

Test Lab Guide: Windows Server 2012 Base Configuration

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Abstract

This Microsoft Test Lab Guide (TLG) provides step-by-step instructions to create the Windows Server 2012 Base Configuration test lab, using computers running Windows Server 2012 and Windows 8. With the resulting test lab environment, you can build test labs based on other TLGs from Microsoft, TLG extensions in the TechNet Wiki, or a test lab of your own design that can include Microsoft or non-Microsoft products. For a test lab based on physical computers, you can image the drives for future test labs. For a test lab based on virtual machines, you can create snapshots of the base configuration virtual machines. This enables you to easily return to the base configuration test lab, where most of the routine infrastructure and networking services have already been configured, so that you can focus on building a test lab for the product, technology, or solution of interest.



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# Introduction

Test Lab Guides (TLGs) allow you to get hands-on experience with new products and technologies using a pre-defined and tested methodology that results in a working configuration. When you use a TLG to create a test lab, instructions tell you what servers to create, how to configure the operating systems and platform services, and how to install and configure any additional products or technologies. A TLG experience enables you to see all of the components and the configuration steps on both the front-end and back-end that go into a single- or multi-product or technology solution.

A challenge in creating useful TLGs is to enable their reusability and extensibility. Because creating a test lab can represent a significant investment of time and resources, your ability to reuse and extend the work required to create test labs is important. An ideal test lab environment would enable you to create a basic lab configuration, save that configuration, and then build out multiple test labs in the future by starting with that basic configuration.

The purpose of this TLG is to enable you to create the Windows Server 2012 Base Configuration test lab, upon which you can build a test lab based on other Windows Server 2012-based TLGs from Microsoft, TLG extensions in the TechNet Wiki, or a test lab of your own design that can include Microsoft or non-Microsoft products. See [Windows Server 2012 Test Lab Guides](http://social.technet.microsoft.com/wiki/contents/articles/7807.windows-server-2012-test-lab-guides-en-us.aspx) for more information.

Depending on how you deploy your test lab environment, you can image the drives for the Windows Server 2012 Base Configuration test lab if you are using physical computers or you can create snapshots of the test lab virtual machines. This enables you to easily return to baseline configuration where most of the routine client, server, and networking services have already been configured so that you can focus on building out a test lab for the products or technologies of interest. For this reason, make sure that you perform a disk image on each computer if you’re using physical computers, or perform virtual machine snapshots if you are using virtual machines after completing all the steps in this TLG.

The Windows Server 2012 Base Configuration TLG is just the beginning of the test lab experience. Other Windows Server 2012-based TLGs or test lab extensions focus on Microsoft products or platform technologies, but all of them use this Windows Server 2012 Base Configuration TLG as a starting point. For a description of the different types of TLG content, see [Test Lab Guides](http://social.technet.microsoft.com/wiki/contents/articles/test-lab-guides.aspx).

## In this guide

This document contains instructions for setting up the Windows Server 2012 Base Configuration test lab by deploying four server computers running Windows Server 2012 Standard and one client computer running Windows 8 Enterprise. The resulting configuration simulates a private intranet and the Internet.

Important!

The following instructions are for configuring the Windows Server 2012 Base Configuration test lab. Individual computers are needed to separate the services provided on the network and to clearly show the desired functionality. This configuration is neither designed to reflect best practices nor does it reflect a desired or recommended configuration for a production network. The configuration, including IP addresses and all other configuration parameters, is designed only to work on a separate test lab network. For information about deploying Windows Server 2012 in a pilot or production environment, see [Install and Deploy Windows Server 2012](http://technet.microsoft.com/en-us/library/hh831620.aspx).

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| Note: | If you are able to work from a computer-based copy of this document during the lab exercises and you are running virtual machines in Hyper-V, use the following instructions to leverage the Hyper-V clipboard integration feature to paste commands. This will minimize potential errors with mistyped command strings.   1. Highlight and right-click a command from this document listed in **bold** text. 2. Click **Copy**. 3. From the virtual machine menu bar, click **Clipboard**, and then click **Type clipboard text**. |

## Test lab overview

The Windows Server 2012 Base Configuration test lab consists of the following:

 One computer running Windows Server 2012 Standard named DC1 that is configured as an intranet domain controller, Domain Name System (DNS) server, and Dynamic Host Configuration Protocol (DHCP) server.

 One intranet member server running Windows Server 2012 Standard named APP1 that is configured as a general application and web server.

 One member client computer running Windows 8 Enterprise named CLIENT1 that will switch between Internet and intranet subnets.

 One intranet member server running Windows Server 2012 Standard named EDGE1 that is configured as an Internet edge server.

 One standalone server running Windows Server 2012 Standard named INET1 that is configured as an Internet DNS server, web server, and DHCP server.

The Windows Server 2012 Base Configuration test lab consists of two subnets that simulate the following:

* A private intranet, referred to as the Corpnet subnet (10.0.0.0/24).
* The Internet, referred to as the Internet subnet (131.107.0.0/24), separated from the Corpnet subnet by EDGE1.

Computers on each subnet connect using a physical hub, switch, or virtual switch. See Figure 1 for the configuration of the Windows Server 2012 Base Configuration test lab.

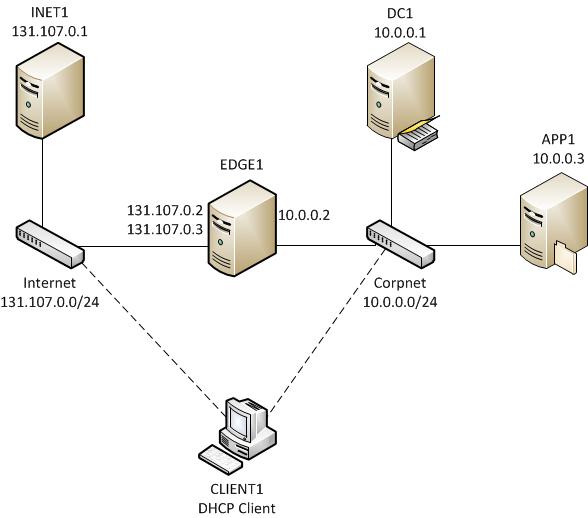


Figure 1: Windows Server 2012 Base Configuration test lab

This document describes how to build out the Windows Server 2012 Base Configuration test lab in two sections:

* [Steps for configuring the Corpnet subnet](#_Steps_for_Configuring) (DC1, APP1, and CLIENT1)
* [Steps for configuring the Internet subnet](#_Appendix) (EDGE1 and INET1)

There are some TLGs that require only the Corpnet subnet. However, it is strongly recommended that you build out both subnets if you ever plan to test technologies, products, or solutions that include access to Corpnet servers and services from the Internet. The Windows Server 2012 Base Configuration test lab environment consisting of both subnets can be saved and reused for other TLGs. By building out both the Corpnet and Internet subnets, you will have a reusable snapshot of the entire Windows Server 2012 Base Configuration test lab that can be used for many TLGs, which have this starting test lab in a unified and consistent state.

