Protocol Deep Dive: EIGRP

COVERING EIGRP ESSENTIALS

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Course Overview

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Covering EIGRP Essentials

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Digging into EIGRP relationships

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Determining How Information is Exchanged with EIGRP

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Reviewing EIGRP Summary Routing and Load-Balancing

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- Covering EIGRP Essentials
- Digging into EIGRP relationships
- Determining How Information is Exchanged with EIGRP
- Covering EIGRP Advanced Topics
- Reviewing EIGRP Summary Routing and Load-Balancing
- Troubleshooting Common EIGRP Issues

Module Overview

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EIGRP vs Other Routing Protocols

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EIGRP vs Other Routing Protocols

EIGRP Routing Concepts

Let’s review the basics

EIGRP Fundamentals

Interior gateway protocol (IGP)

EIGRP Fundamentals

Controls traffic inside a single organization

EIGRP Fundamentals

Other IGP's Include:

OSPF

EIGRP Fundamentals

Other IGP's Include:

- **IS-IS**

Exterior Gateway Protocols

Alternative of IGPs

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Alternative of IGPs

Control traffic
between organizations

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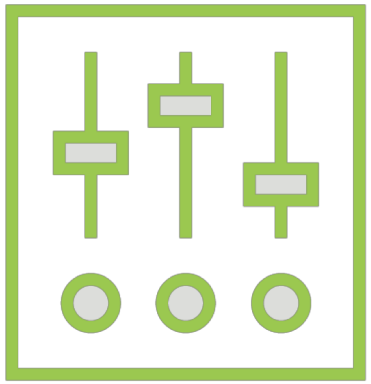
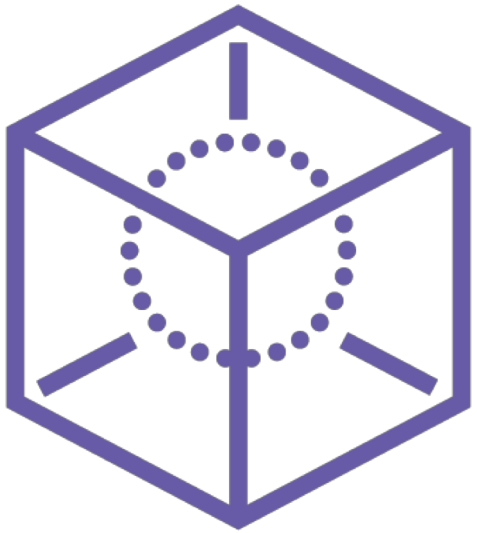
Alternative of IGPs

Control traffic between organizations



BGP the only current option

Interior Gateway Protocols



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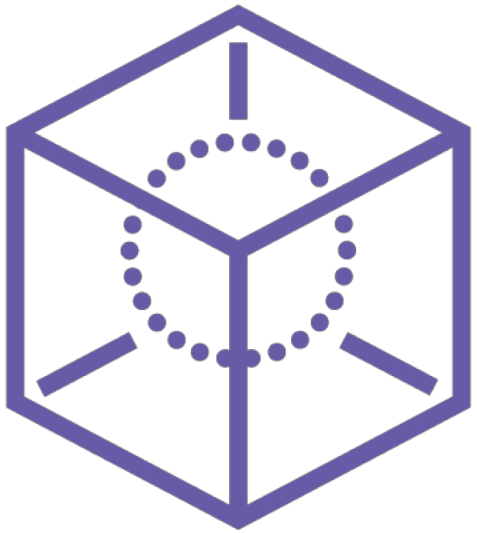
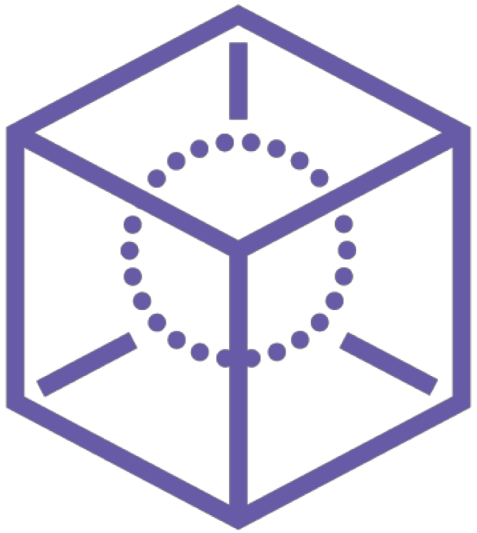


