

# Connecting BPX 8600 Switches Using MGX 8220 IMA Trunks Sample Configuration

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## Introduction

This document provides configuration information for how to connect two BPX 8600 switches with narrowband trunks. Each BPX 8600 switch has an MGX 8220 Edge Concentrator connected as a feeder shelf. The customer premises equipment (CPE) is connected to the feeder shelf. A four T1 inverse multiplexing over ATM (IMA) trunk group is established between two MGX 8220 IMATM–8T3T1/B service modules. A T3 trunk is established between each BPX 8600 BXM–T3 service module and the respective MGX8220 IMATM–8T3T1/B. Two Cisco multichannel (MC) 3810 routers with Frame Relay interfaces are connected to each of the MGX 8220 Frame Relay Service Modules (FRSM)–8T1. IP connectivity between two Cisco MC 3810 routers is achieved through a network interworking (NIW) connection. The MGX 8220 FRSM–8T1 service modules provide the NIW conversion. BPX 8600 switches provide the switching function for this connection.

**Note:** This document is designed to help you configure Cisco equipment. It is not a substitute for proper network design and planning that you can achieve with your Cisco sales engineer, systems engineer, or account manager.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

The information in this document is based on these software and hardware versions:

- BPX 8600 switches
- MGX 8220 Edge Concentrators
- MC 3810 routers
- MGX 8220 IMATM/B cards

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

### Conventions

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

### Versions

The versions used in this document are based on generally available releases and are not intended as strict requirements. Read the applicable release notes in order to verify that required interfaces and configurations are supported on each of the platforms.

- **MC 3810**

Software Cisco IOS<sup>®</sup> Software Release 12.0(3) and 12.0(4)T

Hardware Cisco MC 3810 with T1 multiflex trunk (MFT) interface

- **MGX 8220**

Both Cisco MGX 8220 Edge Concentrators use the same Cisco firmware release and hardware configuration.

Firmware Cisco release 5.0.14 and the appropriate versions of service module hardware and firmware on both MGX 8220s.

Hardware A Cisco IMATM model B service module is used for ATM Forum compliant IMA. Four T1 trunks are used between the two IMATM 8T3T1/B service modules on each of the MGX 8220 Edge Concentrators. The IMATM/B service modules use RJ48 connectors for T1 lines and a coaxial connector for the T3 line. The T3 port on each of the IMATM 8T3T1/B service modules is connected to the respective BXM-T3 port on the BPX 8600 switches. The FRSM-8T1 service module uses RJ48 connectors and connects to the respective MC 3810 MFT interface.

- **BPX 8600**

Both BPX 8600 switches use the same Cisco switch software version.

Software Cisco Switch Software Release 9.1.18 and the appropriate versions of card hardware and firmware as specified in the Release Notes.

Hardware The BPX 8600 switch is connected to the MGX 8220 feeder shelf with a Broadband Network Interface (BNI)–T3 card set. The BXM–T3 card set connects to the MGX 8220 IMATM/B service module. The BXM–T3 service module uses service message block (SMB) connectors. The BNI–T3 service module uses coaxial connectors.