## Hardware and software requirements

The following are the minimum required components of the test lab:

 The product disc or files for Windows Server 2012 Standard. For a trail version, see [Download Windows Server 2012](http://technet.microsoft.com/en-US/evalcenter/hh670538.aspx?ocid=&wt.mc_id=TEC_108_1_33).

 The product disc or files for Windows 8 Enterprise. For a trail version, see [Download Windows 8 Enterprise Evaluation](http://technet.microsoft.com/en-us/evalcenter/hh699156.aspx?ocid=wc-tn-wctc).

 Four computers that meet the [minimum hardware requirements for Windows Server 2012 Standard](http://technet.microsoft.com/en-us/library/jj134246.aspx). One of these computers (EDGE1) has two network adapters installed.

 One computer that meets the [minimum hardware requirements for Windows 8 Enterprise](http://windows.microsoft.com/en-US/windows-8/system-requirements).

* If you wish to deploy the Windows Server 2012 Base Configuration test lab in a virtualized environment, your virtualization solution must support Windows Server 2012 64-bit virtual machines. The server hardware must support the amount of RAM required to run the virtual operating systems included in the Windows Server 2012 Base Configuration test lab and any other virtual machines that may be required by additional TLGs.

If you are using Hyper-V in Windows Server 2012 as your virtualization solution, see [Hosting the Windows Server 2012 Base Configuration test lab with Windows Server 2012 Hyper-V](http://social.technet.microsoft.com/wiki/contents/articles/16277.hosting-the-windows-server-2012-base-configuration-test-lab-with-windows-server-2012-hyper-v.aspx) for additional guidance.

Important

Run Windows Update on all computers or virtual machines either during the installation or immediately after installing the operating systems. After running Windows Update, you can isolate your physical or virtual test lab from your production network.

## Changes from the Windows Server 2008 R2 Base Configuration

The following are the changes from the previous [Test Lab Guide: Base Configuration](http://go.microsoft.com/fwlink/?LinkId=198140), which uses computers running Windows Server 2008 R2 and Windows 7:

* The configuration of a simplified public key infrastructure (PKI) has been removed. You can add this with the [Basic PKI for the Windows Server 2012 Base Configuration](http://go.microsoft.com/fwlink/?LinkId=244229) TLG mini-module.
* Windows PowerShell command equivalents are now available in addition to the UI-based procedures.

# Steps for Configuring the Corpnet Subnet

There are three steps to setting up the Corpnet subnet of the Windows Server 2012 Base Configuration test lab.

1. Configure DC1.

2. Configure APP1.

3. Configure CLIENT1.

Note

You must be logged on as a member of the Domain Admins group or a member of the local Administrators group on each computer to complete the tasks described in this guide.

The following sections provide details about how to perform these steps.

## Step 1: Configure DC1

DC1 provides the following services:

 A domain controller for the corp.contoso.com Active Directory Domain Services (AD DS) domain

 A DNS server for the corp.contoso.com DNS domain

 A DHCP server for the Corpnet subnet

DC1 configuration consists of the following:

 Install the operating system

 Configure TCP/IP

 Install Active Directory and DNS

 Install DHCP

 Create a user account in Active Directory

### Install the operating system on DC1

First, install Windows Server 2012 Standard as a standalone server.

To install the operating system on DC1

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| 1. Start the installation of Windows Server 2012 Standard.  2. Follow the instructions to complete the installation, specifying Windows Server 2012 Standard (full installation) and a strong password for the local Administrator account. Log on using the local Administrator account.  3. Connect DC1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012.  4. Connect DC1 to the Corpnet subnet. |

### Configure TCP/IP properties on DC1

Next, configure the TCP/IP protocol with a static IP address of 10.0.0.1 and the subnet mask of 255.255.255.0.

[Do this step using Windows PowerShell](#PS1)

To configure TCP/IP on DC1

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| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile. Note that the "Ethernet" interface name may be different on your computer.   Note  The link may not immediately appear. Wait for the network interfaces to be enumerated.   1. In **Network Connections**, right-click **Ethernet**, and then click **Properties**. 2. Click Internet Protocol Version 4 (TCP/IPv4), and then click Properties. 3. Select Use the following IP address. In IP address, type 10.0.0.1. In Subnet mask, type 255.255.255.0. Select Use the following DNS server addresses**. In Preferred DNS server, type 127.0.0.1.** 4. Click **OK** and then close the Ethernet Properties dialog. 5. Close the Network Connections window. 6. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile. 7. On the **Computer Name** tab of the System Properties dialog, click **Change**. 8. In **Computer name**, type **DC1**, click **OK** twice, and then click **Close**. When you are prompted to restart the computer, click **Restart Now**.   10. After restarting, logon using the local Administrator account. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png**Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability. Note that the "Ethernet" interface name may be different on your computer. Use the **ipconfig /all** command to list the interfaces.    **New-NetIPAddress 10.0.0.1 -InterfaceAlias "Ethernet" -PrefixLength 24**  **Set-DnsClientServerAddress -InterfaceAlias "Ethernet" -ServerAddresses 127.0.0.1**  **Rename-Computer DC1**  **Restart-Computer** |

### Configure DC1 as a domain controller and DNS server

Next, configure DC1 as a domain controller and DNS server for the corp.contoso.com domain.

