CHAPTER 4

Configuring Ethernet and Fast Ethernet Software

This chapter describes the procedures used to configure the Fast Ethernet ports on the supervisor engine module, the Fast Ethernet switching module, and the Ethernet switching module using the command line interface.

Note For definitions of all commands discussed in this chapter, refer to the "Command Reference" chapter of this document.

Default Configuration

The features you can customize have default values that will most likely suit your environment and probably need not be changed. The default values of these features are set as follows:

- No port name is configured for any port.
- All ports are set to normal priority level.
- All 10/100 Mbps Fast Ethernet switching module ports are set to **auto**.
- All 10 Mbps and 100 Mbps Ethernet and Fast Ethernet module ports are set to half duplex. All 10/100 Mbps Fast Ethernet module ports are set to **auto**.

Customizing the Configuration

As the default configuration, all Ethernet and Fast Ethernet ports are enabled. To configure these ports, complete the tasks in the following sections:

- Setting the Port Name
- Setting the Port Priority Level
- Setting the Port Speed (for the 10/100 Mbps Fast Ethernet module only)
- Setting the Port Transmission Type

Refer to the end of this chapter for switch configuration examples.

Setting the Port Name

Assign a name to each port. To set a port name, perform the following tasks in privileged mode:

Task	Command
Configure a name for a port. Figure 4-1 shows an example of the **set port name** command.	**set port name** *mod_num/port_num [name_string]*
Verify that the port name is correct. Figure 4-2 shows a sample display of the **show port** command. Port names are listed in the Name column.	**show port** *mod_num/port_num*

Figure 4-1 set port name Command Example

```
Console> (enable) set port name 1/1 Router Connection
Port 1/1 name set.
Console> (enable) set port name 1/2 Server 1
Port 1/2 name set.
```

Figure 4-2 show port Command Display Sample

```
Console> (enable) show port
Port Name                 Status   Vlan     Level  Duplex Speed Type
---- -------------------- -------- -------- ------ ------ ----- -------
1/1  Router Connection    ready    2        high     half   100 100BaseTX
1/2  Server 1             ready    1        high     half   100 100BaseTX
2/1                       ready    10       normal   half    10 10BaseT
2/2                       disabled 10       normal   half    10 10BaseT
2/3                       connect  10       normal   half    10 10BaseT
2/4                       connect  10       normal   half    10 10BaseT
.
.
.
2/23          0          0          0          0          0          0
2/24          0          0          0          0          0          0

Port Align-Err  FCS-Err    Xmit-Err   Rcv-Err
---- ---------- ---------- ---------- ----------
1/1           0          0          0          0
1/2           1          0          0          0
2/1           0          0          0          0
2/2           0          0          0          0
2/3           0          0          0          0
2/4          30          0          0          0
2/5           0          0          0          0
2/6           0          0          0          0
2/7           0          0          0          0
2/8           0          0          0          0
2/9           0          0          0          0
2/10          0          0          0          0
2/11          0          0          0          0
2/12          0          0          0          0
```

```
Port Single-Col Multi-Coll Late-Coll  Excess-Col Carri-Sens Giants
---- ---------- ---------- ---------- ---------- ---------- ----------
1/1           0          0          0          0          0          0
1/2         680        418          0          1          0          -
2/1         756         99          0          0          0          0
2/2           0          0          0          0          0          0
2/3           0          0          0          0          0          0
2/4         409        403          0         11          0       1256
2/5           0          0          0          0          0          0
2/6           0          0          0          0          0          0
2/7           0          0          0          0          0          0
2/8           0          0          0          0          0          0
2/9           0          0          0          0          0          0
2/10          0          0          0          0          0          0
2/11          0          0          0          0          0          0
2/12          0          0          0          0          0          0

Last-Time-Cleared
--------------------------
Thu Jun 8 1995, 07:58:06
Console> (enable)
```

Setting the Port Priority Level

Configure the priority level of each port. When ports request simultaneous access to the switching bus, the Catalyst 5000 series switch uses the port priority level to determine the order in which ports have access to the switching bus. To set the priority level, perform the following tasks in privileged mode:

Task	Command
Configure the priority level for each port. Figure 4-3 shows an example of the **set port level** command.	**set port level** *mod_num/port_num* **normal** | **high**
Verify that the port priority level is correct. Figure 4-2 shows a sample display of the **show port** command. Port priority levels are listed in the Level column.	**show port** *mod_num/port_num*

Figure 4-3 set port level Command Example

```
Console> (enable) set port level 1/1 high
Port 1/1 level set to high.
Console> (enable) set port level 1/2 high
Port 1/2 level set to high.
```

Setting the Port Speed

Configure the port speed for 10/100BaseTX ports on the 10/100 Mbps Fast Ethernet Switching module if desired. To set the port speed for a port, perform the following steps in privileged mode.

Task	Command
Set the port speed of a port. Figure 4-4 shows an example of the **set port speed** command.	**set port speed** *mod num/port num* **[*10* | *100* | *auto*]**
Verify that the port speed has been set correctly. Figure 4-2 shows a sample display of the **show port** command.	**show port** *mod_num/port_num*

Note Interfaces automatically configure themselves to operate at the proper speed and transmission type (simplex or duplex) when you set the port speed of a 10/100 Mbps Fast Ethernet Switching module to **auto**.

Figure 4-4 set port speed Command Example

```
Console> (enable) set port speed
Usage: set port speed <mod_num/port_num> <10|100|auto>
Console> (enable) set port speed 2/1 auto
Port 2/1 speed set to auto-sensing mode.
Console> (enable) set port speed 2/2 10
Port 2/2 speed set to 10 Mbps.
Console> (enable) set port speed 2/3 100
Port 2/3 speed set to 100 Mbps.
```

Figure 4-5 show port Command Example

```
Console> show port 4
a = auto-detect of speed

Port Name                 Status   Vlan       Level  Duplex Speed  Type
---- -------------------- -------- ---------- ------ ------ -----  ------------
4/1   FDDI A              standby  1                 half   100    FDDI
4/2   FDDI B              connect  1                 half   100    FDDI
Ler
Port CE-State Conn-State Type Neig Con Est Alm Cut Lem-Ct     Lem-Rej-Ct Tl-Min
---- -------- ---------- ---- ---- --------------- ---------- ---------- ------
4/1  isolated standby    A    U    yes   9   8   7          0          0 61
4/2  isolated active     B    U    yes   9   8   7          0          0 1340000
Last-Time-Cleared
--------------------------
Tues Aug 22 1995, 18:28:51
Console>
```

Setting the Port Transmission Type

Set the transmission type to full or half duplex for the ports that will be used. To set the transmission type of a port, perform the following steps in privileged mode:

Task	Command
Set the transmission type of a port. Figure 4-6 shows an example of the **set port duplex** command**.**	**set port duplex** *mod num/port num* **full** | **half**
Verify that the transmission type has been set correctly. Figure 4-2 shows a sample display of the **show port** command. The transmission type is listed in the Duplex column.	**show port** *mod_num/port_num*

Note When a port is in autosensing mode, both its speed and duplex are determined by autosensing. An error message is generated if you attempt to set the transmission type of autosensing ports. On a 10/100 module, if a port speed is set to **auto**, its transmission type (duplex) will also set to **auto** automatically, i.e., the duplex of an autospeed port is not settable.

Figure 4-6 set port duplex Command Example

```
Console> (enable) set port duplex 2/1 half
Port 2/1 set to half-duplex.
Console> (enable) set port duplex 2/2 half
Port 2/2 set to half-duplex.
```

