Configuring FDDI Software

This chapter describes how to configure the FDDI software of the Cisco Catalyst 1800 Token Ring switch. It contains the following sections:

- Accessing the Configuration Menu
- Configuring FDDI MAC Parameters
- Configuring FDDI Path Parameters
- Configuring FDDI Port Parameters
- Configuring FDDI SMT Parameters

Accessing the Configuration Menu

The Configuration menu allows you to define the nonsecurity functions available on the FDDI board. Normally, the default for each parameter is listed on the corresponding menu.

To use the Configuration menu, type the following from the Main menu:

```
Configure
```

The Configuration menu appears (see Figure 7-1), listing the options you can access.

Figure 7-1 Configuration Menu with FDDI Parameters

```
        Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink


                  Select From

              Bridge
              IP
              Logical Segments
              NetBIOS
              Physical Ports
              Port Priority
              Prompt
              Serial Port
              SNMP
              STP Ports
              System
              TFTP

Catalyst 1800> Configure
```

The system displays the following prompt:

```
Enter Next Configuration Menu Selection
```

From this menu you can access the submenus that allow you to change various configuration parameters. We recommend you use the abbreviated text recognition feature described in the section "Abbreviated Text Recognition" in the chapter "Getting Started." For example, to access the configuration menu for the FDDI port, type the following command from the Main menu:

c ph *fddi_port #*

Configuring FDDI MAC Parameters

The MAC menu allows you to configure FDDI-specific media access control (MAC) parameters. To access the MAC menu, follow these steps.

Step 1 Type this command from the Main menu:

`Configure Physical Ports`

The system displays the following prompt:

```
Enter port number or 0 for setting all ports (FDDI Port = 5)
```

Step 2 Enter the FDDI port number. Note that the prompt lists the default as 5.

The Configuring Physical Port menu appears (see Figure 7-2).

Note From this menu, you can select any FDDI parameter. You can also type the Display command to display 802.5 configuration information.

Figure 7-2 Configuring Physical Ports Menu

```
Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

                Select From

Active Monitor
Address
Direct Attach
Early Release
MAC (FDDI)
Path (FDDI)
Port (FDDI)
Ring Speed
SMT (FDDI)
State
Display
```

```
Catalyst 1800>con phy 5 MAC
```

The following table describes the FDDI parameters on this menu and points to where you can find procedures describing their use.

Table 7-1 Configuration Menu Selections

Parameter	Allows you to . . .	For more information, see . . .
MAC (FDDI)	Set FDDI MAC parameters	"Configuring FDDI MAC Parameters"
Path (FDDI)	Set FDDI Path parameters	"Configuring FDDI Path Parameters"
Port (FDDI)	Set FDDI Port Parameters	"Configuring FDDI Port Parameters"
SMT (FDDI)	Set FDDI SMT Parameters	"Configuring FDDI SMT Parameters"

Step 1 To change a FDDI MAC parameter on this menu, use this syntax:

```
c ph 5 m
```

Note Note that the numeral 5 is a constant, because FDDI ports always use 5.

The Configuring Physical Ports FDDI MAC menu appears (see Figure 7-3) and the system displays the following prompt:

```
Enter Next Menu Selection
```

Figure 7-3 Configuring Physical Ports FDDI MAC Menu

```
    Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

                  Select From

               Address
               RequestedPaths
               UnitDataEnable
               Display
```

```
Catalyst 1800>con phy 5 MAC
```

When you specify one of the preceding parameters, the FDDI Configuration screen appears (see Figure 7-4) .

