



NETWORK  
DESIGN &  
ADMINISTRATION  
(NDA) - LAB

NOTTINGHAM  
TRENT UNIVERSITY 

# Lab 2

## Network Design and Administration Lab Book.

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# **Part 1:**

## **Installing and configuring the network & servers**

# Lab 2: Installing DNS, DHCP and Active Directory Roles

**YOU NEED TO START TAKING PERSONAL NOTES AS YOU PROCEED WITH THESE LABS.**

## 2.1 Installing DNS

1. Start the “Windows Server R2” virtual machine.

**NOTE:** Do NOT check the box “Do not show this window at logon”.

### **Changing the Computer Name of the server to “DailyPlanetServer”**

Firstly, investigate how to change the computer name of the server.

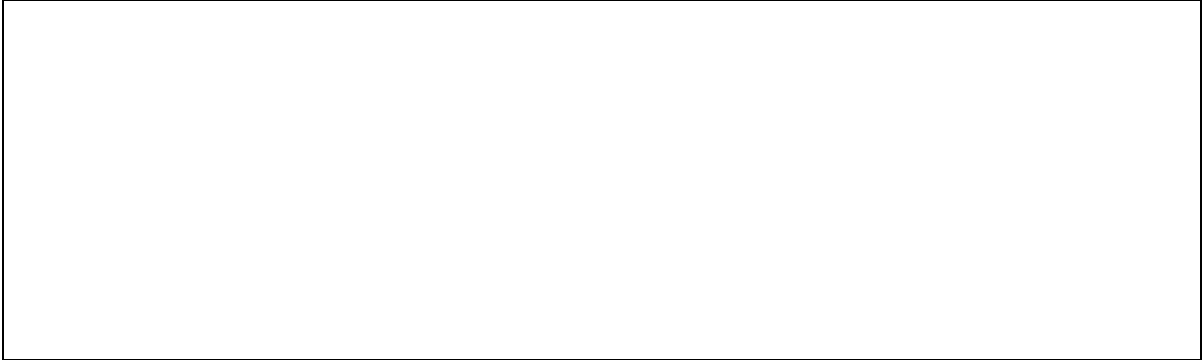
*Note that you will receive a message/warning that says the NetBIOS name of the computer is limited to 15 bytes which is 15 characters in this case. The NetBIOS name will be shortened to “DAILYPLANETSERV” which may cause conflicts under NetBIOS name resolution. Just click ok to the message.*

Afterwards, change the full computer name of the server to read “DailyPlanetServer”.

2. To send a **Ctrl+Alt+Del** key press to the virtual machine you can either click on the “VM” menu and select “Send **Ctrl+Alt+Del**” or press “**Ctrl+Del+Insert**”.
3. Type **P@ssword** into the “password” box and press enter or click on the round blue arrow button.
4. If the “**Initial Configuration Tasks**” window is not available on the screen, then click on “**start**” and in the “search programs and files” type “**oobe**” in the search space. Once found launch the “**oobe**” program in order to bring out the “**Initial Configuration Tasks**”.
5. On the “**Initial Configuration Tasks**” window, select the “Add Roles” option.

6. On the “Before you Begin” setup window, click on the “Next” button.
7. Click on the “**DNS Server**” option.

**8. Explain why you think the error occurred.**



9. In the “Add Roles Wizard” warning dialogue, click on the “Cancel” button.
10. Close the “Add Roles Wizard” window.
11. Click on “Start” and select the “Command Prompt” option.
12. Type **ipconfig** and press enter. Check to see what the IP address is. Keep the command prompt window open.
13. Click on the network icon in the bottom right of the system tray.
14. Alternatively, go to start and search for “Network and Sharing Center”.
15. Click on the “Open Network and Sharing Center” option.
16. Click on the “Local Area Connection” option for the “Unidentified network”.
17. Click on the “properties” button.
18. Highlight the “*Internet Protocol Version 4 (TCP/IPv4)*” option and click on “properties”.
19. Select “Use the following IP address” and enter the following information:
20. IP address: **192.168.1.1**
21. Subnet mask: **255.255.255.0**
22. Select “Use the following DNS server addresses” and enter **192.168.1.1** in to the “Preferred DNS server” box.

23. Click on the “OK” button.
24. Click on the “Close” button on the “Local Area Connection Properties” window.
25. Click on the “Close” button on the “Local Area Connection Status” window.
26. Move back to the command prompt window.
27. Confirm that the IP address of the server has now changed.
28. Type **exit** into the command prompt and press enter.
29. Close the “Network and Sharing Center” window.
30. Go back to the “Initial Configuration Tasks” window (or go to start and type oobe) and click on the “Add roles” option.
31. Click on the “DNS Server” option in the “Select Server Roles” window.
32. Click on the “Next” button.
33. On the “DNS Server” setup window read what it says and then click on the “Next” button.
34. On the “Confirm Installation Selections” setup window, click on the “Install” button.