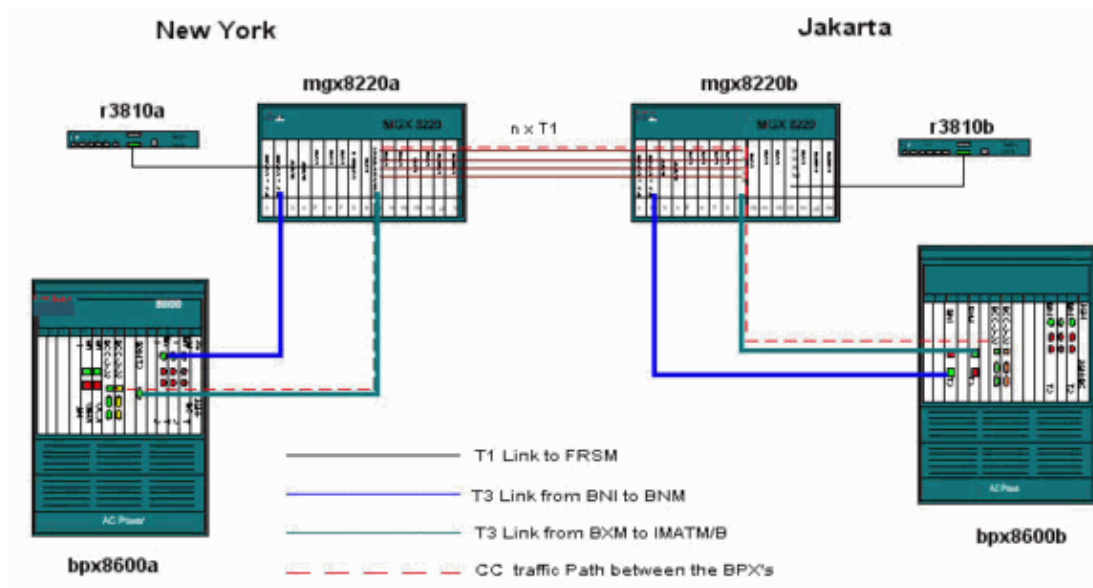
## Configure

In this section, you are presented with the information to configure the features described in this document.

**Note:** Use the Command Lookup Tool (registered customers only) to obtain more information on the commands used in this section.

## Network Diagram

This document uses this network setup:



## Configurations

This document uses these configurations:

**Note:** Make all physical connections before you create configurations.

- MGX 8220 IMATM–8T3T1/B New York
- MGX 8220 FRSM New York
- BPX 8600 New York
- MC 3810 New York
- MGX 8220 IMATM–8T3T1/B Jakarta
- MGX 8220 FRSM Jakarta

- BPX 8600 Jakarta
- MC 3810 Jakarta

## MGX 8220 IMATM-8T3T1/B – New York

Add the lines on the IMATM-8T3T1/B card to be included in the inverse multiplexing over ATM (IMA) group.

```
mgx8220a.1.8.IMATMB.a > addln 1
mgx8220a.1.8.IMATMB.a > addln 2
mgx8220a.1.8.IMATMB.a > addln 3
mgx8220a.1.8.IMATMB.a > addln 4
```

Check all lines and clear alarms before you add lines to the IMA group. It is recommended that you use contiguous lines in an IMA group. However, it is not required. An IMA group can be composed of lines 1, 3, 4, and 5.

**Note:** Line framing and line coding for the T1s between the two IMATM/B service modules must match.

```
mgx8220a.1.8.IMATMB.a > dsplns
```

Line	Conn Type	Type	Status/Coding	Length	XmtClock Source	Alarm	Stats Alarm
8.1	RJ-48	dsx1ESF	Ena/dsx1B8ZS	0-131 ft	LocalTim	No	No
8.2	RJ-48	dsx1ESF	Ena/dsx1B8ZS	0-131 ft	LocalTim	No	No
8.3	RJ-48	dsx1ESF	Ena/dsx1B8ZS	0-131 ft	LocalTim	No	No
8.4	RJ-48	dsx1ESF	Ena/dsx1B8ZS	0-131 ft	LocalTim	No	No
8.5	RJ-48	dsx1ESF	Dis/dsx1B8ZS	0-131 ft	LocalTim		
8.6	RJ-48	dsx1ESF	Dis/dsx1B8ZS	0-131 ft	LocalTim		
8.7	RJ-48	dsx1ESF	Dis/dsx1B8ZS	0-131 ft	LocalTim		
8.8	RJ-48	dsx1ESF	Dis/dsx1B8ZS	0-131 ft	LocalTim		

```
LineNumOfValidEntries: 8
Syntax : dsplns
mgx8220a.1.8.IMATMB.a >
```

```
mgx8220a.1.8.IMATMB.a > dspalms -ds1
Line AlarmState StatisticalAlarmState
-----
8.1 No Alarms No Statistical Alarms
8.2 No Alarms No Statistical Alarms
8.3 No Alarms No Statistical Alarms
8.4 No Alarms No Statistical Alarms
```

Add the IMA group and include all the added lines in the group.

```
mgx8220a1.1.8.IMATMB.a > addimagrp 1 2 1.2.3.4 1
```

where:

<b>1</b>	IMA group number value ranges from 1 to 8
<b>2</b>	Port Type; 1- UNI, 2- NNI, 3- STI, 4- Virtual trunks UNI(STI in UNI)
<b>1.2.3.4</b>	List of links list of links separated by dots
<b>1</b>	minimum no of links minimum number of links for the group formation; value ranges from 1 to 8. <b>This</b>