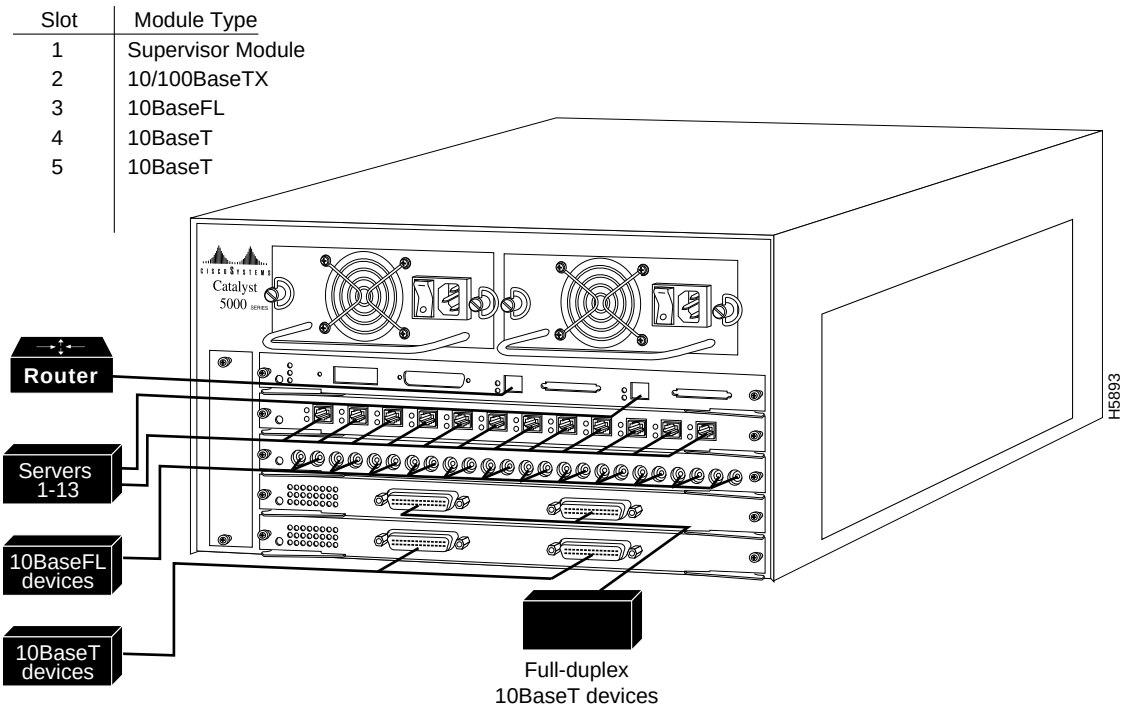
Single Switch Configuration Example

A simple Catalyst 5000 series switch configuration example is shown in Figure 4-7. The configuration illustrates a case that includes the following elements:

- 1 full-duplex Fast Ethernet connection to a router
- 13 full-duplex Fast Ethernet connections to servers (1 connection on card 1 and 12 connections on card 2)
- 12 half-duplex 10BaseFL Ethernet connections to servers
- 24 full-duplex 10BaseT Ethernet connections to network devices
- 24 half-duplex 10BaseT Ethernet connections to network devices
- Low traffic priority assignments for all 10BaseT and 10BaseFL connections
- High traffic priority assignments for all Fast Ethernet connections

For simplicity, this example shows all devices on each module as either full duplex or half duplex; however, each port on each module can be independently configured for either full- or half-duplex operation. Also, this example shows a direct correlation between port speed and traffic priority, although the two parameters are completely independent of one another. All ports are in VLAN 1 as a default setting, so no customization is necessary for the ports.

Figure 4-7 Single Catalyst 5000 Series Switch Configuration



Port Name Example

The following example illustrates how to establish the port name for the Catalyst 5000 series switch provided in the single switch configuration example and shown in Figure 4-7:

```
system1 (enable) set port name 1/1 Router Connection
Port 1/1 name set.
system1 (enable) set port name 1/2 Server 1
Port 1/2 name set.
system1 (enable) set port name 2/1 Server 2
Port 2/1 name set.
system1 (enable) set port name 2/2 Server 3
Port 2/2 name set.
.
.
.
system1 (enable) set port name 2/12 Server 13
Port 2/12 name set.
system1 (enable) set port name 3/1 Nodename 1
Port 3/1 name set.
system1 (enable) set port name 3/1 Nodename 2
Port 3/2 name set.
system1 (enable) set port name 3/1 Nodename 3
Port 3/3 name set.
.
.
.
system1 (enable) set port name 3/12 Nodename 12
Port 3/12 name set.
system1 (enable) set port name 4/1 Nodename 13
Port 4/1 name set.
system1 (enable) set port name 4/2 Nodename 14
Port 4/2 name set.
system1 (enable) set port name 4/3 Nodename 15
Port 4/3 name set.
.
.
.
system1 (enable) set port name 4/24 Nodename 36
Port 4/24 name set.
system1 (enable) set port name 5/1 Nodename 37
Port 5/1 name set.
system1 (enable) set port name 5/2 Nodename 38
Port 5/2 name set.
system1 (enable) set port name 5/3 Nodename 39
Port 5/3 name set.
.
.
.
system1 (enable) set port name 5/24 Nodename 60
Port 5/24 name set
```

