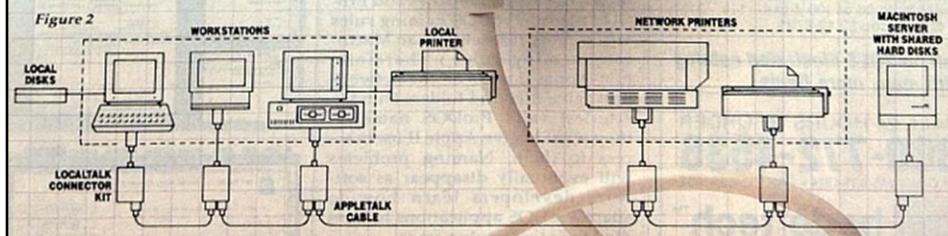


Talkin' about LocalTalk

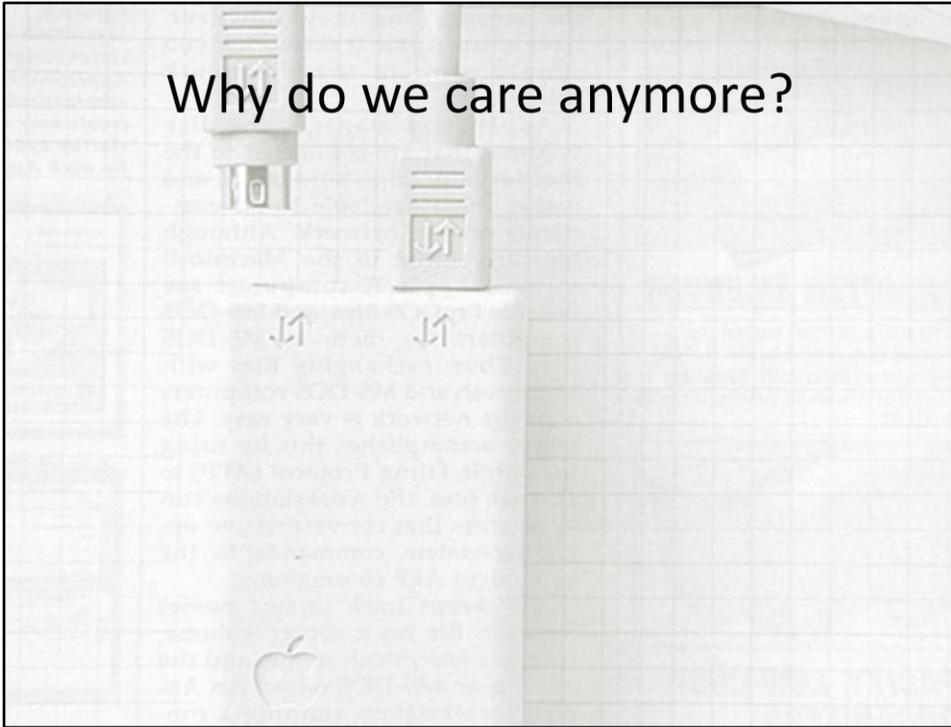
Peter Neubauer
KansasFest 2013
www.bluerwhite.org

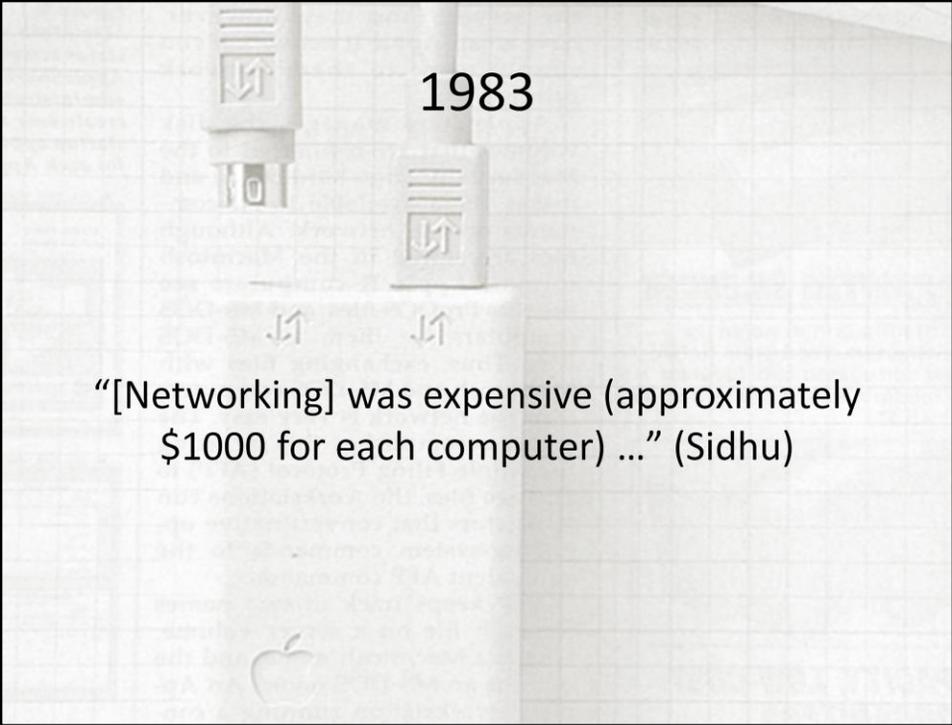
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A+ May 1988