<b>number must be the same at each end of the IMA group.</b>
--

Add a channel route for the IMA group with the **addchrte** command. This command creates a virtual path identifier (VPI) map listing on the IMATM and defines which cells are routed to which IMA group. If a single IMA group is defined and the VPI range being sent from the attached equipment (here, the BPX 8600) is not known, then specify the entire VPI range.

```
mgx8220a.1.8.IMATMB.a > addchrte 1 1 0 4095
```

where:

<b>1</b>	Range number value ranges from 1 to 128
<b>1</b>	IMA trunk number value ranges from 1 to 8
<b>0</b>	Min. VPI value -255 (UNI/VpTrkUNI), 0-1023(STI), 0-4095(NNI)
<b>4095</b>	Max. VPI value -255 (UNI/VpTrkUNI), 0-1023(STI), 0-4095(NNI). <b>In this case, the port type is NNI so the max. value of 4095 is used.</b>

```
mgx8220a.1.8.IMATMB.a > dspaimgrp 1
  IMA Group number           : 1
  Port type                   : NNI
  Lines configured            : 1.2.3.4
  Enable                       : Enabled
  IMA Port state              : Active
  IMA Group Ne state          : operational
  PortSpeed (cells/sec)       : 14364
  GroupTxAvailCellRate (cells/sec) : 14364
  ImaGroupTxFrameLength(cells) : 128
  LcpDelayTolerance (IMA frames) : 1
  ReadPtrWrPtrDiff (cells)     : 4
  Minimum number of links      : 1
  MaxTolerableDiffDelay (msec) : 275
  Lines Present                : 1.2.3.4 --> verify all configured links are present
  ImaGroupRxImaId             : 0x2
  ImaGroupTxImaId             : 0x2
  Observed Diff delay (msec)   : 0
  Clock Mode                   : CTC
  GroupAlpha                   : 2
  GroupBeta                    : 2
  GroupGamma                   : 1
Type <CR> to continue, Q<CR> to stop:
  GroupConfiguration          : 1
  IMAGrp Failure status       : No Failure
  Timing reference link       : 3
```

Verify that the IMATM-8T3T1/B port payload scrambling configuration is the same at both ends of the IMA trunk. Payload scrambling was developed in order to ensure that the ATM cell payload does not resemble a cell header. It is significant only locally. Specifically, each side of an ATM interface must have the same payload scrambling value, but all ATM interfaces in the network do not require the same configuration.

```
mgx8220a.1.8.IMATMB.a > dsports
```

```
No ATM T1/E1 UNI ports currently active
List of IMA groups:
=====
```

```

ImaGrp PortType Conf Avail Lines configured Lines present Tol Diff Port e
          rate rate
-----
8.1 NNI 14364 3591 1.2.3.4 1.2.3.4 275 Active
NextPortNumAvailable: 8
mgx8220a.1.8.IMATMB.a > dspplpp 1
PhysicalPortNumber: 1
CellFraming: ATM
CellScramble: No Scramble
Plpp Loopback: No Loopback
Single-bit error correction: Disabled

```

## MGX 8220 FRSM – New York

Verify the existing lines.

```

mgx8220a.1.9.FRSM.a > dsplns
Line Conn Type Status/Coding Length XmtClock Alarm Stats
      Type Source Alarm
-----
9.1 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.2 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.3 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.4 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.5 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.6 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.7 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
9.8 RJ-48 dsx1ESF Dis/dsx1B8ZS 0-131 ft LocalTim
LineNumOfValidEntries: 8
Syntax : dsplns

```

Enable the line connected to the Multichannel (MC) 3810 router.

**Note:** Line framing and line coding for the T1 between the Frame Relay Service Module (FRSM) and MC 3810 must match.

```

mgx8220a.1.9.FRSM.a > addln 1

Enable the logical port and configure for Frame Relay service.

mgx8220a.1.9.FRSM.a > addport 1 1 2 1 24 1

```

where:

1	port number values that range from 1–192 are accepted for T1 and 1–2481.
1	line number value ranges from 1 to 8.
2	DS0 speed; for 56K, 2 for 64K
1	beginning slot beginning time slot in 1 base
24	number of slot number of DS0 time slots assigned to
1	port type values 1–3, 1=frame relay, 2=FUNI mode–1a, 3=frForward

