

# Planning

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This chapter describes the FDDI and 100BaseT cabling guidelines and several common EtherSwitch 1420 configurations using the EtherSwitch 1420 modules. The cabling guidelines and sample networks are divided according to the two groups of modules, FDDI and 100BaseT.

## 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-optic cable is 2 kilometers.

## Port Connections

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

## Common EtherSwitch 1420 FDDI Configurations

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**Table 3-1 Valid FDDI Port Configurations**

<b>Module Connection</b>	<b>Other Device</b>	<b>Description</b>
A	B	Peer connection between FDDI fiber-optic DAS and another DAS device on trunk ring.
B	A	Peer connection between FDDI fiber-optic DAS and another DAS device on trunk ring.
S	M	Connection between FDDI fiber-optic SAS or UTP SAS and concentrator.
A	M	Connection between FDDI fiber-optic DAS and concentrator. Used for dual homing.
B	M	Connection between FDDI fiber-optic DAS and concentrator. Used for dual homing.
S	S	Connection between FDDI fiber-optic SAS or UTP SAS and another SAS station.

## Common EtherSwitch 1420 FDDI Configurations

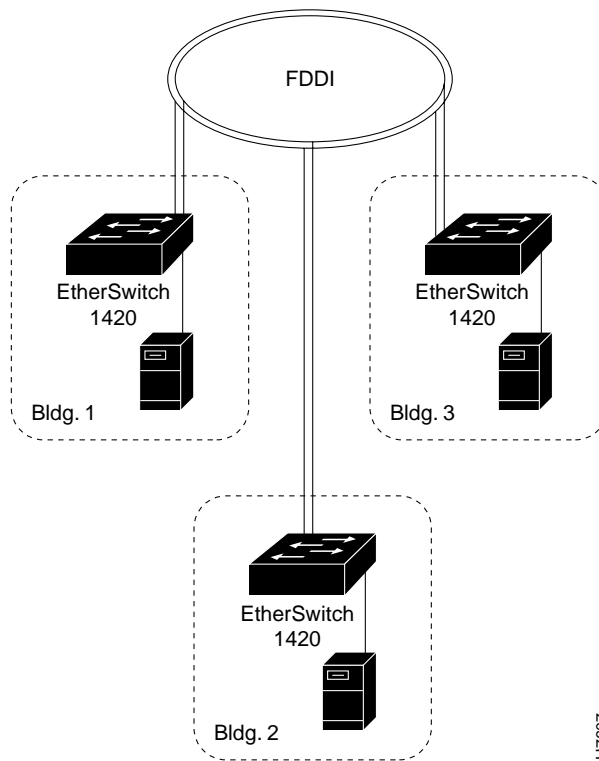
This section describes several common EtherSwitch 1420 network configurations:

- EtherSwitch 1420 connected to a trunk ring using FDDI Fiber DAS
- EtherSwitch 1420 connected to a concentrator in a dual-homing configuration using FDDI Fiber DAS
- EtherSwitch 1420 connected to a server, router, or concentrator using FDDI Fiber SAS
- EtherSwitch 1420 connected to a server, router, or concentrator using FDDI UTP SAS

## Trunk Ring Connection Using FDDI Fiber DAS

Figure 3-1 shows three EtherSwitch 1420s connected to a trunk ring. Each EtherSwitch 1420 is configured with an FDDI Fiber DAS module and a 100BaseTX/1 module for a local server connection.

Figure 3-1 Trunk Ring Connection Using FDDI Fiber DAS

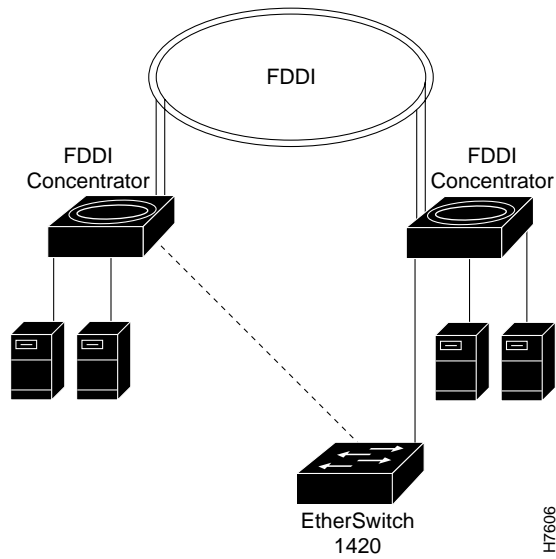


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## Concentrator Connection in a Dual-Homing Configuration Using FDDI Fiber DAS

Figure 3-2 shows an EtherSwitch 1420 connected to a concentrator in a dual-homing configuration using a fiber-optic DAS module.

