirectory and Active Directory:</b> You synchronize ESN with eDirectory and Active Directory identity stores through LDAP. See “<a href="#">LDAP Servers and Synchronization</a>” in the <i>ESN 1.0: Administrative UI Reference</i>.</li> <li>♦ <b>Local Users:</b> You can create users on the ESN system independent of any LDAP source using the <a href="#">New user button</a> &gt; <a href="#">New User dialog</a>, as documented in the <i>ESN 1.0: Administrative UI Reference</i>.</li> <li>♦ <b>External Users:</b> When a user outside the organization responds to an invitation to share a file or folder, ESN creates a username using the invitation’s email address. When users accept these invitations, they can set their passwords. For more information, see “<a href="#">Sharing Files and Folders</a>” in the <i>ESN 1.0: User Access Guide</i>.</li> </ul>
B	<p>ESN lets users access files and folders through the following:</p> <ul style="list-style-type: none"> <li>♦ A Web (browser-based) application</li> <li>♦ Apps for Apple iOS 8 and later and Android 2.3.X and later</li> <li>♦ Clients for Windows 7 and later and Macintosh OS X 10.9 and later workstations</li> </ul>
C	<p>ESN is designed to work with your security infrastructure. Your firewalls continue to protect your data while ESN provides access to it from practically anywhere. For more information, see “<a href="#">Security</a>” in the <i>ESN 1.0: Administrative UI Reference</i>.</p>
D	<p>ESN lets users collaborate by supporting user comments on files and folders. For more information, see “<a href="#">ESN Comments</a>” on page 55.</p>
E	<p>ESN lets users access their personal files and folders on either or both traditional home directories and local ESN storage. For more information, see “<a href="#">My Files (Personal Storage)</a>” on page 67.</p>
F	<p>ESN lets users access your organization’s files and folders that were previously available only through mapped drives. For more information, see “<a href="#">Net Folders</a>” on page 71.</p>
G	<p>ESN 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 “<a href="#">ESN Search Appliance—Accessibility, and Searchability</a>” on page 59.</p>



Letter	Details
<b>H</b>	ESN lets users share files in Net Folders, and files and folders in My Files, with internal and external users. For more information, see <a href="#">“Sharing through ESN” on page 85</a> .
<b>I</b>	ESN lets you synchronize eDirectory and Active Directory users as well as files and folders according to your organization's needs. For more information, see <a href="#">“ESN Synchronization” on page 95</a> .
<b>J</b>	ESN provides access to storage on Micro Focus file servers, Windows file servers, and personal storage on the ESN appliance.

## Why Appliances?

In contrast with servers, appliances simplify the development and delivery model for ESN so that we can provide you with new services more quickly.

Appliance benefits include the following:

- ♦ **Simplified Deployment:** ESN appliances are built on specific and tuned operating systems (SLES 11 SP3 in the case of ESN 1.2). 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.



# 2 Setting Up ESN

This section presents high-level overviews of the following setup tasks. For detailed setup information and instructions, see the [ESN 1.0: Installation, Deployment, and Upgrade Guide](#).

- ♦ “Getting and Preparing ESN Software” on page 15
- ♦ “Appliance Storage Illustrated” on page 18
- ♦ “Deploying ESN Appliances” on page 19
- ♦ “Initial Configuration of ESN Appliances” on page 22
- ♦ “ESN Clustering (Expanding a Deployment)” on page 25
- ♦ “Integrating ESN Inside Your Network Infrastructure” on page 27
- ♦ “Ports Used in ESN Deployments” on page 30
- ♦ “There Are No Changes to Existing File Servers or Directory Services” on page 31

## Getting and Preparing ESN Software

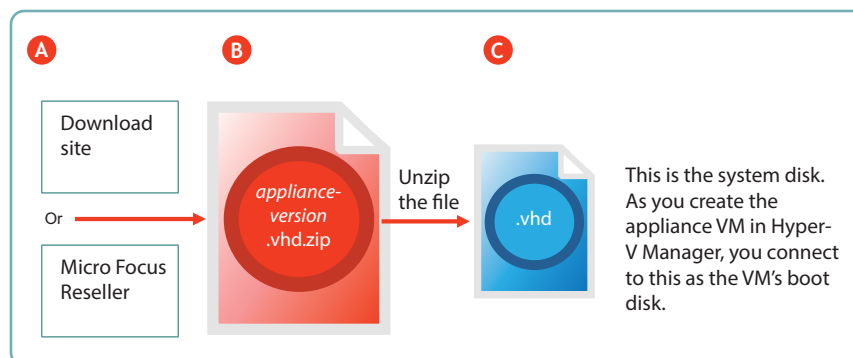
The process of getting and preparing ESN software is straightforward, as illustrated in the following sections.

- ♦ “Hyper-V” on page 15
- ♦ “VMware” on page 16
- ♦ “Xen and Citrix Xen” on page 17

For more information, see “[Downloading and Preparing the ESN Software](#),” in the [ESN 1.0: Installation, Deployment, and Upgrade Guide](#).

### Hyper-V

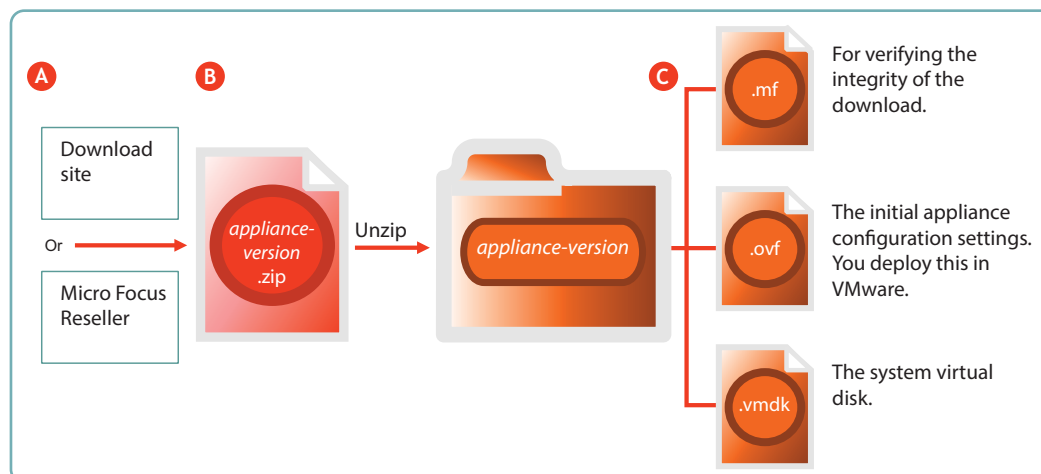
**Figure 2-1** Downloading and Preparing Micro Focus Appliances for Hyper-V



Letter	Details
A	You can download the .zip archive files for the Hyper-V build of the three Micro Focus ESN appliances (ESN, Search, and MySQL) directly from the <a href="#">Download Site</a> , or you can obtain them through your <a href="#">Micro Focus Authorized Reseller</a> .
B	Unzip the archive to expose the appliance system disk image. For more information, see “ <a href="#">Hyper-V</a> ,” in the <a href="#">ESN 1.0: Installation, Deployment, and Upgrade Guide</a> .
C	<p>The .vhd file is a Hyper-V disk image that contains all of the appliance's system files.</p> <p>You connect to this file in Hyper-V Manager by selecting the <b>Use an existing virtual hard disk</b> option.</p> <p>Unlike VMware and Xen, no pre-configured settings file is supplied for the VM. Instead you specify the RAM, network card, additional disks, and so on as instructed in the <a href="#">ESN 1.0: Installation, Deployment, and Upgrade Guide</a>.</p>

## VMware

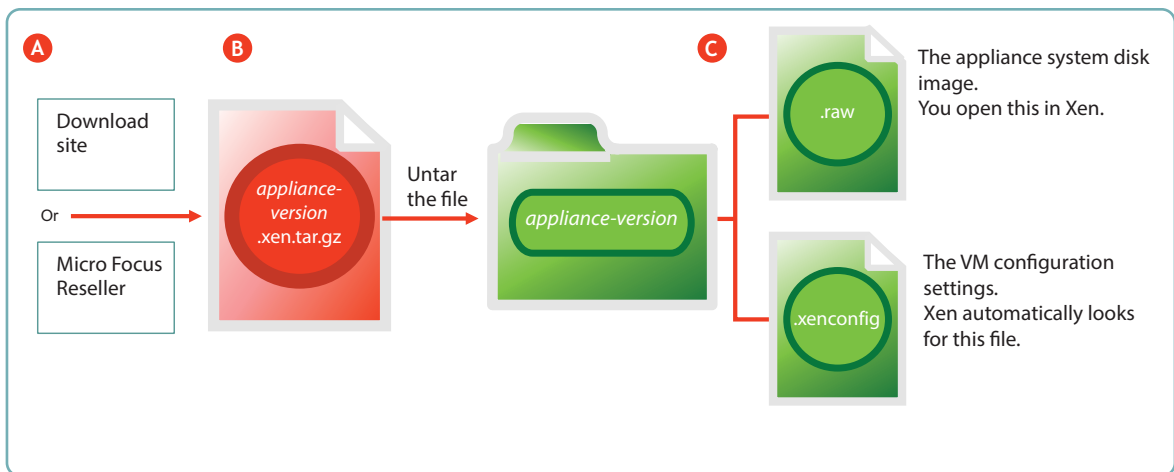
**Figure 2-2** Downloading and Preparing Micro Focus Appliances for VMware



Letter	Details
A	You can download the .zip archive files for the VMware build of the three Micro Focus ESN appliances (ESN, Search, and MySQL) directly from the <a href="#">Download Site</a> , or you can obtain them through your <a href="#">Micro Focus Authorized Reseller</a> .
B	Unzip the archives to expose a folder that contains the three files needed for deployment. For more information, see “VMWare,” in the <a href="#">ESN 1.0: Installation, Deployment, and Upgrade Guide</a> .
C	<p>The .mf file contains an SHA1 digest that VMware uses to verify the integrity of the other two files.</p> <p>The .ovf file contains the virtual appliance's configuration settings. You open and deploy this file in VMware to create the ESN appliance. You modify its settings during the initial deployment phase.</p> <p>The .vmdk 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>

## Xen and Citrix Xen

**Figure 2-3** Downloading and Preparing Micro Focus Appliances for Xen



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

Letter	Details
B	Untar the archives to expose a folder that contains the two files needed for deployment. For more information, see “ <a href="#">Xen</a> ,” and “ <a href="#">Citrix Xen</a> ,” in the <a href="#">ESN 1.0: Installation, Deployment, and Upgrade Guide</a> .
C	<p>The <code>.raw</code> file contains the system disk image. You open this file in Xen to begin the deployment process</p> <p>The <code>.xenconfig</code> file contains the virtual appliance's configuration settings. You modify its settings during the initial deployment phase.</p>

## Appliance Storage Illustrated

The information that was in this section has been consolidated in three graphic drafts to illustrate what information and data is stored where. Storage planning is one of the most critical planning steps and is covered in the [ESN 1.0 Planning Your ESN Deployment—Best Practices](#) guide.

Figure 2-4

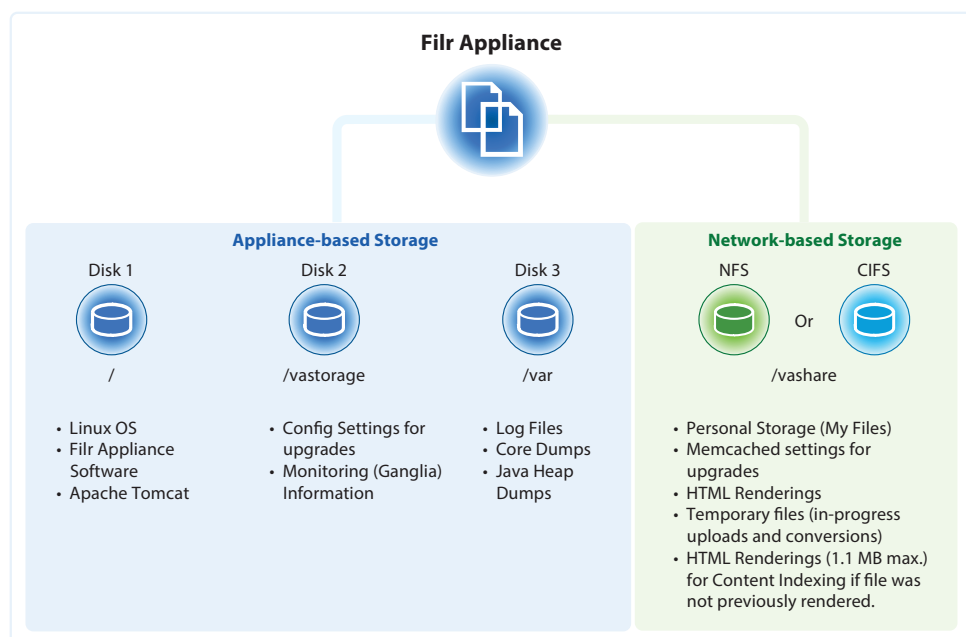


Figure 2-5

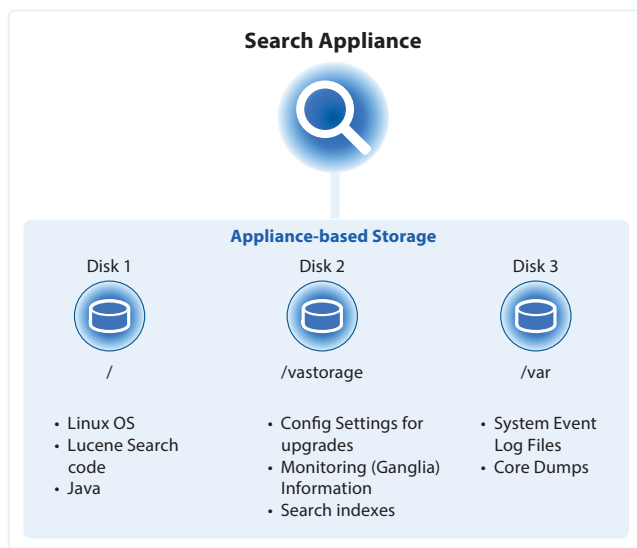
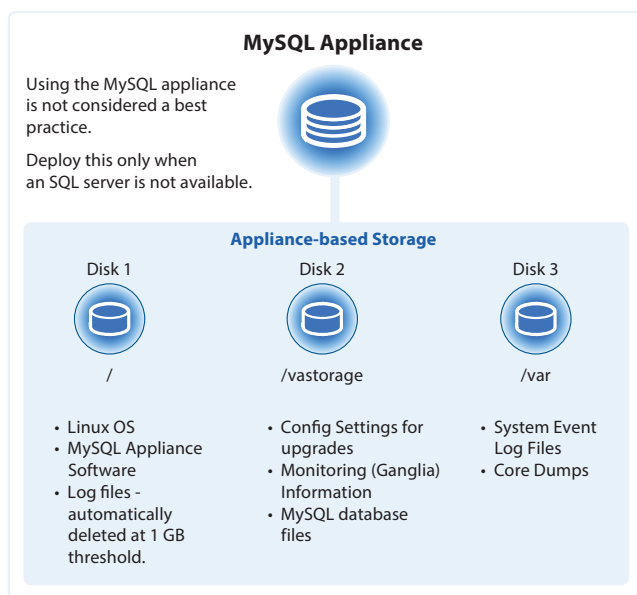


Figure 2-6



## Deploying ESN Appliances

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**NOTE:** The information in this section illustrates a VMware deployment. The same basic steps apply to other supported hypervisors. For specific deployment instructions, refer to the [ESN 1.0: Installation, Deployment, and Upgrade Guide](#).

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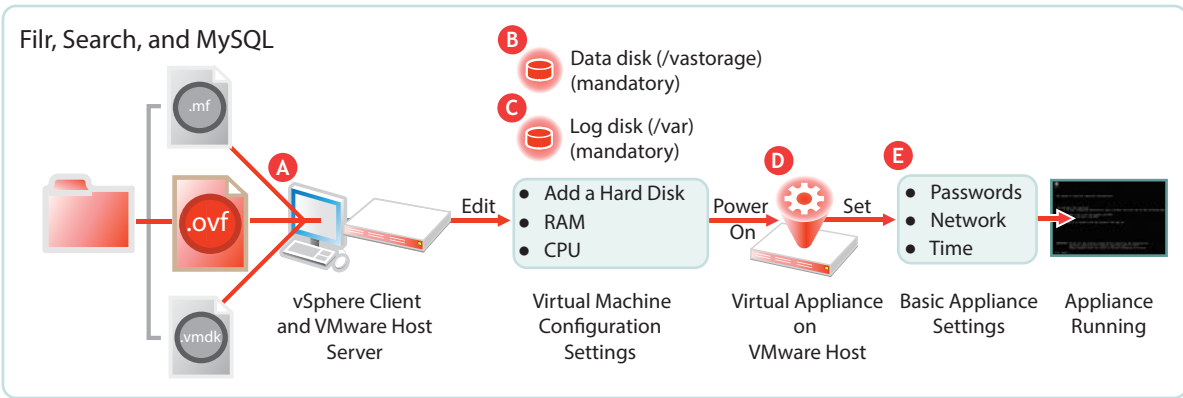
After you have obtained and extracted the appliance software, you need to deploy it on your host server, as illustrated in [Figure 2-7](#) and [Figure 2-8](#) and as explained in the tables that follow them.

- ♦ “[Small ESN Deployment Overview](#)” on page 20
- ♦ “[Expandable ESN Deployment Overview](#)” on page 21

# Small ESN Deployment Overview

**NOTE:** After initial VM preparation is completed, deploying on Hyper-V and Xen is comparable to the VMware steps illustrated below.

Figure 2-7 A Small Deployment of ESN on VMware



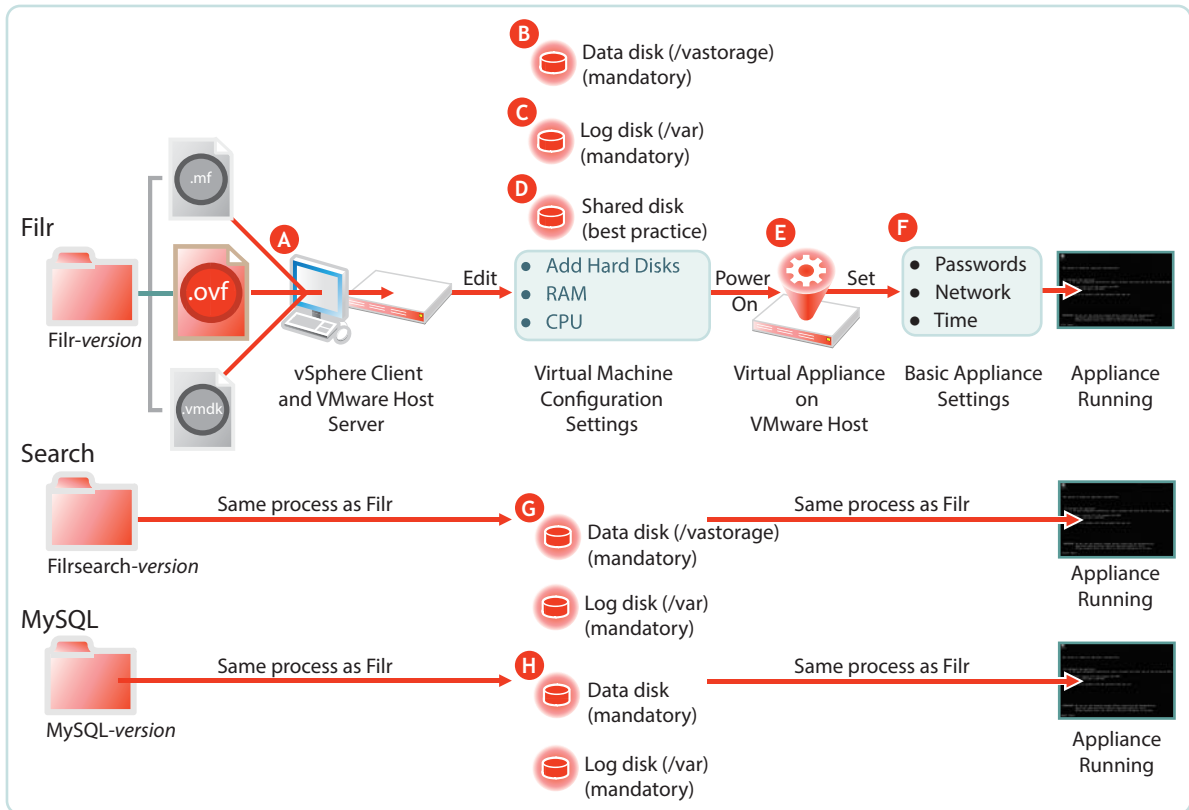
Letter	Details
A	<p>Using the vSphere client, access the VMware host server and deploy the .ovf template file.</p> <p>Specify the hostname and IP address. If possible, the system determines the mask and gateway, and automatically populates those fields.</p> <p>The network interface is bridged by default. 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	<p>A third disk is needed for storing log files, which prevents the system disk from running out of space.</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 Micro Focus appliances.</p>



# Expandable ESN Deployment Overview

**NOTE:** After initial VM preparation is completed, deploying on the other hypervisors is comparable to the VMware steps illustrated below.

**Figure 2-8** A Large Deployment of ESN



## Letter

## Details

**A**

Using the vSphere client, access the VMware host server and deploy the .ovf template file.

Specify the hostname and IP address. If possible, the system determines the mask and gateway, and automatically populates those fields.

The network interface is bridged by default. Make sure this setting matches the network configuration in your VMware environment.

**B**

A second disk is needed for the following reasons:

- ♦ Adequate personal storage disk space
- ♦ Separation of system and data files to facilitate appliance updates

You might want to also change the RAM allocation and the number of CPUs.

Letter	Details
<b>C</b>	A third disk is needed for storing log files, which prevents the system disk from running out of space.
<b>D</b>	<p>Even if you deploy only one ESN appliance initially, the best practice recommendation is to add a shared CIFS or NFS disk. That way the deployment can be expanded to include more ESN appliances in the future. Otherwise, it cannot.</p> <p>If you don't use shared storage, the deployment is non-expandable and although it is supported, it doesn't comply with best practice recommendations.</p> <p>This only applies to the ESN VA, not to the Search or MySQL appliances.</p>
<b>E</b>	Start the appliance.
<b>F</b>	<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 Micro Focus appliances.</p>
<b>G</b>	If you are installing separate appliances, you need to deploy at least one and preferably two search appliances as well. The process is very similar to a ESN VA deployment, except that the search appliances don't use shared storage.
<b>H</b>	<p>Installing separate appliances also requires configuring a MySQL or MS SQL database. Deploying the MySQL appliance that comes with ESN is very similar to the process for ESN and the search appliances.</p> <p>If you already have a MySQL or MS SQL database in your organization, you can use it instead of the MySQL appliance that comes with ESN.</p>

## Initial Configuration of ESN Appliances

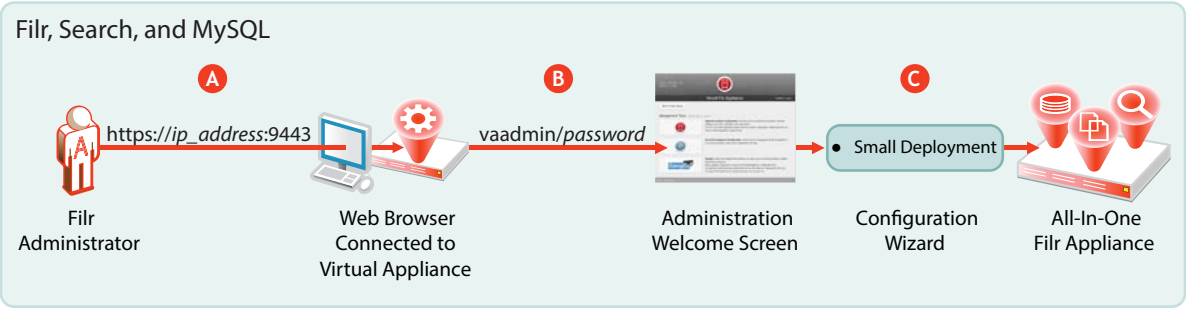
After you have deployed the appliances and set a few basic system settings, such as passwords, you must perform an initial appliance configuration. The process varies, depending on which deployment scenario you are implementing.

- ♦ [“Small ESN Deployment Configuration” on page 22](#)
- ♦ [“Large ESN Deployment Configuration” on page 23](#)

### Small ESN Deployment Configuration

Starting and configuring an all-in-one ESN appliance is quite straightforward, as illustrated in [Figure 2-9](#) and explained in the table that follows it.

Figure 2-9 Configuring an All-in-One ESN Appliance



Letter	Details
A	Access and configure the ESN 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 Micro Focus ESN services.

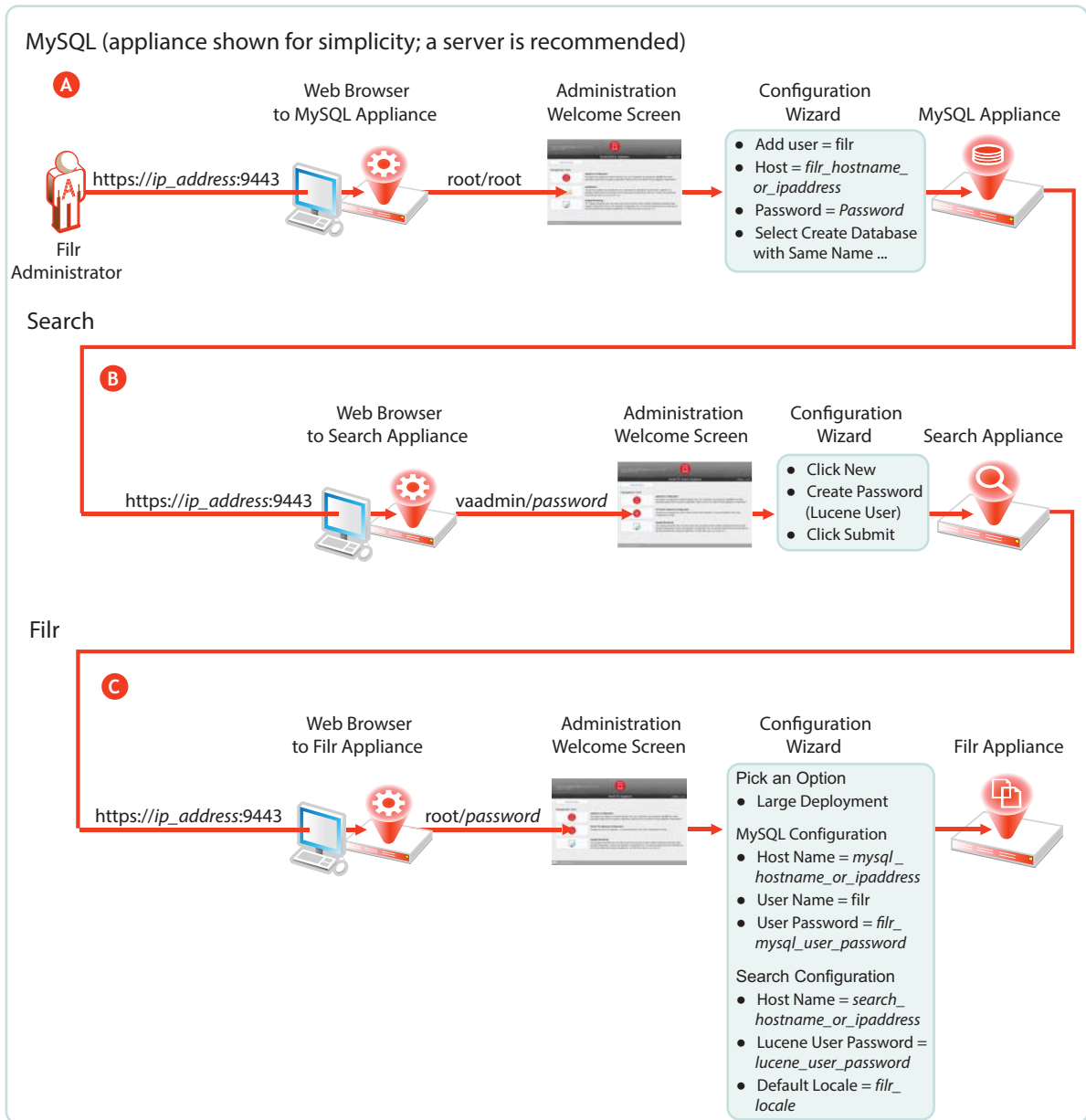
For more information, see “[Creating an All-in-one \(Small\) Deployment](#)” in the *ESN 1.0: Installation, Deployment, and Upgrade Guide*.

## Large ESN Deployment Configuration

Starting and configuring the appliances for a large deployment is more involved than for a single appliance. However, the process is well documented and also very straightforward, as illustrated in [Figure 2-10](#) 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 2-8](#) on page 21.

