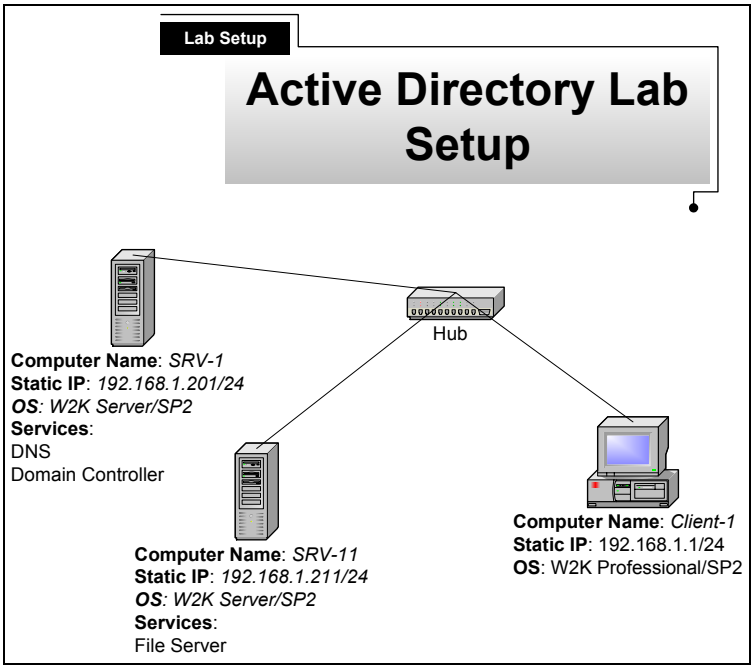
Building an Active Directory Infrastructure for
Ben & Brady's Ice Cream, Corp.

Mega Lab 1

Part 1 of 3 in the Building a Windows 2000/Server 2003
Server Series



Lab 1

First Name	Last Name	Username	Password	OU
Ben	Smith	bsmith	test	Users
Brady	Jones	bjones	test	Users

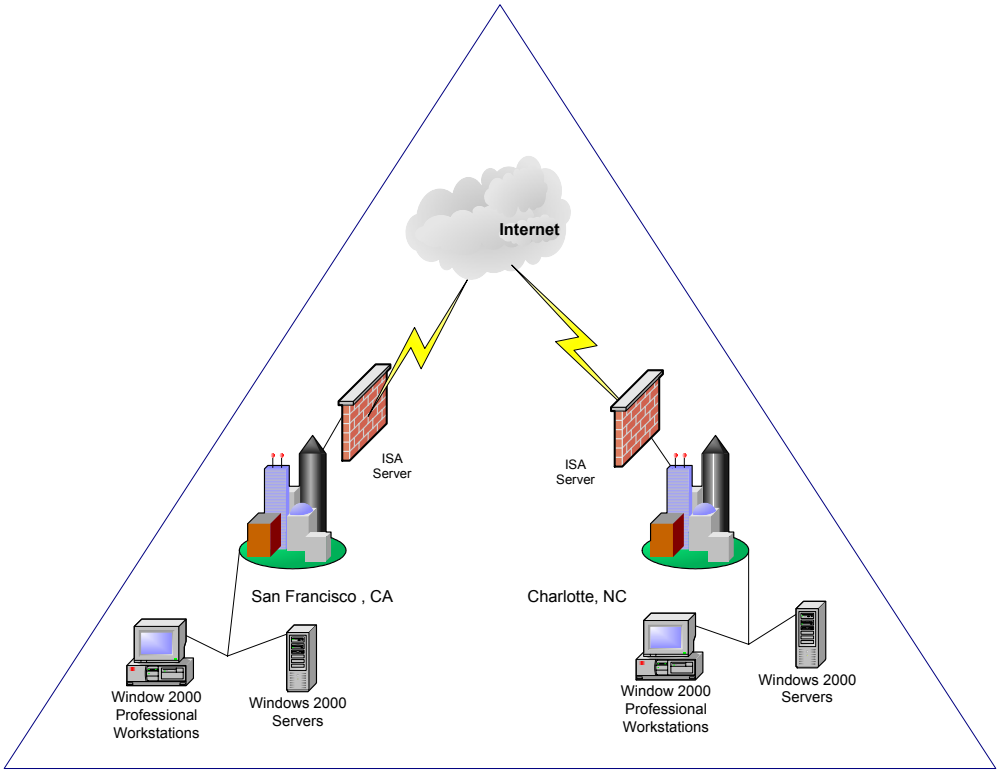
Lab 2

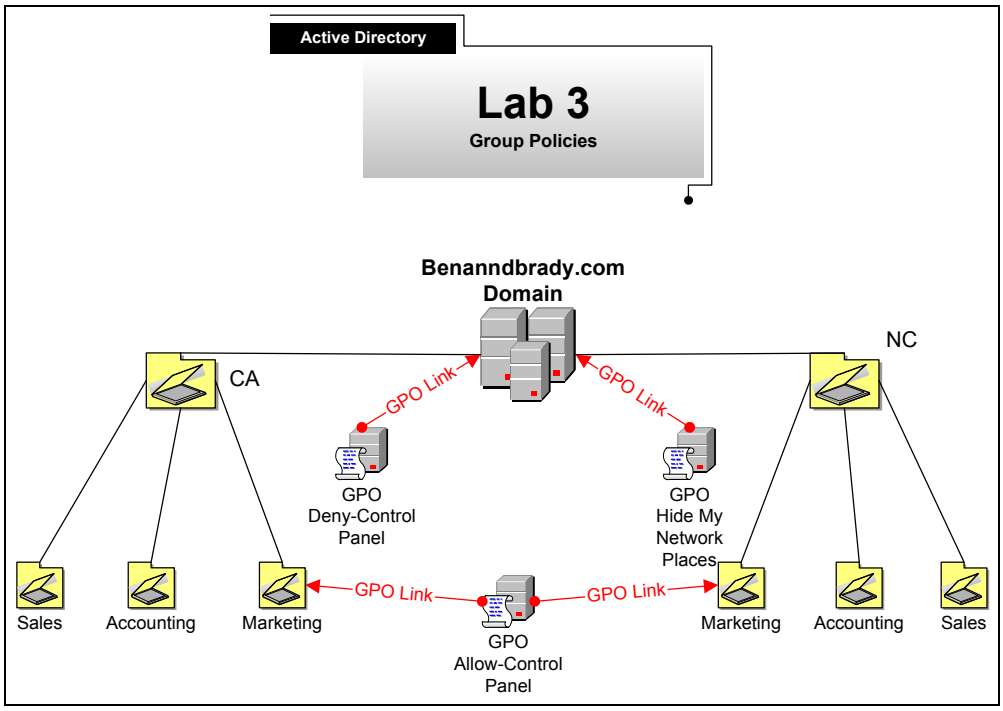
First Name	Last Name	Username	Password	OU
Jill	Smith	jsmith	test	CA→Accounting
Maria	Perez	mperez	test	CA→Marketing
Mark	Jones	mjones	test	CA→Sales
Christina	Sanchez	csanchez	test	CA→Accounting
Brady	Jones	bjones	test	CA→Marketing
Jack	Straw	jstraw	test	CA→Marketing
Sue	Stevens	sstevens	test	NC→Sales
Bob	Hayes	bhayes	test	NC→Accounting
Peter	Ramirez	pramirez	test	NC→Accounting
Ben	Smith	bsmith	test	NC→Marketing

Lab 3

First Name	Last Name	Username	Password	OU
Ben	Smith	bsmith	test	NC→Marketing
Jill	Smith	jsmith	test	CA→Accounting
Jack	Straw	jstraw	test	CA→Marketing

Benandbrady.com





Building an Active Directory Infrastructure for Ben & Brady's Ice Cream, Corp.

Mega Lab 1

Part 1 of 3 in the Building a Windows 2000 Server Series

About the Authors

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TABLE OF CONTENTS

Introduction

Welcome to Train Signal!

This series of labs on Windows 2000 is designed to give you detailed, hands-on experience working with Windows 2000. Train Signal's Audio-Visual Lab courses are targeted towards the serious learner, those who want to know more than just the answers to the test questions. We have gone to great lengths to make this series appealing to both those who are seeking Microsoft certification and to those who want an excellent overall knowledge of Windows 2000.

Each of our courses put you in the driver's seat, working for different fictitious companies, deploying complex configurations, and then modifying them as your company grows. They are not designed to be a "cookbook lab," where you follow along with the steps of the "recipe" until you have completed the lab and have learned nothing. Instead, we recommend that you perform each step and then analyze the results of your actions in detail.

To complete these labs yourself, you will need three computers equipped as described in the Lab Setup section. You also need to have a foundation in Windows 2000 and TCP/IP concepts. You should be comfortable with installing Windows 2000 Professional or Server and getting the basic operating system up and running. Each of the labs in this series will start from a default installation of Windows 2000 and will then run you through the basic configurations and settings that you must use for the labs to be successful. It is very important that you follow these guidelines **exactly**, in order to get the best results from this course.

The course also includes a CD-ROM that features an audio-visual walk-through of all of the labs in the course. In the walk-through, you will be shown all of the details from start to finish on each step, for every lab in the course. During the instruction, you will also benefit from live training that discusses the current topic in great detail, making you aware of many of the fine points associated with the current topic.

Thank you for choosing Train Signal!

Lab Setup

Setting up the Lab

1. Computer Equipment Needed

Item	Minimum	Recommended
Computers	(3) Pentium I 133 MHz	(3) Pentium II 300MHz or greater
Memory	128 MB	256 MB
Hard Drive	2 GB	4 GB or larger
NIC	1/machine	1/machine
Hubs	1	1
Network Cable	(3) Category 5 cables	(3) Category 5 cables

I strongly urge you to acquire all of the recommended equipment in the list above. It can all be easily purchased from eBay or another source, for around $500 (less if you already have some of the equipment). This same equipment is used over and over again in all of Train Signal's labs and will also work great in all sorts of other network configurations that you may want to set up in the future. It will be an excellent investment in your education. You may also want to look into a disk-imaging product such as Norton Ghost. Disk imaging software will save you a tremendous amount of time when it comes to reinstalling Windows 2000 for future labs. Many vendors offer trial versions or personal versions of their products that are very inexpensive.

2. Computer Configuration Overview

Computer Number	1	2	3
Computer Name	SRV-1	SRV-11	Client-1
IP Address	192.168.1.201/24	192.168.1.211/24	192.168.1.1/24
OS	W2K Server	W2K Server	W2K Pro
Additional Configurations	SP2	SP2	SP2

3. Detailed Lab Configuration

*****Important Note*****
This lab should NOT be performed on a live production network. You should only use computer equipment that is not part of a business network AND is not connected to a business network. Train Signal Inc., is not responsible for any damages. Refer to the full disclaimer and limitation of liability which appears at the beginning of this document and on our Website, www.trainsignal.com.

Computer 1
Computer 1 will be named SRV-1 and the operating system on this computer will be Windows 2000 Server or Advanced Server. You should also install Service Pack 2 to avoid any unforeseen problems. If you do not have a copy of Windows 2000 Server you can obtain an evaluation copy of Windows 2000 Advanced Server within the Microsoft Press series of books, and Service Pack 2 is available for download on Microsoft's Website.

SRV-1 will have a static IP address of 192.168.1.201 with a 255.255.255.0 subnet mask. The default gateway field can be left blank but you should enter this computer's own IP address for the Preferred DNS field (192.168.1.201). The alternate DNS Server field can be left blank. See figure 1, next page.

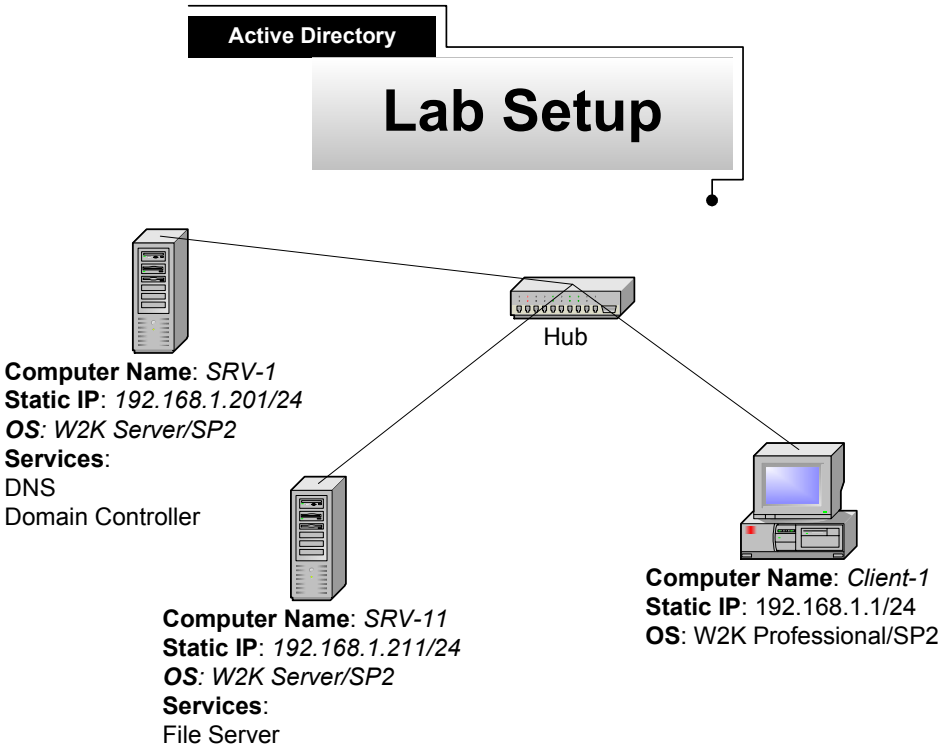
Computer 2

Computer 2 will be named SRV-11 and Windows 2000 (either version once again) will be installed on this computer with Service Pack 2. SRV-11 will have a static IP address of 192.168.1.211 with a 255.255.255.0 subnet mask. The default gateway field can be left blank but you should configure the preferred DNS server setting to point to SRV-1, 192.168.1.201 and leave the alternate DNS setting blank. See figure 1, next page.

Computer 3

Computer 3 will be named Client-1 and have Windows 2000 Professional installed as the operating system. Client-1 will have a static IP address of 192.168.1.1 with a 255.255.255.0 subnet mask. The default gateway field can be left blank but you should configure the preferred DNS server setting to point to SRV-1, 192.168.1.201 and leave the alternate DNS setting blank. See figure 1, next page.

Important - You should test the network connections (using the PING command) between each of these machines to ensure that your network is set up properly. Testing before you get started will save you major time and effort later.



(figure 1)

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Lab 1

Creating an Active Directory Domain for Ben & Brady's Ice Cream, Corp.

You will learn how to:

- Install Active Directory
- Configure and test DNS for Active Directory
- Join clients and servers to the domain
- Add additional domain controllers to the domain
- Test Active Directory replication between domain controllers

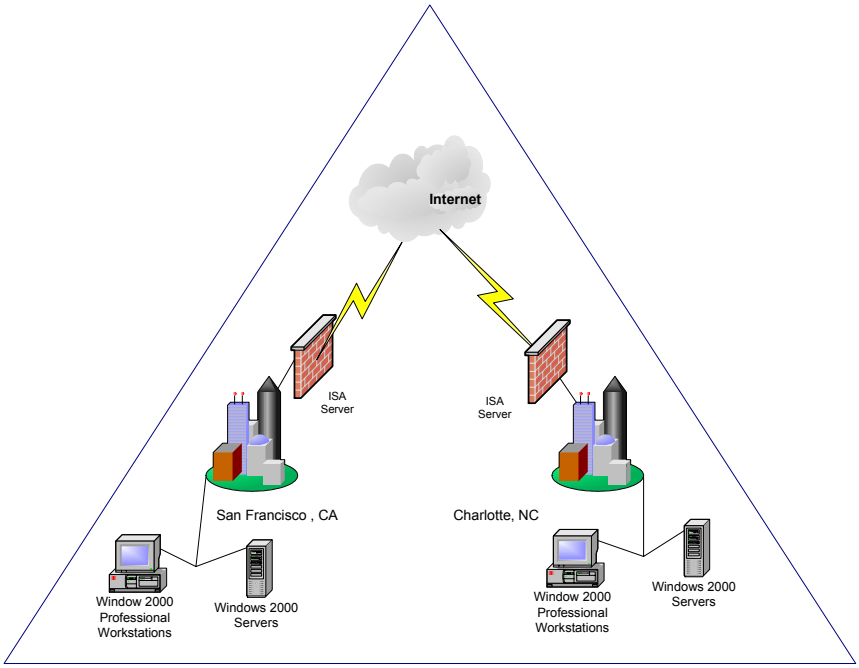
Scenario – Part One

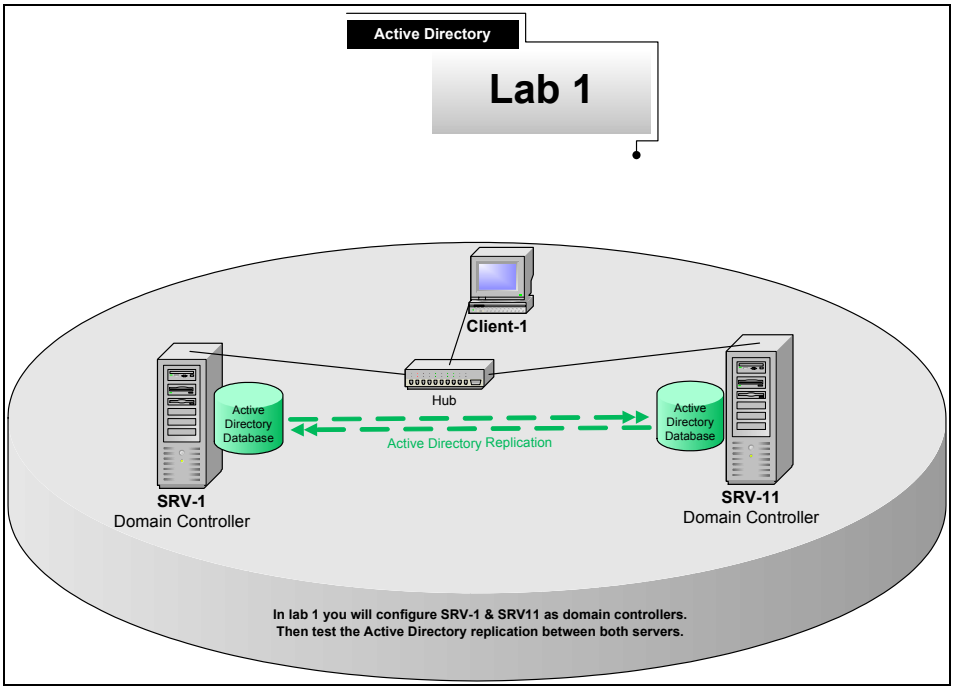
Ben & Brady's Ice Cream Corp., is a manufacturer of gourmet ice cream products that are sold internationally. They are in the process of migrating their network from Novell to Windows 2000 as well as replacing all of their current servers with new equipment. Their main headquarters is located in San Francisco and they have a manufacturing facility in Charlotte, North Carolina. The San Francisco office is connected to the Internet with a full T1 (1.544 Mbps) and Microsoft's ISA Server (firewall) will protect the internal network. The facility in Charlotte is used to manufacture ice cream and ship to Ben & Brady's East Coast distributors. The San Francisco office has five servers that have just been purchased; all will be running Windows 2000 Server and also 25 workstations that will be running Windows 2000 Professional. The Charlotte location also has five new servers that were recently purchased, all running Windows 2000 Server and 45 workstations, all running Windows 2000 Professional. Charlotte is connected to the Internet with a Fractional T1 (768 Kbps) and they also use ISA Server to protect their internal network. The two locations will be connected together through a VPN that is formed between the two ISA Servers over the Internet.

Ben & Brady's Ice Cream Co. has hired you on a contract basis, to help with the implementation of a new pristine Windows 2000 domain. You have been given the task of installing the first domain controller on the network at the San Francisco office, which will install Active Directory and create a new domain for Ben & Brady's Ice Cream Co. You are also in charge of making sure that all client computers, which have been installed, are able to join the new domain. The Operations Manager, Jill, also mentions that there is an opportunity for you to become a full time administrator with the company, if the project goes well.

