

Cisco 7200 Bandwidth Points

NPE-G1

NPE-400/300, NSE-1

NPE-225

Contents

Bandwidth points concept on 7200

Bandwidth points with NPE-G1

Bandwidth points with NPE-400/300, NSE-1

Bandwidth points with NPE-225

Bandwidth Points Concept on 7200

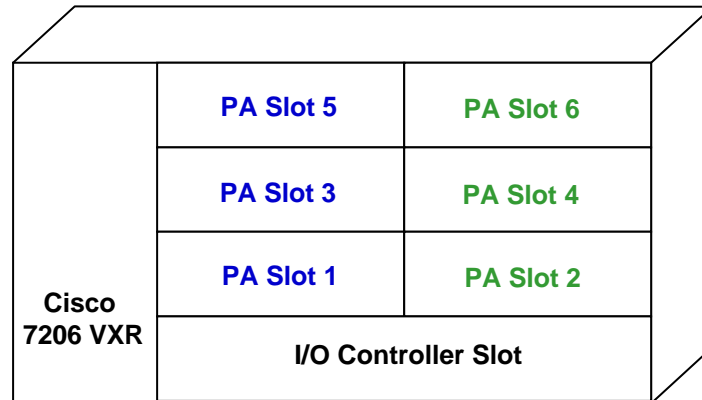
Bandwidth Points

Each Port Adapter (PA), Service Adapter (SA) and I/O Controller has been assigned a value for the number of Bandwidth Points it uses

There are limitations to the total number of Bandwidth Points (and therefore interfaces) that can be supported on a 7200 chassis

By applying the rules in this presentation, add up the Bandwidth Points needed by your configuration to confirm that it is valid

Guidelines for using Dynamic Configuration Tool



Config Tool allows you to select an I/O Controller, Port Adapters (PAs) and Service Adapters (SAs) when configuring a chassis

PAs and SAs are selected under the following options:

- 7200VXR PORT ADAPTER OPTIONS LEFT
- 7200VXR PORT ADAPTER OPTIONS RIGHT

In the following slides, Slots 1, 3, and 5 and the I/O Controller Slot (where noted) correspond to the chassis “LEFT” side on the Config Tool

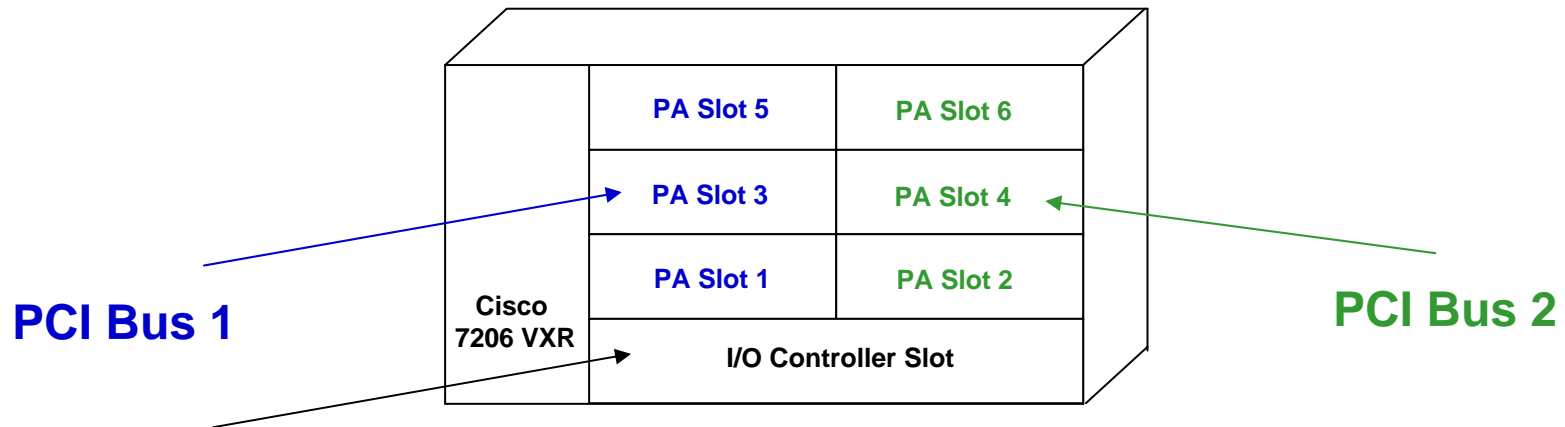
In the following slides, Slots 2, 4, and 6 correspond to the chassis “RIGHT” side on the Config Tool

Guidelines for using Dynamic Configuration Tool (cont.)