[Do this step using Windows PowerShell](#PS2)

To configure DC1 as a domain controller and DNS server

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| 1. Launch **Server Manager**.  2. On the Dashboard screen, under **Configure this local server**, click **Add roles and features**.  3. Click **Next** three times to get to the server role selection screen.  4. In the **Select Server Roles** dialog, select **Active Directory Domain Services**. Click **Add Features** when prompted, and then click **Next**.  5. In the **Select features** dialog, click **Next**.  6. In the **Active Directory Domain Services** dialog, click **Next**.  7. In the **Confirm installation selections** dialog, click **Install.** Wait for the installation to complete.  8. In the **Installation Progress** dialog, click the **Promote this server to a Domain Controller** link.  **Note:** If you close the "Installation Progress" dialog before it presents the promotion link, click the gray **Tasks** flag in the upper right section of **Server Manager.** When the installation is complete you will seethe **Promote this server to a Domain Controller** link.  9. In the **Deployment Configuration** dialog, select **Add a new forest**. In the **Root domain name** field, type **corp.contoso.com**. Click **Next**.  10. In the **Domain Controller Options** dialog, leave the default values, specify a strong DSRM password twice, and then click **Next** four times to accept default settings for DNS, NetBIOS, and directory paths.  11. In the **Review Options** dialog, review your selections and then click **Next**.  **Note:** You can also click the **View script** button to review and save the PowerShell commands that Server Manager will run during DC Promotion.  12. In the **Prerequisites Check** dialog, allow the validation to complete and verify that no errors are reported. Since this is the first DNS server deployment in the forest, you can safely ignore all warnings regarding DNS delegation. Click **Install** to start the domain controller promotion. Allow the installation to complete.  13. Allow the domain controller to restart. After the server restarts, logon using the CORP\Administrator credentials. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure.    **Install-WindowsFeature AD-Domain-Services -IncludeManagementTools**  **Install-ADDSForest -DomainName corp.contoso.com** |

Note

Windows PowerShell in Windows Server 2012 implements dynamic module loading. Using the **Import-Module** cmdlet is no longer required; instead, simply invoking the cmdlet, alias, or function automatically loads the module. To see loaded modules, use the **Get-Module** cmdlet.

### Install and configure DHCP on DC1

Next, configure DC1 as a DHCP server so that CLIENT1 can automatically configure itself when it connects to the Corpnet subnet.

[Do this step using Windows PowerShell](#PS3)

To install and configure the DHCP server role on DC1

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| 1. In the **Dashboard** console of Server Manager, under **Configure this local server**, click **Add roles and features**. 2. Click **Next** three times to get to the server role selection screen. 3. In the **Select server roles** dialog, select **DHCP Server**, click **Add Features** when prompted, and then click **Next**. 4. In the **Select features** dialog, click **Next**. 5. Click **Next** on the DHCP Server screen, and then click **Install**. 6. Allow the installation to complete, and then in the Results window, click the link for **Complete DHCP configuration**. 7. In the DHCP Post-Install configuration wizard, click **Next**, and then click **Commit**. 8. On the Summary page, click **Close**. 9. In the Add Roles and Features Wizard, click **Close**. 10. From the **Start** screen, click **DHCP**. 11. In the DHCP console tree, expand **dc1.corp.contoso.com**, and click **IPv4**. Right-click **IPv4**, and click **New Scope**. 12. Click **Next** in the New Scope Wizard. 13. Type **Corpnet** for scope name, and then click **Next**. 14. Next to **Start IP Address**, type **10.0.0.100**, next to **End IP Address**, type **10.0.0.200**, and next to **Subnet Mask**, type **255.255.255.0**. 15. Click **Next** eight times to accept all scope option default settings, and then click **Finish**. 16. Close the DHCP Manager console. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability.    **Install-WindowsFeature DHCP -IncludeManagementTools**  **Add-DhcpServerv4Scope -name "Corpnet" -StartRange 10.0.0.100 -EndRange 10.0.0.200 -SubnetMask 255.255.255.0**  **Set-DhcpServerv4OptionValue -DnsDomain corp.contoso.com -DnsServer 10.0.0.1**  **Add-DhcpServerInDC -DnsName dc1.corp.contoso.com** |

### Create a user account in Active Directory on DC1

Next, create a user account in Active Directory that will be used when logging in to CORP domain member computers.

[Do this step using Windows PowerShell](#PS4)

To create a user account in Active Directory

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| 1. From the **Start** screen, click **Active Directory Administrative Center**. 2. In the console tree, click the arrow to expand **corp (local)**, and then double-click **Users**. This adds Users as a recent navigation link in the console tree. 3. In the **Tasks** pane, click **New**, and then click **User**. 4. In the Create User dialog, type **User1** next to **Full name** and type **User1** next to **User SamAccountName logon: corp\**. 5. In Password, type the password that you want to use for this account, and in Confirm password, type the password again. 6. Under Password options, select **Other password options**, and select **Password never expires**. 7. Scroll down to access the **Member of** section of the Create User dialog, and click **Add**. Type **Domain Admins; Enterprise Admins**, and then click **OK**. 8. Click **OK** to close the Create User dialog. 9. Exit the Active Directory Administrative Center. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability. Note that the first command results in a prompt to supply the User1 account password.    **New-ADUser -SamAccountName User1 -AccountPassword (read-host "Set user password" -assecurestring) -name "User1" -enabled $true -PasswordNeverExpires $true -ChangePasswordAtLogon $false**  **Add-ADPrincipalGroupMembership -Identity "CN=User1,CN=Users,DC=corp,DC=contoso,DC=com" -MemberOf "CN=Enterprise Admins,CN=Users,DC=corp,DC=contoso,DC=com","CN=Domain Admins,CN=Users,DC=corp,DC=contoso,DC=com"** |

## Step 2: Configure APP1

APP1 provides web and file sharing services. APP1 configuration consists of the following:

 Install the operating system.

 Configure TCP/IP.

 Join the computer to the domain.

 Install the Web Server (IIS) role.

 Create a shared folder.

