Configuring DHCP on a Cisco Router

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DHCP Basics

DHCP stands for Dynamic Host Configuration Protocol. It offers many benefits including lower cost for Internet access, lower cost for IP client configuration, and centralized management.

When a DHCP client comes online, it broadcasts a DHCPDISCOVER packet, which is an IP lease request. A DHCP server then sends the client a DHCPOFFER unicast which offers the client an IP lease (and possibly other parameters). The client selects the first one it receives by sending a DHCPREQUEST broadcast packet and the DHCP server then sends a DHCPACK unicast back to the client.

Design Considerations

Before configuring DHCP on your Cisco router, identify an external File Transport Protocol (FTP), Trivial File Transfer Protocol (TFTP), or remote copy protocol (rcp) server that you will use to store the DHCP bindings database. You must also identify the IP addresses that you will enable the DHCP server to assign, and the IP addresses that you will exclude. Additionally, identify necessary DHCP client device options, including: default boot image name, default router(s) (gateways), DNS server(s), NetBIOS name server (WINS), decide on a NetBIOS node type (b, p, m, or h), and decide on a DNS domain name.

Once the preliminary design is completed, the steps required to configure DHCP on a Cisco router are fairly simple.

Configuring a DHCP Pool

Configure a DHCP pool name, which also allows you to enter DHCP configuration mode:
Router(config)#**ip dhcp pool [name]**
(I like to use names that describe the subnet serviced by the pool. For example, I might use "net-192.168.0" to name a pool that services the 192.168.0.0/24 subnet.)

Configure the DHCP pool subnet address and mask:
Router(dhcp-config)#**network 10.16.0.0 /12**

Configuring DHCP Options

Configure a domain name for the client:
Router(dhcp-config)#**domain-name [name]**

Configure DNS server addresses:
Router(dhcp-config)#**dns-server [address]**
(You can configure multiple DNS server addresses.)

Configuring WINS server addresses:
Router(dhcp-config)#**netbios-name-server [address]**

Configuring the client's NetBIOS node type:
Router(dhcp-config)#**netbios-node-type [b,h,m,p]**

Configuring the client's default router:
Router(dhcp-config)#**default-router [address]**

Setting the address lease time:
Router(dhcp-config)#**lease [(days, hours, minutes) infinite]** (Defaults to one day)

Monitoring and Administering DHCP

"clear" commands:
Router#**clear ip dhcp binding [address/*]**
Router#**clear ip dhcp server statistics**

"debug" commands:
Router#**debug ip dhcp server [events/package/linkage]**

"show" commands:
Router#**show ip dhcp [binding/confict/server statistics]**
Router#**show ip dhcp database**

This document is taken from soundtraining.net's two-day hands-on workshop **Cisco Router Fundamentals: Two-Day Hands-On Workshop**