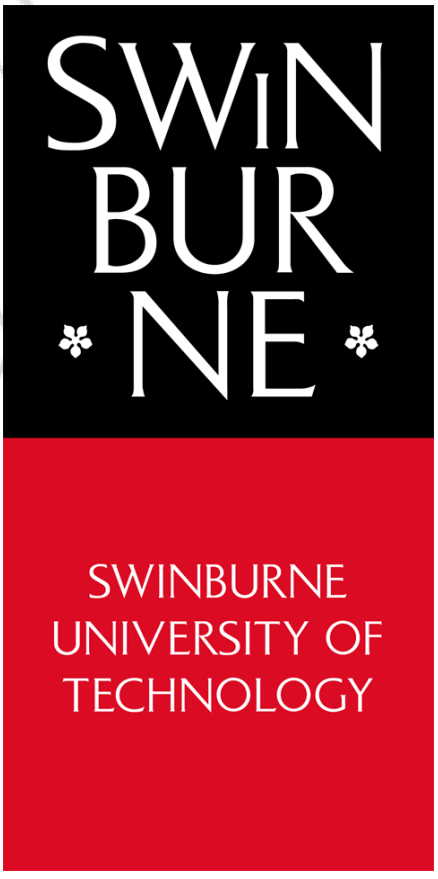
TNE10005/TNE60002

Network Administration

Lab 5

Introduction to DNS



Aims:

To

- Understand the purpose of DNS.
- Install DNS
- Configure zones, records, and zone transfers

Virtual Machines

sWin22DC1, sWin22SVR1, sWin22SVR3, sWin10PC203

Preliminary Settings

1. Change sWin22SVR3's switch to the Hawthorn network. Configure sWin22SVR3's IP configuration to:
    - IP: **172.16.32.13**/24
    - GW: **172.16.32.1**
    - Preferred DNS Server: **172.16.32.10**
2. Change sWin10PC203's switch to the Hawthorn network. Configure sWin10PC203's IP configuration to:
    - IP: **172.16.32.203**/24
    - GW: **172.16.32.1**
3. Ensure all VMs are on the Hawthorn network and have IP addresses in the same subnet.

Laboratory

Installation

1. Log into **sWin22DC1.**
2. Log into **sWin22SVR1** and from **Server Manager > Manage > Add Roles and Features** install the **DNS Server** role, with all default settings.

When the installation is complete, **close** the **Add Roles and Features Wizard**. Go back to **Server Manager**, and from the **Tools** menu, select **DNS**.
This should bring up the **DNS Manager** console.

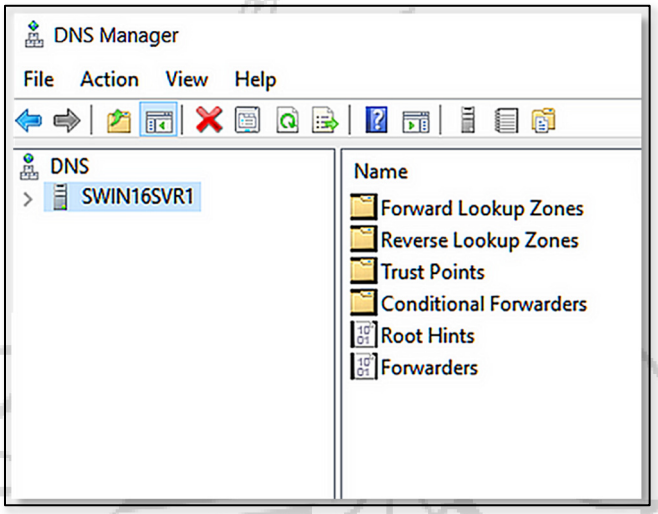


Figure 1 - DNS Manager Console

Notes:

*The figures in this lab document are captured for DHCP Management console on **sWin-Server that running Windows Server 2016.** Hence, the server's name is sWin16SVR1. Students should check on sWin22SVR1 when practicing using the unit Azure lab VMs.*

Creating a Primary Forward Lookup Zone

3. In **DNS Manager**, expand **SWIN22SVR1** and click on **Forward Lookup Zones**.
4. Right click **Forward Lookup Zones** to bring up the context menu, and select **New Zone…**
5. On the Welcome screen, click **Next**. On the **Zone Type** page, select **Primary zone** and click **Next**. Enter the Zone name ***burne.edu***, and click **Next**.

   Accept the default Zone file name and location, and click **Next**.
6. Dynamic updates are important for networks that have a lot of mobile users (e.g. a large corporation with a number of buildings in a city and meetings being scheduled across different buildings). When a computer leases a new IP address (e.g. when it connects in a different building) then its DNS record will be dynamically updated with the new IP address.