Configure the logical port to use local management interface (LMI) signaling. This example uses StrataLMI with asynchronous updates enabled and enhanced LMI disabled.

```
mgx8220a.1.9.FRSM.a > cnfport 1 s 2 n
```

<b>1</b>	port number values that range from 1–192 are accepted for T1 and 1–2481.
<b>S</b>	LMI signalling (N)one (S)trataLMI au–AnnexAUNI du–AnnexDUNI an–AnnexANNI dn–AnnexDNNI. <b>Must match LMI on MC3810.</b>
<b>2</b>	asyn UPD/UFS (UPD = Update Status, UFS = Unsolicited Full Status) (n or 1) = both dis, (y or 2) = UPD en, 3 = UFS en, 4 = both en
<b>n</b>	Enhanced LMI (N or n) disable (Y or y) enable

Display and verify the configuration of the logical port.

```
mgx8220a.1.9.FRSM.a > dspports
```

```

      Port   Ena/Speed  EQServ  SignalType  T391 T392 N391 N392 N393   Type   AlarI
      -----
9.1.1   Mod/1536k    1       StrataLMI    10   15    6    3    4  frameRel  No f
Number of ports:                1
PortDs0UsedLine1:              0x00ffffff
PortDs0UsedLine2:              0x00000000
PortDs0UsedLine3:              0x00000000
PortDs0UsedLine4:              0x00000000
PortDs0UsedLine5:              0x00000000
PortDs0UsedLine6:              0x00000000
PortDs0UsedLine7:              0x00000000
PortDs0UsedLine8:              0x00000000
PortNumNextAvailable:          154
Syntax : dspports

```

Now add the connection, and enable the network internetworking function.

**Note:** Connection values are not optimized and are used for example only.

```
mgx8220a.1.9.FRSM.a > addchan 100 1 100 1536000 1
```

where:

<b>1</b>	channel number value ranges from 16 to 1015
<b>100</b>	port number values ranges from 1–192 are accepted for T1 and 1–2481
<b>1</b>	DLCI number value ranges from 0 to 1023. <b>Must match DLCI on MC3810.</b>
<b>1536000</b>	committed rate –1536000 bps for T1; 0–2048000 bps for E1
<b>1</b>	chan type values 1–5, 1=NIW 2=SIW–transparent 3=SIW–xlation 4=FUNI 5=frForward

## BPX 8600 – New York

Add the MGX 8220 as a feeder shelf to the BPX 8600 switch with the **addshelf** command. Before you add the shelf to the switch, activate the T3 trunk with the **uptrk** command.

```
bpx8600a          TRM   SuperUser          BPX 8600  9.1.18
Sept. 28 2000 08:28 PST
TRK   Type      Current Line Alarm Status          Other
End
  2.1   T3      Clear - OK                               -

Last Command: uptrk 2.1

Next Command:
```

Check the trunk and clear any alarms before you issue the **addshelf** command.

```
bpx8600a          TRM   SuperUser          BPX 8600  9.1.18   Sept. 28 2000 08:31 PST
                               BPX 8600 Interface Shelf Information
Trunk  Name      Type          Part Id   Ctrl Id   Alarm
  2.1   mgx8220a  AXIS         -         -         MIN

Last Command: addshelf 2.1 A

Shelf has been added
Next Command:
```

Now activate the T3 trunk on the BXM-T3 to the MGX 8220 IMATM/B with the **uptrk** command.

```
bpx8600a          TRM   SuperUser          BPX 8600  9.1.18
Sept. 28 2000 08:31 PST
TRK   Type      Current Line Alarm Status          Other
End
  1.4   T3      Major - AIS (BLU)                       -
  2.1   T3      Clear - OK                               -
mgx8220a (AXIS)

Last Command: uptrk 1.4

Next Command:
```

