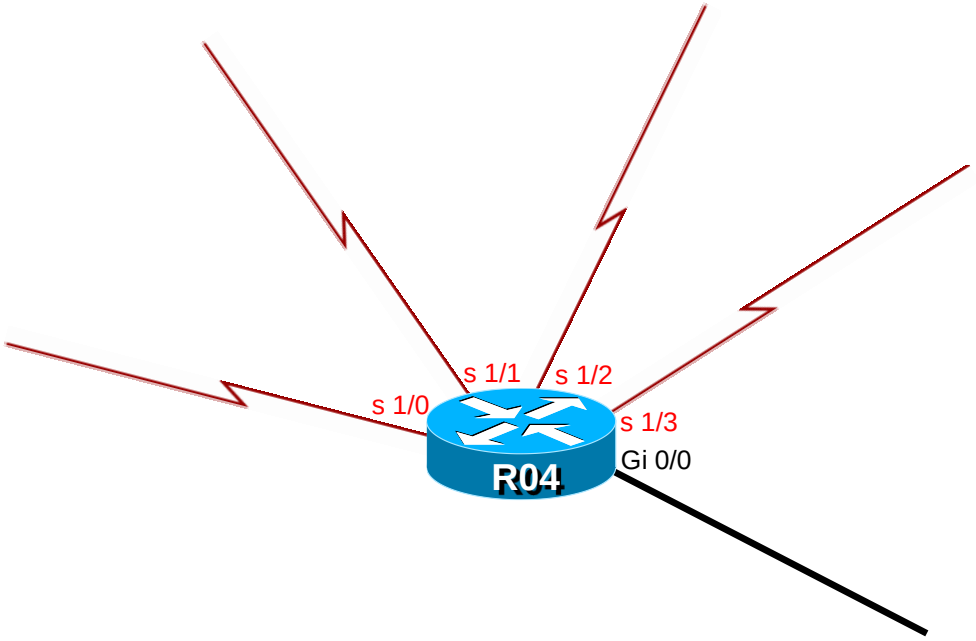
Routing Table Criteria



Routing Table Criteria

Packet wants to reach 1.1.1.1

```
R04#show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
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       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is 192.168.24.2 to network 0.0.0.0

R        0.0.0.0/0 [120/4] via 192.168.24.2, 00:00:20, Serial1/0
S        1.0.0.0/8 [1/0] via 192.168.14.1, 00:00:07, GigabitEthernet0/0
D        1.1.0.0/16 [90/216549] via 192.168.45.5, 00:00:11, Serial1/2
O        1.1.1.0/24 [110/65] via 192.168.34.3, 00:00:18, Serial1/1
i        1.1.1.0/28 [115/20] via 192.168.46.6, 00:00:07, Serial1/3

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Longest Prefix Match (LPM)

Routing Table Criteria

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R04#
```

Lowest Administrative Distance

Administrative Distance

- Cisco routers use a value called administrative distance to select the best path when they learn of two or more routes to the same destination with the same prefix from different routing protocols.
- Administrative distance rates a routing protocol's *believability*.
- Cisco has assigned a default administrative distance value to each routing protocol supported on its routers.
  - Each routing protocol is prioritized in the order of most to least believable.

Administrative Distances

Route Source	Default Distance	Routing Table Entry
Connected interface	0	C
Static route to a next-hop address	1	S
EIGRP summary route	5	D
External BGP	20	B
Internal EIGRP	90	D
IGRP	100	I
OSPF	110	O
IS-IS	115	i
RIPv1, RIPv2	120	R
Exterior Gateway Protocol (EGP)	140	E
ODR	160	O
External EIGRP	170	D EX
Internal BGP	200	B
Unknown	255	

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```

Lowest Metric

Routing Metric

The following are metrics, used in determining the best path for a routing protocol:

Bandwidth – Throughput speed in bits per second

Delay – Network latency caused by such factors as distance or congestion

Load – Measurement of traffic that flows through a router

MTU – The largest unit size allowed to be transmitted on all routes from source to destination

Reliability – Represents the amount of network downtime, that is, how reliable a network path is)

Hop Count – The number of routers (hops) a packets passes through to its destination

Cost – An arbitrary value assigned by an administrator for the intersecting of networks

Ticks – Measurement of delay, where is tick is 1/18 of a second.

Routing Metric

The following are metrics used in which routing protocol:

Bandwidth – EIGRP

Delay – EIGRP

Load – EIGRP

MTU – EIGRP

Reliability – EIGRP

Hop Count – RIPv1, RIPv2, EIGRP, *BGP* *(mostly)*

Cost – OSPFv2, OSPFv3, IS-IS

Ticks – IPX RIP

Routing Table Criteria

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R04#
```

Equal Cost Path Load Balance

Routing Table Criteria

- The best route selected from various routing protocols for a specific destination is chosen by considering the following four criteria:
  - O 1.1.1.0/24 [110/65] via 192.168.45.5, 00:07:22, Serial1/0
- Valid next-hop IP address {IF}

1. **Longest Prefix Match (LPM)**
2. **Lowest Administrative Distance**
3. **Lowest Metric**
4. **Equal Cost Path Load Balance**

Q&A