- **The Config Tool can be found at:**
<http://www.cisco.com/order/apollo/configureHome.html>
- **The first step is to choose a Chassis/Processor**
- **Next select PAs, SAs, and I/O controllers for each side of the chassis using the rules in this documents based on the Processor chosen**
- **Exceeding the bandwidth points documented here on either the LEFT or RIGHT sides of the chassis will result in an error on Configuration Final Check**
- **Configurations that exceed the recommended bandwidth points are also not supported by TAC or the BU**

Bandwidth Points with NPE-G1

Cisco 7200 Bandwidth Point Calculations with NPE-G1



Dedicated PCI Bus

- Slots 1, 3, and 5 have 600 points total
- Slots 2, 4, and 6 have 600 points total
- Bandwidth points do not affect the I/O controller slot

Port Adapter Points for NPE-G1

Cisco.com

Product ID	Points
PA-A1-OC3-xx	300
PA-A2-4E1XC-E3ATM	90
PA-A2-4E1XC-OC3SM	300
PA-A2-4T1C-T3ATM	90
PA-A2-4T1C-OC3SM	300
PA-A3-8E1IMA	0
PA-A3-8T1IMA	0
PA-A3-E3/T3	90
PA-A3-OC3xx	300
PA-A6-E3/T3	90
PA-A6-OC3xx	300
PA-MC-2E1/120	0
PA-MC-8E1/120	0
PA-MC-xT1	0
PA-MC-8TE1+	0
PA-MCX-2TE1	0
PA-MCX-4TE1	0
PA-MCX-8TE1	0
PA-MC-E3/T3	90
PA-MC-2T3+	180
PA-MC-STM-1xx	250

Product ID	Points
PA-4E	40
PA-5EFL	50
PA-8E	80
PA-FE-TX/FX	200
PA-2FE-TX/FX	400
PA-2FEISL-TX/FX	400
PA-GE	400
PA-4R-DTR	120
PA-H	100
PA-2H	200
PA-E3/T3	90
PA-2E3/T3	180
PA-T3+	90
PA-2T3+	180
PA-4E1G/120	0
PA-4E1G/75	0
PA-4T+	0
PA-8T-xx	0
PA-POS-OC3xx	300
PA-POS-2OC3	600
PA-SRP-OC12xx	150+150

Product ID	Points
PA-1C-E	100
PA-1C-P	0
PA-4C-E	100
PA-FC-1G	400
SA-ISA	200
SA-VAM	300
SA-VAM2	600
PA-VXA-1TE1-xx	0
PA-VXB-2TE1+	0
PA-VXC-2TE1+	0
C7200-I/O-2FE/E	0
C7200-I/O-GE+E	0

All PAs have the same BW points with NPE-G1/400/300, NSE-1 but for NPE-G1, BW points don't affect I/O controller slot

PA-SRP-OC12 BW is divided equally between two buses

Sample Bandwidth Point Calculations with **NPE-G1**

Left Side Total = 300

Right Side Total = 270

Cisco 7206 VXR	PA-A3-OC3 = 300	PA-MCX-8TE1 = 0
	PA-MC-8T1 = 0	PA-2T3 = 180
	PA-MC-8T1 = 0	PA-T3 = 90
	C7200-I/O-2FE/E	

- The left side totals 300 points
- The right side totals 270 points
- Bandwidth points do not affect the I/O controller slot