The default Transmit Rate for a T3 trunk on the BPX switch is 96000 cells per second (cps). Reduce the value of the Transmit Rate for this trunk in order to match the value to that of four T1s by with the **cnftrk** command. The value is rounded off by the switch.

```
bpx8600a          TN    StrataCom          BPX 8600  9.1.18
Sept. 28 2000 08:39 PST
TRK  1.4 Config  T3    [9962 cps]      BXM slot:      1
Transmit Rate:      10000          VPC Conns disabled:  No
Subrate data rate:  --              Line framing:    PLCP
Line DS-0 map:     --              coding:          --
```



```

Statistical Reserve: 1000 cps          recv impedance:  --
Idle code:           7F hex           cable type:       --
Max Channels/Port:  256                length:          0-225 ft.
Connection Channels: 256                Pass sync:       Yes
Traffic:  V,TS,NTS,FR,FST,CBR,VBR,ABR  Loop clock:      No
SVC Vpi Min:        0                  HCS Masking:     Yes
SVC Channels:        0                  Payload Scramble: No
SVC Bandwidth:      0 cps              Frame Scramble:  --
Restrict CC traffic: No                 Virtual Trunk Type: --
Link type:           Terrestrial        Virtual Trunk VPI: --
Routing Cost:        10                 Deroute delay time: 0 seconds

Last Command: cnftrk 1.4 10000

Next Command:

```

**Note:** The trunk numbered 1.4 is in Alarm because the remote side of the trunk is not activated. The trunk goes from Alarm to Clear Ok only when both sides of the trunk have been activated.

## MC 3810 – New York

```

r3810a#conf t
r3810a(config)#cont t1 0
r3810a(config-controller)#framing esf
r3810a(config-controller)#linecode b8zs
r3810a(config-controller)#channel-group 0 timeslots 1-24 speed 64
r3810a(config-controller)#no shut
r3810a(config-controller)#int s0:0
r3810a(config-if)#ip address 2.2.2.2 255.255.255.0
r3810a(config-if)#encapsulation frame-relay
r3810a(config-if)#frame-relay map ip 2.2.2.1 100 broadcast
-> associate the DLCI to the IP address

r3810a(config-if)#no shut

```

## MGX 8220 IMATM–8T3T1/B – Jakarta

The configuration for the MGX 8220 IMATM/B service module is identical to the MGX 8220 IMATM/B for New York. Repeat the steps listed for this configuration in order to configure the IMATM/B.

## MGX 8220 FRSM – Jakarta

The configuration for the MGX 8220 FRSM service module is identical to the MGX 8220 FRSM for New York. Repeat the steps listed in this configuration in order to configure the FRSM.

## BPX 8600 – Jakarta

Add the MGX 8220 as a feeder shelf to the BPX 8600 switch. Activate the BXM–T3 trunk, as mentioned in this document, for the BPX 8600 in New York. Also, configure the Transmit Rate for a BXM–T3 trunk in order to match the other end of the trunk.

Add the trunk between the nodes with the **addtrk** command. This command is executed at one of the nodes that terminates the trunk. A trunk must be free of major alarms before you can add it.

```

bpx8600b          TRM   StrataCom      BPX 8600  9.1.18
Sept. 28 2000    08:40 PST

```

TRK	Type	Current Line Alarm Status	Other End
2.1	T3	Clear - OK	mgx8220b(Axis)
13.1	T3	Clear - OK	bpx8600a/1.4

Last Command: **addtrk 13.1**

Next Command:

Now add the connection on the BPX 8600 switch with the **addcon** command.

```
addcon 2.1.9.300 bpx8600a 2.1.9.100 atfr 3000 * * * * *
Add these connections (y/n)?y
```

bpx8600b	TRM	StrataCom	BPX 8600	9.1.18
Sept. 28 2000 08:40 PST				
Local	Remote	Remote		Route
Channel	NodeName	Channel	State	Type
2.1.9.300	bpx8600a	2.1.9.100	Ok	atfr
				Avoid COS 0
				0 L

Last Command: **addcon 2.1.9.300 bpx8600a 2.1.9.100 atfr 3000 \* \* \* \* \* y**

Verify the added connection:

bpx8600b	TN	StrataCom	BPX 8600	9.1.18
Sep. 28 2000 09:47 PST				
Conn:	2.1.9.300	bpx8600a	2.1.9.100	atfr
	PCR(0+1)	% Util	CDVT(0+1)	FBTC
	3000/3000	100/100	250000/250000	y
			SCR	3000/3000
				MBS
				1000/1000
				PLC
				3
Owner: LOCAL Restriction: NONE COS: 0				
Path: bpx8600b13.1-- 1.4bpx8600a				
Pref: Not Configured				
bpx8600b	BNI-T3	: OK	bpx8600a	BNI-T3
	Line 2.1	: OK		Line 2.1
	OAM Cell RX:	Clear		NNI
	NNI	: OK		: OK

