

Lab 6.2.1 Observing DNS Name Resolution

Objectives

- Observe the conversion of a URL to an IP address.
- Observe DNS lookup using the nslookup command.

Background / Preparation

Domain Name System (DNS) is invoked when you type a Uniform Resource Locator (URL), such as <http://www.cisco.com>, into a web browser. The first part of the URL describes which protocol is being used. Common ones are HTTP (Hypertext Transfer Protocol), HTTPS (Hypertext Transfer Protocol over Secure Socket Layer), and FTP (File Transfer Protocol).

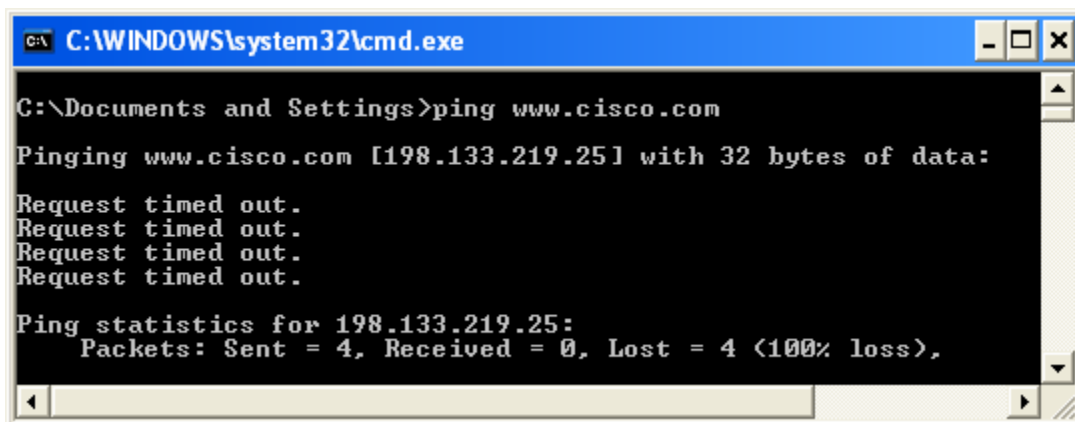
DNS uses the second part of the URL, which in this example is `www.cisco.com`. DNS translates the domain name (like `www.cisco.com`) to an IP address in order to allow the source host to reach the destination host. Work in pairs to complete this lab.

The following resources are required:

- Windows-based computer with Internet connectivity
- Access to the Run command

Step 1: Observe DNS conversion

- Click the **Start** button, select **Run**, type **cmd**, and then click **OK**. The command prompt window appears.
- At the command prompt, type **ping www.cisco.com**. The computer needs to translate `www.cisco.com` into an IP address so it knows where to send the Internet Control Message Protocol (ICMP) packets. Ping is a type of ICMP packet.
- The first line of the output shows `www.cisco.com` converted to an IP address by DNS. You should be able to see the effect of DNS even if your school has a firewall that prevents pinging, or if Cisco has prevented people from pinging their web server.



```

C:\WINDOWS\system32\cmd.exe

C:\Documents and Settings>ping www.cisco.com

Pinging www.cisco.com [198.133.219.25] with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 198.133.219.25:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
  
```

- d. Which IP address is shown on the screen? _____
- e. Is it the same as the one shown in the figure? _____ Why do you think this occurred?

- f. Work together with another student and discuss one or two other instances (besides the **ping** command) in which the computer would use DNS.

Step 2: Verify DNS operation using the nslookup command

- a. At the command prompt, type the **nslookup** command.
- b. What is the default DNS server being used? _____
- c. Notice how the command prompt changed. This is the **NSLOOKUP** prompt. From this prompt, you can enter commands related to DNS.
- d. At the prompt, type **?** to see a list of all the available commands that you can use in **NSLOOKUP** mode.
- e. Write three commands that you can use with **NSLOOKUP**. _____

- f. At the **NSLOOKUP** prompt, type **www.cisco.com**.
- g. What is the translated IP address? _____
- h. Is it the same as the IP address shown with the **ping** command? _____
- i. At the 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.
Using the previous procedures, find an IP address associated with www.google.com.

Step 3: Identify mail servers using the nslookup command

- a. At the prompt, type **set type=mx** to have **NSLOOKUP** identify mail servers.
- b. At the prompt, type **www.cisco.com**.
- c. What is the primary name server, the responsible mail address, and the default Time to Live (TTL)?

- d. At the prompt, type **exit** to return to the regular command prompt.
- e. At the prompt, type **ipconfig /all**.
- f. Write the IP addresses of all the DNS servers that your school uses.

- g. Type **exit** to close the command prompt window.

Step 4: Reflection

- a. If your school did not have a DNS server, what effect would this have on your use of the Internet?

- b. Some companies do not dedicate a single server for DNS. Instead, the DNS server provides other functions as well. Which functions do you think might be included on a DNS server? Use the **ipconfig /all** command to help you with this.
