AppleTalk Phase 2 and LocalTalk-Based Networks

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TOPIC --

I would like to clear up what appears to be some confusion about the use of
AppleTalk Phase 2 on a LocalTalk-based network. This is my understanding of
the situation:

1) AppleTalk Phase 2 does not necessarily provide any benefit on a
   LocalTalk-based network and, in particular, does not enhance network
   performance. It may, however, be useful where the number of nodes on an
   Internet are expected to exceed 256 (because of address lengths).

2) It is better to use AppleTalk Phase 2 on a LocalTalk-based network when
   connecting to another AppleTalk Phase 2 network (removing the overhead of
   the AppleTalk Phase 2 Upgrade Utility). There are also some other benefits
   related to zone naming and removing some old limitations on Internets. To
   upgrade a LocalTalk-based network to AppleTalk Phase 2, all that is
   necessary is to copy the AppleTalk file that comes with AppleTalk Internet
   Router into the System Folder of any LocalTalk machines.

3) All networked machines should be upgraded to AppleTalk Phase 2 as it
   eventually will be included in ROMs, and additionally, Apple will stop
   shipping the AppleTalk Phase 2 Upgrade Utility with the router (from the
   MacLAN documentation).

4) Can you tell me where devices like LaserWriters fit in? On the AppleTalk
   Phase 2 Upgrade Utility, when you search for network devices, Macintosh
   systems with the AppleTalk file are identified as AppleTalk Phase 2. Other
   Macintosh systems are identified as AppleTalk Phase 1 (that is, on
   LocalTalk), and LaserWriters are identified as unknown devices. What does
   this mean?

5) Why does the router need the upgrade utility to route between AppleTalk
   Phase 1 and AppleTalk Phase 1? How is it used (that is, does it convert the
   address to AppleTalk Phase 2 and back again)?

Will you confirm or correct my understanding of this issue. I am aware that
opinions do differ somewhat within Apple, indicating that there is some
confusion in this matter.

DISCUSSION --

1) AppleTalk Phase 2 routers on LocalTalk-based networks do offer better
   performance than AppleTalk Phase 1 routers in the following situation:

   Reduced broadcast traffic: One of the key reasons for customers to upgrade
   from AppleTalk Phase 1 to AppleTalk Phase 2 is the split horizon RTMP
   enhancement. Split horizon reduces the number of redundant routing table
   entries exchanged by routers. The split horizon algorithm is: All entries
   whose forwarding port in the routing table is equal to the port out that the
   entry is being sent are omitted from the RTMP Data packet. In other words,
   Router A will not include network numbers in RTMP packets broadcast on
   Network X when Network X is the path (forwarding port) for Router A to reach
   these other networks.

   This information applies to LocalTalk-based networks connected via
   AppleTalk Internet Routers. Note that each AppleTalk Internet Router
   running the AppleTalk Phase 2 Upgrade Utility broadcasts AppleTalk
   Phase 1 and AppleTalk Phase 2 RTMP packets on LocalTalk-based networks.
   This means that an AppleTalk Internet Router running the AppleTalk
   Phase 2 Upgrade Utility actually increases broadcast traffic on
   LocalTalk-based networks networks connected to it.

   AppleTalk Phase 2 does not provide any benefit to LocalTalk-based
   networks and Internets for node addressing. Node IDs are still 8 bits
   (0-255), and network numbers are still 16 bits (0-65,535).

2) The AppleTalk file you are referring to, when installed in the System
   Folder, causes version 53 of AppleTalk to be used in place of the ROM
   version of AppleTalk. Version 53 of the AppleTalk driver gives users on
   LocalTalk-based networks the ability to support some of the new
   high-level AppleTalk calls that do not in any way change the protocols used
   on the LocalTalk physical medium. These new high-level AppleTalk calls are
   documented in Macintosh Technical Note #250 (available on AppleLink under
   the Developer Services icon).