### Install the operating system on APP1

 To install the operating system on APP1

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| 1. Start the installation of Windows Server 2012 Standard.  2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account.  3. Connect APP1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012.  4. Connect APP1 to the Corpnet subnet. |

### Configure TCP/IP properties on APP1

[Do this step using Windows PowerShell](#PS5)

To configure TCP/IP properties on APP1

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| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile. Note that the "Ethernet" interface name may be different on your computer.  2. In **Network Connections**, right-click **Ethernet**, and then click **Properties**.  3. Click Internet Protocol Version 4 (TCP/IPv4), and then click Properties.  4. Select Use the following IP address. In IP address, type 10.0.0.3. In Subnet mask, type 255.255.255.0.  5. Select Use the following DNS server addresses. In Preferred DNS server, type 10.0.0.1.  6. Click **OK**, and then click **Close**. Close the **Network Connections** window.  7. From the **Start** screen, type **cmd**, and then press **ENTER**.  8. To check name resolution and network communication between APP1 and DC1, type **ping dc1.corp.contoso.com** in the command prompt windowand press **ENTER**.  9. Verify that there are four replies from 10.0.0.1.  10. Close the Command Prompt window. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability. Note that the "Ethernet" interface name may be different on your computer. Use **ipconfig /all** to list the interfaces.    **New-NetIPAddress 10.0.0.3 -InterfaceAlias "Ethernet" -PrefixLength 24**  **Set-DnsClientServerAddress -InterfaceAlias "Ethernet" -ServerAddresses 10.0.0.1** |

### Join APP1 to the CORP domain

[Do this step using Windows PowerShell](#PS6)

To join APP1 to the CORP domain

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| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile. 2. In the System Properties dialog box, on the **Computer Name** tab, click Change. 3. In Computer Name, type **APP1**. Under Member of, click Domain, and then type **corp.**contoso.com. 4. Click OK. 5. When you are prompted for a user name and password, type User1 and its password, and then click OK. 6. When you see a dialog box welcoming you to the corp.contoso.com domain, click OK. 7. When you are prompted that you must restart the computer, click OK. 8. On the System Properties dialog box, click Close. 9. When you are prompted to restart the computer, click Restart Now. 10. After the computer restarts, click the Switch User arrow icon, then click Other User and log on to the CORP domain with the User1 account. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Note that you must supply the User1 account domain credentials after entering the Add-Computer command.    **Add-Computer -NewName APP1 -DomainName corp.contoso.com**  **Restart-Computer** |

### Install the Web Server (IIS) role on APP1

Next, install the Web Server (IIS) role to make APP1 a web server.

[Do this step using Windows PowerShell](#PS7)

To install the Web Server (IIS) server role

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| 1. In the **Dashboard** console of Server Manager, click **Add roles and features**. 2. Click **Next** three times to get to the server role selection screen. 3. In the **Select Server Roles** dialog, select **Web Server (IIS)**. 4. When prompted, click **Add Features**, and then click **Next**. 5. Click **Next** three times to accept the default Web Server role settings, and then click **Install**. 6. Allow the installation to complete, and then click **Close**. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell command, run at an administrator-level Windows PowerShell command prompt, performs the same function as the preceding procedure.    **Install-WindowsFeature Web-WebServer -IncludeManagementTools** |

### Create a shared folder on APP1

Next, create a shared folder and a text file within the folder.

[Do this step using Windows PowerShell](#PS8)

To create a shared folder

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| 1. From the **Start** screen, click **Computer**, and then double-click **Local Disk (C:)**. 2. Right-click in the details pane, point to **New**, and then click **Folder**. 3. Type **Files**, and then press **ENTER**. Leave the **Local Disk** window open. 4. From the **Start** screen, type **Notepad**. Right-click **Notepad**, and then click **Run as administrator**. 5. If prompted by User Account Control, click **Yes**. 6. In the **Untitled – Notepad** window, type **This is a shared file**. 7. Click **File**, click **Save**, double-click **Computer**, double-click **Local Disk (C:)**, and then double-click the **Files** folder. 8. In **File name**, type **Example.txt**, and then click **Save**. Close the Notepad window. 9. In the **Local Disk** window, right-click the **Files** folder, point to **Share with**, and then click **Specific people**. 10. Click **Share**, and then click **Done**. 11. Close the **Local Disk** window. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure.    **New-Item -path c:\files -type directory**  **Write-Output "This is a shared file." | out-file c:\files\example.txt**  **New-SmbShare -name files -path c:\files -changeaccess CORP\User1** |

## Step 3: Configure CLIENT1

CLIENT1 configuration consists of the following:

 Install the operating system

 Join CLIENT1 to the CORP domain

 Test access to intranet resources on the Corpnet subnet

### Install the operating system on CLIENT1

To install the operating system on CLIENT1

|  |
| --- |
| 1. Start the installation of Windows 8 Enterprise.  2. When you are prompted for a PC name, type CLIENT1.  3. When you are prompted by the Settings dialog, click Use express settings.  4. At the Log on prompt, click **Don't want to sign in with a Microsoft account?** Click **Local account**.  5. When you are prompted for a user name, type **User1**. Type a strong password twice, type a password hint, and then click **Finish**.  6. Connect CLIENT1 to a network that has Internet access and run Windows Update to install the latest updates for Windows 8.  7. Connect CLIENT1 to the Corpnet subnet. Click **Yes, turn on sharing and connect to devices** when prompted. |

### User account control

When you configure the Windows 8 operating system, you are required to click Continue or **Yes** in the User Account Control (UAC) dialog box for some tasks. Several of the configuration tasks require UAC approval. When you are prompted, always click Continue or **Yes** to authorize these changes. Alternatively, see the [Appendix](#_Appendix_1) of this guide for instructions about how to set the UAC behavior of the elevation prompt for administrators.

### Join CLIENT1 to the CORP domain

[Do this step using Windows PowerShell](#PS9)

To join CLIENT1 to the CORP domain

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| 1. From the **Start** screen, right-click Computer, and then click Properties. 2. On the **System** page, click **Advanced system settings**. 3. In the System Properties dialog box, on the **Computer Name** tab, click Change. 4. In the Computer Name/Domain Changes dialog box, click Domain, type corp.contoso.com, and then click OK. 5. When you are prompted for a user name and password, type the user name and password for the User1 domain account, and then click OK. 6. When you see a dialog box that welcomes you to the corp.contoso.com domain, click OK. 7. When you see a dialog box that prompts you to restart the computer, click OK. 8. In the System Properties dialog box, click Close. Click **Restart Now** when prompted. 9. After the computer restarts, click the **Switch User arrow icon**, and then click **Other User**. Log on to the CORP domain with the **User1** account. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Note that you must supply the User1 account domain credentials after entering the Add-Computer command.    **Add-Computer -DomainName corp.contoso.com**  **Restart-Computer** |

### Test access to resources from the Corpnet subnet

Next, verify that intranet web and file share resources on APP1 can be accessed by CLIENT1.