This Command: **dspscon 2.1.9.300**

Continue?y

---

Conn:	2.1.9.300	bpx8600a	2.1.9.100	atfr	Status:OK
	PCR(0+1)	% Util	CDVT(0+1)	SCR	MBS
	3000/3000	100/100	250000/250000	3000/3000	1000/1000
Policing	VC Qdepth	EFCI	IBS		
	3	1280/1280	35/35	1/1	

Last Command: **dspcon 2.1.9.300**

Next Command:

## MC 3810 – Jakarta

The configuration for the MC 3810 is also identical to the MC 3810 for New York. Repeat the steps listed for this configuration in order to configure the IMATM/B.

## Verify

There is currently no verification procedure available for this configuration.

## Troubleshoot

This section provides information you can use to troubleshoot your configuration.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

**Note:** Refer to Important Information on Debug Commands before you use **debug** commands.

## show Commands

Command summary:

- **version**
- **dsplns**
- **dspln**
- **dspdsx3lns**
- **dsports**
- **dspimagrp**
- **dspimainfo**
- **dspplpp**
- **dspimlncnt**
- **dspimaln**

## version

```
mgx8220a.1.8.IMATMB.a > version

***** Cisco Systems, Inc. AXIS IMATM Card *****

Firmware Version      = 5.0.12

Backup Boot version =  IMA_BT_1.0.02

IMATM Xilinx file = imatm_b_xilinx.h

VxWorks (for Cisco Systems, Inc.) version 5.1.1-R3000.

Kernel: WIND version 2.4.

Made on Thu Jun 22 11:22:38 PDT 2000.
```

Boot line:

## dsplns

mgx8220a.1.8.IMATMB.a > **dsplns**

Line	Conn Type	Type	Status/Coding	Length	XmtClock Source	Alarm	Stats Alarm
8.1	RJ-48	dsxlESF	Ena/dsxlB8ZS	0-131 ft	LocalTim	No	No
8.2	RJ-48	dsxlESF	Ena/dsxlB8ZS	0-131 ft	LocalTim	No	No
8.3	RJ-48	dsxlESF	Ena/dsxlB8ZS	0-131 ft	LocalTim	No	No
8.4	RJ-48	dsxlESF	Ena/dsxlB8ZS	0-131 ft	LocalTim	No	No
8.5	RJ-48	dsxlESF	Dis/dsxlB8ZS	0-131 ft	LocalTim		
8.6	RJ-48	dsxlESF	Dis/dsxlB8ZS	0-131 ft	LocalTim		
8.7	RJ-48	dsxlESF	Dis/dsxlB8ZS	0-131 ft	LocalTim		
8.8	RJ-48	dsxlESF	Dis/dsxlB8ZS	0-131 ft	LocalTim		

LineNumOfValidEntries: 8

## dspln

mgx8220a.1.8.IMATMB.a > **dspln 1**

LineNum: 1  
LineConnectorType: RJ-48  
LineType: dsxlESF  
LineEnable: Enabled  
LineCoding: dsxlB8ZS  
LineLength: 0-131 ft  
LineXmtClockSource: LocalTiming  
LineLoopbackCommand: NoLoop  
LineSendCode: NoCode  
LineUsedTimeslotsBitMap: 0xffffffff  
LineLoopbackCodeDetection: codeDetectDisabled  
LineBERTEnable: Disable  
LineNumOfValidEntries: 8

## dspdsx3lns

mgx8220a.1.8.IMATMB.a > **dspdsx3lns**

Line	Type	Coding	Length	Criteria	AIScBitsCheck
8.1	dsx3CbitParity	dsx3B3ZS	LessThan225ft	3 out of 8	Ignore C-bits

LineNumOfValidEntries: 1

Syntax : dspdsx3lns

## dsports

mgx8220a.1.8.IMATMB.a > **dsports**

List of IMA groups:

```
=====
ImaGrp PortType Conf Avail Lines configured Lines present Tol Diff Port
          rate   rate rate rate rate rate Delay(ms)
-----
```

```

      8.1      NNI      14364  14364      1.2.3.4      1.2.3.4      275      Active
NextPortNumAvailable: 4
Syntax : dspimagrps (or dspaimgrps)

mgx8220a.1.8.IMATMB.a >