Two types including:

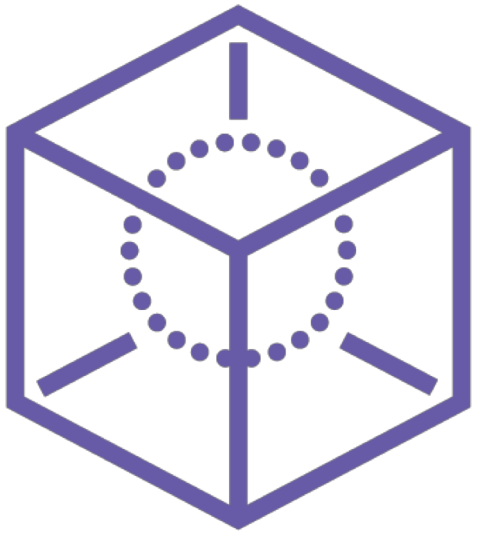
Interior Gateway Protocols



Two types including:

- Distance vector

Interior Gateway Protocols



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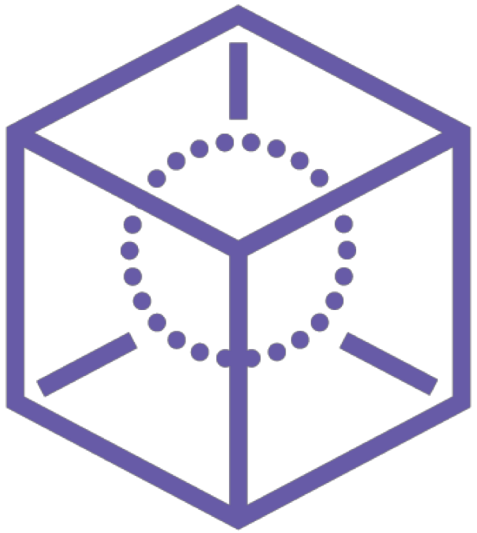

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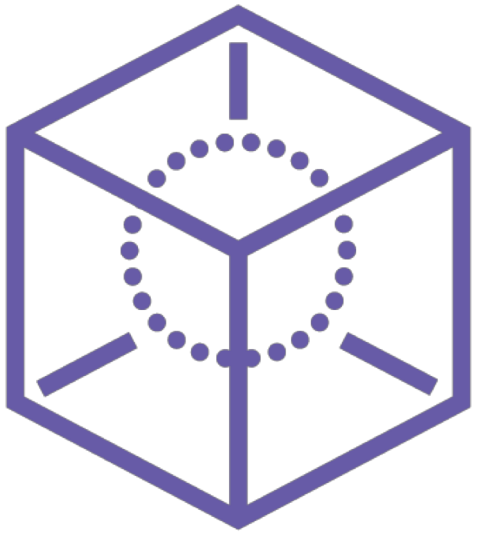
Distance vector:

Exchange distance (metric) and vector (direction)

Interior Gateway Protocols



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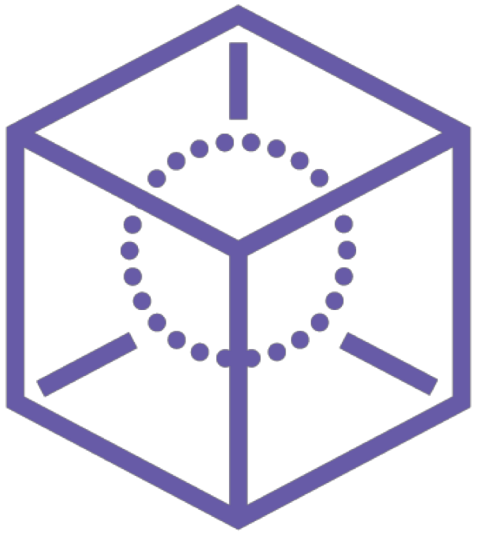
Interior Gateway Protocols