In this lab, you will create a new domain for Ben & Brady's Ice Cream Co., called benandbrady.com, by building the first domain controller on the network using the Active Directory installation program. You will then configure DNS to work with Active Directory and test that it is working properly on the network using the NSLOOKUP utility. Once your domain controller is working properly, you will join a Windows 2000 server and a Windows 2000 Professional machine to the domain. Finally, you will create a second domain controller on your domain and test replication between the two domain controllers.

Benandbrady.com



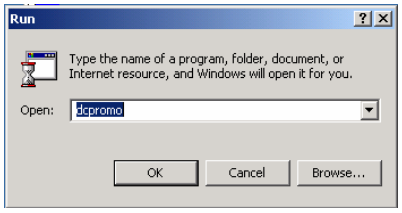


Active Directory

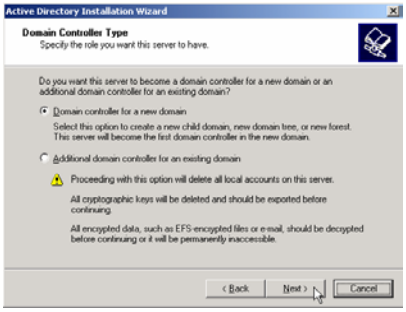
Active Directory is a new feature in Windows 2000 that allows users to logon and access resources from anywhere in the network. It allows administrators to manage the network from a single location and makes network security much easier to manage. Active Directory is really a database that stores information about all objects on the network. Think of Active Directory as a phone book for the network. For example, if you needed to find a resource on the network but you can't remember where it is located, you can do a search in Active Directory to find that resource. Resources include users, groups, computers, printers, and shared folders, to name a few. The Active Directory database is stored on Windows 2000 servers known as Domain Controllers. All of the domain controllers within a domain hold the same copy of the Active Directory database, in a file named NTDS.DIT. Windows 2000 domain controllers are multi-master replication partners, all replicating data back and forth to each other.

Installing Active Directory

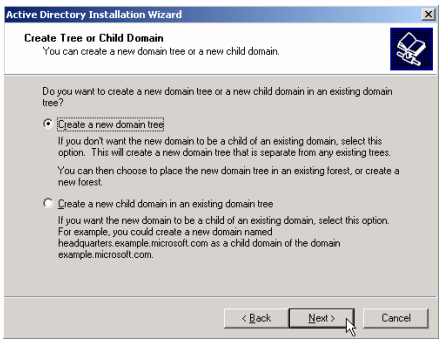
1. Log on to srv-1 and open the run command. From the desktop click on Start→Run then type in DCPROMO in the run command and click OK.



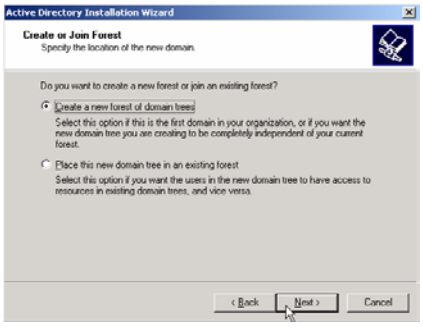
2. This will begin the Active Directory installation wizard. The first screen to appear is the welcome screen, click on **Next** to continue. The next screen will ask you for the type of domain controller you would like to install. You have two options; one is to install this as the first domain controller for a new domain or as an additional domain controller for an already existing domain. This is the first domain controller on the network, select **Domain controller for a new domain** and click **Next**.



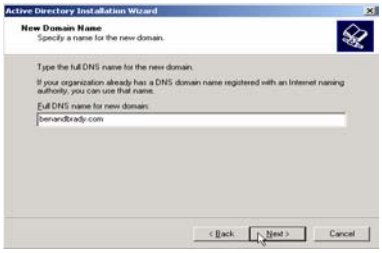
3. The next screen will ask you to specify whether you want to create a new domain tree or create a new child domain in an existing domain tree. In Windows 2000 you can build domain trees so that the domains are in a hierarchy, for domains to be in a tree they must have a contiguous (continuous) namespace. The first domain in a tree is known as the root domain and any child domains in the tree will have to contain the name of the root domain. For example TRAINSIGNAL.COM may have a child domain for a Chicago office with the name of CHI.TRAINSIGNAL.COM and would be considered part of the domain tree because it has the contiguous namespace of the root domain, TRAINSIGNAL.COM. Remember, that this is the first domain controller on the network, so it will be the "root" domain of a new tree. Select **Create a new domain tree** and click **Next**.



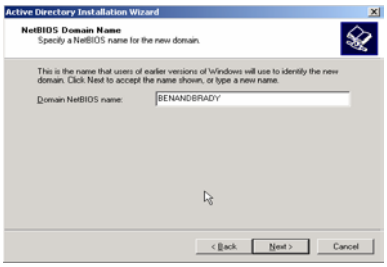
4. The next screen asks you if you would like to create a new forest or join an existing forest. Windows 2000 lets you place the domain trees into forests, if there are any existing forests. Forests are used when you would like to combine two domain trees that have a non-contiguous namespace. For example TRAINSIGNAL.COM and SAS-TA.COM may not be placed in a domain tree together, because of the non-contiguous root domain names, but they may be a part of a forest that contains domain trees. You are creating the first and only tree with the benandbrady.com domain. Select **Create a new forest of domain trees** and click **Next**.



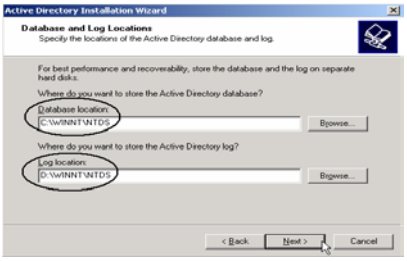
5. The next screen will ask you to specify the full DNS domain name for your new domain. You do not have to use your company's registered public (Internet) domain name here, but you can if you would like. For this lab, type in **benandbrady.com** and click **Next**.



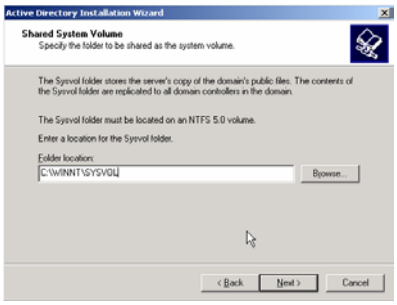
6. The next screen will ask you to specify the NetBIOS name for the domain. This is the domain name that legacy systems (anything before Windows 2000) and applications that only support NetBIOS will use. The main difference is that the NetBIOS domain name can only contain up to 15 characters with no periods. By default the wizard will suggest a name for you, based on the domain name you entered earlier, only now it will use the NetBIOS name rules. In this case, it should come up as **BENANDBRADY.** You can modify this name if you would like, but it would most likely lead to confusion down the road, as your domain will effectively have two names. Leave the default name, BENANDBRADY. Click on **Next**.



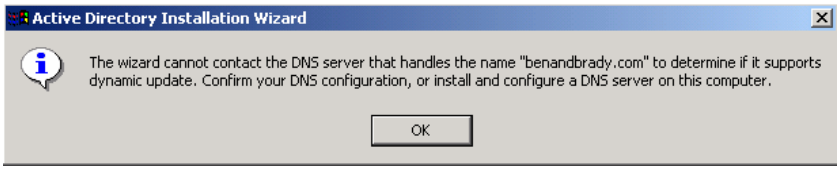
7. The next screen will ask where you want to place the Active Directory database and log. It's recommended in a production environment, that you place the log file on a separate physical hard drive to increase the performance of Active Directory. This is optional for the lab, if you do not have two physical hard drives you can leave it at the default setting which will be the *%systemroot%*\WINNT\NTDS for both the database and the log, or c:\WINNT\NTDS. Click **Next**.



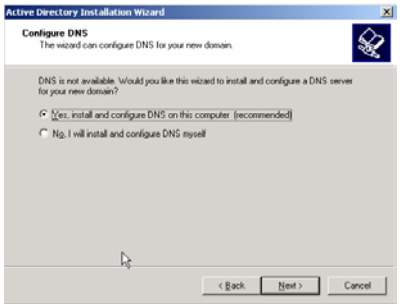
8. The next screen will ask you for the location of the SYSVOL folder. This system folder stores any user configurations, default profiles, and logon scripts that you may have on the network. The folder is automatically shared and replicates to other domain controllers throughout Active Directory. The default location of the folder is *%systemroot%\WINNT\SYSVOL* but you may still change the location of the folder. You always want to try to keep things as simple as possible so leave the default location for the folder and click **Next**.



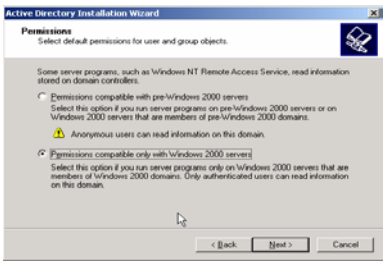
9. A dialog box will appear and tell you the wizard was unable to find the DNS server that handles the name *benandbrady.com* and then ask you to confirm that the DNS configuration is working properly, or install and configure a DNS server on this computer. Active Directory was designed to work with DNS and will not function without a DNS server that handles name resolution for the domain. Click **OK**.



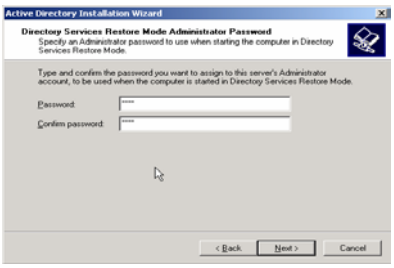
10. Within the wizard, you will see a screen asking if you would like to install and configure DNS on this computer now or if you would like to install and configure DNS yourself. If you select yes, the wizard will install DNS for you but if you select no it will end the wizard and tell you that it cannot continue and the Active Directory installation will fail. Let the wizard install and configure the DNS server for you. Select **Yes, install, and configure DNS on this Computer** and click **Next**.



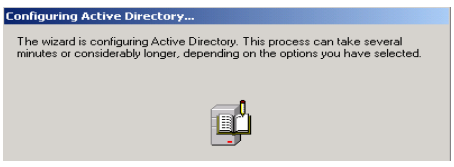
11. The next screen will ask you what the default permissions should be for users and groups. The first option is for permissions compatible with pre-Windows 2000 servers. This setting will loosen up security a little, but it will allow NT 4.0 RAS servers and other programs to be able to authenticate users. The second option is for permissions compatible only with Windows 2000 servers. This will give you tighter security but will not work with any NT 4.0 RAS servers and can cause problems within NT 4.0 domains. There are no NT 4.0 servers of any kind in the network, nor do you ever plan on having any on the network, so you may choose the second option of **Permissions compatible only with Windows 2000 servers** and click **Next**.



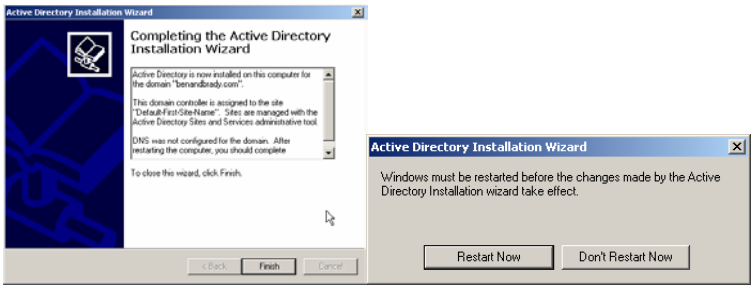
12. The next screen will ask you for a **directory services restore mode administrator password.** This password is used to protect against anyone other than an administrator from rebuilding the Active Directory database from the directory services restore mode. This password is different from any logon password and should be a different from the administrator's logon password in case the administrators' account gets compromised. Type in **pass** as the password and click **Next**.



13. The next screen will give you a summary of all the information you entered in the wizard. Review and confirm that everything is correct and click **Next** to start the Active Directory installation. You may be asked for the *i386* folder during the installation of DNS, so you should have the Windows 2000 Server CD-Rom handy. The installation should take about 15-30 minutes.

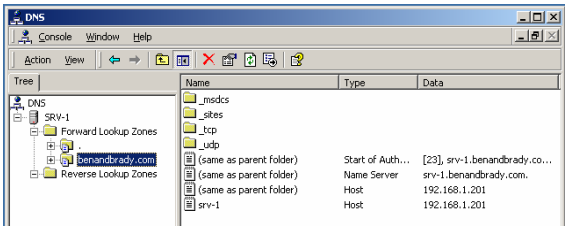


14. You will eventually get a screen letting you know the installation is done. Click on **Finish** and you will see a dialog box appear telling you that the server must be restarted before the changes made by the Active Directory installation wizard take effect. Click **Restart Now** for the computer to restart.

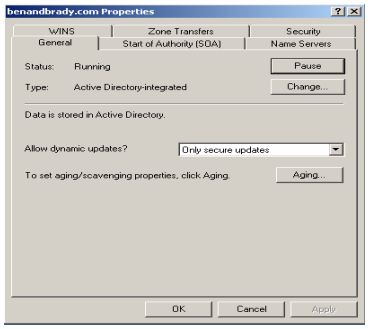


Configuring DNS to work with Active Directory

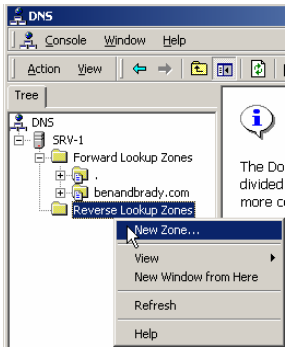
1. When the server restarts, log on as administrator and open **the DNS management console**. Go to **Start→Programs→Administrative Tools→DNS**. In the left pane open srv-1, then open **Forward Lookup Zones** folder and find the zone for **benandbrady.com**. Check to make sure there is a host entry for srv-1.



2. Right click on the **benandbrady.com** and select **Properties**. Here you can see that when DNS is installed automatically through the Active Directory installation wizard, the zone type is set to *Active Directory-integrated* and dynamic updates are set for O*nly secure updates* by default. Click **OK**.

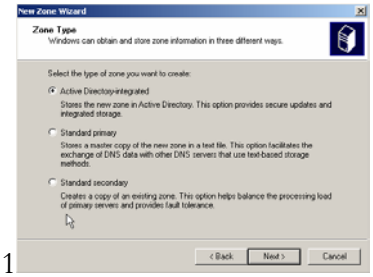


3. Now you will need to create a reverse lookup zone for the benandbrady.com network. The reverse lookup zone is needed in order to use the *NSLOOKUP* utility to test that DNS is working properly and troubleshoot any problems that may arise. Right click on the **Reverse Lookup Zones** folder, select **New Zone** and the Reverse lookup zone wizard will start.

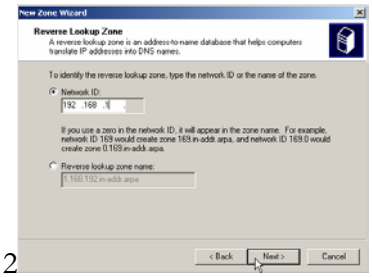


4. The first screen is the welcome screen, just click on **Next**. The next screen will ask you to specify the type of zone you want to create. Choose the same type of zone that the forward lookup zone is set to. Select **Active Directory integrated**, by selecting an Active Directory integrated zone, dynamic updates will automatically be set to allow *Only secure updates*, click **Next.** The next screen will ask you to specify the Network ID for the reverse lookup zone. Type in the network ID **192.168.1** and click **Next**. The last screen will show a summary of all the information you entered on the wizard, confirm that it's all correct and click **Finish** to create the reverse lookup zone.

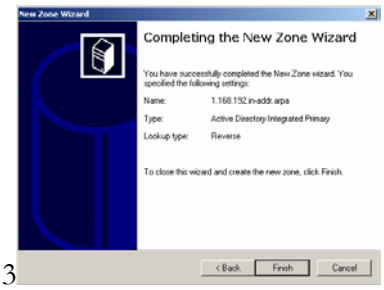
1



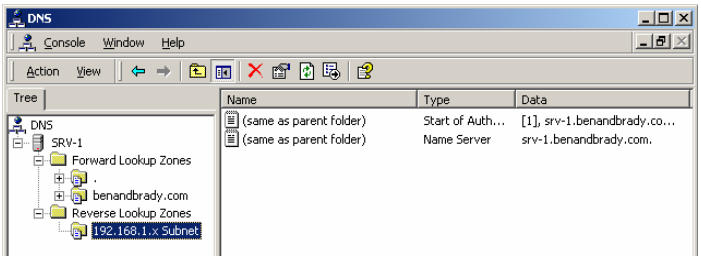
2



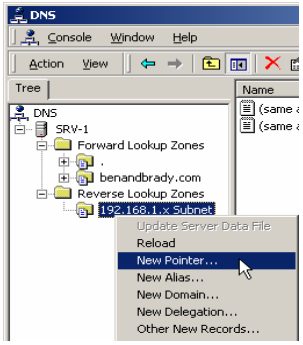
3



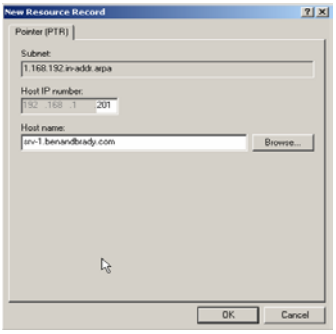
5. On the DNS console, open the **Reverse Lookup Zones** folder and you should find the zone, **192.168.1.x Subnet.** Open the **Properties** of the zone to confirm that the zone type is set to *Active Directory integrated* and dynamic updates are set to allow *only secure updates*. Close the **Properties.**



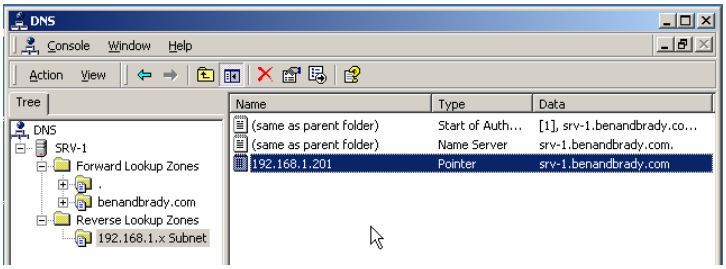
6. The next step is to create a pointer record for **srv-1**, this should be the only pointer record you will have to create manually because any other clients that support dynamic updates will automatically update and create their own host and pointer records. Srv-1 did not update or create a pointer record automatically because there was no reverse lookup zone available when the host record was originally created. Right click on **192.168.1.x Subnet** and select **New Pointer.**



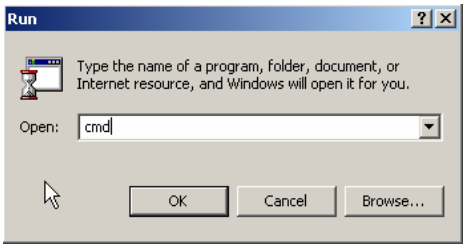
7. A dialog box will appear asking you for the Host IP address and Host name of the Pointer record. Type in **201** for the host IP number and **srv-1.benandbrady.com** for the host name then click **OK**.

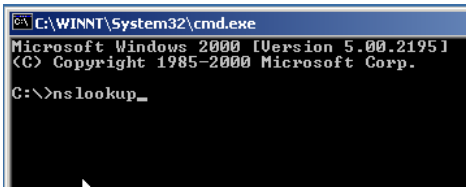


8. On the DNS console, you should now have a pointer record for *192.168.1.201*. Close the DNS Console.

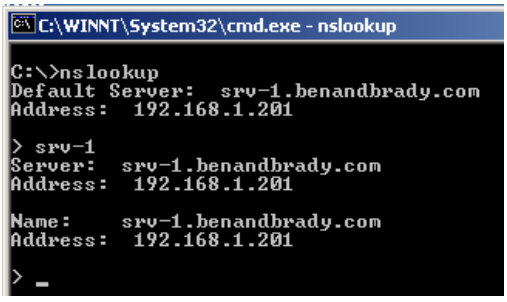


9. From the desktop, open the command prompt; go to **Start→Run**, type in **CMD** and click **OK**. On the command prompt type in ***NSLOOKUP*** and press **Enter**.



