

Migrating from Windows NT4 to Server 2003

By Aloka Arachige & Peter Huddleson Catapult Integrated Systems © 2003

Introduction

This is a step-by-step guide for migrating from Windows NT 4 to Windows Server 2003. Included are procedures for the operating system (OS) upgrade and the NT domain to Active Directory (AD) migration. Also included are the procedures for configuration of multiple sites and Domain Controllers (DC) over a WAN connection.

Preparing the Primary Domain Controller for the Server 2003 Upgrade

- Start with the Primary Domain Controller (PDC) of the NT domain.
- Make sure the entire domain is synchronized so all the user and computer accounts exist on the PDC and all Backup Domain Controllers (BDC):
 - Go to **Start, Programs, Administrative Tools, Server Manager**.
 - Highlight the PDC and select **Synchronize Entire Domain** from the **Computer** menu.
- If you are using a BDC to perform the upgrade, you will first need to promote it to a PDC. (**Note:** Only perform this procedure if you wish to execute the upgrade and AD migration on the BDC while it is isolated from the NT domain. Otherwise, you will create a conflict with the original PDC once you promote the BDC.):
 - Go to **Start, Programs, Administrative Tools, Server Manager**.
 - Highlight the BDC you wish to promote from the list of computer accounts and then select **Promote to Primary Domain Controller** from the **Computer** menu.
- Define the PDC as its own primary DNS and WINS servers. Part of the migration process to AD includes the installation and configuration of DNS on the master AD Domain Controller (DC). This process goes more smoothly if the PDC already has itself listed as the primary DNS server, even if DNS is not currently installed on it. Similarly, by having the PDC defined as its own WINS server, the process of installing WINS and migrating other machines from the NT domain to AD will go more smoothly. More detail about the installation and configuration of DNS and WINS will come later in this document. For now, simply input the IP address of the PDC as the primary DNS and WINS servers:
 - Right click on **Network Neighborhood** and select **Properties**.
 - Click on the **Protocols** tab.
 - Highlight **TCP/IP Protocol** and hit the **Properties** button.
 - Click on the **DNS** tab, click on the **Add** button, type in the IP address of the PDC and click **Add**.
 - Highlight all other DNS servers in the **DNS Service Search Order** window and click **Remove** until only the PDC is listed.
 - Click on the **WINS Address** tab, type in the IP address of the PDC in the **Primary WINS Server** field and remove any other WINS server that may be defined in the **Secondary WINS Server** field.
 - Click **OK** and then **Close**.
 - Click **Yes** to restart your computer when prompted.
- The PDC is now ready to be upgraded to Windows 2003 Server:
 - Insert the Windows Server 2003 CD into the PDC.
 - When the menu appears, select **Install Windows Server 2003**.
 - In the **Installation Type** field, make sure **Upgrade (Recommended)** is displayed and click **Next**.
 - Select **I accept this agreement** and click **Next**.
 - Input the **Product key** in the appropriate fields and click **Next**.
 - Since this is an upgrade from Windows NT, a **Report System Compatibility** window will display to provide information about which client operating systems are not compatible with Windows Server 2003. To view information about this incompatibility, click **Details**. When finished, click **OK** to close the Details window and then click **Next** to continue the upgrade.
 - The installer will now copy the installation files and reboot the computer automatically.

- Allow the computer to boot up on its own. (**DO NOT** press any key to boot from CD or select another boot option other than **Windows Server 2003 Installation** from the boot menu.)
- The installer will continue the installation process. This will take approximately 45 minutes to complete, depending on your hardware.
- The computer will reboot again as part of the installation. Again, allow the computer to boot up on its own by not hitting any keys.
- When the installation is finished, the computer will reboot a final time. Again, allow it to come up on its own.

Installing Active Directory and DNS on the Primary DC

- Now it is time to install AD and DNS on the newly upgraded DC. After it comes back up from the final installation reboot, it will display an **Active Directory Installation Wizard** window:
 - Click **Next** on the **Welcome to the Active Directory Installation Wizard** window.
 - Click **Next** on the **Operating System Compatibility** window.
 - Select **Domain in a new forest** on the **Create New Domain** window. This is the option to use for the first domain controller in the AD. Click **Next**.
 - In the **New Domain Name** window, type the fully qualified domain name in the **Full DNS name for the new domain** field (e.g. *company-ad.company.com*). Click **Next**.

