

Interior gateway protocol

An **interior gateway protocol (IGP)** is a type of protocol used for exchanging routing information between gateways (commonly routers) *within* an autonomous system (for example, a system of corporate local area networks). This routing information can then be used to route network-layer protocols like IP.

Interior gateway protocols can be divided into two categories: distance-vector routing protocols and link-state routing protocols. Specific examples of IGPs include Open Shortest Path First (OSPF), Routing Information Protocol (RIP), Intermediate System to Intermediate System (IS-IS) and Enhanced Interior Gateway Routing Protocol (EIGRP).

By contrast, exterior gateway protocols are used to exchange routing information *between* autonomous systems and rely on IGPs to resolve routes within an autonomous system.

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- Link-state routing protocol
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Types

Distance-vector routing protocol

Distance-vector routing protocols use the Bellman–Ford algorithm. In these protocols, each router does not possess information about the full network topology. It advertises its distance value (DV) calculated to other routers and receives similar advertisements from other routers unless changes are done in the local network or by neighbours (routers). Using these routing advertisements each router populates its routing table. In the next advertisement cycle, a router advertises updated information from its routing table. This process continues until the routing tables of each router converge to stable values.

Some of these protocols have the disadvantage of slow convergence.

Examples of distance-vector routing protocols:

- Routing Information Protocol (RIP)
- Routing Information Protocol Version 2 (RIPv2)
- Routing Information Protocol Next Generation (RIPng), an extension of RIP version 2 with support for IPv6
- Interior Gateway Routing Protocol (IGRP)

Link-state routing protocol

In link-state routing protocols, each router possesses information about the complete network topology. Each router then independently calculates the best next hop from it for every possible destination in the network using local information of the topology. The collection of best-next-hops forms the routing table.

This contrasts with distance-vector routing protocols, which work by having each node share its routing table with its neighbours. In a link-state protocol, the only information passed between the nodes is the information used to construct the connectivity maps.

Examples of link-state routing protocols:

- Open Shortest Path First (OSPF)
- Intermediate system to intermediate system (IS-IS)

Advanced distance vector routing protocol

Advanced distance vector routing protocols have both the features of distance vector routing protocols and link-state routing protocols. One example is Enhanced Interior Gateway Routing Protocol (EIGRP).

See also

- Route analytics
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