***Routing tables***

A routing table contains the information necessary to forward a packet along the best path toward its destination. Each packet contains information about its origin and destination. When a packet is received, a network device examines the packet and matches it to the routing table entry providing the best match for its destination. The table then provides the device with instructions for sending the packet to the next [hop](http://searchcio-midmarket.techtarget.com/definition/hop) on its route across the network.

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| **What is “hop?”** |
| In a packet-switching network, a hop is the trip a [data](http://searchdatamanagement.techtarget.com/definition/data) [packet](http://searchnetworking.techtarget.com/definition/packet) takes from one [router](http://searchnetworking.techtarget.com/definition/router) or intermediate point to another in the network. On the Internet (or a network that uses [TCP/IP](http://searchnetworking.techtarget.com/definition/TCP-IP)), the number of hops a packet has taken toward its destination (called the "hop count") is kept in the packet header. A packet with an exceedingly large hop count is discarded. Using Cellular Digital Packet Data (CDPD), a hop is a switch to another radio frequency (RF) channel. |

***A basic routing table includes the following information:***

* **Destination**: The [IP address](http://searchwindevelopment.techtarget.com/definition/IP-address) of the packet's final destination
* **Next** **hop**: The IP address to which the packet is forwarded
* **Interface**: The outgoing network interface the device should use when forwarding the packet to the next hop or final destination
* **Metric**: Assigns a cost to each [available route](http://searchnetworking.techtarget.com/definition/adaptive-routing) so that the most cost-effective path can be chosen
* **Routes**: Includes directly-attached [subnet](http://searchnetworking.techtarget.com/definition/subnet)s, indirect subnets that are not attached to the device but can be accessed through one or more hops, and default routes to use for certain types of traffic or when information is lacking.

Routing tables can be maintained manually or dynamically. Tables for static network devices do not change unless a network administrator manually changes them. In dynamic routing, devices build and maintain their routing tables automatically by using routing [protocol](http://searchnetworking.techtarget.com/definition/protocol)s to exchange information about the surrounding network [topology](http://whatis.techtarget.com/definition/network-topology). Dynamic routing tables allow devices to "listen" to the network and respond to occurrences like device failures and network congestion