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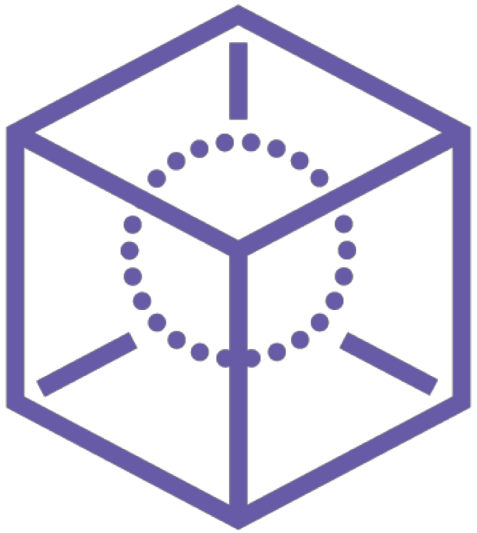

Two types including:

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Distance vector:

Exchange distance (metric) and vector (direction)

Devices route based on this information

Based on currently reachable destinations from neighbors

Devices have limited view

Link State Protocols

Link State Protocols

Exchange state of all network links

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Each device includes complete copy of link states

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Have a better view of the network

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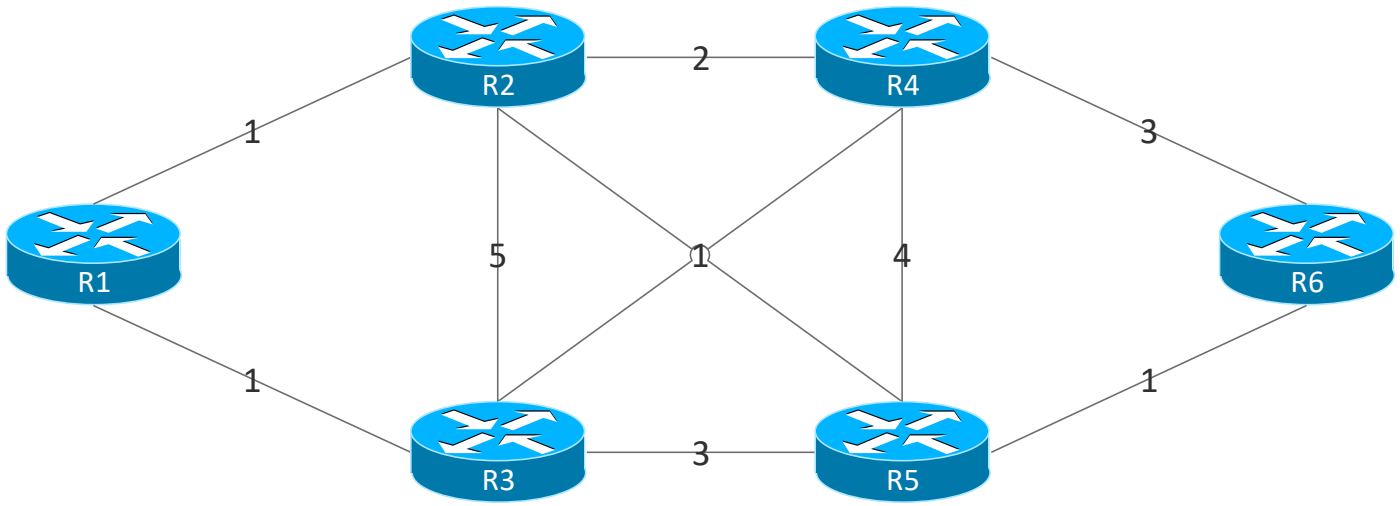
More complex

