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AppleTalk Internet: Using 9600-baud Links

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TOPIC -----

Do you see any problems with routing AppleTalk across an existing Token Ring network? The existing network has one central location to four remote locations using LLC802.2 bridges and 56k line. Those four remote locations have three more Token Ring remotes with LLC802.2 and 9.6k lines. All 17 sites will have an Apple Internet Router to route from the Token Ring to Ethernet and LocalTalk. Will we be flooding the network with so many routing tables that the 9600 connections will have problems sending or receiving data or documents?

DISCUSSION -----

We can't really recommend using the 9600-baud lines as part of the proposed AppleTalk internet because of several issues.

Bandwidth

If you look at the numbers, it doesn't look all that bad. You'll probably be using about 17% of the total bandwidth of the 9600-baud links just for RTMP. This may or may not be acceptable, depending on the other traffic flowing over the same link. The total bandwidth used really depends on how many entries you have configured in your routing tables.

For a router that is configured for two Phase 2 extended networks (1 Token Ring, 1 Ethernet) and two non-extended (LocalTalk) networks, the RTMP packet is going to look something like this:

RTMP packet header = ~50 bytes (802.2 LLC and DDP header -- depends on
number of source routing bridges but this
is a good approximation)
RTMP data = ~18 bytes

Total = ~68 bytes

With 30 routers, you'll be transmitting three RTMP packets every second (RTMP packets being broadcast every 10 seconds $10/30 = 3$ pps). Multiply

those three by the number of bytes in each packet:

$$68 \times 3 = 204 \text{ bytes} \times 8 = 1632 \text{ bps}$$

If you subtract the 9600 bps data rate, you see that you'll be using about 17% of your bandwidth just for RTMP.

Routers

Another concern with a 9600-baud link is that on a large wide area Token Ring network, the AppleTalk network looks like one big network. As such, any router on the ring can become the choice router to use for any Macintosh connected directly to the ring. This means that any router anywhere on the ring might be used to service NBP lookups or ZIP getzonelist requests.

The Macintosh listens to RTMP packets, and the router that last sent a packet is the router used to service the request. This could be one of the routers located across one of these 9600-baud links.

NBP has some fairly loose timers. Retry is 1.5 seconds with 5 retries per NBP transaction, and an infinite loop and progressive back-off algorithm. ZIP is another story. It has a one second timeout with no retries; so if the router doesn't respond fast enough or if the link is congested, the Chooser will display a partial or completely empty zone list. This affects any directly connected Token Ring based Macintosh anywhere on the ring. This won't affect Macintosh computers connected behind AppleTalk routers, but that may not be any consolation.

We'd recommend not using the 9600-baud links that are a part of this Token Ring internet. And if at all possible, route AppleTalk at every point where a Token Ring source routing bridge is presently installed. This will provide you with reliable AppleTalk services in a Token Ring environment.

If you won't be connecting Macintosh computers directly to any of the rings, you could use the ring(s) as a backbone AppleTalk network. You could expect good performance from all parts minus the 9600-baud links.
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