Note: It is strongly recommended that you make your AD domain a sub domain of your second-level (company) domain. The reason for this is because the DNS zones on your second-level domain name are most likely managed by your ISP. If you use this level of DNS naming, then your internal (Windows) DNS zones will overlap the zones on the publicly available DNS servers your ISP is using to manage your domain name. This will cause DNS resolution between your public and private servers to not work correctly. You could make your Windows-based DNS servers the primary, public-facing DNS servers, which would allow you to use a second-level domain name on the DC. This is not advisable, however, since you would be exposing your entire AD structure to the open Internet, creating a major security hole. Hackers could use a process called “dig” to gather information about your Windows network through publicly-exposed Windows-based DNS. Our purpose in using Windows-based DNS with AD is simply to implement a method for AD clients and servers to register and resolve host names and IP addresses on a private network.

- In the **Forest Functional Level** window, select **Windows 2000**. This is the most compatible option for non-native Server 2003 AD implementations. Click **Next**.
 - Select both default entries in the **Database and Log Folders** window (i.e. **C:\WINNT\NTDS**). Click **Next**.
 - Again, select the default entry in the **Shared System Volume** window (i.e. **C:\WINNT\SYVOL**). Click **Next**.
 - In the **DNS Registration Diagnostics** windows, select **Install and configure the DNS server on this computer, and set this computer to use this DNS server as its preferred DNS server**. This is extremely important when setting up the first domain controller since this is how it links to Windows-based DNS. Click **Next**.
 - Select **Permissions compatible with pre-Windows 2000 server operating systems** in the **Permissions** window. This gives you compatibility with any existing NT domain clients. Click **Next**.
 - Type the domain administrator’s password in the two fields in the **Directory Services Restore Mode Administrator Password** window. Click **Next**.
 - Click **Next** in the **Summary** window to execute the AD installation. This process will take about 5-10 minutes to complete.
 - When the installation completes, click **Finish** in the **Completing the Active Directory Installation Wizard** window. Then click **Restart Now** to reboot the server.
- When the DC comes back up, you will need to configure DNS:
 - Click on **Don’t display this page at logon** in the **Manage Your Server** window and close the window.
 - Go to **Start, Programs, Administrative Tools, DNS**. This will start the DNS management console.
 - Expand the folder list under the **DNS** object. Keep expanding it until you see the **Forward Lookup Zones** and **Reverse Lookup Zones** folders. Initially, there will be two Forward zones and no