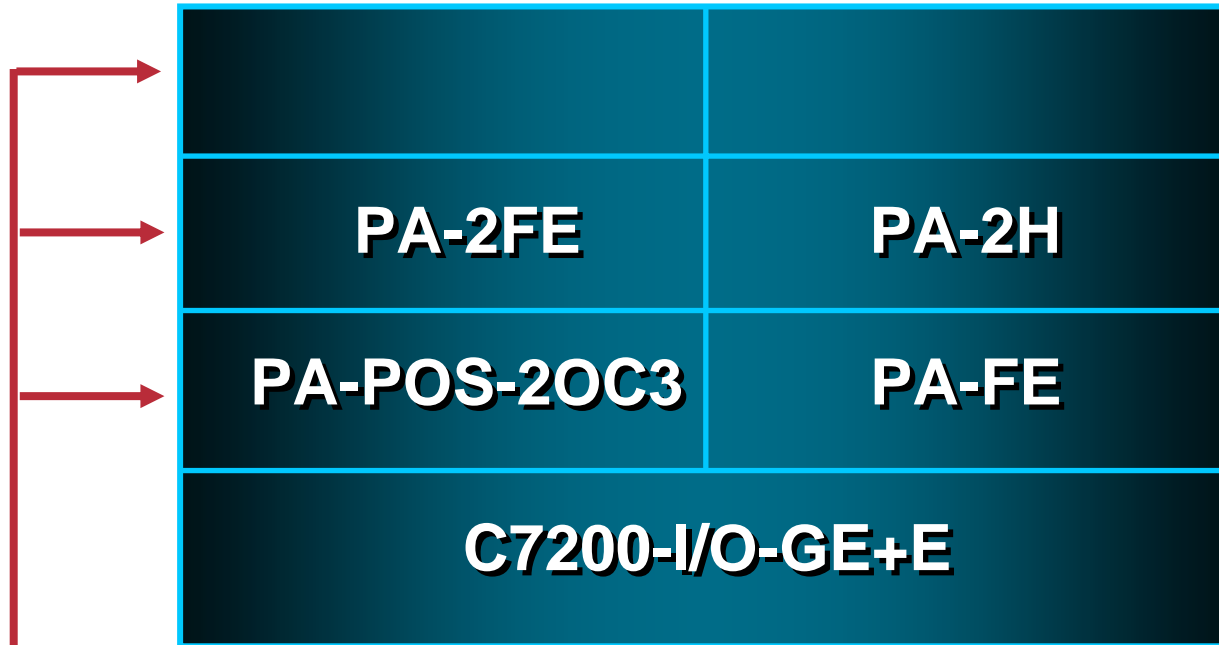
CONFIGURATION VALID!

One Port Use of Specific Port Adapters for NPE-G1

- The bandwidth point of PA-POS-2OC3, PA-2FE-FX, PA-2FE-TX will be counted as half of their original value if only one port is used (the other port should be in shut-down mode).
- This rule is supported on any IOS supporting PA-2FE, PA-POS-2OC3. Latest IOS adds informational messages for better understanding of the rule.

	BW Points	BW Points with only one port use
PA-POS-2OC3	600	300
PA-2FE-FX	400	200
PA-2FE-TX	400	200

One Port Use Message with NPE-G1 installed, Sample 1



Bus1 = 600 + 400 = 1000

Bus2 = 200 + 200 = 400

With **only one port** in use on PA-2FE **AND** PA-POS-20C3,

Bus1 = 300 + 200 = 500

Config valid in this case

I/O
Controller no
longer
included!

One Port Use Message with NPE-G1 installed, Sample 1

The following messages will appear after these IOS releases: 12.3(10), 12.3(10)T, 12.0(30)S, 12.2(27)S, and 12.1(24)E.

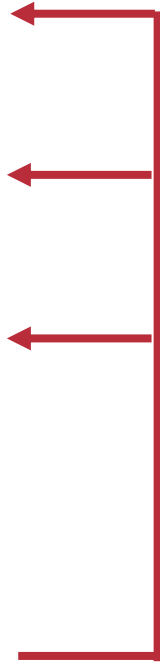
PCI bus mb1 (Slots 1, 3 and 5) has a capacity of 600 bandwidth points. Current configuration on bus mb1 has a total of 1000 bandwidth points. The set of PA-2FE, PA-POS-2OC3, and I/O-2FE qualify for "half bandwidth points" consideration, when full bandwidth point counting results in oversubscription, under the condition that only one of the two ports is used. With this adjustment, current configuration on bus mb1 has a total of 500 bandwidth points. This configuration is within the PCI bus capacity and is supported under the above condition.

