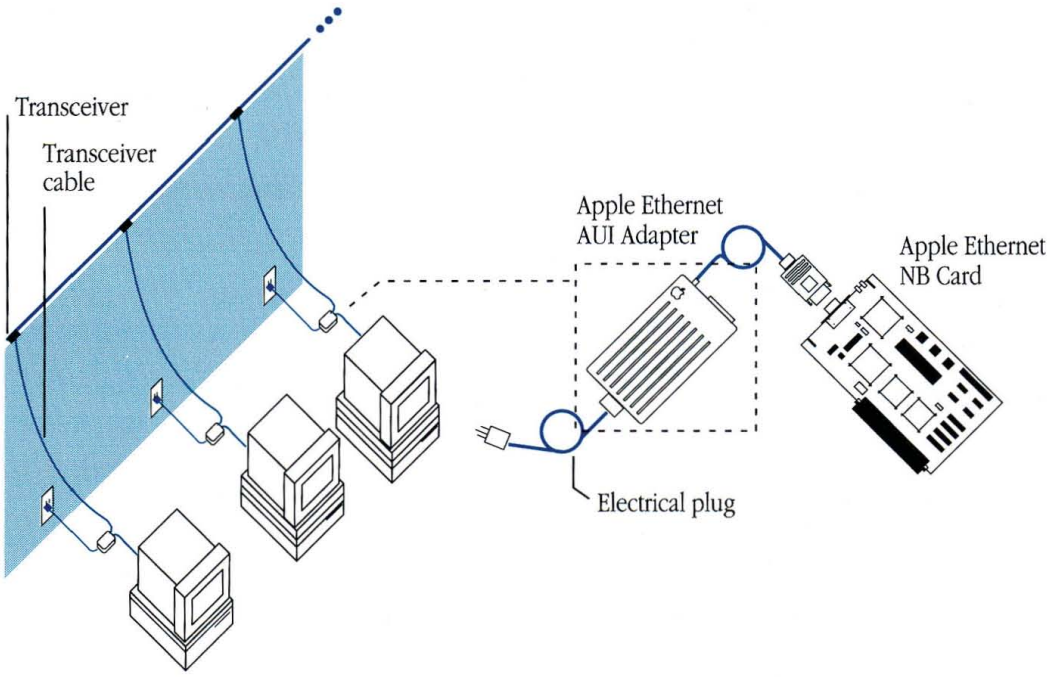
Thick coax and other cable systems for Ethernet

The Apple Ethernet AUI Adapter enables you to connect a device equipped with an Apple Ethernet port to standard Ethernet transceivers for thick coax, fiber-optic, and other Ethernet media types. The AUI Adapter will work with external transceivers from all companies following the 802.3 AUI (Attachment Unit Interface) specification.

Ethernet cable system for fiber-optic and thick coax



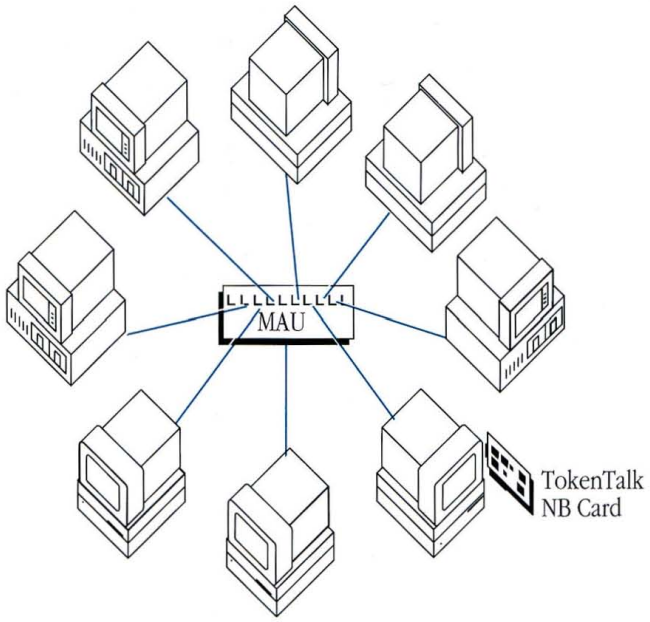
AppleTalk over Token Ring: TokenTalk

A TokenTalk network transmits AppleTalk protocols over industry-standard (IEEE 802.5) **Token Ring** networks. The growing popularity of Token Ring is the result of its compatibility with standard cabling installations and its role in IBM's Systems Application Architecture (SAA), making it ideal for large business installations.

Providing transmission rates of either 4 megabits per second (Mbps) or 16 Mbps, Token Ring can use either shielded twisted-pair cable or unshielded twisted-pair cable. A single network can connect up to 260 devices.

Each device on a Token Ring network is connected to a MAU that is usually located in a wiring closet. A typical MAU provides eight ports for connecting network devices. As your network grows, you can add MAUs to support more devices.

