- Configuring Static Routes -

**Configuring Static Routes**

The basic syntax for a static route is as follows:

```
Router(config)# ip route [destination_network] [subnet_mask] [next-hop]
```

Consider the following example:

![Routing Diagram]

RouterA will have the 172.16.0.0/16 and 172.17.0.0/16 networks in its routing table as directly-connected routes. To add a static route on RouterA, pointing to the 172.18.0.0/16 network off of RouterB:

```
RouterA(config)# ip route 172.18.0.0 255.255.0.0 172.17.1.2
```

Notice that we point to the IP address on RouterB’s fa0/0 interface as the next-hop address. Likewise, to add a static route on RouterB, pointing to the 172.16.0.0/16 network off of RouterA:

```
RouterB(config)# ip route 172.16.0.0 255.255.0.0 172.17.1.1
```

To remove a static route, simply type `no` in front of it:

```
RouterA(config)# no ip route 172.18.0.0 255.255.0.0 172.17.1.2
```

On point-to-point links, an **exit-interface** can be specified instead of a next-hop address. Still using the previous diagram as an example:

```
RouterA(config)# ip route 172.18.0.0 255.255.0.0 fa0/1
```

```
RouterB(config)# ip route 172.16.0.0 255.255.0.0 fa0/0
```

A static route using an exit-interface has an Administrative Distance of 0, as opposed to the default AD of 1 for static routes. An exit-interface is only functional on a point-to-point link, as there is only one possible next-hop device.
**Advanced Static Routes Parameters**

The Administrative Distance of a static route can be changed to form a **floating static route**, which will only be used if there are no other routes with a lesser AD in the routing table. A floating static route is often used as a **backup** route to a dynamic routing protocol.

To change the Administrative Distance of a static route to 250:

```
RouterA(config)# ip route 172.18.0.0 255.255.0.0 172.17.1.2 250
```

Static routes will only remain in the routing table as long as the interface connecting to the next-hop router is up. To ensure a static route remains **permanently** in the routing table, even if the next-hop interface is down:

```
RouterA(config)# ip route 172.18.0.0 255.255.0.0 172.17.1.2 permanent
```

Static routes can additionally be used to **discard** traffic to specific networks, by directing that traffic to a virtual **null** interface:

```
RouterA(config)# ip route 10.0.0.0 255.0.0.0 null0
```

**Default Routes**

Normally, if a specific route to a particular network does not exist, a router will drop all traffic destined to that network.

A **default route**, or **gateway of last resort**, allows traffic to be forwarded, even without a specific route to a particular network.

The default route is identified by all zeros in both the network and subnet mask (**0.0.0.0 0.0.0.0**). It is the **least** specific route possible, and thus will **only** be used if a more specific route does not exist (hence “gateway of last resort”).

To configure a default route:

```
RouterA(config)# ip route 0.0.0.0 0.0.0.0 172.17.1.2
```

Advanced default routing is covered in great detail in another guide.