- Reverse zones defined. **Note:** It is very important that you do not remove either of the forward zones. They are both necessary for the process of migrating servers and clients from the NT domain to AD.
- Right-click on the **Reverse Lookup Zones** folder and select **New Zone**.
 - Click **Next** on the **Welcome to the New Zone Wizard**.
 - Select **Primary Zone** on the **Zone Type** window. Click **Next**.
 - In the **Active directory Zone Replication Scope**, select **To all domain controllers in the Active Directory domain company-ad.company.com**. Click **Next**.
 - Enter the network portion of the DC's IP address in the **Network ID** field on the **Reverse Lookup Zone Name** window. (e.g. If its address is 192.168.1.100 /24, enter 192.168.1) Click **Next**.
 - In the **Dynamic Update** window, select **Allow only secure dynamic updates (recommended by Active Directory)**. Click **Next**.
 - Click **Finish** to complete the wizard.
 - You should now see a folder under **Reverse Lookup Zones** called **192.168.1.x Subnet**.
 - Now go into the **company-ad.company.com** folder listed under **Forward Lookup Zones**.
 - Right-click the record for the server (e.g. **primary-dc Host (A) 192.168.1.100**) and select **Properties**.
 - Select **Update associated pointer (PTR) record** on the **Host (A)** tab and click **OK**. This will create a reverse DNS (PTR) record for the server.
 - Exit the DNS management console.
- Now that DNS has been configured, there are a few more steps to make the server fully functional:
 - Call up a DOS command prompt (**Start, Run, cmd**) and type the following command:
net time /setsntp:*ntp.timeserver.com*
(ntp.timeserver.com is the host name or IP address of an Internet time server)
 This will synchronize the clock on the AD controller and is necessary for its proper functioning. Type **exit** to close the command window.
 - Go to **Start, Run, Administrative Tools, Event Viewer**. Highlight each of the six items in the left pane, right click and select **Clear All Events**. When prompted to save the entries, select **No**. Because AD installation creates a number of error messages, it is a good idea to clear the error logs before the server is rebooted so you can clearly see if there are any remaining issues.
 - Reboot the server. After the server comes back up, check the Event Viewer again to make sure there are no errors.
 - Make sure the correct DNS server is listed:
 - Right click on **My Network Places** and select **Properties**.
 - Right click on the **Local Area Connection** icon and select **Properties**.
 - Highlight **Internet Protocol (TCP/IP)** and hit the **Properties** button.
 - Click on the **Advanced** button, then on the **DNS** tab. Make sure **127.0.0.1** is not listed.
 - If it is, highlight it and click **Remove**. The only IP address that should be listed is that of the primary DC.
 - Click **OK** on the next three windows to close them, and then close the **Network Connections** window.
 - Install WINS (if not already installed):
 - Go to **Start, Settings, Control Panel, Add or Remove Programs**, then click on **Add/Remove Windows Components**
 - Double-click **Networking Services** and select **Windows Internet Name Service (WINS)**. Then click **OK** and **Next** (make sure you have the Windows Server 2003 media in the CD-ROM or that the i386 directory is staged on the server's hard drive).
 - Click **Finish** and reboot if prompted.
 - Double check to make sure the primary DC is configured to use itself for WINS resolution.
 - Check WINS registrations:
 - Go to **Start, Programs, Administrative Tools, WINS**.
 - Highlight **Active Registrations**, right-click and select **Display Records**.
 - Check **Filter Records matching this Name pattern** and type a * in the field.
 - Make sure the primary DC's name and IP address registered.

Preparing the Active Directory for Additional Domain Controllers

- Create a new site to contain a remote DC:
 - Go to **Start, Programs, Administrative Tools, Active Directory Sites and Services**
 - Expand **Sites**
 - Highlight **Sites**, right-click and select **New Site**.
 - Type a name for the new site in the **Name** field (e.g. *Remote-Site*). Then highlight **DEFAULTIPSITELINK** and click **OK**. This creates a new site for the remote DC, which we will discuss in the next section of this document.
 - Click **OK** in the AD message window.

- Now we need to link the original site (Default-First-Site-Name) and the new site (Remote-Site) to their respective subnets:
 - Right-click **Subnets** and select **New Subnet**.
 - Type the network address of the primary DC in the **Address** field (e.g. if IP address is 192.168.1.100, then network address is 192.168.1.0).
 - Type the corresponding subnet mask of the primary DC in the **Mask** field (e.g. the above IP address would have a subnet mask of 255.255.255.0)
 - Highlight **Default-First-Site-Name** and click **OK**.
 - Repeat the above steps to create a subnet for the **Remote-Site** site. The only difference is that you will be inputting a different network address and linking it to **Remote-Site**.

Installing and Configuring Server 2003 on the Remote Server

The process for installing and configuring the remote DC is similar to what's already been done for the primary DC at the main site. The one major difference is that we will be installing the remote DC as a new 2003 server rather than as an upgraded NT server. Other differences will be highlighted as they come up.

- For this part of the procedure, we will do a clean installation of Windows Server 2003 on a new machine:
 - Boot the remote server using the Windows Server 2003 CD. This will begin the installation wizard.
 - Hit **Enter** at the **Setup Notification** screen.
 - Hit **Enter** at the **Welcome to Setup** screen.
 - Hit **F8** to agree to the licensing agreement.
 - Hit **Enter** to begin installation on an existing partition. (If there is no partition defined, hit **C** to create a new one. Enter the size of the new partition in MB and hit **Enter**. Hit **Enter** again to begin the installation onto the new partition.)
 - Select **Format the partition using the NTFS file system <Quick>** and hit **Enter**.
 - The installer will now format the new partition and copy the files needed for installation to the hard drive. This process will take several minutes depending upon the speed of your server and size of the partition. When it is finished, it will reboot automatically. Be sure not to hit any keys so that it will boot up using the new partition.
 - Once back up, the server will begin the graphical part of the installation. Much of this is automatic, but there will be a few places for user input, noted below. This part of the installation will take an additional 30-45 minutes.
 - Click **Next** on the **Regional and Language Options** window.
 - Type in a **Name** and **Organization** in the corresponding fields on the **Personalize Your Software** window and click **Next**.
 - Input the **Product key** in the appropriate fields and click **Next**.
 - Select the **Licensing Mode** you wish to use and click **Next**.
 - Enter the **Computer name** and **Administrator password** in the appropriate fields and click **Next**. If the **Windows Setup** message screen warns you about your password, click **No** to change it or **Yes** keep it.
 - On the **Data and Time Settings** window, verify that the information is correct and click **Next**.

