

# ITFreeTraining



L A P T O P

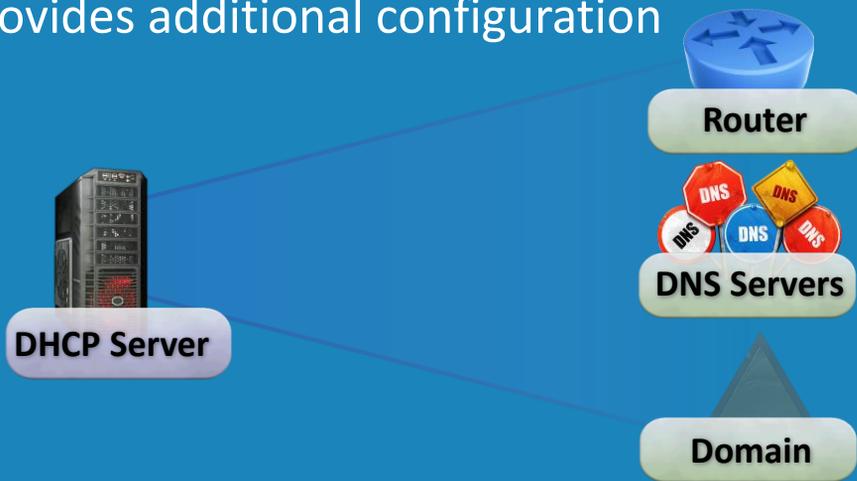
## DHCP Options

For the free video please see  
<http://itfreetraining.com/dhcp/options>

In this video from ITFreeTraining, I will look at configuring DHCP options. DHCP options provide additional configuration that is essential for devices to work on the network.

# DHCP Options

- Provides additional configuration



0:12 A DHCP server can be configured to provide additional configuration for a device on the network. Without additional configuration, the device only has an IP Address and subnet mask, not enough configuration to allow it to communicate on a network and find other resources.

Common options that may be configured with a DHCP server include router, DNS servers and domain. There is a lot more that can be configured, and the administrator can also define custom options if required. The administrator also has some choices about how the options are configured, and thus which devices will receive which options, all of which I will look at next.

# Configure Options Levels



Global



Scope



Class



Reservation



0:52 DHCP allows the administrator to configure options at four different levels. The first is global. These, as the name suggests, are options that are deployed to all devices on the network. For example, at the global level an administrator may configure the domain name as this will be the same for the whole organization.

The next level is the scope option. In the previous video, I demonstrated how to create a scope. A scope contains IP Addresses for a whole network; for example, a subnet. Following this are class options. Windows supports both user and vendor classes. Which class the device belongs to will determine which options it receives. More on this later in the video.

The last level is reservations. Later in the course, I will look into reservations in more detail. For the moment, you just need to understand that a reservation allows a DHCP server to allocate the same IP Addresses and options to a particular device every time it joins the network.

The last point to remember is that moving left to right, settings are overwritten by other settings. For example, any options that are configured globally will be overwritten by any settings that are to the right of it – that is, scope, class and reservations will always override global options.

A lot of networks will have a simple setup for DHCP, but to understand how it works, let's consider a complex DHCP example using all four levels of options. Don't worry, I will make it easy to understand and I am sure you are ready for it.

# Example: DHCP Options

Global



DNS Servers

Scope

New York



Router

8 Day Lease

Class

Laptop



5 Hour Lease

Reservation

Testing



DNS Servers

Laptop NY  
Reservation



DNS Servers

Router

5 Hour Lease

2:27 To start with, let's consider that on this network there are two DNS servers. These are used on all networks in the company, so these will be configured as global options.

In this example, a scope will be created for the New York network. This will contain the default gateway and the lease configured for eight days. It is common to configure a router in the scope since most networks generally only have the one. Also note, that I could have configured the eight-day lease in the global option. Both would be equally valid, and it is up to the administrator to decide where they want to configure this option.

On this network, a class has been configured for laptops. Laptops will be configured to be part of this class and thus receive options from that class. In this case, the laptop class has the options for a five-hour lease. In this example, those that have laptops are generally the sales staff who are very mobile. They don't spend a lot of time in the office, and thus having a short lease time allows the IP Addresses to be reclaimed quickly.

Next, a reservation has been configured on the DHCP server. In this case, a new application is being tested. This application requires DNS records, so a test DNS server has been set up. The reservation thus contains the test DNS servers.

Now that all the options have been configured, let's consider an example of a laptop that is being used on the New York network. Working from left to right, the global DNS server's settings will be considered first.

Next, the scope setting will be considered. This consists of the router and the eight day lease time. So far, there are no conflicts. Next, since the laptop has been configured to use the class laptop, the option for a five-hour lease will be added. Notice that this will replace the option for the eight-day lease. Lastly, the reservation options will be considered. These are the DNS servers which will replace the DNS servers configured from the global options. You can see that having different levels of DHCP options gives the administrator a lot of control.

# User and Vendor Class

User

Vendor

String of characters



Administrator configured  
IPConfig /setclassid



Configured in hardware  
by vendor

L A P T O P

C I S C O A P

4:43 To end this video, I will have a look at the two different classes that DHCP supports. These are the user and vendor classes. A user and vendor class is essentially defined by a string of characters. The DHCP server will look at this string of characters and give the device settings based on that string of characters.

The user class is configured by the administrator. In the case of Windows, this can be configured using the IPConfig command or group policy. In Linux, this can be performed by editing a configuration file.

In this example, the administrator could configure a class called laptop with settings for laptops. Using the IPConfig command, the administrator could configure the laptop to ask for laptop settings from the DHCP server. The point to take away here is that the administrator has configured the laptop to request different settings. Perhaps the laptops require different security settings to connect to the network since the laptop can be moved. Having a different group of DHCP settings allows the administrator to configure different settings.

Vendor configuration is different in that it is configured by the vendor. For example, a vendor may have a desktop phone that they have configured a vendor class for. The administrator can then deploy DHCP settings for all desktop phones that have that vendor class. For example, the administrator could create a vendor class called Cisco AP. Then, for Cisco Aironet network access, there is a vendor class that starts with Cisco AP followed by the model number. The administrator is able to create a specific vendor class for each model number. The DHCP settings assigned to that vendor class would be applied to all hardware devices that have that vendor class in their hardware.

It is up to the administrator to decide if they want to use user and vendor classes. The administrator can use both, one or none. Using user and vendor classes is a way that an administrator can have more control over which devices on the network receive which settings. In later videos I will have a closer look at how these work.

I hope you have enjoyed watching this video from ITFreeTraining. Until next time, I would like to thank you for watching.

#### References

“Installing and Configuring Windows Server 2012 R2 Exam Ref 70-410” page 216

“Option Classes” <https://technet.microsoft.com/en-us/library/cc958901.aspx>

“Managing DHCP Options” <https://technet.microsoft.com/en-us/library/cc958929.aspx>

“Dynamic Host Configuration Protocol (DHCP) and Bootstrap Protocol (BOOTP) Parameters” <http://www.iana.org/assignments/bootp-dhcp-parameters/bootp-dhcp-parameters.xhtml>

“Dynamic Host Configuration Protocol for IPv6 (DHCPv6)”  
<https://tools.ietf.org/html/rfc3315#page-70>

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