Figure 7-4 FDDI Configuration Screen

```
                        Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

                                        FDDI Configuration

                                                                                Primary      Secondary
MAC                                     PATH                                    (Nanosecs)   (Nanosecs)

Address:        00-05-77-ff-ff-06       MaxTReq:                                165000000    165000000
RequestedPaths: LO, SA, PA              TMaxLowerBound:                         165000000    165000000
UnitDataEnable: True                    TVXLowerBound:                          2500000      2500000

PORT            A             B         SMT

Action/State:   PC_Enable     PC_Enable Action/State:       Connect
ConnectPolicy:  None          None      Bypass:             Disable
LERAlarm:       8             8         RPTPolicy:          True
LERCutoff:      7             7         Tnotify:            30 sec
ConnectPolicy:  None          None      TraceMaxExp:        7000 ms
RequestedPaths:                         UserData:           FDDI SMT v7.3
         *None: LO            LO        ConnectPolicy:      AA,AS,BB,BS,SA,SB,MM
         *Tree: LO,CA,SP      LO,CA,PP
         *Peer: LO,CA,SP,TH LO,CA,PP,TH


Catalyst 1800> c ph 5 m a
```

The following table explains the MAC parameters on the FDDI Configuration screen. Other parameters are explained in subsequent sections.

Table 7-2 FDDI Configuration Parameters

<table>
<tr><th>Title</th><th>Description</th></tr>
<tr><td>Address</td><td>The MAC address for the FDDI port. The system accepts any valid MAC address.
The default is the MAC address shipped with the product.</td></tr>
<tr><td>RequestedPaths</td><td>The list of permitted paths that specifies the path(s) into which the MAC address may be inserted. They are the following types:
<table>
<tr><th>Path Type</th><th>Meaning</th></tr>
<tr><td>LO</td><td>Local. The local path refers to the segment(s) of ring(s), excluding the primary and secondary rings that pass through this node.</td></tr>
<tr><td>SA</td><td>Secondary-Alternate. The secondary path refers to the segment(s) of the secondary ring(s) that pass through this node.</td></tr>
<tr><td>PA</td><td>Primary-Alternate. The primary path refers to the segment(s) of the primary ring(s) that passes through this node.</td></tr>
<tr><td>CA</td><td>Concatenated-Alternate</td></tr>
<tr><td>SP</td><td>Secondary-Preferred</td></tr>
<tr><td>PP</td><td>Primary-Preferred</td></tr>
<tr><td>CP</td><td>Concatenated-Preferred. Cocatenated refers to the port inserted into both the primary and secondary paths in a cocatenated wrap configuration.</td></tr>
<tr><td>TH</td><td>Thru. Thru refers to the port inserted into both the primary and secondary paths in a thru configuration.</td></tr>
<tr><td>CA</td><td>Concatenated-Alternate. Cocatenated is defined as the port that is inserted in both the primary and secondary paths in a cocatenated wrap configuration.</td></tr>
</table>
Three default values are enabled: LO, SA, and PA</td></tr>
<tr><td>UnitDataEnable</td><td>Controls access of high-level protocols to the frame transmission and reception services of the port. To allow higher level protocols to transmit and receive frames, set UnitDataEnable to True.
The default value is True.</td></tr>
</table>

Address

Step 1 To change the Address parameter (that is, the FDDI MAC address), type this command:

```
c f m a
```

The system displays the following prompt:

```
Enter 12-digit hex MAC address (ex. 0102030a0b0c)
```

Step 2 Type the new MAC address in noncannonical format (MSB) for the FDDI port and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

RequestedPaths

Step 1 To change the RequestedPaths parameter, type this command:

```
c ph 5 m r
```

The system displays the following prompt:

```
Enter CA,CP,LO,PS,PP,SA,SP, or TH
```

Step 2 Choose the specific FDDI MAC RequestedPaths type you want to change. For example, to change the local from enable to disable, type this command:

```
c ph 5 m r l
```

The system displays the following prompt:

```
Enter Enable or Disable
```

Step 3 Type **enable** or **disable** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

UnitDataEnable

Step 1 To change the UnitDataEnable parameter, type this command:

```
c ph 5 m u
```

The system displays the following prompt:

```
Enter True or False
```

Step 2 Type **True** or **False** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

Configuring FDDI Path Parameters

The FDDI Path menu allows you to configure path parameter values. To access this menu, follow these steps.

