

3Com[®] Corporation

PathBuilder[™] S200 Series Switch Ethernet Basics Guide

Notice

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Overview

Introduction

Ethernet is a common implementation of LAN topology where stations are connected using a bus topology. Stations access the Ethernet using Carrier Sense with Multiple Access and Collision Detection (CSMA/CD).

This guide explains how to use configure PathBuilder S200 series switch ports for Ethernet operations.

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Ethernet LAN

Introduction

This section provides a brief description of how PathBuilder S200 series switches use Ethernet.

PathBuilder S200 Series Switch Support for Ethernet

PathBuilder S200 series switch Ethernet functionality complies with the IEEE 802.3 specifications and provides Transparent Bridging to transport many different protocols over the Wide Area Network (WAN) to remote destinations. Supported protocols include:

- Novell Netware
- DECnet
- Banyan Vines

Example of Basic Ethernet Frame Format

Figure 1 shows the basic frame formats for Ethernet frames supported by PathBuilder S200 series switches.

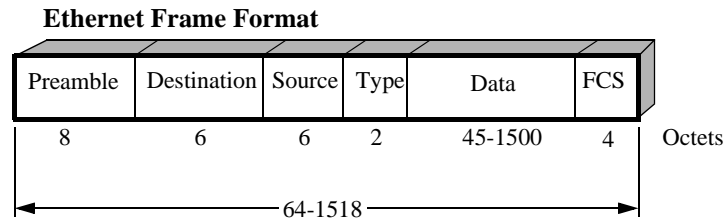


Figure 1. Frame Format for Ethernet Frames

802.3 MAC Frame Format

Figure 2 shows the supported 802.3 Ethernet MAC Frame format.

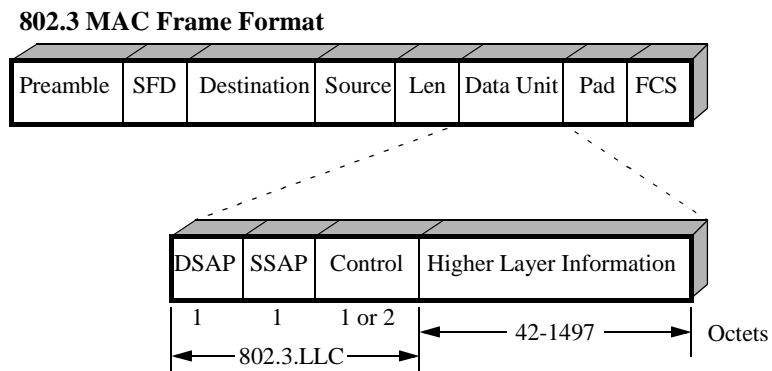


Figure 2. 802.3 Ethernet MAC Frame Format Example

**Example of
Ethernet Bridge
Operation**

Figure 3 shows an example of two Ethernet LANs connected across a WAN using two PathBuilder S200 series switches as bridges. The example shows a Frame Relay WAN application, but you can also bridge across an X.25 WAN.

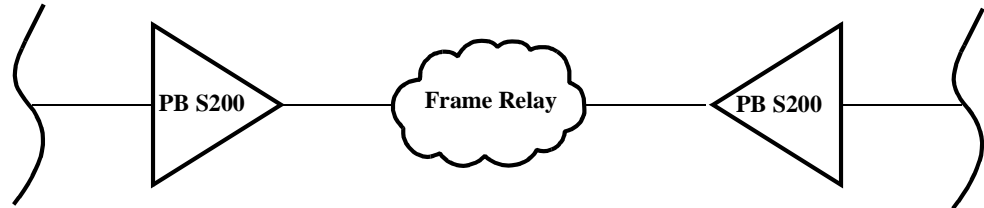


Figure 3. Ethernet Bridge Example

Configuration

Introduction

This section describes the Ethernet Port Parameters

Figure 4 shows the location of the Ethernet Port Record and lists the parameters.