- Select **Custom Settings** on the **Network Settings** window and click **Next**. This is necessary because we are installing a server which will become a domain controller and DNS server, both of which require a static IP address.
 - 1) On the **Networking Components** window, verify the listed device is the one you want to configure. If not, hit **Next** until it is listed. Then, highlight **Internet Protocol (TCP/IP)** and hit the **Properties** button.
 - 2) On the **TCP/IP Properties** window, select **Use the following IP address** and input the server's **IP address**, **Subnet mask** and **Default gateway** in the appropriate fields. **Note:** Make sure this IP address corresponds to the new subnet you created in the previous section for **Remote-Site**.
 - 3) Select **Use the following DNS server addresses** and input the IP address of the primary domain controller previously configured.
 - 4) Click on the **Advanced** button, and then on the **WINS** tab. Click on **Add**, input the IP address of the primary domain controller and then click the second **Add** button.
 - 5) Select **Enable NetBIOS over TCP/IP** and click **OK**.
 - 6) Click **OK** again to exit the **TCP/IP Properties** window. Then click **Next**.
- In the **Workgroup or Computer Domain** window, select the first option (**No, this computer is not on a network...**) and type in a name for the workgroup (e.g. *GROUPNAME-WG*). This setting will be changed later when the server joins the AD domain. For now, though, it needs to be in workgroup mode. Click **Next**.
- The installation will now continue automatically to completion, when it will reboot itself.
- As before, click on **Don't display this page at logon** in the **Manage Your Server** window and close the window.
- Once the basic Windows Server 2003 installation is done, it is time to join the new server to the existing Active Directory created previously.
 - Right-click on **My Computer** and select **Properties**.
 - Click the **Computer Name** tab and then on the **Change...** button.
 - In the **Member of** section, click the **Domain** option and type the name of the previously defined AD domain (e.g. *company-ad.company.com*). Click **OK**.
 - Type in the name of a user account (usually, **administrator**) which has rights to join computers to the domain and input the corresponding password. Click **OK**.
 - After a few moments, you should see a confirmation that the computer is now a member of the AD domain (e.g. "Welcome to the *company-ad.company.com* domain"). Click **OK**.
 - You will be prompted to reboot the computer. Click **OK** to close the message window and then click **OK** again on the **System Properties** window.
 - Click **Yes** to reboot the computer. Do not be concerned if the server seems to take a long time to boot up after joining the AD domain. This is common when a machine is first joined to a domain.
- Verify that the remote server is now in the AD:
 - On the primary DC, go to **Start, Programs, Administrative Tools, Active Directory Users and Computers**.
 - Click on the **Computers** object and verify that the remote server is listed.
 - Double-click on it to open its properties. Verify that its full name is listed in the **DNS name** field (e.g. *remote-dc.company-ad.company.com*).

Promoting the Remote Server to be a Domain Controller

- After the computer comes back up from joining the domain, it is time to promote it to an AD domain controller. This will be similar to the procedure outlined in the **Installing Active Directory and DNS on the Primary DC** section, except that you must start this process manually (**Note:** DNS will not install automatically during this process since it will detect the DNS server on the other DC.):
 - On the remote server, log on to the AD as the domain administrator. (Be sure you are logging into correct domain in the **Log on to** field.) Again, do not be concerned if the server seems to take a long time to login.
 - Go to **Start, Run** and type **cmd** in the **Open** field to start a command window.
 - Type **dcpromo** and hit **Enter** to begin the **Active Directory Installation Wizard**. Click **Next**.
 - Click **Next** on the **Operating System Compatibility** window.