You need TokenTalk software and a Token Ring interface card for each computer that you want to attach to the network. To connect members of the Macintosh II family of computers to Token Ring networks that operate at 4 Mbps, Apple provides the TokenTalk NB Card. This card connects to IBM Type 1 cable (shielded twisted-pair). Other vendors provide media filters for attaching to IBM Type 3 cable (unshielded twisted-pair). You may also purchase interface cards from other companies that allow you to connect a Macintosh SE or SE/30 to a Token Ring network.



Conclusion

In this chapter, you've learned about the different network types that are supported by the AppleTalk network system—LocalTalk, Ethernet, and Token Ring. These network types target the needs of varying network environments. The following table enables you to compare the features of these network types. Note that AppleTalk protocols can also operate on other types of networks, such as ARCnet, LANSTAR, and IBM baseband networks. For more information on these additional network types, refer to the sources listed in the Appendix.

Table 6-1 A comparison of network types

	Medium	Transmission rate	Topology	Maximum number of devices	Maximum length	Ease of installation
LocalTalk	Shielded twisted-pair	230.4 Kbps	Bus	32	1000 ft.	Easy
	Unshielded twisted-pair (phone wire)	230.4 Kbps	Bus Passive star	20–40 Varies	2000 ft. 4000 ft. (sum of branches)	Easy Requires installer
			Active star	254	3000 ft./branch	Requires installer
	Infrared light	230.4 Kbps	NA	128 per transceiver	Transceivers must be within 70-ft. diameter	Easy
Ethernet	Thick coaxial	10 Mbps	Bus	100/segment 1024/network	8250 ft.	Requires installer
	Thin coaxial	10 Mbps	Bus	40/segment 1024/network	3300 ft.	Easy with Apple Ethernet product
	Twisted-pair	10 Mbps	Star	1024	330 ft. from hub to device	Requires installer
	Fiber optic	10 Mbps	Bus	1024	14,256 ft.	Requires installer
Token Ring	Shielded twisted-pair	4 /16 Mbps	Star-wired ring	260/ring	990 ft. from MAU to device	Usually requires installer
	Unshielded twisted-pair	4 /16 Mbps	Star-wired ring	72/ring	330 ft. from MAU to device	Usually requires installer

Extending and connecting networks

When designing your network, you may find that you need to extend a single network or divide the network into two or more connected *subnetworks*. Connection devices such as repeaters, bridges, routers, and gateways (discussed fully in the next section) extend networks or provide the link between individual networks, enabling many users to communicate and share resources with one another.

The following situations commonly call for extending or connecting networks:

- *Enlarging a network that has reached its maximum length or number of devices.* If you've reached the specified device or cable length limits of a network, you may need to extend the network. For example, if you're using LocalTalk cable and need to extend the cable beyond the specified 1000-foot limit, you would need to use a connection device.
- *Linking two or more existing networks in your organization.* It's not unusual for networks to be installed in an organization for different reasons and at different times. The result? Separate networks that don't communicate. Connection devices can link these networks together, allowing users on each network to access network services on the entire internet.
- *Connecting different network types or networks using different protocols.* A common reason for connecting networks is to link different network types, such as LocalTalk and Ethernet, each using different connection methods and transmission media. Or you may need to link your AppleTalk network to a network running an entirely different set of protocols, such as DECnet or TCP/IP.
- *Maintaining a satisfactory level of network performance.* In a high-traffic network, performance can be increased significantly by dividing the network into subnetworks, each with a low demand for the resources of another subnetwork. A logical way to divide an existing network is along natural divisions within the organization. For example, networks are commonly divided by department or by groups that have shared requirements. By partitioning the network into largely self-contained subnetworks, you can minimize the amount of traffic flowing between them and maintain higher levels of performance on each subnetwork.

- *Isolating a single group generating high traffic.* When one group of users generates a large amount of network traffic, performance may decline on the entire network. For example, several users performing frequent, high-volume printing and file sharing can cause network congestion for all other users on the same network.

  When designing your network layout, you can plan for such high-traffic groups ahead of time by isolating these users in a network of their own. If your network is already in place, you can use the same traffic-isolation technique, dividing one large network into two smaller networks.
- *Accommodating different user requirements.* If users' needs for network resources vary greatly, you may want to consider creating two networks linked by a connection device. In this way, the special interests of each group may be better satisfied.
- *Restricting access to sensitive information.* You may decide that sensitive or important information—such as product development plans or personnel files—can be better safeguarded and supervised by placing the information in a separate network. Even though users in other networks can access devices on the "secure" network, you can set up certain servers that have restricted access.
- *Creating zones for efficient network organization.* **Zones** are logical divisions within an internet that enable an administrator to balance the number of network services presented to users. See "Dividing Your Internet Into Zones" later in this chapter for a discussion of zones.

Which connection device do you need?

Four kinds of devices are used to extend or connect networks:

- repeaters
- bridges
- routers
- gateways

The device you choose depends on what kind of connection services you need, as described in the following sections.

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