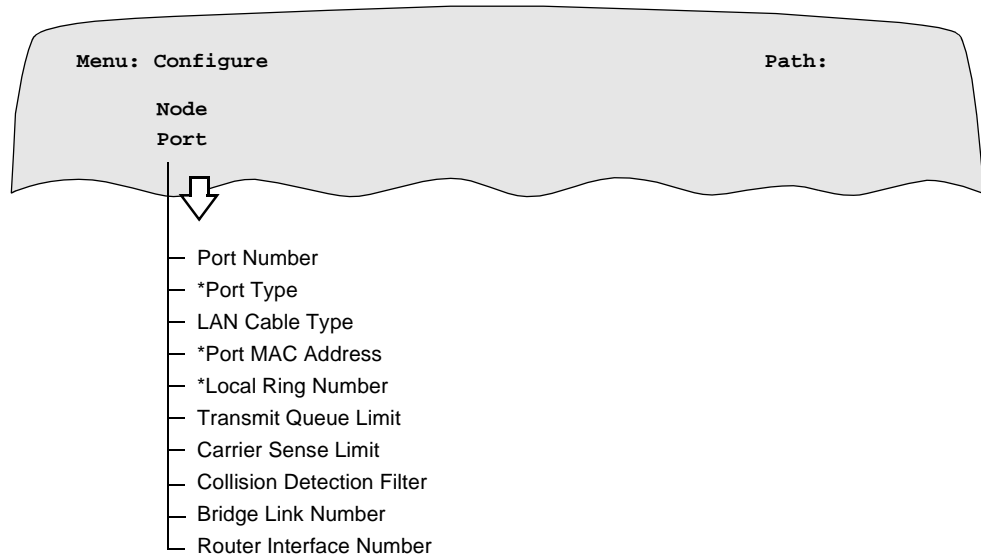


Figure 4. Ethernet Port Record

Parameters

These parameters make up the Ethernet LAN Port Record.

■ Note

An asterisk (*) in the parameter name indicates that a node boot is required for changes to take effect.

Port Number

Range:	Dependent on hardware platform
Default:	1
Description:	Represents the physical port number.
Boot Type:	A Port boot is required for the change to take effect.

***Port Type**

Range:	NULL, ETH
Default:	ETH
Description:	Specifies the port type: NULL: Reserves the port for future use and does not require that you set any parameters. ETH: Specifies this port as an Ethernet port.
Boot Type:	A Node (warm) boot is required for the change to take effect.

LAN Cable Type

Range:	AUI, UTP
Default:	AUI
Description:	Specifies the type of cable and connector to use for the LAN interface: <ul style="list-style-type: none"> • UTP: Unshielded Twisted Pair (RJ-45) • AUI: Attachment Unit Interface (DB-15)
Boot Type:	A Port boot is required for the change to take effect.

***Port MAC Address**

Range:	00-00-00-00-00-00 to FE-FF-FF-FF-FF-FF
Default:	00-00-00-00-00-00
Description:	Specifies the MAC address of the LAN port. If you enter 00-00-00-00-00-00, the Burned In Address (BIA) of the LAN hardware (if present) is used.
Boot Type:	A Node (warm) boot is required for the change to take effect.

Transmit Queue Limit

Range:	20 to 500
Default:	50
Description:	Specifies the number of frames that can be queued to the LAN transmitter before any frame is dropped. In multiple Ethernet systems, you may need to set this to a high value.
Boot Type:	A Port boot is required for the change to take effect.

Carrier Sense Filter

Range:	0 to 7
Default:	0
Description:	Specifies the width required of the carrier sense signal, in bit times, before it is recognized as active. Carrier sense deactivation is recognized immediately. This function is useful in noisy cable environments.
Boot Type:	A Port boot is required for the change to take effect.

Collision Detect Filter

Range:	0 to 7
Default:	0
Description:	Specifies the width required of the collision detection signal, in bit times, before the network recognizes that a collision has occurred.
Boot Type:	A Port boot is required for the change to take effect.

Bridge Link Number

Range:	1 to 4
Default:	1
Description:	Specifies the number of the Bridge Link associated with this LAN port. ■ Note Make sure that the corresponding Bridge Link Record is configured.
Boot Type:	Node boot

Router Interface Number

Range:	1 to 4
Default:	1
Description:	Specifies the number Router Interface associated with this LAN port.
Boot Type:	Node boot

Ethernet LAN Port Statistics

Introduction

When you select Detailed LAN Port Statistics, a screen appears containing information about LAN Ports.

This section describes the statistics available for an Ethernet LAN connection.

What You See in This Screen

Figure 5 is an example of the Detailed LAN Port Statistics screen for Ethernet.

```

Detailed LAN Port Statistics: Port 5                               Page: 1 of 1
Port Number: 5           Port Type: ETH           Port Status: ENABLE
RX Error Condition: Normal           Carrier: Present
TX Error Condition: Normal           Port Address: 08-00-3E-00-50-B2
Last Statistics Reset:

Physical Summary:
RX FCS Errors: 1           TX Carrier Sense Discards: 0
RX Alignment Errors: 14           TX Max Collisions Discards: 0
RX Collisions: 0           TX Total Discards: 0
RX Short Frames: 14           TX Multi Collisions: 0
RX Long Frames: 0           TX Late Collisions: 0
RX Congestions: 0           TX Single Collisions: 0
RX HA Discards: 3228

Data Summary:           RX           TX
Bytes           255345           21883
Frames           1146           51
Avg Frame Len 122           255
FPS           14           0

Press any key to continue ( ESC to exit ) ...