Port Priority Level Example

The following example illustrates how to establish the port priority level for the Catalyst 5000 series switch provided in the single switch configuration example and shown in Figure 4-7:

```
system1 (enable) set port level 1/1 high
Port 1/1 level set to high.
system1 (enable) set port level 1/2 high
Port 1/2 level set to high.
system1 (enable) set port level 2/1 high
Port 2/1 level set to high.
system1 (enable) set port level 2/2 high
Port 2/2 level set to high.
system1 (enable) set port level 2/3 high
Port 2/3 level set to high.
.
.
.
system1 (enable) set port level 2/12 high
Port 2/12 level set to high.
system1 (enable) set port level 3/1 normal
Port 3/1 level set to normal.
system1 (enable) set port level 3/2 normal
Port 3/2 level set to normal.
system1 (enable) set port level 3/3 normal
Port 3/3 level set to normal.
.
.
.
system1 (enable) set port level 3/12 normal
Port 3/12 level set to normal.
system1 (enable) set port level 4/1 normal
Port 4/1 level set to normal.
system1 (enable) set port level 4/2 normal
Port 4/2 level set to normal.
system1 (enable) set port level 4/3 normal
Port 4/3 level set to normal.
.
.
.
system1 (enable) set port level 4/24 normal
Port 4/24 level set to normal.
system1 (enable) set port level 5/1 normal
Port 5/1 level set to normal.
system1 (enable) set port level 5/2 normal
Port 5/2 level set to normal.
system1 (enable) set port level 5/3 normal
Port 5/3 level set to normal.
.
.
.
system1 (enable) set port level 5/24 normal
Port 5/24 level set to normal.
```

Port Transmission Type Example

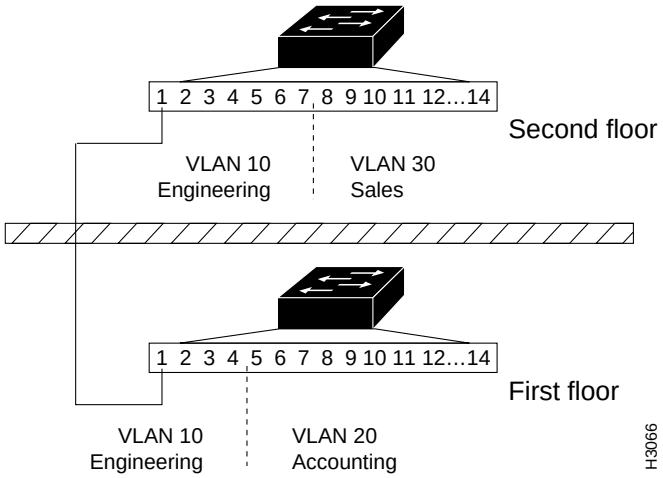
The following example illustrates how to set the port transmission type (half or full duplex) for the Catalyst 5000 series switch provided in the single switch configuration example and shown in Figure 4-7:

```
system1 (enable) set port duplex 1/1 full
Port 1/1 set to full-duplex.
system1 (enable) set port duplex 1/2 full
Port 1/2 set to full-duplex.
system1 (enable) set port duplex 3/1 half
Port 3/1 set to half-duplex.
system1 (enable) set port duplex 3/2 half
Port 3/2 set to half-duplex.
system1 (enable) set port duplex 3/3 half
Port 3/3 set to half-duplex.
.
.
.
system1 (enable) set port duplex 3/12 half
Port 3/12 set to half-duplex.
system1 (enable) set port duplex 4/1 full
Port 4/1 set to half-duplex.
system1 (enable) set port duplex 4/2 full
Port 4/2 set to half-duplex.
system1 (enable) set port duplex 4/3 full
Port 4/3 set to half-duplex.
.
.
.
system1 (enable) set port duplex 4/24 full
Port 4/24 set to half-duplex.
system1 (enable) set port duplex 5/1 half
Port 5/1 set to half-duplex.
system1 (enable) set port duplex 5/2 half
Port 5/2 set to half-duplex.
system1 (enable) set port duplex 5/3 half
Port 5/3 set to half-duplex.
.
.
.
system1 (enable) set port duplex 5/24 half
Port 5/24 set to half-duplex.
```