To test access to resources from CLIENT1

|  |
| --- |
| 1. From the **Start** screen, click the **Internet Explorer** icon. 2. In the **Address** bar, type **http://app1.corp.contoso.com/**, and then press **ENTER**. You should see the default IIS 8 web page for APP1. 3. From the **Start** screen or the desktop taskbar, click the **File Explorer** icon. 4. In the address bar, type **\\app1\Files**, and then press **ENTER**. 5. You should see a folder window with the contents of the Files shared folder. 6. In the **Files** shared folder window, double-click the **Example.txt** file. You should see the contents of the Example.txt file. 7. Close the **example.txt - Notepad** and the **Files** shared folder windows. |

# Steps for Configuring the Internet Subnet

There are two steps to setting up the Internet subnet of the Windows Server 2012 Base Configuration test lab.

1. Configure EDGE1.

2. Configure INET1.

## Step 1: Configure EDGE1

EDGE1 configuration consists of the following:

 Install the operating system.

 Configure TCP/IP.

 Join the computer to the domain.

EDGE1 must have two network adapters installed. Connect one adapter to the physical or virtual switch for the Corpnet subnet, and connect the second adapter to the physical or virtual switch for the Internet subnet.

### Install the operating system on EDGE1

First, install Windows Server 2012 Standard as a standalone server.

To install the operating system on EDGE1

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| 1. Start the installation of Windows Server 2012 Standard. 2. Follow the instructions to complete the installation, specifying Windows Server 2012 Standard (full installation) and a strong password for the local Administrator account. Log on using the local Administrator account. 3. Connect EDGE1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012. 4. Connect one network adapter to the Corpnet subnet and the other to the Internet subnet. |

### Configure TCP/IP properties on EDGE1

Configure the TCP/IP protocol with static IP addresses on both interfaces.

[Do this step using Windows PowerShell](#PS10)

To configure TCP/IP properties on the Corpnet adapter

|  |
| --- |
| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile. 2. In Network Connections, right-click the network connection that is connected to the Corpnet subnet, and then click **Rename**. 3. Type **Corpnet**, and then press **ENTER**. 4. Right-click Corpnet, and then click Properties. 5. Click Internet Protocol Version 4 (TCP/IPv4), and then click Properties. 6. Select Use the following IP address. In IP address, type 10.0.0.2. In Subnet mask, type 255.255.255.0. 7. Select Use the following DNS server addresses. In Preferred DNS server, type 10.0.0.1. 8. Click **Advanced**, and then the **DNS** tab. 9. In **DNS suffix for this connection**, type **corp.contoso.com**, and then click **OK** three times to close the network properties dialog. 10. In the Network Connections window, right-click the network connection that is connected to the Internet subnet, and then click **Rename**. 11. Type **Internet**, and then press **ENTER**. 12. Right-click Internet, and then click Properties. 13. Click Internet Protocol Version 4 (TCP/IPv4), and then click Properties. 14. Select Use the following IP address. In IP address, type 131.107.0.2. In Subnet mask, type 255.255.255.0. 15. Click **Advanced**. On the **IP Settings** tab, click **Add** under **IP Addresses**. In the **TCP/IP Address** section,type **131.107.0.3** in **IP address**, type **255.255.255.0** in **Subnet mask**, and then click **Add**. 16. Click the **DNS** tab. 17. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK** three times to close the network properties dialog. 18. Close the **Network Connections** window. 19. From the **Start** screen, type **cmd**, and then press **ENTER**. 20. To check name resolution and network communication between EDGE1 and DC1, type **ping dc1.corp.contoso.com** in the command prompt windowand press **ENTER**. 21. Verify that there are four responses from 10.0.0.1. 22. Close the Command Prompt window. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Prior to executing these commands, rename the network connections to **Corpnet** and **Internet** according to their associated subnets.    **New-NetIPAddress 10.0.0.2 -InterfaceAlias "Corpnet" -PrefixLength 24**  **Set-DnsClientServerAddress -InterfaceAlias "Corpnet" -ServerAddresses 10.0.0.1**  **Set-DnsClient -InterfaceAlias "Corpnet" -ConnectionSpecificSuffix corp.contoso.com**  **New-NetIPAddress 131.107.0.2 -InterfaceAlias "Internet" -PrefixLength 24**  **New-NetIPAddress 131.107.0.3 -InterfaceAlias "Internet" -PrefixLength 24**  **Set-DnsClient -InterfaceAlias "Internet" -ConnectionSpecificSuffix isp.example.com** |

### Join EDGE1 to the CORP domain

[Do this step using Windows PowerShell](#PS11)

To join EDGE1 to the CORP domain

|  |
| --- |
| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile. 2. In the System Properties dialog box, on the **Computer Name** tab, click Change. 3. In Computer Name, type **EDGE1**. Under Member of, click Domain, and then type **corp.**contoso.com. 4. Click OK. 5. When you are prompted for a user name and password, type User1 and its password, and then click OK. 6. When you see a dialog box welcoming you to the corp.contoso.com domain, click OK. 7. When you are prompted that you must restart the computer, click OK. 8. On the System Properties dialog box, click Close. 9. When you are prompted to restart the computer, click Restart Now. 10. After the computer restarts, click the **Switch User arrow icon**, then click **Other User** and log on to the CORP domain with the **User1** account. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Note that you must supply the User1 account domain credentials after entering the Add-Computer command.    **Add-Computer -NewName EDGE1 -DomainName corp.contoso.com**  **Restart-Computer** |

## Step 2: Configure INET1

INET1 configuration consists of the following:

 Install the operating system

 Configure TCP/IP

 Rename the computer

 Install the Web Server (IIS) and DNS server roles

* Create DNS records

 Install DHCP

 Configure the NCSI web site

 Test CLIENT1 access to Internet resources from the Internet subnet

### Install the operating system on INET1

To install the operating system on INET1

|  |
| --- |
| 1. Start the installation of Windows Server 2012 Standard. 2. Follow the instructions to complete the installation, specifying a strong password for the local Administrator account. Log on using the local Administrator account. 3. Connect INET1 to a network that has Internet access and run Windows Update to install the latest updates for Windows Server 2012. 4. Connect INET1 to the Internet subnet. |

### Configure TCP/IP properties on INET1

[Do this step using Windows PowerShell](#PS12)

To configure TCP/IP properties on INET1

|  |
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| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Ethernet** in the Properties tile. 2. In the Network Connections window, right-click **Ethernet**, and then click Properties. 3. Click Internet Protocol Version 4 (TCP/IPv4), and then click Properties. 4. Select Use the following IP address. In IP address, type 131.107.0.1. In Subnet mask, type 255.255.255.0.In **Preferred DNS server**, type **127.0.0.1.** 5. Click **Advanced**, and then click the **DNS** tab. 6. In **DNS suffix for this connection**, type **isp.example.com**, and then click **OK**. 7. Click **OK** twice to close the Ethernet Properties dialog box. 8. Close the Network Connections window. 9. From the **Start** screen, type **cmd**, and then press **ENTER**. 10. To verify network connectivity between INET1 and EDGE1, type ping 131.107.0.2 in the command prompt and press ENTER. 11. Verify that there are four failures from 131.107.0.2 indicating that the request timed out. The reason is that Windows Firewall with Advanced Security on EDGE1 blocks the incoming ping messages. At the command prompt, run the **arp -g** command and confirm that a **Physical Address** is associated with the **Internet Address** of **131.107.0.2**. This confirms reachability of 131.107.0.2. 12. Close the Command Prompt window. 13. Right-click the network icon in the desktop System Notification Area and select **Open Network and Sharing Center**. 14. In the **Network and Sharing Center** window, click **Change advanced sharing settings**. 15. In the **Advanced sharing settings** window, click **Turn on file and printer sharing**, and then click **Save changes**. 16. Close the **Network and Sharing Center** window. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability. Note that the "Ethernet" interface name may be different on your computer. Use **ipconfig /all** to list the interfaces.    **New-NetIPAddress 131.107.0.1 -InterfaceAlias Ethernet -PrefixLength 24**  **Set-DnsClientServerAddress -InterfaceAlias "Ethernet" -ServerAddresses 127.0.0.1**  **Set-DnsClient -InterfaceAlias "Ethernet" -ConnectionSpecificSuffix isp.example.com**  **netsh advfirewall firewall set rule group="File and Printer Sharing" new enable=yes** |

### Rename the computer to INET1

[Do this step using Windows PowerShell](#PS13)

To rename the computer to INET1

|  |
| --- |
| 1. In Server Manager, click **Local Server** in the console tree. Click the link next to **Computer name** in the Properties tile. 2. In the System Properties dialog box, on the **Computer Name** tab, click Change. 3. In Computer Name, type **INET1**. Click OK. 4. When you are prompted that you must restart the computer, click OK. 5. On the System Properties dialog box, click Close. 6. When you are prompted to restart the computer, click Restart Now. 7. After the computer restarts, log on with the local administrator account. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure.    **Rename-Computer -NewName INET1**  **Restart-Computer** |

### Install the DNS Server and Web Server (IIS) server roles on INET1

Next, install role services for INET1, which will act as an Internet web and DNS server for computers that are connected to the Internet subnet.

[Do this step using Windows PowerShell](#PS14)

To install the IIS and DNS server roles

|  |
| --- |
| 1. On the Server Manager Dashboard screen, under **Configure this local server**, click **Add roles and features**. 2. Click **Next** three times to get to the server role selection screen. 3. On the Select Server Roles page, select **DNS Server** and click Add Features when prompted**.** 4. Select **Web Server (IIS)**, click Add Features when prompted, and then click **Next**. 5. Click Next four times to accept the default DNS server and web server settings, and then click Install. 6. Verify that the installations were successful, and then click Close. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure.    **Install-WindowsFeature DNS -IncludeManagementTools**  **Install-WindowsFeature Web-WebServer -IncludeManagementTools** |

**Create DNS records on INET1**

Next, create DNS records for the INET1 and EDGE1 IPv4 addresses on the Internet subnet and for the Network Connectivity Status Indicator (NCSI).

[Do this step using Windows PowerShell](#PS15)

**To create A records**

|  |
| --- |
| 1. From the **Start** screen, click **DNS**.  2. In the console tree of DNS Manager, expand **INET1**, and click **Forward Lookup Zones**.  3. Right-click **Forward Lookup Zones**, click **New Zone**, and then click **Next**.  4. On the **Zone Type** page, click **Next**.  5. On the **Zone Name** page, type **isp.example.com**, and then click **Next**.  6. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.  7. In the console tree, expand **Forward Lookup Zones**, right click **isp.example.com**, and then click **New Host (A or AAAA)**.  8. In **Name**, type **INET1**. In **IP address**, type **131.107.0.1**. Click **Add Host**.  9. Click **OK**, and then click **Done**.  10. In the console tree, right-click **Forward Lookup Zones**, click **New Zone**, and then click **Next**.  11. On the **Zone Type** page, click **Next**.  12. On the **Zone Name** page, type **contoso.com**, and then click **Next**.  13. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.  14. In the console tree, right click **contoso.com**, and then click **New Host (A or AAAA)**.  15. In **Name**, type **EDGE1**. In **IP address**, type **131.107.0.2**.  16. Click **Add Host**. Click **OK**, and then click **Done**.  17. In the console tree, right-click **Forward Lookup Zones**, click **New Zone**, and then click **Next**.  18. On the **Zone Type** page, click **Next**.  19. On the **Zone Name** page, type **msftncsi.com**, and then click **Next**.  20. Click **Next** twice to accept defaults for zone file and dynamic update, and then click **Finish**.  21. In the console tree, right click **msftncsi.com**, and then click **New Host (A or AAAA)**.  22. In **Name**, type **www**. In **IP address**, type **131.107.0.1**.  23. Click **Add Host**. Click **OK**.  23. In **Name**, type **dns**. In **IP address**, type **131.107.255.255**. Click **Add Host**. Click **OK**. Click **Done**.  24. Close the DNS Manager console. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability.    **Add-DnsServerPrimaryZone -Name isp.example.com -ZoneFile isp.example.com.dns**  **Add-DnsServerResourceRecordA -ZoneName isp.example.com -Name inet1 -IPv4Address 131.107.0.1**  **Add-DnsServerPrimaryZone -Name contoso.com -ZoneFile contoso.com.dns**  **Add-DnsServerResourceRecordA -ZoneName contoso.com -Name edge1 -IPv4Address 131.107.0.2**  **Add-DnsServerPrimaryZone -Name msftncsi.com -ZoneFile msftncsi.com.dns**  **Add-DnsServerResourceRecordA -ZoneName msftncsi.com -Name www -IPv4Address 131.107.0.1**  **Add-DnsServerResourceRecordA -ZoneName msftncsi.com -Name dns -IPv4Address 131.107.255.255** |