**Note:** *Windows Server will now install the DNS Server.*

35. On the “Installation Results” setup screen clicks on the “Close” button.

**Note:** *At the moment the DNS server has been installed but not configured. We will come back to this in section for Configuring DNS.*

**36. Explain what DNS is**

37. Explain why you would want to set up a DNS server for your domain.



## 2.2 Installing DHCP

1. On the “**Initial Configuration Tasks**” window, click on the “Add Roles” option.
2. On the “Before you begin” setup window, click on “Next”.
3. Click on the “DHCP Server” option. A tick should now appear next to it.
4. Click on the “Next” button.
5. Read the contents of the “DHCP Server” setup window and then click on the “Next” button.



6. On the “Select Network Connection Bindings” setup window, make sure the **192.168.1.1** IP address is ticked. Click on the “Next” button.
7. On the “Specify IPv4 DNS server Settings” setup window, type **dailyplanet.com** into the “Parent Domain” box.
8. Leave the IP address in the “Preferred DNS server IPv4 address” box unchanged.
9. Click on the “Next” button.
10. On the “Specify IPv4 WINS server settings” setup window make sure the “WINS is not required for applications on this network” option is selected.

**11. Explain what the purpose of WINS is and why you are disabling it.**

12. Click on the “Next” button.
13. On the “Add or Edit DHCP scopes” setup window, click on the “Add...” button.

**Note:** *We can also add or modify DHCP scopes from the DHCP manager after the DHCP service has been installed.*

14. Type **Test Network IP Range** into the “Scope Name” box.
15. Type **192.168.1.10** in to the “Starting IP address” box.
16. **Explain why you think the DHCP range is starting from this IP address?**

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17. Type **192.168.1.50** into the “Ending IP address” box.
  18. Verify that the “Activate this scope” check box is selected.
  19. Type **255.255.255.0** into the “Subnet mask” box.
  20. Click on the “OK” button.
  21. Click on the “Next” button on the “Add or Edit DHCP scopes” setup window.
  22. On the “Configure DHCPv6 Stateless Mode” setup window, select the “Disable DHCPv6 stateless mode for this server” option.

**23. Explain what you think stateless mode is used for.**

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24. Click on “Next”.
  25. On the “Confirm Installation Selections” setup window, click on the “Install” button.
  26. On the “Installation Results” setup window, click on the “Close” button.
  27. Click on the “Close” button on the “Initial Configuration Tasks” window.

***Note:*** *Once DHCP has been initially configured, you can go back and alter configuration details using the Server Manager and DHCP Server role. Alternatively, you can use the DHCP option within the Administrative Tools menu.*

***Additionally, we have only configured DHCP for IPv4 addresses. Windows Server 2008 R2 also provides a DHCPv6 service for configuring IPv6 addresses. Investigate the IPv6 functionality in your own time.***

## 2.3 Configuring DNS

1. On the “Server Manager” window, scroll down until you see the “Roles Summary” list and click on the “DNS Server” option.
2. In the “Server Manager” windowpane on the right, double click on the “DNS Server” option.
3. Double click on the “DNS” option.
4. Double click on the server name.

**Note: We will first setup a primary DNS forward lookup zone.**

5. Select and right-click on “Forward Lookup Zones”, and then select “New Zone”.
6. On the “Welcome to the New Zone Wizard” window, click on the “Next” button.
7. **Briefly explain what a forward lookup zone is used for and what the three zone types do.**

8. Verify that the “Primary Zone” option is selected and then click on “Next”.
9. On the “Zone Name” setup window, type **dailyplanet.com** into the “Zone Name” box and click on “Next”.
10. On the “Zone File” setup window, click on “Next”.

11. Click on the “Do not allow dynamic updates” option.

**Note:** For now, we are turning off dynamic DNS updates because we have not setup Active Directory which allows secure dynamic updates from clients.

12. Click on the “Next” button.

13. Click on “Finish”.

14. Now double click on the “dailyplanet.com” option under the “Forward Lookup Zones” section in the server manager to see what has been added.