Multiple Switch VLAN Configuration Example

VLAN groups can be set up across multiple Catalyst 5000 series switches if the switches have any two ports of the same VLAN connected, as shown in the example in Figure 4-8.

Figure 4-8 Multiple Catalyst 5000 VLAN Configuration



The trunks and VLANs for the Catalyst 5000 series switch 1 on the first floor were configured as follows:

```
System1> (enable) set vtp domain abc
VTP: domain abc modified

System1> (enable) set vlan 10
VTP: vlan addition successful

System1> (enable) set vlan 10 2/1-4
VLAN 10 modified.
VLAN 1 modified.
VLAN  Mod/Ports
---- ----------------------
10    2/1-4

System1> (enable) set vlan 20
VTP: vlan addition successful

System1> (enable) set vlan 20 2/5-24
VLAN 20 modified.
VLAN 1 modified.
VLAN  Mod/Ports
---- ----------------------
20    2/5-24

System1> (enable) set trunk 1/2 on
Port 1/2 mode set to on.
System1> (enable)
Mon May 6 1996, 18:22:07  Port 1/2 has become trunk.
```

```
System1> (enable) show trunk
Port     Mode       Status
-------  ---------  ------------
1/1      auto       not-trunking
1/2      on         trunking
4/1-2    off        not-trunking

Port     Vlans allowed
-------  ------------------------------------------------------------
1/1      1-1000
1/2      1-1000
4/1-2    1-1000

Port     Vlans active
-------  ------------------------------------------------------------
1/1      1
1/2      1,10,20
4/1-2    1

System1> (enable) show port
Port Name       Status        Vlan       Level  Duplex Speed Type
---- ---------------------- ---------- ------ ------ ----- -----------
1/1             notconnect    1          normal   half   100 100BaseTX
1/2             connected     trunk      normal   half   100 100BaseTX
2/1             notconnect    10         normal   half    10 10BaseT
2/2             notconnect    10         normal   half    10 10BaseT
2/3             notconnect    10         normal   half    10 10BaseT
2/4             connected     10         normal   half    10 10BaseT
2/5             notconnect    20         normal   half    10 10BaseT
2/6             notconnect    20         normal   half    10 10BaseT
.
.
.
2/23notconnect 20         normal   half    10 10BaseT
2/24notconnect 20         normal   half    10 10BaseT
4/1notconnect 1          normal   half   100 FDDI
4/2notconnect 1          normal   half   100 FDDI

Port Align-Err  FCS-Err    Xmit-Err   Rcv-Err
---- ---------- ---------- ---------- ----------
1/1           0          0          0          0
1/2           0          0          0          0
2/1           0          0          0          0
2/2           0          0          0          0
2/3           0          0          0          0
2/4           0          0          0          0
.
.
.
2/22          0          0          0          0
2/23          0          0          0          0
2/24          0          0          0          0

Port Single-Col Multi-Coll Late-Coll Excess-Col Carri-Sens Runts Giants
---- ---------- ---------- --------- ---------- ---------- ----- -------
1/1           0          0         0          0          0         0         -
1/2           0          0         0          0          0         0         -
2/1           0          0         0          0          0         0         0
2/2           0          0         0          0          0         0         0
2/3           0          0         0          0          0         0         0
2/4           0          0         0          0          0         0         0
.
.
.
```

```
2/22          0          0          0          0          0          0          0
2/23          0          0          0          0          0          0          0
2/24          0          0          0          0          0          0          0

                                    Ler
Port CE-State ConnState Type Neig Con Est Alm Cut Lem-Ct Lem-Rej-Ct Tl-Min
---- -------- --------- ---- ---- --------------- ------- --------- ------
4/1  isolated disabled  A   U     no  9   8   7      0          0 40
4/2  isolated disabled  B   U     no  9   8   7      0          0 40

Last-Time-Cleared
--------------------------
Mon May 6 1996, 17:59:45
```

