5.10.2 Name Resolution Troubleshooting Facts

Common name resolution problems include the following:

- The DNS server could be down or otherwise unreachable.
- There may be a routing problem between the sending host and the DNS server.
- The sending host could be configured with the wrong IP address for the DNS server.

Name resolution problems typically have the following symptoms:

- You can ping a destination host using its IP address but not its host name.
- Applications that use host names fail. This could include:
  - Entering a URL into a browser.
  - Pinging the host using the host name.
  - Searching for the host by its name.

To troubleshoot DNS name resolution, use the following tools:

- **ping**
- **tracert** (Windows) or **traceroute** (Linux)
- **nslookup**
- **dig** (Linux)
- **host** (Linux)

The following table lists several ways to use these commands:

Command	Purpose	Example
ping	Contacts the DNS server to see if it responds. Be aware that the firewall protecting the DNS server may be configured to drop ICMP packets in order to prevent DoS attacks—if the server doesn't respond, it is not necessarily down.	ping 8.8.4.4
tracert or **traceroute**	Tests the route between your workstation and the DNS server.	tracert 8.8.4.4
nslookup *[host]*	Queries the IP address of a host.	nslookup www.mit.edu
nslookup	Starts **nslookup** in interactive mode. The default interactive mode query is for A records, but you can use the **set type=** command to change the query type.	nslookup set type=ns
dig *hostname* **host** *hostname*	Queries a host. The default query is for A records. You can change the default search by appending one of the record types below to the end of the command: - a—address records - any—any type of record - mx—mail exchange records - ns—name server records - soa—sort of authority records - hinfo—host info records - axfr—all records in the zone - txt—text records	dig www.vulture.com ns host www.vulture.com -t ns
dig *@IP address or host name domain*	Queries the root server at the IP address or host name for the domain's A records. You can change the default query type by appending a different record type to the end of the command.	dig @192.168.1.1 vulture.com ns
dig -x *IP address* **host** *IP address*	Finds the host name for the queried IP address.	**dig -x 62.34.4.72** **host 62.34.4.72**

Local computers have a cache of recently resolved DNS names. The cache holds the DNS name and its IP address. When you use a DNS name, the computer first checks its cache. If the name is in the cache, the corresponding IP address will be used. This can cause problems if the IP address of a host has changed. Old values in the cache might continue to be used temporarily, making communication via the DNS name impossible. To correct this problem on a Windows computer, run **ipconfig /flushdns** to delete the local DNS name cache.