Step 1 Type this command from the Main menu:

```
Configure Physical Port 5 Path
```

The system displays the following prompt:

```
Enter Primary or Secondary
```

Step 2 Enter **Primary** or **Secondary** and press **Return**.

Note We will use the primary path in all subsequent examples, although you can use the secondary path in the same manner.

The Configuring Physical Port menu appears (see Figure 7-2).

The system displays the following prompt:

```
Enter Next Menu Selection
```

Step 3 To change a parameter on this menu, use this syntax:

```
c ph 5  pa  p
```

The following menu appears (Figure 7-5) and the system prompts you to type the appropriate value for the Token Rotation Timer (TRT). Each MAC address has a TRT used to control ring scheduling during normal operation. A TRT can also be used to detect and recover from serious ring error situations.

Figure 7-5 Configuring Physical Ports FDDI Path Menu

```
Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

                Select From

MaxTReq
TMaxLowerBound
TVXLowerBound
Display
```

```
Catalyst 1800>c ph 5  pa  p
```

Caution Be *very* careful changing any FDDI Path parameters. They can seriously affect performance.

The following table describes the parameters on this screen.

Table 7-3 Physical Ports FDDI Path Menu Selections

Selection	Description
MaxTReq	The maximum time value of the requested target token rotation time (TTRT). For more information, see the section "MaxTReq." The range is TVXLowerBound < MaxTReq <=TMaxLowerBound. The default is 165,000,000 nsec.
TMaxLowerBound	Specifies the minimum time value of the maximum TTRT this station supports. The time value range is MaxTReq <= TMaxLowerBound. The default is 165,000,000 nsec.
TVXLowerBound	Specifies the minimum time value of the maximum available time between valid transmissions. The station uses this value to recover from ring error conditions. The value range is 0 to 2147483647. The default is 2,500,000 nsec.

MaxTReq

The MaxTReq parameter specifies the maximum time value of the requested target token rotation time (TTRT), in nanoseconds, for this station's synchronous traffic. The TTRT is the time limit within which the station expects to receive and use the token. The TTRT for the ring is determined at ring initialization, when each station declares what it wants the TTRT to be. (This process is called bidding.)

Step 1 To change the MaxTReq parameter value, type this command:

```
c ph 5 pa p m
```

The system displays the following prompt:

```
Enter MaxTReq (range: TVXLowerBound < MaxTReq <= TMaxLowerBound)
```

Step 2 Type the new FDDI Primary Path MaxTReq value for the FDDI port and press **Return**. The value must be greater than that of the TMaxLowerBound parameter and less than or equal to that of the TMaxLowerBound parameter.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

TMaxLowerBound

Step 1 To change the TMaxLowerBound parameter, type this command:

```
c ph 5 pa p tm
```

The system displays the following prompt:

```
Enter TMaxLowerBound (range: MaxTReq <= TMaxLowerBound)
```

Step 2 Type the new value and press **Return**. The value must be greater than or equal to that of the MaxTReq parameter.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

TVXLowerBound

Step 1 To change the TVXLowerBound parameter, type this command:

```
c ph 5 pa p tv
```

The system displays the following prompt:

```
Enter TVXLowerBound (range: 0 < TVXLowerBound < MaxTReq)
```

Step 2 Enter the new value and press **Return**. The value must be greater than 0 and less than that of the MaxTReq parameter. The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

Configuring FDDI Port Parameters

The FDDI Port menu allows you to configure FDDI Port parameters. To access this menu, follow these steps.

Step 1 Type this command from the Main menu:

```
con phy 5 po a
```

The system displays the following prompt:

```
Enter Port number A or B
```

Note In the subsequent examples, we use port A. However, you can perform the same procedures with port B.