**Figure 2-10** Configuring Separate Appliances



Letter	Details
B	<p>First, access and configure your database server as outlined in “<a href="#">Setting Up the SQL Database</a>” in the <i>ESN 1.0: Installation, Deployment, and Upgrade Guide</i>.</p> <p>(If you are using the MySQL database appliance, use the phpMyAdmin utility to configure the appliance, as instructed in “<a href="#">Configuring the MySQL Appliance to Provide the SQL Database (Alternate Practice)</a>” in the <i>ESN 1.0: Installation, Deployment, and Upgrade Guide</i>.)</p> <p>When you finish this step, your database is ready to provide services to the ESN appliance.</p>
A	<p>Second, access and configure the Search appliances through a browser, logging in to the administration console, and running the configuration wizard.</p> <p>When you finish this step, your Search appliances are running and ready to provide indexing services for ESN.</p> <p>For details, see “<a href="#">Setting Up Two ESN Search Appliances</a>” in the <i>ESN 1.0: Installation, Deployment, and Upgrade Guide</i>.</p>
C	<p>Finally, access and configure the ESN appliance through an administrative browser, logging in to the administrative console, and running the configuration wizard.</p> <p>For more information, see “<a href="#">Setting Up the ESN Appliances</a>” in the <i>ESN 1.0: Installation, Deployment, and Upgrade Guide</i>.</p>

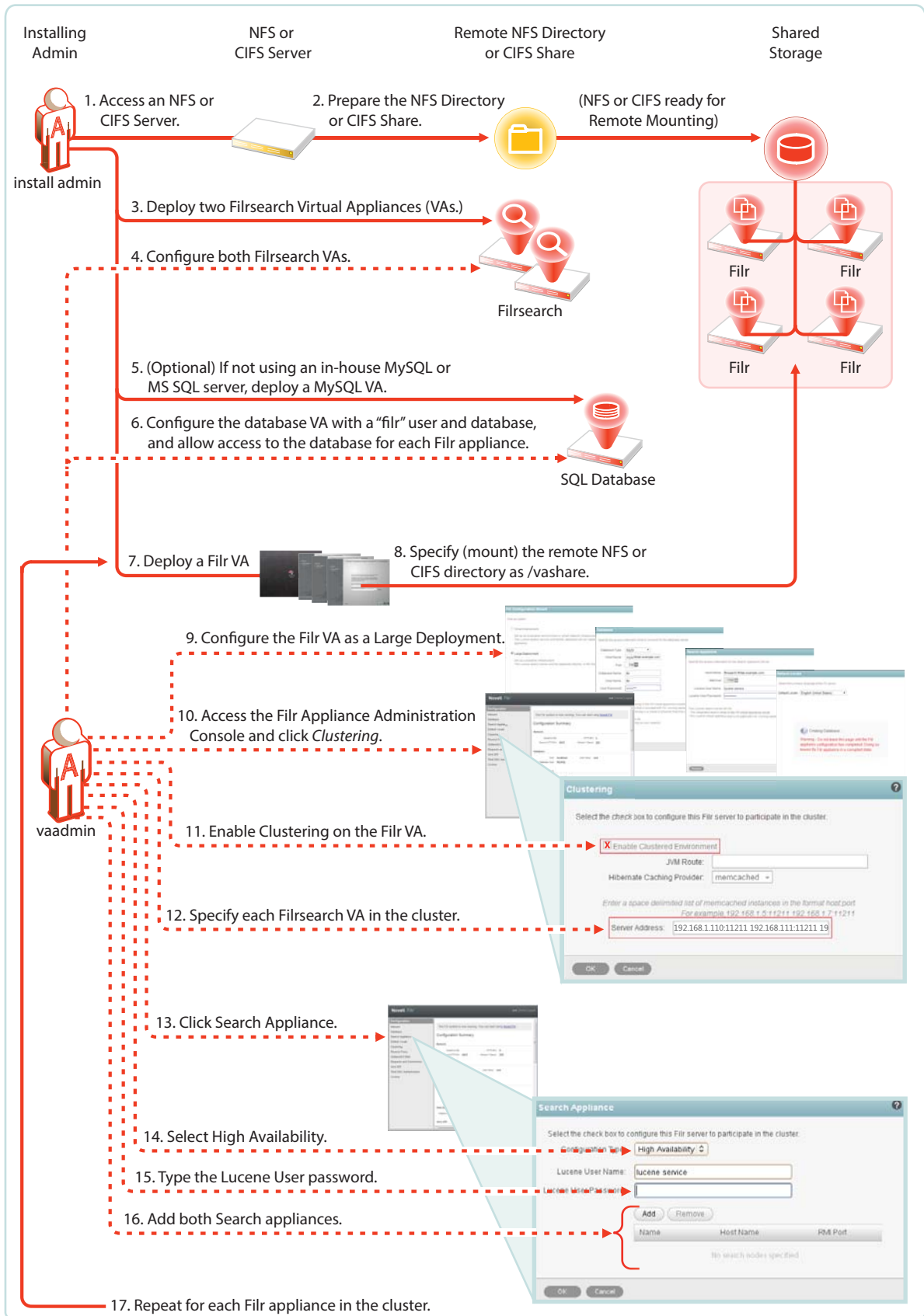
For more information, see “[Creating an Expandable ESN Deployment](#)” in the *ESN 1.0: Installation, Deployment, and Upgrade Guide*.

## ESN Clustering (Expanding a Deployment)

ESN clustering involves two or more ESN VAs sharing the same NFS or CIFS data storage location (/vashare). You can only create a cluster if your ESN appliances were deployed pointing to the same /vashare disk.

Basic steps for setting up ESN clustering are included in [Figure 2-11](#).

**Figure 2-11** Clustered ESN VAs



For step-by-step instructions, see “[Creating an Expandable ESN Deployment](#)” in the *ESN 1.0: Installation, Deployment, and Upgrade Guide*.

## Integrating ESN Inside Your Network Infrastructure

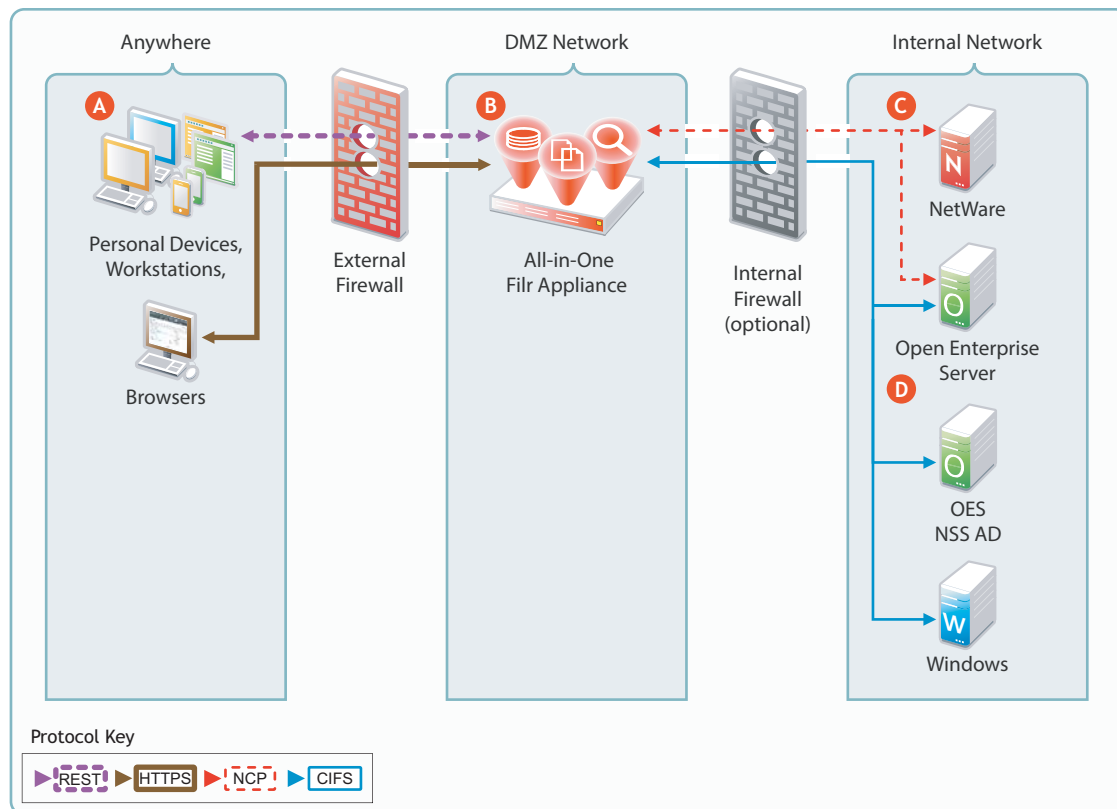
The following examples illustrate two possibilities out of many potential network configurations for deploying ESN.

- ♦ “[A Small ESN Deployment](#)” on page 27
- ♦ “[A Large ESN Deployment](#)” on page 29

### A Small ESN Deployment

[Figure 2-12](#) 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 2-12** Example of a Small ESN Deployment

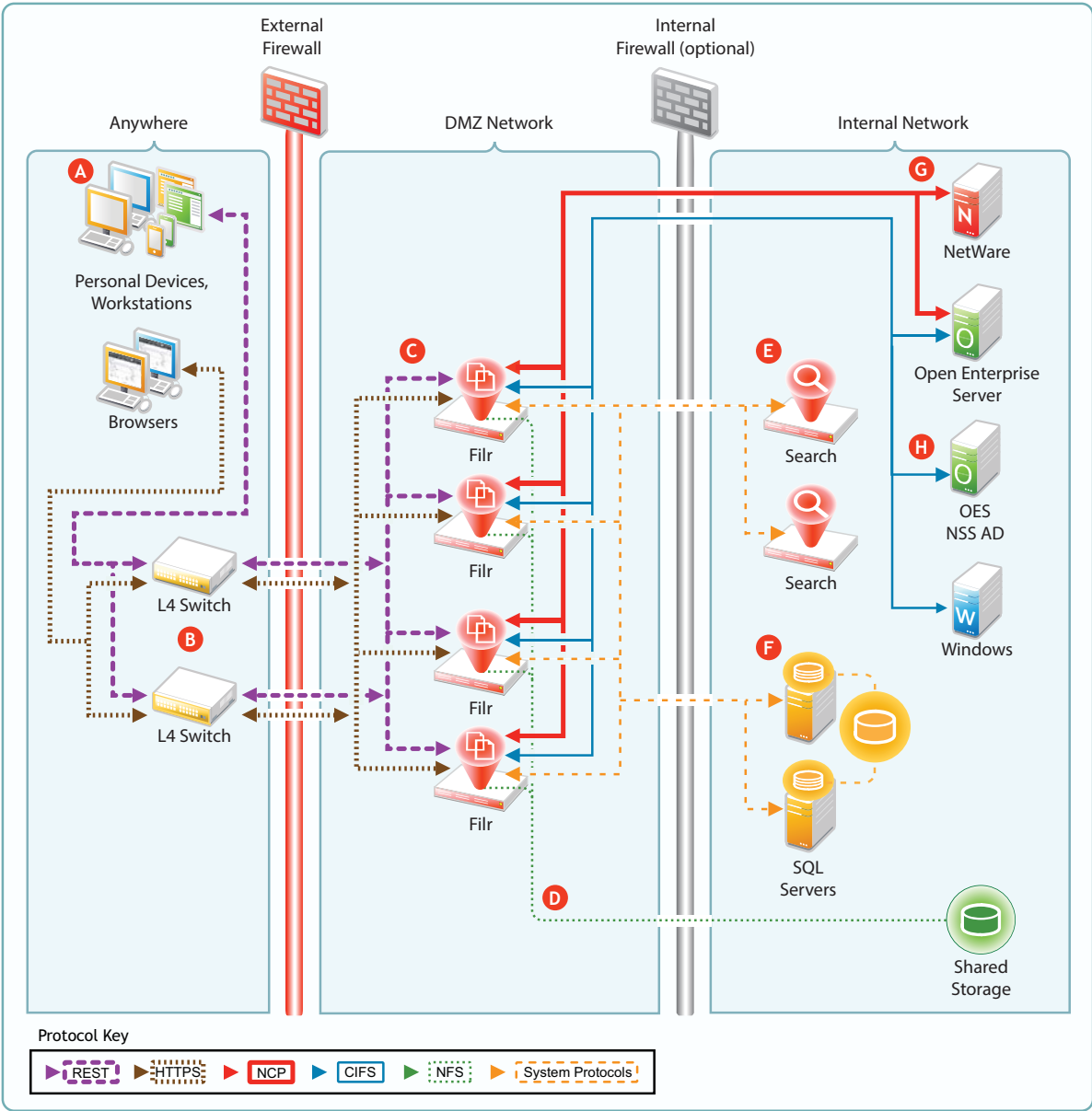


Letter	Details
A	ESN brings Micro Focus and Windows file services to personal devices, Macintosh and Windows workstations, and Web browsers.
B	ESN is built for fitting in with your security infrastructure and can be deployed in a DMZ network, allowing your organization's data to remain safely inside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



# A Large ESN Deployment

Figure 2-13 Example of a Large ESN Deployment



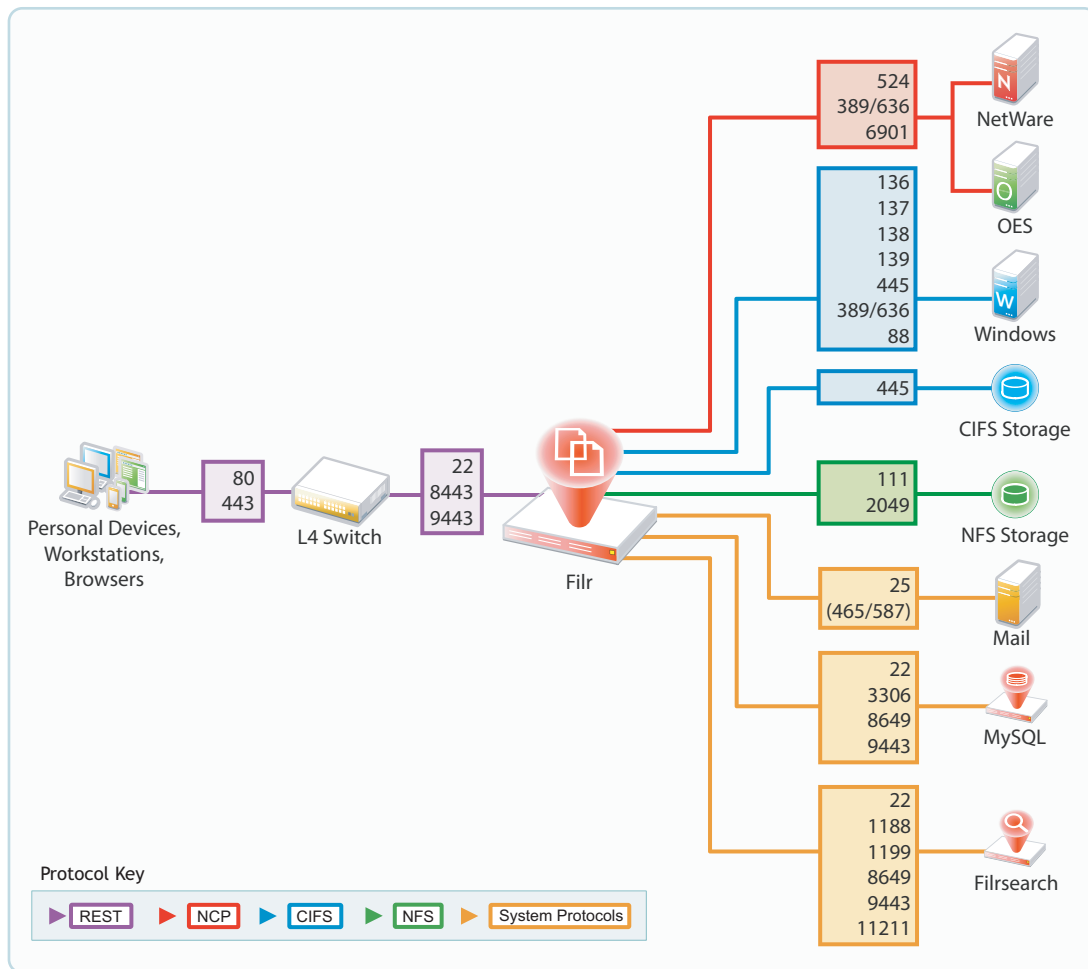
Letter	Details
A	ESN brings Micro Focus and Windows file services to personal devices, Macintosh and Windows workstations, and Web browsers.
B	You can use L4 switches to provide load balancing of REST requests to your ESN appliances. Although not shown, you can, of course, also use software-based load balancers for this.

Letter	Details
C	You can deploy ESN appliances inside a front-end DMZ and configure multiple ESN VAs to share NFS- or CIFS-based storage (D), thus providing scalability and high availability.
D	Shared storage ( <code>/vashare</code> ) lets you expand your ESN deployment to include multiple ESN VAs (C). Although an exported NFS disk is shown in the illustration, CIFS shares are also supported.
E	You can deploy multiple search appliances in an internal network, each of which maintains indexes of ESN data to provide failover for search and other requests coming through the ESN appliances.
F	Your organization's MySQL or MS SQL servers can be deployed in the internal network and configured to access the same database.
G	As with small deployments, this configuration supports NCP file services.
H	CIFS file services are also supported.

## Ports Used in ESN Deployments

Figure 2-14 illustrates the ports that can be used in ESN deployments, including insecure ports. For information on configuring and securing ESN securely, see “DMZ Setup for ESN” in the *ESN 1.0: Maintenance Best Practices Guide*.

Figure 2-14 ESN Port Usage



## There Are No Changes to Existing File Servers or Directory Services

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



# 3 ESN Administration

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

- ♦ “ESN Administrative Users” on page 33
- ♦ “Ganglia Appliance Monitoring” on page 35
- ♦ “Updating Appliances” on page 36
- ♦ “Certificate Management in ESN” on page 37
- ♦ “ESN Site Branding” on page 38

## ESN Administrative Users

ESN appliances are installed and administered in two phases and require two different administrative users, each with different Web-based administrative tools, as explained in the following sections:

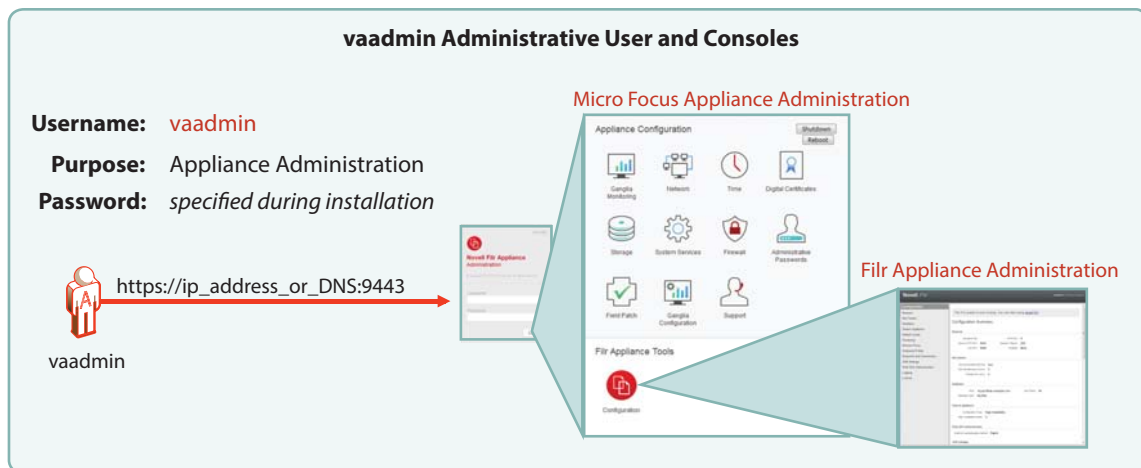
- ♦ “vaadmin” on page 33
- ♦ “admin (the Built-in Port 8443 Administrator)” on page 34
- ♦ ““Direct” Port 8443 Administrators” on page 34
- ♦ “root” on page 35

### vaadmin

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

Use vaadmin to change or adjust appliance settings. For example,

- ♦ Installing certificates and licenses
- ♦ Adjusting the network configuration
- ♦ Setting up ESN clustering



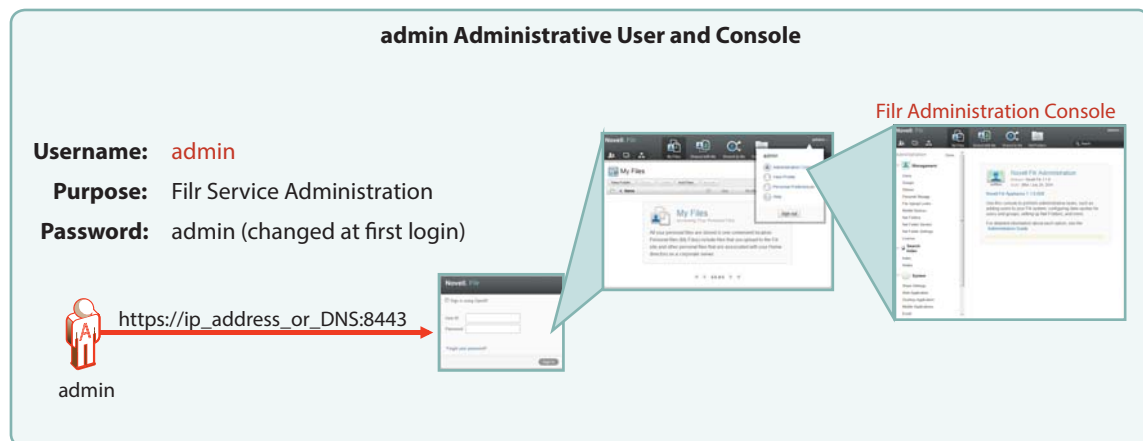
## admin (the Built-in Port 8443 Administrator)

After the appliances are fully operational, most of the administrative work is accomplished using the ESN `admin` user account.

The first time you log in, the username/password are `admin/admin`. You are prompted to change this. See “[Assigning and Managing Port 8443 Direct Administrators](#)” in the *ESN 1.0: Administrative UI Reference*.

You use this administrative user to do everything within the Port 8443 administrative console, including the following:

- ♦ Import (synchronize) users and groups from LDAP identity stores
- ♦ Create additional ESN users
- ♦ Set up My Files personal storage
- ♦ Set up Net Folders
- ♦ Set synchronization schedules
- ♦ Manage access
- ♦ Manage quotas
- ♦ Manage shares



## “Direct” Port 8443 Administrators

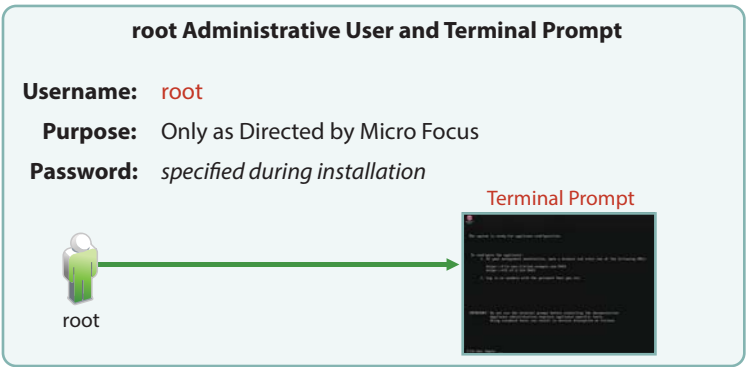
There are two types of Port 8443 Administrators

- ♦ **Built in (admin):** Has full rights to the Port 8443 console, including the right to add or remove Direct administrators.
- ♦ **Direct:** Have rights to administer only
  - ♦ Users
  - ♦ Groups
  - ♦ Mobile Devices
  - ♦ Net Folders
  - ♦ Net Folder Servers

# root

Micro Focus ESN 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, Micro Focus strongly discourages this practice because it can result in service disruption or more serious problems, including data loss.

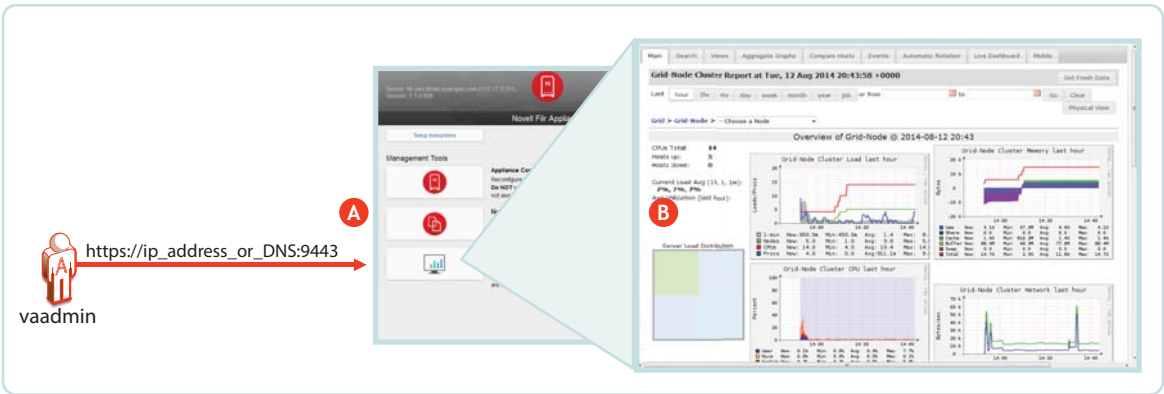
If you contact Micro Focus Support with a ESN support incident, you might be asked to access the appliance's terminal prompt as the `root` user. Otherwise, there are no ESN administrative tasks that involve `root` or the bash interface.



## Ganglia Appliance Monitoring

By launching the Ganglia monitoring page, as shown in [Figure 3-1](#), you can access various real-time monitoring statistics for all of the Ganglia-enabled machines on your network segment.

Figure 3-1 Ganglia Appliance Monitoring



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

Letter	Details
<b>B</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 ESN appliance you see ESN metrics, /vastorage 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.

## Updating Appliances

ESN 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 3-2](#).

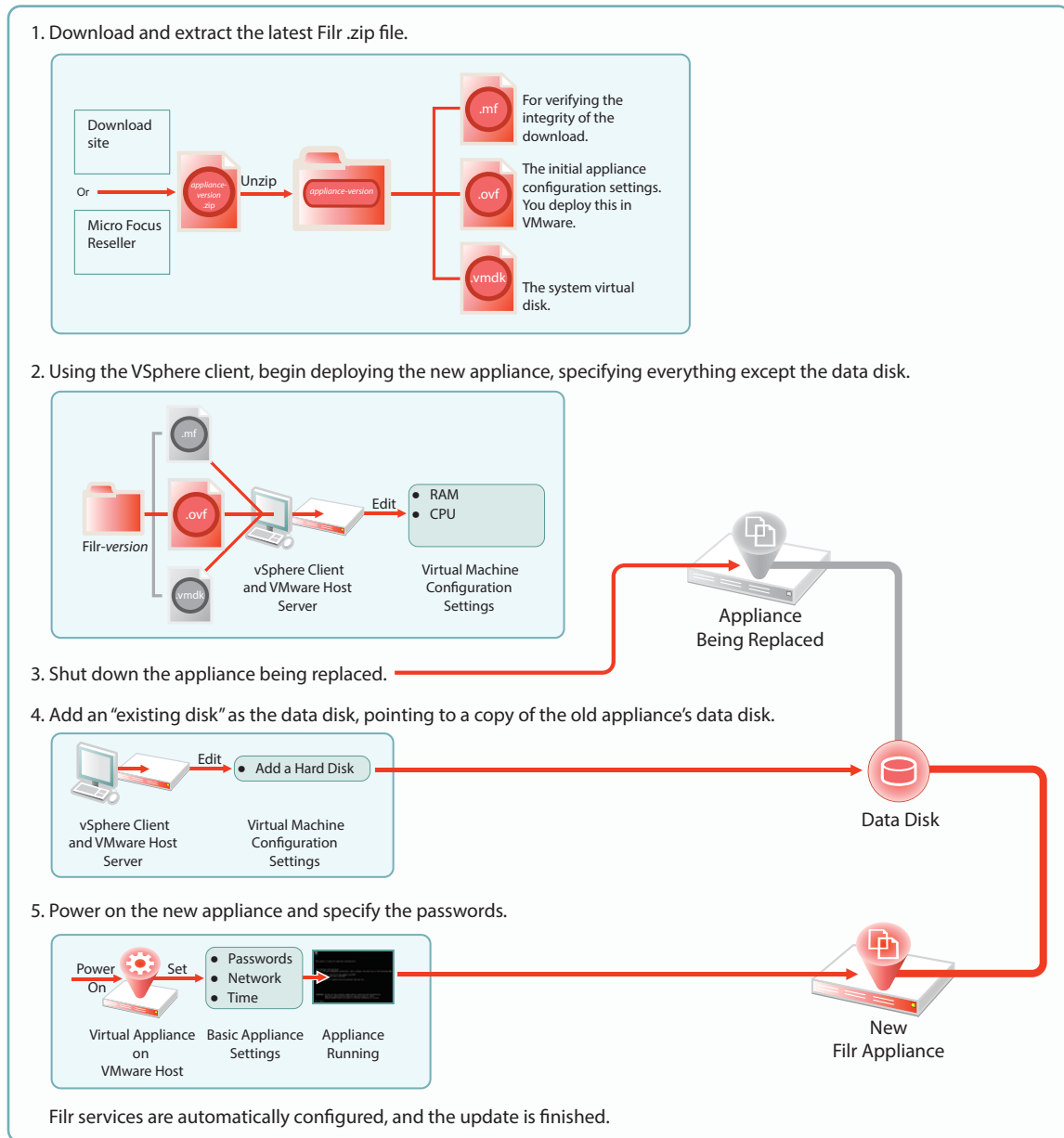
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**IMPORTANT:** While performing an upgrade, be sure to consult the detailed instructions in “Upgrading ESN” in the [ESN 1.0: Installation, Deployment, and Upgrade Guide](#). A successful upgrade depends on following sub-tasks that are not illustrated here, such as the order in which appliances are shut down and then restarted.

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**Figure 3-2** Updating a ESN or Search Appliance

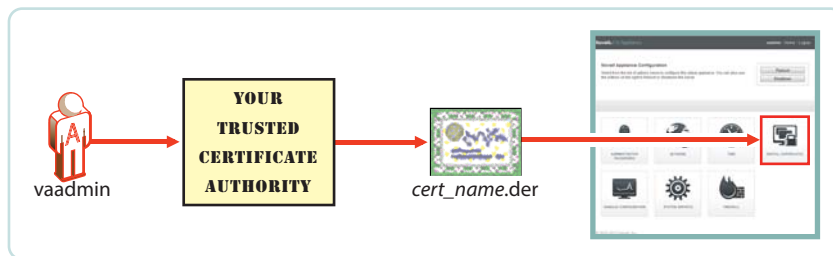


## Certificate Management in ESN

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

You can also set up ESN 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.

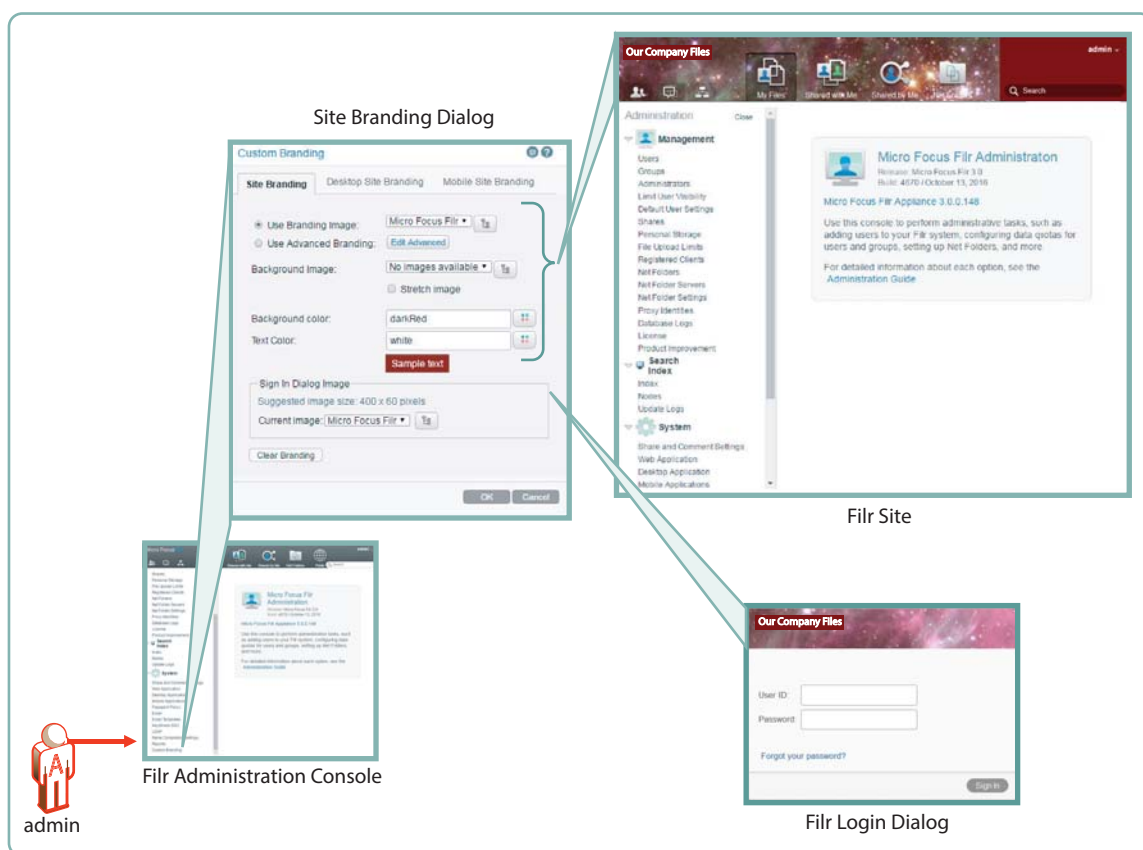
**Figure 3-3** Importing a CA certificate



## ESN Site Branding

You can customize the colors and images displayed on the ESN site and the login dialog box, as illustrated in [Figure 3-4](#). Customizations are retained when ESN is upgraded. For more information, see [“Branding the Web Client”](#) in the *ESN 1.0: Administrative UI Reference*.

