Routing tables

You can examine a machine's routing table with **netstat -r**. Use **netstat -rn** to avoid DNS lookups and present all the information numerically, which is generally more useful. We discuss **netstat** in more detail starting on page 868, but here is a short example to give you a better idea of what routes look like:

```
redhat$ netstat -rn
Kernel IP routing table
Destination     Genmask          Gateway          Fl   MSS   Iface
132.236.227.0   255.255.255.0    132.236.227.93   U    1500  eth0
default         0.0.0.0          132.236.227.1    UG   1500  eth0
132.236.212.0   255.255.255.192  132.236.212.1    U    1500  eth1
132.236.220.64  255.255.255.192  132.236.212.6    UG   1500  eth1
127.0.0.1       255.255.255.255  127.0.0.1        U    3584  lo
```

This host has two network interfaces: 132.236.227.93 (eth0) on the network 132.236.227.0/24 and 132.236.212.1 (eth1) on the network 132.236.212.0/26.

The destination field is usually a network address, although you can also add host-specific routes (their genmask is 255.255.255.255 since all bits are consulted). An entry's gateway field must contain the full IP address of a local network interface or adjacent host; on Linux kernels it can be 0.0.0.0 to invoke the default gateway.

For example, the fourth route in the table above says that to reach the network 132.236.220.64/26, packets must be sent to the gateway 132.236.212.6 through interface eth1. The second entry is a default route; packets not explicitly addressed to any of the three networks listed (or to the machine itself) are sent to the default gateway host, 132.236.227.1.

A host can only route packets to gateway machines that are reachable through a directly connected network. The local host's job is limited to moving packets one hop closer to their destinations, so it is pointless to include information about nonadjacent gateways in the local routing table. Each gateway that a packet visits makes a fresh next-hop routing decision based on its own local routing database.[12]

*See page 481 for more information about the **route** command.*

Routing tables can be configured statically, dynamically, or with a combination of the two approaches. A static route is one that you enter explicitly with the **route** command. Static routes remain in the routing table as long as the system is up; they are often set up at boot time from one of the system startup scripts. For example, the Linux commands

```
route add -net 132.236.220.64 netmask 255.255.255.192
    gw 132.236.212.6 eth1
route add default gw 132.236.227.1 eth0
```

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12. The IP source routing feature is an exception to this rule; see page 473.