CSG1105 Workshop One

1 Introduction

This week will be a short lab to build some basic skills and understanding regarding URLS and DNS.

1.1 Important:

Please keep up to date with the workshops, as each week generally builds on the knowledge gained in the previous week.

2 Uniform Resource Locators (URLs)

Clickable links in a web page have a **Uniform Resource Locator** linked to provide the location from which an item may be retrieved. The item may be another web page, an image, a file, a video or may other item types.

2.1 Read the following:

Read the document at the following link to better understand the structure of URLs
https://developer.mozilla.org/en-US/docs/Learn/Common_questions/What_is_a_URL.

2.1.1 Exercise: Review URLs

Browse a number of web sites and hover the mouse cursor over a number of links. You should see (depending on your browser) the URL being displayed in the bottom left of the screen. Try to identify the sections of the URLs described in the Mozilla document.

3 The Domain Name System (DNS)

3.1 Read the following:

Read the document at the following link to better understand of DNS
https://developer.mozilla.org/en-US/docs/Learn/Common_questions/What_is_a_domain_name.

3.2 Exercise: DNS Tools

DNS normally operates in the background, used by many other programs on the system. Every operating system has tools for examining DNS record to debug configurations issues. These may also be used in reconnaissance when trying to discover information about remote systems. Many of these tools operate from the command line rather than from a GUI front end. We will be using some simple features of these tools. If you want to learn more of their capabilities, use a search engine such as google or bing to find out more.
DNS has many record types. Today we will mostly be looking at "A" or address records.

3.2.1 Windows

1. Pressing the WINKey-R (WINKey and R at the same time) launches the **run** dialog
2. Enter "cmd" and click OK. This launches a command window
3. In the terminal Window type

   ```
   nslookup www.ecu.edu.au
   ```

   This will display the IP address of the FQDN supplied.

4. Try a few other addresses

3.2.2 Mac

1. Run the terminal app from the utilities folder
2. In the terminal Window type

   ```
   host www.ecu.edu.au
   ```

   This will display the IP address of the FQDN supplied.

3. Try a few other addresses

3.3 Online Tools

A popular Linux tool for looking at DNS is the "dig" program. The following site provides a web access to this tool. https://www.digwebinterface.com/

1. In the **Hostname** dialog box, enter `microsoft.com`
2. In the **Type:** drop down, select type "A" (noting the other types)
3. In the checkboxes, select "show command","colorize output", "no recursive" and "Show IP geolocation"

You will see that `microsoft.com` resolves to different IPs depending on the location. **Why do you think that might be the case?**.

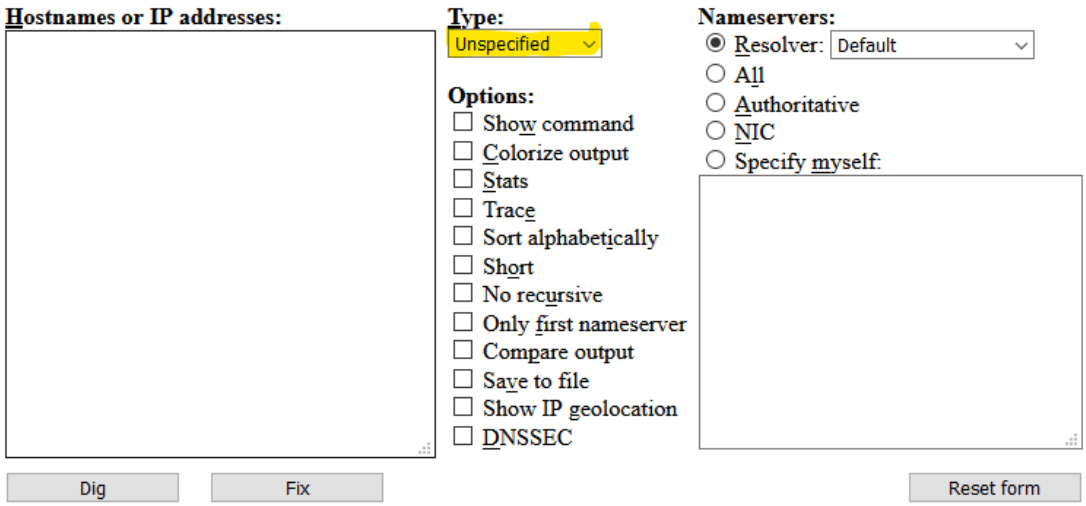
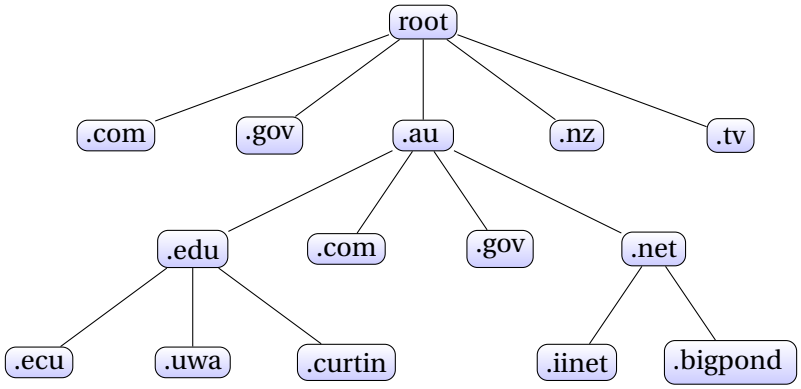


Figure 3.1: DIG Web Interface

3.3.1 DNS Hierarchy

Recall this diagram from the lecture.



3.3.2 Exercise: Explore the DNS server hierarchy

1. Repeat the previous search but add the **trace** checkbox
2. This displays each of the name servers at each level of the hierarchy, the **root** level, the **.com** level, the **microsoft.com** name servers and finally the varios host IPs that respond to **microsoft.com**.
3. Replace **microsoft.com** with each of **ecu.edu.au, curtin.edu.au, uwa.edu.au and murdoch.edu.au**
4. Use the information provided to draw a hierachy diagram similar to the above, but note at each level the namesevers used.

4 Learning Journal

None of the workshop exercises are assessed. They are used to build understanding that will be required in the quizzes and assignments. What I do **recommend** (not require!) is for you to keep a **Learning Jounal**. It can be a paper notebook, A Word or Google document, a OneNote notebook or what ever medium suits you. It's purpose is to document your learning journey. It's personal to you and you don't have to show it to me unless you wish to. Use it as a means of recording questions for me to answer later or to record useful websites to share later in the forums. Cut and paste useful diagrams or to draw pictures to enhance your understanding. It is a technique for **active** rather than **passive** learning. Give it a go, I find it personally very useful.