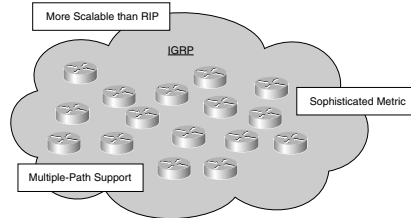


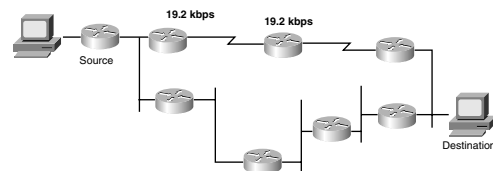
Enabling Interior Gateway Routing Protocol

Interior Gateway Routing Protocol (IGRP) is a distance vector routing protocol with sophisticated metrics and improved scalability, allowing better routing in larger-sized networks. IGRP uses delay and bandwidth as routing metrics (reliability and load are optional). IGRP has a default maximum hop count of 100 hops. (RIP's maximum is 15 hops.) This can be reconfigured to 255 hops.

IGRP can load-balance across six nonequal paths, increasing the available bandwidth and providing route redundancy.



IGRP Metrics



IGRP achieves greater route selection accuracy than RIP with the use of a composite metric. The path that has the smallest metric value is the best route. IGRP's metric includes the following components: bandwidth

delay, reliability (based on keepalives), loading (bits per second), and maximum transmission unit (MTU). You can significantly affect performance by adjusting IGRP metric values.

Paths of Different Metrics

IGRP allows load balancing over unequal paths. If two unequal paths are used and one path is four times better than the other, the better path will be used four times as often. The **variance** command specifies the metric range allowed for load balancing across multiple paths.

Here's the procedure for configuring IGRP:

```
RouterA>enable
RouterA#config term
RouterA(config)#router igrp 100
RouterA(config-router)#network 170.8.0.0
RouterA(config-router)#variance 1
RouterA(config-router)#traffic share balanced
RouterA(config-router)#exit
RouterA(config)#exit
RouterA#show ip protocols
```

The syntax for the router IGRP command includes the AS number. All routers within an autonomous system must use the same system number.

- The default value of **variance** is 1 (equal-cost load balancing).
- The **traffic share balanced** command distributes traffic proportionally to the metrics' ratios.
- Use **show ip protocols** to verify the IGRP protocol configuration.
- Use **show ip route** to display the contents of the IP routing tables.

Enabling IGRP Summary

- IGRP has increased scalability and a more sophisticated routing metric than RIP. IGRP can load balance over unequal paths.
- IGRP's routing metric is a composite of bandwidth, delay, reliability, load, and MTU.
- The **debug ip igrp** configuration commands display routing and transaction information for troubleshooting purposes.

Access Lists and Their Applications

As a network grows, it becomes more important to manage the increased traffic going across the network. Access lists help limit traffic by filtering traffic based on packet characteristics. Access lists define a set of rules used by routers to identify particular types of traffic. Access lists can be used to filter both incoming and outgoing traffic on a router's interface. An access list applied to a router specifies rules for only traffic going through the router. Traffic originating from a router is not affected by that router's access lists. (It is subject to access lists within other routers as it passes through them.)