CHAPTER 3

Planning

This chapter describes the FDDI and Fast Ethernet cabling guidelines and several common Catalyst 2800 configurations using the Catalyst 2800 modules. The cabling guidelines and sample networks are divided according to the two groups of modules, FDDI and Fast Ethernet.

FDDI Cabling Guidelines

The following cabling guidelines apply to an FDDI network:

- The maximum length for an unshielded twisted pair (UTP) cable segment is 100 meters.
- The maximum length for a fiber cable is 2 km.

Port Connections

The FDDI modules can have one or two ports: an A port and a B port in a dual-attach configuration or an S port in a single-attach configuration. The valid port configurations for an FDDI module are described in Table 3-1.

Table 3-1 Valid FDDI Port Configurations

Module Connection	Other Device	Description
A	B	Peer connection between FDDI Fiber DAS and another DAS device on trunk ring.
B	A	Peer connection between FDDI Fiber DAS and another DAS device on trunk ring.
S	M	Connection between FDDI Fiber SAS or UTP SAS and concentrator.
A	M	Connection between FDDI Fiber DAS and concentrator. Used for dual homing.
B	M	Connection between FDDI Fiber DAS and concentrator. Used for dual homing
S	S	Connection between FDDI Fiber SAS or UTP SAS and another SAS station.

Common Catalyst 2800 FDDI Configurations

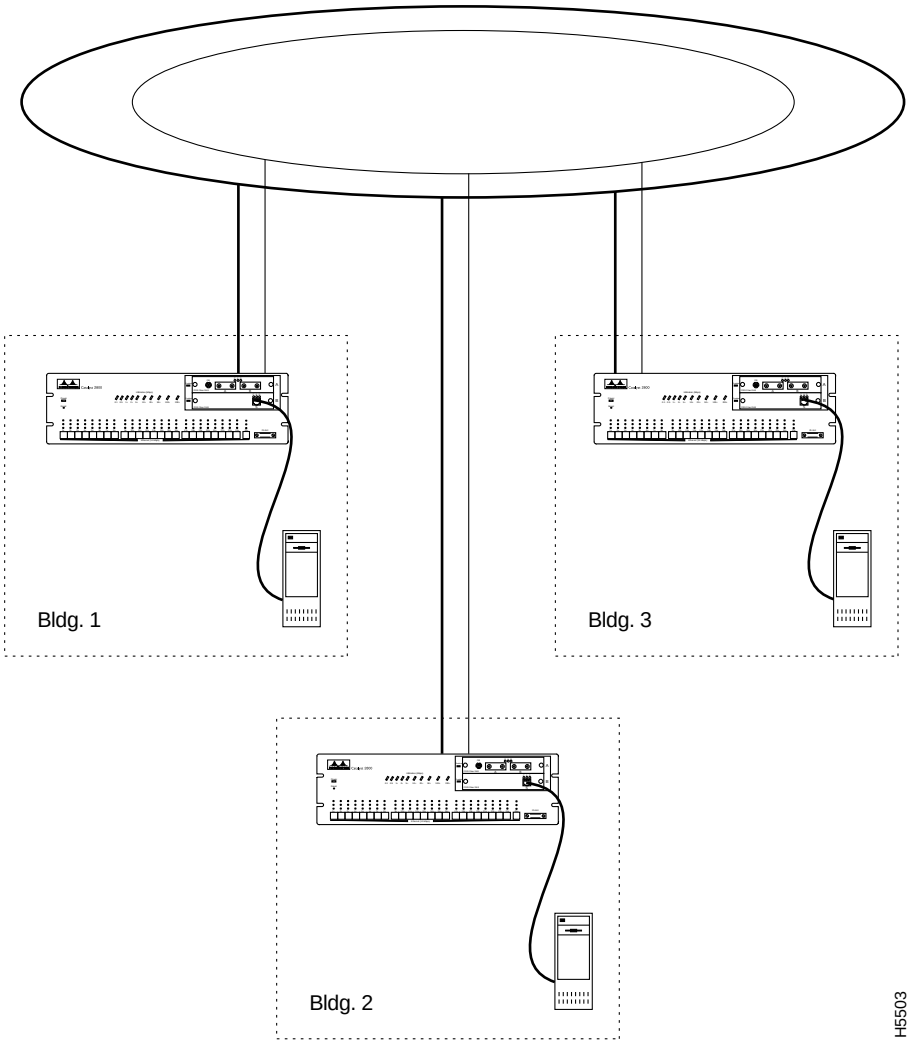
This section describes several common Catalyst 2800 network configurations:

- Catalyst 2800 connected to a trunk ring via FDDI Fiber DAS
- Catalyst 2800 connected to a concentrator in a dual-homing configuration via FDDI Fiber DAS
- Catalyst 2800 connected to a server, router, or concentrator via FDDI Fiber SAS
- Catalyst 2800 connected to a server, router, or concentrator via FDDI UTP SAS

Catalyst 2800 Connected to a Trunk Ring via FDDI Fiber DAS

Figure 3-1 shows multiple Catalyst 2800s connected to a trunk ring. Each Catalyst 2800 is configured with an FDDI Fiber DAS module and a 100BaseTX/1 module for a local server connection.

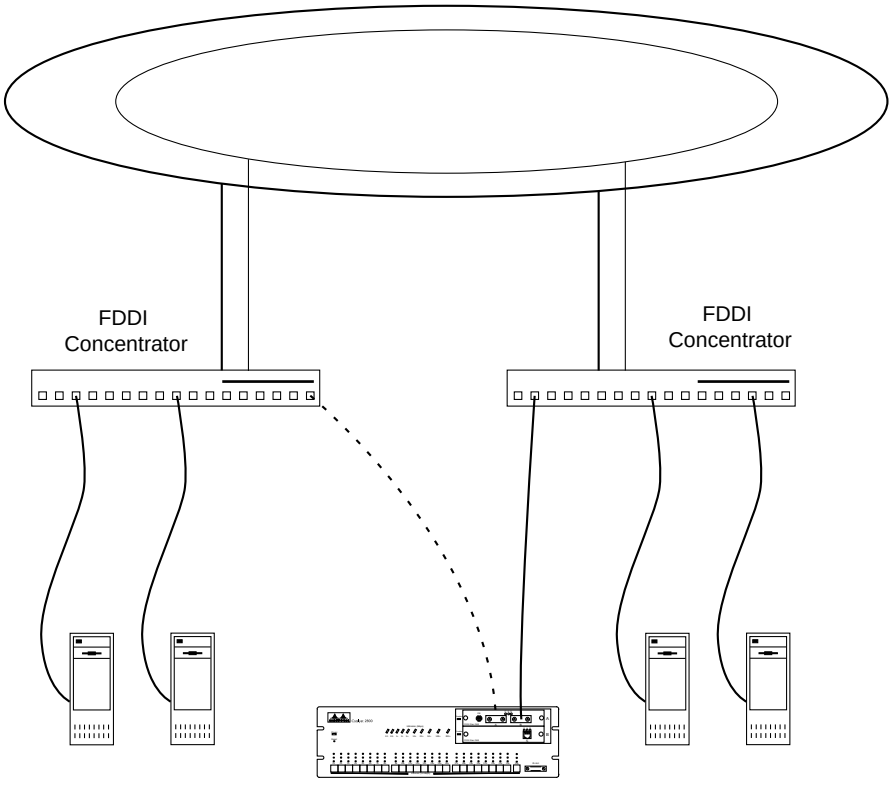
Figure 3-1 Catalyst 2800 Connected to a Trunk Ring via FDDI Fiber DAS



Catalyst 2800 Connected to a Concentrator in a Dual-Homing Configuration via FDDI Fiber DAS

Figure 3-2 shows a Catalyst 2800 connected to a concentrator in a dual-homing configuration using a Fiber DAS module.

