



## **DHCP Q&A - Part One**

With an increase in TCP/IP networks the ability to assign IP client configurations automatically for a specific time period (called a lease period) has alleviated the painful process of IP address management. Network administrators can now automate and control from a central position the assignment of IP address configurations using the Dynamic Host Control Protocol (DHCP).

We are presenting the information in a Q&A (Questions and Answers) format that we hope will be useful. Our knowledge of this subject relates primarily to DHCP servers in general use, although the information offered here should cover almost any DHCP server.

We are providing the best information available to us as at date of writing and intend to update it at frequent intervals as things change and/or more information becomes available. However we intend this Q&A as a guide only and recommend that users obtain specific information to determine applicability to their specific requirements. (This is another way of saying that we can't be held liable or responsible for the content).

The full Q&A is divided into two parts. Part one is general in nature and less technical, Part two deals with more technical matters.

Vicomsoft have gained extensive knowledge in the use and implementation of DHCP servers. Vicomsoft would advise the use of DHCP in any environment. The Use of DHCP has many benefits over alternative configuration methods. It drastically reduces the time to set up client computers and eliminates the likelihood of configuration errors.

### **Part One: Questions**

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2. Who Created DHCP?
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4. How Does DHCP Work?
5. What Advantages Does DHCP Have Over Manual Configuration Methods?
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### **Part 1: Answers**

#### **1. What Is DHCP?**

DHCP (Dynamic Host Configuration Protocol) is a protocol that lets network administrators manage centrally and automate the assignment of IP (Internet Protocol) configurations on a computer network. When using the Internet's set of protocols (TCP/IP), in order for a computer

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system to communicate to another computer system it needs a unique IP address. Without DHCP, the IP address must be entered manually at each computer system. DHCP lets a network administrator supervise and distribute IP addresses from a central point. The purpose of DHCP is to provide the automatic (dynamic) allocation of IP client configurations for a specific time period (called a lease period) and to eliminate the work necessary to administer a large IP network.

## **2. Who Created DHCP?**

DHCP was created by the Dynamic Host Configuration Working Group of the Internet Engineering Task Force (IETF: a volunteer organization which defines protocols for use on the Internet). As such, its definition is recorded in an Internet RFC (standard) and the Internet Activities Board (IAB) is asserting its status as to Internet Standardization.

## **3. Why Is DHCP Important?**

When connected to a network, every computer must be assigned a unique address. However, when adding a machine to a network, the assignment and configuration of network (IP) addresses has required human action. The computer user had to request an address, and then the administrator would manually configure the machine. Mistakes in the configuration process are easy for novices to make, and can cause difficulties for both the administrator making the error as well as neighbors on the network. Also, when mobile computer users travel between sites, they have had to relive this process for each different site from which they connected to a network. In order to simplify the process of adding machines to a network and assigning unique IP addresses manually, there is a need to automate the task.

The introduction of DHCP alleviated the problems associated with manually assigning TCP/IP client addresses. Network administrators have quickly appreciated the importance, flexibility and ease-of-use offered in DHCP.

## **4. How Does DHCP Work?**

When a client needs to start up TCP/IP operations, it broadcasts a request for address information. The DHCP server receives the request, assigns a new address for a specific time period (called a lease period) and sends it to the client together with the other required configuration information. This information is acknowledged by the client, and used to set up its configuration. The DHCP server will not reallocate the address during the lease period and will attempt to return the same address every time the client requests an address. The client may extend its lease with subsequent requests, and may send a message to the server before the lease expires telling it that it no longer needs the address so it can be released and assigned to another client on the network.

## **5. What Advantages Does DHCP Have Over Manual Configuration Methods?**

The use of DHCP is highly recommended and there are a number of obvious reasons why you should use it. As mentioned before, there are two ways you can configure client addresses on a computer network, either manually or automatically. Manual configuration requires the careful input of a unique IP address, subnet mask, default router address and a Domain Name Server



address. In an ideal world, manually assigning client addresses should be relatively straight forward and error free. Unfortunately, we do not live in an ideal world; computers are frequently moved and new systems get added to a network. Also if a major network resource, such as a router (which interconnects networks) changes network addresses, this could mean changing EVERY system's configuration. For a network administrator this process can be time consuming, tedious and error prone. Problems can occur when manually setting up your client machines, so if you have the option to set-up your client machines automatically, please do, as it will save you time and a lot of headaches.

DHCP has several major advantages over manual configurations. Each computer gets its configuration from a "pool" of available numbers automatically for a specific time period (called a leasing period), meaning no wasted numbers. When a computer has finished with the address, it is released for another computer to use. Configuration information can be administered from a single point. Major network resource changes (e.g. a router changing address), requires only the DHCP server be updated with the new information, rather than every system.

#### **6. Can DHCP Provide Support For Mobile Users?**

Yes. The benefits of dynamic addressing are especially helpful in mobile computing environments where users frequently change locations. Mobile users simply plug-in their laptop to the network, and receive their required configuration automatically. When moving to a different network using a DHCP server, then the configuration will be supplied by that network's server. No manual reconfiguration is required at all.

#### **7. Are DHCP Servers Easy To Set-up And Administer?**

DHCP Servers offer completely centralized management of all TCP/IP client configurations, including IP address, gateway address and DNS address. DHCP servers are easy to administer and can be set-up in just a few minutes. Client addresses are assigned automatically unlike static set-up which requires the manual input of client addresses which can be a time consuming and tedious task.

#### **8. Are There Any Limitations That I Should Be Aware Of?**

Some machines on your network need to be at fixed addresses, for example servers and routers. The DHCP server you choose should be capable of assigning pre-allocated addresses to these specific machines.

You need to be able to assign a machine to run the DHCP server continually as it must be available at all times when clients need IP access.

To avoid conflicts between addresses assigned by the DHCP server and those assigned manually, users should be discouraged, or preferably prevented, from reconfiguring their own IP addresses.

Some older operating systems do not support DHCP. If you have such systems you may be able to upgrade them. If this is not possible they may support the older BOOTP protocol, and a DHCP server can be chosen that will support this option.



For peace of mind, it is a good idea to decide what is important to you, which of the available DHCP servers is best suited to meet your specific requirements and always get a second opinion.

#### **9. What's The Bottom Line? What Do Vicomsoft Recommend?**

Assigning client addresses automatically is by far the easiest option of the two. To set-up clients to receive their address information automatically all you need to do is to set your TCP/IP control panels to receive automatically. The DHCP server then assigns the required client address information.

If you intend to set up your client computers manually, make sure that the assigned IP address is in the same range of your default router address and that it is unique to your private network. However we would highly recommend that if you have a network of computers and the option to assign your TCP/IP client configurations automatically, please do. An IP address allocation scheme will reduce the time it takes to set-up client computers and eliminate the possibilities of administrative errors.