## 2.3.1 Configuring a Reverse Lookup Zone.

1. Select and right-click on “Reverse Lookup Zones” and click on “New Zone”.
2. On the “Welcome to the New Zone Wizard” setup window, click on “Next”.
3. On the “Zone Type” window, select “Primary Zone” and clear the “Store the zone in Active Directory” (available only if the DNS server is also a domain controller) and then click on “Next”.
4. Select the “IPv4 Reverse lookup zone” option and click on “Next”.
5. On the “Reverse Lookup Zone Name” setup window enters the first three octets of the servers IP address into the “Network ID” box. **What do you notice?**
6. **Briefly explain what a reverse lookup zone is used for.**

7. Click on “Next”.
8. On the “Zone File” setup window, click on “Next” to accept the default settings.
9. On the “Dynamic Update” setup window, click on “Next” to accept the default settings.
10. Click on “Finish”.
11. Now double click on the “**1.168.192.in-addr.arpa**” option under the “*Reverse Lookup Zones*” section in the server manager to see what has been added.
12. Now restart the server.

## 2.4 Installing Active Directory

1. If you are not there already, then double click on the VMWare icon and start the “Windows Server 2008 R2” virtual machine again.
2. Click on the “**vm**” menu and select the “Send **Ctrl+Alt+Del**” menu option or click in the window and press **Ctrl+Alt+Insert**.
3. Type **P@ssword** into the “password” box and press enter or click on the round blue arrow button.
4. Click on the network icon in the bottom right of the system tray.
5. Click on the “Open Network and Sharing Center” option.
6. Click on the “Local Area Connection” option for the “Unidentified network”.
7. Click on the “properties” button.
8. Highlight the “Internet Protocol Version 4 (TCP/IPv4)” option and click on “properties”.
9. Select “Use the following IP address” and enter the following information:
10. IP address: 192.168.1.1
11. Subnet mask: 255.255.255.0
12. Select “Use the following DNS server addresses” and enter 192.168.1.1 in to the “Preferred DNS server” box.
13. Click on the “OK” button.

14. Click on the “Close” button on the “Local Area Connection Properties” window.

15. Click on the “Close” button on the “Local Area Connection Status” window.

**16. Explain why a static IP address has to be used.**

17. On the “Initial Configuration Tasks” window, select the “Add Roles” option.

18. On the “Before you Begin” setup window, click on the “Next” button.

19. Click on the “Active Directory Domain Services” option.

20. On the “Add Roles Wizard” dialogue, click on the “Add Required Features” button.

21. On the “Select Server Roles” setup window, make sure the “Active Directory Domain Services” option is ticked and click on “Next”.

22. Read the information on the “Active Directory Domain Services” setup window and then click on “Next”.

23. On the “Confirm Installation Selections” setup window, note that we have to run *dcpromo.exe* after the services have been installed to configure AD DS. We will come back to this. Click on “Install”.

**Note:** *Active Directory Domain Services will now be installed.*

24. On the “Installation Results” setup window, click on “Close”.

## 2.4.1 Configuring Active Directory

1. Click on “Start” and select the “Command Prompt” option.
2. At the command line, type “**dcpromo**” and press enter.
3. On the “Welcome to the Active Directory Domain Services Installation Wizard” select the “Use advanced mode installation” and then click on “Next”.
4. Read the “Operating System Compatibility” setup screen and click on “Next”.
5. On the “Choose a Deployment Configuration” setup screen, select the “Create a new domain in a new forest” option.

**6. Explain what a domain is.**

**7. Explain what a forest is and why you would want to create a new domain in a new forest.**

8. Click on the “more about possible deployment configurations” and read the information.
9. Click on the “Next” button on the “Choose a Deployment Configuration” setup window.
10. Select “Create a new domain in aa new forest” and click next.

11. Type **dailyplanet.com** into the “FQDN of the forest root domain” box.
12. Click on “Next”.
13. On the “Domain NetBIOS Name” setup window, accept the default value and click on “Next”.
14. On the “Set Forest Functional Level” setup window, click on the “Forest functional level” pull down box and select “Windows Server 2008 R2”.

**15. Explain what a functional level is.**

16. Click on “Next”.
17. On the “Additional Domain Controller Options” setup window clicks on “Next” to install DNS.

**18. Explain why you would want to integrate DNS into Active Directory.**

19. On the “Active Directory Domain Services Installation Wizard” warning dialogue, click on “Yes”.
20. On the “**Location For Database, Log Files and SYSVOL**” setup window, click on “Next”.
21. On the “Directory Services Restore Mode Administrator Password” setup window, type “P@ssword” into both “password” boxes.
22. **Explain what the DSRM password is used for and why it is different to the Administrator password you have used previously.**





23. Click on “Next”.

24. On the “Summary” setup window, click on “Next”.

**Note:** *Active Directory Domain Services will now be configured.*

25. On the “Completing the Active Directory Domain Services Installation Wizard” setup window, click on “Finish”.

26. Click on “Restart Now”.

27. Log back on to the server using password “**P@ssword**”. Notice the difference to the logon screen.

**28. Explain why the logon screen is different.**



29. **If** Windows Server informs you that your password has expired, then select the “New Password” and “Confirm Password” boxes type “**P@ssword1**” and then click on the round arrow.