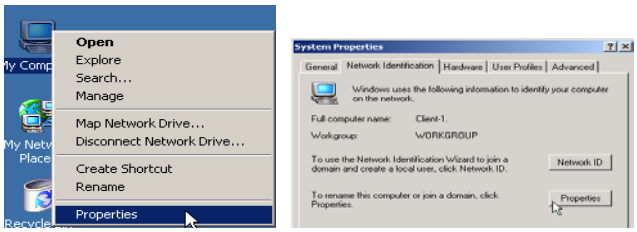


10. The NSLOOKUP utility will look for the DNS server on the network and return the host name and IP address of the server. You should have the default server **srv-1.benandbrady.com** and an IP address of **192.168.1.201** appear. You may now type in any host name and NSLOOKUP will query the preferred DNS server to resolve it to an IP address. Try resolving the host name for srv-1. Type in **srv-1** and press **Enter**. You should get the full DNS name and IP address of the DNS server and underneath it will appear the full DNS name and IP address of the queried host. Type in **Exit** and press **Enter** to exit NSLOOKUP. Then type **Exit** and press **Enter** again to close the command prompt.



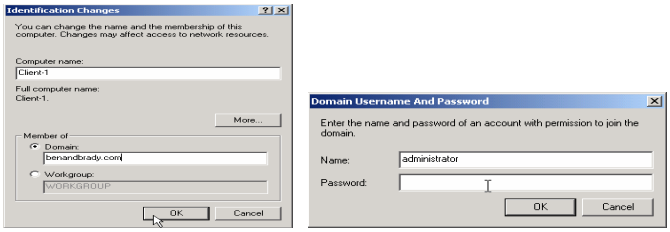
Joining clients and servers to the domain

1. Log on to client-1 and open the network identification tab from the **System Properties**. On the desktop right click on **My Computer** and select properties. On the properties page select the **Network Identification** tab. You will see that the full computer name is *client-1* and it is currently a member of the workgroup named *workgroup*, which is the workgroup that Windows 2000 computers join by default unless otherwise specified during the installation.

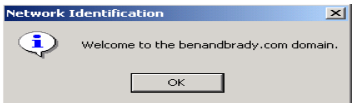


2. To change the network ID information, click on the **Properties** button. On the properties page you can change the computer name and the domain or workgroup that the computer is a member of. Leave the computer name as client-1, for the **Member of** option select **Domain** and type in **benandbrady.com.** Click **OK** and you will be prompted to enter a username and password of an account that has permission to join computers to the *benandbrady.com* domain. Enter the **domain administrator's username** and **password** for the *benandbrady.com* domain and click **OK**.

*****Note*****
The administrator account for the benandbrady.com domain and the account for the local administrator are not the same; it must be the administrator account that you use to log on to the domain.



3. After you enter the name and password you should get a dialog box welcoming you to the **benandbrady.com** domain. Click **OK** and you will get a couple more dialog boxes saying that you must reboot the computer for changes to take effect. Click **OK** and **Yes** until your computer reboots.



4. When the computer restarts make sure, you change the *logon on to* dialog box to **benandbrady**. Use the administrative account from the domain (right now this may be the same username/password as your local administrator account, but it is important to distinguish the two) to logon to the benandbrady.com domain.

5. Once you logon, open the **System Properties** and select the **Network Identification** tab. You should now see the full computer name as *client-1.benandbrady.com* and the domain as *benandbrady.com*. Click **OK** and **log off** client-1.

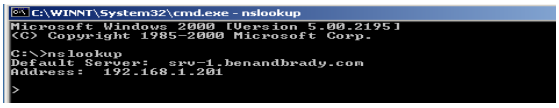
6. The process for joining computers to the domain is the same for Windows 2000 Professional and Server. Now log on to srv-11 and make it a member server of the benandbrady.com domain by using the same steps that you used to join the Windows 2000 Professional computer, client-1, to the domain.

Scenario – Part Two

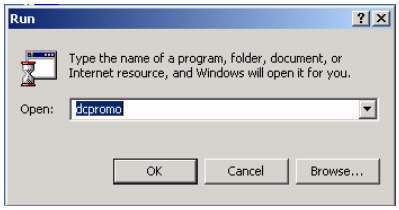
Jill calls you into her office to discuss your progress with the new benandbrady.com domain. She tells you that everything is looking good and informs you that she also wants a second domain controller on the network for higher reliability and better performance. You agree with her about adding the second domain controller and jump right into the new project.

Adding a second Domain Controller

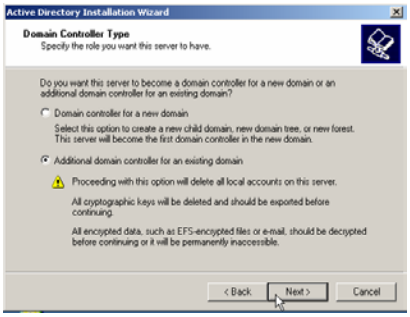
1. Log on to the benandbrady.com domain with member server **srv-11**. Before attempting to add a second domain controller to the domain, it is very important to verify that DNS is working properly on the server. You can do this by using the *NSLOOKUP* utility from the command prompt and making sure that the default server and address appear without any errors. You should have srv-1.benandbrady.com appear as the default server with the IP address of 192.168.1.201. **Exit** *NSLOOKUP* and **Close** the command prompt. If you receive errors at this point, it is very unlikely that the second domain controller will be able to contact the first domain controller and replicate the Active Directory database. You should attempt to fix this problem, which is more than likely related to DNS, before you go on.



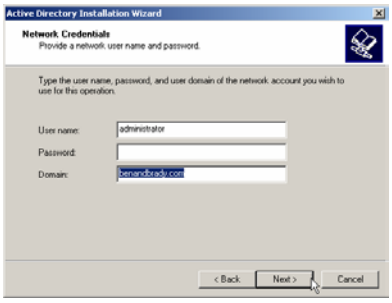
2. Adding another domain controller to a domain is done the same way as creating the first domain controller, by running DCPROMO and using the Active Directory installation wizard, only this time you will have to select different options in the wizard in order to make srv-11 the second domain controller of benandbrady.com. You can start the Active Directory installation wizard by running **DCPROMO** from the run command prompt.



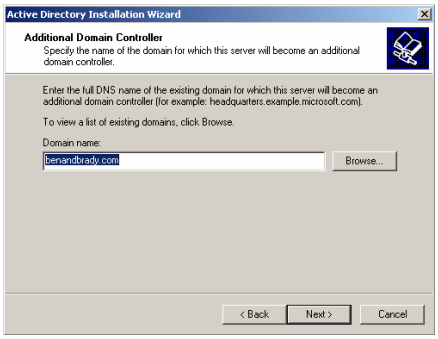
3. The first screen on the wizard is the welcome screen, just click on **Next** to move on to the following screen. On the second screen, you're asked to specify whether this will be a domain controller on a new domain or an additional domain controller for an existing domain. Select **Additional domain controller for an existing domain** and click **Next**.



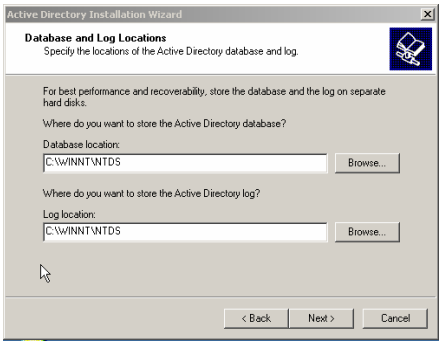
4. The next screen will ask you to specify a username, password and domain name for the domain it will become a domain controller for. Type in the *administrator's* **username** and **password** for the benandbrady.com domain. **benandbrady.com** should appear by default as the domain because this server is a member of the benandbrady.com domain already. Click **Next.**



5. The next screen will ask you to enter the full DNS name of the domain for which the server will become a domain controller. By default it should already appear as benandbrady.com because the server is already a member of this domain. Leave the DNS name **benandbrady.com** and click **Next**.



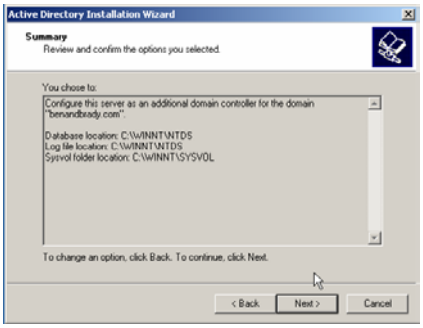
6. The next screen will ask you to specify where to store the Active Directory database and the Active Directory Log. By default they are both placed in the **%systemroot%\WINNT\NTDS** folder. It is recommended that you place the database and the log on separate physical hard drives for better performance. For this lab leave the default location for both the database and the log and then click **Next**.



7. The next screen will ask you to specify the location of the shared system volume. The default location is **%systemroot%\WINNT\SYSVOL.** Keep it simple by leaving the default location for the shared system volume and click **Next**.

8. The next screen will ask you for a *directory service restore mode administrator password.* This password will be asked for when starting the computer in directory services restore mode or if the domain controller is being demoted. Use the same password that was used in the first domain controller to be consistent. Type in **pass** as the password and click **Next**.

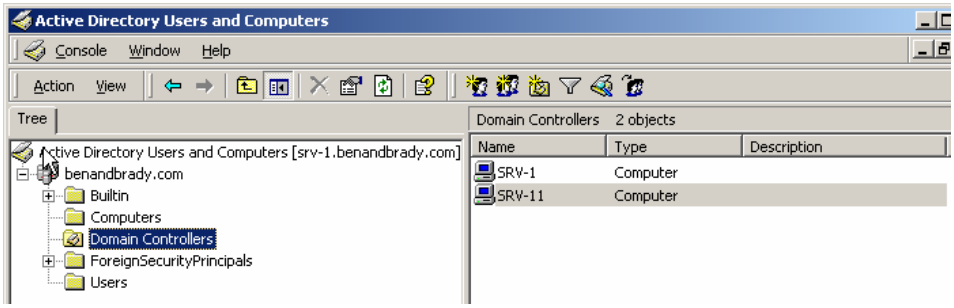
9. The next screen will be a summary of all the information you entered in the wizard. Confirm that the information is correct and click **Next**.



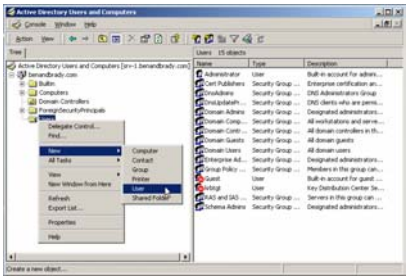
10. The Active Directory installation will then begin and continue for about 15-30 minutes. The final screen for the wizard will appear to let you know the installation is complete. Click on **Finish** and a dialog box will appear telling you that the server must be restarted in order for the changes made by the Active Directory wizard to take effect. Click on **Restart Now** for the computer to restart.

Testing replication between the domain controllers

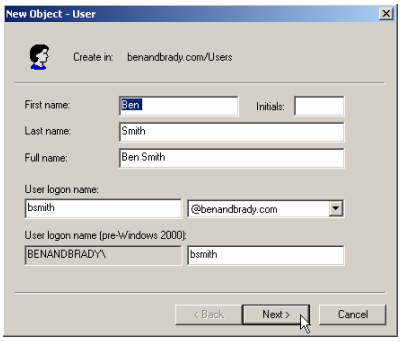
1. Log on to **srv-1** and open the Active Directory Users and Computers console by going to **Start→Programs→Administrative Tools→Active Directory Users and Computers.** In the left pane of the console open the container named **Domain Controllers**, all domain controllers in the *benandbrady.com* should appear in the details pane on the right. You should see both *srv-1* and *srv-11* appear. By default, any domain controllers on the network are placed in this container.

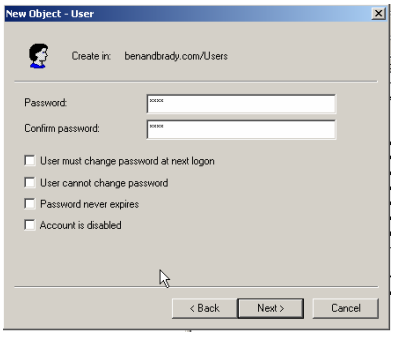


2. Now create a user account for *Ben Smith* to test replication between the two domain controllers. Right click on the **Users** container in the left pane and select **New→User**.

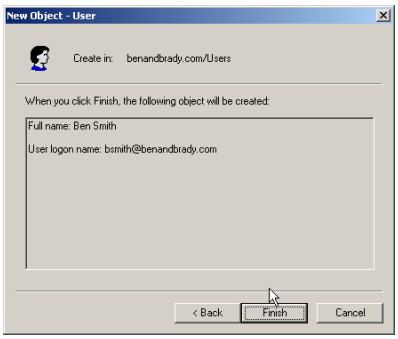


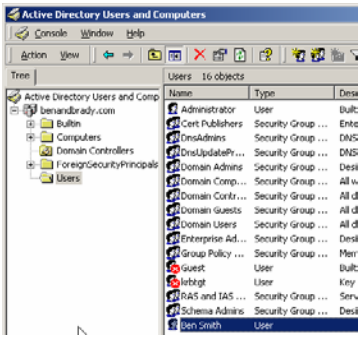
3. That will bring up a wizard for creating a new user. On the first screen type in the first and last name for the user **(***Ben Smith***)** and for the logon name type in the first initial of the first name and the full last name **(***bsmith***)** and click **Next**. On the next screen you must enter a password for the new user account. Type in **mega** as the password and click **Next**.





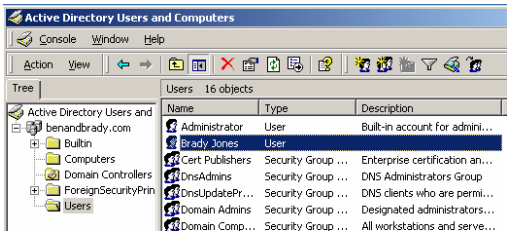
4. The final screen is just a summary of all the information that you entered in the wizard. Confirm that the information is correct and click **Finish**. Then on the Active Directory Users and Computers console there should be a user account named *Ben Smith* in the **Users** container.



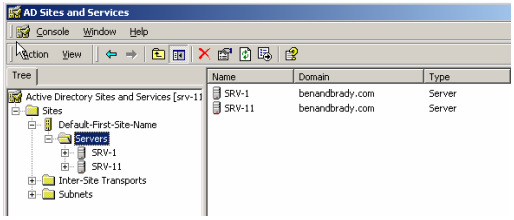


5. Now log on to **srv-11** and open the **Active Directory Users and Computers** console and then click on the **Users** container in the left pane. Now look into the Details pane on the right and try to find the user account **Ben Smith**. It may or may not appear here. It all depends on whether the domain controllers have replicated the Active Directory database yet or not. There is no absolute time as to how often the domain controllers replicate, they may replicate instantly or it may take up to about 5 minutes after a change is made to the database. For the lab let us assume that the replication has not taken place so your Active Directory Users and Computers console on srv-11 will not have the user *Ben Smith.*

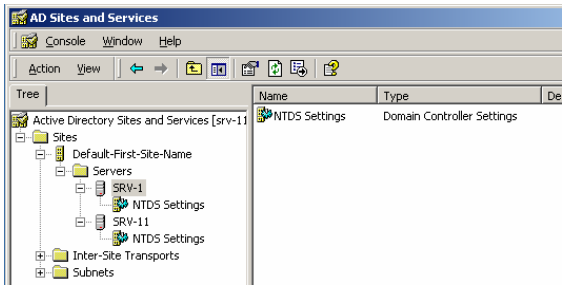
6. Now create a user account in the **Users** container for **Brady Jones** with the password **mega** from within srv-11's Active Directory Users and Computers console. This way you can see how replication will update the Active Directory database on both domain controllers. Close the Active Directory Users and Computers console when finished.



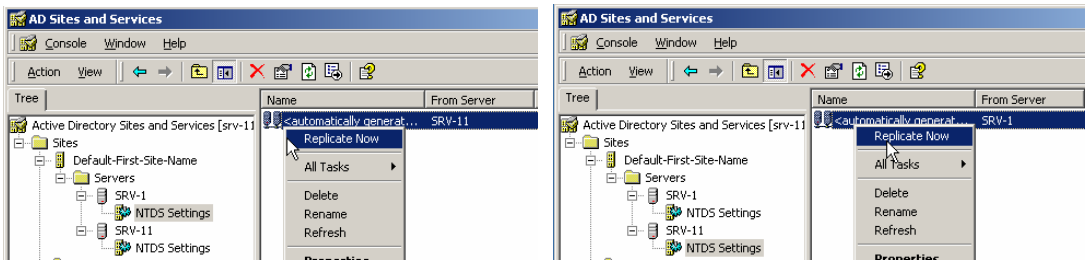
7. Replication can be forced from any of the domain controllers in the domain from within the **Active Directory Sites and Services console**. Use **srv-11** since it is the server you were last on and go to **Start→Programs→Administrative Tools→ Active Directory Sites and Services.** In the left pane go to **Sites→Default-First-Site-Name→Servers.** There you should see domain controllers, *srv-1* and *srv-11.*



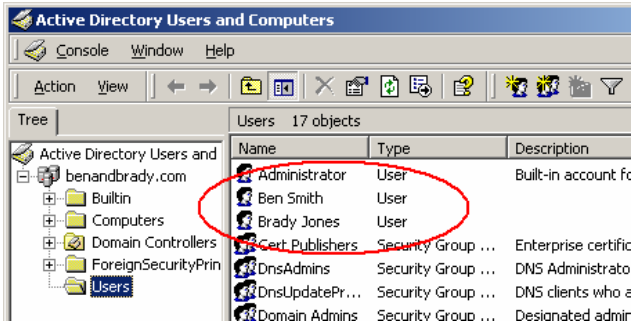
8. Now within each server are the **NTDS (Active Directory Database)** settings. Open both servers in the left pane so that you can see the NTDS settings.



9. Select the **NTDS settings** for **srv-1** and you should see the connection to *srv-11* in the detail pane. Right click on the connection and select **Replicate Now.** A dialog box will appear telling you that Active Directory replicated. Now do the same for the connection to *srv-1* within the **NTDS settings** for **srv-11** and **close** the Active Directory Sites and Services console when you are finished.



10. Now on **srv-11** open the **Active Directory Users and Computers** console and try to find the users accounts for *Ben Smith* and *Brady Jones* in the **Users** container. They should both appear in the user's container. Now try to find them on the **Active Directory Users and Computers** console on **srv-1**. If you are able to see both user accounts on either server, it means that Active Directory replication is working properly.



Lab 2

Creating an Organizational Unit (OU) Structure for Wired Brain Coffee, Inc.

You will learn how to:

- Create and manage Organizational Units (OUs)
- Create and move objects within Organizational Units
- Delegate control of Organizational Units
- Test delegated Organizational Units
- Remove delegated control of an Organizational Unit

Scenario Part One

You finish the installation of the domain controllers way ahead of schedule and everything is working great. You report to Jill, the Operations Manager, that the domain is up and running without any issues. She says, "WOW great job!" She is very impressed, you think to yourself, "that full time administrator job is all mine." Jill then asks you if you're ready for the next project. She has designed the Organizational Unit (OU) structure that the company is going to use on the network. She hands the project over to you with all of the necessary information and asks you to see her after you have implemented and tested the OU structure.

In this lab you will create an Organizational Unit (OU) structure for Ben & Brady's Ice Cream Co. Jill's design is a "hybrid" approach, based on location first, then on business functions. You will first create OUs for each location and then create child OUs within them for each department in the company. You will also create and move objects within the OU structure. Finally, you will delegate control of some basic administrative functions to a user located in the North Carolina location.