**Install and configure DHCP on INET1**

Next, configure INET1 as a DHCP server so that CLIENT1 can automatically configure itself when connecting to the Internet subnet.

[Do this step using Windows PowerShell](#PS16)

**To install and configure the DHCP server role on INET1**

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| --- |
| 1. On the Server Manager **Dashboard** screen, under Configure this local server, click **Add roles and features**. 2. Click **Next** three times to get to the server role selection screen. 3. In the Select Server Roles dialog, select **DHCP Server**, click **Add Features** when prompted, and then click **Next**. 4. In the Select features dialog, click **Next**. 5. Click **Next** on the Introduction screen, and then click **Install**. 6. Allow the installation to complete, and then in the Installation progress window, click the link for **Complete DHCP configuration**. 7. In the DHCP Post-Install configuration wizard, click **Commit**, and then click **Close**. 8. In the Installation progress window, click **Close**. 9. From the **Start** screen, click **DHCP**. 10. In the DHCP console tree, expand **INET1**. Right-click **IPv4**, and click **New Scope**. 11. Click **Next** in the New Scope Wizard. 12. Type **Internet** for scope name, and then click **Next**. 13. Next to **Start IP Address**, type **131.107.0.100**, next to **End IP Address**, type **131.107.0.150**, and next to **Subnet Mask**, type **255.255.255.0**. 14. Click **Next** four times to accept default settings for exclusions, delay and lease duration. 15. On the **Router (Default Gateway)** dialog, type or confirm the address **131.107.0.1**. Click **Add**, and then click **Next**. 16. On the **Domain Name and DNS Servers** page, next to **Parent domain**, type **isp.example.com**. Under IP address, type **131.107.0.1**. Click **Add**, and then click **Next**. 17. On the WINS Servers page, click **Next**. 18. On the Activate Scope page, click **Next**, and then click **Finish**. 19. Close the DHCP Manager console. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following Windows PowerShell commands, run at an administrator-level Windows PowerShell command prompt, perform the same function as the preceding procedure. Long command lines are indented for readability.    **Install-WindowsFeature DHCP -IncludeManagementTools**  **Add-DhcpServerv4Scope -name "Internet" -StartRange 131.107.0.100 -EndRange 131.107.0.150 -SubnetMask 255.255.255.0**  **Set-DhcpServerv4OptionValue -DnsDomain isp.example.com -DnsServer 131.107.0.1 -Router 131.107.0.1** |

### Configure the NCSI web site on INET1

Windows clients attempt to connect to the URL http://www.msftncsi.com/ncsi.txt and resolve the name dns.msftncsi.com to determine if they have Internet connectivity. In the following procedure, you create the ncsi.txt file and place it in the WWWROOT directory on INET1.

[Do this step using Windows PowerShell](#PS17)

To configure the NCSI web site on INET1

|  |
| --- |
| 1. On INET1, launch **File Explorer**, and then navigate to **C:\inetpub\wwwroot**. 2. In the details pane, right click an empty area, point to **New**, and then click **Text Document**. 3. Rename the document to **ncsi**. 4. Double-click on **ncsi**. 5. In the **Notepad** window, type **Microsoft NCSI** and do *not* press **ENTER** to add a new line. 6. Click **File**, and then click **Exit**. In the **Notepad** dialog box, click **Save**. 7. Close the File Explorer window. |

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| Description: Description: Description: http://upload.wikimedia.org/wikipedia/en/7/7f/Windows_PowerShell_icon.png **Windows PowerShell equivalent commands** |
| The following PowerShell commands perform the same steps to write the Ncsi.txt file without a new line after the "Microsoft NCSI" string:    **$filename = "C:\inetpub\wwwroot\ncsi.txt"**  **$text = "Microsoft NCSI"**  **[System.IO.File]::WriteAllText($fileName, $text)** |

### Test access to Internet resources from the Internet subnet

Next, connect CLIENT1 to the Internet subnet and test connectivity to resources on INET1.

To test access to Internet resources from CLIENT1 when connected to the Internet subnet

|  |
| --- |
| 1. Move CLIENT1 from Corpnet subnet to the Internet subnet. From the Desktop, note that after network detection is complete, the warning symbol on the network icon in the system notification area no longer appears. Hover over the network icon in the system notification area and notice that it indicates *Internet access*. When prompted, click **Yes, turn on sharing and connect to devices**.  2. From the **Start** screen, click the Internet Explorer icon.  3. In the **Address** bar, type **http://inet1.isp.example.com/**, and then press **ENTER**. You should see the default Internet Information Server 8 web page.  4. Close the Internet Explorer window.  5. From the **Start** screen, type **cmd**, and then press **ENTER**.  6. Type **ping inet1.isp.example.com** and press **ENTER**. You should see four responses from **131.107.0.1**. Type **ping edge1.contoso.com** and press **ENTER**. You should see four failures for 131.107.0.2 indicating that the request timed out. Recall that Windows Firewall with Advanced Security on EDGE1 blocks the ping messages. At the command prompt, run the **arp -g** command and confirm that a **Physical Address** is associated with the **Internet Address** of **131.107.0.2**.  7. Move CLIENT1 from the Internet subnet to the Corpnet subnet.  8. From the command prompt window, type **ping inet1.isp.example.com**, and then press **ENTER**. You should see a “could not find host inet1” message and no responses. Type **ping 131.107.0.1**, and then press **ENTER**. You should see “transmit failed” messages and no responses. This indicates that there is no connectivity between the Corpnet subnet and the Internet subnet.  Although EDGE1 is connected to both the Internet and Corpnet subnets, it is not providing any routing, address translation, or proxying services to allow computers on the Corpnet subnet to access resources on the Internet subnet. An additional test lab guide will configure Internet subnet access from the Corpnet subnet as needed. |