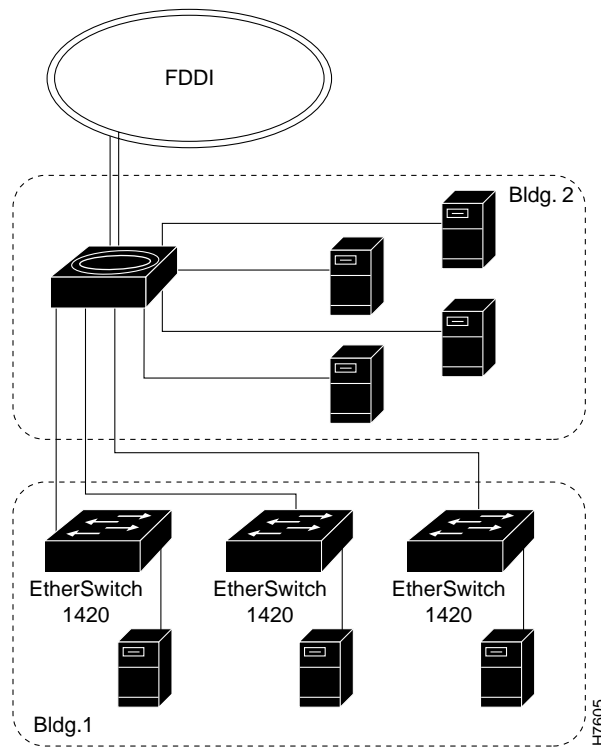
**Figure 3-2** Concentrator Connection in a Dual-Homing Configuration



## Concentrator Connection Using FDDI Fiber SAS

Figure 3-3 shows three EtherSwitch 1420s connected to a concentrator. Each EtherSwitch 1420 is configured with an FDDI Fiber SAS module and a 100BaseTX module for a local server connection. This configuration could also apply to an EtherSwitch 1420 connected to a server or router port.

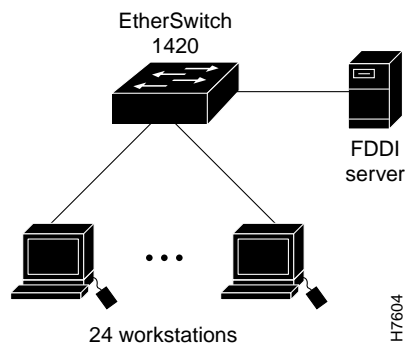
Figure 3-3 Concentrator Connection Using FDDI Fiber SAS



## Server or Router Connection Using FDDI UTP SAS

Figure 3-4 shows a server connected to an EtherSwitch 1420 with an installed FDDI UTP SAS module. This configuration could also apply to an EtherSwitch 1420 connected to a concentrator or router port.

**Figure 3-4 Server or Router Connection Using FDDI UTP SAS**



## 100BaseT Cabling Guidelines

This section describes 100BaseT cabling guidelines and some common EtherSwitch 1420 configurations. The following cabling guidelines apply to a 100BaseT 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-optic cabling.

The 100BaseT standard specifies that individual cable lengths do not exceed an overall cable budget. To determine your cable budget, use the following formula:

$$400 - (R \times 90) = \text{Maximum cable length between any two nodes (in meters).}$$

R represents the number of repeaters (shared 100BaseT modules or standalone hubs) between any two nodes.

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

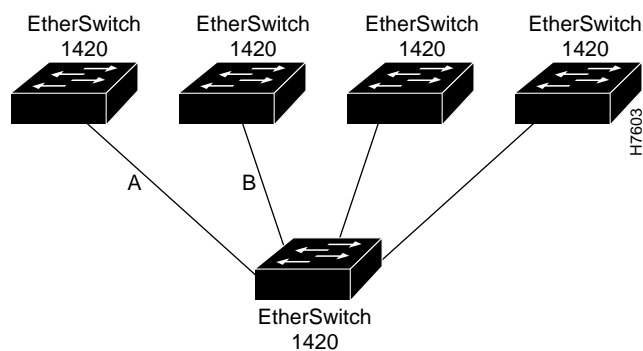
**Table 3-2 Cabling Limits in a 100BaseT Network**

Number of Repeaters	Maximum Cable Length Between Two Nodes
0	400 m
1	310 m
2	220 m

**Note** For switch-to-switch or switch-to-server connections in full-duplex mode, the maximum cable length between any two nodes extends to two kilometers using fiber-optic cabling.

## 100BaseT Cabling Example

The maximum cable length between any two nodes in a one-repeater 100BaseT network is 310 meters. Figure 3-5 illustrates this guideline. An EtherSwitch 1420 with a shared 100BaseFX module is connected with fiber-optic cable to four other EtherSwitch 1420 switches with switched 100BaseFX modules. In this example, the total length of cable A plus cable B must be 310 meters or less.

