Investigating DNS

# Introduction

This activity uses **Packet Tracer**. The networks used in this simulation are based on a similar principle to the ones used in Lesson 6. You will notice that there is still a home network on the left side with a single PC. You will also notice that there has been the addition of:

* an ISP network with the ISPs DNS
* a network for the “Cambridge punting” web server
* a network for the “Tyne bakery” web server

You will use this worksheet to investigate the DNS server that has been set up and to add a new website and IP address to the list of websites held by it.

# Browse using IP addresses .

| **Steps** | **Instructions** |
| --- | --- |
| 1. **Locate** the Packet Tracer software | * Teacher enter the instructions for opening Packet Tracer on your school network here |
| 1. **Open** the A2 Investigating DNS file | * Go to File > Open * Teacher enter the instructions for locating the A2 Investigating DNS file here |
| 3. **Access** the browser for PC0(1) | * Make sure that you have the select tool selected      * Click on PC0(1) in the **home network**. This is the PC that is on the far left side of the screen. * Click on **Desktop**. * Click on **Web Browser**. |
| 4. **Attempt** to use the URLs | * Type in the **URL** for the Cambridge punting website: [www.cambridgepunting.com](http://www.cambridgepunting.com) * You will notice that an error occurs Host Name Unresolved * Try the same thing with the Tyne Bakery. Use [www.tynebakery.com](http://www.tynebakery.com) * The same error message occurs.   There is no way of linking that URL to an IP address, which is why the errors occur. |
| 5. **Access** the websites via their IP addresses | * In the same web browser. Try typing in the IP addresses for each web server.   Cambridge Punting - 190.0.0.10  Tyne Bakery - 176.0.0.10   * You should be able to view the websites by using the IP addresses. * Notice how the data moves from the web server to the home PC. |

# Link to the DNS server .

| **Steps** | **Instructions** |
| --- | --- |
| 1. **View** the settings for PC0(1) | * You should still have the settings box open (the window with the browser on it). If not, use the select tool again and click on PC0(1). |
| 1. **Link** to the ISPs DNS server | * Click on the **Config** tab in the settings window. * Make sure that you are on ‘Global Settings’; this is typically the section that is open when you first click on the **Config** tab. * Where it says ‘**DNS Server**’ enter the DNS server’s IP address. This is:   189.0.0.10   * You have now linked the PC in the home network to the DNS server provided by the ISP. |
| 3. **Test** the DNS server | * The DNS server currently knows the IP address for [www.cambridgepunting.com](http://www.cambridgepunting.com). * Open the web browser and type the URL into the address bar. * You should now be able to see the Cambridge Punting website using the URL.   NOTE: The first attempt might be very slow.  NOTE: You must use the **www.** before the rest of the URL or it won’t work. |
| 4. **Test** Tyne bakery | * Tyne bakery has not yet been added to the DNS. You can test this out by typing in the URL.   [www.tynebakery.com](http://www.tynebakery.com).   * Note that you still get the Host Name Unresolved error message. |

# Add tyne bakery to the DNS .

| **Steps** | **Instructions** |
| --- | --- |
| 1. **View** the settings for the DNS server | * Make sure that you have the select tool selected      * Click on Server-PT Server0 in the **ISP network**. It is labelled as ‘**ISP's DNS Server**   **189.0.0.10**’. |
| 1. **Access** the DNS settings | * Click on the **Services** tab. * Click on **DNS** on the left-hand menu. * You will notice that Cambridge Punting is already listed by the DNS. |
| 3. **Add** Tyne Bakery | * In the **Name** box, type the URL [www.tynebakery.com](http://www.tynebakery.com). * In the **Address** box type the IP address 176.0.0.10 * Click **Add**. |
| 4. **Test** the DNS | * Close the **settings** window for the DNS server. * Open the **settings** window for PC0(1). * Go to the **Web browser**. * Type in the URL [www.tynebakery.com](http://www.tynebakery.com).   NOTE: The first time that you access the website might be a little slow.  TROUBLESHOOTING: If it hasn’t worked, go through the steps again and make sure that you have entered the correct numbers and addresses. |