30. Click on the “OK” button on the password changed confirmation screen.

31. Make additional notes on what you have done.

## 2.5 Configuring PowerShell

**Note:**

*To administer a server using the PowerShell prompt (you will be using this extensively during the rest of the labs) you will need to configure it so that it provides access to all of the commands to modify and control active directory. The default PowerShell prompt does not allow you access to these administrative commands unless explicitly tell it to do so.*

If you are not already there, start the “Windows Server 2008 R2” virtual machine again.

### **Installation of Windows PowerShell Integrated Scripting Environment (ISE)**

Open the initial configuration task, under Section 3: (***Customize This Server***), then click on **Add features**.

The Add Feature Wizard is opened. Check the box for 2 of the features below:

1. ***.NET Framework 3.5.1 features***
2. ***Windows process activation service***

Continue to click on next in the following windows to complete the installation. Click close.

Open the initial configuration task again, then click on **Add features**.

Check the box for “**Windows PowerShell Integrated Scripting Environment (ISE)**”.

Click next and install. Click close once installation is succeeded.

Then start the following steps:

1. Find and open up a PowerShell window using the start button.

Familiarise yourself with PowerShell. Most commands are not case sensitive.

On the PowerShell Terminal, type the following commands and see what they do:

The command “Get-location” or “GL” gives the location path of where you are.

The command “Set-location” or “SL” allows you to change directory to another path/location.

*Type set-location C:\xxxxx to change directory. Investigate how to get back to the previous directory.*

*Type get-alia -Definition Get-ChildItem*

*Type Get-alia -definition set-location*

*Type Get-alia -definition get-location*

*Try the following basic commands:*

- *dir,*
- *ls,*
- *pwd*

*Type get-alia -Definition clear-host*

*Type get-childitem*

2. To get help on what each command does, you can use the Get-Help commandlet.
3. Test to see what commands are available which relate to active directory. You will need to use the Get-Command commandlet. First, find out what this command will do by using get-help.
4. Now type in **Get-Command \*-AD\*** and see what commands it finds.

5. Now test to see if any commands are found by typing in ***Get-Command \*-GPO\****

**Note:** *the AD and GPO prefixes are shorthand for Active Directory and Group Policy Objects – you will learn about these and use them more in a couple of labs.*

6. Close the power shell window.
7. Now add a new icon to the desktop that points to power shell (either by finding the PowerShell executable or creating a shortcut to the PowerShell link in the start bar). To enter the details into the shortcut directly, type in:

***%windir%\system32\WindowsPowerShell\v1.0\powershell.exe***

***Or***

***%SystemRoot%\system32\WindowsPowerShell\v1.0\powershell.exe***

into the location box of the shortcut.

Repeat the step 7 above for the PowerShell ISE.

8. Try the icons to see if both PowerShells work and then see if the commands are available. Once you have checked, close the PowerShell window.

**Note:** *PowerShell can be expanded by including a number of modules when it starts. To access the active directory functionality, you will need to import modules that provide these commands.*

9. Edit the icon on the desktop and add the following to the end of the location information:

***-noexit -command import-module ActiveDirectory, GroupPolicy***

***also try***

***-noexit -command import-module ServerManager***

10. Now try the icon again and notice if it starts up differently and then try steps 4 & 5 again.

***Take note of the errors and try to locate the reason for the errors***

**Note:**

***When running PowerShell scripts that originate from trusted modules, PowerShell will execute them directly. However, when you start to write your own scripts or use ones from a third party (e.g. from the Web); PowerShell will usually block them from running as they are viewed as not being trusted. This is to stop untrusted scripts from harming the system in anyway. This execution policy will need to be changed.***

11. Type in get-help “set-executionpolicy” and make notes about the different execution policies available and why it is important.
12. Type “get-executionpolicy” command to see the output.
13. To set the execution you will need to use the “set-executionpolicy” command.
14. Type “Get-executionpolicy” command and the changes in the output.

**Note: -**

***Read the help associated to this command to work out what needs to be done (and which execution policy to use).***

15. Make a note of what command and options you had to use to enable third party scripts to run.

16. Type “Get-host” on PowerShell terminal to see the version.
17. Now shutdown the server.