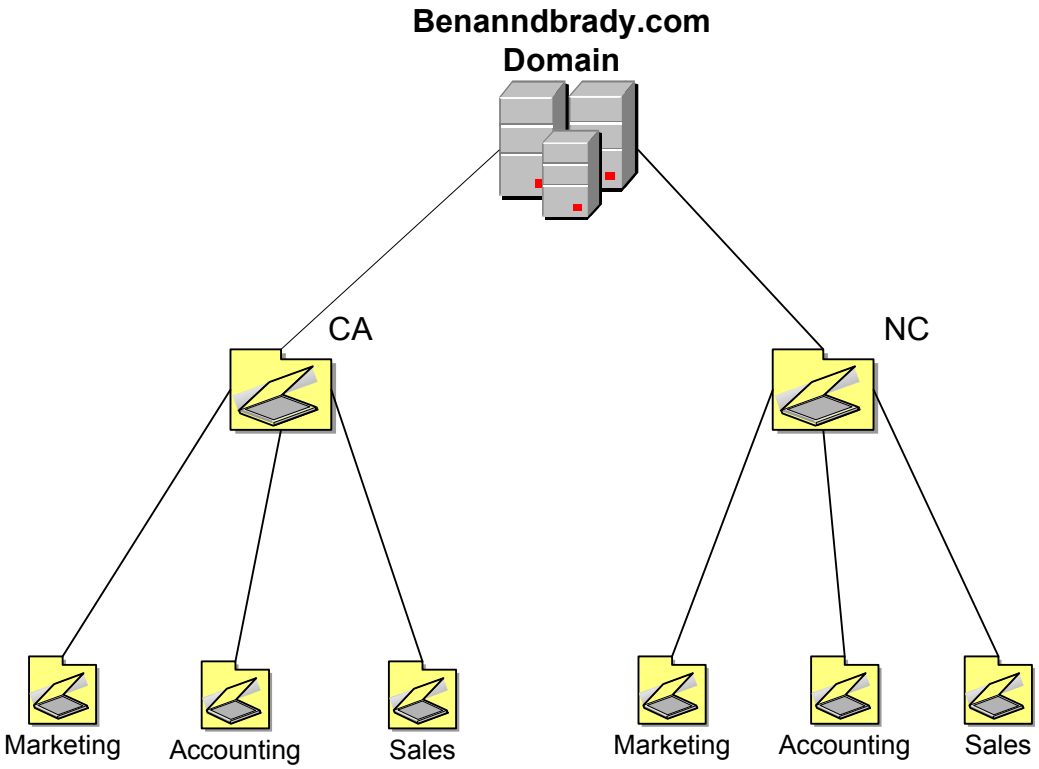
Organizational Units

Organizational units are new to Windows 2000. OUs are Active Directory containers that you use to organize objects within a domain. An OU can contain objects like users, groups, computers, printers, other OUs, and shared folders. OUs can be assigned group policies and can be used to delegate administrative tasks to users or groups. The key to building an OU structure is to have a system that is easy to manage and works well for the company. A company may use different strategies for creating their OU structure. The OU structure can be based on location, business functions, types of objects, or a hybrid of many different strategies. This structure will vary from company to company, depending on what the needs of the individual company are. OUs are a good alternative to creating multiple domains and Microsoft recommends that your company only have one domain if possible.

Active Directory

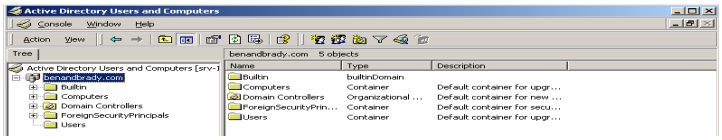
Lab 2

OU-Structure



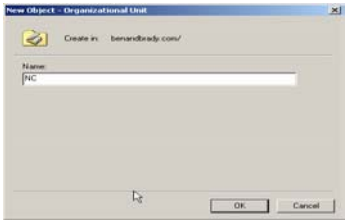
Creating OUs

1. Log on to **srv-1** as the domain administrator and open the **Active Directory Users and Computers** console. Go to **Start→Programs→Administrative Tools→ Active Directory Users and Computers.**



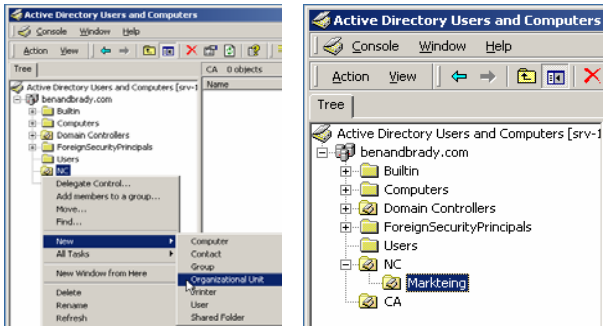
2. On the left pane, right click on benandbrady.com and select New→Organizational **Unit.**

3. A screen will appear asking you to specify a name for the new *OU*. Type in **NC** for *North Carolina* and click **OK**. You will now have an *OU* named NC in the left pane of the Active Directory Users and Computers console.

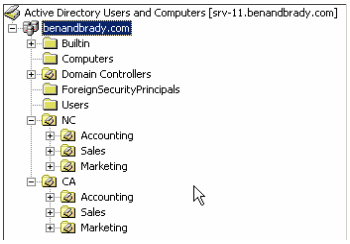


4. Create another *OU* in the **benandbrady.com** domain for *California* and name it **CA**. You should now have two *OUs* appear in the left pane of the Active Directory Users and Computers console. One named **NC** for the North Carolina location and one named **CA** for the California location.

5. Right click on the **NC** organizational unit and select **New→Organizational Unit.** Type in **Marketing** for the name of the new organizational unit and click **OK**. You have now created an organizational unit for the marketing department within the **NC** (North Carolina) organizational unit.

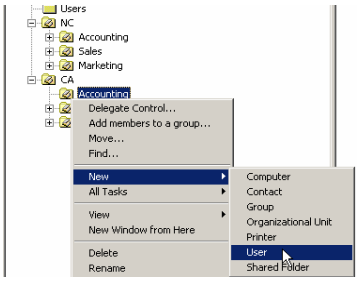


6. Next, create additional organizational units for the **Sales** and **Accounting** departments within the **NC** (North Carolina) *OU*. Then create the same three organizational units for the different departments within the **CA** (California) organizational unit. Your final structure should look like the figure below.

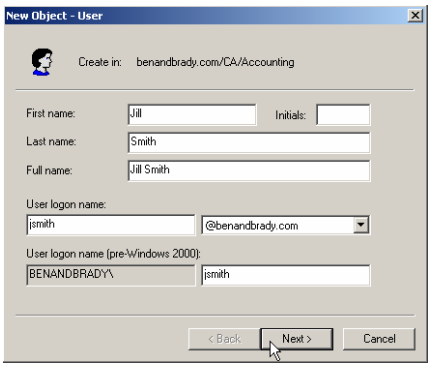


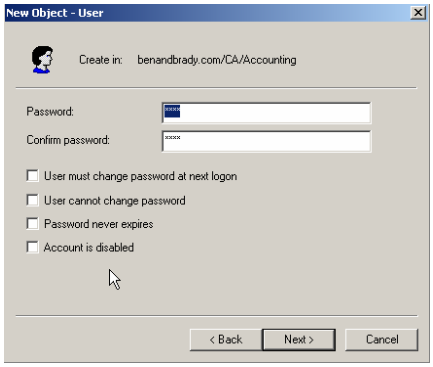
Creating objects within the Organizational Units

1. Create a user account for *Jill Smith* in the Accounting *OU* within the CA (California) *OU*. Right click on the **Accounting *OU*** within the **CA (**California**) *OU*** and select **New→User**.

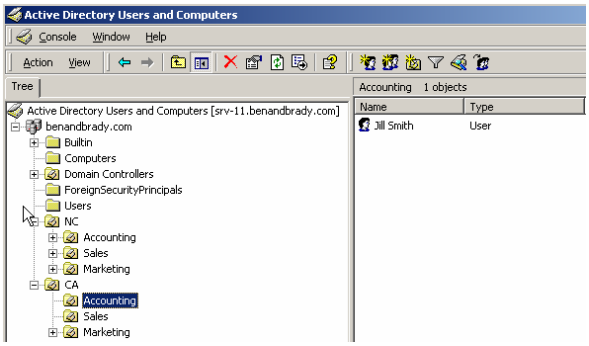


2. The new user wizard will appear. Type in the full name of **Jill Smith** with the user logon name of **jsmith** and click **Next**. Type in **test** as the password, then click **Next. Click Finish** on the last screen.





3. You should now have a user account for Jill Smith appear in the details pane on the right side when you select the **Accounting OU** within the **CA OU**.

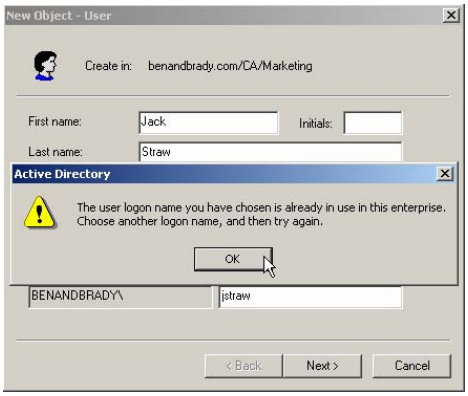


4. Now create the following users from within the table below. Make sure that they are created within the correct OUs.

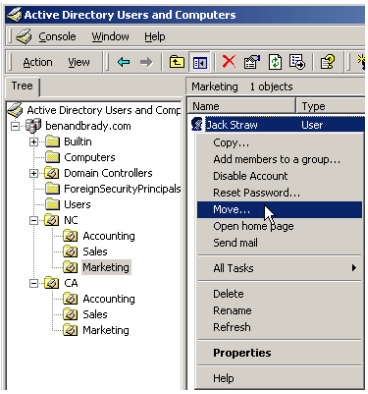
First Name	Last Name	Username	Password	OU
Jack	Straw	jstraw	test	NC→Marketing
Sue	Stevens	sstevens	test	NC→Sales
Bob	Hayes	bhayes	test	NC→Accounting
Peter	Ramirez	pramirez	test	NC→Accounting
Maria	Perez	mperez	test	CA→Marketing
Mark	Jones	mjones	test	CA→Sales
Christina	Sanchez	csanchez	test	CA→Accounting

Moving Objects between Organizational Units

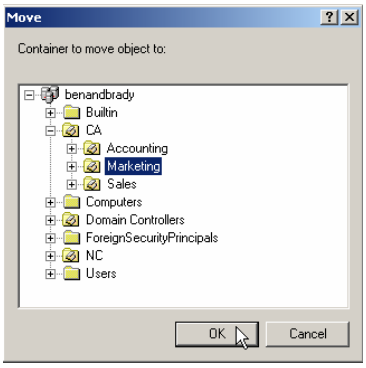
1. You cannot have two objects with the same username in your domain; regardless of what organizational unit they are in (technically you *can* make this work, but it is not worth the hassle and is beyond the scope of this lesson). For example, let's say that the user Jack Straw is being relocated from the North Carolina location to the California location. If you try to create a user account for **Jack Straw** in the **Marketing OU** within the **CA (California) OU**, you will get an error message when you try to advance to the next screen of the new user wizard. If you followed along, Click **OK** and then click **Cancel** to close the new user wizard.



2. Instead of deleting and re-creating the user account in the **California-Marketing *OU***, try moving the user account. Find the user account **Jack Straw**, which is located in the **North Carolina→Marketing *OU***. Next, right click on the user account and select **Move**.

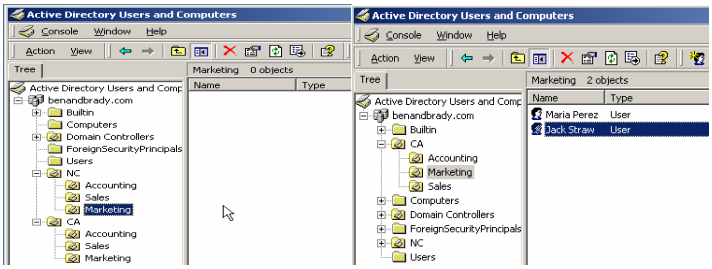


3. That will bring up a small explorer window where you can browse through all the containers that are available within the domain. Open the **CA *OU***, select the **Marketing *OU***, and click **OK**.

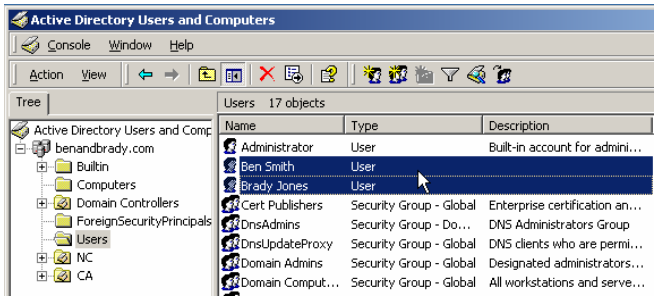


4. The user account for **Jack Straw** should no longer appear in the details pane on the right of the console for the **North Carolina→Marketing *OU*** (see below).

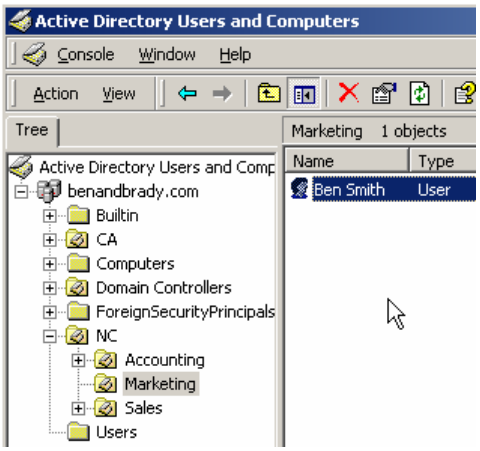
5. Now open the **California→Marketing *OU*** and you should find the user account for **Jack Straw** located in the details pane of the console.

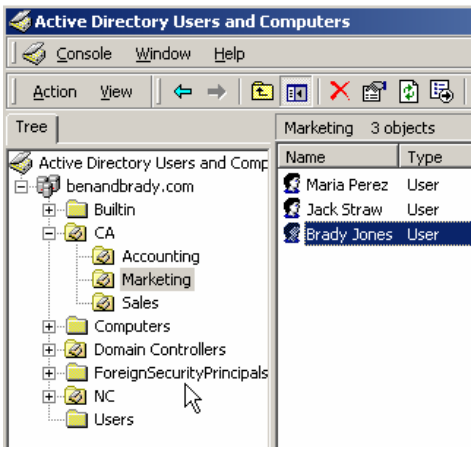


6. Next, you will move the user account for *Ben Smith* and *Brady Jones* from the Users container to the departments they are a part of. Open the **Users** container and find the user accounts for **Ben Smith** and **Brady Jones.**



7. The user account for **Ben Smith** needs to be placed in the **North Carolina→Marketing *OU*** and the user account for **Brady Jones** needs to be placed in the **California→Marketing *OU***.





Scenario – Part Two

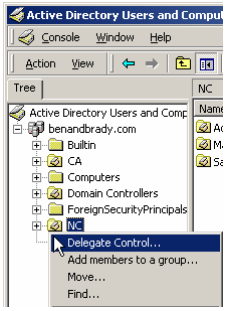
You have completed the initial work on the OU structure. When you check in with Jill, she is very happy with your progress. "The job is completed and way ahead of schedule too. How would you like to be the full time Network Administrator?" Jill asks you. You know that you should probably get back to her so you can think it over more, but you can't contain yourself. "I'll take it!" you blurt out.

You have been a network administrator at Ben & Brady's Ice Cream Corp., for six months now and have been bombarded with lots of projects to work on. The worst part is that the Jr. Network Administrator at the North Carolina location resigned about a month ago and the company still hasn't found a replacement. You have been extremely busy trying to handle problems at both locations. It wouldn't be so bad if you didn't have to deal with all of the little problems that always come up, like resetting passwords and managing user/group accounts. To provide some relief until the North Carolina people hire someone, you have decided to give the user **Peter Ramirez,** who is a manager in the accounting department, control over creating, deleting, and managing user accounts and groups in the **NC OU.** You chose him because he is tech savvy, familiar with all of the departments in the North Carolina location, and many users already go to him when they need help. Peter is more than happy to take on the added responsibility.

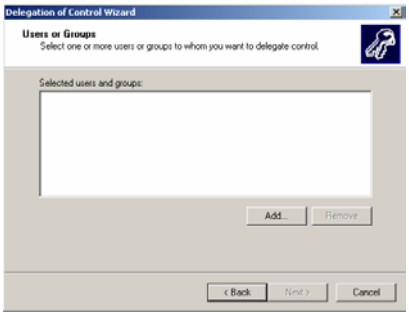
Delegating Control

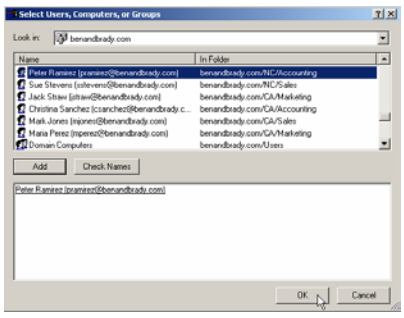
By using Organizational Units (OUs), you can delegate control of tasks for an OU to a particular user or group that may not have any administrative privileges to perform these tasks. That user or group can then administer the tasks and *only* those tasks that were delegated to them. For example if a user in accounting is delegated control of resetting passwords for the Accounting *OU* in California, they will only be able to reset passwords for that OU. If the user tried to reset a password anywhere else in the domain they will be denied.

1. On the Active Directory Users and Computers console, right click on the **NC *OU*** and select **Delegate Control**.

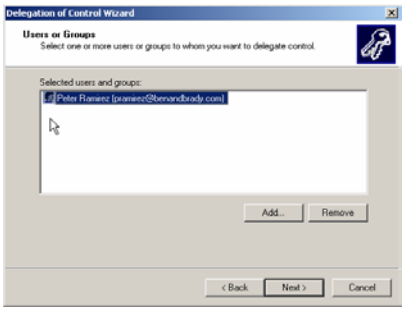


2. This will start the delegation of control wizard. The first screen is just a welcome screen, click **Next**. On the next screen you will have to select the users or groups that you want to delegate control to. Click on **Add** and you will have another screen appear showing you a list of the users and groups that are available on the domain. Find and select the user **Peter Ramirez** click **Add** then **OK**.

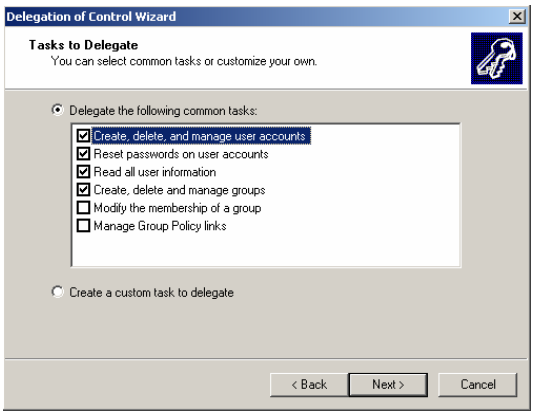




3. You should now have the user named Peter Ramirez appear as the selected user that you want to delegate control to. Click **Next**.



4. The next screen will show you some of the possible tasks that can be delegated to this user. Microsoft selected six of the most common tasks that administrators may want to delegate. If none of these tasks are what you want, you can also choose to create a custom task to delegate. Creating a custom task to delegate is a lot more complex, especially if you are not very familiar with Active Directory security. Use the tasks that are supplied by Microsoft until you become a Windows 2000 expert or have excellent documentation to guide you. Select the first four **common tasks** that are supplied, which will give Peter Ramirez all of the control he needs without giving him too much control and then click **Next**. The final screen of the wizard will give you a summary of the selections you made. Confirm that all of the information is correct and click **Finish**.