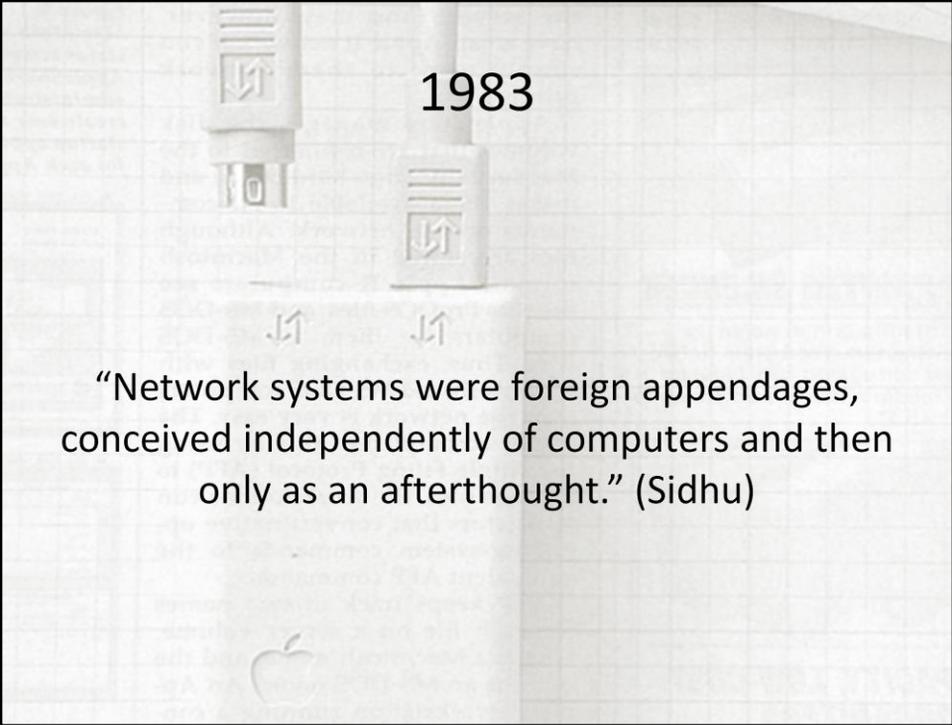
Why do we care anymore?





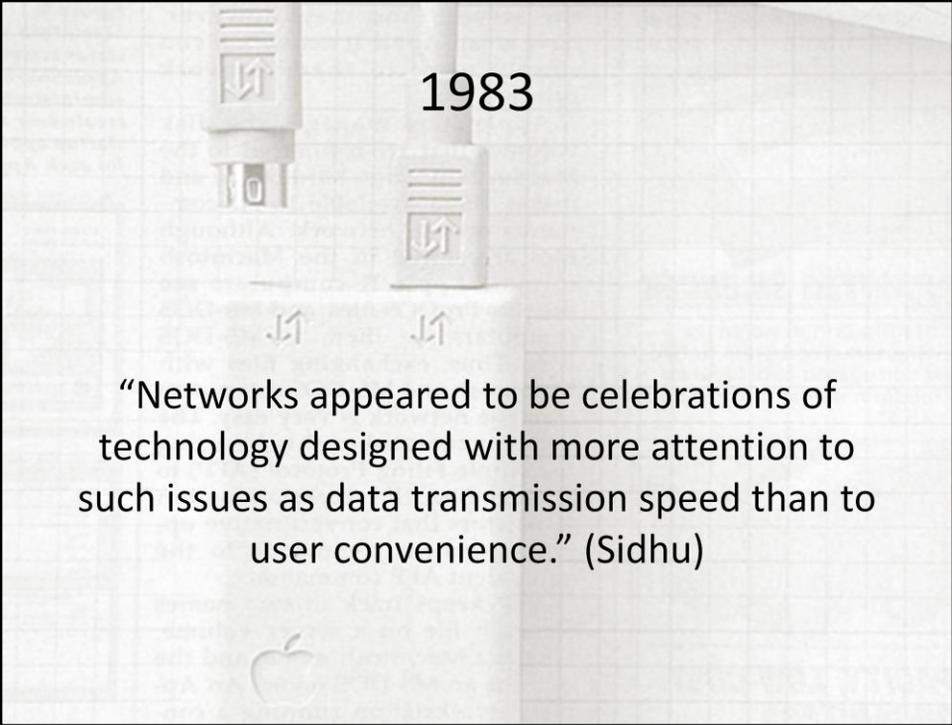
1983

“[Networking] was expensive (approximately \$1000 for each computer) ...” (Sidhu)