```

Figure 5. Ethernet Detailed LAN Port Statistics

Description of Terms

This table describes the information in the Detailed LAN Port Statistics screen:

Screen Term	Description
Port Number	Number of the port displaying statistics.
Port Type	ETH: Configured Value of the Port type.
Port Status	Can be either Enable or Disable depending upon the Port Control command.
RX FCS Errors	Ethernet transceiver received frame with a checksum error. Frame is discarded.
RX Alignment Errors	Ethernet transceiver received a frame that does not end on an octet boundary. Frame is discarded.
RX Collisions	While Ethernet transceiver is receiving a frame, it detects a collision on the Ethernet. These frames are discarded.

Screen Term	Description (continued)
RX Short Frames	Ethernet transceiver received a frame whose length is less than 64 bytes. These frames are discarded.
RX Long Frames:	Ethernet transceiver received a frame whose length (including CRC) is greater than 1518. These frames are discarded.
RX Congestions:	Ethernet transceiver received a frame but did not have any buffer space to store the frame. These frames are discarded.
RX HA Discards:	The Ethernet LAN Card Hardware Accelerator (HA) function indicates to the Ethernet transceiver not to receive frames that are destined to Stations on the Local LAN. These frames are not received by the Ethernet transceiver, and are referred to as RX HA Discards.
TX Carrier Sense Discards:	The number of frames that were lost when the Ethernet transceiver detected a “No Carrier” condition on the Ethernet LAN when it was attempting to transmit. This is usually due to the Ethernet LAN Port Cable being disconnected.
TX Single Collisions	This is the number of times that the Ethernet transceiver attempted to transmit a frame and a collision occurred during the frame preamble. Collisions are usually indicative of heavy LAN traffic or 802.3 LAN length specifications being exceeded.
TX Multi Collisions	This is the number of times that the Ethernet transceiver made multiple attempts to transmit a frame and a collision occurred during the frame preamble on each attempt.
TX Max Collisions Discards:	This is the number of times that the Ethernet transceiver made 16 attempts to transmit a frame and a collision occurred during the frame preamble on each attempt. After 16 attempts, the Ethernet transceiver drops the frame it tried to transmit.
TX Late Collisions:	This is the number of times that the Ethernet transceiver attempted to transmit a frame and a collision occurred after the frame preamble, and during the actual data of the frame. A frame where a late collision occurred is lost.
TX Total Discards:	This is the number of frames that the Ethernet transceiver transmitter dropped. It is the sum of TX Carrier Sense Discards and TX Max Collisions Discards, plus the number of frame dropped due to Transmit Queue Overflow.

Appendix A

Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFactsSM automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

<http://www.3com.com/>

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, and software, across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com (or 192.156.136.12)**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

■ Note

A user name and password are not needed with Web browser software such as Netscape Navigator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 28,800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 56 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 408 654 2703

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Below is a list of worldwide technical telephone support numbers:

<i>Country</i>	<i>Telephone Number</i>	<i>Country</i>	<i>Telephone Number</i>
Asia Pacific Rim			
Australia	1 800 678 515	P.R. of China	10800 61 00137 or
Hong Kong	800 933 486		021 6350 1590
India	61 2 9937 5085	Singapore	800 6161 463
Indonesia	001 800 61 009	S. Korea	
Japan	0031 61 6439	From anywhere in S. Korea:	82 2 3455 6455
Malaysia	1800 801 777	From Seoul:	00798 611 2230
New Zealand	0800 446 398	Taiwan, R.O.C.	0080 611 261
Pakistan	61 2 9937 5085	Thailand	001 800 611 2000
Philippines	1235 61 266 2602		
Europe			
From anywhere in Europe, call:	+31 (0)30 6029900 phone		
	+31 (0)30 6029999 fax		
From the following European countries, you may use the toll-free numbers:			
Austria	06 607468	Netherlands	0800 0227788
Belgium	0800 71429	Norway	800 11376
Denmark	800 17309	Poland	0800 3111206
Finland	0800 113153	Portugal	05 05313416
France	0800 917959	South Africa	0800 995014
Germany	0130 821502	Spain	900 983125
Hungary	00800 12813	Sweden	020 795482
Ireland	1 800 553117	Switzerland	0800 55 3072
Israel	177 3103794	U.K.	0800 966197
Italy	1678 79489		
Latin America			
Argentina	541 312 3266	Colombia	571 629 4847
Brazil	55 11 523 2725, ext. 422	Mexico	01 800 849 2273
North America			
	1 800 NET 3Com		
	(1 800 638 3266)		

**Returning
Products for Repair**

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

<i>Country</i>	<i>Telephone Number</i>	<i>Fax Number</i>
Asia, Pacific Rim	65 543 6342	65 543 6348
Europe, South Africa, and Middle East	011 44 1442 435860	011 44 1442 435718
From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 764 6883
U.S.A. and Canada	1 800 876 3266, option 2	1 408 764 7120

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