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Summary

(Seminar of Routing Protocol)

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Routing

Routing forms the backbone of the Internet. Without it no Internet would exist. Routing provides the means of forwarding logically addressed packets from their local sub network toward their ultimate destination. In large networks packets may pass through many intermediary destinations before reaching their destination. Routing occurs at layer 3 of the OSI seven-layer model.

Routing Protocol

Routing protocols facilitate the exchange of routing information between networks, allowing routers to build routing tables dynamically. Traditional IP routing stays simple because it uses next-hop routing where the router only needs to consider where it sends the packet, and does not need to consider the subsequent path of the packet on the remaining hops.

Some protocols are routable and others are no routable. No routable protocols are typically broadcast-based, which adds overhead and traffic to a network. No routable protocols do not contain network layer addressing information that routers need to determine the destination of network or host traffic. However, any protocol that has layer three logical network addressing can be routed.

Routers serve as traffic forwarders for remote end systems. Routing protocols and mechanisms are needed to build and maintain route information. To forward traffic, routers need to know the destination address, from which source it can learn the path to a given destination, the best path, and a way of verifying the most current path upon which to take. When a router receives a frame, it identifies the destination network address and checks its route table to determine the best path. Routers use a combination of the following routing methods to build a router's route table: directly connected interface, static, default, and dynamic.

Two proprietary network protocols that supports the Internet Protocol are the "Interior Gateway Routing Protocol" and "Enhanced IGRP", developed by the communications equipment vendor Cisco Systems, and included here as an example of a proprietary IGP protocol.

The term IGP (Interior Gateway Protocol) describes any routing protocol operating as a separate routing domain within an AS.

EGPs (Exterior Gateway Protocols), such as BGP (Border Gateway Protocol), serve as a conduit for communication between autonomous systems.
Routing protocols fall into two main categories, Distance Vector or Link State. Distance Vector protocols determine best path on how far away the destination is (distance) while Link State protocols can use more sophisticated methods to determine the best path. Link State can take into consideration link variables, such as bandwidth, delay, reliability, and load. When determining the best path, Distance Vector protocols use hops or a combination of calculated metrics that represent a distance value.

Security

The lack of a common set of security requirements and methods for routing protocols has resulted in a wide variety of security mechanisms for individual routing protocols. Ongoing work on requirements for the next generation
Routing system and future work on the actual mechanisms for it will require well documented routing security requirements. A firewall is as necessary for a company network as virus scanning. Unfortunately setting up firewalls requires much more attention to detail than installing a virus scanner on your PC.

References:

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