Course Topology – Simple Metrics



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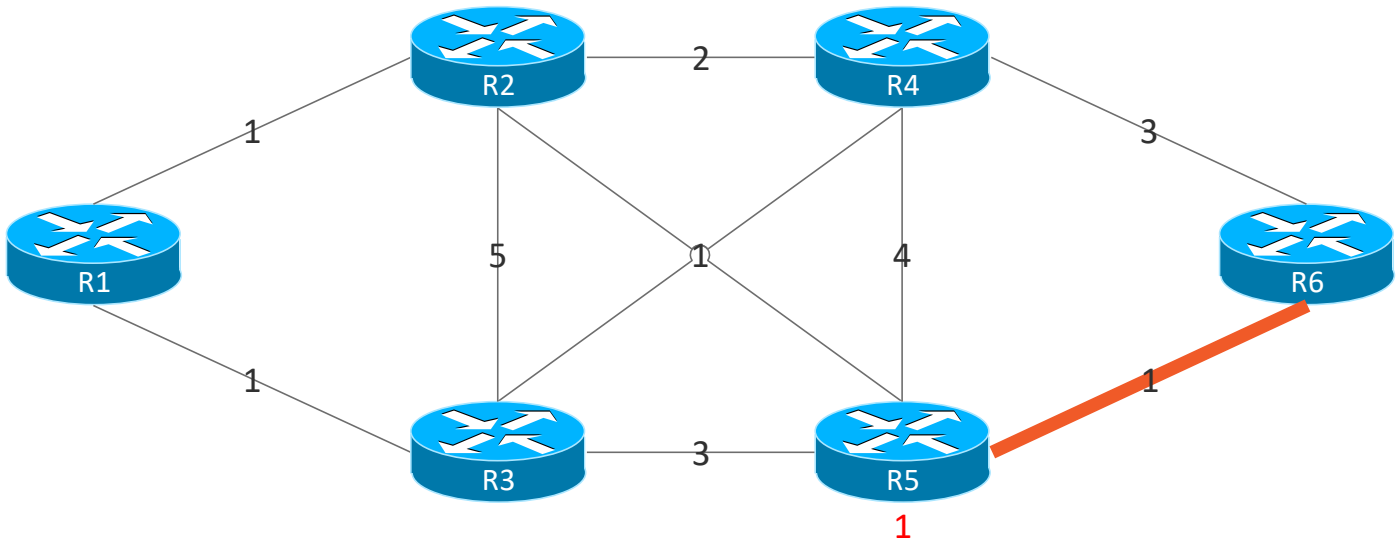

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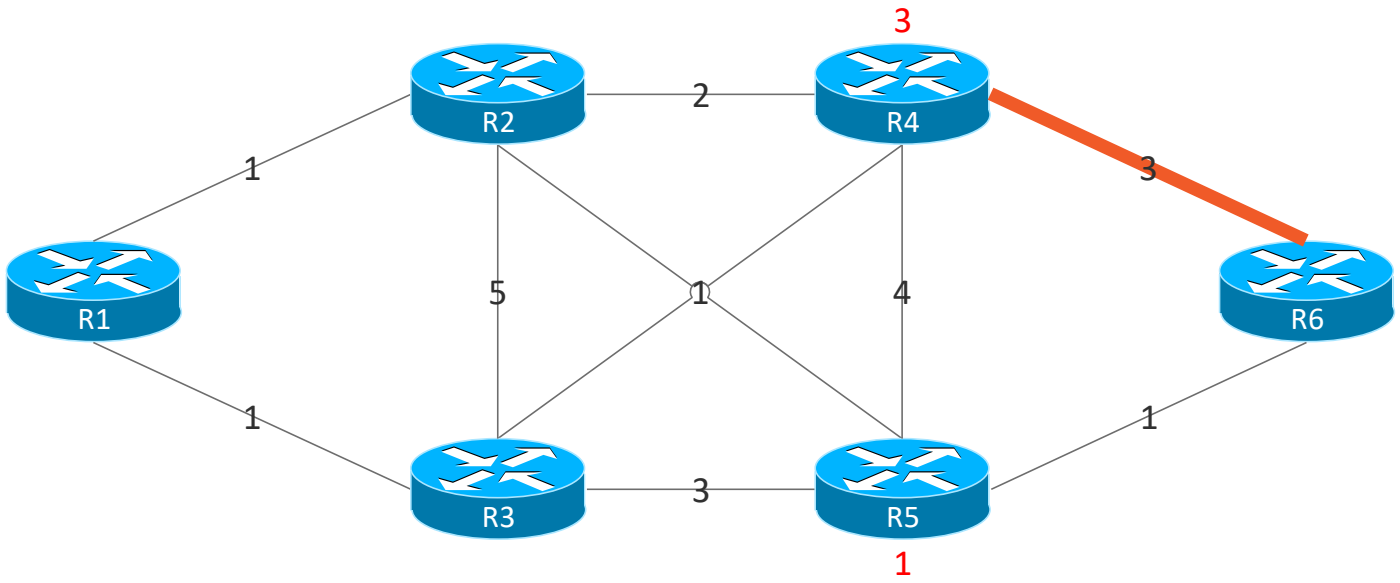

