Static and Default Routes Cheat Sheet for Cisco Beginners

What are Static Routes?

Static routes are manually configured routes that tell the router exactly where to send packets for specific networks. They don't change automatically and remain in the routing table until manually removed.

What are Default Routes?

Default routes (0.0.0.0/0) are used when no specific route exists for a destination. Often called the "gateway of last resort."

Basic Static Route Configuration

Standard Static Route Syntax

```
Router(config)# ip route [destination-network] [subnet-mask] [next-hop-ip | exit-interface]
```

Examples

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2
Router(config)# ip route 172.16.0.0 255.255.0.0 serial0/0/0
Router(config)# ip route 10.0.0.0 255.0.0.0 gigabit0/1 10.1.1.2
```

Default Route Configuration

Default Route Syntax

```
Router(config)# ip route 0.0.0.0 0.0.0.0 [next-hop-ip | exit-interface]
```

Examples

```
Router(config)# ip route 0.0.0.0 0.0.0.0 203.0.113.1
Router(config)# ip route 0.0.0.0 0.0.0.0 serial0/0/0
```

Administrative Distance

Default Administrative Distances

- **Directly Connected**: 0

- **Static Route**: 1
- **OSPF**: 110
- **RIP**: 120

Setting Custom Administrative Distance

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2 [admin-distance]
```

Example with Custom AD

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2 50
```

Floating Static Routes

Floating static routes are backup routes with higher administrative distance than the primary route.

Example: Primary OSPF (AD 110), Backup Static (AD 120)

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2 120
```

Essential Show Commands

View Routing Table

```
Router# show ip route
Router# show ip route static
```

View Specific Route

```
Router# show ip route 192.168.10.0
```

View Default Route

```
Router# show ip route 0.0.0.0
```

View Route Summary

```
Router# show ip route summary
```

Route Types in Routing Table

Route Codes

- **C** = Connected
- **S** = Static
- **S*** = Default route (static)
- **O** = OSPF
- **R** = RIP
- **D** = EIGRP

Example Routing Table Entry

```
S    192.168.10.0/24 [1/0] via 10.1.1.2
S*   0.0.0.0/0 [1/0] via 203.0.113.1
```

Removing Static Routes

Remove Specific Static Route

```
Router(config)# no ip route 192.168.10.0 255.255.255.0 10.1.1.2
```

Remove Default Route

```
Router(config)# no ip route 0.0.0.0 0.0.0.0 203.0.113.1
```

Next-Hop vs Exit Interface

Next-Hop IP (Recommended)

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2
```

- More reliable
- Router performs recursive lookup

Exit Interface

```
Router(config)# ip route 192.168.10.0 255.255.255.0 serial0/0/0
```

- Faster processing
- Good for point-to-point links

Both (Most Reliable)

```
Router(config)# ip route 192.168.10.0 255.255.255.0 gigabit0/1 10.1.1.2
```

Common Static Route Scenarios

Host Route (Single Host)

```
Router(config)# ip route 192.168.10.100 255.255.255.255 10.1.1.2
```

Summary Route (Multiple Networks)

```
Router(config)# ip route 192.168.0.0 255.255.0.0 10.1.1.2
```

Null Route (Blackhole)

```
Router(config)# ip route 192.168.100.0 255.255.255.0 null0
```

Load Balancing

Equal Cost Load Balancing

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.3
```

Unequal Cost (Different AD)

```
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.2 1
Router(config)# ip route 192.168.10.0 255.255.255.0 10.1.1.3 2
```

Verification Commands

Check Route Installation

```
Router# show ip route | include 192.168.10.0
```

Test Connectivity

```
Router# ping 192.168.10.1
Router# traceroute 192.168.10.1
```

Check Interface Status

```
Router# show ip interface brief
```