Apple Internet Router: Tunneling Definitions and Concepts (2/93)

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TOPIC ---

This article describes Wide Area Network support through tunneling. Tunneling definitions and concepts are presented.

DISCUSSION ---

Apple Internet Router supports wide area networks through tunneling and half-routing ports. These two types of ports, unlike AppleTalk routing ports, use AppleTalk Update-Based Routing Protocol (AURP) as a replacement for Routing Table Maintenance Protocol (RTMP) in order to reduce network overhead.

The important point to keep in mind is that Apple Internet Router can safely assume that any routers it sees through tunneling or half-routing ports are other Apple Internet Routers or Apple Internet Router-compatible routers. Therefore, it is safe to use AURP on these ports, since it is known that the other router is also using it.

Tunneling

In AppleTalk terminology, tunneling means connecting two or more AppleTalk networks by using a "foreign" network system as a conduit between them. Tunneling uses "exterior" AppleTalk routers to connect the AppleTalk internets with the foreign data link. Each exterior router is configured as a node on both the AppleTalk network and on the foreign network. The AppleTalk packets are encapsulated in the protocol of the foreign network as they travel across it.

Tunneling does not imply any connectivity between the AppleTalk nodes and the nodes on the foreign network. The foreign network is simply passing the AppleTalk packets, as data, between nodes. In other words, a tunneling router is not a router for, or a gateway to, the foreign network system, although other programs providing these functions could run simultaneously.

Each exterior router must know specifically what other exterior routers are its tunneling partners. This is accomplished either by configuring each router with a specific list of partners, or by allowing a router to tunnel

with partners that have been configured to know about it.

There are two types of tunnels:

- Point-to-point, in which each tunnel connects only two exterior routers. If you wish to tunnel to more than one exterior router, then you set up a separate tunnel to each one.

- Multipoint, in which each exterior router can tunnel to more than one partner. This way, there is no need to have more than one tunnel on any exterior router.

Multiple, independent tunnels can exist on the same foreign network system. When properly configured, such tunnels can be invisible to, and secure from, each other. They simply happen to share the same data link as a media for their respective tunnels.

The first implementation of tunneling for AppleTalk was DECnet tunneling, which has been supported in AppleTalk for VMS and Digital's PATHWORKS for Macintosh for several years. Apple Internet Router and its extensions will add TCP/IP and X.25 to the list of networks that can tunnel AppleTalk. It is also expected that there will be third-party extensions for tunneling across such foreign network systems as T1, Frame Relay, SMDS, and others.

A fully-connected tunnel is one in which all exterior AppleTalk routers know about all the other exterior routers. A tunnel is partially-connected if some exterior routers on the tunnel do not know about every other exterior router on the tunnel.

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