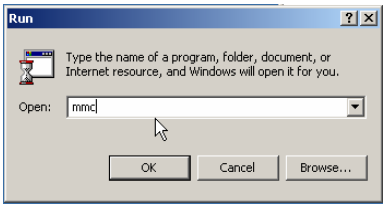


Testing the delegated permissions

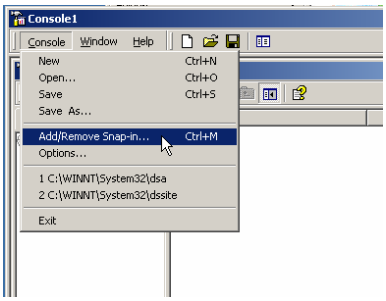
In order for the user to access the **Active Directory Users and Computers** console, you will need to remotely configure his computer (the Windows 2000 Professional machine at his desk) to make him a **local administrator**. This will give him administrative privileges to his local computer only, not the domain. The user will then be able to install the **adminpak.msi** file that is located on the **i386** folder of the **Windows 2000 Server CD-ROM**. The adminpak.msi file will install the administrative tools for the domain on the

computer because Windows 2000 Professional does not include the Active Directory administrative tools. You will then need to create a management console for Active Directory Users and Computers so that the user can easily access the tools he will need without giving him access to all the administrative tools. Then you will have to create a share for this user to be able to access the files he needs over the network.

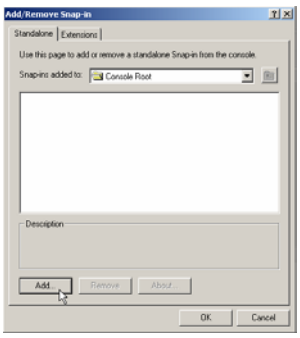
1. Log on to srv-11 as the domain administrator. Now create a management console to connect to **client-1's** local users and groups snap-in tool. Go to **Start→Run,** in the command prompt type in **mmc** and click **OK.**

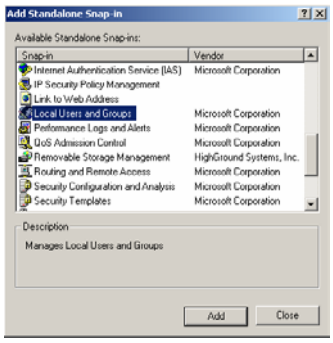


2. That will bring up an empty management console. On the top menu select **Console→Add/Remove Snap-in.**

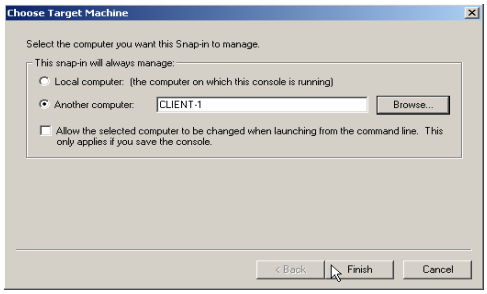


3. That will bring up another empty screen, which is where you add the snap-in tools that you want to use. Click on **Add** to bring up a list of available tools that can be added. Select **Local Users and Groups** then click **Add→Close**.

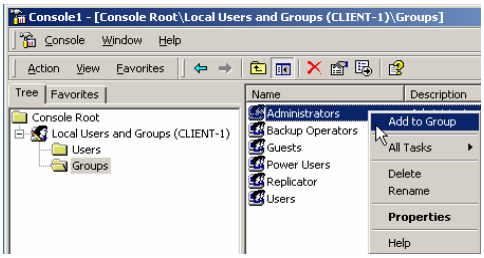




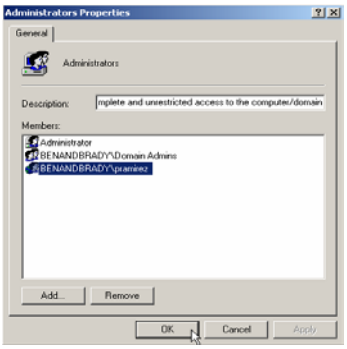
4. You will be asked to select the computer you want to manage with this snap-in tool. By default, it will have the local computer you are on selected, but you want to manage the computer **client-1.** Select the option for **Another computer** then **Browse** the *benanbrady.com* domain for *client-1* or simply type in **client-1** and click **Finish**.



5. This will bring you back to the management console within the local users and groups snap-in tool for client-1. You want to add the *domain* username ***pramirez*** to client-1's local **Administrators** group**.** In the left pane open the **Groups** folder, then in the details pane, right click on the **Administrators** group and select **Add to Group**.

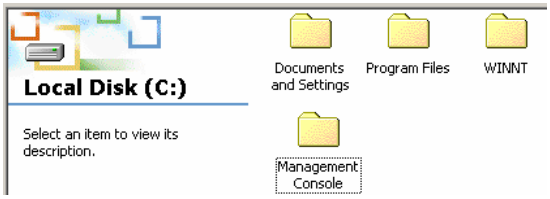


6. That will bring up a screen with a list of the members in the group. Click on the **Add** button and it will open up a new screen with a list of users and groups available in the benandbrady.com domain. Find the user **Peter Ramirez** then **Add** the user and click **OK**. That will bring you back to the list of members in this local administrators group. Look to make sure that the user **BENANDBRADY\pramirez** appears on the list and click **OK**.

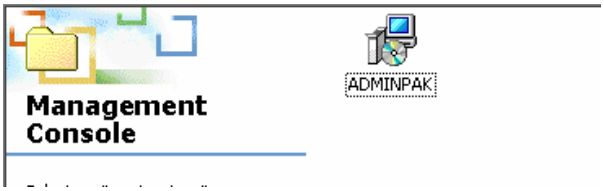


7. The user Peter Ramirez is now a member of the local administrators group for the computer client-1 only. He will not have any administrator privileges for the domain or any other computer in the domain, except for client-1. Now close the management console without saving it. This is not a tool you will be using very often and it's easily accessible if it's ever needed again.

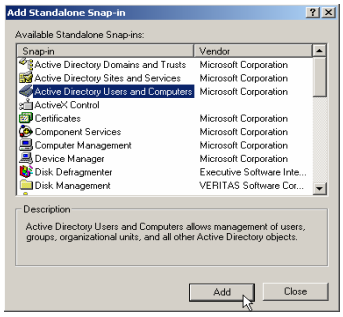
8. Now open the **C: drive**, using **Windows explorer** and create a new folder named *Management Console* to place the files the user will need. Right click on an empty space, select **New→Folder** and name the folder **Management Console**.



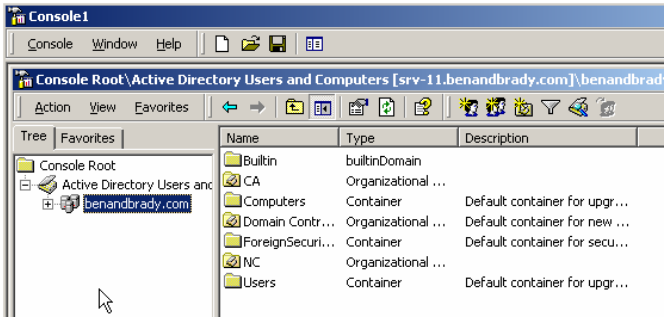
9. Next, insert the Windows 2000 Server CD-ROM and copy the **ADMINPAK.msi** file located in the **i386** folder to the folder you just created named **Management Console** on the **C: Drive**.



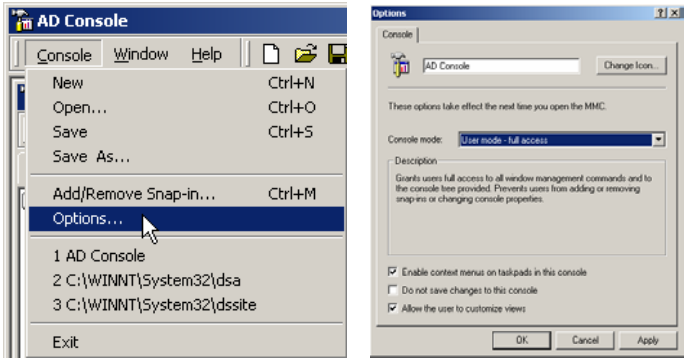
10. Now you need to create a management console with the Active Directory users and computers snap-in tool and save it in the management console folder. This will make it easier for the user to manage the *OU* and it will keep all the other administrative snap-in tools out of site. Go to **Start→Run→**type **mmc** in the command prompt and click **OK**. This will open an empty console. On the menu select **Console→Add/Remove Snap-in.** On the next screen click **Add** to see a list of available snap-in tools. Select **Active Directory Users and Computers** then click **Add→Close**.



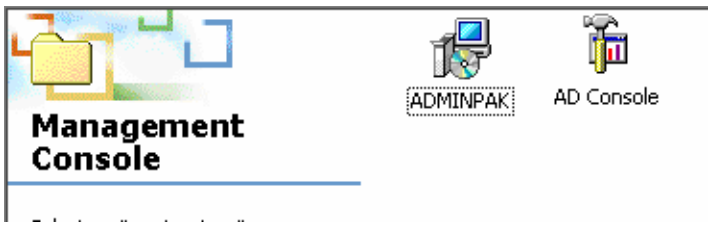
11. Then, click **OK** on the next screen and you should have the **Active Directory Users and Computers** snap-in tool appear in the management console.



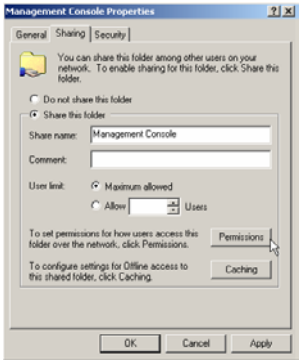
12. Before saving the management console, make sure to set the options on the console so that it is set to user mode. This way the user will not be able to add or remove any other snap-in tools to this console. From the top menu select **Console→Options**. Change the **Console mode** option to **User-mode – full access**. This will allow the user to have access to all the management commands, but will prevent the user from adding or removing any snap-in tools and keep him from changing the console properties. Click **OK**.



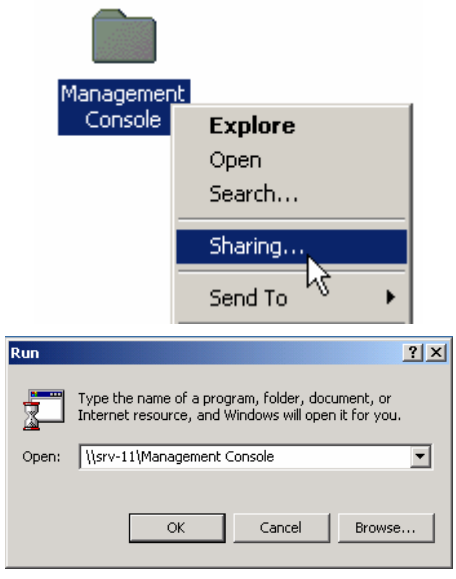
13. Now save the console with the name **AD Console** in the **Management Console folder** on the **C: drive**. Close the console and open the **C: drive** to confirm that the file was saved.



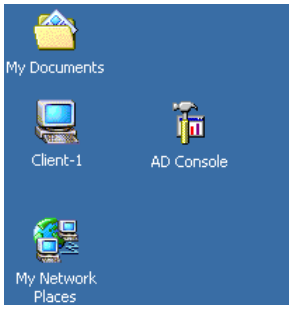
14. Now you will need to share the folder so that the user will be able to access the folder from his computer. On the **C: drive**, right click on the **Management Console folder** and select **Sharing**. Select the **Share this folder** option, leave the default share name **Management Console** and click **OK**. Now close windows explorer and log off the server.

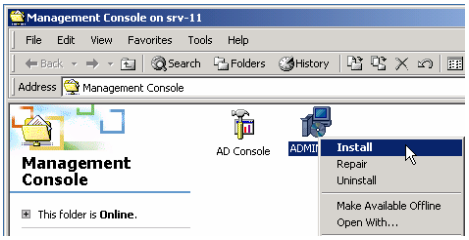


15. Now you will need to share the folder so that the user will be able to access the folder Log on to **client-1** with the username **pramirez**, you will pretend to be the user, install **ADMINPAK.msi** onto his computer and copy the **AD Console** over to the desktop. Open the shared folder by using the **UNC** (Universal Naming Convention) path in the run command prompt. Go to **Start→Run** and type in **\\srv-11\Management Console** then click **OK**. The UNC path is ***Computer_Name**Share_Name***, which in this case is **\\srv-11\Management Console.**

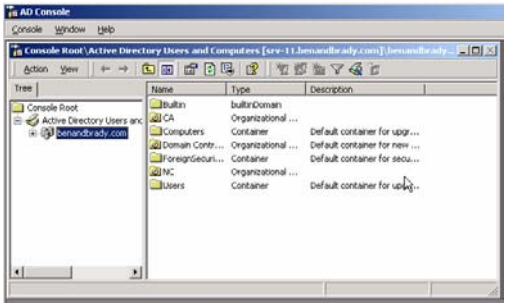


16. This will directly open the shared folder, **Management Console** on srv-11. Copy the **AD Console** over to the desktop and then open the **adminpak.msi** file to install the administrator tools on to the Windows 2000 Professional computer.

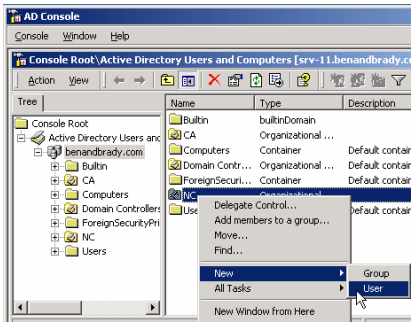




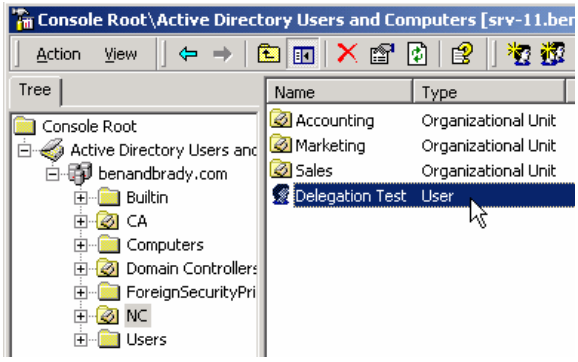
17. When the installation of the administrator tools is finished, close the **Management Console** folder and open the **AD Console** located on the desktop. It should open up to the **Active Directory Users and Computers** snap-in tool.



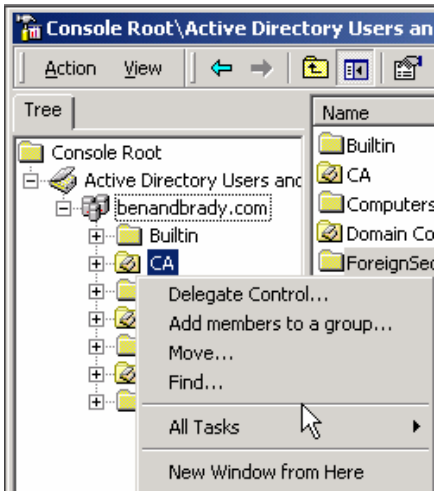
18. Now, to test if the delegation worked, try to create a new user in the North Carolina *OU*. Right click on the **NC** OU and select **New.** Notice that you only have two options to choose from under new, they are *Group* and *User*. Select **User,** to open the new user wizard and create a user named **Delegation Test**, username **dtest** and a password **test**.



19. When you finish the new user wizard, you should see the new user you created in the **NC-*OU***.



20. Now try to create a new user for the **California** OU. Right click on the **CA** OU. Notice that there is no **New** option available on the shortcut menu because this user was only given permission to mange the **NC** OU and therefore, cannot create any new users or groups in the **CA** OU. Although there are other options still available, the user will get an error message stating that access is denied if they try to use any other option. Close the **AD Tools** console and log off **client-1.**



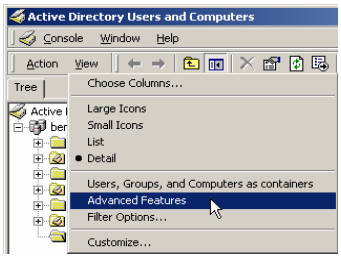
Scenario – Part Three

Finally, your relief has arrived! Ben & Brady's Ice Cream Corp., has hired a Jr. Network Administrator for the North Carolina office. Although Peter Ramirez has done a great job helping you out in North Carolina, you want the Jr. Network Administrator to be the only person with permissions to manager users. Therefore, you will have to remove the delegated permissions that were assigned on the North Carolina OU.

Removing the delegated permissions

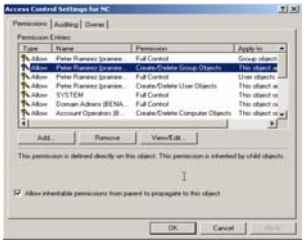
Removing the delegated control is slightly more difficult than delegating the controls because there is no wizard that will "un-delegate" permissions. The only way to remove any delegated permissions is to go to the security tab of the container and remove the permissions that were granted through the delegation wizard. This can be a touch complex for anyone not familiar with Windows 2000. Another point to keep in mind, is that you should always document any permissions that are delegated. It will make it easier on you and anyone who may come in after you when trying to figure out who has permission to do what in the domain.

1. Log on to **srv-1** as the domain administrator and open the **Active Directory Users and Computers** console. The first thing you need to do is change the view of the console to *advanced features* so that you can access the security tab for the containers. Try to open the security tab in the properties of the **North Carolina** *OU* without changing the view first to see what it shows. **Right click** on the **NC** OU and select **Properties**. Notice that there is no security tab available. Close the properties page by clicking **Cancel** and on the menu select **View→Advanced Features**.



2. Now go ahead and open the Properties for the **NC** OU again. You will see there is now a security tab available. Select the **Security** tab and find the name for the user **Peter Ramirez** in the security list. Notice that all the permissions for the user are blank. It doesn't mean that the user has no permissions for this OU though. If you look at the bottom of the screen, next to the advanced button, you will see that the user has *additional permissions* set.

3. Click on the **Advanced** button to view the advanced permissions. You should see that there are four permissions for the user **Peter Ramirez**. You can either remove specific permissions from the user or remove them all. You can also add specific permissions that may not have been included on the wizard from here. If you plan on removing all the permissions from the user, then you would be better off just removing the user from the security list on the security tab. Click **Cancel** to return to the security tab.

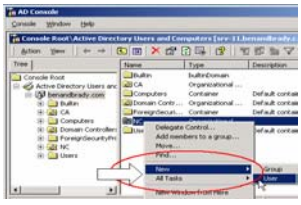


4. Select the user **Peter Ramirez** in the security list, click the **Remove** button and the user will now disappear from the security list. Click **OK** to close the properties page.

5. Now log on to **client-1** with the username **pramirez.** Open the console **AD Tools** located on the desktop and try to create a new user or group for the **NC-*OU*.** Notice how the **New** option on the shortcut menu is no longer available.

*****Note*****

If the New option is still appearing on the menu it may be that the domain controllers have not replicated and therefore, the user still has permissions to the OU. You can wait a few minutes for them to replicate or you can log on to one of the domain controllers to force replication. Either way, you will have to log off and log back on to client-1 for the changes to take place.



Lab 3

Creating and Assigning Group Policies for Ben & Brady's Ice Cream, Corp.

You will learn how to:

- Create a Group Policy
- Assign a Group Policy Object (GPO) to a domain
- Assign a Group Policy Object (GPO) to an OU
- Test a Group Policy from a client computer
- Remove a Group Policy Object

Scenario – Part One

Up until now, users in both offices of Ben & Brady's Ice Cream, Corp. have been able to change their display settings and install their own screen savers and backgrounds. But in your weekly meeting with Jill, the Operations Manager, she feels that there are some users who have taken it to far by either placing inappropriate pictures on their screens or spending way too much time installing and looking for new screen savers to install on their systems.

In some cases, they have even damaged their computers by changing the display settings. "How can we stop users from accessing parts of the operating system that they shouldn't access?" Jill asks. "Group Policy is the easiest way," you respond, "and we won't have to police the users either. It just works!" After discussing the matter in great detail, you and Jill reach the conclusion that there is really no reason that the users of the domain need to access the control panel either. You decide to create a group policy on the domain to restrict all users (except the administrators) from the control panel. You also decide to disable the My Network Places icon on the desktop to keep the users from browsing the network and instead, just allowing them to use their mapped network drives that are pre-assigned.