The FDDI Port Configuration menu appears (Figure 7-6) and displays the following prompt.

```
Enter Next Menu Selection.
```

Figure 7-6 FDDI Port Configuration Menu

```
        Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

                        Select From

                      Action
                      ConnectionPolicy
                      LERAlarm
                      LERCutoff
                      RequestedPaths
                      Display


Catalyst 1800>con phy 5 po a
```

Step 2 To change a parameter for port A on this menu, type this command:

```
c ph 5  po  a menu_selection
```

The following table describes the parameters.

Table 7-4 FDDI Port Configuration Parameters

Title	Description
Action/State	A value representing the type of action taken on the port. The hardware port is implemented through a physical connection management (PCM) state machine that defines the rules governing the allowable topologies in a FDDI ring. You can perform the following actions: **Action** — **Meaning** PC_Maint — Generates a signal to PCM indicating that the PCM state machine should enter the maint state. This value causes a transition to maint state only when the signal is issued while the PCM state machine is in the off state. PC_Enable — Generates a signal to PCM indicating that the PCM state machine should cause a transition from maint state to the off state. PC_Disable — Generates a signal to PCM indicating that the PCM state machine should cause a transition to the maint state. This value causes a transition to the maint state from any state of the PCM. PC_Start — Generates a signal to PCM indicating that the PCM state machine should enter the break state. ECM signals PC_Start to start the PCM state machine. PC_Stop — Generates a signal to PCM indicating that the PCM state machine should enter the off state. This value causes a transition to the off state from any state of the PCM except the maint state. There is no default value.
ConnectionPolicy	A value representing the port's connection policies desired in the node. **Value** — **Meaning** None — There is no connection policy. LCT — The link confidence test. The MAC is used to run the link confidence test to determine if the test passed or failed. Loop — The local loop test. Run this test before a connection is made active to determine if the test passed or failed. The default value is None.
LERAlarm	The link error rate at which a link connection exceeds a preset alarm threshold. It ranges from 10^{-4} to 10^{-15} and is reported as the absolute value of the base 10 logarithm. The range is 4 to 15. The default is 8. For example, a value of 4 indicates that the link error rate is 10^{-4} or one error in 10, 000 frames.
LERCutoff	The link error rate estimate at which a link connection will be broken. It ranges from 10^{-4} to 10^{-15} and is reported as the absolute value of the base 10 logarithm. The default is 7. The range is 4 to 15. For example, a value of 4 indicates that the link error cutoff rate is 10^{-4} or one error in 10, 000 frames.

Title	Description
RequestedPaths	A list of permitted paths where each list element defines the port's permitted paths. For descriptions of these port defaults, see Table 7-2.

Value	Meaning
Peer(P)	Neither the port currently under control nor the port at the other end of the connection is of type M (an FDDI concentrator).
Tree(T)	A port at one end of the connection is of type M.
None (N)	Nothing has been established.

Port A Defaults	Port B Defaults
None: LO	LO
Tree: LO, CA, SP	LO, CA, PP
Peer: LO, CA, SP, TH	LO, CA, PP, TH

Action

Caution Be careful changing any FDDI port action parameter. If you want to enable or disable the FDDI port, refer to the SMT section called “Action.”

Step 1 To change the Action parameter value for port A, type this command:

```
c ph 5 po a a
```

The system displays the following prompt:

```
Enter PC_Enable,PC_Disable,PC_Maint,PC_Start,or PC_Stop
```

Step 2 Type the new Action parameter value for the FDDI port and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

ConnectPolicy

Step 1 To change the ConnectPolicy parameter value for port A, type this command:

```
c ph 5 po a c
```

The system displays the following prompt:

```
Enter LCT or Loop
```

Step 2 Type **LCT** to indicate the link confidence test or **Loop** to indicate a local loop test.