**Figure 3-5 100BaseT One-Repeater Network**

## Common EtherSwitch 1420 100BaseT Configurations

This section describes several common EtherSwitch 1420 network configurations:

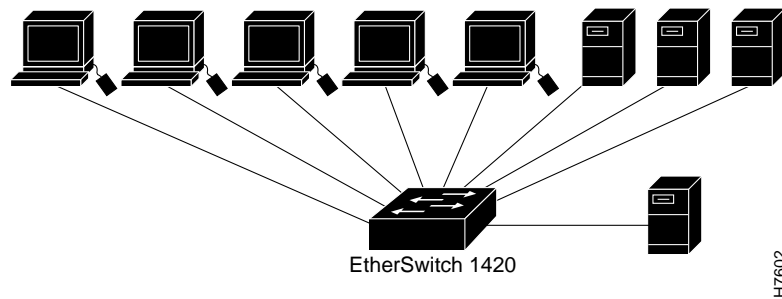
- EtherSwitch 1420 connected to a high-performance client-server workgroup
- EtherSwitch 1420s with 100BaseFX modules connected to servers
- EtherSwitch 1420s connected to a 100BaseFX backbone

### High-Performance Client/Server Workgroup Connection

Figure 3-6 shows an high-performance client-server workgroup connected to an EtherSwitch 1420 with one 8-port shared module and one 100BaseTX switched module.

The servers and workstations are configured with 100BaseT adapters.

**Figure 3-6 High-Performance Client/Server Workgroup Connection**

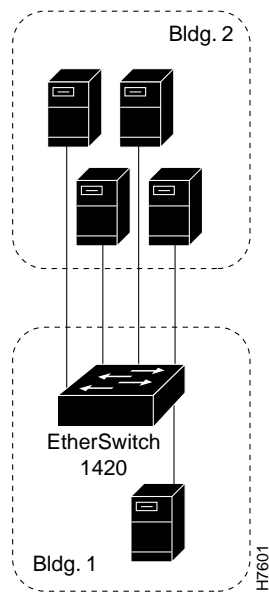




## Server Connection Using 100BaseFX Modules

Figure 3-7 shows an EtherSwitch 1420 connected to several 100BaseT servers. The EtherSwitch 1420 has a 4-port shared 100BaseFX module and a switched 100BaseFX module. The servers in building 2 are configured with 100BaseFX adapters.

**Figure 3-7 Server Connections Using 100BaseFX**



## 100BaseFX Backbone Connections

Figure 3-8 shows multiple EtherSwitch 1420s with switched 100BaseFX modules connected by fiber-optic cable in a high-rise network. With full-duplex operation over fiber-optic cabling, the cable length can extend to 2 kilometers.

**Figure 3-8 EtherSwitch 1420s with 100BaseFX Modules in a High-Rise Building**

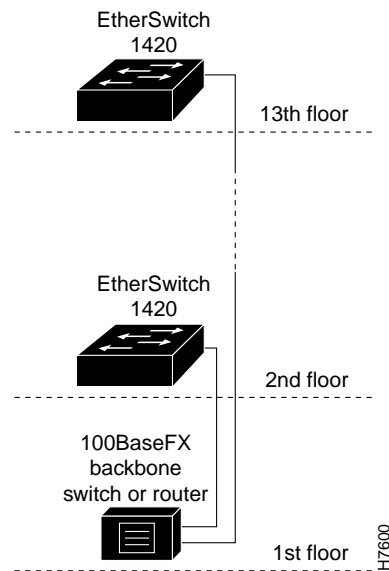
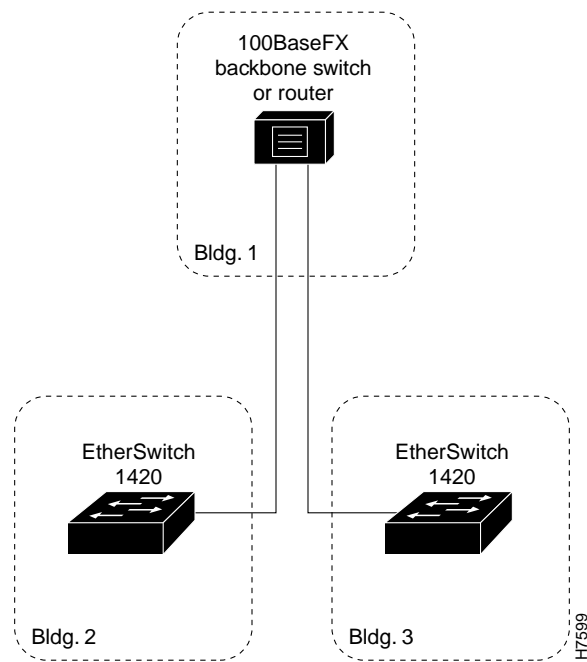


Figure 3-9 shows two EtherSwitch 1420s with switched 100BaseFX modules connected via fiber-optic cable in a campus network. With full-duplex operation over fiber-optic cabling, the cable length can extend to 2 kilometers.

**Figure 3-9 100BaseFX Connection in a Campus Environment**



## Common EtherSwitch 1420 100BaseT Configurations

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