**Figure 3-4** Branding ESN



# 4 Access Roles and Rights in ESN

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

- ♦ [“ESN Authentication” on page 39](#)
- ♦ [“Access to Files and Folders Is Controlled by the File System” on page 40](#)
- ♦ [“Access Permissions and ESN” on page 40](#)
- ♦ [“Net Folder Access Involves Four Roles” on page 41](#)
- ♦ [“User Access Inside ESN” on page 47](#)
- ♦ [“File Attributes Are Always Honored” on page 49](#)
- ♦ [“Net Folder Role Requirements Are Rigidly Enforced” on page 50](#)
- ♦ [“ESN Roles and NSS File System Rights Might Not Match” on page 52](#)
- ♦ [“Sharing Rights” on page 53](#)
- ♦ [“Windows Share Rights Don’t Affect ESN” on page 53](#)
- ♦ [“Access-based Enumeration \(Windows\) Doesn’t Affect ESN” on page 53](#)

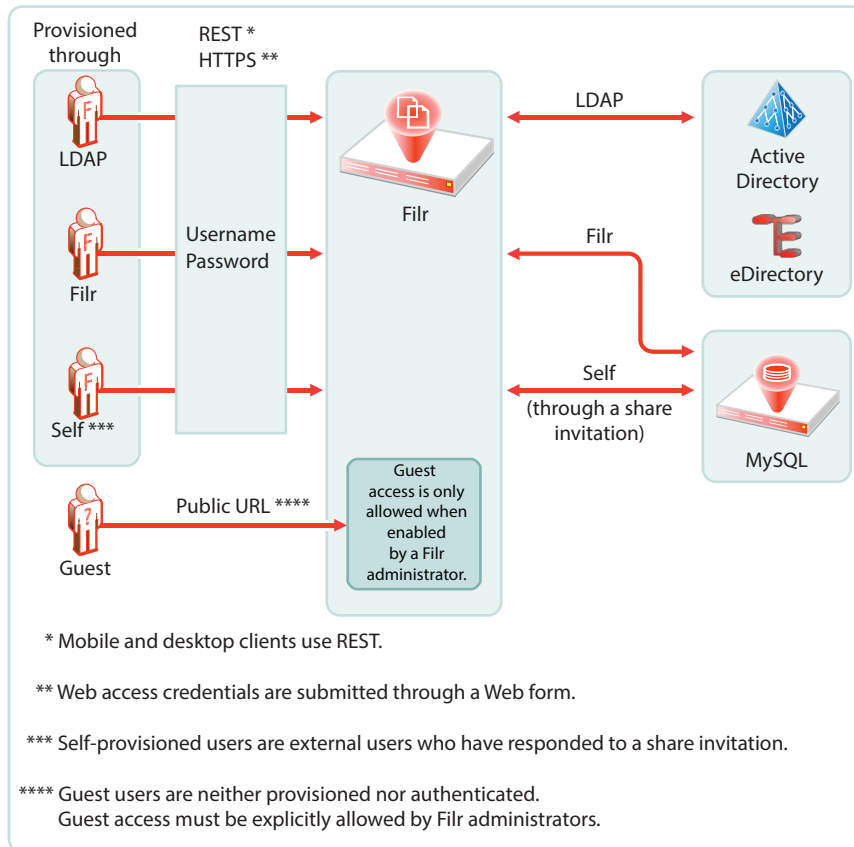
## ESN Authentication

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

Web access is through a Web form that lets ESN take the credentials supplied and validate them as with REST.

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

**Figure 4-1** User Authentication in ESN



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

The NSS file system on OES and NetWare, the NTFS file system on Windows servers, and the SharePoint Document Libraries on SharePoint 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 system or document library to gain access.

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

Sharing through ESN is no exception. Obviously, users must have access to files and folders in order to share them, and they cannot grant a higher shared-access role than they have.

- ♦ [Shared access to files and folders in Net Folders and Home Folders](#) depends on the Net Folder proxy user having the required file system or document library rights.
- ♦ [Shared access to folders and files in Personal Storage](#) is controlled by the ESN system itself because the files and folders are contained in ESN-based storage.

## Access Permissions and ESN

- ♦ [“Access Permissions to Net Folders” on page 41](#)
- ♦ [“Access Permissions to My Files” on page 41](#)

## Access Permissions to Net Folders

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

- ♦ **Directly:** Users are assigned permissions to the files and folders on the file system or SharePoint Document Library where they reside. After they are imported as LDAP users, ESN administrators can then grant them access to the Net Folder. The system then derives a [role](#) based on their file system rights.
- ♦ **Group Membership:** Users can also inherit permissions to the files and folders through membership in a group that has been assigned the required permissions on the file system. After the group is imported through LDAP and granted access to a Net Folder, group members have the same rights as if they were directly assigned.
- ♦ **Shared Access:** Users who receive and accept share invitations to Net-Folder-based files and folders, access the shared items through the Net Folder's assigned proxy user. Each proxy user must have the [required permissions](#) on the file systems that are targeted by the assigned Net Folders.

## Access Permissions to My Files

My Files can contain Home folders and/or personal storage.

Home folder access is controlled by the file system where the folder is located. Personal Storage is located in ESN-based storage and access is directly controlled by ESN.

- ♦ **Direct Ownership:** ESN users have full ownership of their personal files and folders, whether in ESN-based personal storage or in their home folders.
- ♦ **Shared Access:** If sharing is enabled at the system level, then by default, users can share their personal folders and files within system constraints.

The sharing process involves assigning a shared-access role to the folder or file being shared.

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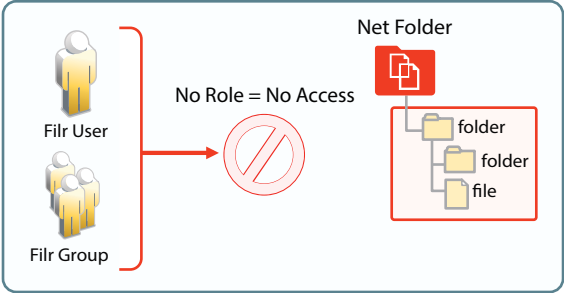
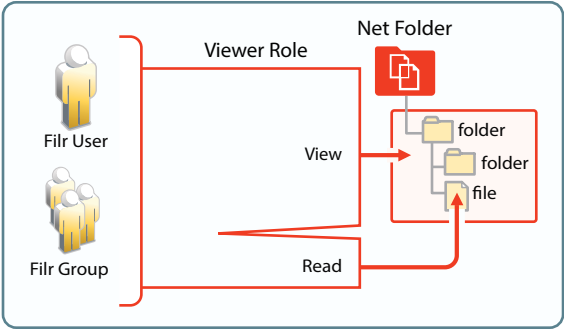
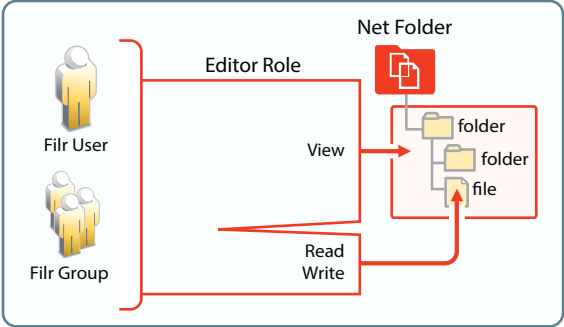
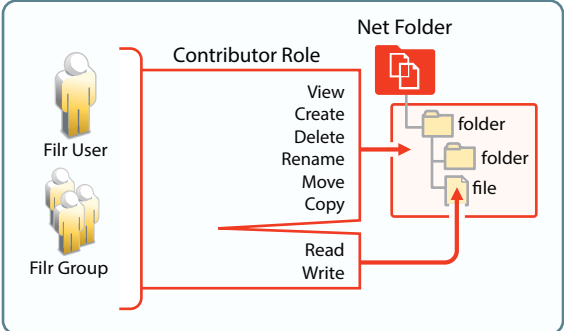
**IMPORTANT:** Before granting access to their personal storage, users should clearly understand each shared-access role, especially the Contributor shared-access role, which allows share recipients to rename or delete the shared folder.

---

## Net Folder Access Involves Four Roles

When users are assigned to a Net Folder, then depending on the rights that users have on the file system or library (see [Access Permissions and ESN](#)), ESN assigns them one of four roles, as outlined in [Table 4-1](#).

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

Role	Rights Through ESN	Rights Illustrated
None	No rights	
Viewer	<ul style="list-style-type: none"> <li>♦ View Net Folder contents</li> <li>♦ Read existing files</li> </ul>	
Editor	<ul style="list-style-type: none"> <li>♦ View Net Folder contents</li> <li>♦ Read and Write to existing files</li> </ul>	
Contributor	<ul style="list-style-type: none"> <li>♦ View, Create, Delete, Rename, Move, and Copy inside the Net Folder</li> <li>♦ Read and Write to existing files</li> </ul>	

The file system and library rights required for each Net folder role are illustrated and explained in the following sections.

- ♦ [“Net Folder Roles are Derived, Not Assigned” on page 43](#)
- ♦ [“Net Folder Role Requirements on NSS File Systems” on page 43](#)

- ♦ “Net Folder Roles on NTFS File Systems” on page 44
- ♦ “Net Folder Roles on SharePoint” on page 45

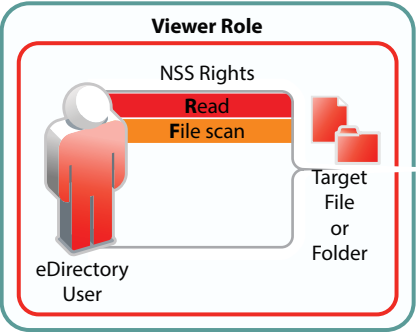
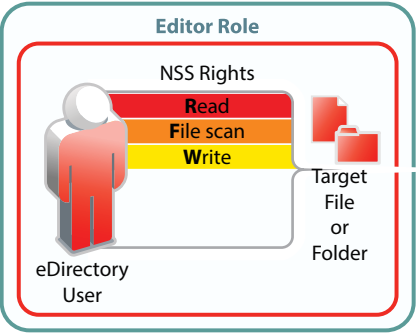
## Net Folder Roles are Derived, Not Assigned

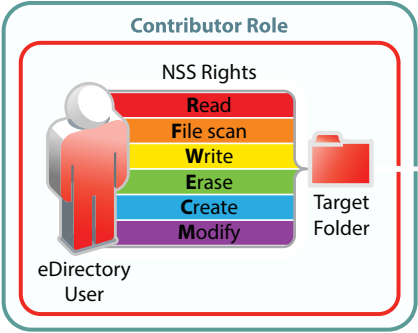
For ESN users to access Net Folders, ESN administrators must simply [grant them access](#). Granting access is the only Net Folder access control mechanism in ESN. Net Folder Roles are not assigned; they are derived from the access rights that users have on the target file systems, as outlined in the sections that follow.

## Net Folder Role Requirements on NSS File Systems

For eDirectory users to function in Net Folder roles, they must have the NSS rights illustrated and explained in [Table 4-2](#). If the minimum requirements for the Net Folder Viewer role are not met, they have no access through ESN as explained in “[Net Folder Role Requirements Are Rigidly Enforced](#)” on page 50.

**Table 4-2** NSS File System Rights Required for Net Folder Roles

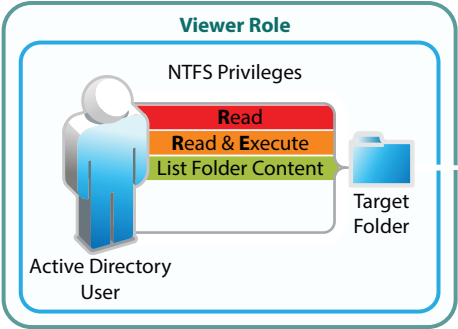
Role and Minimum NSS Rights Required	Comments
<div> <p><b>Viewer Role</b></p>  </div>	<p>To view files through ESN, eDirectory users must have both <code>Read</code> and <code>File Scan</code> file system trustee rights on the target file or folder.</p>
<div> <p><b>Editor Role</b></p>  </div>	<p>To modify file content through ESN, eDirectory users must have the <code>Write</code> file system trustee right in addition to <code>Read</code> and <code>File Scan</code>.</p>

Role and Minimum NSS Rights Required	Comments
 <p>The diagram illustrates the Contributor Role. It features a red stick figure labeled 'eDirectory User' on the left. To its right is a stack of six colored rectangles representing 'NSS Rights': Read (red), File scan (orange), Write (yellow), Erase (green), Create (blue), and Modify (purple). A red folder icon labeled 'Target Folder' is on the right. A red line connects the 'Write' right to the 'Target Folder'.</p>	<p>To perform contributor functions, eDirectory users must either have</p> <ul style="list-style-type: none"> <li>♦ All file system trustee rights to the file or folder (except for Access Control)</li> </ul> <p>Or</p> <ul style="list-style-type: none"> <li>♦ The Supervisor right to the file or folder</li> </ul> <p>The presence or absence of Access Control has no meaning in ESN because ESN cannot modify file system trustee rights. A ESN user with the Access Control right on the file system cannot grant <i>file system</i> access to another user through ESN.</p> <p>It is true that ESN users with sufficient ESN permissions can <i>share</i> access to files and folders with other users, but this is a ESN 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.</p>

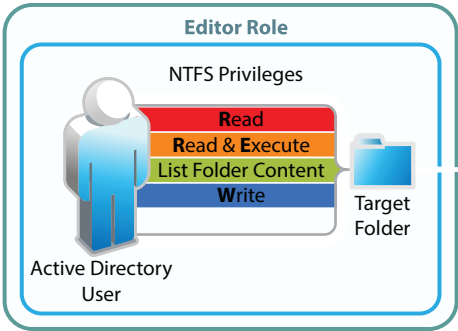
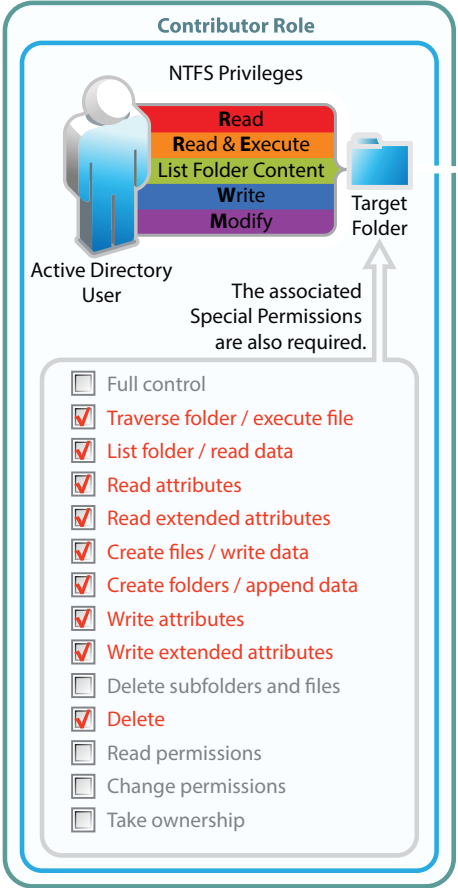
## Net Folder Roles on NTFS File Systems

For Active Directory users to function in Net folder roles, they must have the NTFS file system permissions illustrated and explained in [Table 4-3](#). If the minimum requirements for the Net Folder Viewer role are not met, they have no access through ESN as explained in [“Net Folder Role Requirements Are Rigidly Enforced”](#) on page 50.

**Table 4-3** NTFS Permissions Required for Net Folder Roles

Role and Minimum NTFS Permissions Required	Comments
 <p>The diagram illustrates the Viewer Role. It features a blue stick figure labeled 'Active Directory User' on the left. To its right is a stack of three colored rectangles representing 'NTFS Privileges': Read (red), Read &amp; Execute (orange), and List Folder Content (green). A blue folder icon labeled 'Target Folder' is on the right. A blue line connects the 'List Folder Content' privilege to the 'Target Folder'.</p>	<p>To view files and folders through ESN, Active Directory users must have Read, Read &amp; Execute, and List Folder Content basic permissions on the target folder.</p> <p>The default special permissions associated with these basic permissions are also required.</p>



Role and Minimum NTFS Permissions Required	Comments
<div> <p><b>Editor Role</b></p>  </div>	<p>To modify file content through ESN, Active Directory users must have the basic <code>Write</code> permission in addition to <code>Read</code>, <code>Read &amp; Execute</code>, and <code>List Folder Content</code> basic permissions on the target folder.</p> <p>The default special permissions associated with these basic permissions are also required.</p>
<div> <p><b>Contributor Role</b></p>  </div>	<p>To perform contributor functions, users must either have</p> <ul style="list-style-type: none"> <li>♦ The basic <code>Full Control</code> permission</li> </ul> <p>Or</p> <ul style="list-style-type: none"> <li>♦ The basic <code>Modify</code> permission included with the privileges required for the Editor role (<code>Write</code>, <code>Read</code>, <code>Read &amp; Execute</code>, and <code>List Folder Content</code>)</li> </ul> <p><b>IMPORTANT:</b> The default special permissions associated with these basic permissions are also required as illustrated.</p>

## Net Folder Roles on SharePoint

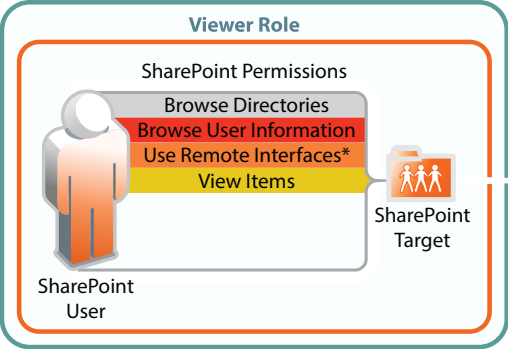
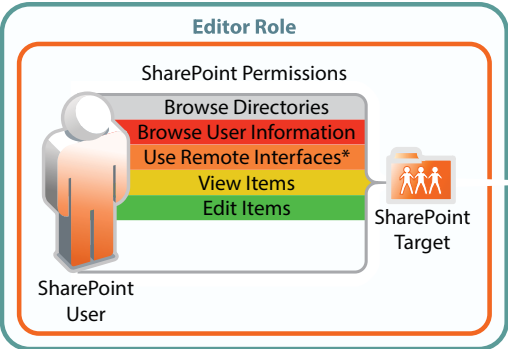
For SharePoint users to function in Net folder roles, they must have the SharePoint permissions illustrated and explained in [Table 4-4](#). If the minimum requirements for the Net Folder Viewer role are not met, they have no access through ESN as explained in [“Net Folder Role Requirements Are Rigidly Enforced” on page 50](#).

**IMPORTANT:** It is a common practice for SharePoint administrators to create customized permission lists that do not include the `Use Remote Interfaces` permission.

ESN uses a REST interface to communicate with the SharePoint system. Therefore, you must ensure that the `Use Remote Interfaces` permission is enabled for all SharePoint users and groups that access ESN. Otherwise, those using desktop clients and mobile devices will not be able to access SharePoint using ESN.

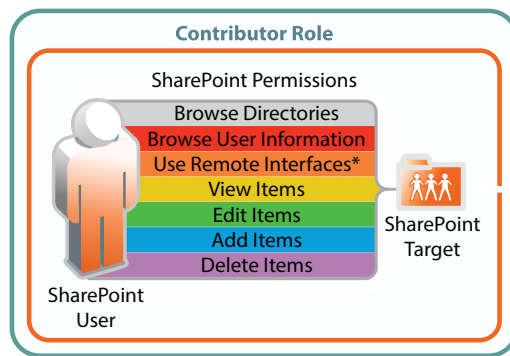
The `Use Remote Interfaces` permission is marked with an asterisk (\*) in [Table 4-4](#) below to emphasize this point.

**Table 4-4** SharePoint Permissions Required for Net Folder Roles

Role and Minimum SharePoint Permissions Required	Comments
<b>IMPORTANT:</b> SharePoint users' Net Folder roles are derived not only from their rights to the SharePoint folder but also from rights that are "shared" with them within SharePoint.	
For example, User B has access to Net Folder-1 and based on its SharePoint rights, can view File-X.	
Working in Sharepoint, User A shares File-X with User B and grants "Can Edit" privileges.	
User B now has sufficient ESN rights to rename File-X.	
<div><p><b>Viewer Role</b></p><p>The diagram shows a 'SharePoint User' icon on the left. A box labeled 'SharePoint Permissions' contains a list of permissions: 'Browse Directories' (grey), 'Browse User Information' (red), 'Use Remote Interfaces*' (red), 'View Items' (yellow), and 'Edit Items' (green). A 'SharePoint Target' icon is on the right. The 'Viewer Role' title is at the top.</p></div>	To view files and folders in SharePoint document libraries, SharePoint users must have the <code>Browse Directories</code> , <code>Browse User Information</code> , <code>Use Remote Interfaces*</code> , and <code>View Items</code> permissions in the document libraries.
<div><p><b>Editor Role</b></p><p>The diagram shows a 'SharePoint User' icon on the left. A box labeled 'SharePoint Permissions' contains a list of permissions: 'Browse Directories' (grey), 'Browse User Information' (red), 'Use Remote Interfaces*' (red), 'View Items' (yellow), and 'Edit Items' (green). A 'SharePoint Target' icon is on the right. The 'Editor Role' title is at the top.</p></div>	To modify file content, SharePoint users must have the <code>Edit</code> permission in addition to the permissions required for the Viewer role.

## Role and Minimum SharePoint Permissions Required

## Comments



To perform contributor functions, users must have the **Add Items** and **Delete Items** permissions in addition to all of the permissions required for the **Viewer** and **Editor** roles.

## User Access Inside ESN

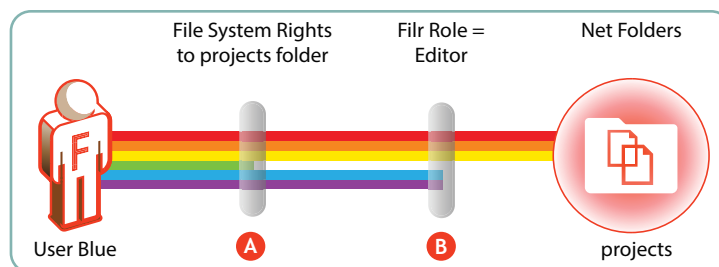
The ESN User Interface lets users access files in different categories. The My Files category can contain files from two different locations: [Home folders](#) or [Personal Storage](#).

- ♦ “Net Folders” on page 47
- ♦ “My Files (Home Folders)” on page 48
- ♦ “My Files (Personal Storage)” on page 48
- ♦ “Shared with Me” on page 49

## Net Folders

Users who are granted access to a Net Folder are not restricted by ESN. The file system of the target folder retains complete access control. The level of rights that users have through ESN depends on the system-derived role they have, as explained in, “[Net Folder Access Involves Four Roles](#) (page 41).” Roles are automatically derived from users’ permissions on [NSS](#) and [NTFS](#) file systems, and on [SharePoint](#) document libraries.

**Figure 4-2** Users’ effective rights to Net Folders are controlled by the file system or library where the Net Folder resides and the Net Folder role that these rights qualify them for

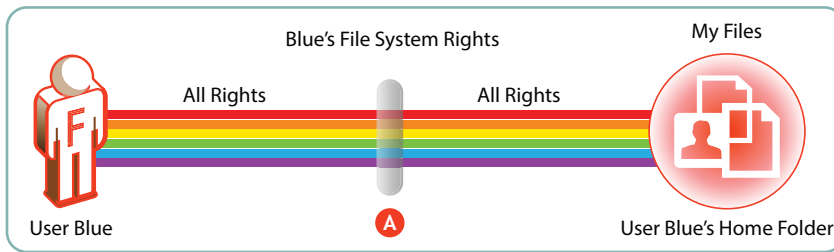


Letter	Details
A	User Blue is granted all rights to the NSS-based <code>projects</code> folder, except the <code>Erase</code> right (green bar).
B	<p>Because User Blue doesn't have the <code>Erase</code> right, ESN assigns the Editor role.</p> <p>This means that even though Blue has <code>Create</code>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

For more information, see [“Granting Access to Net Folders” on page 81](#).

## My Files (Home Folders)

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



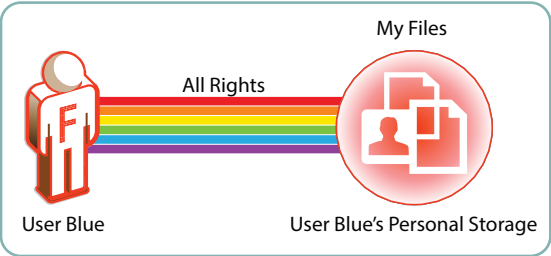
Letter	Details
A	<p>Although it is certainly possible that an administrator might choose to limit the file system rights to a home folder, that would seem to defeat the whole purpose behind providing home directories in the first place.</p> <p>Of course, rights restrictions are completely separate from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

## My Files (Personal Storage)

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

To be available to users, personal storage must be administratively enabled because it is turned off by default.

Figure 4-3 ESN 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 67.

## Shared with Me

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

Users sending invitations can only assign shared-access roles up to the level that they have on the file or on the folder and all of its subfolders.

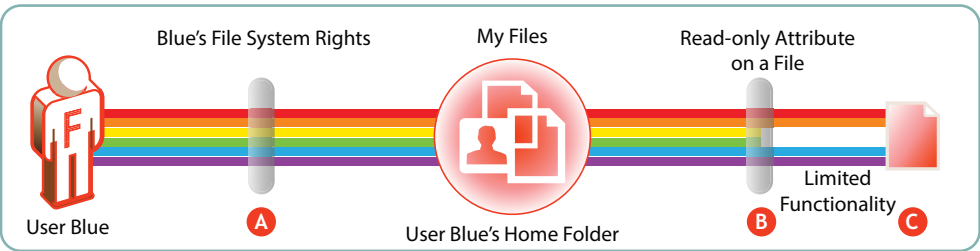
Users receiving and accepting share invitations might or might not have direct rights on the file system or in SharePoint, but that is irrelevant when accessing a file or folder through a share. Individual user rights do not apply to shared items. Shared items in Net Folders (including Home Folders) are accessed on behalf of users by the Net Folder proxy user; shared items in personal storage are accessed through the ESN system itself.

**NOTE:** Shared files that live in SharePoint are not accessed through Shared with Me, but rather in Net Folders. However, the same principles apply as explained in this section.

For example, if a user already has Viewer access to a file in a SharePoint Net Folder and someone shares the file with the user and grants Editor shared-access role, the user then has Editor access for that file within the Net Folder.

## File Attributes Are Always Honored

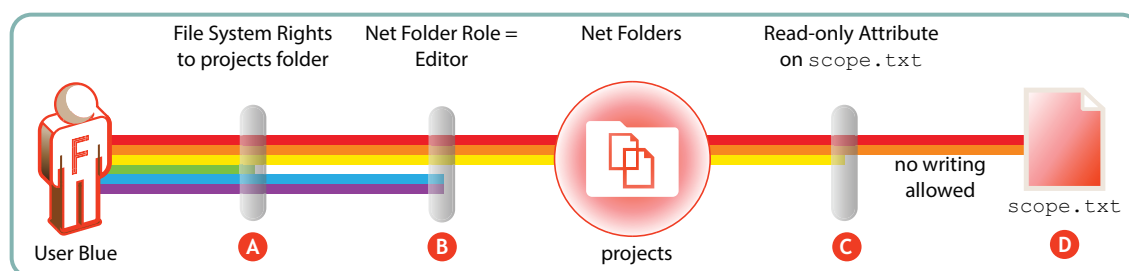
Figure 4-4 File attributes affect functionality in home folders



Letter	Details
A	User Blue is granted all rights to an NSS-based home folder.

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

**Figure 4-5** File attributes also affect functionality in Net Folders



Letter	Details
A	As shown in <a href="#">Figure 4-2 on page 47</a> , Blue doesn't have <code>Erase</code> rights on the <code>projects</code> folder.
B	Therefore, Blue only qualifies for the ESN Editor role.
C	The project leader maintains strict control of the <code>scope.txt</code> file by using the <code>Read-only</code> 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.

## Net Folder Role Requirements Are Rigidly Enforced

On NSS, NTFS, and SharePoint, it is possible to define customized permissions. For example, you can create a directory in which users can create files even though they have no permission to view them afterward.

Customized permissions do not apply to ESN.

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

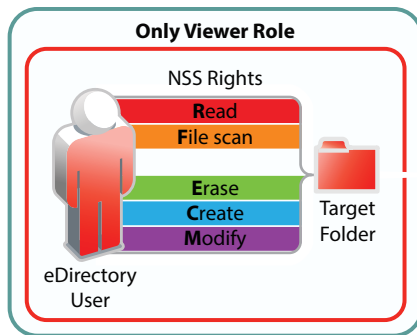
If any permissions are missing for a given role, ESN defaults to a more restrictive role. Additionally, if each and every permission required for the Viewer role is not present, then ESN grants no role to the user, as illustrated in the following sections.

- ♦ [“NSS Example” on page 51](#)
- ♦ [“NTFS Example” on page 51](#)
- ♦ [“SharePoint Example” on page 51](#)

## NSS Example

Figure 4-6 shows that if the NSS `write` right is missing, the user can only function as a viewer, even though all of the other Contributor-level rights are present.

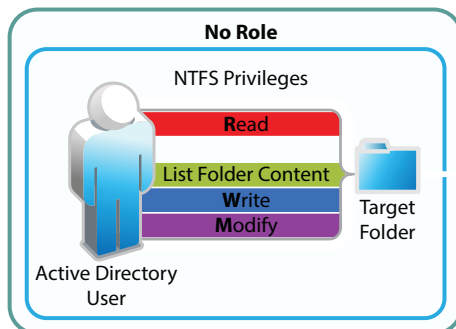
**Figure 4-6** Missing Write right limits to only Viewer role



## NTFS Example

Figure 4-7 shows that for NTFS, if the `Read & Execute` privilege is missing, the user has no Net folder role, even though all of the other permissions are present.

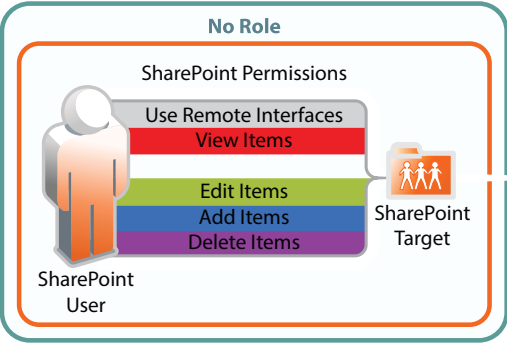
**Figure 4-7** Missing Read & Execute privilege prevents access through ESN



## SharePoint Example

Figure 4-8 shows that, for SharePoint, if the `Browse User Information` privilege is missing, the user has no Net folder role, even though all of the other permissions are present.