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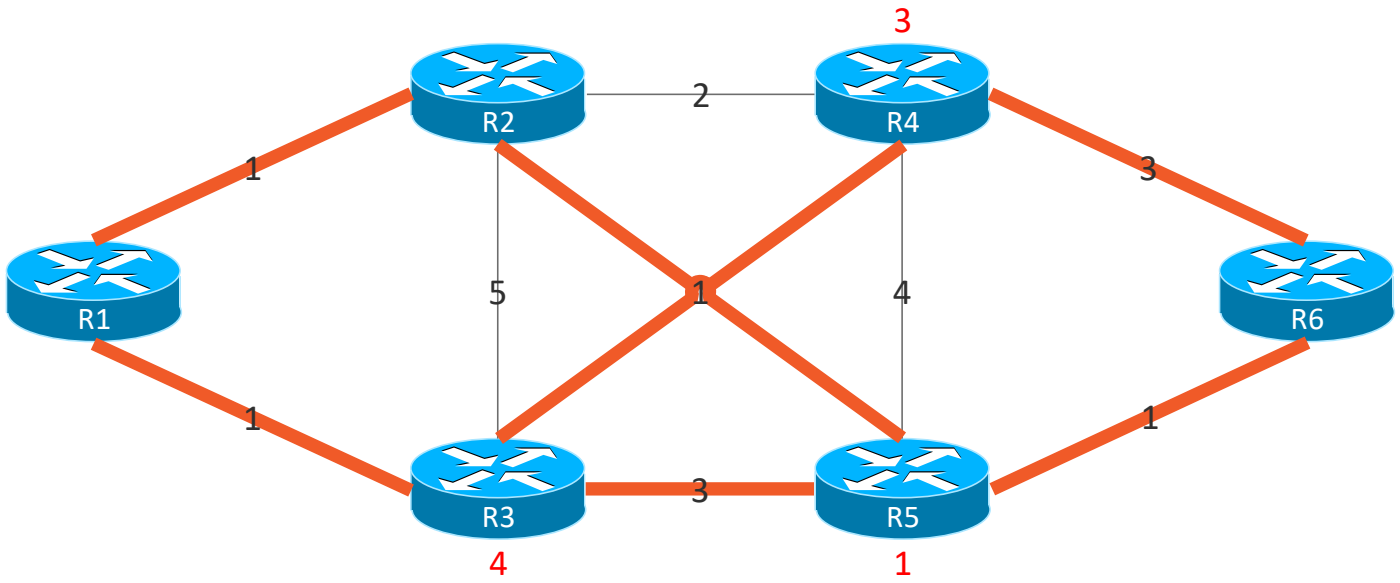

