5.1.9 IP Address Assignment Facts

The following table lists several options for assigning IP addresses.

Method	Uses

Dynamic Host Configuration Protocol (DHCP)	A DHCP server is a special server configured to pass out IP addresses and other IP configuration information to network clients. DHCP servers ensure that each client is assigned a unique IP address.
	▪ When a DHCP client system boots, it contacts the DHCP server for IP configuration information. The DHCP server is configured with a range of IP addresses it can assign to hosts. These ranges are called scopes.
	  ▪ The DHCP server can be configured to prevent specific addresses in the range from being assigned to clients. This is called an exclusion.
	  ▪ You can also configure a DHCP server to deliver the same address to a specific host each time it requests an address. This is called a reservation.
	▪ The DHCP server can also be configured to pass out other IP configuration information, such as the default gateway and DNS server addresses.
	▪ The DHCP server assigns the IP address and other information to the client. The assignment is called a *lease*, and it includes a lease time that identifies how long the client can use the IP address.
	  ▪ Periodically, the client contacts the DHCP server to renew the lease on the IP address. The client will also attempt to renew the lease on the same IP address if it reboots.
	  ▪ The DHCP lease process uses broadcast frames at Layer 2. For this reason, DHCP requests do not pass through routers to other subnets by default. To enable DHCP broadcasts between subnets, enable IP helper or DHCP relay on the appropriate routers.
	  ▪ When the lease expires, the DHCP server releases the reserved IP address. This is known as the expired IP address.
	▪ Any client configured to use DHCP can get an IP address from any server configured for DHCP, regardless of its operating system.
	DHCP is the preferred IP configuration method for small, medium, and large networks.

Static (Manual) Assignment	Static addressing means that IP configuration information is manually configured on each host. Static addressing is best used in the following situations: ▪ On networks with a very small number of hosts. ▪ On networks that do not change often or that will not grow. ▪ To permanently assign IP addresses to hosts that must always have the same address (such as printers, servers, or routers). ▪ For hosts that cannot accept IP addresses from DHCP servers. ▪ To reduce DHCP-related traffic. Static addressing is very susceptible to configuration errors and duplicate IP address configuration errors. Static addressing disables both APIPA and DHCP functions on the host.