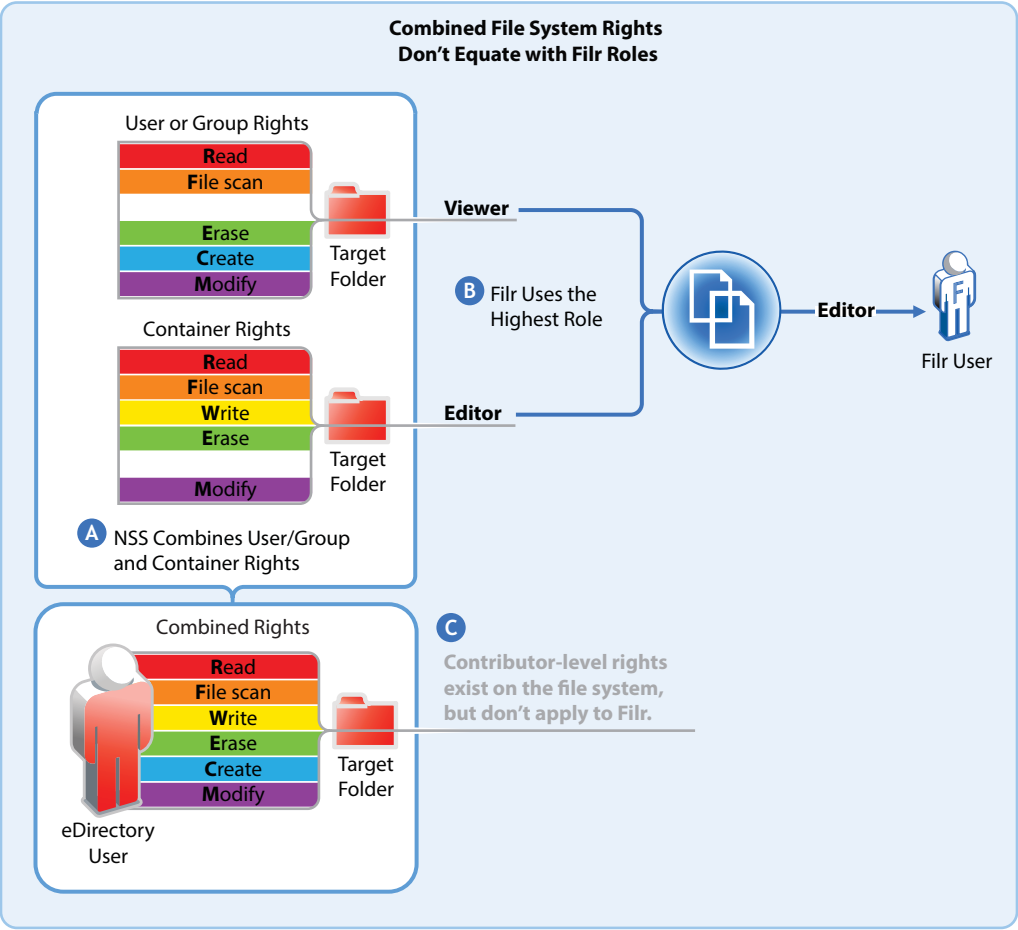
Figure 4-8 Missing Browse User Information permission prevents access through ESN



# ESN Roles and NSS File System Rights Might Not Match

Figure 4-9 illustrates that NSS file system rights are calculated differently than ESN roles on NSS-based Net Folders.

Figure 4-9 Roles and Rights Might Not Match





Letter	Details
A	<ul style="list-style-type: none"> <li>♦ NSS combines User/Group rights and Container rights to derive File System rights.</li> </ul>
B	<ul style="list-style-type: none"> <li>♦ ESN uses the highest role derived from either <ul style="list-style-type: none"> <li>♦ The assigned User/Group rights</li> <li>or</li> <li>♦ The assigned Container rights</li> </ul> </li> </ul>
C	<ul style="list-style-type: none"> <li>♦ ESN doesn't consider the combined NSS file system rights when deriving Net Folder roles</li> </ul> <p>In this case, the Contributor role would be available to the ESN user only if the Write right were added as a User or Group file system rights, or the Create right were added as a Container file system right.</p>

## Sharing Rights

In contrast to file and folder rights, which are controlled by the file system, ESN 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 ESN,” on page 85](#).

## Windows Share Rights Don't Affect ESN

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

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

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

## Access-based Enumeration (Windows) Doesn't Affect ESN

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

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.

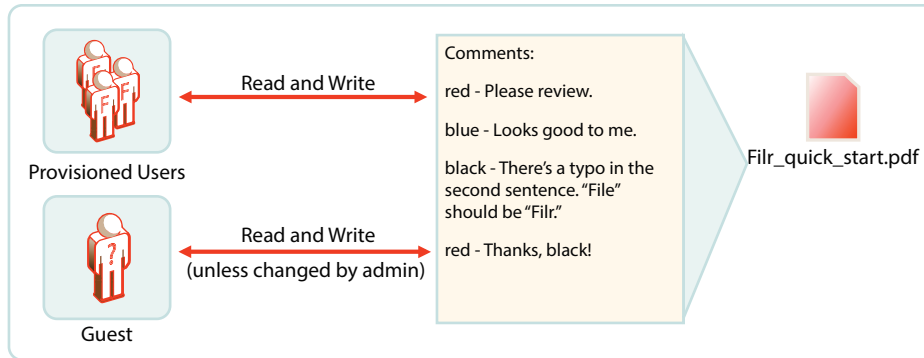
The administrator might then expect that users would also be able to see the files through ESN. That is not the case. Disabling Access-based Enumeration has no effect on ESN. Only those users who have all of the NTFS permissions required for the Viewer role (Read, Read & Execute, and List Folder Content)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



# 5 ESN Comments

Comments are linked to the files that are commented on. All users, including Guest, have Read and Write access to comments on the files and folders that they are allowed to see. If there is a risk of Guest users logging inappropriate comments, rights can be changed to Read Only, as indicated in [Figure 5-1](#).

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



For more information about ESN comments, see ["Comments and Security"](#) in the *ESN 1.0: Administrative UI Reference*.

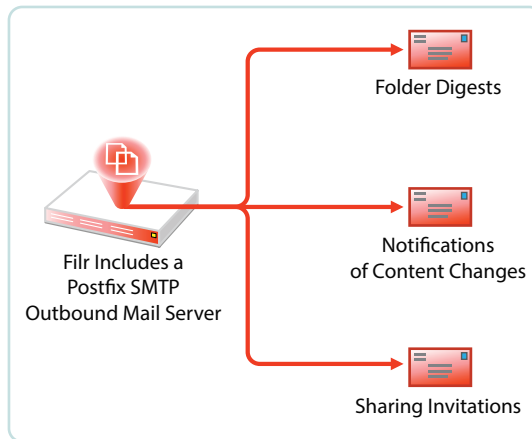


# 6 ESN Email Notifications

## ESN's Postfix Mail Server

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

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



Although the default mail server should work well for most ESN installations, you can configure ESN to use your outbound SMTP mail server. For more information, see “[Configuring an Email Service for ESN to Use](#)” in the *ESN 1.0: Administrative UI Reference*.

Beginning with ESN 2.0, you can also customize parts of the email notifications that are generated by ESN. For more information, see “[Email Notification Template Customization](#)” in the *ESN 1.0: Administrative UI Reference*.

## What ESN's Notification Services Provide

- ♦ **ESN-generated Notifications:** ESN can notify users through email when items are shared with them and when changes occur on the ESN system to files and folders that they are interested in.
  - ♦ **Sharing Invitations:** ESN users can have ESN notify other users when they share a folder or file with them, as described in “[Sharing Files and Folders](#)” in the *ESN 1.0: User Access Guide*.

---

**NOTE:** To receive notifications, users must have a valid email address in their ESN accounts.

ESN doesn't verify that valid email addresses exist in target user accounts as a prerequisite for their being included in a notification list.

- 
- ♦ **Content Change Digests:** ESN users can subscribe to email notifications, so that they automatically receive a message whenever content of interest changes. For more information, see “[Subscribing to a Folder or File](#)” in “[Getting Informed](#)” in the *ESN 1.0: User Access Guide*.

ESN users can subscribe others to receive notifications by configuring their folders to send email notifications to folder contributors. For more information, see [“Configuring Folders to Send Email Notifications to Other Users”](#) in the *ESN 1.0: User Access Guide*.

---

**NOTE:** To receive notifications, users must have a valid email address in their ESN accounts.

ESN doesn't verify that valid email addresses exist in target user accounts as a prerequisite for their being included in a notification list.

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- ♦ **Emailing Folder Contributors:** ESN users can send email messages to folder contributors, as described in [“Sending an Email to Folder Contributors”](#) in the *ESN 1.0: User Access Guide*.

# 7 ESN Search Appliance—Accessibility, and Searchability

The ESN Search (Lucene) appliance performs critical functions within ESN deployments as described in the following sections.

- ♦ [““Indexing” Refers to Two Linked but Separate Processes” on page 59](#)
- ♦ [“Object Accessibility Requires Search Appliances” on page 59](#)
- ♦ [“What Is Indexed and When” on page 60](#)
- ♦ [“Net Folder File Content Indexing Overview” on page 62](#)
- ♦ [“About File-Content Searchability” on page 62](#)

## “Indexing” Refers to Two Linked but Separate Processes

The term “Indexing” as used in ESN can become a bit confusing. There are two types of indexing that are handled by the ESN Search appliance:

- ♦ **Metadata Indexing:** For files, folder, users, and groups to be visible and accessible in ESN, their associated metadata must be transferred to the ESN system and processed or indexed. The process of making objects visible in ESN is described in [“How ESN Makes Files and Folders Visible to Users” on page 103](#) and [“How ESN Makes LDAP Users and Groups Visible” on page 118](#).
- ♦ **Content Indexing:** Only after file metadata has been indexed can ESN begin processing the words in files for searchability. For details about this process, see [“About File-Content Searchability” on page 62](#) and [“Net Folder File Content Indexing Overview” on page 62](#).

## Object Accessibility Requires Search Appliances

- ♦ [“Only Objects That Have Their Metadata Indexed Are Accessible” on page 59](#)
- ♦ [“Both Metadata Indexing and Content Indexing Require Planning” on page 60](#)
- ♦ [“Having Two Search Servers Is Critical” on page 60](#)

## Only Objects That Have Their Metadata Indexed Are Accessible

Administrators and users can only access a file, folder, user, or group in ESN after

1. The Search server has processed/indexed the associated metadata for the file, folder, user, or group that has been synchronized to the SQL database.
2. The resulting metadata index is stored in the SQL database.

As objects have their metadata synchronized and indexed by ESN Search, they become accessible. If the metadata index is unavailable because the ESN Search appliance is down, objects disappear from ESN.

## Both Metadata Indexing and Content Indexing Require Planning

For new ESN deployments, the initial processing/indexing of file and folder metadata can take anywhere from a few seconds to a few hours, depending on the number of files and folders involved.

Content indexing for searchability can take much longer. See [“Net Folder File Content Indexing Overview” on page 62](#).

After the initial synchronization and indexing of file and folder metadata and content is complete, ESN handles metadata and content changes quickly and automatically.

---

**NOTE:** User and group metadata processing happens as the objects are created and doesn't require separate planning.

---

## Having Two Search Servers Is Critical

Because ESN requires an accessible metadata index, if the only available search server goes down or if its index is lost (for example during an metadata index rebuild), access to files and folders, etc. is also lost (at least temporarily). For this reason, Micro Focus strongly recommends that every large deployment have two search servers. (See [“Setting Up Two ESN Search Appliances”](#) in the *ESN 1.0: Installation, Deployment, and Upgrade Guide*.)

## What Is Indexed and When

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

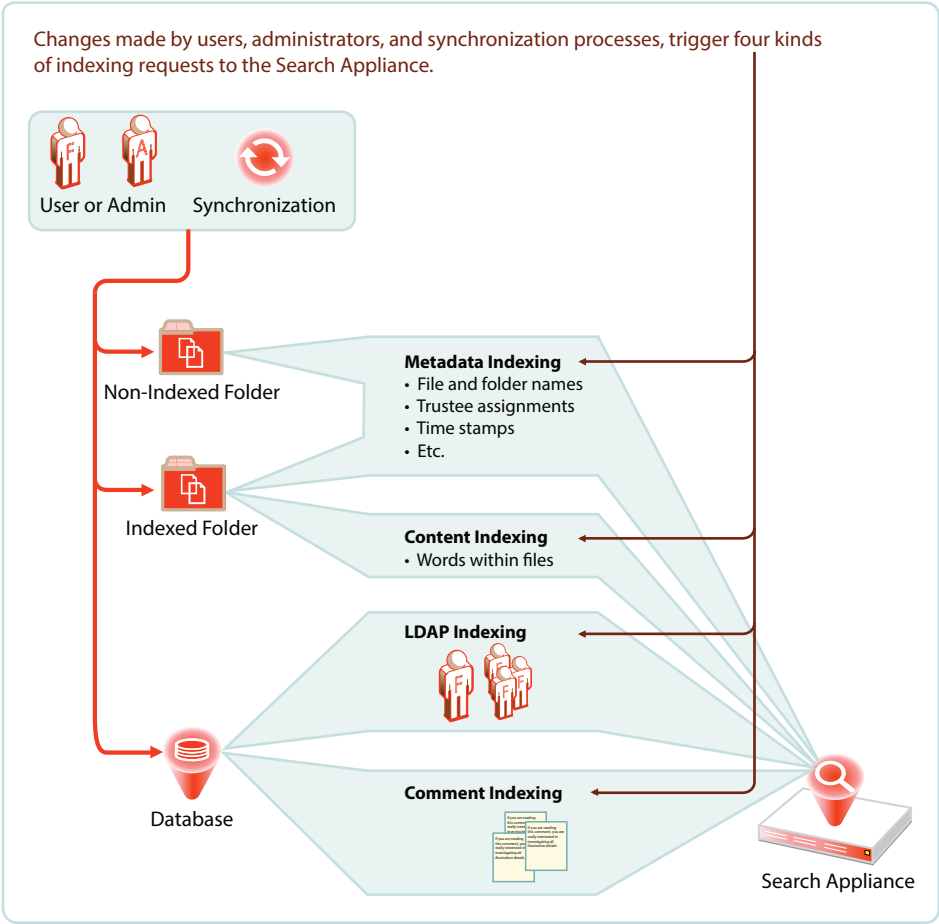
- ♦ Modifications made by a user or administrator
- ♦ Synchronization of files and folders

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

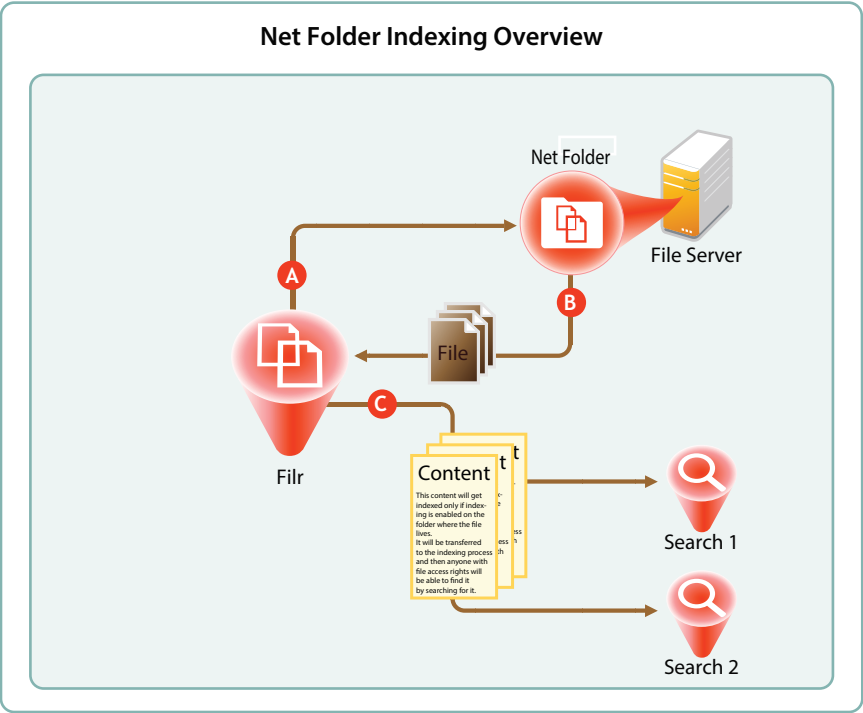


Figure 7-1 When Indexing Occurs



# Net Folder File Content Indexing Overview

Figure 7-2 File Content Indexing



Letter	Details
A	For content indexing, ESN first requests copies of all of the files contained in the Net Folder.
B	After a file is copied to the ESN appliance, up to the first 1.1 MB of file content is extracted by Stellent, the technology that provides HTML rendering of file content in ESN.
C	<p>ESN then sends the extracted content to each Search appliance for content indexing.</p> <p><b>IMPORTANT:</b> Content indexing is powerful and useful functionality. It is also very CPU- and IO-intensive because each file is processed separately.</p> <p>It is therefore important to carefully consider which Net Folders contain files that organization members must be able to search for specific content.</p>

## About File-Content Searchability

- ♦ [“FAQs” on page 63](#)
- ♦ [“Content Indexing Is Resource-Intensive” on page 63](#)
- ♦ [“More Information” on page 63](#)

## FAQs

- ♦ **When Does Content Indexing Begin?** After all file and folder metadata has been indexed for accessibility.
- ♦ **Is My Files Content Searchable?** Files in Personal Storage are always searchable. This cannot be disabled. Files in home folders and personal storage are not indexed for searchability by default, but this can be changed either at the Home Net Folder Server level or for individual users.
- ♦ **What About Net Folders?** Net Folders must be enabled for indexing as described in [“Creating and Managing Net Folder Servers”](#) and [“Creating and Modifying Net Folders”](#) in the *ESN 1.0: Administrative UI Reference*.

## Content Indexing Is Resource-Intensive

Although content indexing is performed as a background process, it is resource-intensive.

Depending on the number of files, initial content indexing can take hours or even days.

It is vital to carefully define your organization’s content-indexing scope by carefully identifying exactly which files your organization requires to be content-searchable.

## More Information

For an overview of when indexing occurs in conjunction with Net Folder synchronization, see [“Net Folder Synchronization Detail Overview”](#) on page 99.

ESN indexing is also discussed in [“Managing the Lucene Index”](#) in the *ESN 1.0: Administrative UI Reference*.



# 8 ESN Licensing

ESN comes with a 60-day evaluation license pre-installed. You must install a full license in order for ESN to continue functioning beyond the 60-day evaluation period.

For instructions on viewing and installing ESN licenses, see “[Installing/Updating the ESN License](#)” in the [ESN 1.0: Administrative UI Reference](#).



# 9 My Files (Personal Storage)

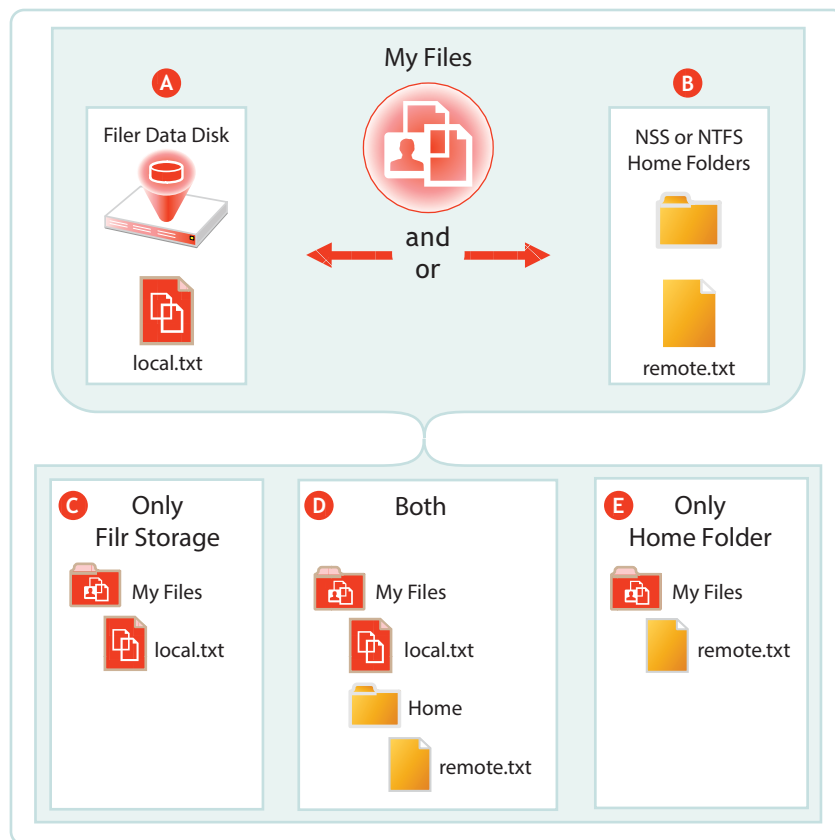
Many organizations let their network users store personal files on organization file servers. ESN supports this practice through My Files, which can include access to personal storage on ESN as well as to traditional home directories.

- ♦ “Understanding My Files” on page 67
- ♦ “Enabling Personal Storage” on page 68
- ♦ “Restricting Disk Space Usage” on page 70
- ♦ “Home Folders Vs. Net Folders” on page 70
- ♦ “My Files Sharing Rights” on page 70

## Understanding My Files

**My Files** is an optional personal storage area that you can make available to your ESN 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
<b>A</b>	If you enable personal storage for users as outlined in <a href="#">Figure 9-2 on page 69</a> , then ESN automatically creates a personal storage directory on its data disk.
<b>B</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, ESN creates special Net Folders that link to their home directories.
<b>C</b>	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 ESN data store in their <b>My Files</b> .
<b>D</b>	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 ESN data store and a folder named <b>Home</b> under <b>My Files</b> . The <b>Home</b> folder provides a distinction between files and folders in the ESN data store and those in Home directories on the file server.
<b>E</b>	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 <b>My Files</b> .
<b>NOTE:</b> Of course, if you don't enable personal storage, and users don't have home directories, then their <b>My Files</b> is empty and not usable.	

## Enabling Personal Storage

Personal storage can be enabled for all users on the ESN system or on individual users and/or groups level, as fits your organization's needs.

- ♦ ["Personal Storage for All LDAP Users" on page 68](#)
- ♦ ["Personal Storage for Individual Users and/or Groups" on page 69](#)

### Personal Storage for All LDAP Users

If personal storage is enabled, then space is allocated to users for personal storage. [Figure 9-2](#) illustrates how to enable personal storage for all of the LDAP users on the ESN site.

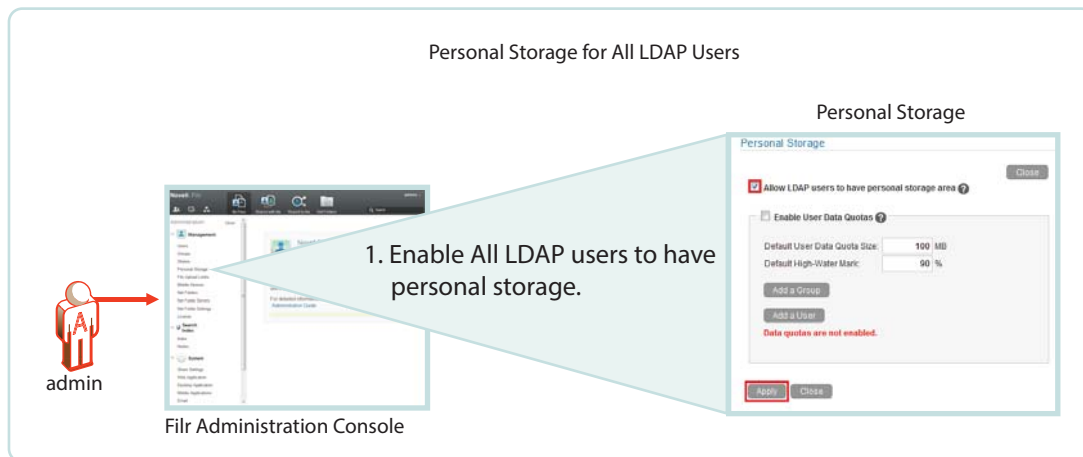
After enabling personal storage for everyone, you can then use the **Users > More** and/or **Groups > More** menu to disable or modify personal storage settings for individual users and/or groups.

Alternatively, you can choose to not use this dialog at all, but rather enable personal storage for only specific users or groups by using the **Users > More** and/or **Groups > More** menu.

For an overview of personal storage disk space quotas, see ["Restricting Disk Space Usage" on page 70](#).



**Figure 9-2** Enabling Personal Storage for All Users

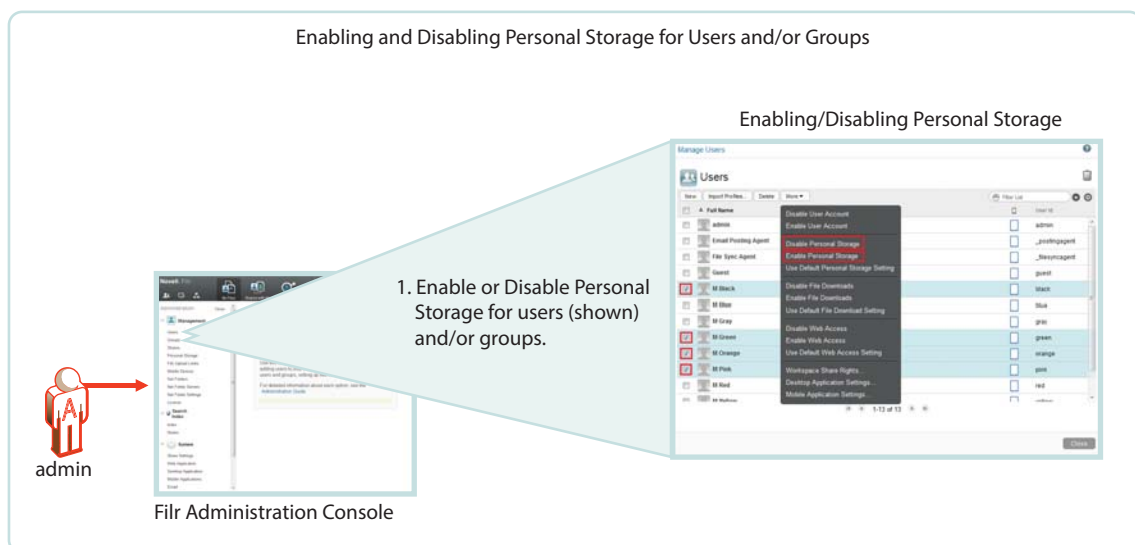


## Personal Storage for Individual Users and/or Groups

ESN 1.2 and later lets you directly enable personal storage for individual users and/or groups as illustrated in [Figure 9-3](#).

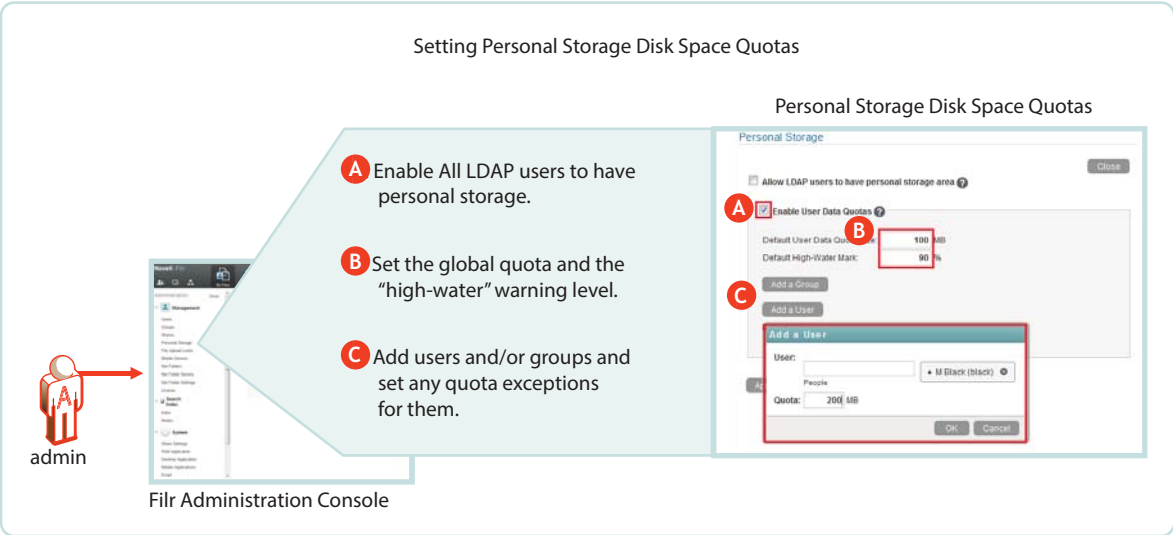
For an overview of personal storage disk space quotas, see [“Restricting Disk Space Usage” on page 70](#).

**Figure 9-3** Setting Default and Individual Storage Quotas



# Restricting Disk Space Usage

Figure 9-4 Enabling Personal Storage for All Users



## Home Folders Vs. 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.

	Home Folders	Net Folders
File-server-based	Yes	Yes
Focus	Individual users	Groups or teams of users
Appear under Net Folders icon	No	Yes
Appear under My Files icon	Yes	No
Indexing	<ul style="list-style-type: none"><li>♦ Accessibility - Yes</li><li>♦ Searchability - Yes</li></ul>	<ul style="list-style-type: none"><li>♦ Accessibility - Yes</li><li>♦ Searchability - Optional</li></ul> <p>Must be manually enabled.</p>
Sharing granularity	Files and sub-folders	Files only

## My Files Sharing Rights

See [“My Files Sharing Is Automatic” on page 87](#).

# 10 Net Folders

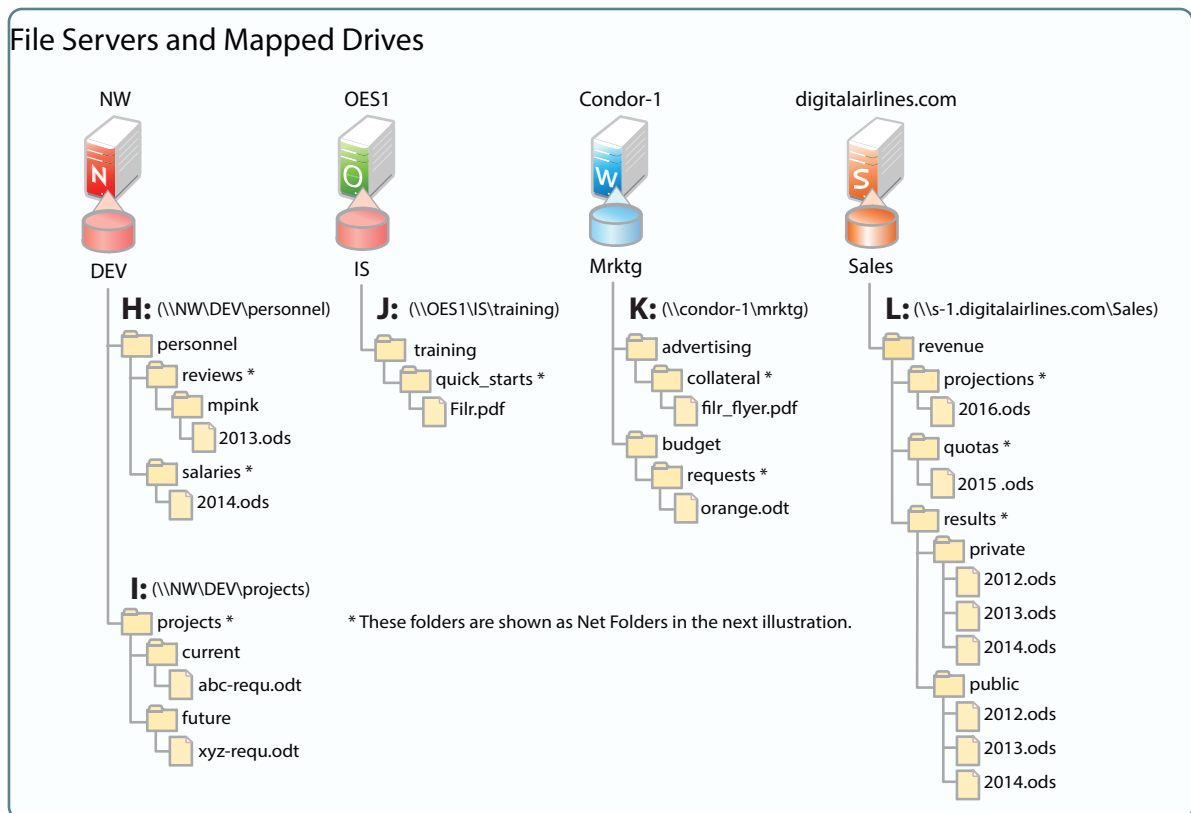
ESN introduces a new way of accessing file server data—Net Folders—a new file access method that shares some similarities with Micro Focus long-standing concept of mapped network drives.