   If we were installing within an Active Directory Domain we could choose *Allow only secure updates*. Be we are installing in a Workgroup on a Stand-alone server. Allowing non-secure updates means a hacker could spoof one of our servers and update the

record for that server so that all traffic will be directed to an IP address of the hacker's choice.

7. So we will keep the default **Do not allow dynamic updates**, and click **Next,** then **Finish**.

   DNS Manager should look like Figure 2 - New Primary Zone

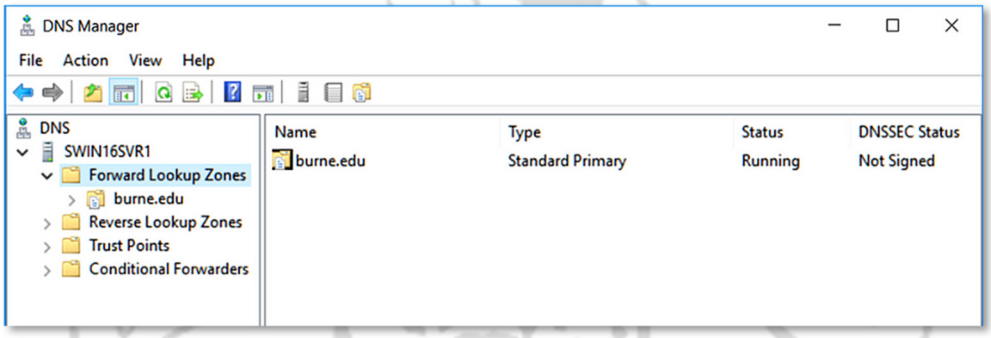


Figure 2 - New Primary Zone

Creating Network Resources

File Server

In Windows Server 2022, the **File Server** role is installed by default, so all we need to do now is make resources available on the network.

8. On **sWin22SVR3**, launch the **File Explorer** ( ) and navigate to **This PC**. Under **This PC**, create a Folder by right clicking **Local Disk (C:)**, choosing **New** from the context menu, and **Folder**.
9. Name the new folder **Data**.

   In the Data folder create a New text document called **TopSecret.txt**, add some text to the document and save it.

   We now need to **Share** the folder so users can access it over the network.
10. To share the **Data** folder, right click on the Data folder and select **Properties** from the context menu. Then select the **Sharing** tab, and click **Advanced Sharing...**
11. Check **Share this folder**. Limit the number of simultaneous users to **10.** Click the **Permissions** button and make sure that **Read** permissions are configured for **Everyone**. Click **OK**, twice, then **Close** to return to File Explorer.

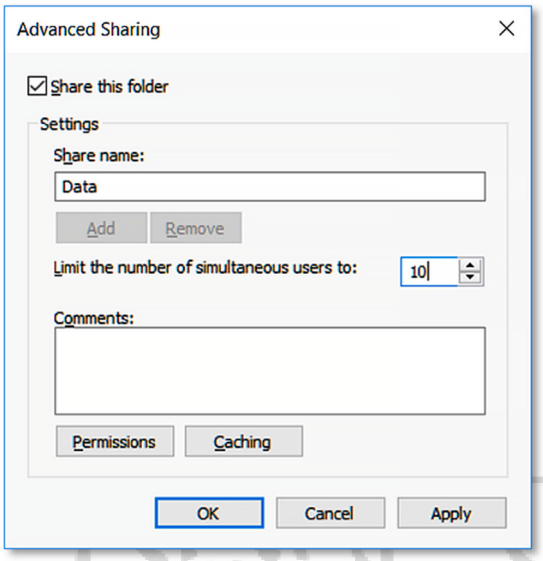


Figure 3 - Advanced Sharing

Web Server

In Windows Server, Internet Information Services (IIS) provides the Web Server role. We will now install IIS and create a default web page, so we can investigate how DNS supports web browsing.

12. On **sWin22SVR3**, in **Server Manager**, start the **Add Roles and Features** wizard, and accept the default options until you get to the **Select server roles** page.
13. Add the **Web Server (IIS)** role, accepting the default options for the remainder of the wizard. Close the wizard when installation has completed.

    Note: If the installation takes a while, move onto steps 14-15, and ensure that installation is complete before attempting step 16.
14. Click **Start**, and resisting the urge to press the enter key afterwards, type **notepad.** The **notepad** icon will appear in the programs list.

    Right click this icon and **Run as administrator**.
15. In the notepad type something similar to the following *(do better if you can)*:

```
<html>
<body>
<h1>Welcome to Kim's Web Site</h1>
<p align="center">This site is under construction </p>
</body>
</html>
```

16. Save this text file as **index.htm** in the **C:\inetpub\wwwroot** folder.
    Note: If we had not run notepad as an administrator, Windows would not have allowed us to save here.