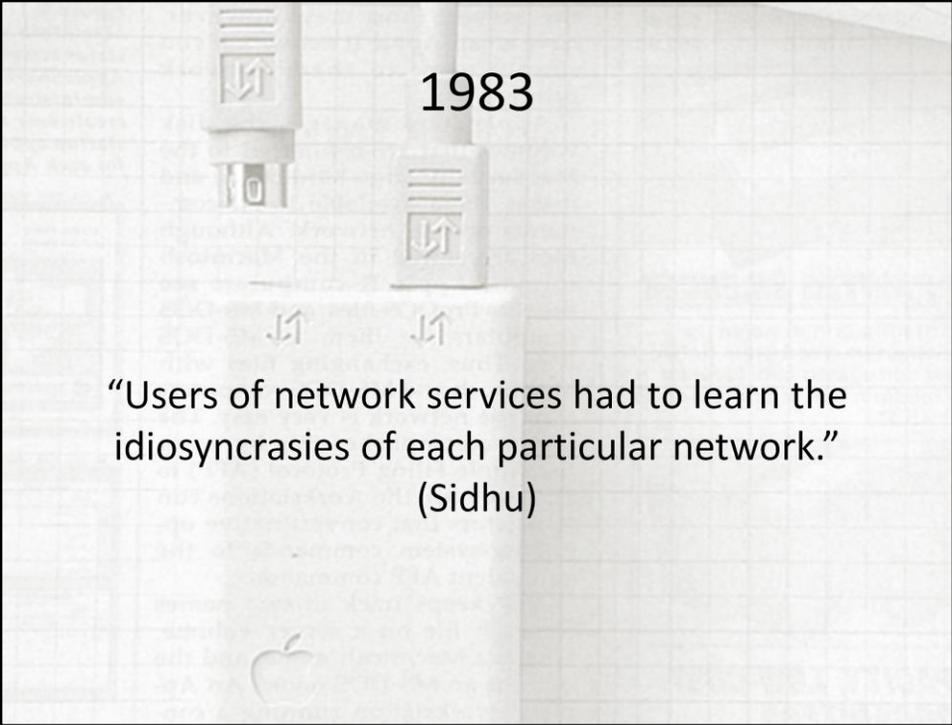
1983

“Network systems were foreign appendages,
conceived independently of computers and then
only as an afterthought.” (Sidhu)



1983

“Networks appeared to be celebrations of technology designed with more attention to such issues as data transmission speed than to user convenience.” (Sidhu)



1983

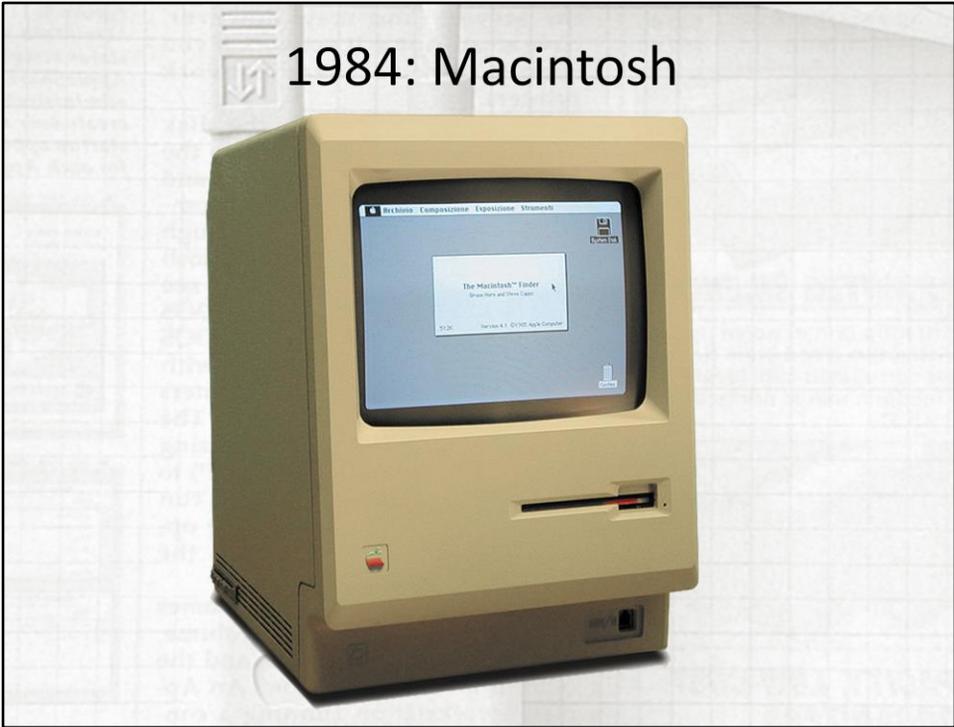
“Users of network services had to learn the idiosyncrasies of each particular network.”
(Sidhu)

