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AppleTalk Phase 2 and the
Macintosh



AppleTalk Phase 2

AppleTalk Phase 2–Why?

- Allow AppleTalk networks to support many more than 254 nodes
- Provide better support for large internets
- New products and capabilities

AppleTalk Phase 2–What?

- Up to 16 million nodes per network
- Multiple zones per network
- New products
- Better routing (“best router”)
- 802.2 packet formats
- Reduced broadcast traffic

AppleTalk Phase 2–Goals

- Remain compatible with *current* AppleTalk applications
- Provide extended capabilities for use in *future* products
- Require no immediate changes to LocalTalk non-routing nodes



**AppleTalk Phase 2
Protocols**

New Concepts

- “Extended” AppleTalk network:
 - A range of network numbers sharing the same “physical” cable
- Nodes addressed by 16-bit network number and 8-bit node ID

New Concepts (*cont.*)

- Network zone lists
 - No longer one zone per network or per network number
 - Lists set up and maintained in routers
- AppleTalk internets can mix extended and non-extended networks, however all routers must be Phase 2 routers

New Concepts (*cont.*)

- Multicast addressing used for all AppleTalk broadcasts. NBP lookups performed using zone-specific multicast.
- Packet format–802.2 Type 1
- Only DDP long header is used on an extended network

What's Affected?

- No LocalTalk non-routing nodes need change until need new Phase 2 features
- Nodes on extended networks:
 - No applications need change
 - Implement new lower-level protocols
 - Provide ability for user to choose node's zone from list

What's Affected? (*cont.*)

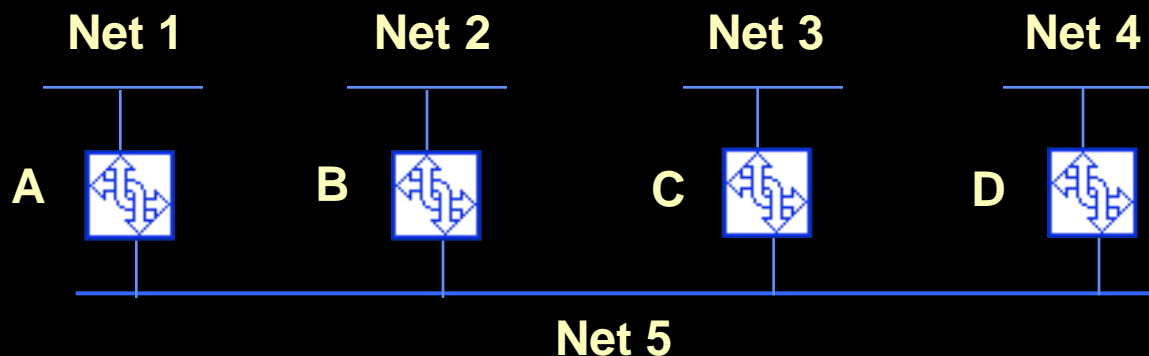
- All routers must change:
 - Implement new routing protocols
 - If on extended networks, must allow setup with network ranges and zone lists

Packet Formats

- Packets are sent using 802.2 and Sub-network access protocol (SNAP)
 - SNAP type for AppleTalk is \$080007809B, AARP is \$00000080F3
 - Data part of packet starts with long DDP header

RTMP

- “Split horizon” – greatly reduces size of routing table broadcasts on backbone networks
- “Best router” cache maintained by end nodes



NBP

- Nodes maintain a variable MY-ZONE
- NBP must filter LkUp packets by:
Object, Type and **Zone**
- Wildcard support extended through
“ ” character

ZIP

- ZIP GetNetInfo (for extended networks)
 - Used during node startup for network and zone verification
- GetLocalZones returns network's zone list

ZIP

- Responsible for assignment of zone multicast addresses
 - Data links provide a number of well-known multicast addresses for use by NBP/ZIP
 - Routers map zone names to multicast addresses and use for NBP lookups

ATP

- ATP Exactly-Once (XO) service
 - XO request packets will indicate the value of the TRel timer to be used by the responding side
 - Values from 30 seconds (current ATP XO timeout value) to 8 minutes are now possible



**AppleTalk Phase 2
Products**

Macintosh Programming

- Changes in calls to AppleTalk drivers
- Changes in implementing AppleTalk connection files (ADEVs)
 - New calls to support Phase 2
 - New LAP Manager calls

Macintosh Programming (*cont.*)

- Requires AppleTalk version 53 or later
- Shipped in "AppleTalk" file with EtherTalk and TokenTalk
- In ROM on Macintosh IIx
- Will ship with system 7.0

New ZIP calls (XPP driver)

- Two calls replace use of ATP by application
 - GetMyZone
 - GetZoneList
- Old ATP method still supported (not recommended)
- New call: GetLocalZone

New MPP/ATP driver calls

- Ability to set TRel timer in ATP SendRequests
- KillAllGetReq call
- MPP GetInfo - general info about the node
Includes 24-bit address of a router
- ATClosePrep and ATClosePrepCancel—for system use before AppleTalk drivers close

AppleTalk Transition Queue

- Ability to be notified of significant driver events (opening, closing, etc.)
- Applications can tell AppleTalk drivers that AppleTalk shouldn't close (will replace Chooser bit in low memory)

ADSP–What is it?

- AppleTalk Data Stream Protocol
- A symmetric, connection-oriented protocol
- Reliable, duplicate-free data delivery
- Built-in flow control mechanism

ADSP - Why use it?

- Provides simple yet powerful interface to the AppleTalk network system
- Flexible data handling: streams or messages
- Examples: File Transfer, Terminal Emulators, Remote Screening

ADSP - Version 1.5

- Rewritten in C
- Improved error codes
- Improved performance
- Increased number of LocalTalk connections
- To ship with system 7.0

AppleTalk Connection Files (ADEVs)

- Extended and non-extended ADEVs
(old ADEVs still work)
- New calls
 - ReselADEV
 - AGetInfo
 - AGetMulticast
 - ASetMulticast
 - ADelMulticast

LAP Manager

- Support added for multiple concurrent AppleTalk connections (used by the *AppleTalk Internet Router*)
- Support added for extended ADEVs
 - 24-bit AppleTalk addresses
 - Direct data link addressing

LAP Manager (*cont.*)

- 802.2 Type 1 support
 - Can receive packets from Ethernet-like drivers based on SAP or SNAP protocol discriminator
- XID and TEST frames supported

New Macintosh Products

- AppleTalk Internet Router
- EtherTalk 2.0 for the Macintosh
- TokenTalk 2.0 for the Macintosh

EtherTalk 2.0

- Ships with all EtherTalk NB cards
- Zone selection through the Network CDEV
- Replaces EtherTalk 1.0
- Can incrementally upgrade nodes through use of AppleTalk Internet Router and Phase 2 Upgrade Utility
- Licensed to third-parties



TokenTalk 2.0

- Ships with all TokenTalk NB cards
- Zone selection through the Network CDEV
- Includes support for IBM source routing bridges
- Includes full 802.2 LLC implementation
- Brings the benefits of AppleTalk to the token ring environment



Documentation

- “AppleTalk Phase 2 Protocol Specification”
- “Macintosh AppleTalk Connections Reference”
- Macintosh Tech Note #250
- Product documents, including “AppleTalk Phase 2 Introduction and Upgrade Guide”
- *Inside AppleTalk*, second edition



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