   It is not necessary to use the AppleTalk Phase 2 Upgrade Utility on
   AppleTalk Internet Routers when no AppleTalk Phase 1 routers are on the
   Internet. This means that an all-LocalTalk Internet using only AppleTalk
   Internet Routers does not require the use of the AppleTalk Phase 2 Upgrade
   Utility. The LocalTalk nodes do not require the use of AppleTalk version 53
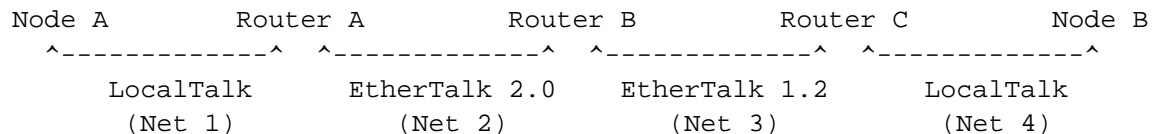   in this scenario.

   LocalTalk-based networks, running AppleTalk version 53 or not, do not
   receive "other benefits related to zone naming and removing some old
   limitations on Internets" as you imply. LocalTalk networks have not changed
   in this respect with the advent of AppleTalk Phase 2.

3) Yes, all non-LocalTalk AppleTalk devices should eventually upgrade to
   AppleTalk Phase 2 compatibility. Yes, future Macintosh systems will ship
   with AppleTalk version 53 or later in ROM. Eventually, the AppleTalk Phase
   2 Upgrade Utility will stop being shipped with the AppleTalk Internet
   Router. There is no timeframe for this.

4) AppleTalk devices that attach to a network via LocalTalk will continue to
   work on AppleTalk Phase 2 Internets as they do now on AppleTalk Phase 1
   Internets. Remember, LocalTalk-based networks have the same limitations
   running under AppleTalk Phase 2 that they had under AppleTalk Phase 1. The
   AppleTalk "Phase 2 Node Identifier" utility that comes on the AppleTalk
   Phase 2 Upgrade Utility disk declares an AppleTalk node as AppleTalk Phase 2
   if the AppleTalk version is 53 or greater and the AppleTalk type is
   "Macintosh xxx" where "xxx" is the type of Macintosh. If the AppleTalk
   version is less than 53 and the AppleTalk type is "Macintosh xxx", the node
   is identified as AppleTalk Phase 1. Nodes with an AppleTalk type other than
   "Macintosh xxx" are identified as unknown devices.

5) The AppleTalk Internet Router does not need the AppleTalk Phase 2 Upgrade
   Utility when routing between two LocalTalk-based networks. The AppleTalk
   Phase 2 Upgrade Utility allows the AppleTalk Internet Router to broadcast
   and receive AppleTalk Phase 1-style RTMP packets. This is all the AppleTalk
   Phase 2 Upgrade Utility does. The only time the AppleTalk Internet Router
   needs the AppleTalk Phase 2 Upgrade Utility is when there is an AppleTalk
   Phase 1 router on the same physical cable as the AppleTalk Internet Router.

   An example of this:

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    Node A          Router A          Router B          Router C          Node B
     ^-------------^  ^-------------^  ^-------------^  ^-------------^
         LocalTalk       EtherTalk 2.0   EtherTalk 1.2      LocalTalk
         (Net 1)         (Net 2)         (Net 3)            (Net 4)
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   Router A is an AppleTalk Internet Router
   Router B is an AppleTalk Internet Router
   Router C is a Kinetics FastPath 4 - AppleTalk Phase 1 only

   Since Router C, the FastPath, is an AppleTalk Phase 1 router, the AppleTalk
   Internet Router (Router B) must run the AppleTalk Phase 2 Upgrade Utility.
   The AppleTalk Phase 2 Upgrade Utility causes Router B to generate and
   broadcast AppleTalk Phase 1-style RTMP packets onto Net 3. Router A does
   not need to use the AppleTalk Phase 2 Upgrade Utility because it is not on
   the same physical cable as the AppleTalk Phase 1 router (the FastPath). If
   Router C was replaced with an AppleTalk Internet Router and Net 3 was an
   EtherTalk 2.0 network, the AppleTalk Phase 2 Upgrade Utility would not be
   needed on any of the routers.
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