- ♦ “Overview” on page 71
- ♦ “Specifying Net Folder Servers” on page 73
- ♦ “Specifying Net Folders” on page 75
- ♦ “Net Folder Proxy Users” on page 77
- ♦ “Granting Access to Net Folders” on page 81

## 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*

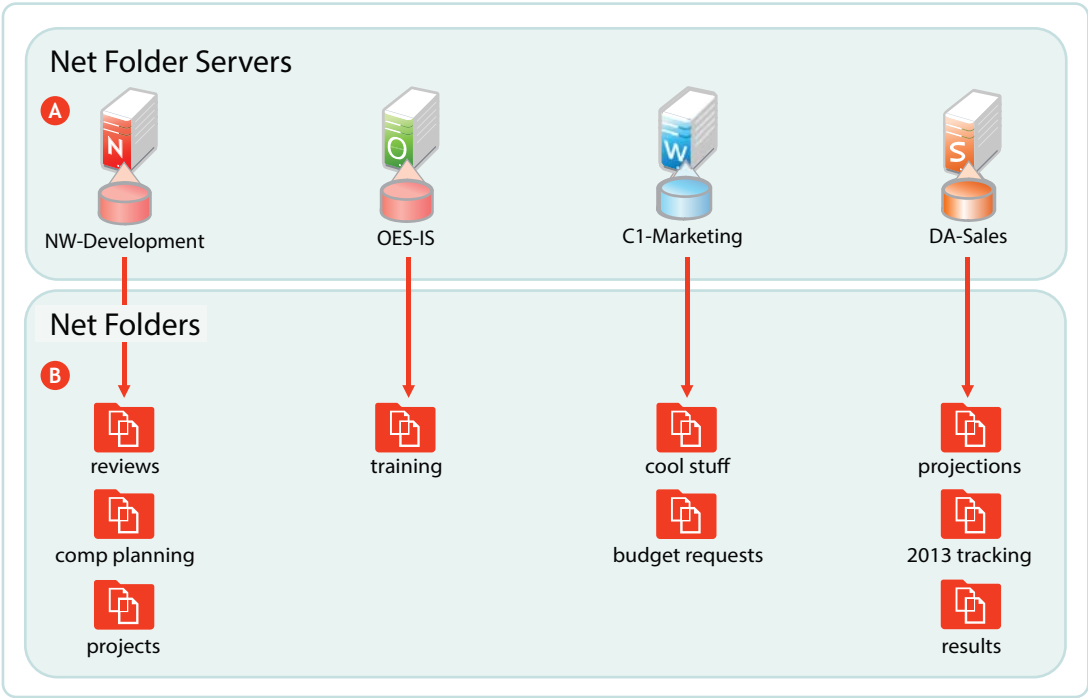


[Figure 10-2](#) shows the same servers as in [Figure 10-1](#), with their volumes defined as Net Folder Servers. Notice that the Net Folder Server names do not need to match the volume names, which can sometimes be rather cryptic.

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



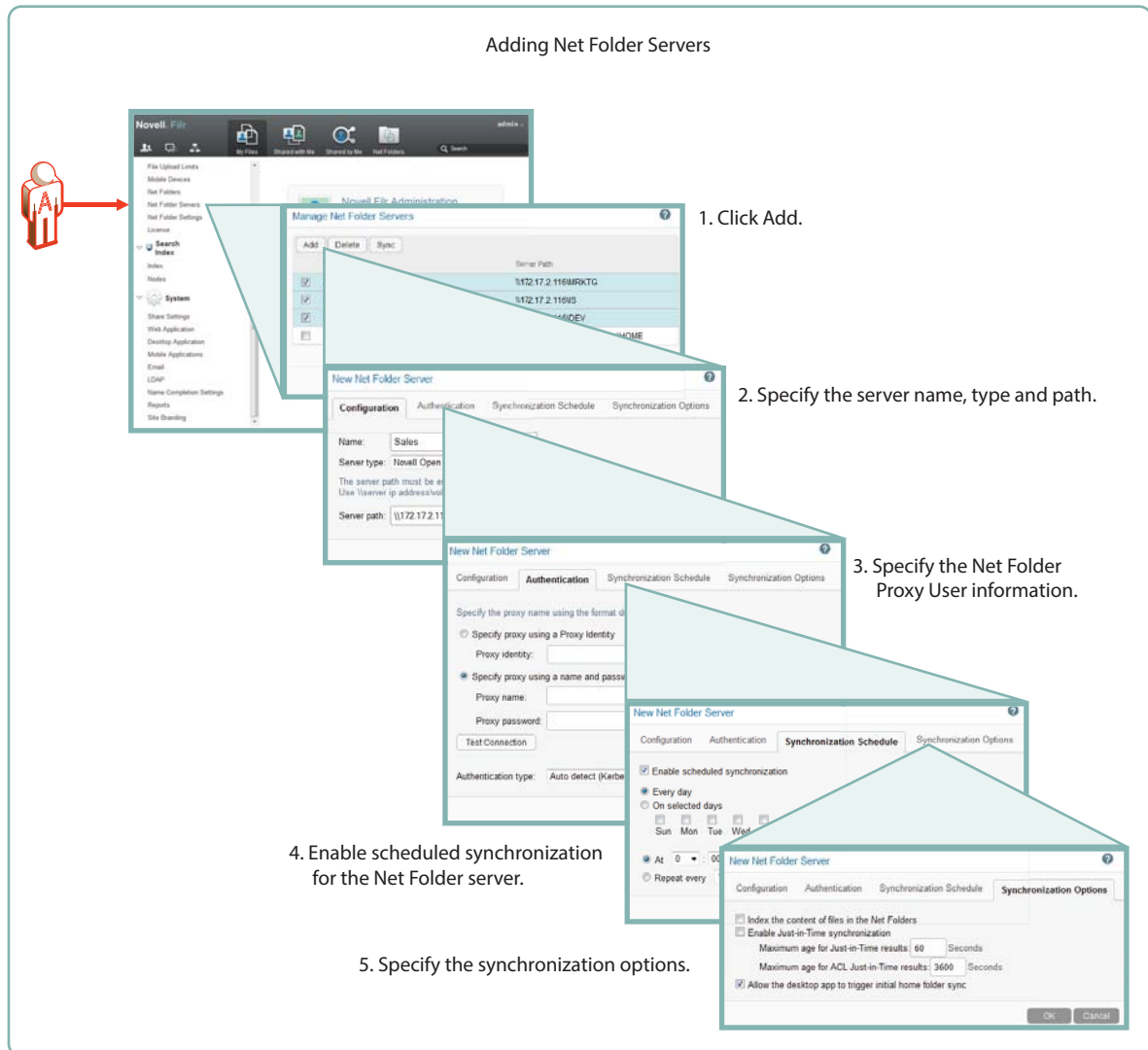
Letter	Information
<b>A</b>	<p>A Net Folder Server represents a volume or share on a NetWare, OES, Windows or SharePoint file server.</p> <p>In this example, the Net Folder Server for OES points to the root of an NSS volume on the server, but they can also point to a directory or sub-directory.</p> <p>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.</p> <p>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.</p>

Letter	Information
B	<p data-bbox="870 222 1393 275">A Net Folder is a pointer or reference to a specific folder within a Net Folder Server.</p> <p data-bbox="870 300 1438 443">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.</p> <p data-bbox="870 468 1357 520">Why might you want to duplicate Net Folders? Possibilities include the following:</p> <ul data-bbox="898 546 1438 705" style="list-style-type: none"> <li>♦ Different synchronization schedule requirements</li> <li>♦ Different access rights requirements</li> <li>♦ Different usage patterns</li> <li>♦ Different access loads</li> </ul>

## 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:

- ◆ **Specifying the Name, Type, and Path**
  - ◆ **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`.
  - ◆ **Type:** Select the server type being targeted: Microsoft Windows, Micro Focus OES, Micro Focus OES (NSS for AD), or NetWare
  - ◆ **Server Path:** This is the full UNC path to the NSS volume or directory on OES, or to the Windows share on NTFS where your Net Folder is located.
- ◆ **Specifying the Net Folder Proxy User Information**
  - ◆ **Proxy Identity:** If you have defined a Proxy Identity that applies to this Net Folder, select **Specify proxy using a Proxy Identity**, begin typing the identity's name, then select it. For more information, see "[Proxy User Identities](#)" in the *ESN 1.0: Administrative UI Reference*.
  - ◆ **Proxy Name:** This is the name of the Net Folder proxy user that provides access to this volume. For more information, see "[Net Folder Proxy Users](#)" on page 77.

---

**IMPORTANT:** Be sure to follow these guidelines when specifying the proxy user

- ♦ **OES, NetWare, and NSS AD:** Always use a fully qualified name, such as `cn=admin,o=myorganization`.

If you specify only a simple name, such as `admin`, then ESN 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 ESN 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.

- ♦ **Windows:** Use `domain\username` as the syntax.

DFS for Windows requires this, and the syntax will always work with Active Directory and Windows.

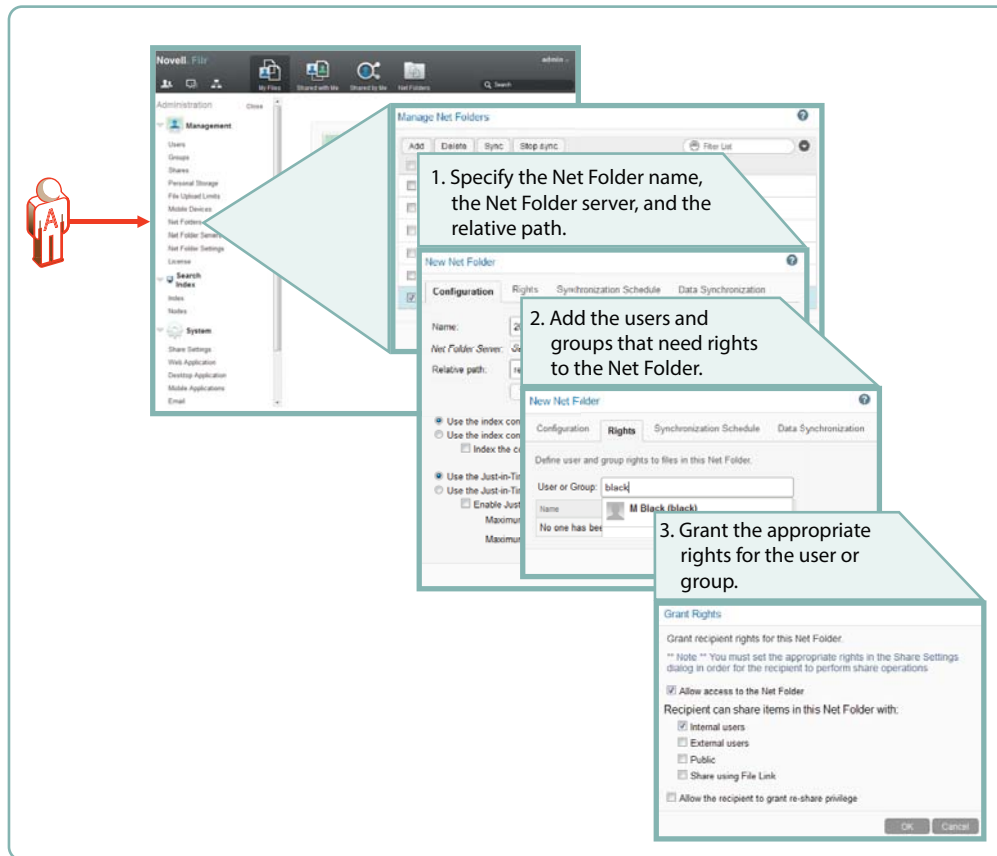
- 
- ♦ **Proxy Password:** This is the password of the Net Folder proxy user. If the password changes in the identity store, it must be updated here.
  - ♦ **Test Connection:** This lets you test the path and the credentials of the proxy user that you have specified.
  - ♦ **Enabling Synchronization for the Net Folder Server**
    - ♦ **Enable Scheduled Synchronization:** This creates a synchronization schedule for this Net Folder Server. You can then specify when you want the synchronization to occur. Any Net Folders for this server that don't have their own synchronization schedules will be synchronized according to this schedule.
    - ♦ **Specifying the Synchronization Options** This lets you specify whether you want Net Folder contents indexed for searching, whether to enable Just-in-Time synchronization, and whether to allow desktop users to request Net Folder synchronizations.

For more information about Net Folder Server creation, see “[Creating and Modifying Net Folders](#)” in the *ESN 1.0: Administrative UI Reference*.

## Specifying Net Folders

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

Figure 10-4 Net Folder Creation



The minimum tasks required for adding a Net Folder are illustrated in [Figure 10-4](#). Setting a synchronization schedule and specifying the data synchronization options are not specifically called out because they are summarized in [Figure 10-3 on page 74](#).

- ◆ **Specify the Net Folder Information**

- ◆ **Name:** ESN 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.

- ◆ **Add Users and/or Groups**

- ◆ **User or Group:** As you type a user or group name, a list populates from which you can make your selection. When you click the name, the Access Rights dialog displays
- ◆ **Access and Sharing rights:** After you enable access to the Net Folder for the user or group, you can specify sharing privileges as well.

For more information about Net Folder creation, see “[Creating and Modifying Net Folders](#)” in the *ESN 1.0: Administrative UI Reference*.



# Net Folder Proxy Users

For more information about Net Folder Server proxy users, see [“Planning Net Folder Proxy Identities \(and Proxy Users\)”](#) in the *ESN 1.0 Planning Your ESN Deployment—Best Practices*.

- ♦ [“Net Folder Proxy Identities”](#) on page 77
- ♦ [“The Functions Facilitated by Net Folder Proxy Users”](#) on page 79
- ♦ [“Rights Required for Net Folder Proxy Users”](#) on page 79
- ♦ [“Net Folder Proxy User Passwords”](#) on page 80

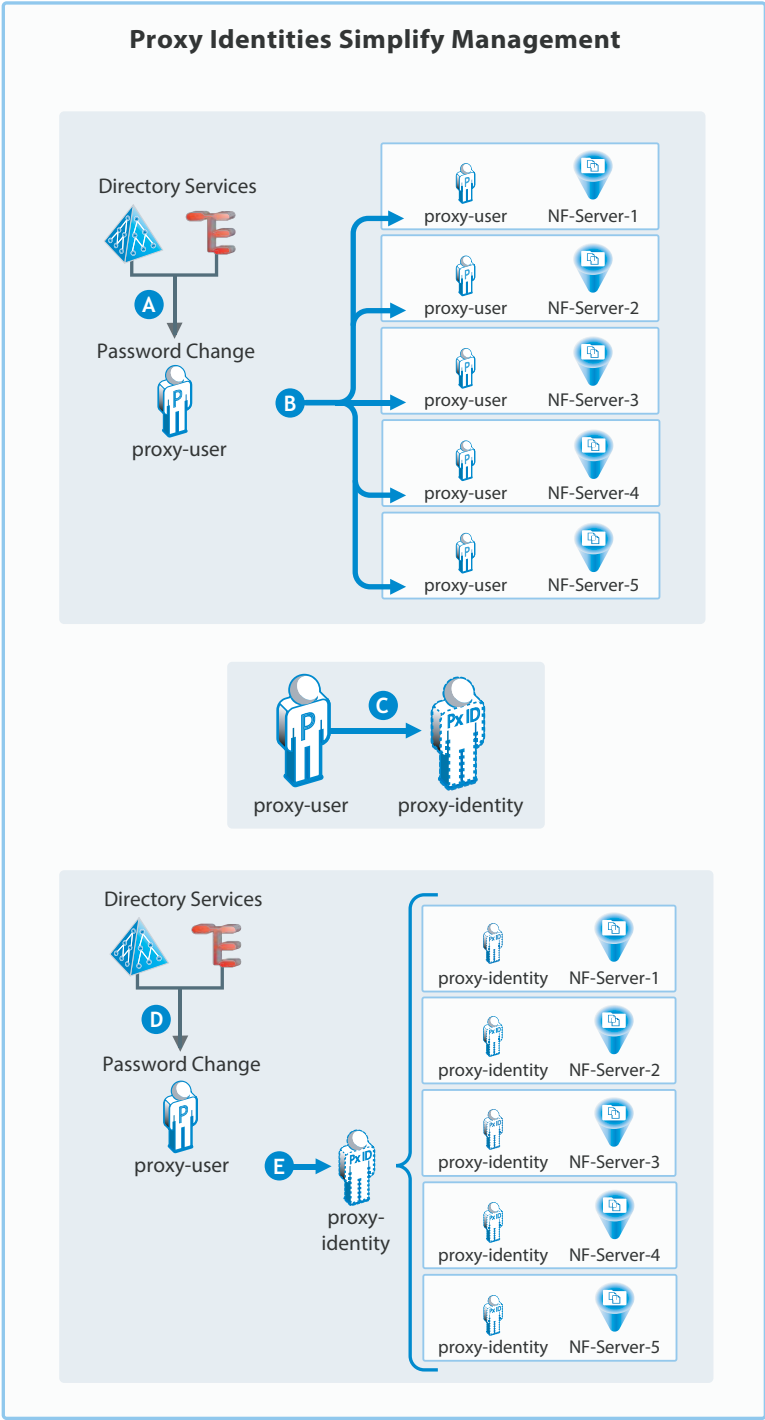
## Net Folder Proxy Identities

Beginning with ESN 2.0, administrators can define Net Folder Proxy Identities, which greatly simplify proxy user management and maintenance.

Rather than specifying the same proxy user information within the definition of multiple Net Folder Servers, you can create a Proxy Identity to represent the proxy user. Then as you create Net Folder Servers, you simply select the Proxy Identity that you created.

As a proxy user’s password or other information changes, you simply change the information for the appropriate Proxy Identity rather than needing to modify the information within each affected Net Folder Server, as illustrated in

Figure 10-5 Proxy Identities Simplify Net Folder and Proxy User Management



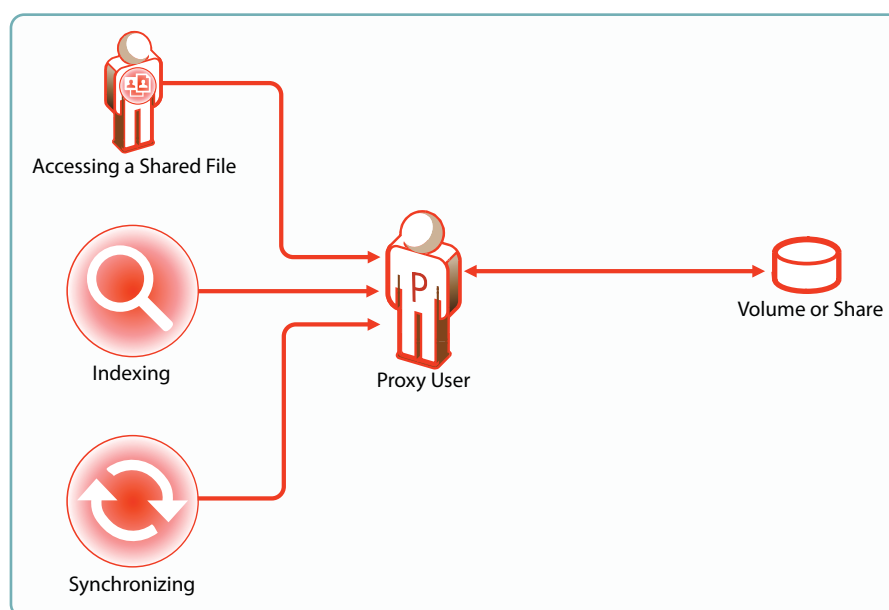
Letter	Explanation
A	Many organizations have security policies that require periodic password changes. When the password for the user defined as a proxy user changes in the directory service, proxy user access is obviously affected.
B	Prior to the release of ESN 2.0, a proxy user password change meant that all Net Folder Server definitions using the proxy user had to change as well.
C	ESN 2.0 introduced Proxy Identities. By creating a Proxy Identity for each Proxy User and specifying a password (ask Glen if the Proxy ID password matching the Proxy User. How does the authentication to the DS work?)

For more information, see “[Proxy User Identities](#)” in the [ESN 1.0: Administrative UI Reference](#).

## The Functions Facilitated by Net Folder Proxy Users

Net Folder proxy users provide Net Folder access for three ESN functions: file sharing, indexing, and synchronization, as illustrated in [Figure 10-6](#).

**Figure 10-6** Functions of a Net Folder Proxy User

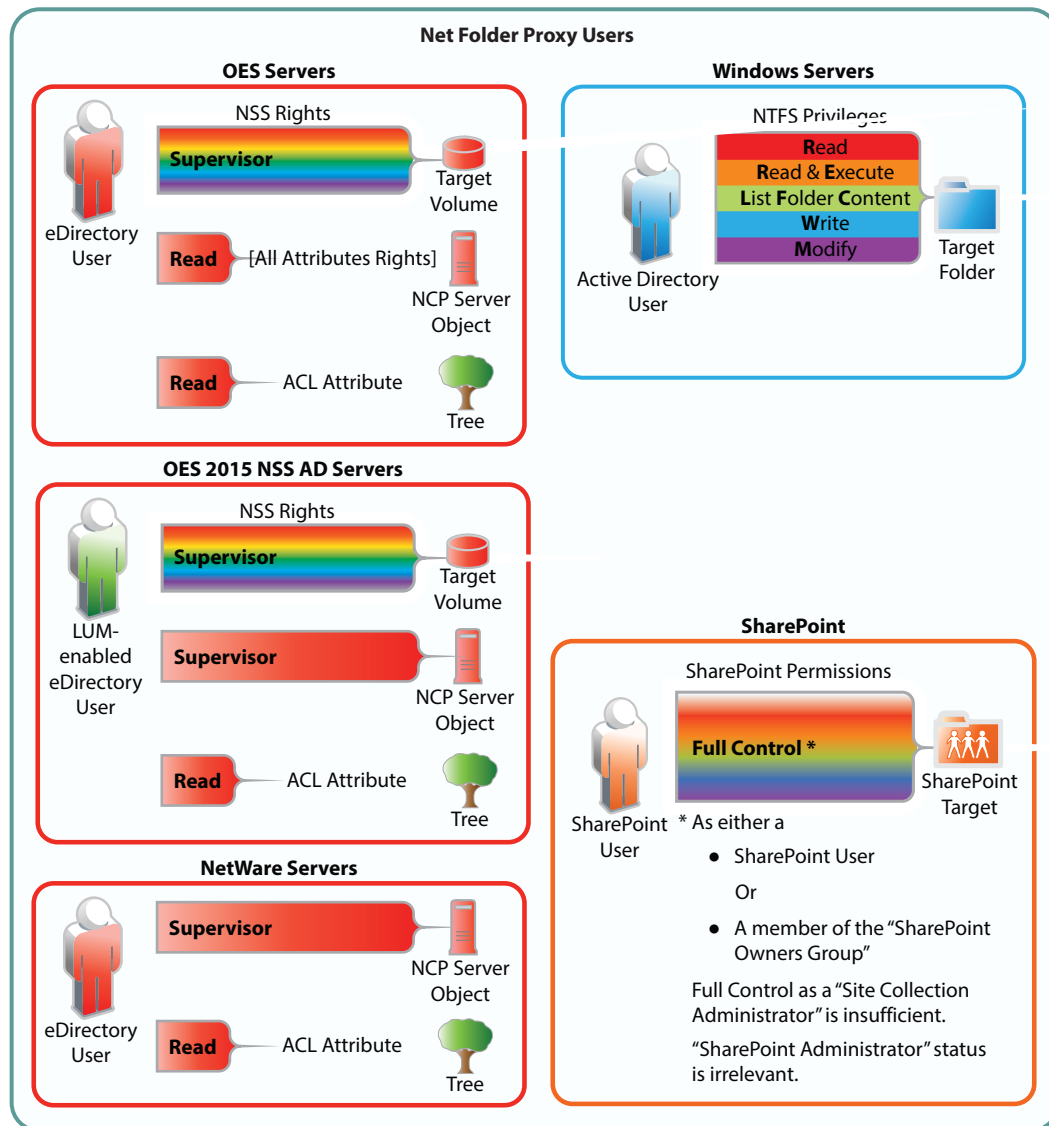


- ♦ Access to shared files always involves the proxy user, even for users who have file system rights to the shared files.
- ♦ Proxy users have no role when users with Net Folder rights access Net Folders directly.

## Rights Required for Net Folder Proxy Users

Net Folder proxy users must have the rights shown in [Figure 10-7](#).

Figure 10-7 Proxy User Rights Summary

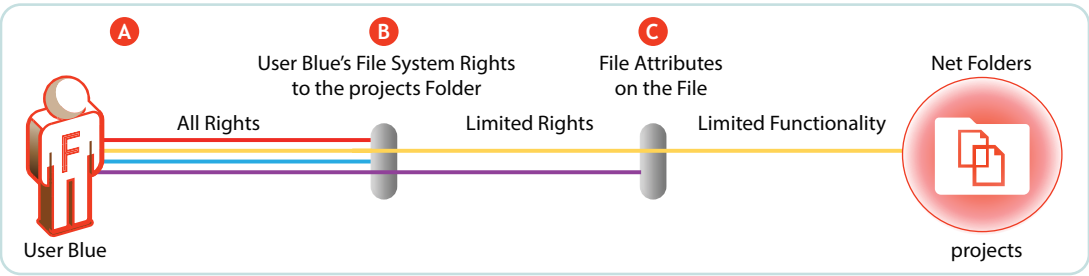


## Net Folder Proxy User Passwords

If the proxy user password changes in the LDAP identity store, it must also be changed in the Net Folder Server definition. Proxy User password maintenance overhead can be greatly reduced starting in ESN 2.0 by leveraging [Proxy Identities](#).

# Granting Access to Net Folders

Figure 10-8 Net Folder Access Involves ESN 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 ESN 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 ESN user.

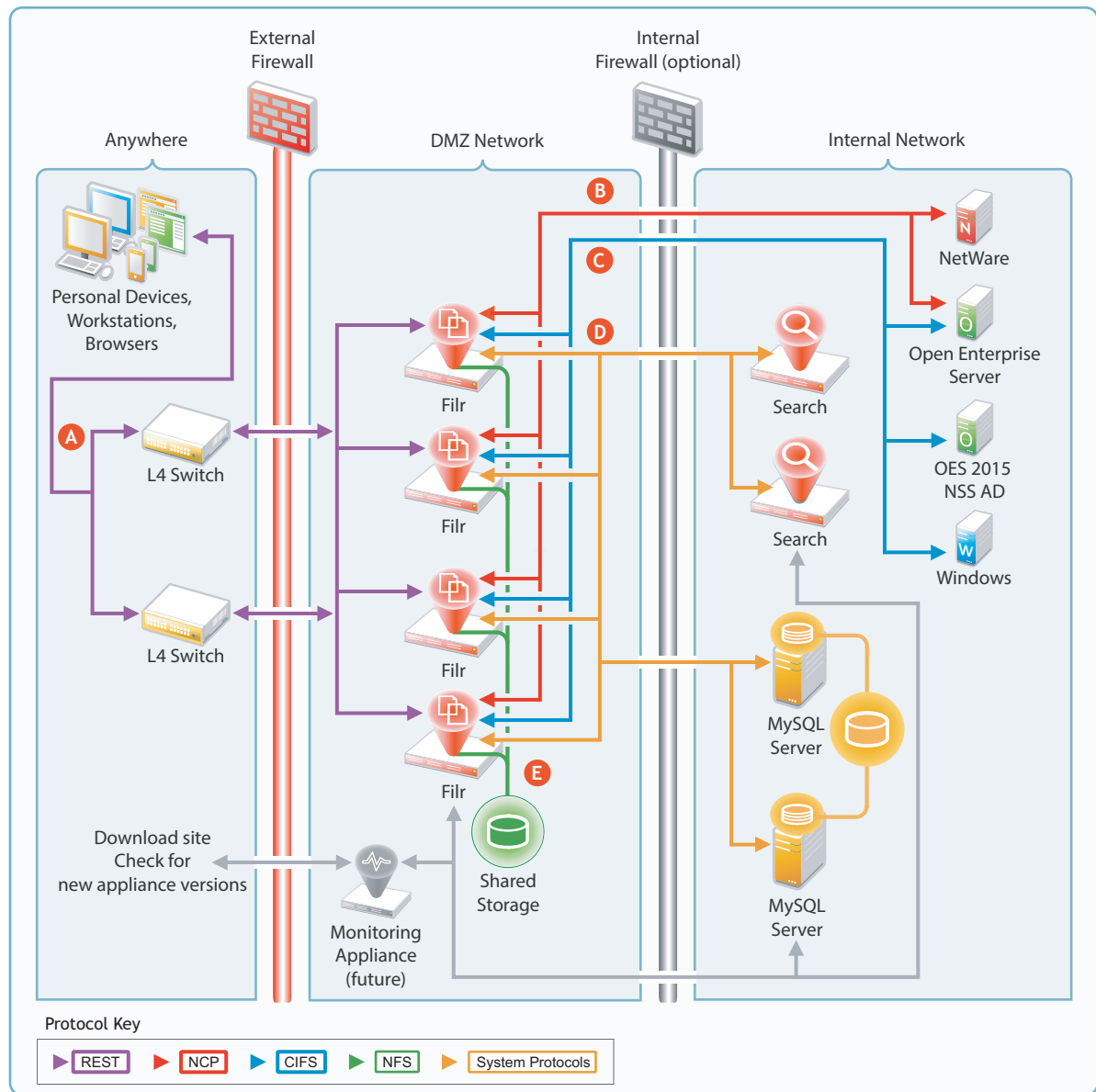
For more information about Net Folders, see “[Managing Net Folders](#)” in the *ESN 1.0: Administrative UI Reference*.