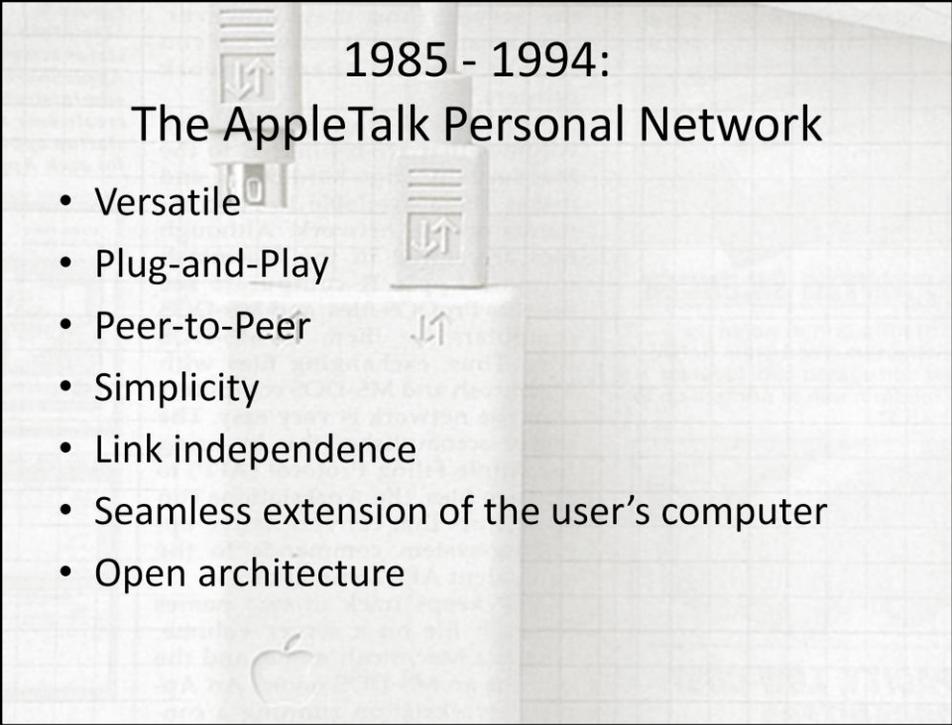
1983

“The network constituted a hindrance when it should have extended the user’s reach.” (Sidhu)



1984: Macintosh

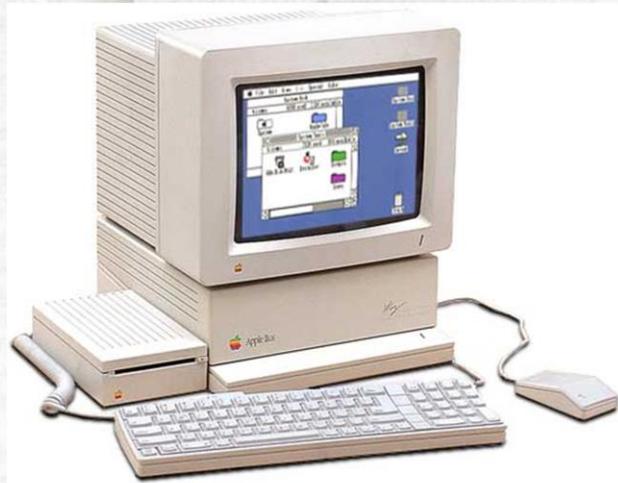




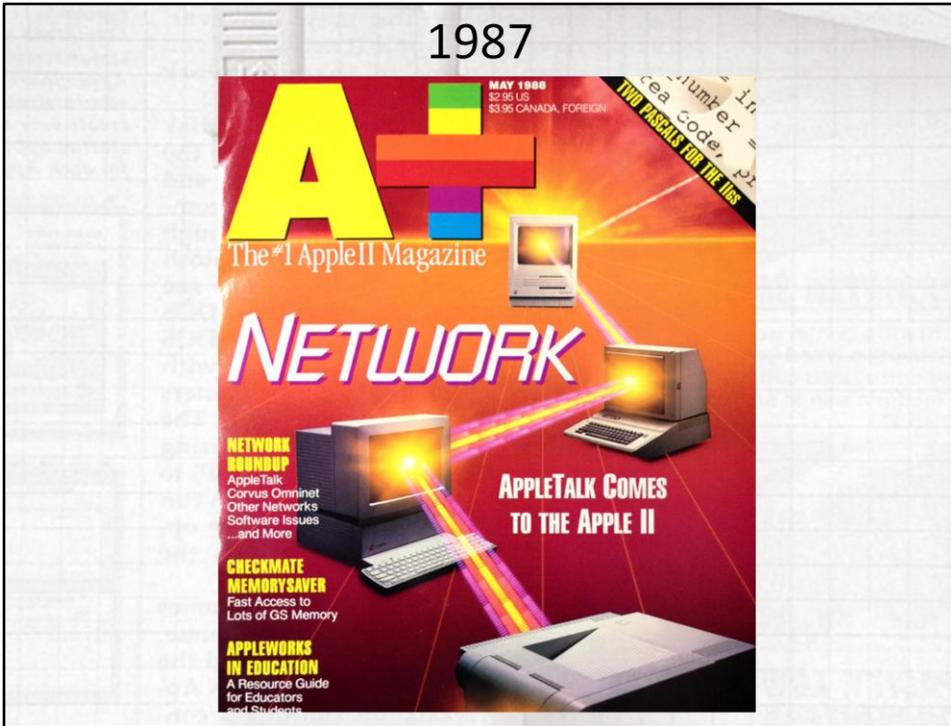
1985 - 1994: The AppleTalk Personal Network

- Versatile
- Plug-and-Play
- Peer-to-Peer
- Simplicity
- Link independence
- Seamless extension of the user's computer
- Open architecture

