EIGRP Cheat Sheet for Cisco Beginners

This is a generic cheat sheet and not for a specific use case.

What is EIGRP?

Enhanced Interior Gateway Routing Protocol (EIGRP) is Cisco's advanced distance-vector routing protocol. It uses the DUAL algorithm for fast convergence and supports unequal-cost load balancing.

Key EIGRP Concepts

Router ID

- Highest IP address on loopback interfaces, or highest IP on active interfaces
- Can be manually set with `eigrp router-id` command

Autonomous System (AS)

- EIGRP routers must have the same AS number to form neighbor relationships
- AS number range: 1-65535

Metric Calculation

- Uses bandwidth, delay, reliability, load, and MTU
- By default, only bandwidth and delay are used
- Lower metric = better path

Basic EIGRP Configuration

Enable EIGRP (Classic)

```
Router(config)# router eigrp [AS-number]
Router(config-router)# network [network] [wildcard-mask]
```

Example Configuration

```
Router(config)# router eigrp 100
Router(config-router)# network 192.168.1.0 0.0.0.255
Router(config-router)# network 10.0.0.0 0.255.255.255
```

Set Router ID (Optional)

```
Router(config-router)# eigrp router-id 1.1.1.1
```

Disable Auto-Summary (Recommended)

```
Router(config-router)# no auto-summary
```

Essential Show Commands

View EIGRP Neighbors

```
Router# show ip eigrp neighbors
```

View EIGRP Topology

```
Router# show ip eigrp topology
Router# show ip eigrp topology all-links
```

View EIGRP Interfaces

```
Router# show ip eigrp interfaces
Router# show ip eigrp interfaces detail
```

View Routing Table

```
Router# show ip route eigrp
```

EIGRP Protocol Information

```
Router# show ip protocols
```

EIGRP Tables

Neighbor Table

- Contains directly connected EIGRP neighbors
- Shows neighbor IP, interface, and hold time

Topology Table

- Contains all learned routes (feasible successors)
- Shows metric information and route status

Routing Table

- Contains best routes (successors)
- Routes marked with "D" for EIGRP

Passive Interface

Make Interface Passive

```
Router(config-router)# passive-interface [interface]
Router(config-router)# passive-interface default
Router(config-router)# no passive-interface [interface]
```

Example

```
Router(config-router)# passive-interface gigabit0/0
```

Authentication

Key Chain Configuration

```
Router(config)# key chain MYCHAIN
Router(config-keychain)# key 1
Router(config-keychain-key)# key-string mypassword
```

Interface Authentication

```
Router(config-if)# ip authentication mode eigrp 100 md5
Router(config-if)# ip authentication key-chain eigrp 100 MYCHAIN
```

Load Balancing

Equal-Cost Load Balancing (Default)

```
Router(config-router)# maximum-paths [1-32]
```

Unequal-Cost Load Balancing

```
Router(config-router)# variance [1-128]
```

Example

```
Router(config-router)# variance 2
Router(config-router)# maximum-paths 6
```

Bandwidth and Delay

Set Interface Bandwidth

```
Router(config-if)# bandwidth [kilobits]
```

Set Interface Delay

```
Router(config-if)# delay [tens-of-microseconds]
```

Example

```
Router(config-if)# bandwidth 1544
Router(config-if)# delay 2000
```

Common EIGRP Route Codes

Routing Table Entries

- **D** = EIGRP route
- **D*** = EIGRP default route
- **D EX** = EIGRP external route

Topology Table Codes

- **P** = Passive (stable route)
- **A** = Active (computing route)
- **U** = Update (route update in progress)
- **Q** = Query (route query in progress)
- **R** = Reply (route reply in progress)

Timers

Hello and Hold Timers

```
Router(config-if)# ip hello-interval eigrp [AS] [seconds]
Router(config-if)# ip hold-time eigrp [AS] [seconds]
```

Default Timers

- **High bandwidth links**: Hello 5s, Hold 15s
- **Low bandwidth links**: Hello 60s, Hold 180s

Verification Commands

Check Neighbor Relationships

```
Router# show ip eigrp neighbors detail
```

View Route Metrics

```
Router# show ip eigrp topology [network]
```

Check for Stuck-in-Active Routes

```
Router# show ip eigrp topology active
```

Default Values

- **AS Number**: 1-65535 (must match between neighbors)
- **K-values**: K1=1, K2=0, K3=1, K4=0, K5=0
- **Maximum Paths**: 4 (equal-cost)
- **Variance**: 1 (equal-cost only)
- **Administrative Distance**: 90 (internal), 170 (external)

Remember: EIGRP neighbors must have matching AS numbers, K-values, and authentication to form adjacencies!