# 11 Protocols and ESN

The components in a ESN deployment use a number of different protocols to communicate and provide ESN 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 ESN Installations



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



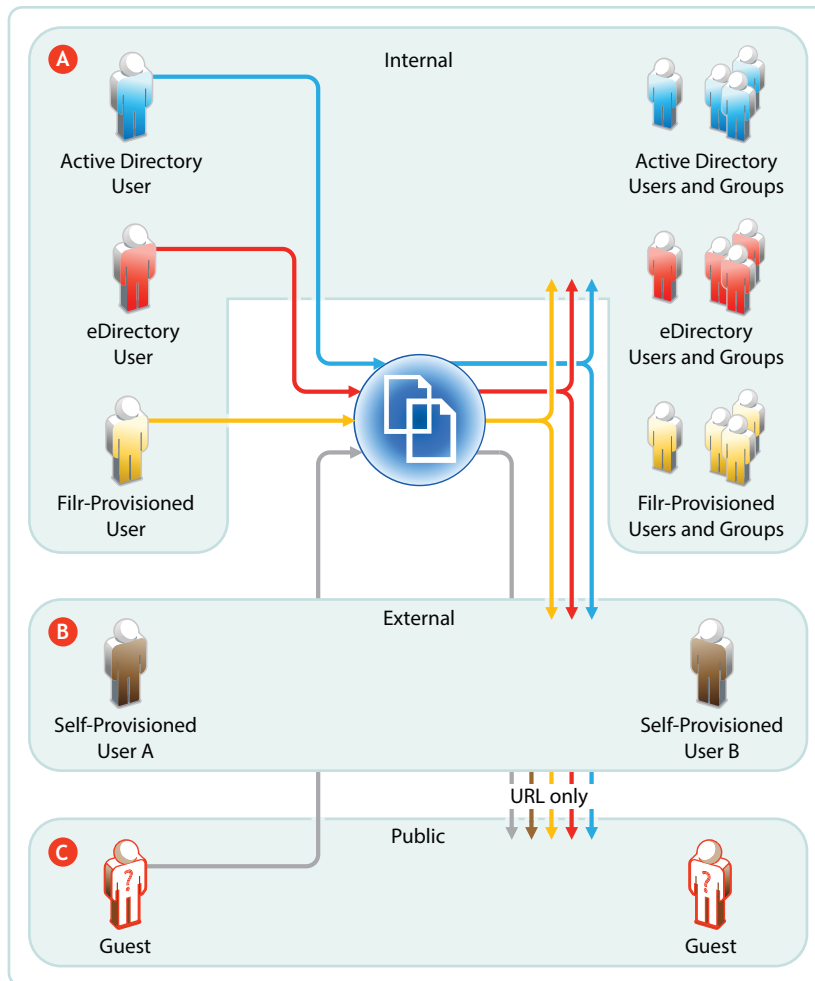
# 12 Sharing through ESN

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

Figure 12-1 presents a high-level overview of the sharing functionality available in ESN as it relates to various ESN user types sharing files and folders with each other. The sections that follow provide more detail.

- ♦ “Setting Up Sharing for Users and Groups” on page 86
- ♦ “Understanding Sharing” on page 89
- ♦ “Folder Sharing” on page 90
- ♦ “A Caution Regarding the Re-sharing Feature” on page 94

**Figure 12-1** Sharing through ESN



Letter	Explanation
<b>A</b>	<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 ESN 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 and folders 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 ESN system for collaboration and other purposes.</p>
<b>B</b>	<p>When External Sharing is enabled in ESN, external users who receive share invitations can self-provision into the ESN system and collaborate with internal and external users, using the Comments feature.</p> <p>If ESN is configured to allow it, external users can also share with internal users, with each other, and with the public.</p>
<b>C</b>	<p>If ESN is configured to allow public sharing, and if a file or folder is shared publicly through a system-generated URL, then anyone with that URL can access the file or folder as a guest user and share it with any other user, including other public users. This re-sharing is not a function of ESN but a function of sharing the URL through email, social networking, and so on.</p>

## Setting Up Sharing for Users and Groups

Before users can share, they must have sharing enabled for them at the ESN system level, either individually or as a member of a group.

After that, sharing of My Files is enabled by default, but sharing in Net Folders requires an additional step.

- ♦ [“Do Not Enable Sharing for All Internal Users and All External Users” on page 86](#)
- ♦ [“System-Level Sharing Must Be Configured First” on page 87](#)
- ♦ [“My Files Sharing Is Automatic” on page 87](#)
- ♦ [“Net Folder Sharing Must Be Explicitly Allowed At Two Levels” on page 88](#)

## Do Not Enable Sharing for All Internal Users and All External Users

Prior to the release of ESN 2.0, the documentation stated that enabling sharing for `All Internal Users` and `All External Users` was an acceptable method of enabling sharing on the system.

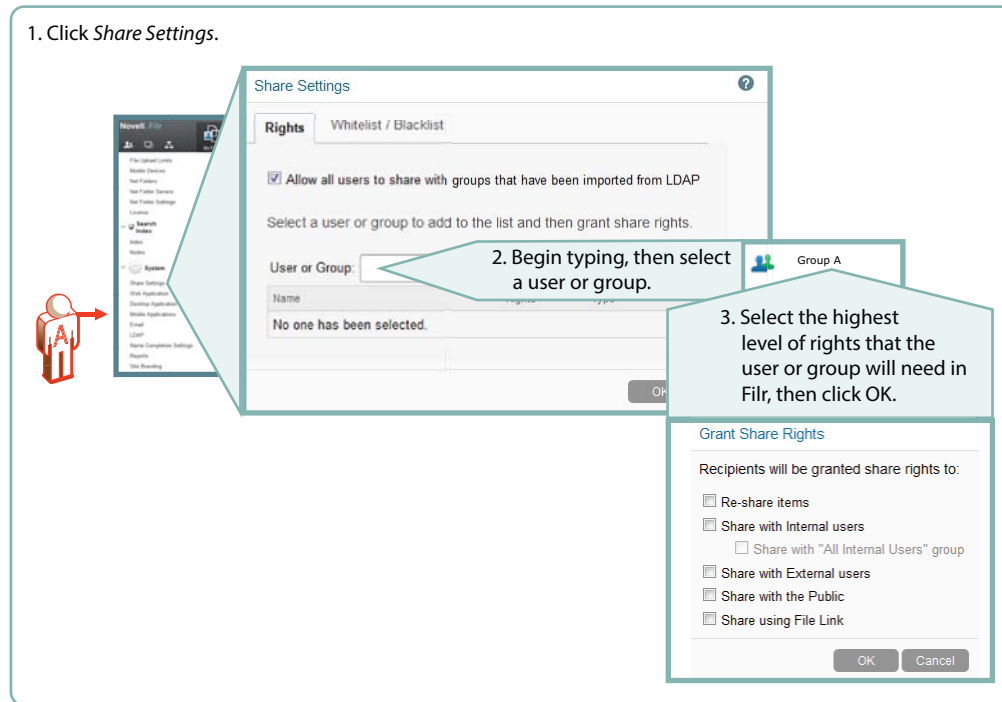
Unfortunately, this shortcut results in significant system overhead and often leads to serious performance degradation.

We strongly recommend that you enabling sharing only for specific users and/or groups, as outlined in the sections that follow.

## System-Level Sharing Must Be Configured First

The first step in allowing ESN sharing to take place is to list the users and groups who are allowed to share in the Share Settings dialog. When you add the user or group, you also specify the upper limits of possible sharing rights for them. You can further restrict the rights, but you can't expand them beyond this limit.

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

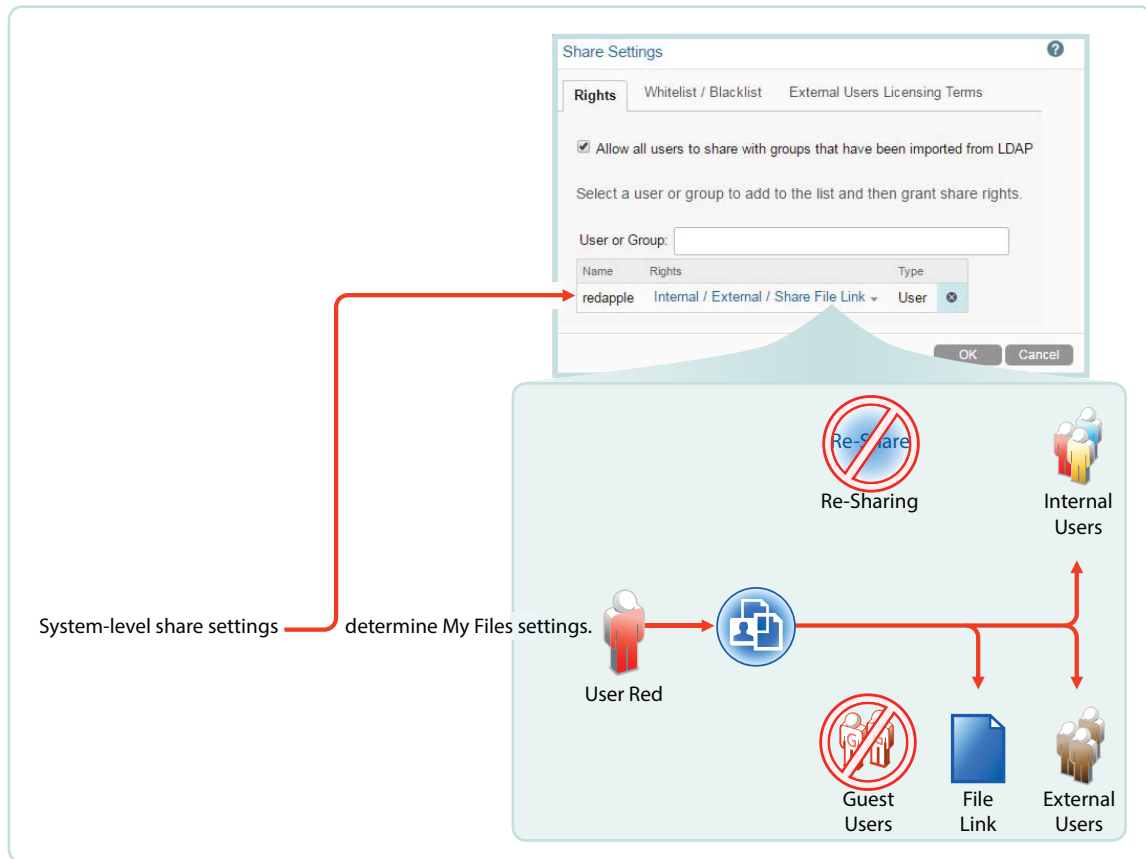


## My Files Sharing Is Automatic

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.

Administrators can disable sharing of files and folders in My Files on an individual user basis.

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



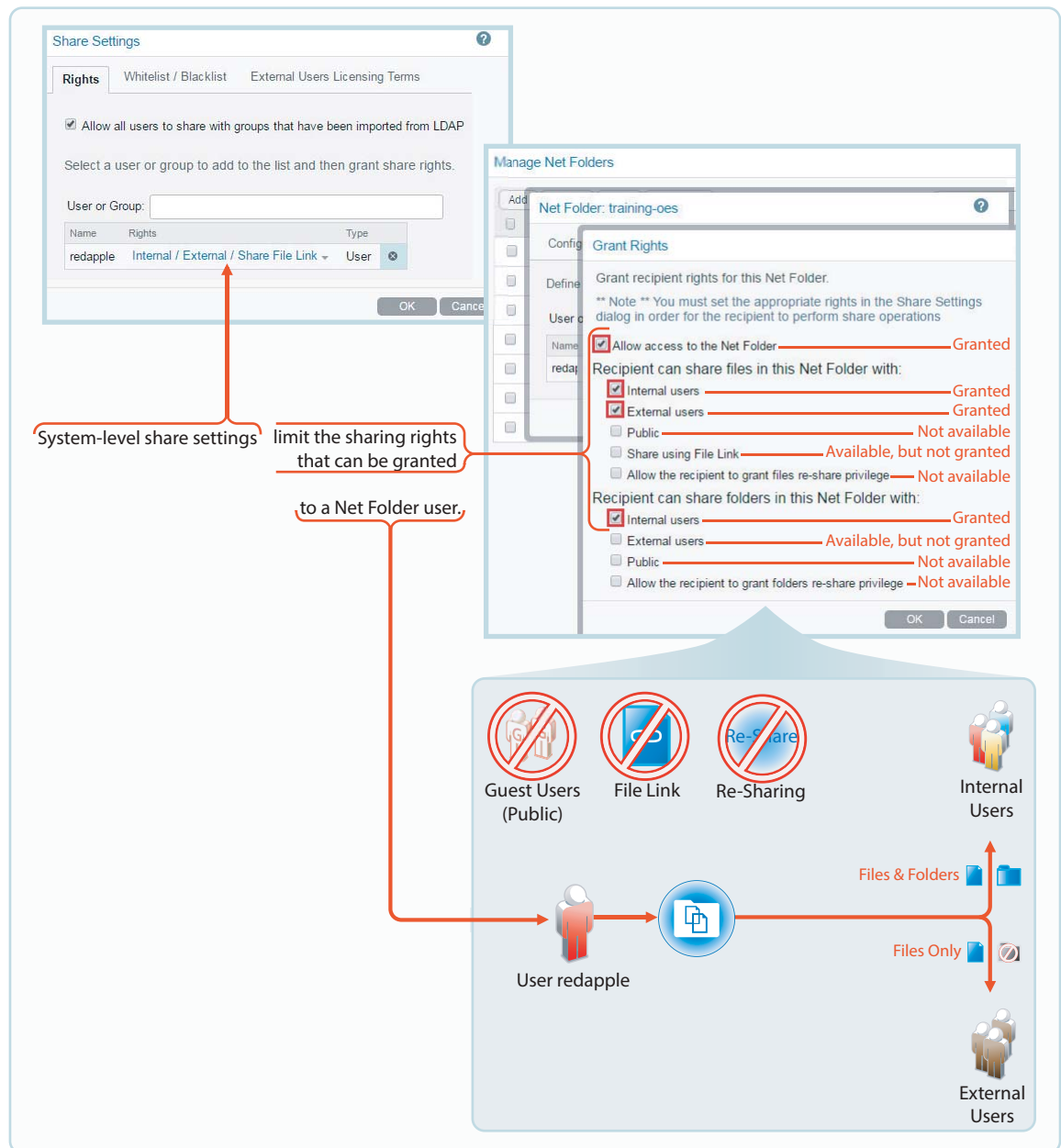
## Net Folder Sharing Must Be Explicitly Allowed At Two Levels

Before the users or groups listed in the Share Settings dialog can share files and folders in their assigned Net Folders, they must have sharing enabled on those Net Folders.

When enabling Net Folder access for a user or group, a ESN administrator can only assign up to the maximum sharing rights that are set at the system level.

In [Figure 12-4](#), user red can only be assigned sharing rights that are allowed at the system level.

**Figure 12-4** An Example of Net Folder Sharing



## Understanding Sharing

- ♦ “Sharing and Shared-access Roles” on page 90
- ♦ “Shared Access to Net Folders Is Always through a Proxy User” on page 90

## Sharing and Shared-access Roles

When users send share invitations, they must designate the role that they want share recipients to have for the file or folder being shared. The roles associated with sharing are the same as [Net Folder roles](#).

ESN administrators who [allow Net Folder sharing](#) should understand the following foundational concepts.

- ♦ **Share Invitations Always Include a Shared-access Role:** When users receive share invitations, they also receive one of three shared-access roles: Viewer, Editor, or Contributor. These provide share recipients with the same rights as [Net Folder User roles](#).
- ♦ **Users Can't Share Roles That They Don't Have:** Users can only grant shared-access roles that correspond to their Net Folder roles or are more restrictive.

For example, a user with the Viewer role can only grant the Viewer shared-access role to other users.

On the other hand, a user with the Contributor role can grant the Viewer, Editor, or Contributor shared-access role to other users. There is, however, a caveat on this point as explained in ["Folder Role Determination Is More Complex" on page 91](#).

---

**NOTE:** Because users have all rights to their My Files area, they can share any role to a folder or file, provided that sharing is enabled on the system.

---

- ♦ **The Highest Role Wins:** If multiple users share the same item with a single user, the user receiving the share has the highest role that was granted along with the share.
- For example, if User B shares a file with User A and grants User A the Viewer role to the file, and then User C shares the same file with User A and grants the Editor role to the file, User A has Editor rights to the file.

## Shared Access to Net Folders Is Always through a Proxy User

When ESN users access a Net Folder-based file or folder in their Shared With Me folder, they access it through the [proxy user](#) assigned to the Net Folder where the file or folder lives. File system rights that users have or don't have on shared items play no role when access is through Shared with Me.

## Folder Sharing

Beginning with ESN 1.0, Net Folder sharing includes folder sharing as well as file sharing.

- ♦ ["How ESN Determines Roles for Files" on page 90](#)
- ♦ ["Folder Role Determination Is More Complex" on page 91](#)
- ♦ ["Working Around Shared-Role Limitations" on page 94](#)

## How ESN Determines Roles for Files

ESN assesses a user's file system rights to a file on the back-end file server to set both

- ♦ The user's role on the file in the Net Folder

and

- ♦ The maximum shared-access role that the user can grant to a share recipient for a shared file

## Folder Role Determination Is More Complex

For working within Net Folders, the role-setting process for folders is the same as for files—ESN assesses a user's file system rights to each folder to set the user's roles within a Net Folder.

As users navigate through the folder structure, their roles on each folder reflect their rights on the back-end file server.

For example, a user might have the Editor role on a folder and the Contributor role on one of its subfolders.

Users might also have file system restrictions on other subfolders that limit their role to only Viewer or even to having No Role at all.

As previously discussed, shared access to Net Folder-based files and folders is through a [Net Folder Proxy User](#) that has all rights on the back-end file system. This is why ESN users must assign a shared-access role with each share operation.

Because folder-shared-access roles apply to shared folders and all their subfolders, folder-shared-access roles cannot exceed the minimum shared-access role on any subfolder in the share.

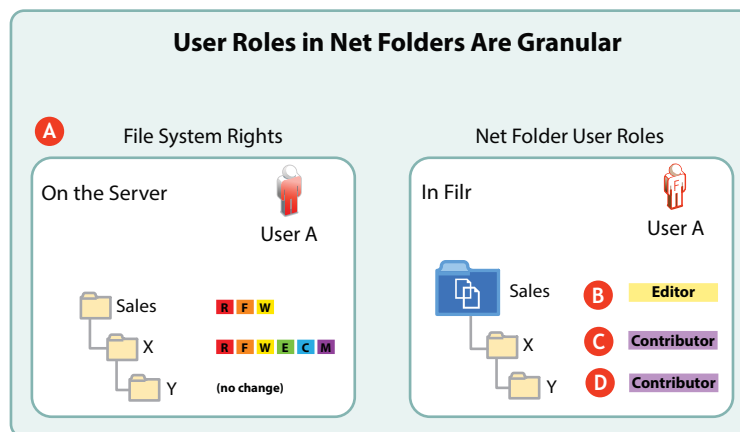
These principles are illustrated in the following graphics.

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**NOTE:** Although these graphics reflect NSS file system trustee assignments, the same basic principles apply to role determination for NTFS file systems and Share Point libraries.

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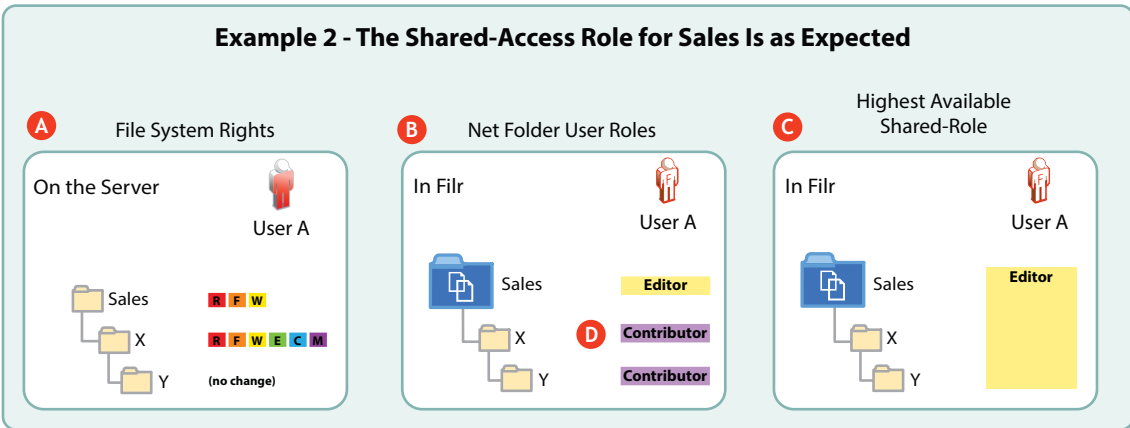
**Figure 12-5** Foundational Principle—Net Folder User Roles Reflect File-System Granularity



**Letter Details**

- A** The NSS trustee assignments that User A has within the Sales folder provide different levels of access. Access is somewhat restricted in the Sales folder, but User A can do anything with the contents of Folder X unless file and folder attributes don't allow it.
- B** ESN assigns User A the Editor user role for the Sales Net Folder.
- C** ESN assigns User A the Contributor user role for the X folder. This means that User A can do anything with Folder X and its contents, including renaming or even deleting Folder X, unless file and folder attributes don't allow it.
- D** Folder Y inherits Folder X's trustee assignments in NSS, and ESN conforms with the file system by assigning User A the Contributor user role.

**Figure 12-6** *The Available Shared-access Role Level Will Usually Be as Expected*

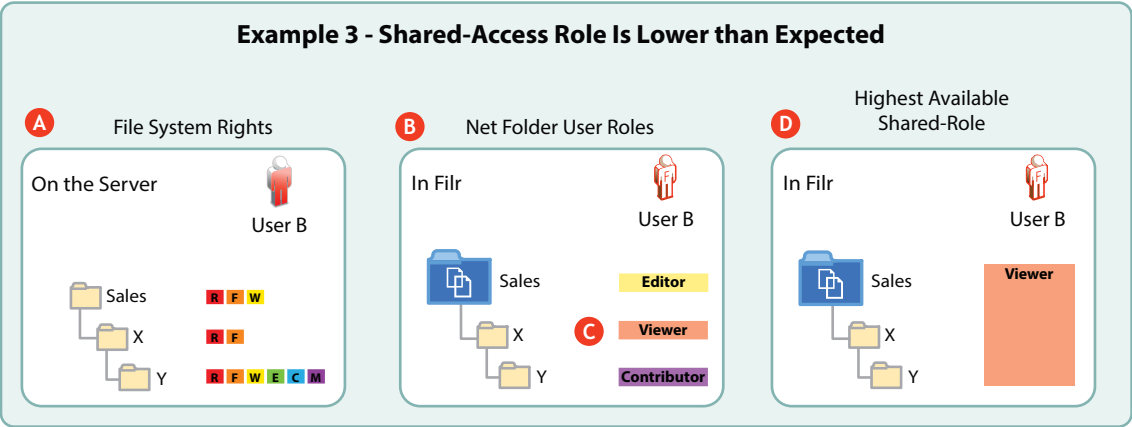


**Letter Details**

- A** The NSS trustee assignments that User A has within the Sales folder provide different levels of access. Access is somewhat restricted in the Sales folder, but User A can do anything with the contents of Folder X unless file and folder attributes don't allow it.
- B** ESN assigns User A the Editor user role for the Sales Net Folder.
- C** Because the Editor shared-access role is the minimum shared-access role in the Net Folder (letter B), User A can only assign the Editor shared access role when sharing the Net Folder and share recipients could only exercise Editor-level rights in folders X and Y.
- D** Although it is not illustrated, User A has the Contributor role on folders X and Y and could grant that shared-access role when creating a share for either of those folders.

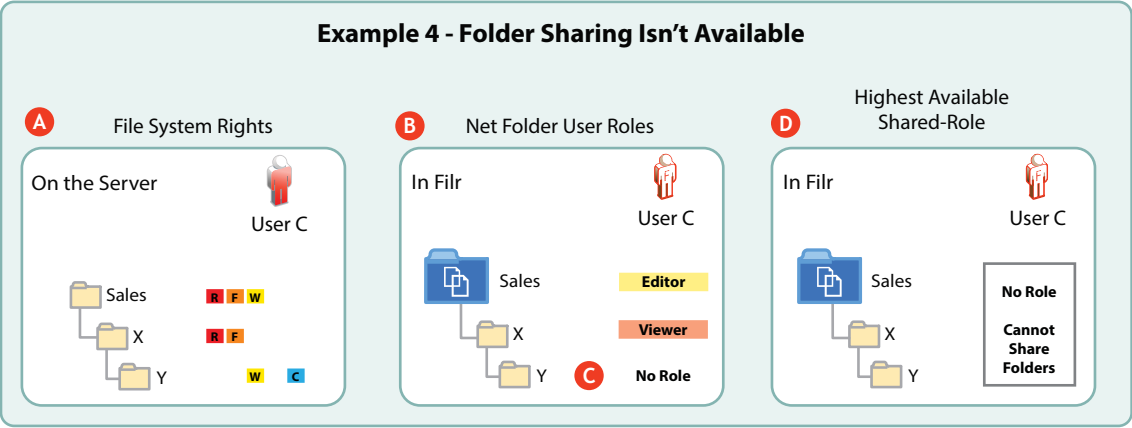


Figure 12-7 Sometimes the Available Shared-Access Role Will Be Lower than Expected.



Letter	Details
A	User B's trustee assignments within the Sales folder allow for editing, but in folder X, they are limited to only viewing the folder's contents.
B	The trustee assignments to the folders under letter A are reflected in User B's roles.
C	The Viewer role assigned to User B for folder X is the lowest role in the Sales Net Folder.
D	Therefore, the highest-available shared-access role that User B can assign when sharing the Sales Net Folder is the Viewer role.

Figure 12-8 Sometimes Folder Sharing Isn't Available.



Letter	Details
A	User C's trustee assignments are progressively restricted in folders X and Y.

Letter	Details
<b>B</b>	User C has the Editor role within the Sales Net Folder but only the Viewer role in folder X.
<b>C</b>	From a ESN perspective, User C has no role for folder Y--the lowest role in the Sales Net Folder.
<b>D</b>	Because the lowest role that User C has in the Sales Net Folder is No Role, and because a shared-access role assignment must be made when sharing a folder, User C cannot share the Sales Net Folder. The same restriction would apply to attempts to share folder X.

## Working Around Shared-Role Limitations

When restrictions prevent assigning shared-access roles at a needed level, users can choose to share folders lower in the structure that don't contain role-restricting subfolders or to share files individually. Even though folder sharing is not available in [Figure 12-8](#), file sharing is unrestricted, except in folder Y.

## A Caution Regarding the Re-sharing Feature

Use caution when enabling file re-sharing. Removing one user's access rights to an item does not remove the access rights of other users with whom the item was re-shared.

For example, suppose User A shares an item with User B and grants re-share rights. User B then shares the file with User C. Even if User A revokes User B's access rights to the item, User C continues to have access to the shared item.

# 13 ESN Synchronization

The synchronization of users, groups, files, and folders, along with the associated ACL rights, file contents, and so on, is central to ESN services. This section provides a high-level overview of the various synchronization processes in ESN 1.2.

- ♦ [“What Synchronization Provides” on page 95](#)
- ♦ [“Synchronization Process Overview” on page 97](#)
- ♦ [“Net Folder Synchronization Detail Overview” on page 99](#)

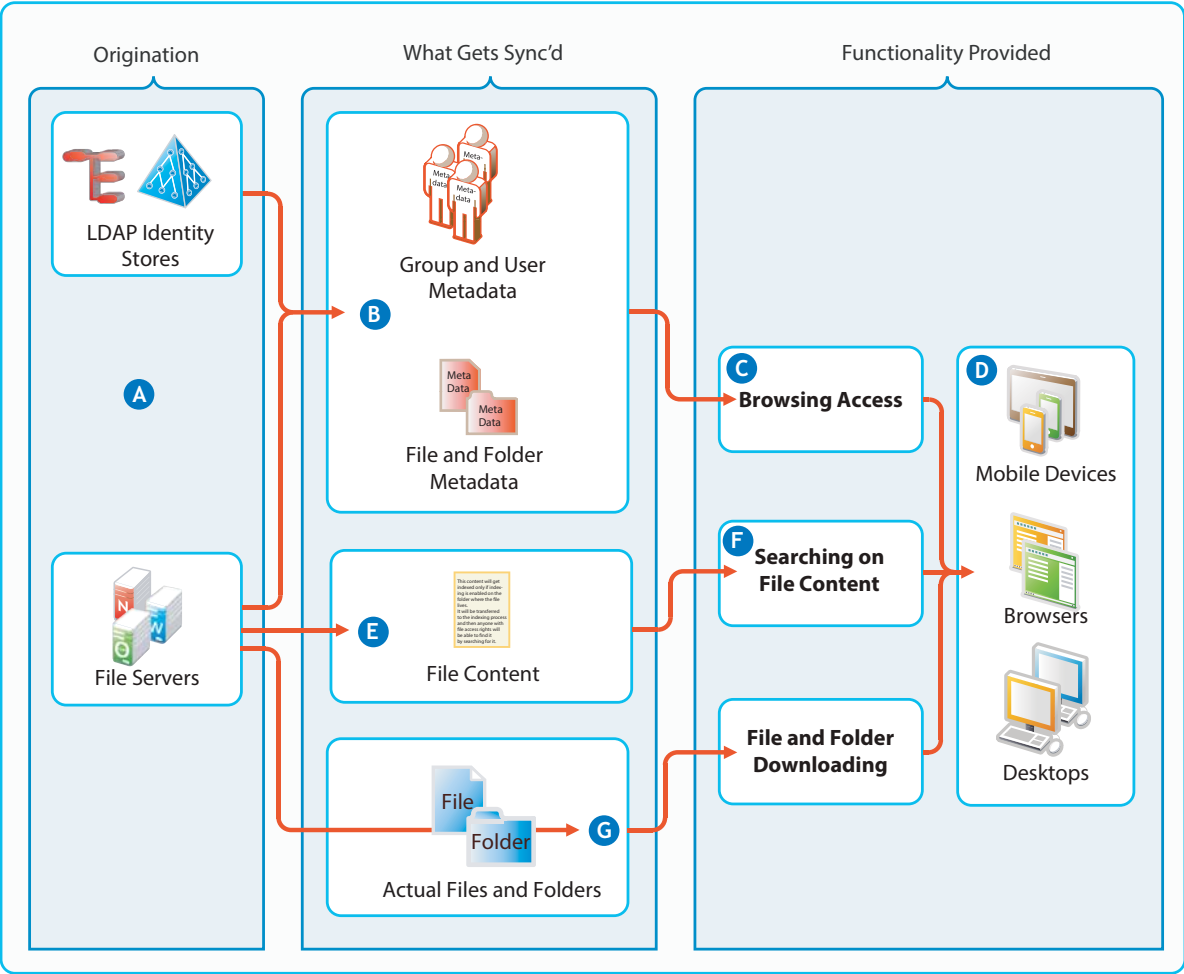
## What Synchronization Provides

ESN synchronization involves three different categories of data on back-end file servers, as illustrated in [Figure 13-2](#):

- ♦ Metadata
- ♦ Content
- ♦ Actual Files and Folders (aka. Data)

as illustrated in [Figure 13-1](#). The table that follows the figure contains additional explanations.