```

## dspimagr

```

mgx8220a.1.8.IMATMB.a > dspimagr 1
  IMA Group number           : 1
  Port type                   : NNI
  Lines configured           : 1.2.3.4
  Enable                      : Enabled
  IMA Port state             : Active
  IMA Group Ne state         : operational
  PortSpeed (cells/sec)      : 14364
  GroupTxAvailCellRate (cells/sec) : 14364
  ImaGroupTxFrameLength(cells) : 128
  LcpDelayTolerance (IMA frames) : 1
  ReadPtrWrPtrDiff (cells)   : 4
  Minimum number of links    : 1
  MaxTolerableDiffDelay (msec) : 275
  Lines Present              : 1.2.3.4 --> all the configured links are present
  Observed Diff delay (msec) : 0
  Clock Mode                 : CTC
  GroupAlpha                 : 2
  GroupBeta                  : 2
  GroupGamma                 : 1
  GroupConfiguration         : 1
  IMAGrp Failure status     : No Failure
  Timing reference link      : 1
  ImaGroupTxImaId           : 0x0
  ExpectedGroupRxImaId      : 0x1

```

## dspimainfo

```

mgx8220a.1.8.IMATMB.a > dspimainfo
Link  Group   NeTx      NeRx      FeTx      FeRx      TxLID  RxID
      State    State    State    State
-----
  1    1    Active    Active    Active    Active    0      0
  2    1    Active    Active    Active    Active    1      1
  3    1    Active    Active    Active    Active    2      2
  4    1    Active    Active    Active    Active    3      3

```

## dspplpp

```

mgx8220a.1.8.IMATMB.a > dspplpp 1
  PhysicalPortNumber:      1
  CellFraming:            ATM
  CellScramble:           No Scramble
  Plpp Loopback:          No Loopback
  Single-bit error correction: Disabled

```

## dspimagrpcnt

```

mgx8220a.1.8.IMATMB.a > dspimagrpcnt 1
  IMA Group number:      1
  Ne Number of failures : 0

```

## dspimalncnt

```
mgx8220a.1.8.IMATMB.a > dspimalncnt 1 1
  IMA group number      : 1
  Line number           : 1
  Icp Cells Received    : 2564790
  Icp Errored Cells Recvd : 0
  Ima Violations Count  : 0
  Ima OIF anomalies     : 1
  Ima Ne Severely Errored Seconds : 10
  Ima Fe Severely Errored Seconds : 1
  Ima Ne Unavailable Seconds : 36
  Ima Fe Unavailable Seconds : 0
  Ima NeTx Unusable Seconds : 1
  Ima NeRx Unusable Seconds : 37
  Ima FeTx Unusable Seconds : 1
  Ima FeRx Unusable Seconds : 1
  Ima FeTx Num. Failues  : 1
  Ima FeRx Num. Failures : 1
  # HEC errored cells    : 0
  # HEC errored seconds  : 0
  # Severely HEC errored seconds : 0
Syntax : dspimalncnt (or dspaimlncnt) imagroup linenum
        IMA group number -- value ranging from 1 to 8
        line number -- value ranging from 1 to 8
mgx8220a.1.8.IMATMB.a >
```

## dspimaln

```
mgx8220a.1.8.IMATMB.a > dspimaln 1 1
  IMA Group number      : 1
  Link number           : 1
  ImaLink TxLid        : 0x0
  ImaLink RxLid        : 0x0
  LinkNeRxState        : Active
  LinkNeTxState        : Active
  LinkNeRxFailureStatus : No Failure
  LinkFeRxState        : Active
  LinkFeTxState        : Active
  LinkFeRxFailureStatus : No Failure
  LinkRelDelay         : 0
  LinkRxTestPattern    : 255
  Ne Link Tx Num Failures : 1
  Ne Link Rx Num Failures : 1

Syntax : dspimaln imagroup linenum
        IMA group number -- value ranging from 1 to 8
        line number -- value ranging from 1 to 8

mgx8220a.1.8.IMATMB.a >
```

## Related Information

- [AUSM-8T1/B-to-3620 IMA Sample Configuration](#)
  - [AUSM/B IMA Troubleshooting Guide](#)
  - [Cisco MGX 8220 Firmware Release Notes, Release 5.0.20](#)
  - [Guide to New Names and Colors for WAN Switching Products](#)
  - [Downloads – WAN Switching Software \( registered customers only\)](#)
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