The system displays the following prompt:

```
Enter Enable or Disable
```

Step 3 Type **Enable** or **Disable** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

LERAlarm

Step 1 To change the LERAlarm parameter value for port A, type this command:

```
c ph 5 po a lera
```

The system displays the following prompt:

```
Enter Link Error Rate Alarm (range: 4-15)
```

Step 2 Type the new parameter value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

LERCufoff

Step 1 To change the LERCutoff parameter value for port A, type this command:

```
c ph 5 po a lerc
```

The system displays the following prompt:

```
Enter Link Error Rate Cutoff (range: 4-15)
```

Step 2 Type the new parameter value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

RequestedPaths

Step 1 To change the RequestedPaths parameter value for port A, type this command:

```
c ph 5 po a r
```

The system displays the following prompt:

```
Enter None, Tree, or Peer
```

Step 2 Type **none**, **tree**, or **peer** and press **Return**.

The system responds:

```
Enter CA,CP,LO,PA,PP,SA,SP, or TH
```

Step 3 Enter the path value and press **Return**. The system displays the following prompt:

```
Enter Enable or Disable
```

Step 4 Type **Enable** or **Disable** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

Configuring FDDI SMT Parameters

The FDDI SMT menu allows you to configure FDDI SMT parameters. To access this menu, follow these steps.

Step 1 Type this command from the Main menu:

```
con phy 5 po sm
```

The Configuring Physical Ports FDDI SMT menu appears (see Figure 7-7) and displays the following prompt:

```
Enter Next Menu Selection
```

Figure 7-7 Configuring Physical Ports FDDI SMT Menu

```
Cisco Systems Catalyst 1800 Token Ring/FDDI Uplink

Select From

Action
Bypass
ConnectionPolicy
RPTPolicy
TNotify
TraceMaxExp
UserData
Display


Catalyst 1800>con phy 5 po sm
```

Note From this menu you can select any SMT parameter. You can also type the Display command.

Step 2 To change a parameter on this menu, use this syntax:

```
c ph 5 smt  parameter_name
```

The system prompts you to type the appropriate value.

The following table describes the parameters.

Table 7-5 Physical Ports FDDI SMT Menu Selections

Selection	Description	
Action/State	A value representing the type of action taken on the station. The following actions are available:	
	Action	**Result**
	Connect	Generates a connect message for this station to join the ring. To enable both port A and B of the FDDI port, issue a Connect action.
	DisableA	Generates a PC-stop signal to port A. To disable only port A of the FDDI port, issue a DisableA action.
	DisableB	Generates a PC-stop signal to port B. To disable only port B of the FDDI port, issue a DisableB action.
	Disconnect	Generates a disconnect sequence to remove this station from the ring. To disable both port A and B of the FDDI port, issue a Disconnect action.
	PathTest	Generates a message to perform a station path test
	SelfTest	Generates a message to perform a station self test
Bypass	If set to Enable, the bypass switch is enabled, if present. If set to Disable, the bypass switch is disabled. The default is Disable.	