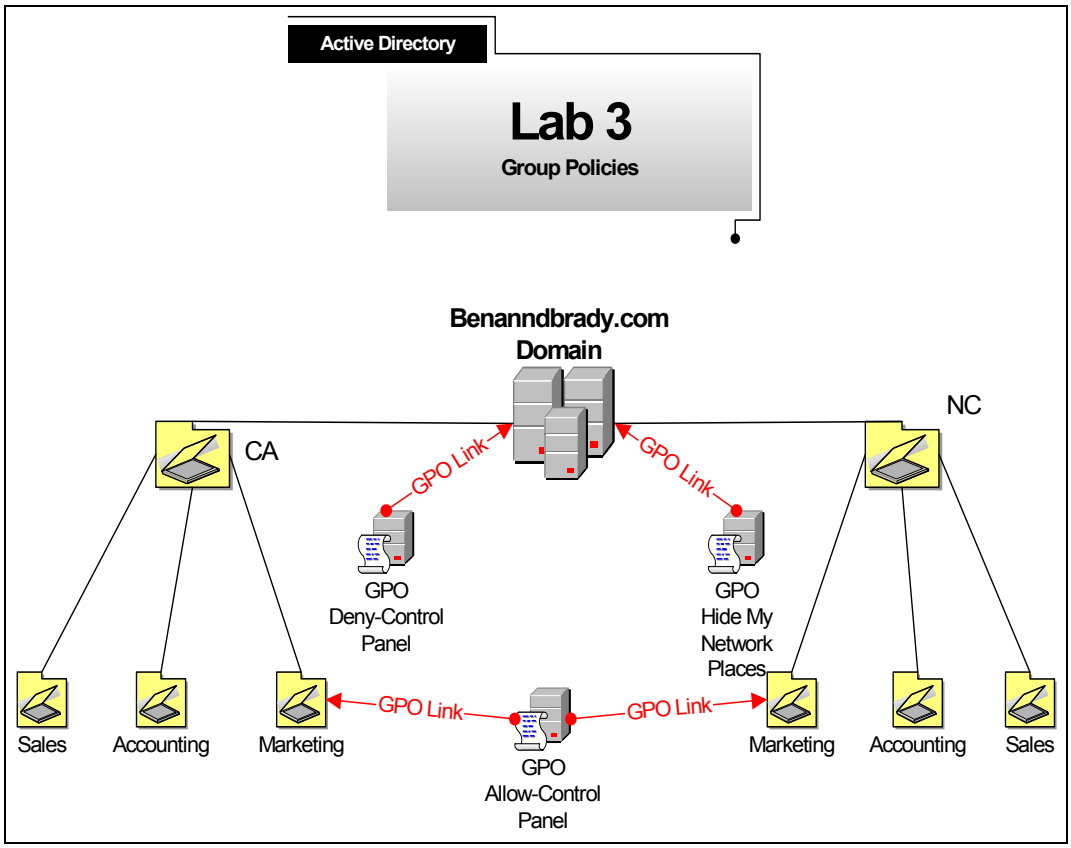
Jill agrees to all of your propositions but reminds you that marketing department in both locations will need to access their display settings because of a custom piece of software that requires them to adjust their screen resolution. This means that the group policy you discussed previously will not be enforced on users in the marketing department.

In this lab, you will create group policies, configure policy settings, and link them to the domain and an OU. You will also see how one group policy can override another group policy based on where in the Active Directory it is linked. Finally, you will see difference between removing a group policy from a container and deleting a group policy from Active Directory.

Group Policies

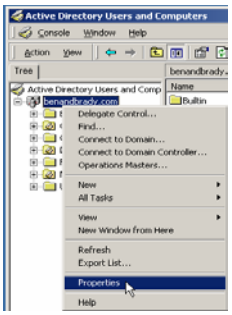
Group policy is a new feature in Windows 2000 that allows the administrator to set user and computer configurations across the network in an efficient manner. Some of the settings that can be specified include scripts, security, folder redirection, software installations, and registry-based options. Group policies are similar to system policies used in NT 4, except that group policies are easier to work with. Group policy settings that you create are stored in a GPO (Group Policy Object) and are replicated to other domain controllers via Active Directory. With NT 4.0 system policies, you have to make sure that the file, which contains the settings, is replicated to all domain controllers in the domain and whenever you delete that system policy you have to remove the setting from every computer that it was applied to. The Group Policy Object (GPO) is assigned to an Active Directory container (Sites, Ous, or Domains) and the settings are then applied to all user and computer objects that

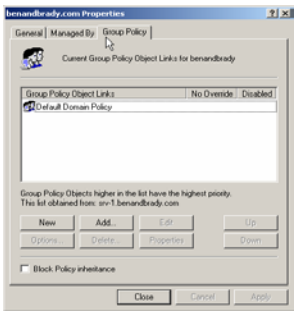
reside within the container. Any group policy setting that is removed does not need to be changed in the registry on each computer. It is automatically removed from each system. There are two general types of group policies in Windows 2000, local policies and domain-based policies. A local based policy will just apply to a local computer or a local user on the computer. A domain-based policy works with Active Directory and is applied to computers or users in the domain.



Creating & assign a group policy to the domain

1. Log on to **srv-1** as the domain administrator and open **the Active Directory Users and Computers** console. Right click on the domain **benandbrady.com** and select **Properties**. On the properties page select the **Group Policy** tab to view a list of **GPO's** that are linked to the domain. By default, you will see the Default Domain Policy on the list. This GPO will have some basic settings in place, but in order to lock down client computers you will have to create additional settings within this GPO or another GPO that is linked to the domain.

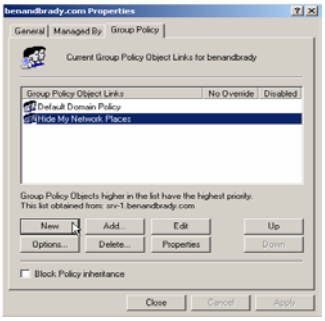


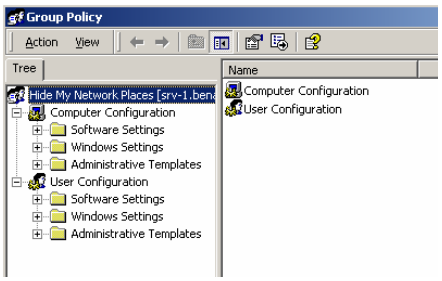


2. Click on the **New** button to create a new **GPO**. Name the GPO, **Hide My Network Places.** Highlight the new **GPO** and select the **Edit** button. This will open the group policy snap-in tool. From here, you can see the two different types of settings. The first one is the computer configuration settings that are applied to the computers when they start up and the second one is the user configuration settings that are applied to users when they logon.

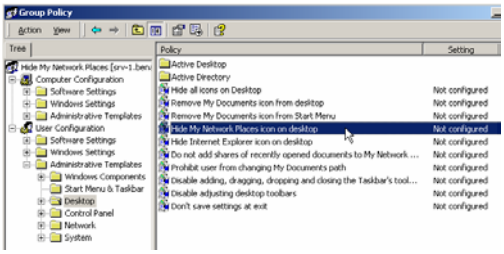
*****Note*****

In this lab we will create one Group Policy Object (GPO) for every policy setting, so that you can see how each GPO works. It does not mean that you are limited to just one policy setting for every GPO. You can configure as many policies as you want in a GPO, but you must have a plan on how you will be implementing group policies on the network, so that you know what policy settings can be placed in the same GPO and what policy settings require a separate GPO.

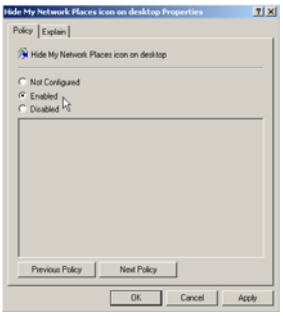


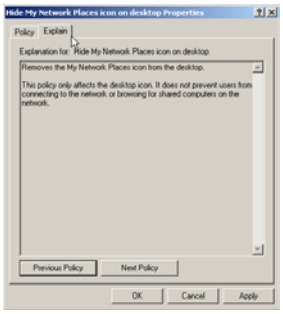


3. You want to create a GPO that will hide the **My Network Places** icon from the desktop and apply it to users on the entire domain. You also don't want it to affect any of the administrators. On the left pane select **Administrative Templates** under **User Configuration**. Under the administrative template folder, select the **Desktop** folder and you will see all of the available settings on the right pane. You should also see that all of the settings on a new GPO are not configured by default. In order to enable the policy find the policy setting that says **Hide My Network Places icon on desktop** and double click on it.

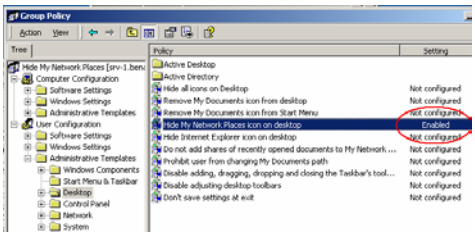


4. This will open the properties of that setting and show you the options available on it. There are three options. The default option that is selected is not configured. There are also options to enable or to disable the policy. Select the **Enable** option. For every setting, you also have a tab called Explain. Select the **Explain** tab and you can read what affect this setting will have if it is enabled or disabled. Go back to the **Policy** tab and make sure the setting is **Enabled** and click **OK**.

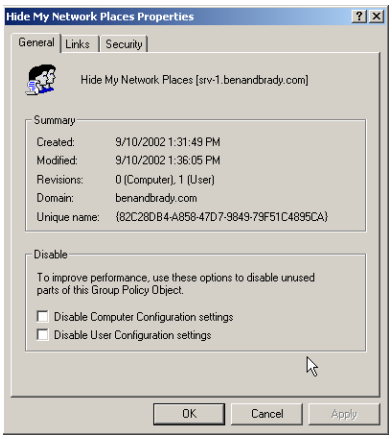




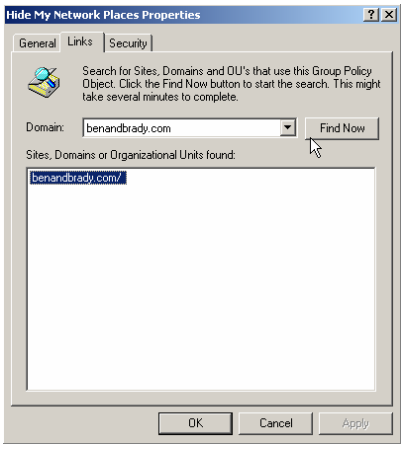
5. This will bring you back to the Group Policy snap-in tool. Now if you look at the **Hide My Network Places icon on desktop** setting you will see that it shows that it is enabled. Close the **Group Policy** snap-in tool.



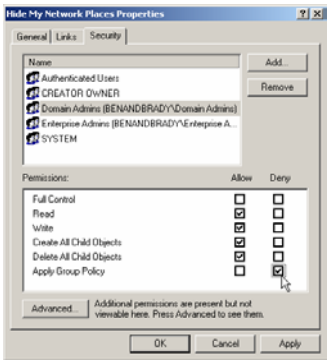
6. This will bring you back to the **Group Policy** tab for the **benandbrady.com** domain. Highlight the **Hide My Network Places** GPO and click on the **Properties** button. On the properties page of the GPO you will see a summary of the GPO. It shows the date and time it was created and the last time it was modified. Then you will see how many revisions have been made to the GPO. This just tells you how many settings have been changed since the GPO was created. In this case, there one was done for the user configuration. Underneath the summary are options to disable unused parts of the GPO. For example in this GPO, since only a user setting has been enabled, selecting the **Disable Computer Configuration settings** will speed up the computer start-up and logon time.



7. Select the **Links** tab. This is where you can do a search to see what containers on the domain have this GPO linked to them as well. Select **benandbrady.com** domain and click on **Find Now**. The search should only find the benandbrady.com domain.

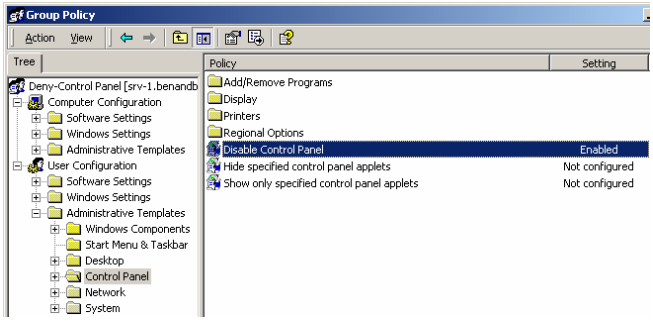


8. Select the **Security** tab. This is where you assign permissions to users or groups for the Active Directory object that you are working on. You set permissions on an Active Directory object in a similar fashion to files and folders. Permissions on an Active Directory object determine what a user or group can "do" to that object (i.e. see it, change it, delete it, etc.). In this case, you do not want this policy to apply to any administrator on the domain. So, find the **Domain Admins** group and the **Enterprise Admins** group, and select **Deny** for the **Apply Group Policy** option. This will apply the GPO to all authenticated users on the domain except for the users in the **Domain Admins** group and the **Enterprise Admins** group. Click **OK,** you will get a warning message about setting Deny permissions because the deny permission always take priority over any Allow permissions. Click on **Yes**, that you wish to continue and click **OK** until you get back to the Active Directory Users and Computers snap-in tool.



9. Now, Create a new domain **GPO** that will disable the Control panel for all users except for administrators. Right click on the **benandbrady.com** domain and select **Properties**. Go to the **Group Policy** tab and click on **New.**

10. Name the new GPO **Deny-Control Panel,** then click on **Edit** to open the group policy snap-in tool for the GPO**.** On the snap-in tool, select **Administrative Templates** under **User Configuration**. On the right pane double click on the **Disable Control Panel** setting to open the properties and select **Enable** on the properties page. Click **OK** and you should see that the setting is now enabled.



11. Close the snap-in tool and open the **Deny-Control Panel** GPO **Properties**. Select the **Security** tab and make sure the GPO does not apply to any *administrators* by following the same procedures you followed in step 8 above. Click **OK** and the benandbrady.com domain should now have three GPO's assigned to it.

Create & assign a group policy to Organizational Units

Next, you must allow the users in the Marketing Department access to the control panel so they are able to change the display settings on their desktop. This is necessary because the Marketing Department runs a piece of software that works best at lower resolutions. Instead of editing the security list for the GPO, you should create a GPO that will apply only to the Marketing OU, which contains all of the users in the Marketing Department. This can be done by creating and assigning the GPO at the OU level so that it overrides the GPO set at the domain level. The order in which the policies are applied is:

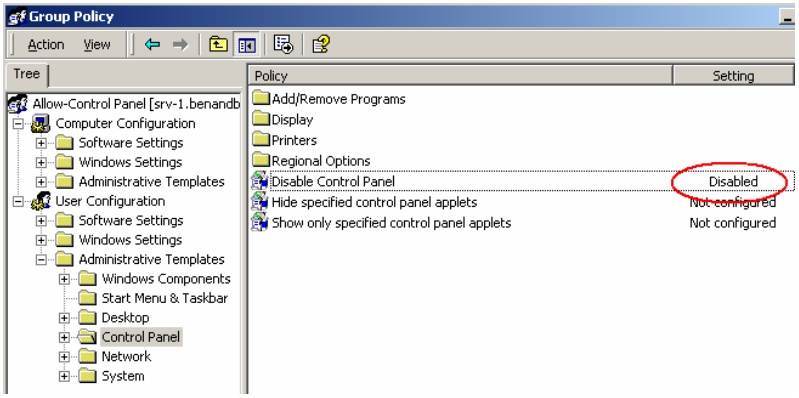
local→site→domain→OU→child OU

In other words, any OU policy will override a domain policy, a domain policy will override a site policy, and a site policy will override a local policy. Keep in mind that this order of precedence only applies to contradicting policy settings. For example, a policy to install software that is applied at the site level will not be overridden by a policy at the OU level to determine the background color of the desktop. But, if you set a policy for a green desktop background at the site level and set a policy for a blue desktop background at the OU level, users or computers within the OU will receive the blue desktop background.

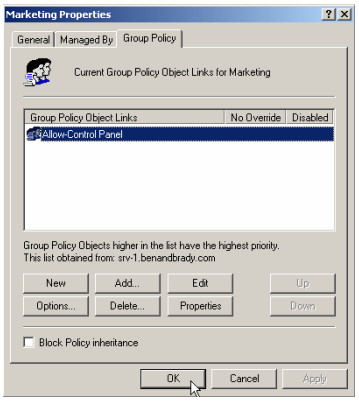
1. Within the Active Directory Users and Computers console, find the **Marketing** OU located within the **CA (California)** OU. Right click on the **OU**, select **Properties** and on the properties page select the **Group Policy** tab.

2. Click on **New** to create a new GPO that will be assigned to this OU and name the new GPO **Allow-Control Panel**. Highlight the new GPO and click **Edit** to open the policy settings snap-in tool. Open the **Control Panel** settings, which are located under **User Configuration** and **Administrative Templates**. Find the setting **Disable Control Panel** in the right pane and double click on it. On the setting properties select the **Disable** option and click **OK**. You should now see that the **Disable Control Panel** setting show that it is **Disabled**.

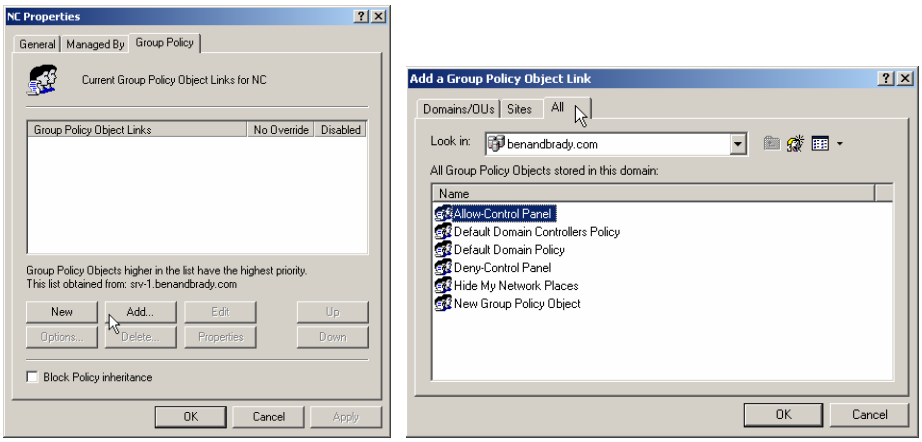
****Note****
You must carefully read what the policy setting does, before configuring it, because some of the policy settings can sound confusing and you may have to read it twice. For example you just disabled the disable control panel setting. Do you know exactly what this will accomplish? By configuring this setting to disable, it will allow all users with this GPO to access the control panel. When you enabled this setting on the GPO at the domain level you enabled it so that all domain users will not be able to access the control panel.



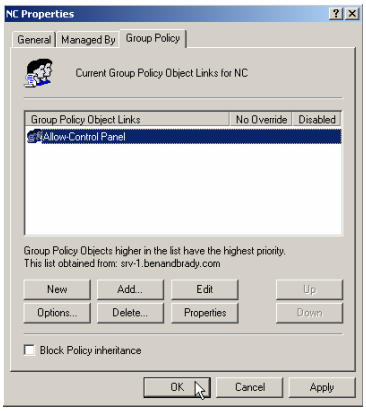
3. Close the **Group Policy** snap-in tool and make sure the **Allow-Control Panel** GPO appears on GPO links list, then click **OK**.



4. Now you will need to add the same policy to the **North Carolina → Marketing** OU. Open the **Active Directory Users and Computers** console, find the **Marketing** OU located within the **NC (North Carolina)** OU. Right click on the **OU**, select **Properties** and on the properties page select the **Group Policy** tab. This time instead of creating a new GPO for the same policy setting, you will use the same GPO that you created for the **California → Marketing** OU. To link the GPO that you created previously to this OU, click on **Add.** This will bring up a list of GPO's that are stored within Active Directory. You can search for a GPO by domain, OU, or site. The last tab, **All,** will show you all of the domains within Active Directory and is generally the easiest to work with. Select the **All** tab. Then select the **Allow-Control Panel** GPO and click **OK**.