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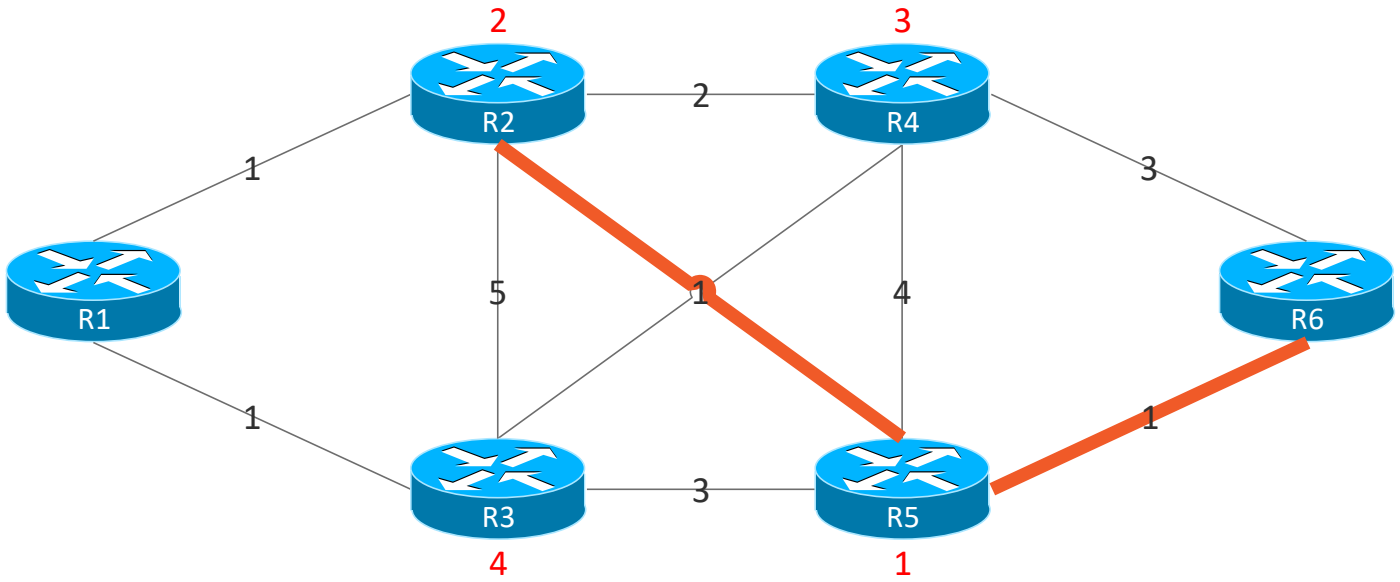

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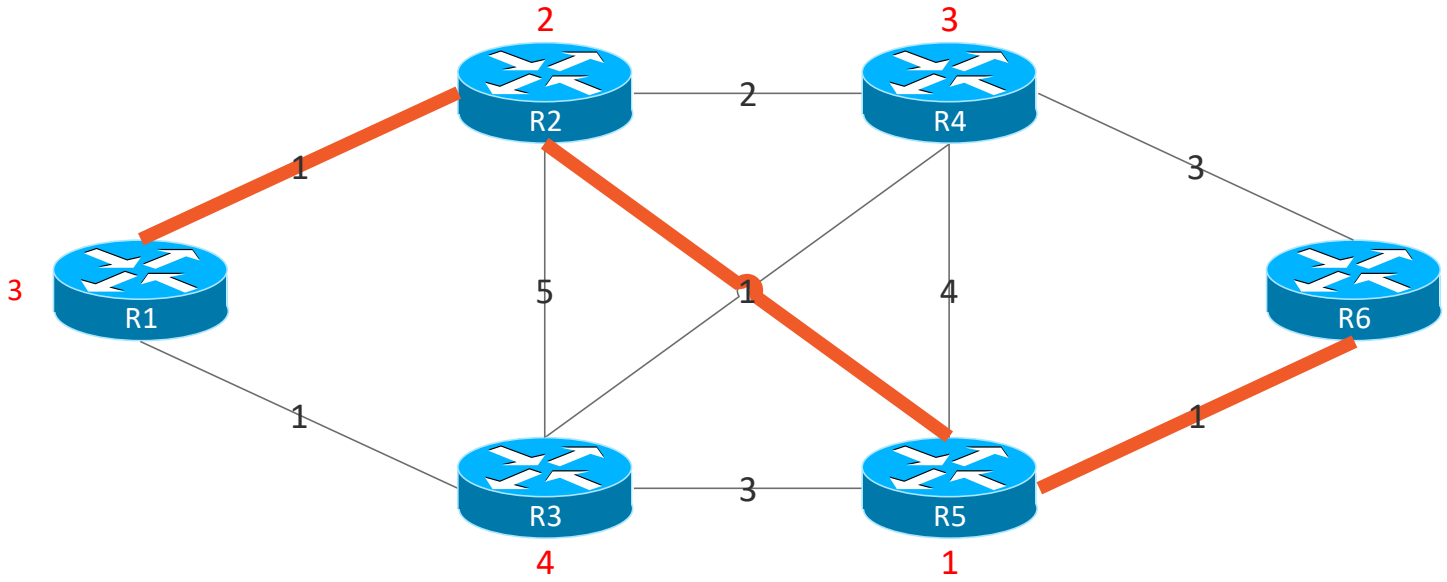