The trunks and VLANs for the Catalyst 5000 series switch 2 on the second floor were configured as follows. Switch 2 is automatically configured with a trunk when the trunk is set on switch 1. Switch 2 learns about the VLANs set on switch 1 using VTP.

```
System2> (enable)
Mon May 6 1996, 16:35:47  Port 1/2 has become trunk.

System2> (enable) show trunk
Port     Mode       Status
-------  ---------  ------------
1/1      auto       not-trunking
1/2      auto       trunking

Port     Vlans allowed
-------  ------------------------------------------------------------------
1/1      1-1000
1/2      1-1000

Port     Vlans active
-------  ------------------------------------------------------------------
1/1      1
1/2      1,10,20

System2> (enable) show port
Port Name         Status     Vlan       Level  Duplex Speed Type
---- ------------ ---------- ---------- ------ ------ ----- -----------
1/1               notconnect 1          normal   half   100 100BaseTX
1/2               connected  trunk      normal   half   100 100BaseTX
2/1               notconnect 10         normal   half    10 10BaseT
2/2               notconnect 10         normal   half    10 10BaseT
2/3               notconnect 10         normal   half    10 10BaseT
2/4               connected  10         normal   half    10 10BaseT
.
.
.
2/21              notconnect 20         normal   half    10 10BaseT
2/22              notconnect 20         normal   half    10 10BaseT
2/23              notconnect 20         normal   half    10 10BaseT
2/24              notconnect 20         normal   half    10 10BaseT
```

```
Port Align-Err  FCS-Err   Xmit-Err   Rcv-Err
---- ---------- --------- ---------- ----------
1/1          0          0          0          0
1/2          0          0          0          0
2/1          0          0          0          0
2/2          0          0          0          0
2/3          0          0          0          0
2/4          0          0          0          0
.
.
.
2/19         0          0          0          0          0          0          0
2/20         0          0          0          0          0          0          0
2/21         0          0          0          0          0          0          0
2/22         0          0          0          0          0          0          0
2/23         0          0          0          0          0          0          0
2/24         0          0          0          0          0          0          0

Last-Time-Cleared
--------------------------
Mon May 6 1996, 16:04:07

System2> (enable) show port
Port Name         Status     Vlan       Level  Duplex Speed Type
---- ------------ ---------- ---------- ------ ------ ----- -----------
1/1               notconnect 1          normal   half   100 100BaseTX
1/2               connected  trunk      normal   half   100 100BaseTX
2/1               notconnect 10         normal   half    10 10BaseT
2/2               notconnect 10         normal   half    10 10BaseT
2/3               notconnect 10         normal   half    10 10BaseT
2/4               connected  10         normal   half    10 10BaseT
.
.
.
2/21              notconnect 20         normal   half    10 10BaseT
2/22              notconnect 20         normal   half    10 10BaseT
2/23              notconnect 20         normal   half    10 10BaseT
2/24              notconnect 20         normal   half    10 10BaseT

Port Align-Err  FCS-Err   Xmit-Err   Rcv-Err
---- ---------- --------- ---------- ----------
1/1          0          0          0          0
1/2          0          0          0          0
2/1          0          0          0          0
2/2          0          0          0          0
2/3          0          0          0          0
2/4          0          0          0          0
.
.
.
2/19         0          0          0          0          0          0          0
2/20         0          0          0          0          0          0          0
2/21         0          0          0          0          0          0          0
2/22         0          0          0          0          0          0          0
2/23         0          0          0          0          0          0          0
2/24         0          0          0          0          0          0          0

Last-Time-Cleared
--------------------------
Mon May 6 1996, 16:04:07
```