EtherTalk and AppleTalk bridges: An Installation Example

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Here is a brief description of a corporation's EtherNet installation. They have used Ethernet as the primary communications medium for achieving transparent connectivity throughout the system.

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Number of segments   > 50
Number of nodes      >500
Span of network      > 20 KM (using Ethernet bridges)
Number of campuses   4
Number of Kinetics FastPath Gateways = 9
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When a Macintosh communicates with a device on another network, it routes packets over AppleTalk bridges. The Macintosh's RTMP stub algorithm does not keep track of which bridge supports which Network ID. Rather, it listens to RTMP routing packets and keeps track of which one it heard from last.

When the Macintosh is ready to transmit a packet to another network, it sends the packet to the bridge it heard from last. This bridge then forwards the packet to the correct bridge, which then completes the request. The Macintosh uses this two-bridge routing throughout the transfer.

If the intermediate bridge is on another campus or in another state, this algorithm can seriously affect throughput and Ethernet loading. For example, printing to an Apple LaserWriter is approximately 25% slower on Ethernet than on LocalTalk.

Is there a suggested solution for this problem?

The speed decrease is accurate. When printing, the packets must cross LocalTalk to get to the printer. For example, assign a time unit of 4 to identify the time a packet takes to travel across a LocalTalk network and a time unit of 1 to a large EtherTalk network. Thus, a packet crossing EtherTalk and LocalTalk to a LocalTalk device takes a total of 5 time units, whereas a packet on the LocalTalk network takes only 4 time units.

The EtherTalk-originated packets cannot move "faster" than those from a LocalTalk system on a LocalTalk network. The EtherTalk packets additionally must travel across the EtherTalk network to get to the LocalTalk network. To decrease the time it takes to get control back when printing, use LaserShare servers connected directly to Ethernet with EtherTalk boards. This eliminates

the LocalTalk slowdown.

The routing of the RTMP packets is a problem, which Apple is looking into. Part of the reason is because AppleTalk was created on the 128K and 512K Macintoshes, and memory was not available for large routing tables capable of mapping a large network. The time difference while taking trips to the source of the last RTMP packet is generally not significant.

The Apple specifications for the RTMP suggest 10-second update periods. This time has been found to work correctly at sites with 60 or more FastPaths. If you have trouble with extreme slowdowns, troubleshoot the network. That is, reinstall software and check all Net and Zone ID's. One site (containing a large, varied network) was able to remove a network zone-delay problem by updating all FastPaths and InterBridges to current ROM and Software levels.

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