1986: Apple IIgs



1987



A+ May 1988

1987: Apple Workstation Card



\$249

http://apple2info.net/index.php?title=Apple_II_Workstation_Card

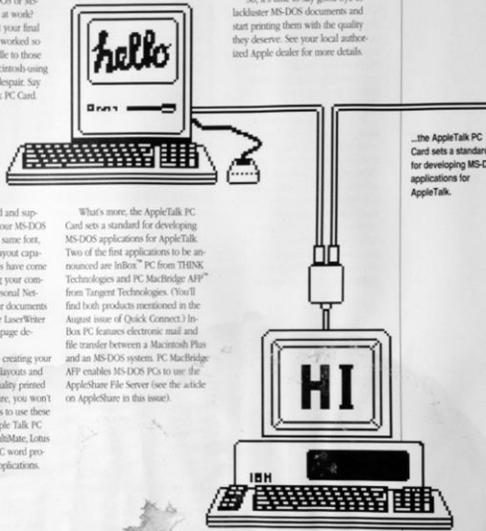
http://www.downloads.reactivemicro.com/Public/Apple%20II%20Items/Hardware/Apple_II_Workstation_Card/

1987: AppleTalk PC Card

The AppleTalk PC Card Says Hello to PCs

Are you using an MS-DOS or MS-DOS-compatible computer at work? And lamenting the fact that your final documents—the ones you worked so hard on—can't hold a candle to those flashy documents your Macintosh-using colleagues printed? Don't despair. Say hello to the new AppleTalk PC Card.

So, it's time to say good-bye to lackluster MS-DOS documents and start printing them with the quality they deserve. See your local authorized Apple dealer for more details.



The AppleTalk PC Card and supporting software can put your MS-DOS machine in touch with the same font, style, graphics, and page layout capabilities that Macintosh users have come to expect. How? By linking your computer to the AppleTalk Personal Network so you can print your documents on an Apple LaserWriter or LaserWriter Plus using the PostScript™ page description language.

PostScript is the key to creating your own custom graphics and layouts and generating presentation-quality printed documents. And chances are, you won't need to switch applications to use these powerful features. The AppleTalk PC Card supports Wordstar, MultiMate, Lotus 1-2-3, and other popular PC word processing and spreadsheet applications.

What's more, the AppleTalk PC Card sets a standard for developing MS-DOS applications for AppleTalk. Two of the first applications to be announced are InBox™ PC from THINK Technologies and PC MacBridge APP™ from Target Technologies. (You'll find both products mentioned in the August issue of Quick Connect.) In-Box PC features electronic mail and file transfer between a Macintosh Plus and an MS-DOS system. PC MacBridge APP enables MS-DOS PCs to use the AppleShare File Server (see the article on AppleShare in this issue).

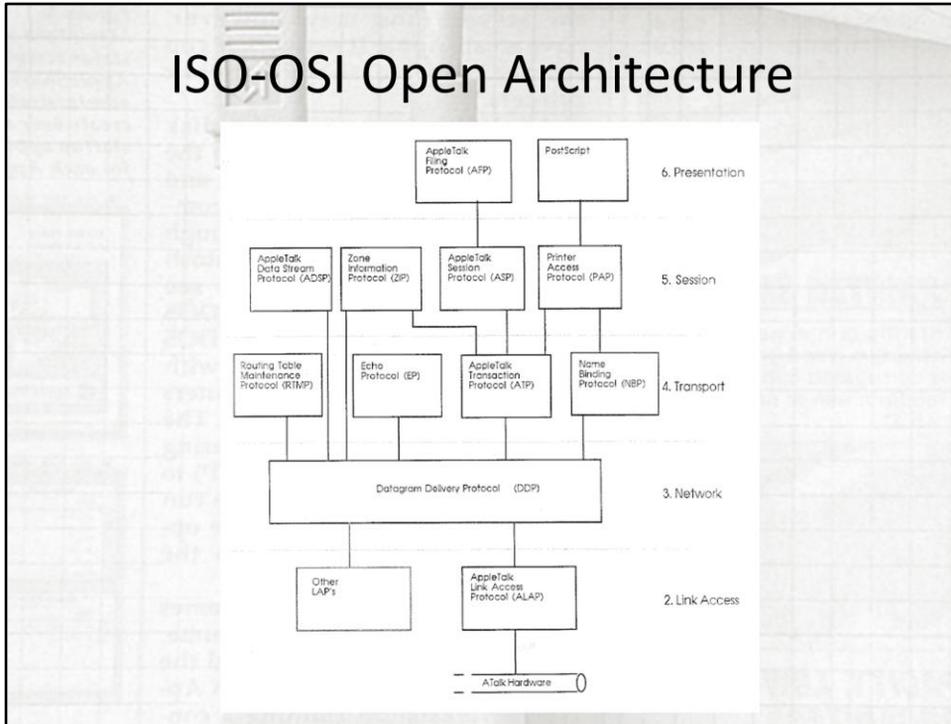
...the AppleTalk PC Card sets a standard for developing MS-DOS applications for AppleTalk.

