**DHCP Address Assignment and Allocation Mechanisms**   
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The two main functions of the Dynamic Host Configuration Protocol are to provide a mechanism for assigning addresses to hosts, and a method by which clients can request addresses and other configuration data from servers. Both functions are based on the ones implemented in DHCP's predecessor, BOOTP, but the changes are much more significant in the area of address assignment than they are in communication. It makes sense to start our look at DHCP here, since this will naturally lead us into a detailed discussion of defining characteristic of DHCP: *dynamic addressing*.

***DHCP Address Allocation Mechanisms***

Providing an IP address to a client is the most fundamental configuration task performed by a host configuration protocol. To provide flexibility for configuring addresses on different types of clients, the DHCP standard includes three different address allocation mechanisms:

* **Manual Allocation:** A particular IP address is pre-allocated to a single device by an administrator. DHCP only communicates the IP address to the device.
* **Automatic Allocation:** DHCP automatically assigns an IP address permanently to a device, selecting it from a pool of available addresses.
* **Dynamic Allocation:** DHCP assigns an IP address from a pool of addresses for a limited period of time chosen by the server, or until the client tells the DHCP server that it no longer needs the address.

I don't really care for the names “automatic” and “dynamic” allocation, because they don't do a good job of clearly conveying the differences between these methods. Both can be considered “automatic” because in each the DHCP server assigns an address with no administrator intervention required. The real difference between them is only in how long the IP address is retained, and therefore, whether a host's address varies over time. I think better names would be “static/permanent automatic allocation” and “dynamic/temporary automatic allocation”. But then, nobody really cares much what I think. J

Regardless of what you call them, all three of these methods exist for configuring IP hosts using DHCP. It is not necessary for an administrator to choose one over the others. Instead, he or she will normally combine the methods, using each for the devices where it makes the most sense.