Lab 10.2.2.9 Observing DNS Resolution

1. Objectives

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

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

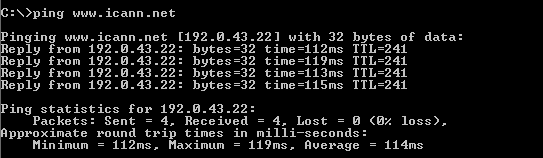
Part 3: Observe DNS Lookup Using the Nslookup Command on Mail Servers

1. Background / Scenario

The **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 used. Common protocols are Hypertext Transfer Protocol (HTTP), Hypertext Transfer Protocol over Secure Socket Layer (HTTPS), and File Transfer Protocol (FTP).

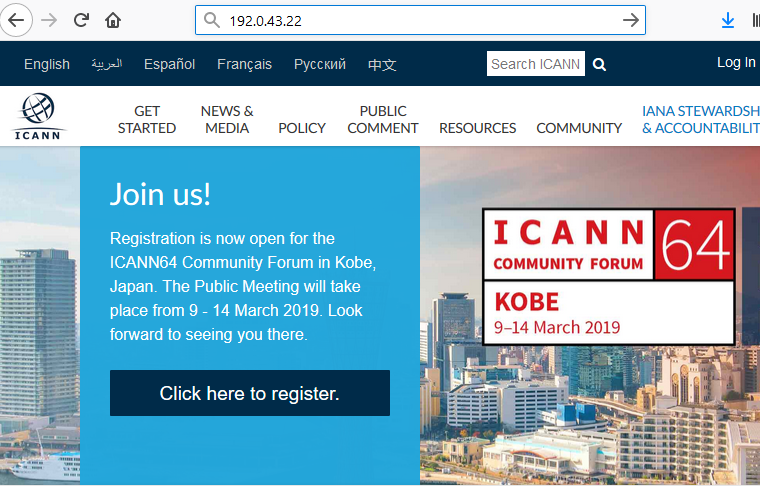
DNS uses the second part of the URL, which in this example is www.cisco.com. DNS translates the domain name (www.cisco.com) to an IP address to allow the source host to reach the destination host. In this lab, you will observe DNS in action and use the **nslookup** (name server lookup) command to obtain additional DNS information. Work with a partner to complete this lab.

1. Observe the DNS Conversion of a URL to an IP Address
   * 1. Click the **Windows + r** button, type **cmd** into the search field,and press Enter. The command prompt window appears.
     2. At the command prompt, ping the URL for the Internet Corporation for Assigned Names and Numbers (ICANN) at **www.icann.net**. ICANN coordinates the DNS, IP addresses, top-level domain name system management, and root server system management functions. The computer must translate www.icann.net into an IP address to know where to send the Internet Control Message Protocol (ICMP) packets.
     3. The first line of the output displays www.icann.net converted to an IP address by DNS. You should be able to see the effect of DNS, even if your institution has a firewall that prevents pinging, or if the destination server has prevented you from pinging its web server.

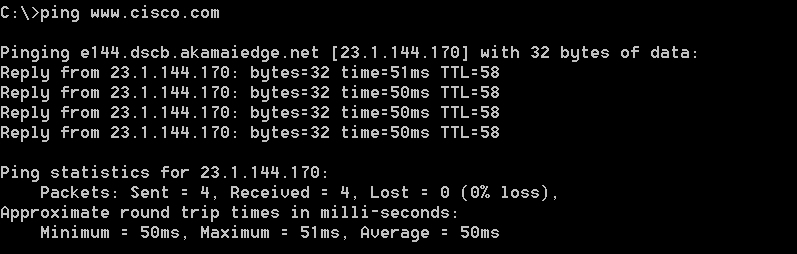


Record the IP Address of www.icann.net\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. Type the IP address from **step c** into a web browser, instead of the URL.
    2. Notice that the ICANN home web page is displayed.



* + 1. Now type **ping** [**www.cisco.com**](http://www.cisco.com).