Figure 13-1 What Synchronization Provides



Letter	Details
<b>A</b>	<p>ESN synchronizes with</p> <ul style="list-style-type: none"><li>♦ LDAP Datastores to provide users and groups access to its services</li></ul> <p>And</p> <ul style="list-style-type: none"><li>♦ File servers to provide those users and groups with access to files and folders.</li></ul>
<b>B</b>	<p>The first thing ESN synchronizes is the metadata associated with LDAP users and groups and with files and folders.</p> <p>Neither the user and group objects themselves nor the actual files and folders are synchronized during these initial synchronizations.</p>

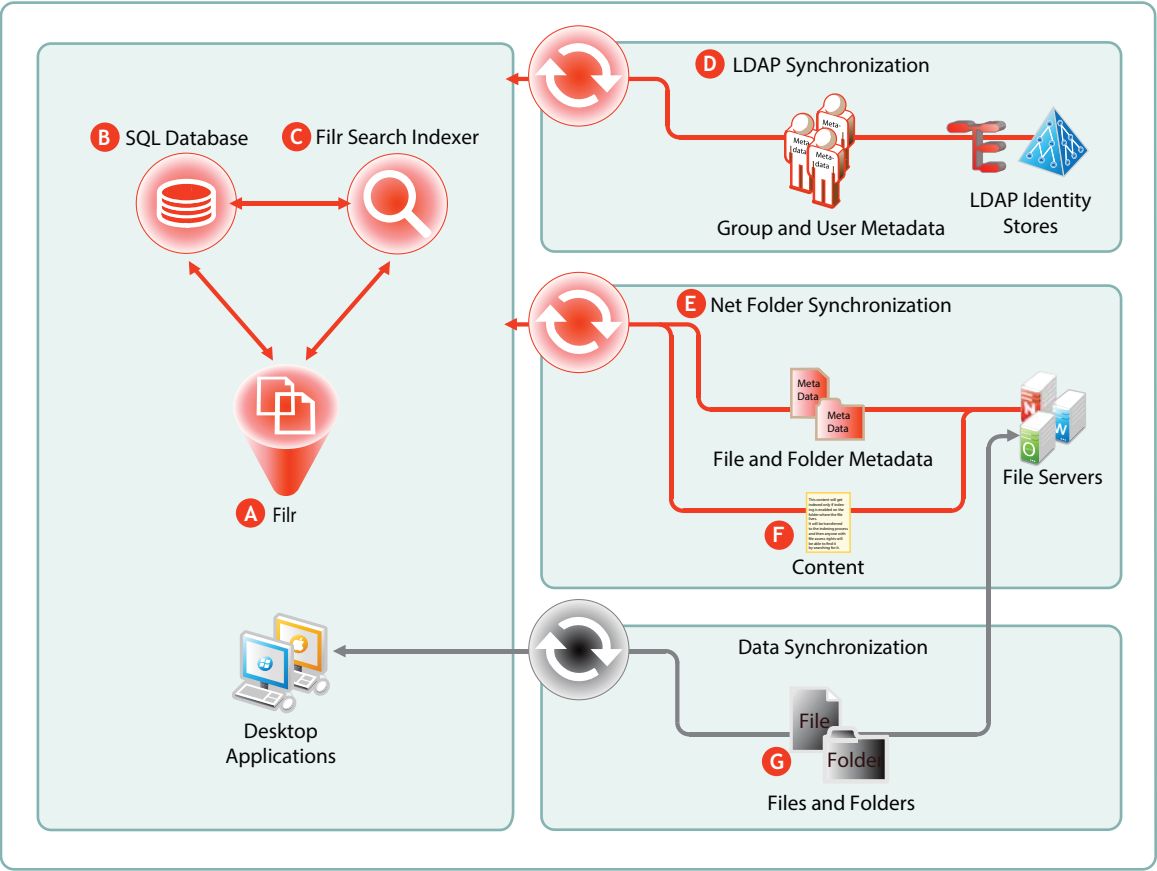
Letter	Details
<b>C</b>	Once the metadata is synchronized and processed in ESN, users see each other and the files and folders they have access right to, just as though these things were actually stored in ESN itself.
<b>D</b>	Mobile, web, and desktop users can browse using whichever method they prefer.
<b>E</b> and <b>F</b>	For Net Folders and Home folders that have their metadata synchronized and also have content indexing enabled, ESN creates HTML renditions of each file and indexes the resulting text to make the file contents searchable.  Files in Personal Storage are always indexed for searchability.
<b>G</b>	Finally, if file and folder downloading is not disabled, users can download files.  ESN merely facilitates the synchronization of files and folders between the devices and the back-end file servers. No files and folders are stored in ESN

## Synchronization Process Overview

Figure 13-2 illustrates at a high level the information and content that get synchronized in ESN. 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 ESN services for storage and indexing.

Figure 13-2 What Gets Synchronized and Where



Letter	Details
A	<p>ESN relies on the SQL database and the ESN Search (Lucene) indexer in order to provide access to</p> <ul style="list-style-type: none"><li>♦ Users and groups</li><li>and</li><li>♦ Files and folders</li></ul>
B	<p>ESN stores metadata for users, groups, files, and folders in the SQL appliance or server.</p>
C	<p>After the metadata is retrieved and stored, ESN directs the ESN Search (Lucene) indexer to process it for viewing by administrators and users.</p> <p>Users, groups, files, and folders are only visible and accessible through ESN after their metadata is stored and indexed.</p> <p>For more details about the content indexing process, see <a href="#">“Net Folder File Content Indexing Overview”</a> on page 62</p>

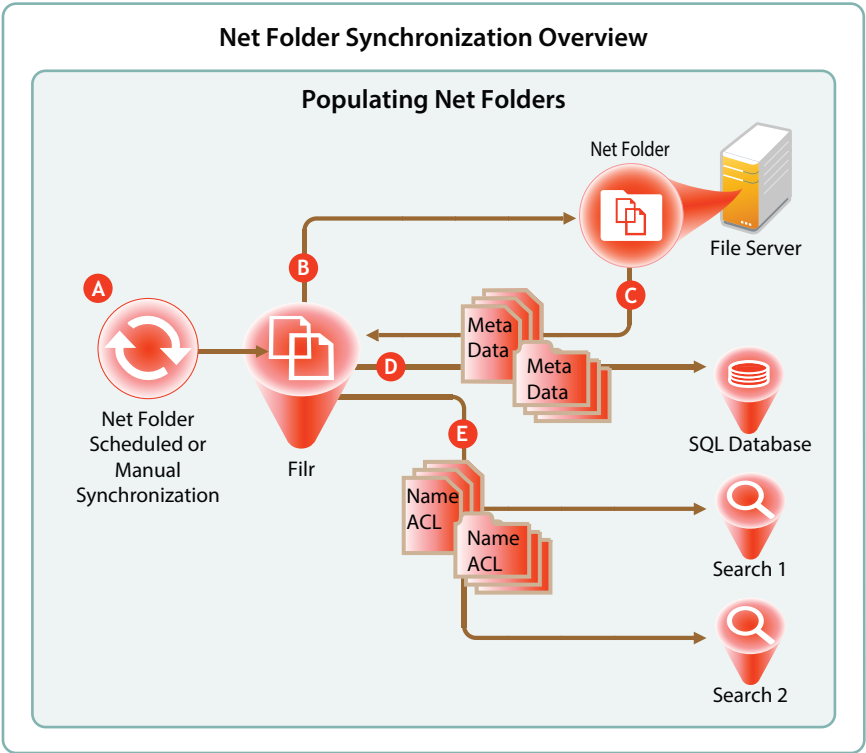
Letter	Details
D	<p>Regular LDAP synchronization ensures that ESN is updated when users are added or removed and when group memberships changes in the LDAP identity store.</p> <p>it is usually sufficient to synchronize LDAP once a day, but some organizations require more frequent synchronization to keep ESN abreast of changes in their identity stores.</p>
E	<p>Net Folder synchronization is highly configurable:</p> <ul style="list-style-type: none"> <li>♦ <b>Schedules for Net Folder Servers:</b> 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.</li> <li>♦ <b>Schedules for Net Folders:</b> 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.</li> <li>♦ <b>Manual:</b> These are especially helpful when you create Net Folders to ensure that ESN users can browse and access the files and folders that they contain.</li> <li>♦ <b>Just-in-Time Synchronization (JITS):</b> You can enable JITS so that as ESN users browse in Net Folders, file and folder metadata is synchronized with ESN.</li> </ul> <p>For more details about the synchronization process, see <a href="#">“Net Folder Synchronization Detail Overview” on page 99</a></p>
F	<p>For users to be able to search file content, folders must have content indexing enabled.</p> <p>For folders that are enabled for content indexing, ESN retrieves the content for each file and directs the indexer to process it for searchability.</p>
G	<p>By default, Net Folders allow data synchronization with desktop applications.</p> <p>To prevent users from getting a local copy of sensitive files on the organization’s file server, the download functionality can be disabled.</p>

## Net Folder Synchronization Detail Overview

**IMPORTANT:** My Files > Personal Storage doesn’t require a synchronization of metadata because the files are stored and managed on the ESN appliance itself. There is no synchronization with a back-end file server.

My Files > Home Folders function exactly like all other Net Folders from a synchronization standpoint.

**Figure 13-3** Net Folder Synchronization



Letter	Details
A	<p>Full Net Folder synchronizations occur according to individual Net Folder schedules, or if no schedule is defined for the Net Folder, then they occur according to the associated Net Folder Server's synchronization schedule.</p> <p>If no schedule is set, then it falls to ESN administrators to manually synchronize them.</p>
B	<p>When a Net Folder Synchronization is triggered, the ESN appliance connects to the specified Net Folder location on the target file server.</p>
C	<p>ESN then walks the directory structure, collecting meta data (name, size, dates, ACL information, etc.) about each folder and file as it goes.</p>
D	<p>ESN stores the collected meta data in the SQL database.</p>



Letter	Details
E	<p data-bbox="870 222 1419 300">Then ESN sends the folder and file names and ACL information to each ESN Search appliance to be indexed.</p> <p data-bbox="870 327 1409 405">This makes it possible for users to search for folder and file names, provided that they have sufficient rights on the file system to see them.</p> <p data-bbox="870 432 1377 489">The majority of Net Folder synchronization work occurs on the File appliance.</p> <p data-bbox="870 516 1419 594">If content indexing is enabled for the Net Folder, the process continues as illustrated in <a href="#">“Net Folder File Content Indexing Overview”</a> on page 62.</p>



# 14 File and Folder Access in ESN

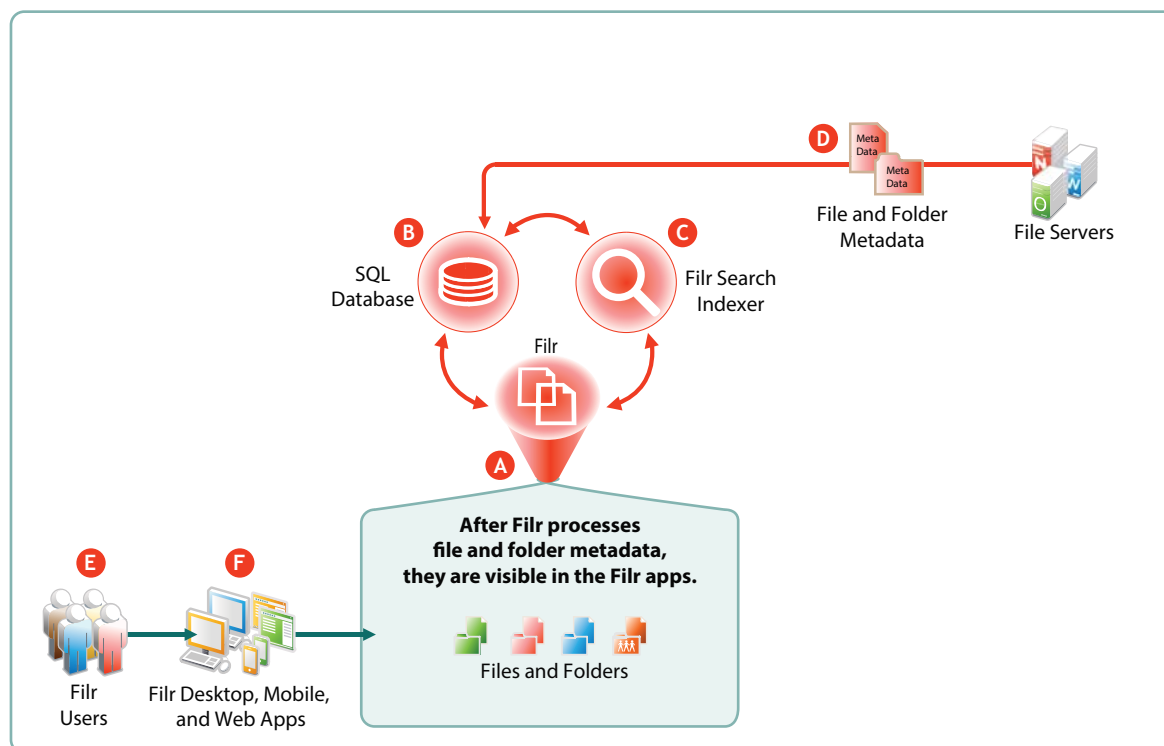
Most organizations store and manage their data in files and folders on network file servers.

ESN lets users see, access, and work with their assigned files and folders.

- ♦ [“How ESN Makes Files and Folders Visible to Users” on page 103](#)
- ♦ [“Web Application for Browsers” on page 104](#)
- ♦ [“Mobile Apps” on page 105](#)
- ♦ [“Desktop Applications” on page 105](#)

## How ESN Makes Files and Folders Visible to Users

*Figure 14-1 ESN Processes Metadata to Make Files and Folders Visible to ESN Users*



Letter	Details
<b>A</b>	ESN directs and coordinates the processing of metadata for files and folders.
<b>B</b>	ESN retrieves and stores the metadata in the SQL appliance or server.

Letter	Details
<b>C</b>	After metadata retrieval, ESN directs the ESN Search (Lucene) indexer to process it for viewing in the ESN apps.
<b>D</b>	My Files files and folders are automatically retrieved and processed.  Net Folder files and folders must be synchronized through one of the methods listed in the <a href="#">description for Letter E</a> in <a href="#">Figure 13-2 on page 98</a> .
<b>E</b>	After the metadata is processed for users, files and so on, ESN users can see the objects in the ESN apps (Letter G).
<b>F</b>	ESN apps for desktops, mobile devices, and web access let ESN users interact with the files, folders, users, and groups that are made accessible through ESN.

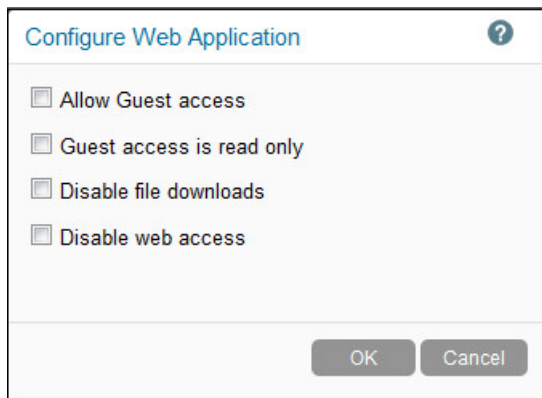
## Web Application for Browsers

Web browser access to ESN is enabled by default. ESN users can browse and access files in their **My Files** and assigned **Net Folders** areas. They can also access files and folders that have been shared with them in **Shared with Me**, and they can see what they have shared in **Shared by Me**.

If file downloading is not disabled, users can download files to their local drives for modification, and so on, and if they have the required [ESN role](#) and [sufficient rights on the back-end file server](#), they can then upload the files back to the network with content changes intact.

Browser access is intuitive and convenient. However, the [ESN 2.0 desktop applications](#) are integrated with Windows Explorer and Mac Finder and are the recommended option for desktop users who need seamless and synchronized access with back-end file servers.

The Configure Web Application dialog (below) ([Administration Console > System > Web Application](#)) shows the controls that administrators have over web browser access to ESN.



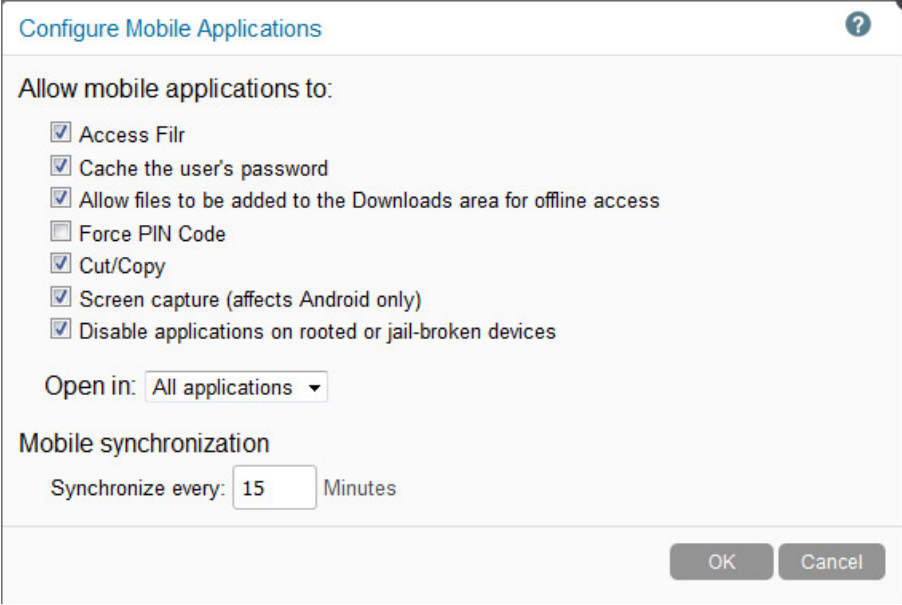
For Administrative instructions and information, see “[Web Browser Access—Default Settings](#)” in the [ESN 1.0: Administrative UI Reference](#).

Information for web application users is in the [ESN 1.0: User Access Guide](#).

# Mobile Apps

ESN users who spend a lot of their time away from their offices and workstations find the ESN mobile apps very convenient and useful.

The Configure Mobile Applications dialog (below) (**Administration Console > System > Mobile Applications**) shows the default settings for the controls that administrators have over mobile application functionality and access to ESN.



Configure Mobile Applications

Allow mobile applications to:

- ☒ Access Filr
- ☒ Cache the user's password
- ☒ Allow files to be added to the Downloads area for offline access
- ☐ Force PIN Code
- ☒ Cut/Copy
- ☒ Screen capture (affects Android only)
- ☒ Disable applications on rooted or jail-broken devices

Open in: All applications ▼

Mobile synchronization

Synchronize every: 15 Minutes

OK Cancel

For Administrative instructions and information, see “[Web Browser Access—Default Settings](#)” in the *ESN 1.0: Administrative UI Reference*.

Information for mobile users is in the *Micro Focus ESN Mobile App 1.0 Quick Start*.

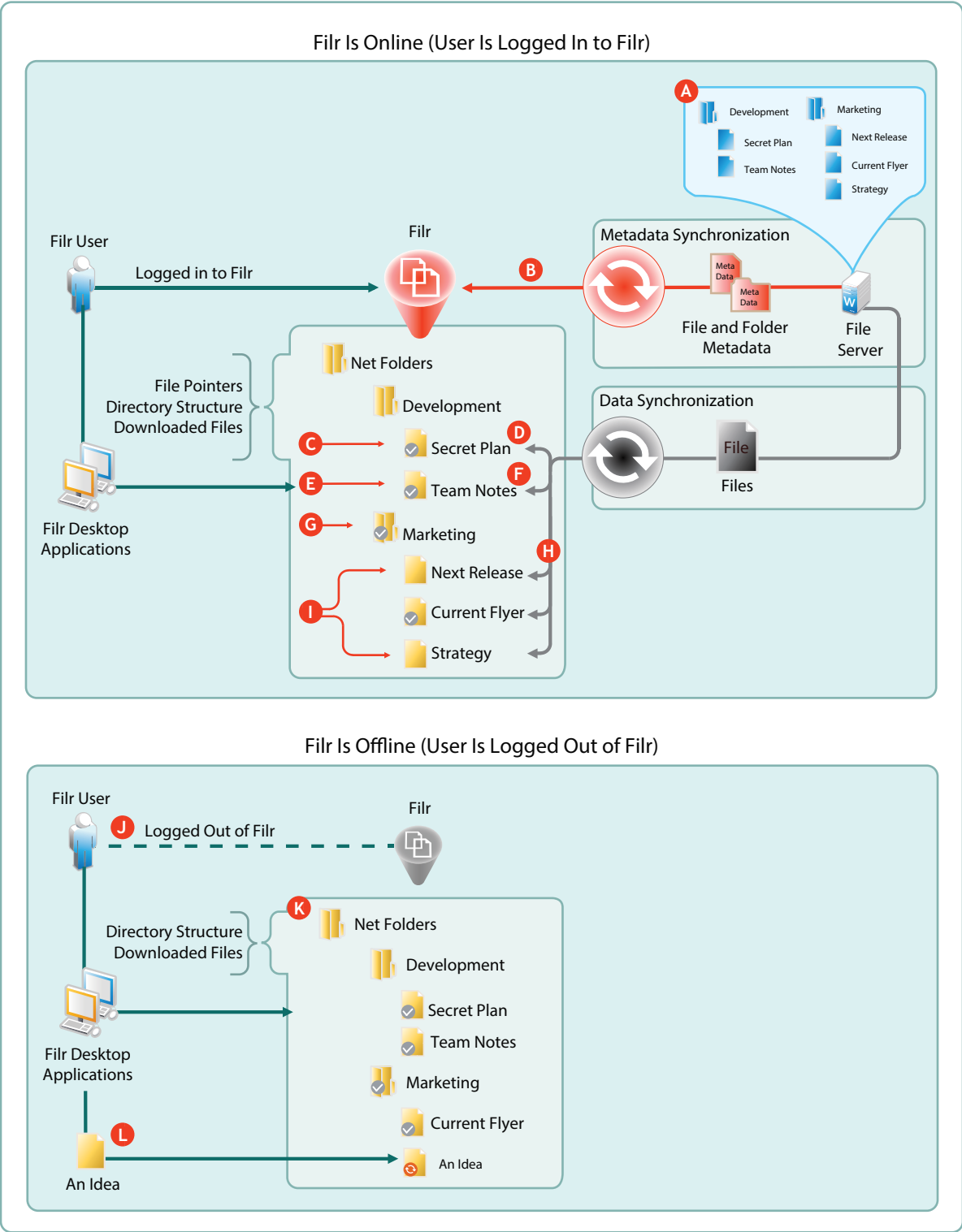
## Desktop Applications

- ♦ “[How the ESN 2.0 and Later Desktops Work](#)” on page 105
- ♦ “[Net Folder Synchronization Is Crucial](#)” on page 108
- ♦ “[Desktop Browsing Triggers JITS](#)” on page 109
- ♦ “[Files on Demand](#)” on page 109
- ♦ “[A Good Replacement for Mapped Drives](#)” on page 110

## How the ESN 2.0 and Later Desktops Work

As shown in [Figure 14-2](#), what desktop application users see in Windows Explorer and Mac Finder varies, depending on whether they are logged in to ESN and what they have marked to be **Available Offline**, in other words, available when ESN is offline.

Figure 14-2 ESN Desktops: Online Vs. Offline



Letter	Details
A	The back-end Windows file server has files and folders in two parent folders: <code>Development</code> and <code>Marketing</code> .
B	<p>The ESN administrator creates Net Folders for the <code>Development</code> and <code>Marketing</code> folders and synchronizes them with ESN.</p> <p>Although not shown in the graphic, at this point none of the folders or files have the overlay icon that indicates downloaded files that are synchronized with the back-end file server.</p> <p>(For more detail about Net Folder Synchronization, see <a href="#">“How ESN Makes Files and Folders Visible to Users”</a> on page 103 and <a href="#">“Net Folder Synchronization Detail Overview”</a> on page 99)</p>
C	In Windows Explorer, the desktop user marks the <code>Secret Plan</code> file as <b>Available Offline</b> .
D	<p>The file is downloaded to the local disk and the overlay icon displays on it.</p> <p><b>IMPORTANT:</b> Because it is marked as <b>Available Offline</b> in ESN, the <code>Secret Plan</code> file is retained on the local disk and kept in sync with its counterpart on the back-end file server until it is marked <b>Online Only</b>.</p>
E	Using an application on the workstation, the desktop user opens the <code>Team Notes</code> file.
F	<p>The file is downloaded to the local disk and the overlay icon displays on it.</p> <p><b>IMPORTANT:</b> The <code>Team Notes</code> file is not marked in ESN as <b>Available Offline</b>. Rather it is classified as a Cached file. This matters because it is subject to ESN's cache cleanup process, which removes inactive files from the local disk.</p>
G	The desktop user marks the <code>Marketing</code> folder as <b>Available Offline</b> .

Letter	Details
H	<p>The three files in the <code>Marketing</code> folder are downloaded to the workstation's hard drive and marked <b>Available Offline</b>.</p> <p>Although not shown in the graphic, at this point all of the files under the <code>Marketing</code> folder have the overlay icon indicating that they are downloaded to the local disk and synchronized with the file server.</p> <p><b>IMPORTANT:</b> When a folder is marked as <b>Available Offline</b> or <b>Online Only</b>, the folder and all its children (all files, all subfolders, and all subfolder files) are marked the same way.</p> <p>For example, A subfolder is marked <b>Available Offline</b> and all its files are downloaded.</p> <p>Later, the subfolder's parent folder is marked <b>Online Only</b>.</p> <p>At that point, everything in the subfolder is marked <b>Online Only</b> and all of the files in the subfolder structure that were previously downloaded, are removed from the local disk.</p>
I	<p>The desktop user marks the <code>Next Release</code> and <code>Strategy</code> files as <b>Online Only</b>.</p> <p>The files are immediately deleted from the local disk and the overlay icons are no longer displayed.</p>
J	<p>The user logs out of ESN.</p>
K	<p>The <b>Online Only</b> files are no longer displayed.</p> <p>The folder structure remains in place.</p>
L	<p>While traveling and not logged in to ESN, the desktop user has an idea to share with the Marketing Team. Because the folder structure remains in place, the user creates a file named <code>An Idea</code> in the <code>Marketing Net Folder</code>.</p> <p>An overlay icon indicates that the file is not yet synchronized. However, when the user logs back in to ESN, the <code>An Idea</code> file will be copied to the back-end file server, the file will be marked as <b>Available Offline</b>, and the overlay icon will reflect that the file is in sync with the file server.</p>

## Net Folder Synchronization Is Crucial

Although visibility no longer requires downloading files to the local drives, Net Folder synchronization remains a critical factor because desktop users can only see files and folders that have had their metadata synchronized.

- ♦ **Manual Synchronization (Synchronize Now):** If allowed by an administrator for a given Net Folder, this options lets desktop users synchronize with back-end file servers on an as-needed basis.



- ♦ **Net Folder Synchronization Schedules:** Regularly scheduled Net Folder synchronizations can keep files and folders in sync with ESN, especially if file server content is fairly static.
- ♦ **Just-in-Time Synchronization (JITS):** Prior to ESN 2.0, JITS had very limited applicability to the desktop applications, but now it can be very valuable for browsing, especially when Net Folder content is constantly changing. See [“Desktop Browsing Triggers JITS”](#).

## Desktop Browsing Triggers JITS

Starting with ESN 2.0, if Just-in-Time Synchronization (JITS) is enabled for a Net Folder, then browsing in that Net Folder from a desktop, a mobile device, or a web browser always triggers JITS.

When a user browses to a folder, JITS is triggered, and the metadata for everything in the folder is synchronized with the back-end file server, stored in the SQL database, and processed by the ESN Search appliance.

For help with evaluating whether to enable JITS on a Net Folder, see [“Net Folder Synchronization Types”](#) in the *ESN 1.0 Planning Your ESN Deployment—Best Practices*.

## Files on Demand

The following points summarize what Files on Demand means:

- ♦ **Downloading for Visibility Is Not Required:** Before ESN 2.0, files and folders had to be downloaded to the local hard drive to be visible.

ESN 2.0 desktop applications are integrated with Windows Explorer and Mac Finder so that ESN users see an integrated view of downloaded files and file pointers derived from metadata synchronization (see [“How ESN Makes Files and Folders Visible to Users”](#) on page 103).

- ♦ **Folder Structures Are Always Retained:** Whether users are online with ESN or logged out, the folder structures in Net Folders, Home Folders, and Personal Storage are always retained.

While users are logged in, folders are synchronized to local hard drives and kept in sync with back-end file servers and the ESN appliance.

As users work offline, they see the same folder structure as when they are online. Therefore, they can therefore create new files, move files and folders, and make other changes that are automatically synchronized when they log back in to ESN.

- ♦ **My Files—Personal Storage Files Are Automatically and Immediately Visible:** Because personal storage files and folders reside on the ESN appliance, they are automatically visible in Windows Explorer and Mac Finder in the **My Files** folder. Metadata synchronization is not required.
- ♦ **Net Folders (Including Home Folders) Are Visible After Metadata Synchronization:** After files and folders are [synchronized](#), and when ESN users are logged in to ESN, all Net Folder-based files and folders that a desktop user is authorized to view are automatically [visible](#) in Windows Explorer and Mac Finder under **Net Folders**.
- ♦ **File Pointers and Files Appear Together:** The ESN 2.0 desktop applications provide a consolidated view that includes file pointers that are generated from file metadata synchronized to ESN and actual files in ESN folders on workstation hard drives.
- ♦ **ESN Minimizes Local Disk Space Usage:** Initially, all files and folders are **Online Only**, meaning that the local disk contains only file pointers that link to the ESN appliance and in turn, to back-end file servers.
- ♦ **Full Browsing Is Supported:** When users are logged in to ESN, they can browse through their assigned files and folders as though they were all physically present on local hard drives.

- ♦ **Users Control Which Files Are Downloaded:** Files are downloaded only when a local copy is needed.

This saves network bandwidth, streamlines file synchronization, and reduces workstation disk space requirements.

Users can download files to their local hard drives in one of two ways:

- ♦ They can open them in an application
- Or
- ♦ They can mark them as “Available Offline”

## A Good Replacement for Mapped Drives

For many traditional Micro Focus desktop users, the files-on-demand features in Windows Explorer and Mac Finder provide an excellent alternative to traditional mapped drives.

- ♦ **Full Browsing Support:** Users can browse network file systems just like with mapped drives.
- ♦ **Data Synchronization:** Changes made by desktop users and by others on the back-end file server are kept in sync.
- ♦ **Conflict Resolution:** If simultaneous changes by multiple users cause copies to get out of sync, ESN’s file-conflict-handling facilitates reconciling the differences.

# 15 Network Time and ESN

ESN 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.



# 16 Users and Groups in ESN

- ♦ [“Leveraging the Built-in Security of eDirectory and Active Directory” on page 113](#)
- ♦ [“Provisioning Users and Groups” on page 113](#)
- ♦ [“User Visibility” on page 117](#)

## Leveraging the Built-in Security of eDirectory and Active Directory

Micro Focus recommends that you leverage the security features of eDirectory and Active Directory whenever possible.

Both of these directory services have extensive and proven experience with authorization and authentication services. They also provide security features, such as intruder detection, forced complex passwords, password expiration, password history, and so on.

Local user accounts that you create through ESN in the SQL database are certainly not insecure, but neither are they protected by the security features mentioned above.