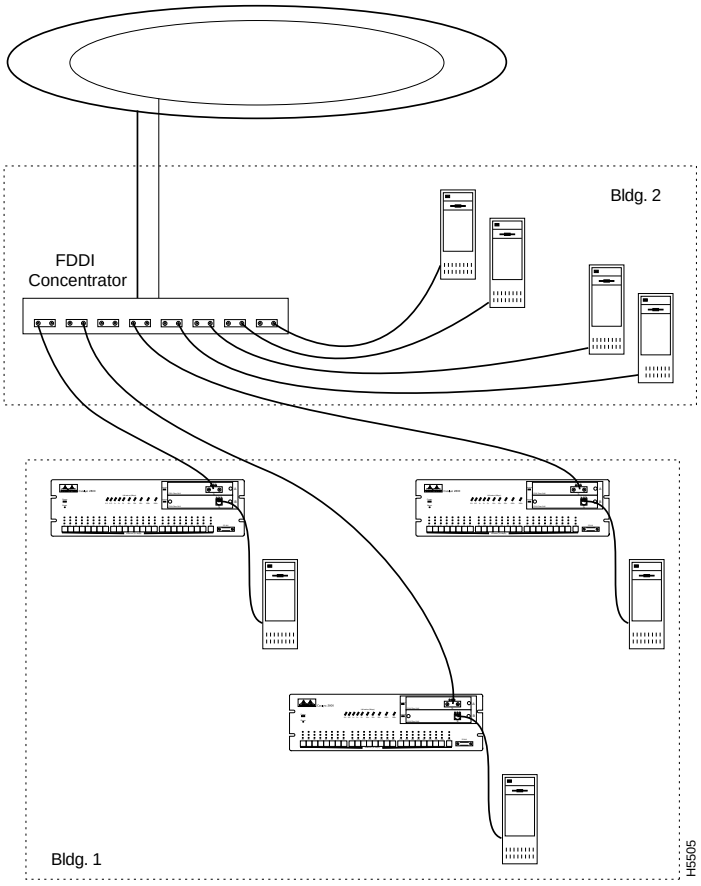
Figure 3-2 Catalyst 2800 Connected to a Concentrator in a Dual Homing Configuration via FDDI Fiber DAS



Catalyst 2800 Connected to a Concentrator via FDDI Fiber SAS

Figure 3-3 shows multiple Catalyst 2800s connected to a concentrator. Each Catalyst 2800 is configured with an FDDI Fiber SAS module and a 100BaseTX/1 module for a local server connection. This configuration also applies to a Catalyst 2800 connected to a server or router port.

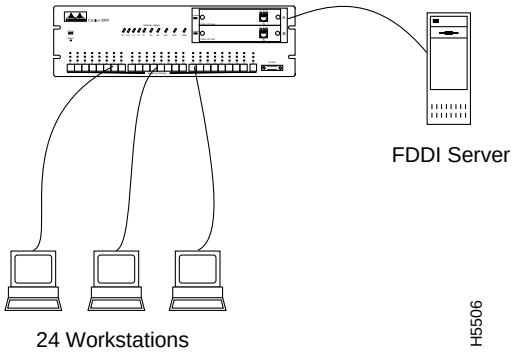
Figure 3-3 Catalyst 2800 Connected to a Concentrator via FDDI Fiber SAS



Catalyst 2800 Connected to a Server or Router via FDDI UTP SAS

Figure 3-4 shows a Catalyst 2800 connected to a server using a UTP SAS module. This configuration also applies to a Catalyst 2800 connected to a concentrator or router port.

Figure 3-4 Catalyst 2800 Connected to a Server or Router via FDDI UTP SAS



100Base-T Cabling Guidelines

This section describes 100Base-T cabling guidelines and some common configurations for Catalyst 2800 modules. The following cabling guidelines apply to a 100Base-T network:

- The maximum length for an Unshielded Twisted Pair (UTP) cable segment is 100 meters.
- Any cable segment longer than 100 meters must be fiber.
- A 100Base-T repeater is equivalent to 95 meters of cable.
- The maximum cable length between any two nodes on a repeated network is 305 meters.

To determine your cable budget, use the following formula:

400 - (R x 95) = Maximum cable length between any two nodes (in meters)

R represents the number of 100Base-T repeaters.

Table 3-2 lists the maximum cable length between two nodes in a 100Base-T network.

Table 3-2 Cabling Limits in a 100Base-T Network

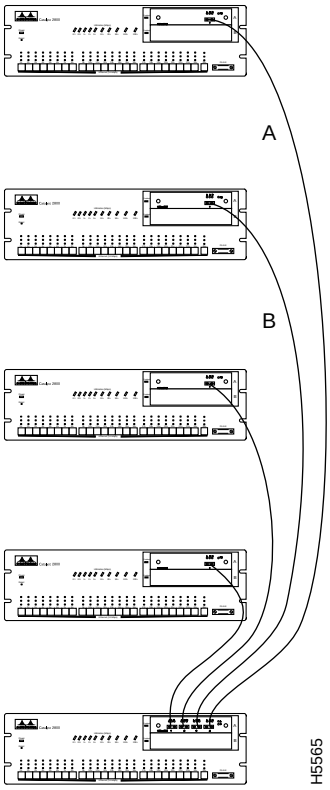
Number of Repeaters	Maximum Cable Length Between Two Nodes
0	400 meters
1	305 meters
2	210 meters

Note For switch-to-switch or switch-to-server (0 repeaters) and full duplex operation, the maximum cable length between any two nodes extends to two kilometers using fiber.