Apple User Group Connection "quick Connect" February 1987

Terminology

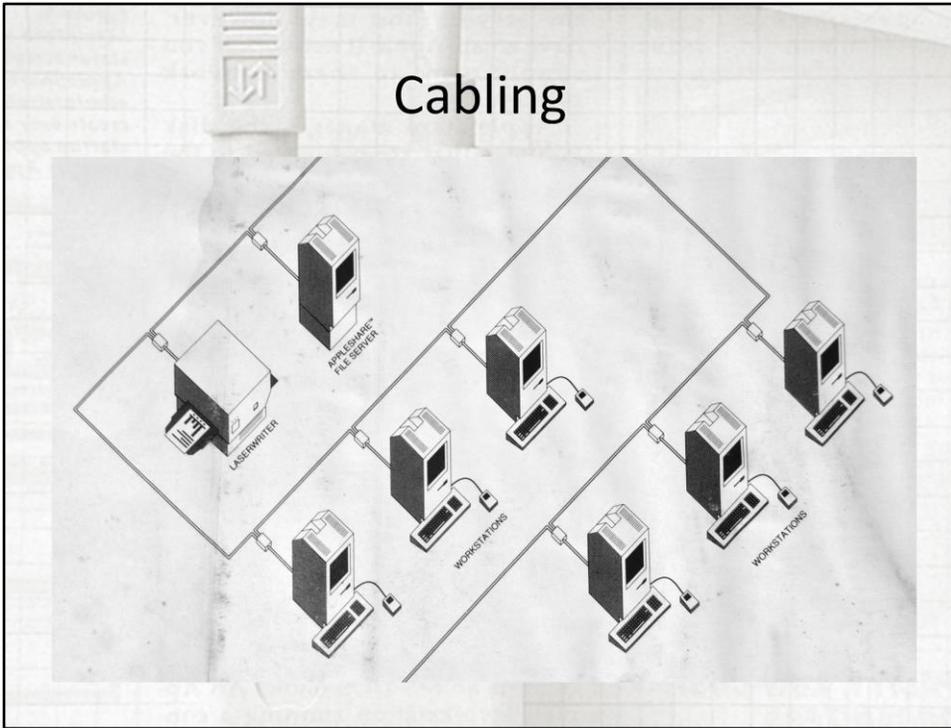
- AppleTalk Personal Network
- AppleTalk
- LocalTalk
- EtherTalk (version 1.0 in 1987 vs. 2.0 in 1989)
- TokenTalk
- Internet Routers (IRs) and Bridges
- Phase II, “Extended” vs. “Non-extended”
- AppleShare

ISO-OSI Open Architecture



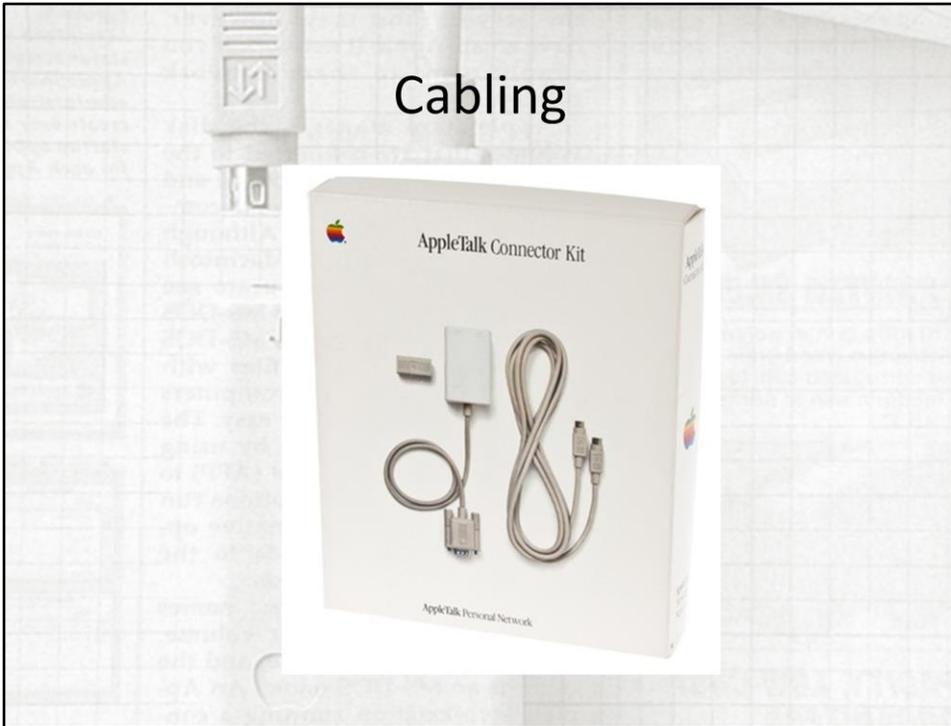
“Inside AppleTalk” (1986 revision)