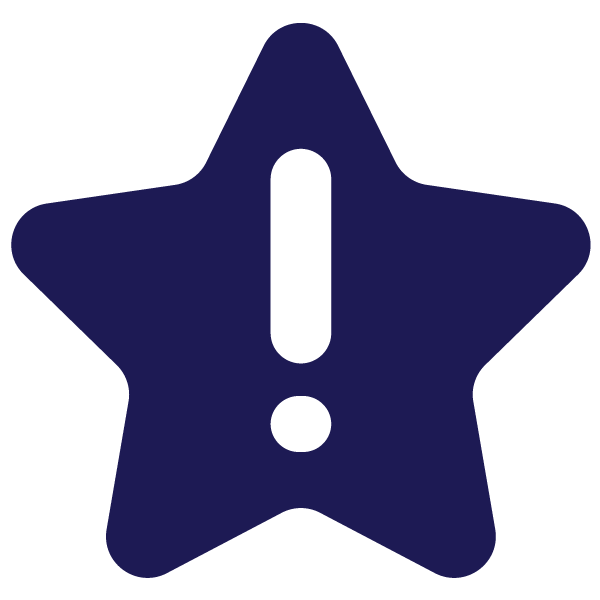
# Investigate the Web Browser .

| **Steps** | **Instructions** |
| --- | --- |
| 1. Access the settings for the **Cambridge Punting** web server | * Make sure that you have the select tool selected. * Click on Server-PT Server0(1) in the **Cambridge punting network**. It is labelled as ‘**Web Server 190.0.0.10**’. |
| 1. **Access** the **HTTP** services | * Click on the **Services** tab. * You should already be able to see the HTTP window. If not, click on HTTP on the left-hand menu. |
| 3. **View** list of files stored on the web server | * You will notice that there are two files listed that are saved on this web server:   punting.jpg  index.html   * index.html is the default page that all web servers will display if a specific page hasn’t been requested. * punting.jpg is the image that is placed on the web page. Note that they are not all saved in one file, they are separate files that are built as one page by the web browser. |
| 4. **Edit** the index page | * Click on **Edit** to the right of index.html in the list of files. * You are now looking at the HTML code for the Cambridge Punting homepage. * Notice the text ‘This is a demonstration page created by the Raspberry Pi foundation’. This is inside two HTML tags that are used to apply formatting styles to the text. <p> stands for ‘new paragraph’. * Change this text to something else – be careful not to delete the <p></p> tags from the start and end. * Click **save**, **overwrite**, and **close** the window. |
| 5. **View** the changes | * Go back to the home PC and navigate to the Cambridge Punting page to view your changes! |
| 6. **Repeat** it for the bakery | * Edit the HTML code for the bakery website and view your changes. |

# Explorer task .

In Lesson 6 you lowered the bandwidth of the network to observe a change in the route that was taken. If you lower the bandwidth, you will also notice a change to the speed that your web pages load. The instructions below remind you of how to lower the bandwidth from Blackpool to Newcastle. Follow these instructions and use them for the other routes on the network too.

| **Steps** | **Instructions** |
| --- | --- |
| 1. **View** the routing table for Blackpool(1) | * Click on the magnifying glass icon in the top left corner      * Click on the **Blackpool(1)** router. * Select **Routing table**. |
| 1. **Observe** the data in the routing table | * The network 190.0.0.0 is the network that contains the web server (on the right of your screen). * Find this network in the table (it will have /16 at the end of it). * Notice the Port is Serial0/0/1. This is labelled on the simulation as the bottom route (route two). * The **Metric** is also listed. This is the routing cost for this route. |
| 3. **Access** the CLI (Command Line Interface) | * **Close** the routing cost table. * Click on the select tool in the top left corner. * Click on the **Blackpool(1)** router. * Click on CLI at the top of the new window. |
| 4. **Get started** | * Make sure that you click **inside** the new window and then press the Enter key. You should now see a prompt like the example below:   Blackpool> |
| 5. **Lower** the bandwidth | * Enter the following text into the prompt:   en  conf t  interface s0/0/1  bandwidth 100 |
| 6. **Observe** the change (if there is one!) | * Enter the URL for the Tyne Bakery. See which route the data takes by watching the data points flash. See if the web page loads any slower at this point. |
| 7. **Check** the routing table for Blackpool(1) | * Switch back to the magnifying glass and open up the routing table on **Blackpool(1)** again. * Notice that the port to the web server has now changed to Serial0/0/0. |

**Remember:** This only gives you instructions for lowering the bandwidth of the Blackpool route. You will also need to lower the bandwidth for all other routes to see a significant change. This is because your data will just take a different route!

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