PCI bus mb2 (Slots 2, 4 and 6) has a capacity of 600 bandwidth points. Current configuration on bus mb2 has a total of 400 bandwidth points. This configuration is within the PCI bus capacity and is supported.

Please refer to the following document "Cisco 7200 Series Port Adaptor Hardware Configuration Guidelines" on CCO <www.cisco.com>, for c7200 bandwidth points oversubscription/usage guidelines.

One Port Use Message with NPE-G1 installed, Sample 2

	PA-2H
	PA-FE
PA-2FE	PA-POS-2OC3
C7200-I/O-2FE/E	



Bus1 = 400

Bus2 = 600 + 200 + 200 = 1000

With **only one port** in use on PA-POS-2OC3,

Bus2 = 300 + 200 + 200 = 700

Config INVALID in this case

One Port Use Message with NPE-G1 installed, Sample 2

The following messages will appear after these IOS releases: 12.3(10), 12.3(10)T, 12.0(30)S, 12.2(27)S, and 12.1(24)E.

```
PCI bus mb1 (Slots 1, 3 and 5) has a capacity of 600 bandwidth points.Current
configuration on bus mb1 has a total of 400 bandwidth points. This configuration is
within the PCI bus capacity and is supported.
```

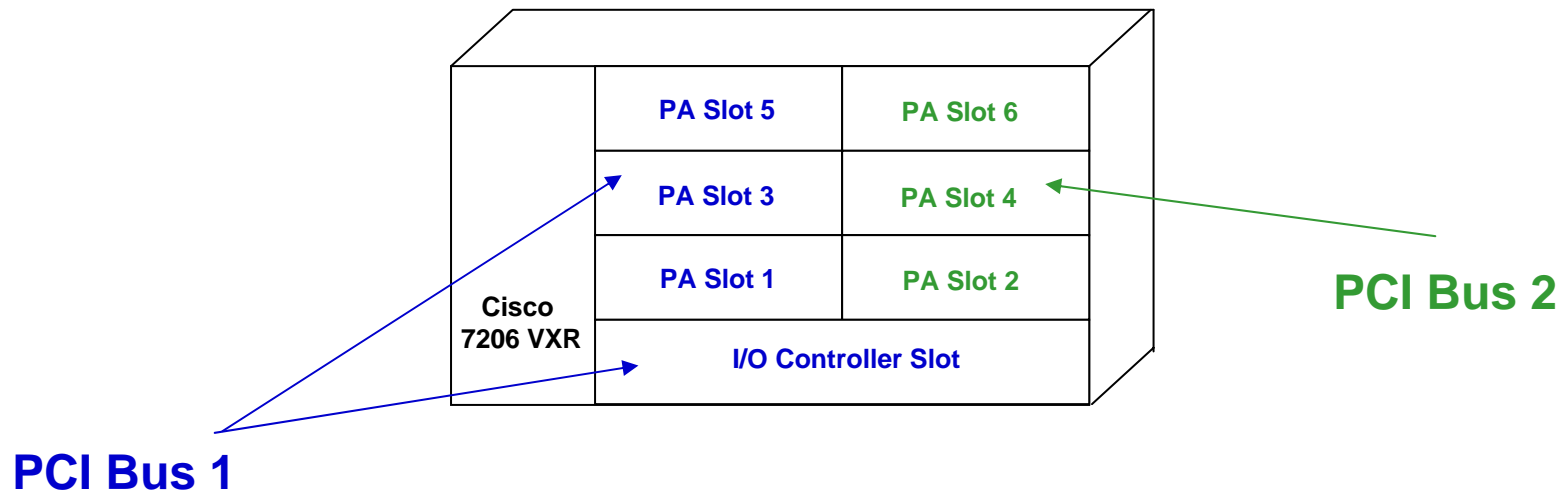
```
PCI bus mb2 (Slots 2, 4 and 6) has a capacity of 600 bandwidth points.Current
configuration on bus mb2 has a total of 1000 bandwidth points.The set of PA-2FE, PA-POS-
20C3, and I/O-2FE qualify for "half bandwidth points" consideration, when full bandwidth
point counting results in oversubscription, under the condition that only one of the two
ports is used. With this adjustment, current configuration on bus mb2 has a total of 700
bandwidth points. This configuration has oversubscribed the PCI bus and is not a
supported configuration.
```

```
Please refer to the following document "Cisco 7200 Series Port Adaptor Hardware
Configuration Guidelines" on CCO <www.cisco.com>, for c7200 bandwidth points
oversubscription/usage guidelines.
```