Cabling



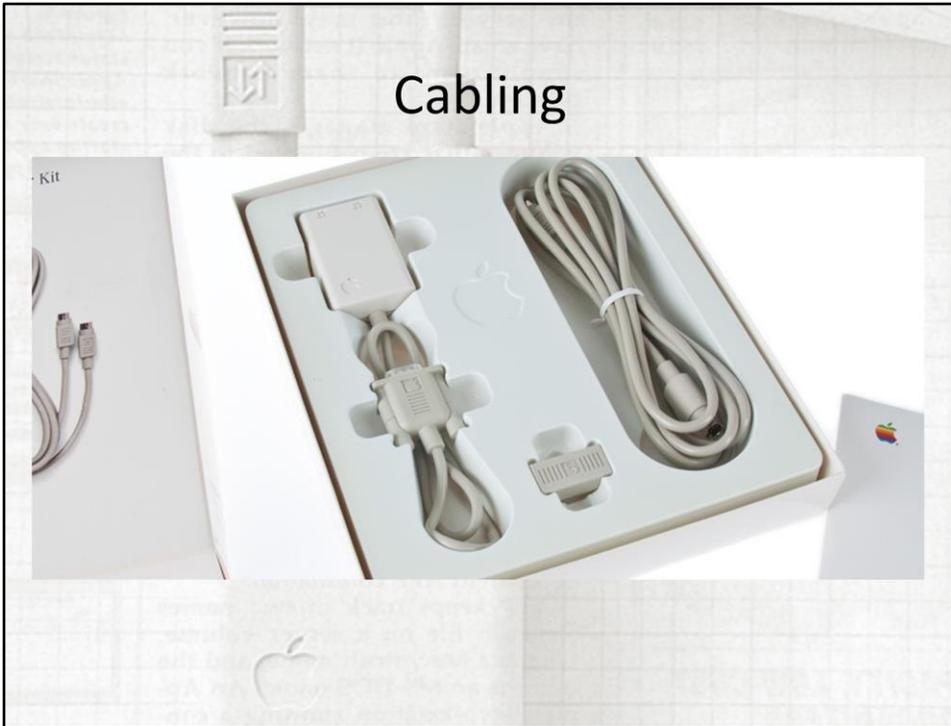
Apple User Group Connection "quick Connect" February 1987

Cabling



<http://shrineofapple.com/blog/2011/10/03/appletalkconnectorkit/>

Cabling

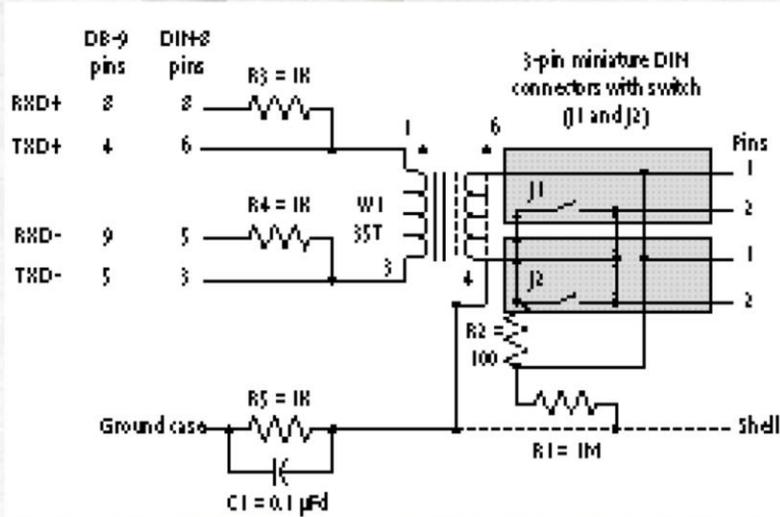


<http://shrineofapple.com/blog/2011/10/03/appletalkconnectorkit/>



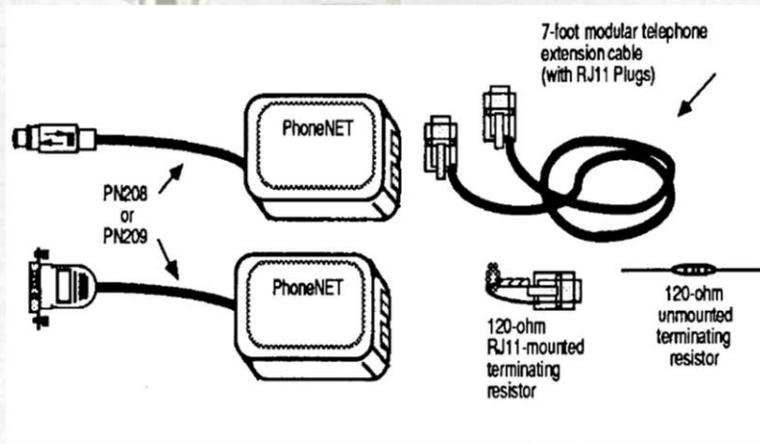
<http://shrineofapple.com/blog/2011/10/03/appletalkconnectorkit/>

Cabling – AppleTalk Connector



“Inside AppleTalk”

Cabling - PhoneNet



“PhoneNet User’s Guide” (<http://www.scribd.com/doc/40017/1987-farallon-phonenet>)

Electrical

- 230.4 kbps
- 300 meter length, 32 nodes
- Multi-drop
- EIA RS-422 signaling (balanced, differential, isolated)
- FM-0 (bi-phase space) line coding
- Synchronous Data Link Control (SDLC) framing