Creating DNS records

Without DNS users from around the internet would need to use the server's IP address to access the resources on the server. So we need to create records so when a user types in *www.burne.edu* into their browser it takes them to the web server.

17. On **sWin22SVR1**, in DNS Management and in the **Forward Lookup Zones** > **burne.edu** primary zone, create records for www by:
    a. Right click the burne.edu zone and select **New Host**.
    b. In the **Name** field enter ***www***. Make sure that the FQDN is *www.burne.edu*.
    c. In the **IP address** field enter ***172.16.32.13***, then click the **Add Host** button.

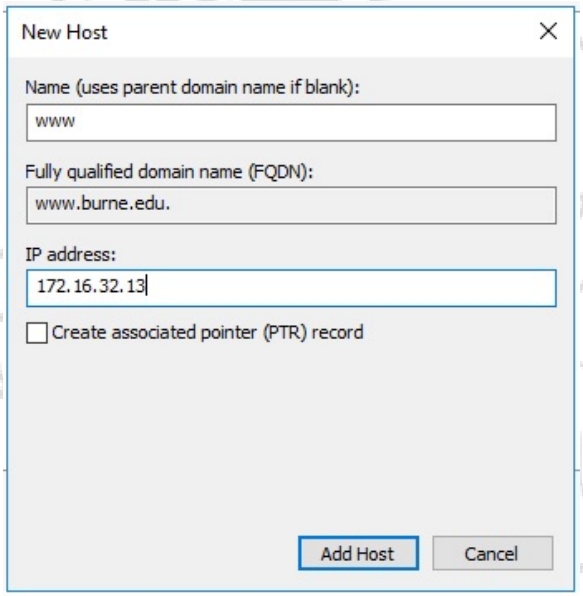


Figure 4 - Creating a New DNS A Record

    d. You will get a pop-up to tell you that the record has been created. Click **OK**.

18. We will now create a record for our **File server**. But the File Server role is being hosted on sWin22SVR3, and we have already created a record for it in step 17.

    It also makes no sense to tell users to enter *www.burne.edu* when they want to access a file server!

    So rather than creating a new record for a server that already has a record. This redundancy would cause real problems if you ever had to change the IP address of a server, you would then have to change every record for that server.

    So we will create an **alias** by creating a **CNAME** record. A CNAME record points to an existing record and allows an alias name to be attached to it.

    a. Right click on the **burne.edu** zone and select **New Alias (CNAME)**.
    b. Enter the name ***FileSvr*** in the **Alias name** field and make sure that the FQDN is *FileSvr.burne.edu*.

c. To set the **target host** click on the **Browse** button. Double click **sWin22SVR1** in the **Records** pane, then double click the **Forward Lookup Zones** container, double click the **burne.edu** zone and select the **www Host (A)** record. Click **OK** twice to return to DNS Management.

We have now created DNS records for our network resources.

If you discover that you have made a mistake with your DNS record, remember that you may need to type ***ipconfig /flushdns*** on **sWin10PC203** in order to clear the DNS cache.

Testing DNS

19. Log onto **sWin10PC203** as **Admin**:
    a. In the Ethernet adapter settings add **sWin22SVR1**'s IP address as sWin10PC203's preferred DNS server.
    b. Open the **Microsoft Edge** browser and type in ***www.burne.edu*** in the address bar. You should be directed to the web page you created in step 15.
    (If you get an error here, try to troubleshoot it with a fellow student and if that is unsuccessful, call the tutor over)
    c. Open File Explorer and type \\FileSvr.burne.edu
        - When prompted enter ***Administrator*** as the username and ***Pa55w.rd*** as the password.
        - You should now be able to see the **Data** folder created in step 9. Double clicking **Data** will allow you to see the contents of the shared folder.

    (If you get an error here, try to troubleshoot it with a fellow student and if that is unsuccessful, call the tutor over)

Zone Transfers

20. Create a secondary zone called ***burne.edu*** on **sWin22DC1** by loading **DNS Management**, right clicking on **Forward Lookup Zones**, and choosing **New Zone…** Work through the wizard to configure a **secondary** zone
21. On the **Zone name** dialog enter ***burne.edu*** and click **Next**.
22. On the Master DNS server dialog, enter **sWin22SVR1**'s IP address and click next, etc, then Finish.
23. Double-click on the new **burne.edu** zone and notice that the zone has not been loaded. This is a security measure. The DNS server on sWin22SVR1 does not hand over information just because another DNS server asks politely. Secondary Zones must have zone transfers approved and configured before data is transferred.
24. On **sWin22SVR1** in **DNS management**, right click on **burne.edu** and select **Properties**.