Bandwidth Points with NPE-400 NSE-1 NPE-300

Cisco 7200 Bandwidth Point Calculations with **NPE-400/300** or **NSE-1**

Cisco.com



- **Slots 1, 3, 5, and I/O controller have 600 points total**
- **Slots 2, 4, and 6 have 600 points total**

Port Adapter and I/O Controller Points for **NPE-400/300** or **NSE-1**

Cisco.com

Product ID	Points
PA-A1-OC3-xx	300
PA-A2-4E1XC-E3ATM	90
PA-A2-4E1XC-OC3SM	300
PA-A2-4T1C-T3ATM	90
PA-A2-4T1C-OC3SM	300
PA-A3-8E1IMA	0
PA-A3-8T1IMA	0
PA-A3-E3/T3	90
PA-A3-OC3xx	300
PA-A6-E3/T3	90
PA-A6-OC3xx	300
PA-MC-2E1/120	0
PA-MC-8E1/120	0
PA-MC-xT1	0
PA-MC-8TE1+	0
PA-MCX-2TE1	0
PA-MCX-4TE1	0
PA-MCX-8TE1	0
PA-MC-E3/T3	90
PA-MC-2T3+	180
PA-MC-STM-1xx	250

Product ID	Points
PA-4E	40
PA-5EFL	50
PA-8E	80
PA-FE-TX/FX	200
PA-2FE-TX/FX	400
PA-2FEISL-TX/FX	400
PA-GE	400
PA-4R-DTR	120
PA-H	100
PA-2H	200
PA-E3/T3	90
PA-2E3/T3	180
PA-T3+	90
PA-2T3+	180
PA-4E1G/120	0
PA-4E1G/75	0
PA-4T+	0
PA-8T-xx	0
PA-POS-OC3xx	300
PA-POS-2OC3	600
PA-SRP-OC12xx	150+150

Product ID	Points
PA-1C-E	100
PA-1C-P	0
PA-4C-E	100
PA-FC-1G	400
SA-ISA	200
SA-VAM	300
SA-VAM2	600
PA-VXA-1TE1-xx	0
PA-VXB-2TE1+	0
PA-VXC-2TE1+	0
C7200-I/O-2FE/E	400
C7200-I/O-GE+E	400

All PAs have the same BW points with NPE-G1/400/300, NSE-1.

PA-SRP-OC12 BW is divided equally between two buses

Sample Bandwidth Point Calculations with **NPE-400/300** or **NSE-1**

Cisco.com

Left Side Total = 580

Right Side Total = 450

Cisco 7206 VXR	PA-E3 = 90	PA-E3 = 90
	PA-E3 = 90	PA-2E3 = 180
	PA-4E1G/120 = 0	PA-2E3 = 180
	C7200-I/O-2FE/E = 400	

- The left side totals 580 points
- The right side totals 450 points

CONFIGURATION VALID!

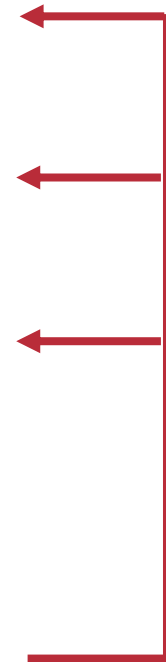
One Port Use of Specific Port Adapters and I/O controller for NPE-400/300 and NSE-1

- The bandwidth point of PA-POS-20C3, PA-2FE-FX, PA-2FE-TX and c7200-I/O-2FE/E will be counted as half of their original value if only one port is used (the other port should be in shut-down mode).
- This rule is supported on any IOS supporting PA-2FE, PA-POS-20C3 and C7200-I/O-2FE/E. Latest IOS adds informational messages for better understanding of the rule.

