**LAB REPORT**

Course Code - Course Name: - COMP4039 – Network Foundations

Program: T433 - Cybersecurity

Section: A

Term: - Winter 2024

Lab Number - Topic: Lab 2 – Observe DNS Resolution

Group Number: 06

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**Required Resources:**

1. PC (Windows with internet and command prompt access)

## Part 1: Observe the DNS Conversion of a URL to an IP Address

a. Open a Windows command prompt.

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b. C:\> **ping** [**www.icann.org**](http://www.icann.org)

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C:\> **ping -4** [**www.icann.org**](http://www.icann.org)

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c. Type the IPv4 addresses from step b into a web browser, instead of the URL. Enter https://192.0.32.7 in the web browser. If your computer has an IPv6 address you can enter the IPv6 address. https://[2620:0:2d0:200::7] in the web browser.

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ICANN website is under maintenance.

d.

Question: The Base 10 IP address 192.0.32.7 in Base 2 numbers is 11000000.00000000.00100000.00000111. What happens if you cut and paste these Base 2 numbers into a browser?

Answer: The reason the website isn't showing up is that web browsers are designed to work with IP addresses in decimal (Base 10), not binary (Base 2). The conversion example, where the IP address "192.0.32.7" is expressed in binary, illustrates how computers handle numerical data internally. However, in the context of web browsers, the actual representation used is the decimal form of the IP address.

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e. At a command prompt, **ping** [**www.cisco.com**](http://www.cisco.com).

C:\> **ping www.cisco.com**

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C:\> **ping -4 www.cisco.com**

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Question: When you ping www.cisco.com, do you get the same IP address as the example? Explain.

Answer: We get a different IP address from the example when we ping [www.cisco.com](http://www.cisco.com). This variation is likely because Cisco uses multiple mirror servers spread across different geographical locations worldwide. These mirrored servers host the same content, and when we ping the Cisco URL, the requests are directed to the closest mirror servers based on the user's location.

Question: Type the IP address that you obtained when you pinged www.cisco.com into a browser. Does the website display? Explain.

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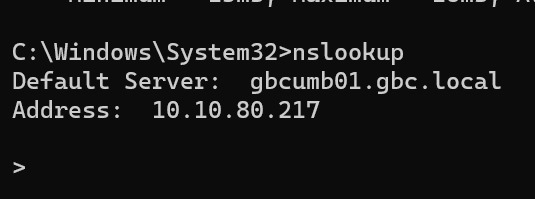
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Answer: When we enter the IP address it shows showing “INVALID URL”. A warning popup message was also there that the page was not secure. This difference in IP addresses could be because Cisco has set up security measures to make sure that web browsers can't reach their servers directly using an IP address.

## Part 2: Observe DNS Lookup Using the nslookup Command on a Web Site

* + 1. At the command prompt, type the **nslookup** command.

C:\> **nslookup**

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Question:What is the default DNS server used?

Answer: The Default DNS server used is: gbcumb01.gbc.local

a. Notice how the command prompt changed to a greater than (>) symbol. This is the nslookup prompt. From this prompt, you can enter commands related to DNS.

At the prompt, type **?** to see a list of all the available commands that you can use in **nslookup** mode.

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b. At the nslookup prompt, type **www.cisco.com**.

> [**www.cisco.com**](http://www.cisco.com)

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Question: What is the translated IPv4 address?

Answer: The translated IPv4 address is: 184.26.152.97

Question: Is it the same as the IP address shown with the **ping** command?

Answer: Yes, the IP address is the same as shown in the ping command.

Question: Under Addresses, in addition to the 172.230.155.162 IP address, there are the following numbers: 2600:1404:a:395::b33 and 2600:1404:a:38e:::b33. What are these?

Answer: These are the IPv6 addresses which help us to reach the website [www.cisco.com](http://www.cisco.com)

* + 1. At the nslookup prompt, type the IP address of the Cisco web server that you just found. You can use **nslookup** to get the domain name of an IP address if you do not know the URL.

> **172.230.155.162**

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Question: Using the **nslookup** tool, record the IP addresses associated with [**www.google.com**](http://www.google.com).

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## Part 3: Observe DNS Lookup Using the nslookup Command on Mail Servers

a. At the nslookup prompt, type **set type=mx** to use **nslookup** to identify mail servers.

> **set type=mx**

b. At the nslookup prompt, type **cisco.com**

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Question: Based on the output above, which mail server will be contacted first when the email is sent to Cisco.com?

Answer: Based upon the output above, The mail server with the lowest MX preference **is alln-mx-01.cisco.com**

c. At the nslookup prompt, type **exit** to return to the regular PC command prompt.

d. At the PC command prompt, type **ipconfig /all**.

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Question: Write the IP addresses of all the DNS servers that your school uses.

Answer:

IPv4: 192.168.56.1

DNS Servers: 10.10.80.217

Primary WINS Server: 10.10.10.83

# Reflection Question

Question: What is the fundamental purpose of DNS?

Answer: DNS, helps us to find things on the internet. It's like a phonebook that translates these names into IP addresses that computers use to talk to each other. So, instead of remembering numbers, we can use names to browse websites and connect devices on the internet.