Traditional vs EIGRP DV

Common problems include speed and reliability issues

Traditional vs EIGRP DV

EIGRP uses common link state mechanisms to remedy

EIGRP's Differences

Utilizes neighborships

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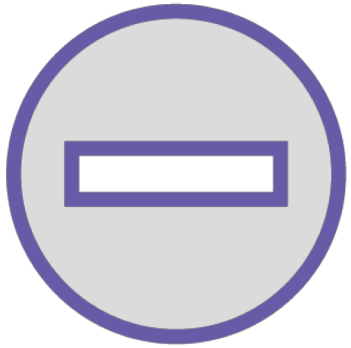
Utilizes neighborships



Doesn't send
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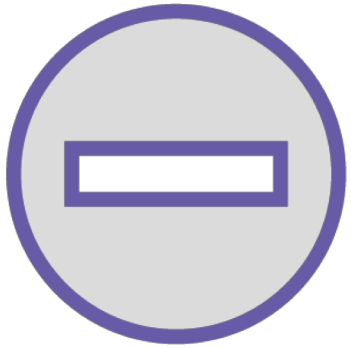
EIGRP's Differences

Utilizes neighborships



Doesn't send periodic updates

Complex metric

Let's move on to
EIGRP concepts

Full EIGRP Metric

$$K_1 = 1, K_2 = 0, K_3 = 1, K_4 = 0, K_5 = 0$$

$$256 \times \left[\left(K_1 \times \text{Bandwidth} + \frac{K_2 \times \text{Bandwidth}}{256 - \text{Load}} + K_3 \times \text{Delay} \right) \times \frac{K_5}{\text{Reliability} + K_4} \right]$$

$$\text{Bandwidth} = \frac{10{,}000{,}000}{\text{MinimumPathBandwidth (Kbps)}}$$

$$\text{Delay} = \text{Sum of Path Delay (10's of microseconds)}$$

$$\text{Load} = \text{Effective Load (0 (0\%) - 255 (100\%)}$$

$$\text{Reliability} = \text{Effective Reliability (255 (100\%) - 0 (0\%))}$$

Default EIGRP Metric

$$256 \times \frac{Bandwidth}{Delay}$$

$$\text{Bandwidth} = \frac{10{,}000{,}000}{\text{MinimumPathBandwidth (Kbps)}}$$

$$\text{Delay} = \text{Sum of Path Delay (10's of microseconds)}$$

What is Feasible?

Feasibility Condition

Not feasible if:

- The advertised distance is equal or more than the best feasible distance

Source	Administrative Distance
Connected	0
Static	1
eBGP	20
EIGRP (internal)	90
OSPF	110
IS-IS	115
RIP	120
EIGRP (external)	170
iBGP	200

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