100Base-T Cabling Example

The maximum cable length between any two nodes in a one repeater 100Base-T network is 305 meters. Figure 3-5 illustrates this guideline. A Catalyst 2800 with a 100BaseFX/4 repeater module installed is connected to four other Catalyst 2800s via fiber. In this example, the total length of cable A plus cable B must be 305 meters or less.

Figure 3-5 100Base-T One Repeater Network



Common Catalyst 2800 Fast Ethernet Configurations

This section describes several common Catalyst 2800 network configurations:

- Catalyst 2800 connected to a high-performance client/server workgroup
- Catalyst 2800 connected to servers via fiber
- Catalyst 2800 connected to a fiber Fast Ethernet backbone

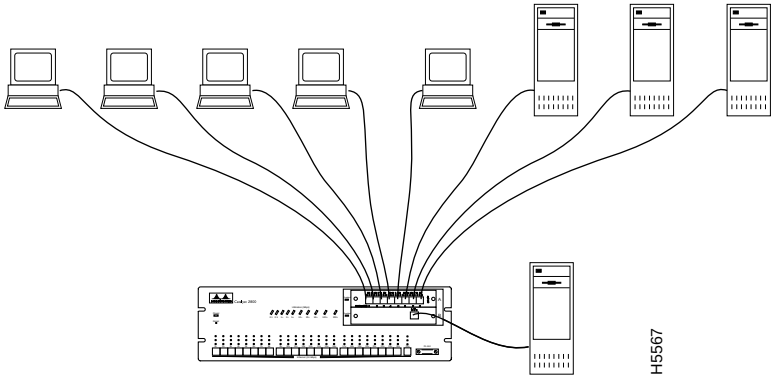
Catalyst 2800 Connected to a High-Performance Client/Server Workgroup

Figure 3-6 shows a Catalyst 2800 connected to a high-performance client/server workgroup using the following:

- One Catalyst 2800 with 100BaseTX/8 module installed.
- One Catalyst 2800 with 100BaseTX/1 module installed.

The servers and workstations are configured with 100Base-T adapters.

Figure 3-6 High-Performance Client/Server Workgroup



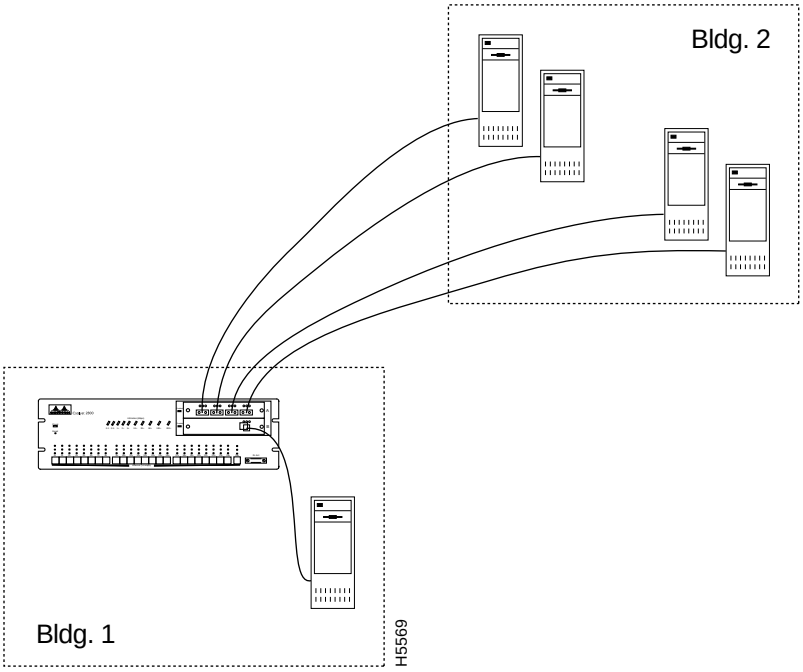
Catalyst 2800 Connected to Servers via Fiber

Figure 3-7 shows a Catalyst 2800 connected to several 100Base-T servers via fiber using the following:

- One Catalyst 2800 with 100BaseFX/4 module installed
- One Catalyst 2800 with 100BaseTX/1 module installed

The servers in building 2 in this example are configured with fiber 100Base-T adapters.