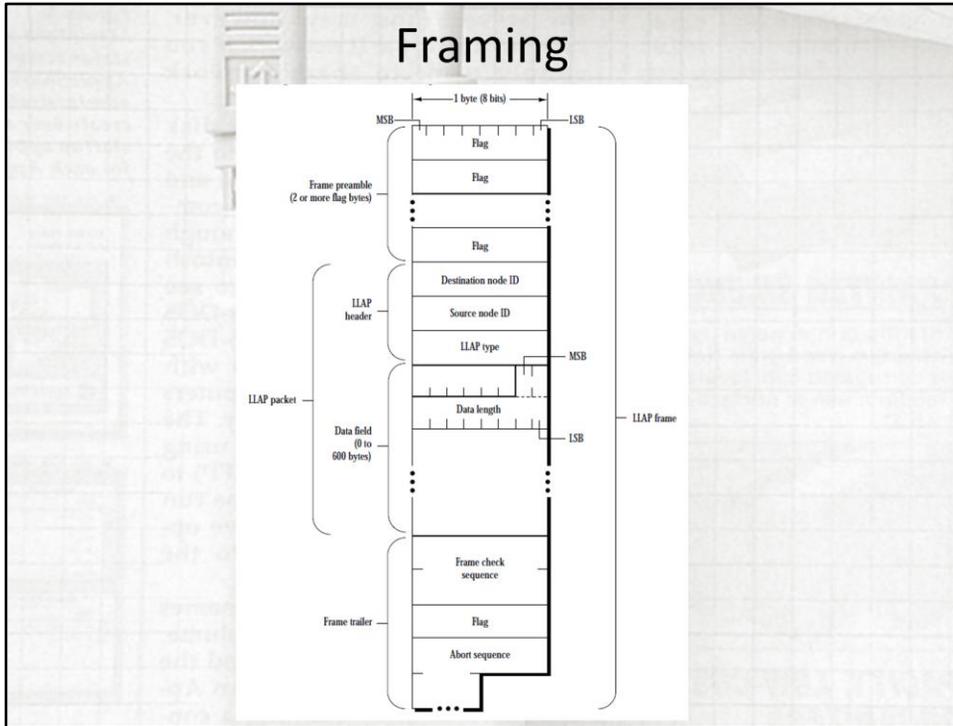
Stick it in Your GS

- Detour to ROM03 schematics
 - Page 4, J15
 - T-network, line drivers, MSEY1, MSEX1
 - SCC

Stick in it your GS

- Schematics
- Link Activity Detector (LAD) \$C044 and \$C045
- T-network for EMI and fault tolerance
- Zilog 8530 Serial Communication Controller (SCC)

Framing



“Inside AppleTalk”

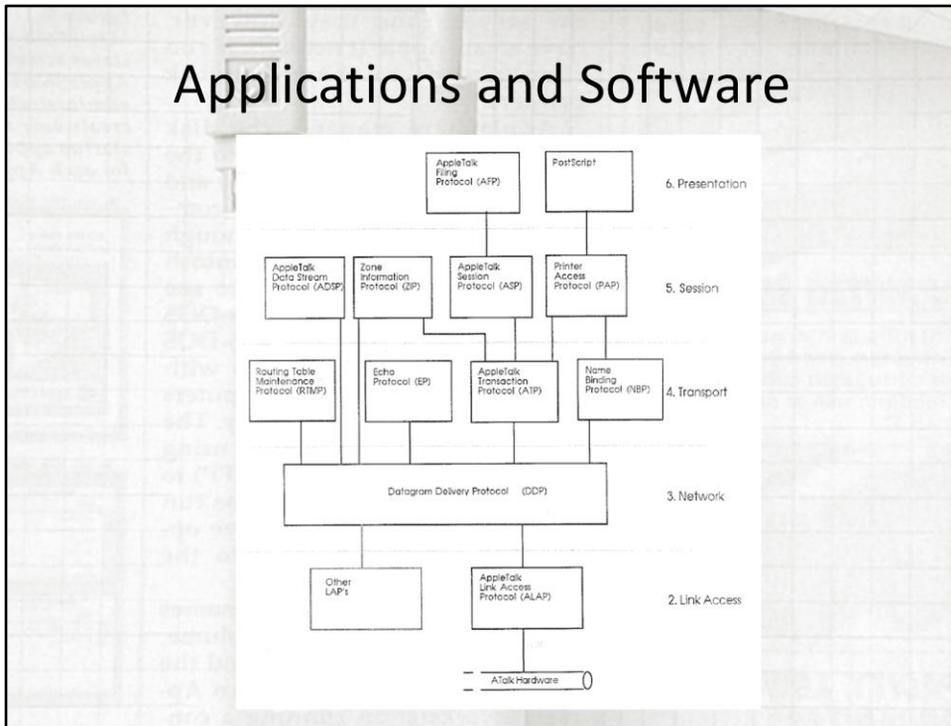
CSMA/CA

- Hardware cannot do collision detection (CD)
- Synchronization pulse and missing clock detection
- Frame preamble (7E)
- Bit-oriented, transparent with bit stuffing
- Timing constraints
- RTS/CTS
- Defer
- Assume/Backoff

Addressing

- 8 bit nodes identifiers
- Control and data packets
- Dynamic address assignment
 - ENQ
 - ACK

Applications and Software



“Inside AppleTalk”

Resources for More

- “Inside AppleTalk”, second edition by G. Sidhu, R. Andrews, and A. Oppenheimer
- Zilog 8530 Data Sheet
- “AppleShare Programmer’s Guide for the Apple II”
- “A History of Macintosh Networking” by A. Oppenheimer
(<http://www.opendoor.com/nethistory/>)

http://basalgangster.macgui.com/RetroMacComputing/The_Long_View/Entries/2012/3/1_AppleTalk.html

<http://www.opendoor.com/nethistory/MacWorld2004/index.html>