25. Click on the **Zone Transfers** tab.

    Now we have two choices, we can either keep a list of all DNS servers in the domain in the Name Servers tab, or we can authorise each DNS server individually. We will do the former.

    a. Click on the **Name Servers** tab and **Add… *sWin22DC1.swin.local***, and click **Resolve**. Notice that we have an error. This error is because we do not have a reverse lookup zone configure. This error will not prevent DNS from working. So click **OK**.

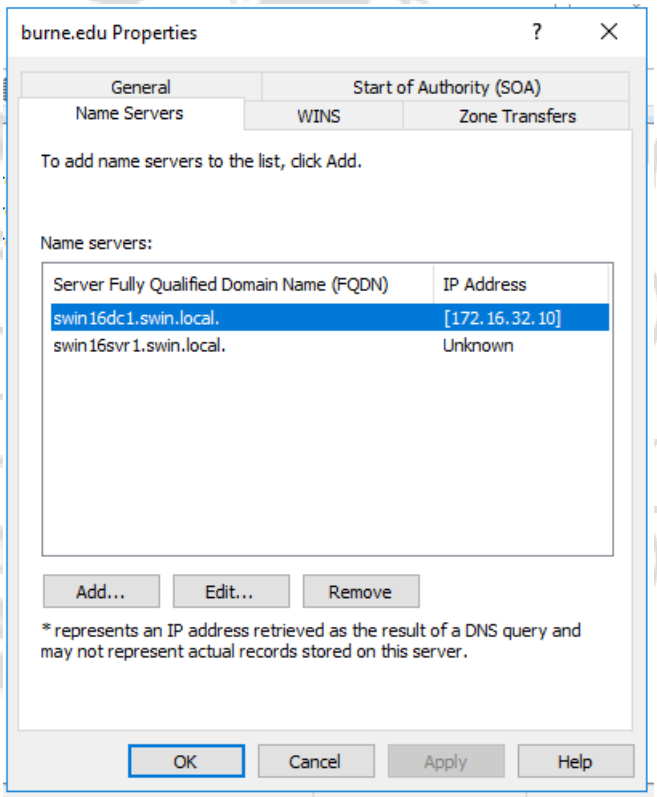


Figure 5 - Zone Transfers Name Servers Tab

    b. Now click on the **Zone Transfers** tab again, and **Allow zone transfers, Only to servers listed on the name servers tab**. Then click **OK**.

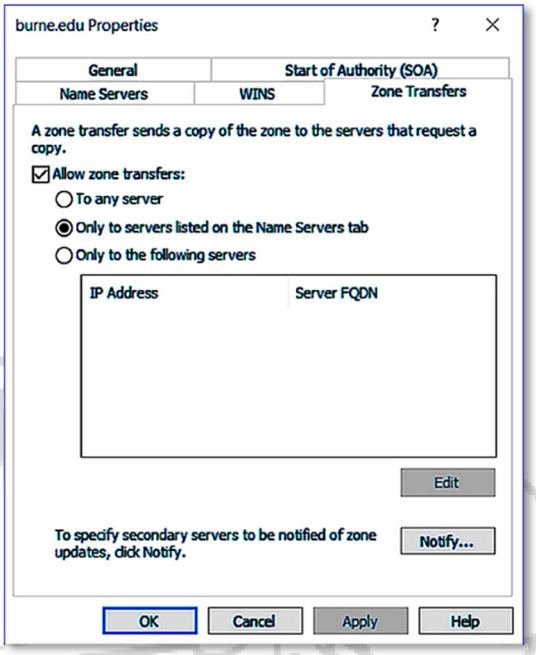


Figure 6 - Allow Zone Transfers

26. Go back to **sWin22DC1** and refresh the new sWin.local secondary zone. Does the data appear? Probably not – it takes time for the transfers to occur. If not, wait a couple of minutes then, right click the **burne.edu** zone and select ***Transfer from Master***. It should load this time.
27. Try creating some more records in the **burne.edu** Primary zone and see it they transfer to your secondary zone.

Extension

(Extension exercises are optional for students who finish the lab early – the subsequent Pack Up section is not optional)

28. Create an alias for your **www** record in the **burne.edu** zone. Use your first name as the record name
29. On **sWin22SVR1** create a **Stub zone** for **sWin.local**, whose primary zone is hosted on **sWin22DC1.**

    Which records were not transferred?

    Which records have been transferred? What do the records in a stub zone have in common?

Pack up

1. Shut down all guest VMs.
2. **Sign out** from the Host virtual machine and make sure that it is **Stopped** otherwise it will run in the background and use up your quota.
3. If on campus, **log off from the ATC626 lab PC,** and push your chair in as you leave.

End of Lab