# Snapshot the Configuration

This completes the Windows Server 2012 Base Configuration test lab. To save this configuration for additional test labs, do the following:

1. On all physical computers or virtual machines in the test lab, close all windows and then perform a graceful shutdown.
2. If your lab is based on virtual machines, save a snapshot of each virtual machine and name the snapshots **Windows Server 2012 Base Configuration**. If your lab uses physical computers, create disk images to save the Windows Server 2012 Base Configuration.

Important

Unlike previous versions of Windows Server, it is permissible in Windows Server 2012 to restore snapshots on domain controllers without fear of USN Rollback blocking further replication. DC virtualization details are demonstrated in the [Test Lab Guide: Demonstrate Windows Server "8" Virtualized Domain Controller (VDC)](http://www.microsoft.com/en-us/download/details.aspx?id=29027).

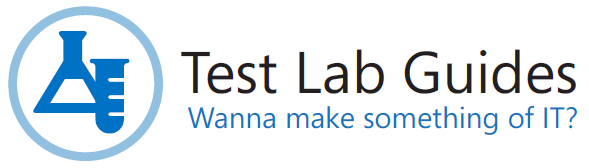
# Additional Resources

For more information about Windows Server 2012, see the [Windows Server 2012 product page](http://www.microsoft.com/en-us/server-cloud/windows-server/default.aspx).

To provide the authors of this guide with feedback or suggestions for improvement, send an email message to [tlgfb@microsoft.com](mailto:tlgfb@microsoft.com).

To submit your questions about this test lab or Windows Server 2012, see the [Windows Server 2012 General Forum](http://social.technet.microsoft.com/Forums/en-US/winserver8gen/threads).

# TLG Resources



For a list of all of the Windows Server 2012 TLGs, see [Windows Server 2012 Test Lab Guides](http://go.microsoft.com/fwlink/?LinkID=243062) in the TechNet Wiki.

For a list of additional Microsoft TLGs, see [Test Lab Guides](http://social.technet.microsoft.com/wiki/contents/articles/test-lab-guides.aspx) in the TechNet Wiki.

For the latest developments in the TLG initiative, subscribe to the [Test Lab Guides blog](http://blogs.technet.com/b/tlgs/).

Microsoft strongly encourages you to develop and publish your own TLG content for Windows Server 2012, either in the TechNet Wiki (example: [Test Lab Guide: Demonstrate Remote Access VPNs](http://social.technet.microsoft.com/wiki/contents/articles/test-lab-guide-demonstrate-remote-access-vpns.aspx)) or in your own publishing forum (example: [Test Lab Guide (Part 1) - Demonstrate TMG PPTP, L2TP/IPsec and SSTP Remote Access VPN Server](http://www.isaserver.org/tutorials/Test-Lab-Guide-Part1.html)). If you want to publish your TLG content in the TechNet wiki, see the [How to contribute series of TLG blog posts](http://blogs.technet.com/b/tlgs/archive/tags/how+to+contribute/) for information about the types of content you can create and for links to templates, guidance, and examples.

# Appendix

This appendix describes how to change the default User Account Control (UAC) behavior and how to work around garbled text in when pasting in Hyper-V guests.

## Set UAC behavior of the elevation prompt for administrators

By default, UAC is enabled in Windows Server 2012 and Windows 8. This service will prompt for permission to continue during several of the configuration tasks described in this guide. In all cases, you can click Continue in the UAC dialog box to grant this permission, or you can use the following procedure to change the UAC behavior of the elevation prompt for administrators.

To set UAC behavior of the elevation prompt for administrators

|  |
| --- |
| * 1. From the **Start** screen, type secpol.msc, and press **ENTER**.   2. In the console tree, open Local Policies, and then click Security Options.   3. In the contents pane, double-click User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode.   4. Click Elevate without prompting in the list, and then click OK.  1. 6. Close the Local Security Policy window. |

## Pasting text to Hyper-V guests sometimes results in garbled characters

When using a Hyper-V Virtual Machine Connection console to a running Windows Server 2012 guest and then using **Type Clipboard Text** menu option, the characters pasted may appear out of order or garbled. This makes copying and pasting Windows PowerShell commands difficult.

To work around this issue:

* Use the **mstsc.exe** RDP client to connect directly to virtual machines. Note that this requires attaching your client computer to your organization network, typically using an additional network adapter on each virtual machine
* Increase the keyboard class buffer size in the virtual machine
* Disable the synthetic keyboard in the virtual machine to force using the emulated keyboard

** To Increase the keyboard class buffer size in the virtual machine**

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| 1. Logon to a running virtual machine as a member of the Administrators group. 2. From the **Start** page, type **regedit**, and press **ENTER**. 3. Locate and then click the following registry entry:   **HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\kbdclass\Parameters**   1. In the details page, double click:   **KeyboardDataQueueSize**   1. Select **Decimal** and type a **value data** of:   **1024**   1. Click **OK**. Close the Registry Editor and restart the virtual machine. |

**To disable the synthetic keyboard for a virtual machine**

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| 1. Logon to a running virtual machine as a member of the Administrators group. 2. From the **Start** page, type **devmgmt.msc**, and then press **ENTER**. 3. Click **Keyboards**, right click **Microsoft Hyper-V Virtual Keyboard** and click **Disable**. 4. Close the Device Manager snap-in.   **Note**  On Windows Server 2012 Core, download [DevCon.exe](http://social.technet.microsoft.com/wiki/contents/articles/182.aspx) from the Windows Driver Kit to [disable](http://msdn.microsoft.com/en-us/library/windows/hardware/ff544722(v=vs.85).aspx) this driver using the command-line. |