5. You should now see the **Allow-Control Panel** GPO appears on the group policy links list for the **North Carolina-Marketing OU.** Anytime there is a change made to the **Allow-Control Panel** GPO it will now affect both OU's. This makes it easier to manage the GPO from just one location and then have the policy settings apply to all of the containers that are linked to it. Click **OK** and close the **Active Directory Users and Computers** snap-in tool.



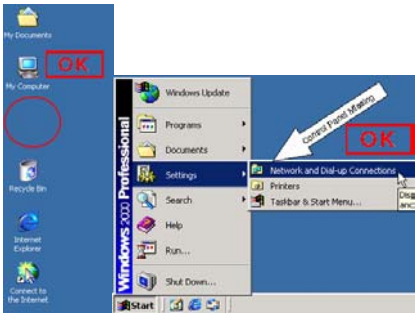
Test the GPO's from a client

1. Log on to **client-1** as the user **Jill Smith (jsmith)**. Remember that this user works in the accounting department in California. Therefore, she is a member of the **Accounting OU** located within the **California OU (CA)** and should not have access to the My Network Places icon, the control panel or the display settings from the desktop.

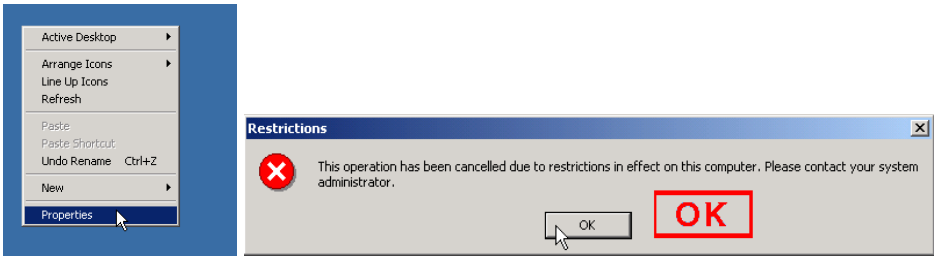
		Yes	No
1	Can the User view My Network Places icon on the desktop?		X
2	Can the user access the control panel from the start menu?		X
3	Can the user access the display settings from the desktop?		X

2. On the desktop, look for the **My Network Places** icon. If you cannot see it on the desktop then the **Hide My Network Places** GPO is working.

3. Now look in the Start menu to see if the Control Panel is available. Go to **Start→Settings.** If you do not have the Control Panel option available then the **Deny-Control Panel** GPO is working.



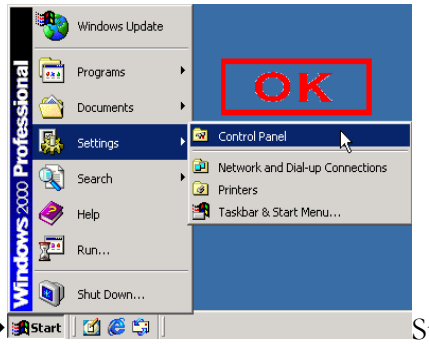
4. Now try to access the display setting by right clicking on any **free space** on the **desktop** and selecting **Properties**. You should get an error message appear saying that the operation has been cancelled due to restriction on the computer which means that the **Deny-Control Panel** GPO is working. Click **OK**.

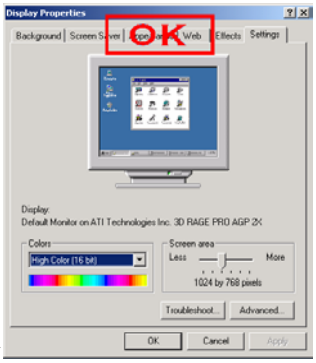


5. Log off the user **Jill Smith (jsmith)** and log back on with the user **Jack Straw (jstraw)**. Remember the user Jack Straw works in the marketing department in California. Therefore he is a member of the **Marketing OU** located within the **California OU (CA)** and should not have access to the My Network Places icon but he should have access to the control panel and the display settings from the desktop.

		Yes	No
1	Can the User view My Network Places on the desktop?		X
2	Can the user access the control panel from the start menu?	X	
3	Can the user access the display settings from the desktop?	X	

6. Repeat *steps 2, 3, and 4*. You should get the same results for *step 2* but not for *steps 3 and 4*. You should be able to access the **control panel** from the start menu and the **display settings** from the desktop.

Step2→ 

Step3→ 

7. Test the group policy settings with the User **Ben Smith (bsmith**) who is located in the **Marketing OU** within the **North Carolina OU (NC).** This user should have the same policy settings as the user **Jack Straw (jstraw)** from the **Marketing OU** in **California**.

8. Log off the user **Jack Straw (jstraw)** and log back on as the **domain administrator**. Repeat *steps 2, 3 and 4*. You should be able to access everything because none of the GPO's applies to any of the administrators.

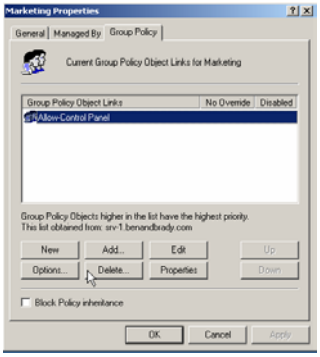
		Yes	No
1	Can the User view My Network Places on the desktop?	X	
2	Can the user access the control panel from the start menu?	X	
3	Can the user access the display settings from the desktop?	X	

Scenario – Part Two

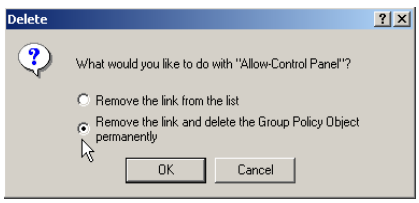
Jill is now asking you to restrict the marketing users on the domain from using the control panel as well because the software that required them to change the display settings in the first place has been upgraded. The new version does not require the display settings to be changed and again, some users have been taking advantage by placing non-work related backgrounds and screen savers on their desktops. She also tells you to place the My Network Places icon back on the desktop because she has had too many complaints from the users about not being able to browse the network.

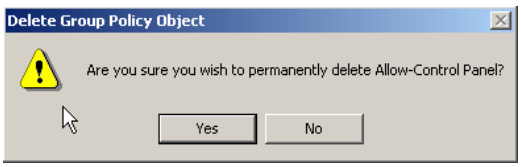
Removing a GPO

1. Log on to **srv-1** as the domain administrator and open the **Active Directory Users and Computers** console. Find the **Marketing** OU located within the **CA** OU. Right click on the **OU**, select **Properties** and then select the **Group Policy** tab. On the group policy tab find and select the **Allow-Control Panel** GPO link then click on **Delete**.

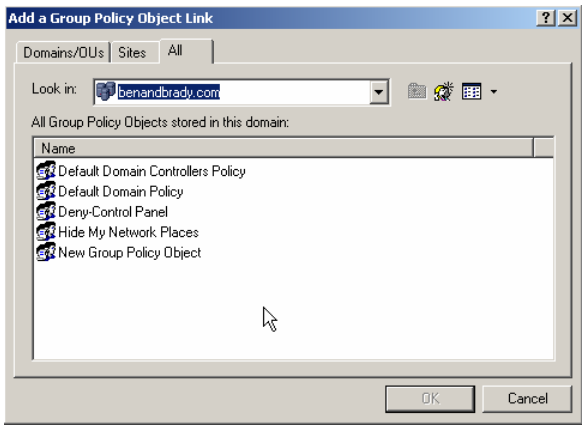


2. This will bring up a screen asking you whether you want to remove the link from this OU or if you want to remove the link and the GPO permanently. By removing the link, the GPO will still exist in Active Directory and will still apply to the North Carolina-Marketing OU. The GPO will still be available to use on other containers on the network. By removing the link and deleting the GPO permanently, it will no longer apply to the North Carolina-Marketing OU and it will no longer exist in Active Directory to use again. Select **Remove the link**, delete the Group Policy Object permanently, and click **OK**. You will then get a warning asking you if you're sure you want to permanently delete the GPO. Click **Yes.**

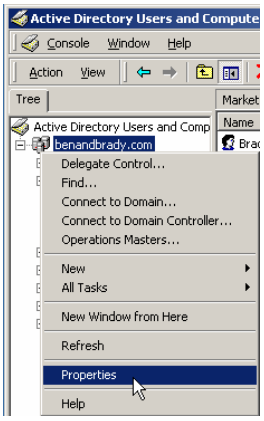


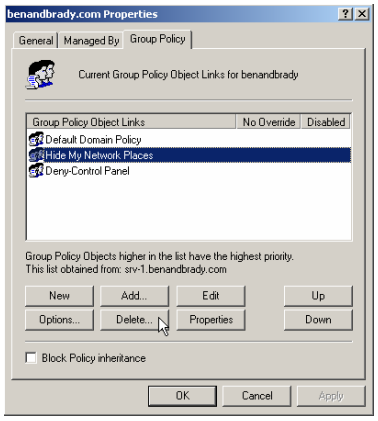


1. This will bring you back to the Group Policy tab for the **Marketing OU** in **California**. Click on **Add** and select the **All** tab on the GPO list. Notice that the **Allow-Control Panel** GPO is no longer on the list of available GPO's for benandbrady.com.

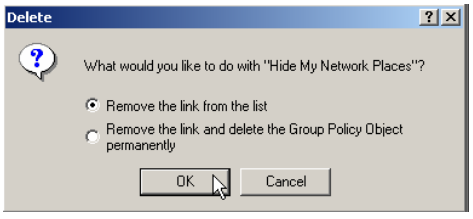


2. Click on **Cancel** and **OK** to return to the Active Directory Users and Computers console. Open the **benandbrady.com** domain **Properties** and select the **Group Policy** tab. On the group policy tab find and select the **Hide My Network Places** GPO link then click on **Delete**.

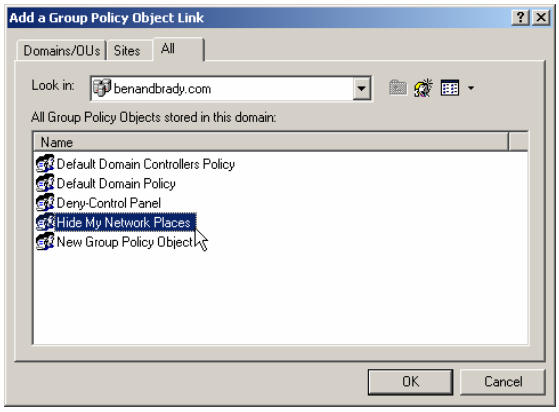




3. That will bring up a screen asking you whether you want to remove the link from this OU to the GPO or if you want to remove the link and the GPO permanently. Select **Remove this link from the list** and click **OK**.



4. On the group policy tab for the **benandbrady.com** domain, you will see that the GPO **Hide My Network Places** no longer appears on the GPO links list. Click on **Add** and select the **All** tab, on the GPO list. Here, notice that the **Hide My Network Places** GPO does still appear on the list of available GPO's for benandbrady.com and can be used in other Active Directory containers for the domain.



Lab 4

Administrating resources within Ben & Brady's Active Directory

You will learn how to:

- Create and publish a shared folder
- Add, share and publish a network printer
- Create a contact in Active Directory
- Perform Active Directory searches for published resources

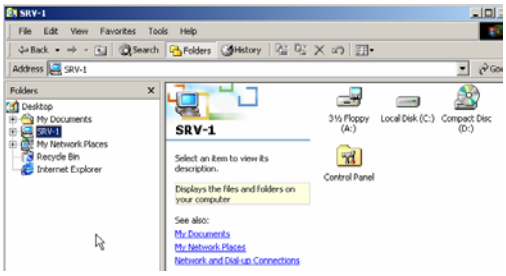
Scenario Part One

Everything seems to be working out pretty good for you at Ben & Brady's Ice Cream Corp. All of your major projects are done and you finally have time to kick back and take it easy for once. For your next project, Jill wants you to work on optimizing Active Directory so the users will be able to search through it more efficiently.

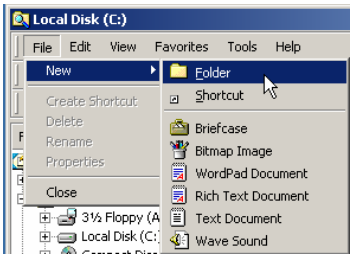
In this lab you will create and publish shared folders, printers, and contacts in Active Directory. Then, you will log on to the client computer as regular users to try and access those resources to make sure they are available.

Create and share a folder

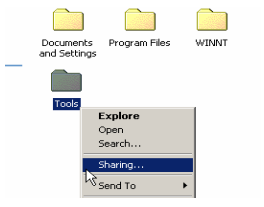
1. Log on to **srv-1** as the domain administrator and open **windows explorer**. Go to **Start→Programs→Accessories→Windows Explorer**.



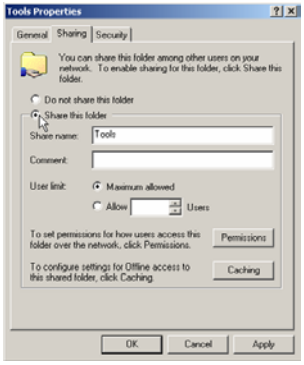
2. Double click on the **C:** drive, and then from the **File menu** select **New→Folder**.

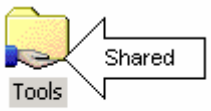


3. Name the new folder **Tools** and then right click on the folder and select **Sharing**.



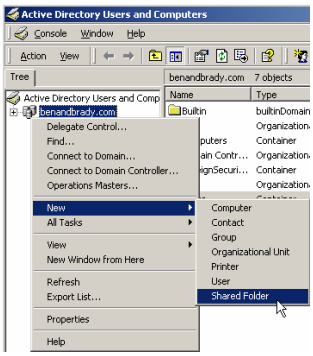
4. This will open to the **Sharing** tab on the properties page of the folder. To share the folder, select the **Share this folder** option, leave the default share name **Tools** and click **OK**. There should now be a hand underneath the folder showing that the folder is being shared.



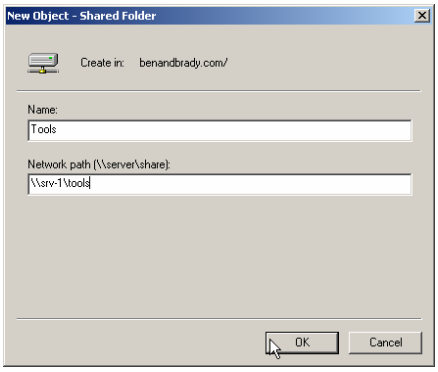


5. Now create another shared folder and name it **Admin Tools** on the **C:** drive. This folder will be used to store support tools for administrators only and will not be published in Active Directory.

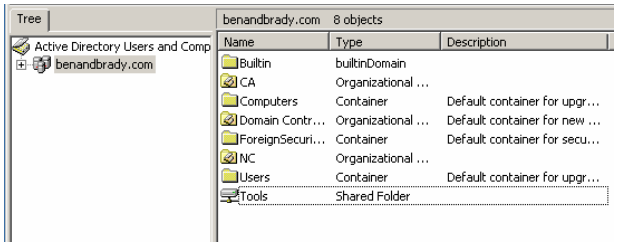
6. In order for users to search the Active Directory database for this shared folder it will have to be published manually. Shared folders are not published into Active Directory automatically. You can publish a shared folder into Active Directory and place it into any container you want for organizational purposes. When you publish the shared folder all you are doing is creating an object for it in the Active Directory database. Close **Windows Explorer** and open the **Active Directory Users and Computers** console. Right click on **benandbrady.com** domain located in the left pane and select **New→Shared folder**.



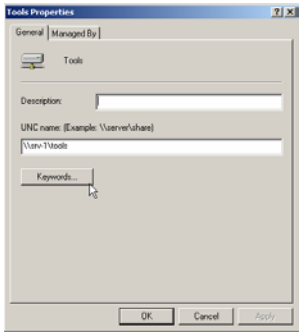
7. This will bring up a screen where you enter the name and the network path (UNC) of the new-shared folder. Type in **Tools** for the name of the share and then the network path (UNC) to the shared folder. This is the name of the computer the shared folder resides on, followed by the actual name of the share. Type in **\\srv-1\tools** for the network path of the shared folder and click **OK.**



8. You will now have a shared folder object named **Tools** located in the domain. It can be moved into other containers just like any other object in Active Directory.

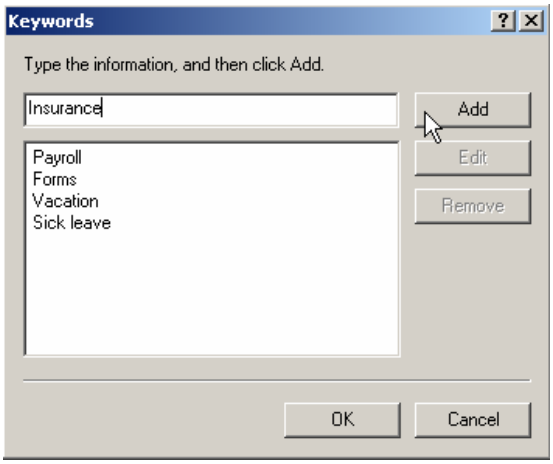


9. The next thing you need to do is create keywords for the shared folder. This way, users who don't know the exact name or path to the share can use keywords to find it in Active Directory. Open the **Properties** of the **Tools** shared folder in the **Active Directory Users and Computers** console by double clicking on it. On the **General** tab of the **Properties** page click on the **Keywords** button.



10. A screen will appear where you can enter the keywords to associate with the shared folder. Employees must have access to this folder because it will contain forms they need to use for benefits, payroll and requesting time off. Therefore you must enter keywords that relate to any of those topics. Type in **Payroll** and click **Add**. That keyword is now associated with the shared folder in Active Directory. Now add the following keywords and any other words you feel may be associated with this folder. Click **OK** when you are done.

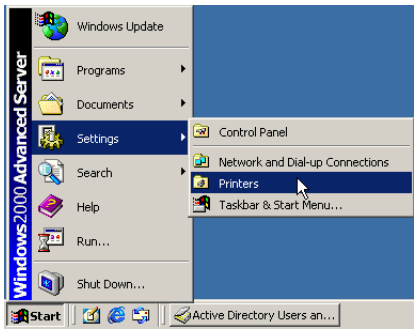
Keywords: Payroll, Forms, Vacation, and Sick Leave

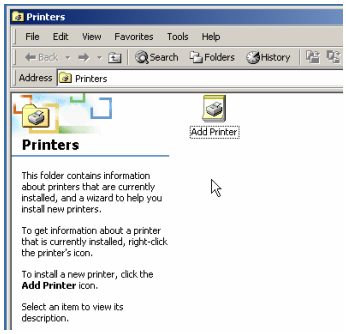


Add, share, and publish a network printer

In order to add a printer to the network you must first install the printer locally on the server and then share the printer similar to the way you would share a folder.

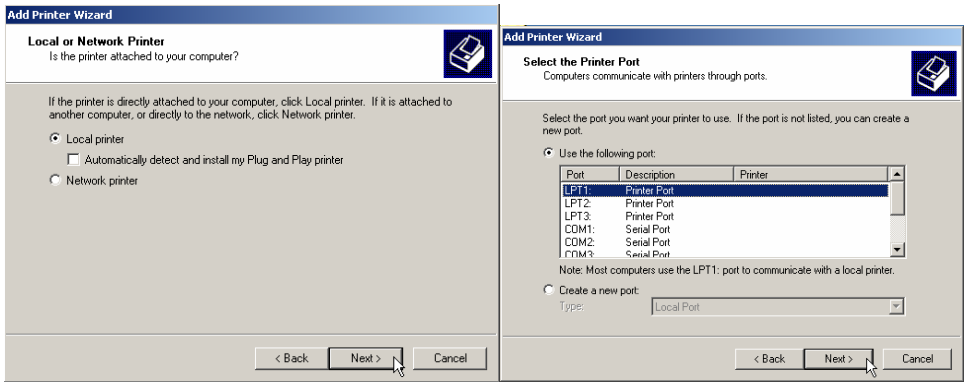
1. Add a printer to the server, **srv-1**. Go to **Start→Settings→Printers.** Double click on the **Add Printer** icon to start the **Add Printer** wizard.