## Provisioning Users and Groups

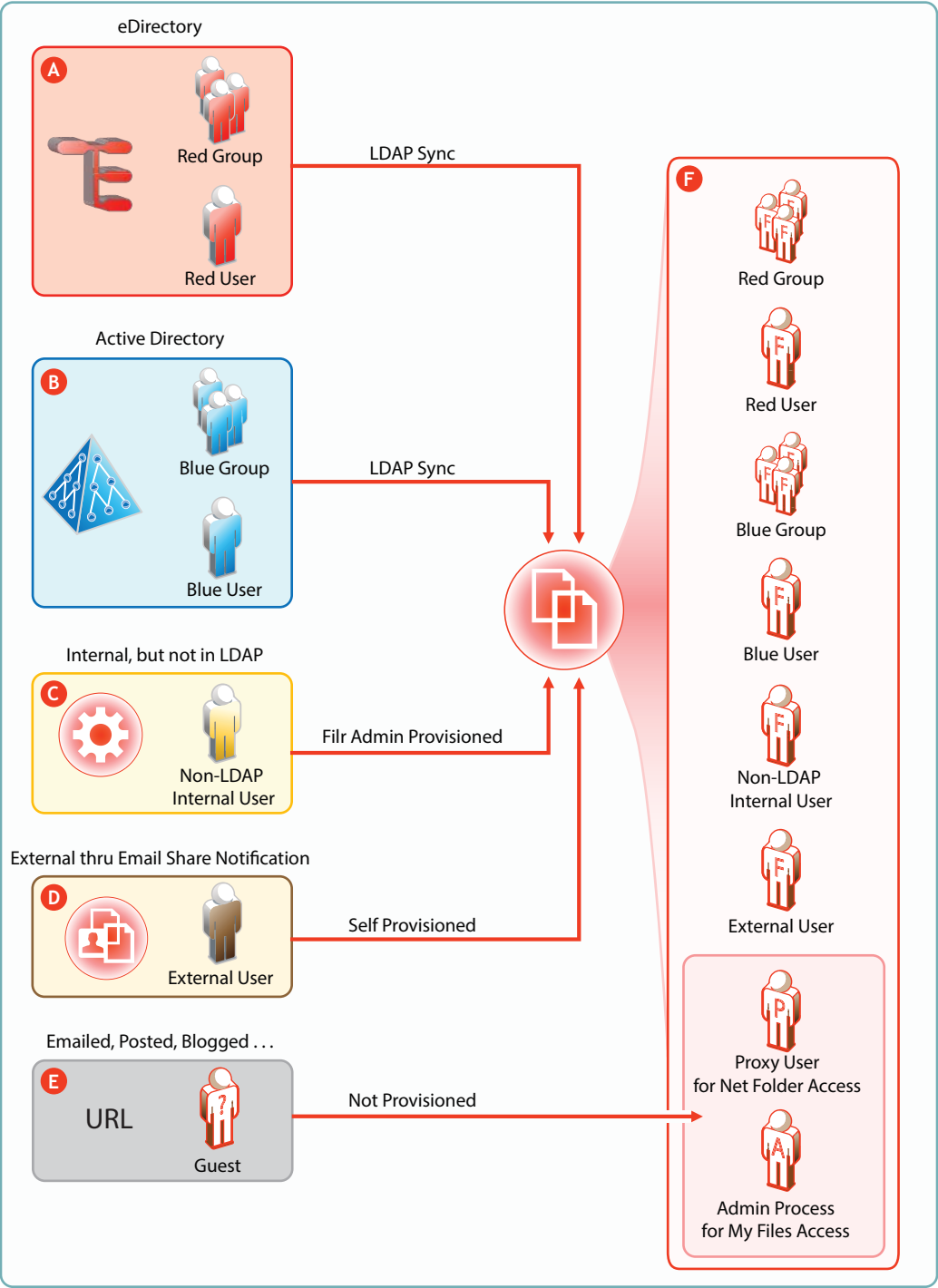
For users to access ESN, they must be provisioned on the ESN system. They can then be assigned [access rights](#).

- ♦ [“User Provisioning Overview” on page 113](#)
- ♦ [“LDAP Proxy User Role and Rights” on page 115](#)
- ♦ [“Types of ESN Users” on page 116](#)
- ♦ [“The Role of Groups in ESN” on page 117](#)

## User Provisioning Overview

[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 ESN.

Figure 16-1 Provisioning Users and Groups



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

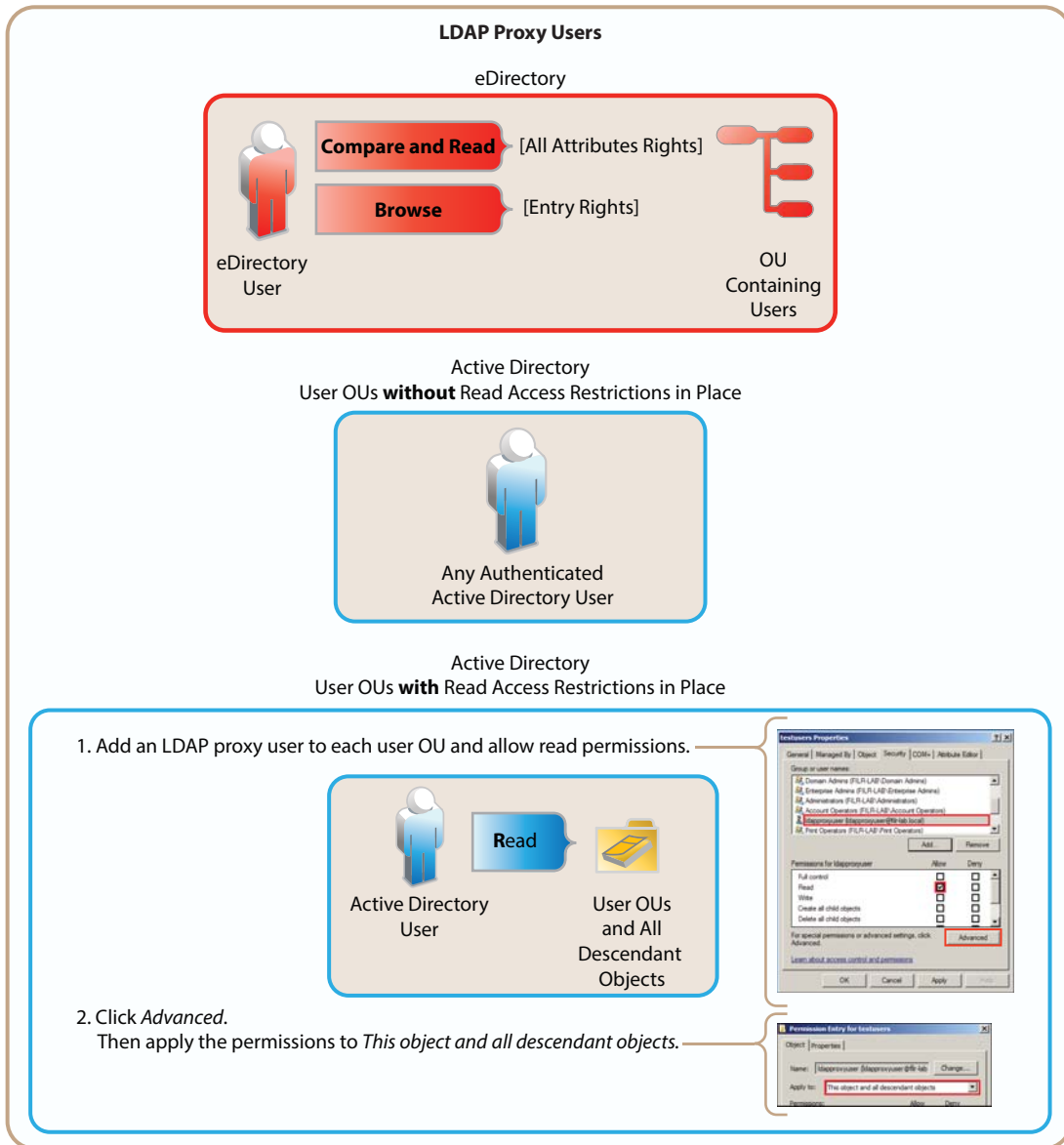
## LDAP Proxy User Role and Rights

ESN synchronizes LDAP users by leveraging proxy users in the targeted LDAP directories that have sufficient rights to read the user and group information required by ESN.

Currently, eDirectory and Active Directory are supported as LDAP identity stores.

The rights required for LDAP synchronization are platform-specific, and for Active Directory they vary depending on whether read access restrictions are in place, as illustrated in [Figure 16-2](#).

**Figure 16-2** Rights Required for LDAP Proxy Users



## Types of ESN Users

- ♦ **LDAP Synchronized Users and Groups:** Can be synchronized from an internal LDAP identity store.

After users and groups are provisioned through an initial synchronization, they have accounts in ESN that correspond to their original identities, but these are only secondary. By leveraging the rights of one or more **LDAP proxy users** in the directory, ESN synchronizes regularly to keep authentication credentials current, update changes in home directory and file system rights assignments, and so on.

- ♦ **ESN Admin Created Users and Groups:** Can be created by ESN administrators.

Admin-created groups are managed as part of the ESN system. They can be assigned personal storage, but access to Net Folders and other users' home directories happens only through ESN-based sharing.



- ♦ **External, Self-Provisioned Users:** Can be invited to participate through share invitations.

When they respond to the invitations, they are given the opportunity to self-provision an account on the ESN server.

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

- ♦ **Guest Users:** When ESN administrators allow it, ESN users can share the URLs to files in Net Folders and My Files, making them available to the general public. Those who access files in this way are referred to as “Guest” users. Guest users are not provisioned and are anonymous from a ESN perspective.

For example, a city government might give ESN user accounts to only key city knowledge workers and allow other city workers and regular citizens to access the site to see a listing of upcoming events, read city news, report complaints, and so forth.

When Guest users log in they can:

- ♦ See the **Shared with Me** tab with all files and folders that are shared with the public.
- ♦ Search within publicly shared files and folders.
- ♦ Comment on items unless the **Guest access is read only** option is selected in [Web Application configuration settings](#).

## The Role of Groups in ESN

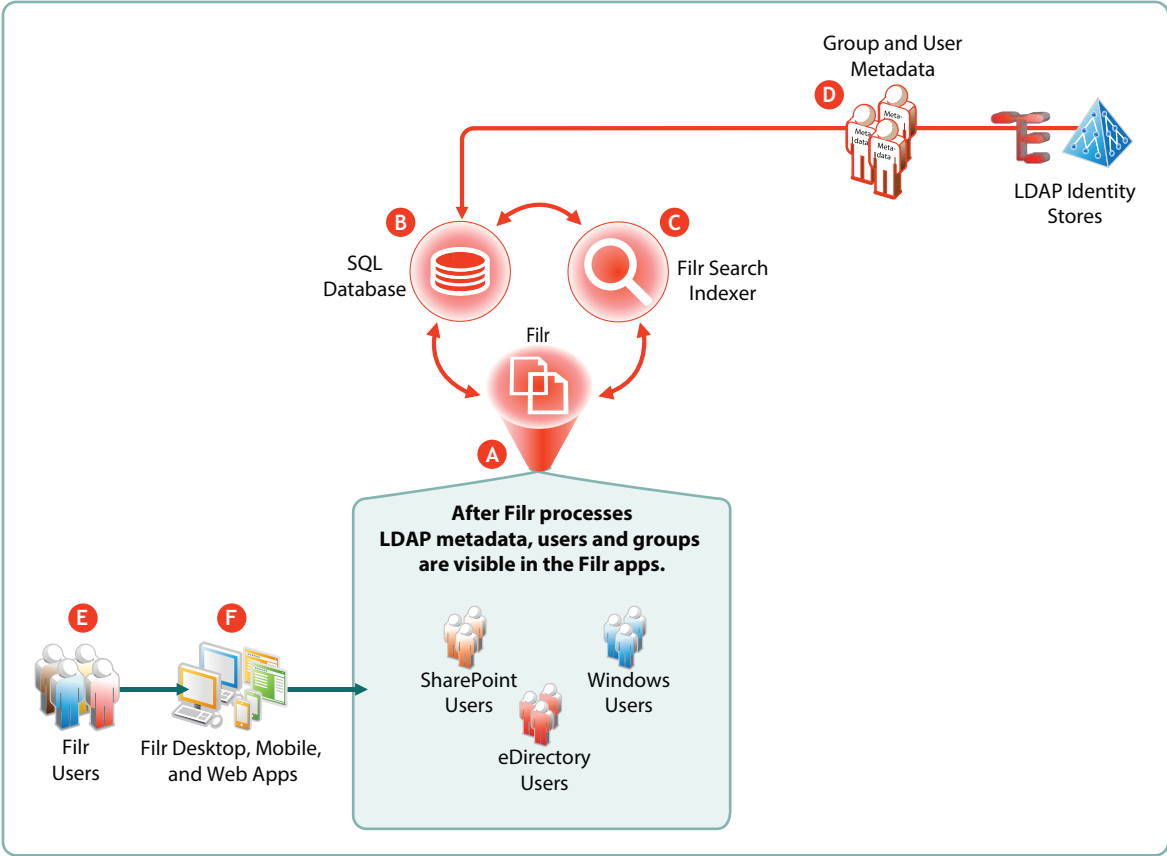
Users can be assigned rights on ESN as members of groups, including as members of either the `All Internal Users` group or the `All External Users` group, which includes those whose accounts were created as a result of an email share invitation.

## User Visibility

- ♦ [“How ESN Makes LDAP Users and Groups Visible” on page 118](#)
- ♦ [“Key Points About User Visibility in ESN” on page 119](#)
- ♦ [“How User-Visibility Limitations Work” on page 119](#)

# How ESN Makes LDAP Users and Groups Visible

Figure 16-3 ESN Processes Metadata to LDAP Users and Groups Visible to ESN Users



Letter	Details
A	ESN directs and coordinates the processing of metadata for users and groups.
B	ESN retrieves and stores the metadata in the SQL appliance or server.
C	After metadata retrieval, ESN directs the ESN Search (Lucene) indexer to process it for viewing in the ESN apps.
D	Organization Users and groups are either synchronized from the LDAP identity stores (shown) or created directly in ESN (not shown).
E	After the metadata is processed for users and groups, ESN users can see them in the ESN apps (Letter G).
F	ESN apps for desktops, mobile devices, and web access let ESN users interact with the users and groups that are made accessible through ESN.

# Key Points About User Visibility in ESN

The following are key points to consider and understand regarding user visibility in ESN.

- ♦ **LDAP Synchronization Is Key:** As explained in [“How ESN Makes LDAP Users and Groups Visible” on page 118](#), LDAP metadata must be imported and processed to make user and group objects visible.

After the initial LDAP import, user and group metadata in ESN must be kept in sync with back-end LDAP identity stores, as explained in [“Synchronization Process Overview” on page 97](#).

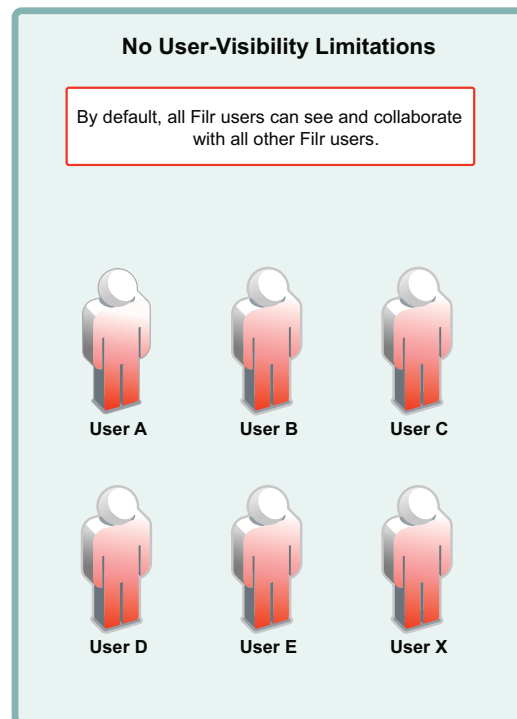
- ♦ **All ESN System Components Must Online:** For ESN users to appear in the various dialogs and lists, the ESN appliance, the ESN Search appliance, and the SQL database must all be online.
- ♦ **Who Can See Whom:** For various reasons, such as security, large numbers of users, and so on, it might be necessary to limit user visibility.

Starting in ESN 2.0, administrators can restrict which users can see each other. See [“User Visibility”](#) in the [ESN 1.0: Administrative UI Reference](#).

- ♦ **User-Visibility Is Either Restricted or Not** From a user-visibility standpoint, there are only two conditions:
  - ♦ **Limited Visibility:** A user account has a user-visibility limitation applied; therefore, the user can see only other members of the groups it belongs to.
  - ♦ **Unlimited Visibility:** Either the user’s account has no user-visibility limitation applied, or an override is in place. In both cases, the user can see all other users on the system.
  - ♦ **Group Visibility:** Cannot be restricted; all groups are visible to all users.

## How User-Visibility Limitations Work

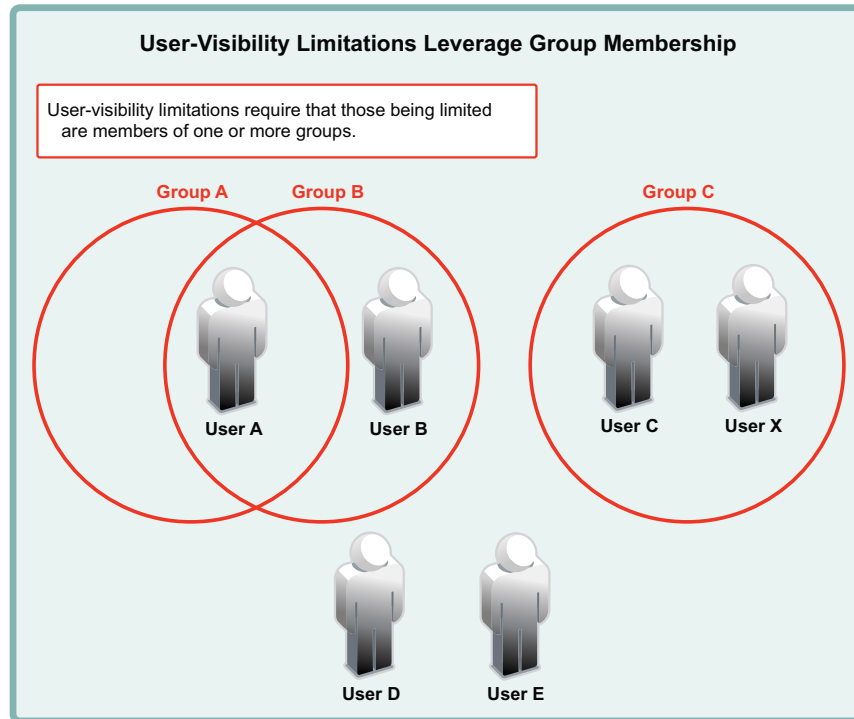
1. In the default state, there are no user-visibility limitations in ESN.



2. User-visibility functionality relies on group membership.

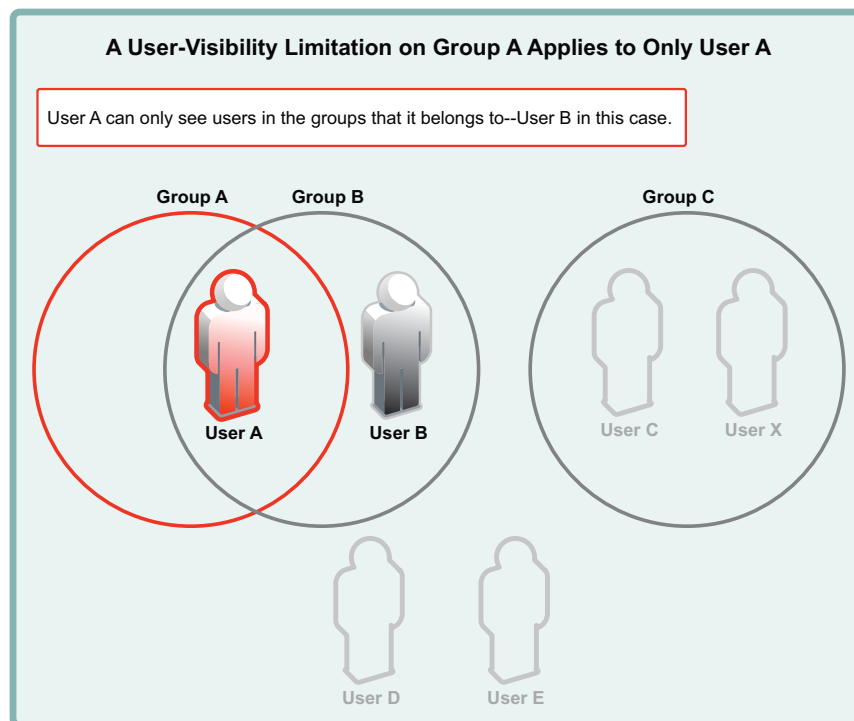
In the figure below

- ♦ Group A contains User A
- ♦ Group B contains User A and User B.
- ♦ Group C contains User C and User X.
- ♦ Users D and E are not members of a group.

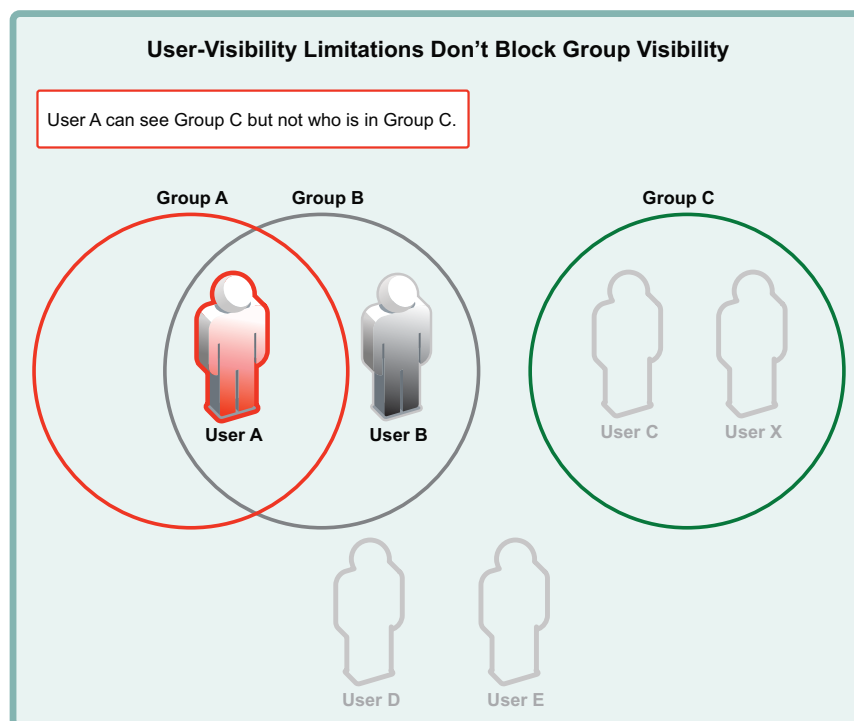


3. ESN admins apply user-visibility limitations to groups. Users within the affected groups can then only see other members of the groups that they belong to.

For example, after a user-visibility limitation is applied to Group A, User A can only see User B. (User B's ability to see other users is not affected because User B is not in Group A.)

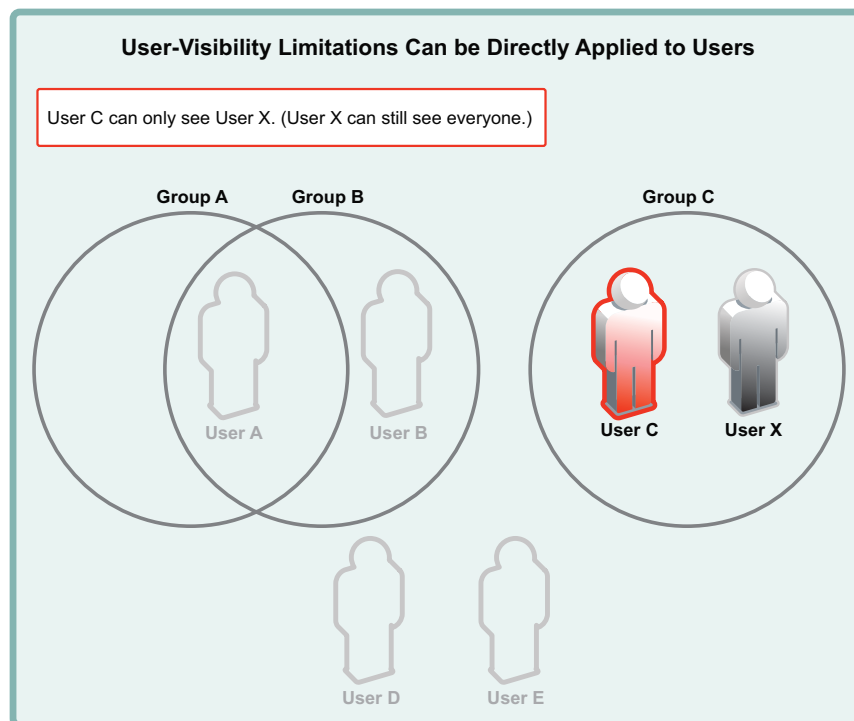


4. You cannot restrict group visibility.

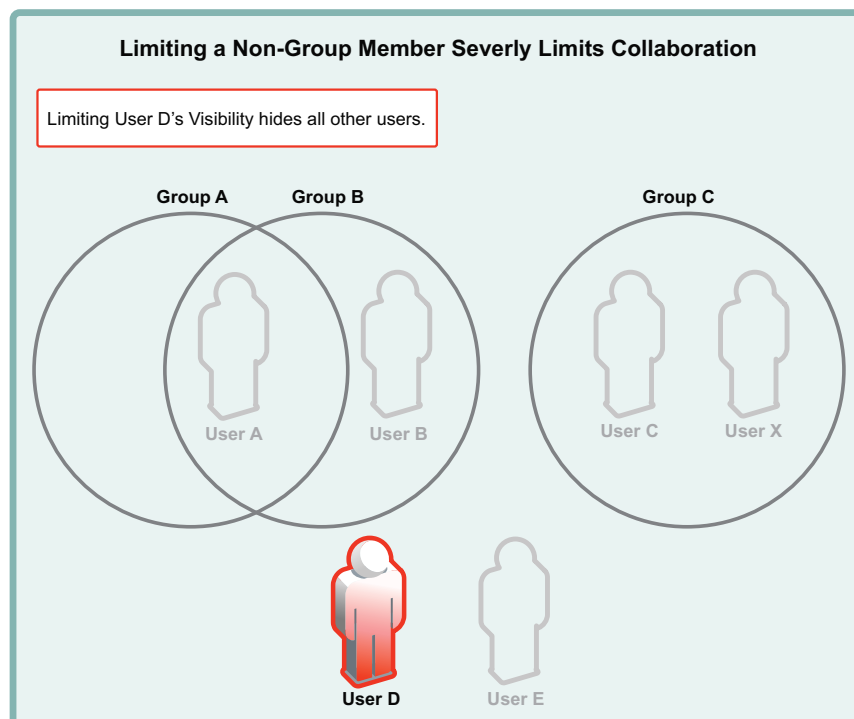


5. You can apply user-visibility limitations to individual users.

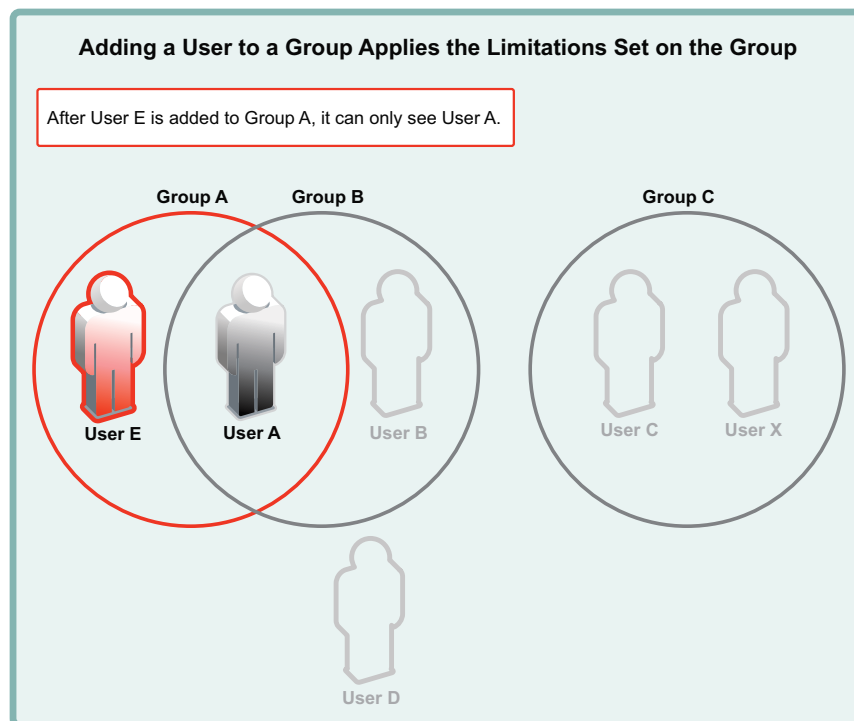
For example, an administrator might restrict User C rather than Group C. User C could then only see User X. (User X, on the other hand, could still see all users on the system.)



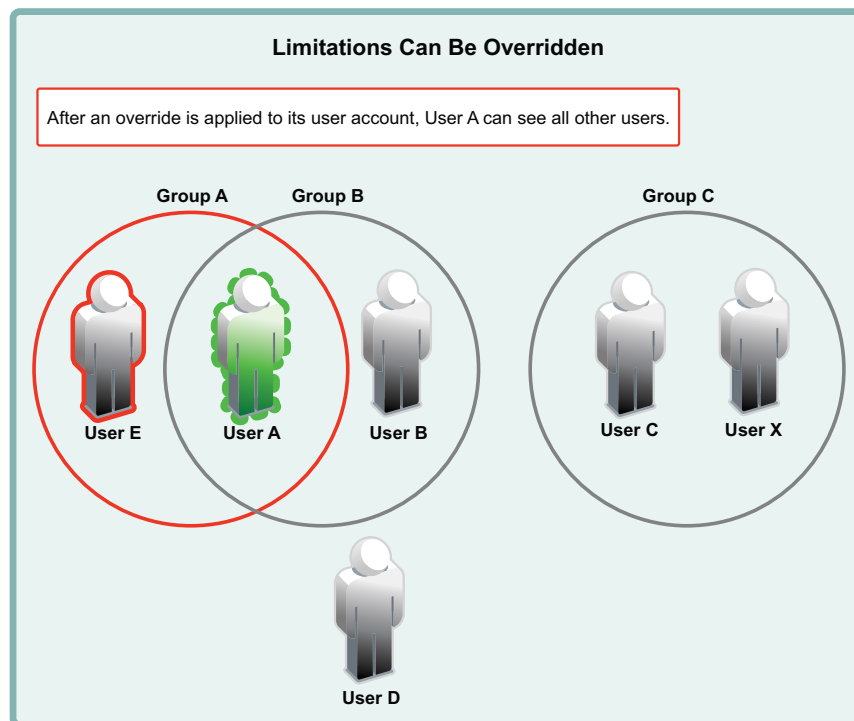
6. A user with user-visibility limitations applied who is not a member of a group, cannot see any other users on the system. Of course, the user can still see all groups, but not being able to see user comments, etc. inhibits effective collaboration through ESN.



7. Adding a user to a group immediately applies the group's visibility limitations. For example, if User E is added to Group A, its user-visibility is immediately limited to seeing only User A.



8. Applying an override to a user account lifts all user-visibility limitations from that user account.



9. Applying new user-visibility limitations doesn't affect overrides. User B is now restricted, but User A can still see all other users.