	BW Points	BW Points with only one port use
PA-POS-20C3	600	300
PA-2FE-FX	400	200
PA-2FE-TX	400	200
C7200-I/O-2FE/E	400	200

One Port Use Message with NPE-400/300 or NSE-1 installed, Sample 1

	PA-POS-20C3
PA-FE	PA-8E
C7200-I/O-2FE/E	



$$\text{Bus 1} = 400 + 200 = 600$$

$$\text{Bus 2} = 80 + 600 = 680$$

With **only one port** in use on PA-POS-20C3,

$$\text{Bus2} = 80 + 300 = 380$$

Config valid in this case

One Port Use Message with NPE-400/300 or NSE-1 installed, Sample 1

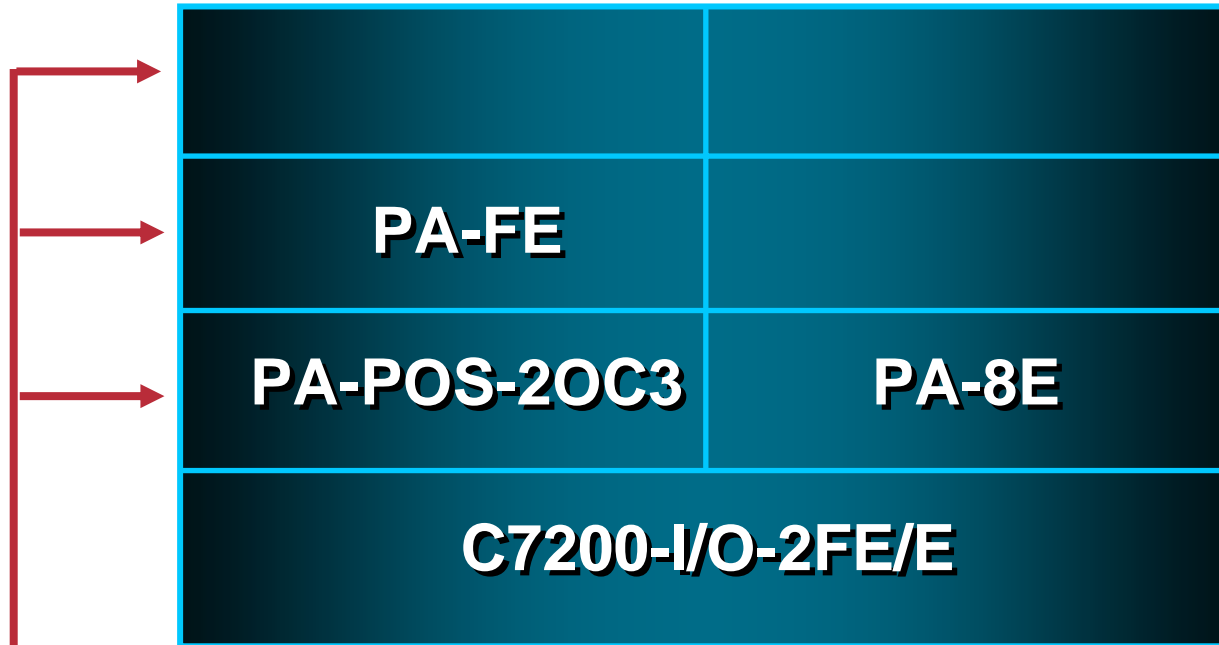
The following messages will appear after these IOS releases: 12.3(10), 12.3(10)T, 12.0(30)S, 12.2(27)S, and 12.1(24)E.

```
PCI bus mb0_mb1 (Slots 0, 1, 3 and 5) has a capacity of 600 bandwidth points. Current configuration on bus mb0_mb1 has a total of 600 bandwidth points. This configuration is within the PCI bus capacity and is supported.
```

```
PCI bus mb2 (Slots 2, 4, 6) has a capacity of 600 bandwidth points. Current configuration on bus mb2 has a total of 680 bandwidth points The set of PA-2FE, PA-POS-20C3, and I/O-2FE qualify for "half bandwidth points" consideration, when full bandwidth point counting results in oversubscription, under the condition that only one of the two ports is used. With this adjustment, current configuration on bus mb2 has a total of 380 bandwidth points. This configuration is within the PCI bus capacity and is supported under the above condition.
```

```
Please refer to the following document "Cisco 7200 Series Port Adaptor Hardware Configuration Guidelines" on CCO <www.cisco.com>, for c7200 bandwidth points oversubscription/usage guidelines.
```