Figure 3-7 Catalyst 2800 Connected to Servers via Fiber



Catalyst 2800 Connected to a Fiber Fast Ethernet Backbone

Figure 3-8 shows multiple Catalyst 2800s connected via fiber in a high-rise building network environment using the following:

- Twelve Catalyst 2800s with 100BaseFX/1 modules installed
- One FastHub 112F

Figure 3-8 Catalyst 2800s Connected via Fiber in a High-Rise Building

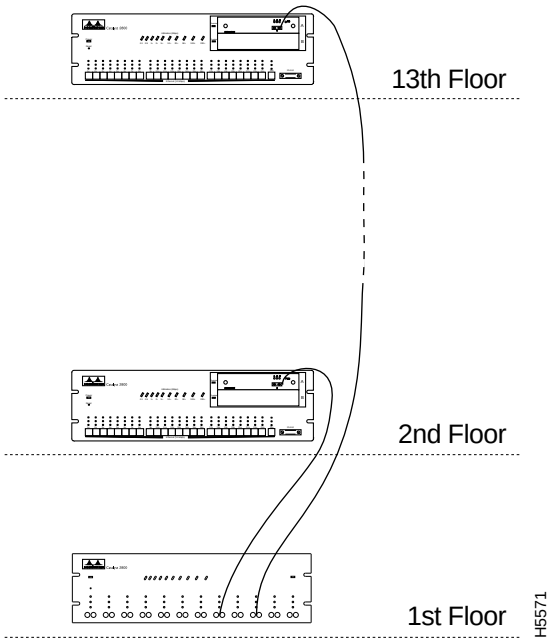


Figure 3-9 shows multiple Catalyst 2800s connected via fiber in a campus network environment using the following:

- Up to 12 Catalyst 2800s with 100BaseFX/1 modules installed
- One FastHub 112F

Figure 3-9 Catalyst 2800s Connected via Fiber in a Campus Environment

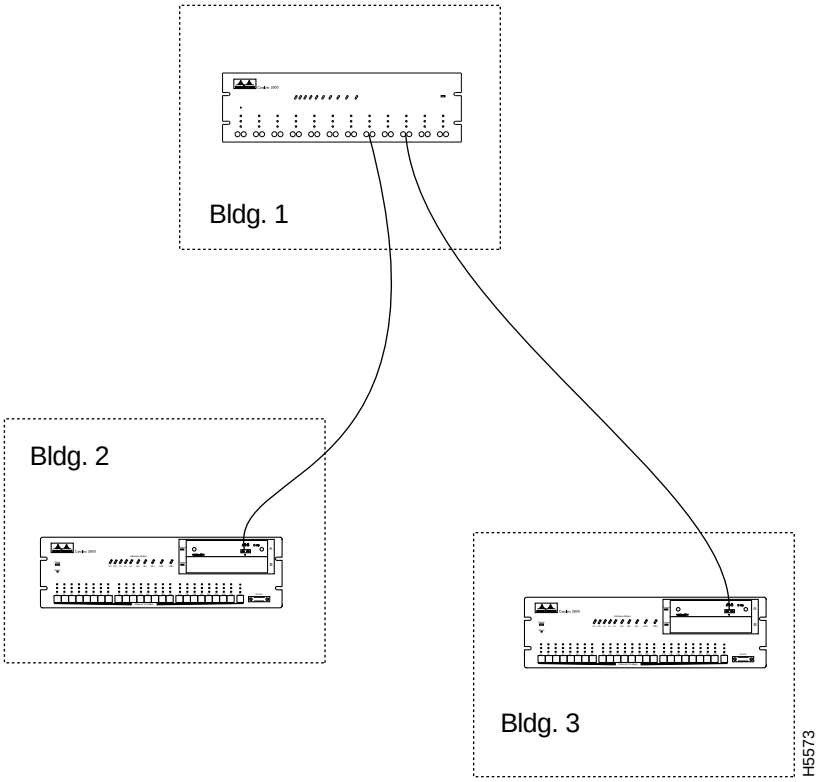


Figure 3-10 shows two Catalyst 2800s with the CollisionFree option connected via fiber using two Catalyst 2800s with 100BaseFX/1 modules installed.

With fiber and full duplex operation, the cable distance between two Catalyst 2800s extends to two kilometers.

Figure 3-10 Two Catalyst 2800s Connected via a Fiber Full Duplex Link