* + 1. When you ping www.cisco.com, do you get the same IP address as the example, or a different IP address, and why?

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* + 1. Type the IP address that you obtained when you pinged www.cisco.com into a browser. Does the web site display? Why or why not?

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1. Observe DNS Lookup Using the Nslookup Command on a Web Site
   * 1. At the command prompt, type the **nslookup** command.

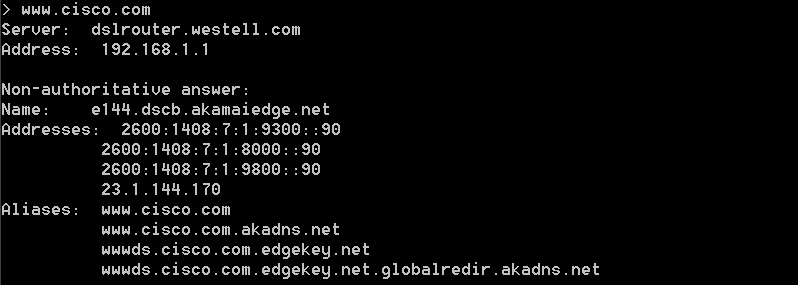


What is the default DNS server used? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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.

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



What is the translated IP address? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Is it the same as the IP address shown with the **ping** command? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Under addresses, in addition to the 23.1.144.170 IP address, there are the following numbers: 2600:1408:7:1:9300::90, 2600:1408:7:1:8000::90, 2600:1408:7:1:9800::90. What are these?

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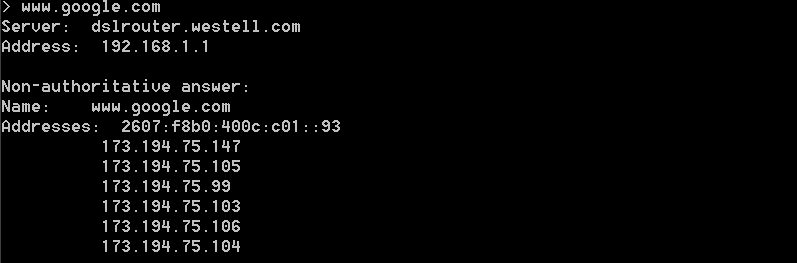
At the prompt, type the IP address of the Cisco web server that you just found. You can use **nslookup** to get the domain name of an IP address if you do not know the URL.



You can use the **nslookup** tool to translate domain names into IP addresses. You can also use it to translate IP addresses into domain names.

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

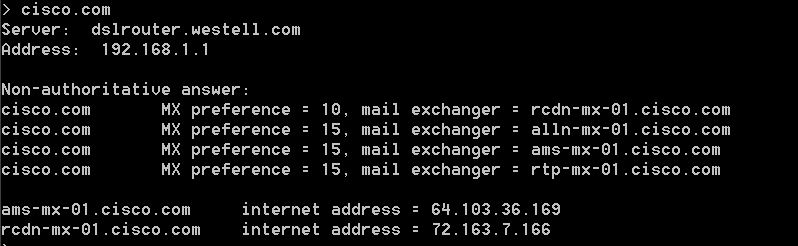
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1. Observe DNS Lookup Using the Nslookup Command on Mail Servers
   * 1. At the prompt, type **set type=mx** to use **nslookup** to identify mail servers.

set type mx

* + 1. At the prompt, type **cisco.com**.



A fundamental principle of network design is redundancy (more than one mail server is configured). In this way, if one of the mail servers is unreachable, then the computer making the query tries the second mail server. Email administrators determine which mail server is contacted first using **MX preference** (see above image). The mail server with the lowest **MX preference** is contacted first. Based upon the output above, which mail server will be contacted first when email is being sent to cisco.com?

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* + 1. At the nslookup prompt, type **exit** to return to the regular PC command prompt.
    2. At the PC command prompt, type **ipconfig /all**.
    3. Write the IP addresses of all the DNS servers that your school uses. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Reflection

What is the fundamental purpose of DNS?

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