One Port Use Message with NPE-400/300 or NSE-1 installed, Sample 2



Bus1 = 400 + 600 + 200 = 1200

Bus2 = 80

With **only one port** in use on I/O-2FE **AND** PA-POS-20C3

Bus1 = 200 + 300 + 200 = 700

Config INVALID in this case

One Port Use Message with NPE-400/300 or NSE-1 installed, Sample 2

The following messages will appear after these IOS releases: 12.3(10), 12.3(10)T, 12.0(30)S, 12.2(27)S, and 12.1(24)E.

```
PCI bus mb0_mb1 (Slots 0, 1, 3 and 5) has a capacity of 600 bandwidth points. Current configuration on bus mb0_mb1 has a total of 1200 bandwidth points. The set of PA-2FE, PA-POS-2OC3, and I/O-2FE qualify for "half bandwidth points" consideration, when full bandwidth point counting results in oversubscription, under the condition that only one of the two ports is used. With this adjustment, current configuration on bus mb0_mb1 has a total of 700 bandwidth points. This configuration has oversubscribed the PCI bus and is not a supported configuration.
```

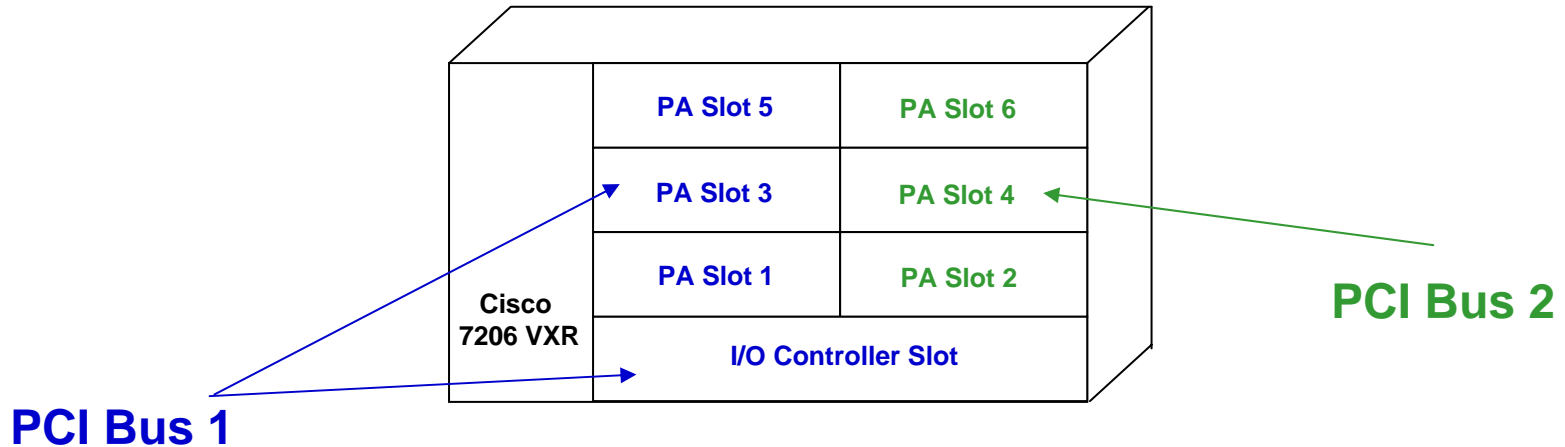
```
PCI bus mb2 (Slots 2, 4, 6) has a capacity of 600 bandwidth points. Current configuration on bus mb2 has a total of 80 bandwidth points This configuration is within the PCI bus capacity and is supported.
```

Please refer to the following document "Cisco 7200 Series Port Adaptor Hardware Configuration Guidelines" on CCO <www.cisco.com>, for c7200 bandwidth points oversubscription/usage guidelines.