<table>
<tr><th>Selection</th><th>Description</th></tr>
<tr><td>ConnectPolicy</td><td>The rejection list of connection types. The connection rules matrix that follows summarizes the validity of, and the action to be taken for, each type of connection. For more information, see the section entitled “ConnectionPolicy.”
<table>
<tr><th>Policy</th><th>Rule</th></tr>
<tr><td>AA</td><td>Reject A-A</td></tr>
<tr><td>AB</td><td>Reject A-B</td></tr>
<tr><td>AS</td><td>Reject A-S</td></tr>
<tr><td>AM</td><td>Reject A-M</td></tr>
<tr><td>BA</td><td>Reject B-A</td></tr>
<tr><td>BB</td><td>Reject B-B</td></tr>
<tr><td>BS</td><td>Reject B-S</td></tr>
<tr><td>BM</td><td>Reject B-M</td></tr>
<tr><td>SA</td><td>Reject S-A</td></tr>
<tr><td>SB</td><td>Reject S-B</td></tr>
<tr><td>SS</td><td>Reject S-S</td></tr>
<tr><td>SM</td><td>Reject S-M</td></tr>
<tr><td>MA</td><td>Reject M-A</td></tr>
<tr><td>MB</td><td>Reject M-B</td></tr>
<tr><td>MS</td><td>Reject M-S</td></tr>
<tr><td>MM</td><td>Reject M-M</td></tr>
</table>
The default is AA, AS, BB, BS, SA, SB, and MM. This means that these seven connection types are excluded from the connection and that the remaining connection types (such as MS) are valid.</td></tr>
<tr><td>RPTPolicy</td><td>If you specify True, the node sends a status reporting frame when there is a change in configuration.
The valid values are True or False.
The default value is True.</td></tr>
<tr><td>TNotify</td><td>Causes a neighbor notification frame to be sent in the specified time interval. The range is from 2 to 30 seconds.
The default value is 30 seconds.</td></tr>
<tr><td>TraceMaxExp</td><td>The maximum propagation time for a trace on an FDDI ring</td></tr>
<tr><td>UserData</td><td>This variable contains 32 characters of user-defined information. The information is expressed in an ASCII string, which you can modify to reflect your needs.
The range is from 1 to 32 characters.
The default value is “FDDI SMT v7.3”.</td></tr>
</table>

Action

Step 1 To change the value of the Action parameter, type this command:

```
c ph 5 sm a
```

The system displays the following prompt:

```
Enter Connect, Disconnect, DisableA, DisableB, PathTest, or SelfTest
```

Step 2 Enter an action from the Configuring Physical Ports FDDI SMT Action menu and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

Bypass

Step 1 To change the value of the Bypass parameter, type this command:

```
c ph 5 sm b
```

The system displays the following prompt:

```
Enter Enable or Disable
```

Step 2 Enter **Enable** or **Disable** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

ConnectionPolicy

The ConnectionPolicy parameter specifies the rejection list of connection types for ports at both ends of a physical connection. The types of ports (A, B, S, or M) determine the characteristics of the physical connection. These characteristics include whether the connection is accepted or rejected, whether SMT is notified of potential connection problems, and the connection mode that is established.

A connection may be rejected to prevent the establishment of illegal or undesirable topologies. It may also be rejected by a neighboring node because of that node's inability to support the connection.

Step 1 To change the value of the ConnectionPolicy parameter, type this command:

```
c ph 5 sm conn
```

The system displays the following prompt:

```
Enter AA,AB,AS,AM,BA,BB,BS,BM,SA,SB,SS,SM,MA,MB, or MS
```

Step 2 Enter the new ConnectionPolicy and press **Return**.

For example, enter **c ph 5 sm conn AA** and press **Return**.

The system displays the following prompt:

```
Enter Enable or Disable
```

Step 3 Type the new parameter value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

RptPolicy

Step 1 To change the value of the RptPolicy parameter, type this command:

```
c ph 5 sm rpt
```

The system displays the following prompt:

```
Enter True or False
```

Step 2 Type **True** or **False** and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

TNotify

Step 1 To change the value of the TNotify parameter, type this command:

```
c ph 5 sm tn
```

The system displays the following prompt:

```
Enter Tnotify (range 2-30 seconds)
```

Step 2 Enter the value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

TraceMaxExp

Step 1 To change the value of the TraceMaxExpirations parameter, type this command:

```
c ph 5 sm tr
```

The system displays the following prompt:

```
Enter TraceMaxExpiration (range: >6001773 micro sec)
```

Step 2 Enter the value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).

UserData

Step 1 To change the value of the UserData parameter, type this command:

```
c ph 5 sm  u
```

The system displays the following prompt:

```
Enter User Data (range: 0-32 characters)
```

Step 2 Enter the value and press **Return**.

The new parameter value appears on the FDDI Configuration screen (see Figure 7-4).