- On the **Domain Controller Type** window, select **Additional domain controller for an existing domain** and click **Next**.
- On the **Network Credentials** window, type in **administrator** and its corresponding password in the **User name** and **Password** fields. The **Domain** field should already have the fully qualified domain name for the administrator user displayed (e.g. *company-ad.company.com*). Click **Next**.
- On the **Additional Domain Controller** window, type in the fully qualified domain name in the **Domain name** field for the domain you are adding the DC to. In this case, it is the same as that in the above step and should already be filled-in. Click **Next**.
- Select both default entries in the **Database and Log Folders** window (i.e. **C:\WINDOWS\NTDS**). Click **Next**.
- Again, select the default entry in the **Shared System Volume** window (i.e. **C:\WINDOWS\SYSTEMVOLUME31\SYSTEM**). Click **Next**.
- Type the domain administrator password in the **Restore Mode Password** and **Confirm Password** field on the **Directory Services Restore Mode Administrator Password** window. Click **Next**.
- Click **Next** on the **Summary** window to begin the DC promotion. This process will take several minutes to complete.
- Once the wizard completes, click **Finish** on the **Completing the Active Directory Installation Wizard** window.
- Click the **Restart Now** button to reboot the server.
- On the primary DC, go to **Start, Programs, Administrative Tools, Active Directory Users and Computers**.
- Click on the **Domain Controllers** object and verify that the remote server is listed.
- Configure the remote DC in the AD Sites and Services:
 - After the remote server comes back up from its AD promotion, go to **Active Directory Sites and Services** on the primary DC and expand the **Remote-Site** site. The remote DC should now be listed under this new site.
 - Expand **Default-First-Site-Name** completely.
 - 1) Right-click on **NTDS Settings** in the left pane and select **Properties**.
 - 2) On the **General** tab, check the **Global Catalog** box (if not already checked) and select **Default Query Policy** in the **Query Policy** field.
 - 3) On the **Connections** tab, verify that the remote DC is listed in both the **Replicate From** and **Replicate To** fields.
 - 4) Click **Apply** and then **OK** to close the window.
 - 5) Highlight **NTDS Settings** in the left pane.
 - 6) In the right pane, right-click on the displayed object (e.g. **<automatically generated> SERVER-REMOTE Remote-Site Connection**) and select **Replicate Now**. Click **OK** on the **Replicate Now** message window.
 - Repeat the above steps for the remote site. Click the Refresh button and then expand **Remote-Site** completely.
 - 1) Right-click on **NTDS Settings** in the left pane and select **Properties**.
 - 2) On the **General** tab, check the **Global Catalog** box (if not already checked) and select **Default Query Policy** in the **Query Policy** field.
 - 3) On the **Connections** tab, verify that the primary DC is listed in both the **Replicate From** and **Replicate To** fields.
 - 4) Click **Apply** and then **OK** to close the window.
 - 5) Highlight **NTDS Settings** in the left pane.
 - 6) In the right pane, right-click on the displayed object (e.g. **<automatically generated> PRIMARY-SERVER Default-First-Site-Name Connection**) and select **Replicate Now**. Click **OK** on the **Replicate Now** message window.
 - The two DCs are now both Global Catalog servers and are able to replicate to each other.

Final Steps

- Install and Configure DNS and WINS on the remote DC:
 - Go to **Start, Settings, Control Panel, Add or Remove Programs**, then click on **Add/Remove Windows Components**
 - Double-click **Networking Services** and select **Domain Name System (DNS)** and **Windows Internet Name Service (WINS)**. Then click **OK** and **Next** (make sure you have the Windows Server 2003 media in the CD-ROM or that the i386 directory is staged on the server's hard drive).
 - Click **Finish** on the **Completing the Windows Components Wizard** window.
 - Configure the remote DC to use itself for primary DNS and WINS resolution, and the primary DC for secondary DNS and WINS resolution.
 - Reboot both the primary and remote domain controllers.

- Check to make sure all the DNS entries from the primary server replicated properly to the remote server. You should see matching entries on both the forward and reverse zones on both servers. It may take up to 15 minutes and several reboots before all the DNS entries are replicated on both domain controllers.