Bandwidth Points with NPE-225

Cisco 7200 Bandwidth Point Calculations with NPE-225

Cisco.com



- **Port adapters labeled high, medium, and low**
- **Bandwidth Point Rules:**
 - 1) No more than 3 high PAs, AND
 - 2) No more than 5 total medium plus high PAs, AND
 - 3) No more than 800 total bandwidth points (refer to slide 18)
- **Distribute port adapter points evenly across both sides (2 highs on Left Hand Side, 1 high and 2 mediums on Right Hand Side)**

Port Adapter Points for **NPE-225**

Cisco.com

Product ID	Points
PA-A1-OC3-xx	High
PA-A2-4E1XC-E3ATM	High
PA-A2-4E1XC-OC3SM	High
PA-A2-4T1C-OC3SM	High
PA-A2-4T1C-T3ATM	High
PA-A3-8E1IMA	Low
PA-A3-8T1IMA	Low
PA-A3-OC3xx	High
PA-A3-E3/T3	High
PA-MC-2E1/120	Low
PA-MC-8E1/120	Low
PA-MC-xT1	Low
PA-MC-8TE1+	Low
PA-MCX-2TE1	Low
PA-MCX-4TE1	Low
PA-MCX-8TE1	Low
PA-MC-STM-1SMI	Low
PA-MC-STM-1MM	Low
PA-MC-E3/T3	High
PA-MC-STM-1MM	High
PA-MC-2T3+	High

Product ID	Points
PA-4E	Medium
PA-5EFL	Medium
PA-8E	Medium
PA-FE-TX/FX	High
PA-2FE-TX/FX	High
PA-2FEISL-TX/FX	High
PA-GE	High
PA-4R-DTR	High
PA-H	High
PA-2H	High
PA-E3/T3	High
PA-2E3/T3	High
PA-T3+	High
PA-2T3+	High
PA-4E1G/120	Low
PA-4E1G/75	Low
PA-4T+	Low
PA-8T-xx	Low
PA-POS-OC3xx	High
PA-SRP-OC12xx	High

Product ID	Points
PA-1C-E	High
PA-1C-P	Low
PA-4C-E	High
SA-ISA	High
SA-VAM	High
SA-VAM2	High
PA-VXA-1TE1-xx	Low
PA-VXB-2TE1+	Low
PA-VXC-2TE1+	Low
C7200-I/O-2FE/E	High

Sample Bandwidth Point Calculations with NPE-225

Left Side Total = 2 High

Right Side Total = 3 Low

Cisco 7206 VXR	PA-A3-T3 = High	PA-MC-8T1=Low
		PA-MC-8T1=Low
		PA-MC-8T1=Low
	C7200-I/O-2FE/E = High	

- The left side has 2 High
- The right side has 3 Low
- Total Points is 490

CONFIGURATION VALID!

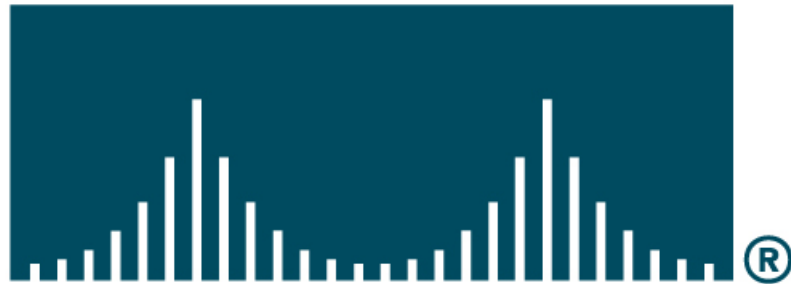
Configuration Guideline Documentation

Cisco.com

**For a detailed explanation of Cisco 7200
configuration guidelines, visit:**

http://www.cisco.com/univercd/cc/td/doc/product/core/7206/port_adp/config/3875in.htm

CISCO SYSTEMS



EMPOWERING THE
INTERNET GENERATIONSM