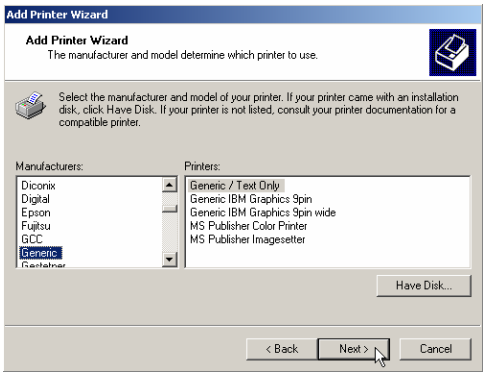


2. The first screen on the wizard is just a welcome screen, click on **Next**. The next screen will ask you where the printer is attached. You can select the local printer option if the printer is directly attached to the computer or the network printer option if you are trying to add a printer that is already on the network. Select **Local Printer** and uncheck the box underneath that says **Automatically detect and install my Plug and Play printer** because you are not installing an actual printer. By leaving the box checked, the wizard would try to find and install the printer, but you will get an error stating that the printer can't be found. Click **Next**.

3. Now the wizard will ask you to choose a port the printer will use. Select the **LPT1 Printer Port** and click **Next**.

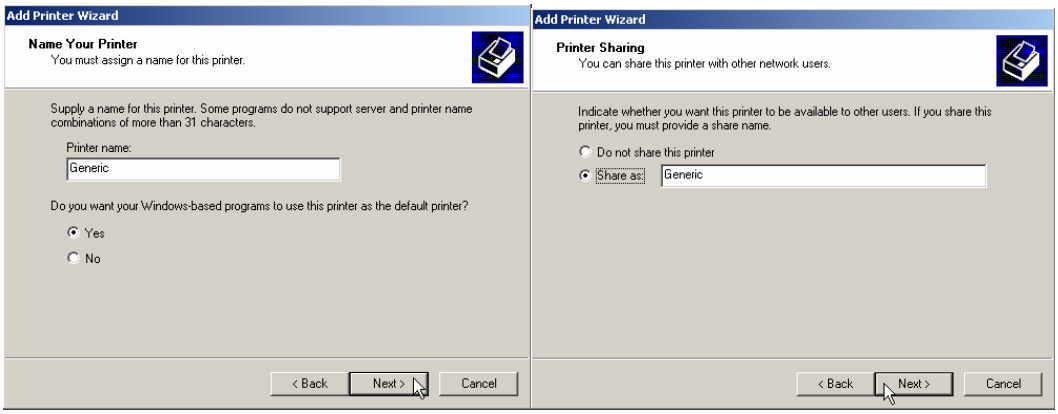


4. The next screen will ask you to specify the **manufacturer and model** of the printer. This will install the drivers necessary for the printer to work on the Windows 2000 operating system. Select the manufacturer **Generic** and the model **Generic / Text Only.** Click **Next**.

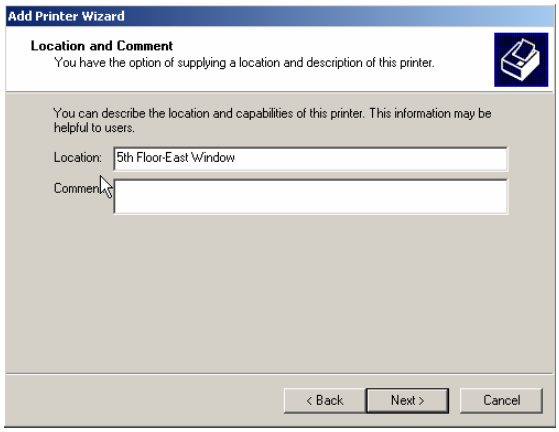


5. The next screen will ask you to assign a name to the printer and to specify if you want this to be your default printer for Windows-based programs. Type in **Generic** as the **Printer name** and select **Yes** to make this the **default Windows printer**.

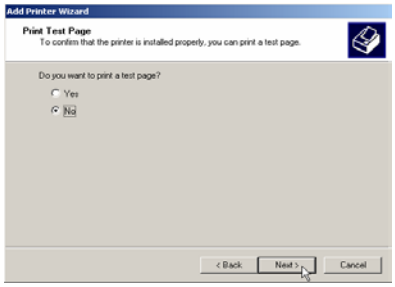
6. The following screen will ask you to specify whether you want to share this printer or not. Select **Share as** to share this printer and leave the default name of **Generic** as the share name.

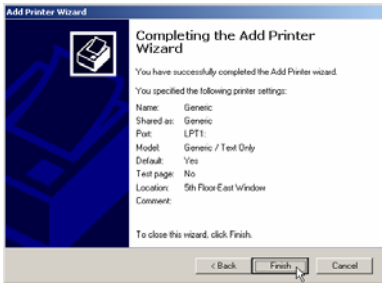


7. The next screen of the wizard allows you to place information about where the printer is located and any other comments you may want to add to this printer. This is optional and can be left blank, but it is a good idea to at least give it a location if you ever need to know where it's located in a big building. For the location type in: **5th Floor-East Window** and you can leave the Comment section blank or enter any comment you want.

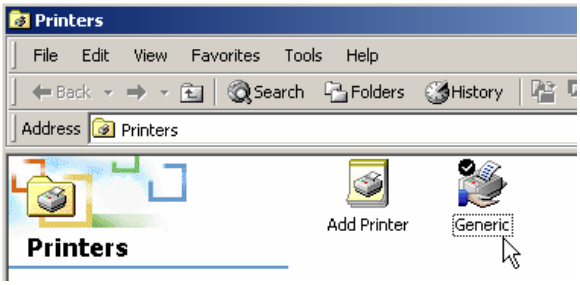


8. The next screen will ask you if you would to print out a test page to confirm that the printer is working. Select **No**, because there is no actual printer to print out to, but it is a good idea to print out a test page if you are installing an actual printer. Click **Next.** The final screen will just be a summary of all the information you entered into the add printer wizard. Confirm that all the information is correct and click on **Finish**.

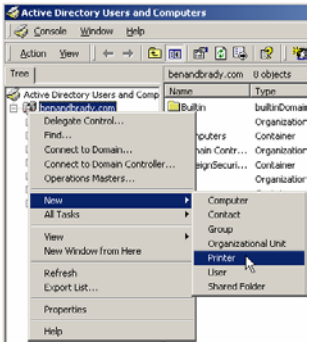




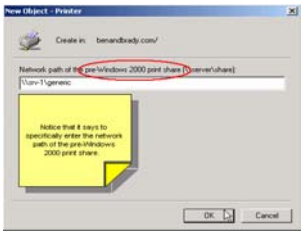
9. You should now have a printer icon appear in the printers folder named **Generic** and a hand underneath it indicating that the printer is being shared.



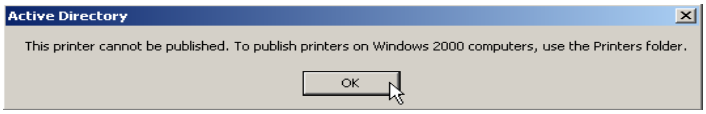
10. Printers are published in Active Directory automatically. The only time a printer will need to be published is if the printer is installed on a pre-Windows 2000 computer. Try to publish that printer anyway to see if it will work. Open the **Active Directory Users and Computers** console. Right click on the **benandbrady.com** domain and select **New→Printer**.



11. This will bring up a screen where you enter the network path of the shared printer. Type in the path to the generic printer on srv-1 **(\\srv-1\generic)** anyway and click **OK**.

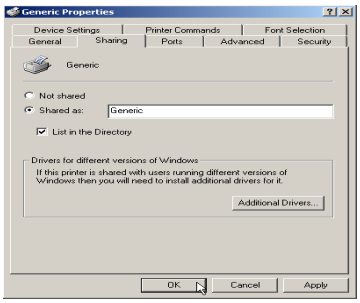


12. You will get an error telling you that the printer cannot be published and to use the printer folder to publish printers on Windows 2000 computers. Click **OK** on the error message and then **Cancel** on the new printer object screen.



13. Close the **Active Directory Users and Computers** console and open the **printers folder**. Right click on **Generic** printer icon and select **Sharing**.

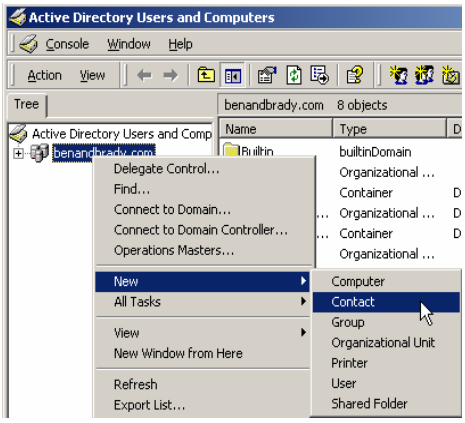
14. This will open to the **Sharing** tab on the **Properties** of the printer. Here you can un-share or share the printer if you did not share it in the wizard and add any additional drivers that may be needed. Remember that printers are automatically published in Active Directory when they are installed on a Windows 2000 computer. If you need to remove the printer from Active Directory all you must do is uncheck the box that says **List in Directory** and vice versa if you need to add it back to the Active Directory**.** Leave the printer **published** in Active Directory, click **OK** and close the **printers folder**.



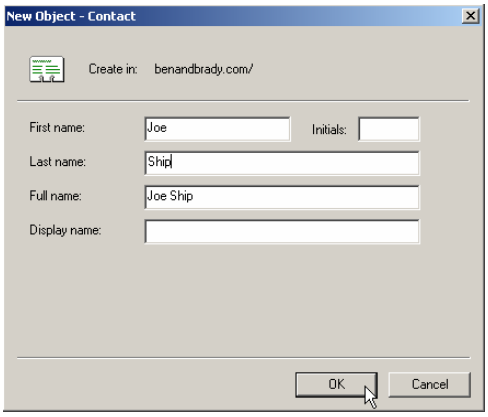
Create a contact in Active Directory

A contact may be created in Active Directory to list information for someone without having to create an actual user account. Contacts are used to store information for people that are outside of your company. For example, business partners, vendors, and possibly customers. Contacts are most useful if you are running Microsoft's Exchange Server (Microsoft's Mail Server product) because they allow you to integrate your mailing lists with your Active Directory structure.

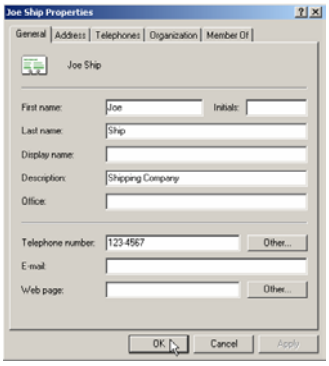
1. Open the **Active Directory Users and Computer** console. Right click on the **benandbrady.com** domain and select **New→Contact.**



2. This will bring up a screen for you to enter the new contact name. Type in **Joe** for the first name, **Ship** for the last name and the full name should appear as **Joe Ship.** Click **OK** when finished.



3. Now double click on the contact **Joe Ship** in the right pane to open the **Properties**. On the properties of the contact you can add more detailed information like telephone numbers, email addresses, etc. Type in **Shipping Company** for the **Description** of this contact and enter any seven-digit telephone number in the **Telephone Number** field. You can view the other tabs to see what additional information you can add about this contact. Now users on the benandbrady.com domain can do a search within Active Directory to find the information they need for this contact. Click **OK** when finished and close the Active Directory Users and Computer console.

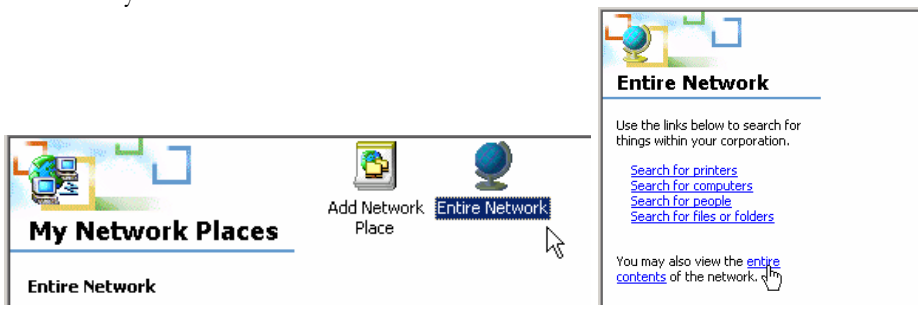


Perform Active Directory searches for published resources

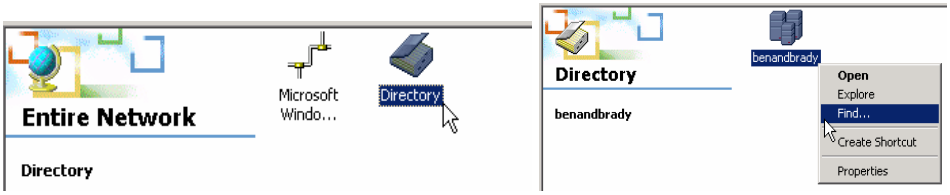
Shared Folder-Scenario

Jill Smith needs to fill out a form requesting vacation time. They told her where the forms were located on the network the first day she started but now almost a year has gone by and she can't remember where it is. She does know how to search the Active Directory for resources though. Maybe she can find it by doing a search with the keyword vacation.

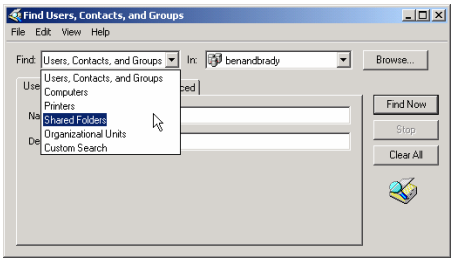
1. Log on to client-1 as the user **Jill Smith (jsmith)**. On the desktop, double click on **My Network Places**. In the My Network Places folder double click on the **Entire Network** icon. Then the Entire Network folder gives you links to all of the options that you can search for within the company network. Click on the link **entire contents** to see the directory.



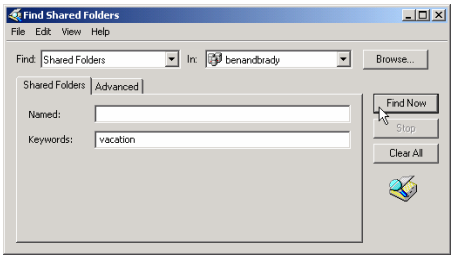
2. Double click on the **Directory** and it will open to show you all the domains that the directory contains, which in this case is just **benandbrady**. Right click on **benandbrady** and select **Find**.



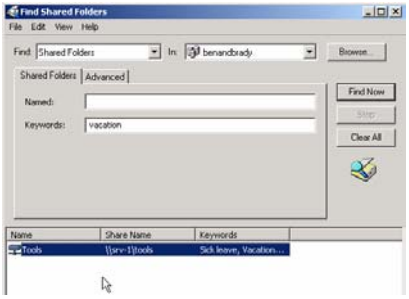
3. This will bring up a search screen where you can search for objects within the Active Directory. Click on the **Find** drop down menu and select **Shared Folders.**



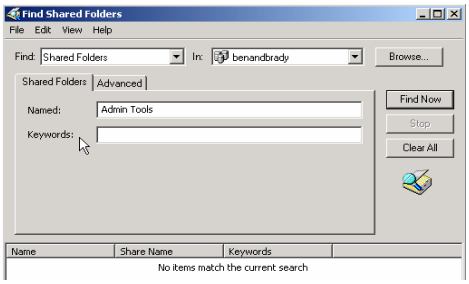
4. This will give you option of searching by name or by keyword for the shared folder. Type in the keyword **vacation** and click on the **Find Now** button.



5. This should list all of the shared folders that have the keyword vacation associated with them. In this case there is only one, which is the folder that contains the necessary forms. This folder can be opened by double clicking on the share.



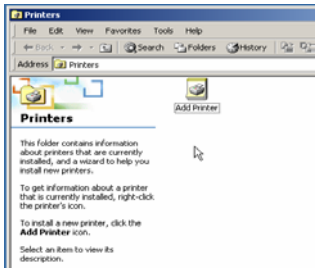
6. Now try to do a search for the **Admin Tool** folder. Even though the share does exist on the network it will not be found in Active Directory because it was not published. Now close all windows and **log off** the user **Jill Smith**.



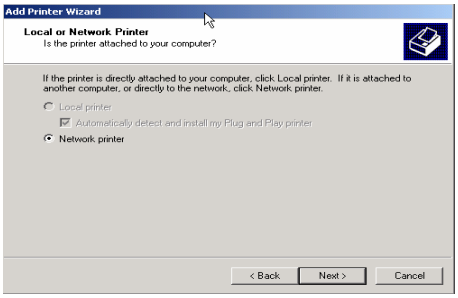
Shared Printer-Scenario

Jack Straw needs to connect to the new printer that was installed right behind his cubicle. Unfortunately, he doesn't know what the printer share name is. He is going to try to add it to his computer anyway.

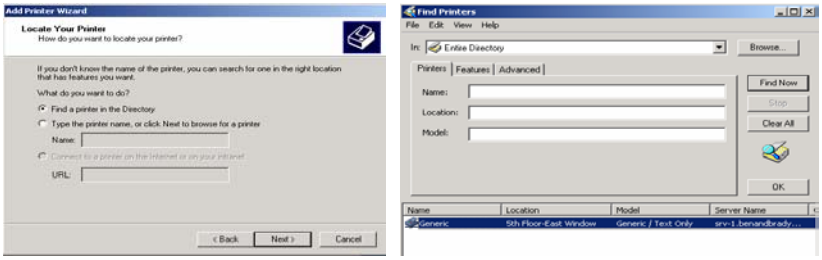
1. Log on to **client-1** as the user **Jack Straw (jstraw)**. Open the **Printers folder** and double click on the **Add Printers** icon.



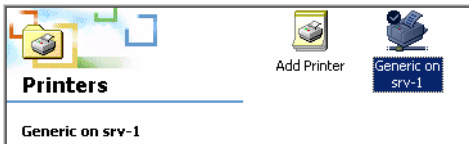
2. This will start the Add Printer wizard. The first screen is just a welcome screen, click **Next** and the next screen will ask you what type of printer you want to install. The **Network printer** is the only one that will be available because the user does not have permission to install a printer locally. Click **Next**.



3. The next screen gives you different options to find the printer. Select the **Find a printer in the Directory** option and click **Next**. This will bring up a search screen for printers. Leave the entries blank and it will give you all of the shared printers available in the directory. Click on **Find Now** and you will get the printer named **Generic** to appear because it is the only printer in the domain. You can see that the location of the printer is the correct one for this user. Double click on the **Generic** printer.



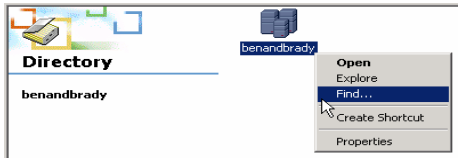
4. This will take you to the next screen of the wizard that asks you if you would like for it to be the default printer. Select **Yes** and click **Next**. The Final screen will show the information you placed in the wizard. Confirm that it's all correct and click **Finish**. You now have the Generic printer icon appear in your printers folder as the default printer. Close the **printers folder**.



Contact-Scenario

Jack's boss told him to call the representative from the shipping company and ask him why he billed the marketing department for a shipment. He gave Jack the phone number but Jack has lost the number in his mess of an office. He remembers that his boss got the number from Active Directory in the first place, so now he is going to try and do a search in Active Directory for the contact.

1. Open **My Network Places** to the **benandbrady directory**. Right click on **benandbrady** and select **Find**.



2. You will do a search for **Shipping,** in hopes of finding the contact for the shipping company. You should get a result for **Joe Ship**. Double click on the contact and you will be able to get all information you need in order contact him.