Portable Product Sheet - Port Adapters

CISCO SYSTEMS

General Information About This Reference

If an adapter is supported in a chassis, there will be a "Y" in the box. To ascertain the minimum IOS revision that this PA may require, you must go to the HW/SW Compatibility Matrix, located at
http://tools.cisco.com/Support/Fusion/FusionHome.do

Platform-Specific Notes

FlexWAN does not support ISDN of any kind.

VIP's/FlexWAN's are hot-swappable in a 7500/7600, but hot-swapping a PA in a VIP/FlexWAN is not. First remove the VIP, add/remove PA's, and then reinstall the VIP/FlexWAN to ensure proper operation.

7200 Bandwidth Points

Each PA has its own "point requirement," which is an indication of how taxing the PA is on the backplane. The slots on the right - 2/4/6 - share a maximum total of 600 points. The slots on the left - 1/3/5 - share their maximum of 600 points with the I/O Controller (the exception is the NPE-G1 & NPE-G2, which has a separate bus for the I/O Controller slot). No combination of PA's are allowed to exceed this limit.

If a 7200 detects that a bus has been exceeded, it will print a warning message but attempt to process packets as normal. This results in a router that has unpredictable stability, at best. TAC will always refuse to troubleshoot a router in this condition.

Newer IOS allows multiport high-speed adapters (PA-2FE-TX/FX, PA-2OC3-POS, and the I/O-2FE/E) to only use half their bandwidth points if one of the two interfaces is **administratively shutdown** (NOTE: the interface **must** be "shutdown" - not just disconnected). Otherwise, if you even have a port disconnected and not forwarding, it still counts towards the 600 point restriction.

Optimal PA insertion order is 2, 1, 4, 3, 6, 5.

The above rules apply only to NPE-300, 400, and NSE-1. NPE-150, 175, 200, and 225 are additionally constrained by the following - they may only have three High-speed PA's, or five High-and-Medium-speed PA's, and the number of bandwidth points for both buses, total, is further limited to 800.

NPE-G1 does not require an I/O controller, and its three onboard 10/100/1000 ports do not consume any bandwidth points from slots 1 through 6. This frees up more PA bandwidth points for the PA slots.

The compatibility charts below only list the 7200VXR, not the "non-VXR" versions. Quite a few legacy PA's work in non-VXR chassis (such as PA-100VG). Including the 7200-only chassis would create too much clutter, so please consult CCO documentation for non-VXR chassis.
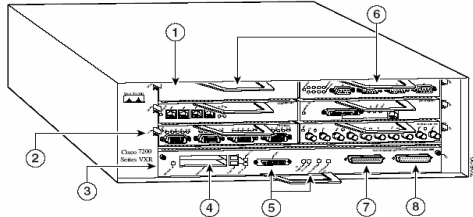
1	Blank port adapter	5	Optional Fast Ethernet port (MII port and RJ-45 port)
2	Port adapter lever	6	Port adapters
3	I/O controller	7	Auxiliary port
4	PC Card slots	8	Console port
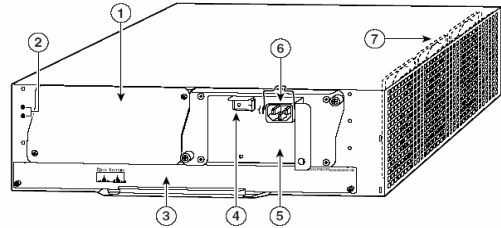
1	Power supply filler plate	5	AC-input power supply
2	Chassis grounding receptacles	6	AC-input power receptacle
3	Network processing engine or network services engine	7	Internal fans
4	Power switch		

Port Adapter Slot Numbering (without Port Adapter Jacket Card Installed)
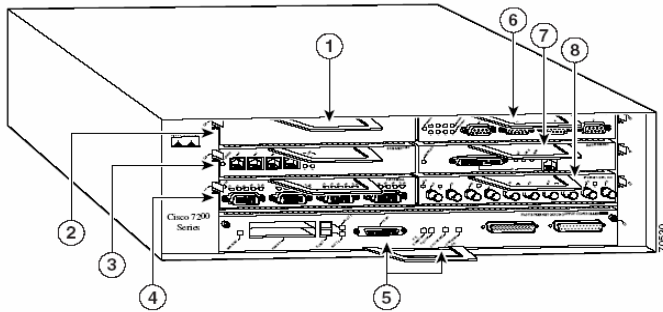
1	Blank port adapter	5	Port adapter slot 0
2	Port adapter slot 5 (left bus—mb1)	6	Port adapter slot 6 (right bus—mb2)
3	Port adapter slot 3 (left bus—mb1)	7	Port adapter slot 4 (right bus—mb2)
4	Port adapter slot 1 ((left bus—mb1)	8	Port adapter slot 2 (right bus—mb2)

Port Adapter Slot Numbering (with Port Adapter Jacket Card Installed)
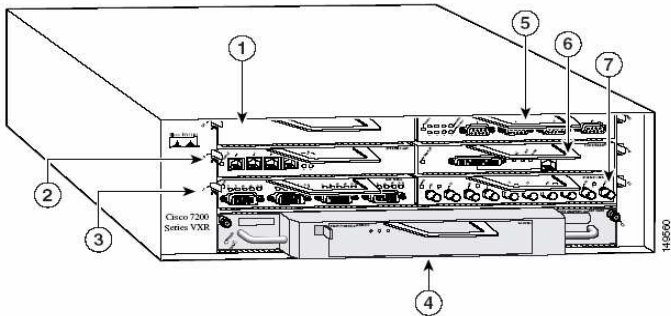
1	Port adapter slot 5 (left bus)	5	Port adapter slot 6 (right bus)
2	Port adapter slot 3 (left bus)	6	Port adapter slot 4 (right bus)
3	Port adapter slot 1 (left bus)	7	Port adapter slot 2 (right bus)
4	Port Adapter Jacket Card slot 0 (mb0 bus), and port adapter slot 7		

Note   The Port Adapter Jacket Card works only with an NPE-G1 or NPE-G2 installed.

Port Adapter Jacket Card

PCI bus mb0 has a 600 point maximum. The Port Adapter Jacket Card accepts one port adapter which can use a maximum of 600 bandwidth points. PCI bus mb0 with a Port Adapter Jacket Card installed is designated as port adapter slot 5 in a Cisco 7204VXR router, or slot 7 in a Cisco 7206VXR router.

NPE-G1 or NPE-G2

- Left side, bus 1 (slots 1, 3, and 5) and I/O controller (slot 0) has a 600 point maximum.
- Right side, bus 2 (slots 2, 4, and 6) has a 600 point maximum.
- Distribute port adapter bandwidth points evenly across both left and right system slots (buses).
- Do not calculate bandwidth points for an I/O controller if an I/O controller is installed with the NPE-G1 or NPE-G2.
- The NPE-G1 or NPE-G2 Gigabit Ethernet interfaces do not use bandwidth points.

NPE-400, NPE-300, NSE-1

- Left side, bus 1 (slots 1, 3, and 5) and I/O controller (slot 0) has a 600 point maximum.
- Right side, bus 2 (slots 2, 4, and 6) has a 600 point maximum.
- Distribute port adapter bandwidth points evenly across both left and right system slots (buses).

NPE-225, NPE-200, NPE-175, NPE-150

- Port adapters are labeled as high, medium, and low.
- Bandwidth point rules:
    - No more than three high-bandwidth port adapters, and
    - No more than five total medium- and high-bandwidth port adapters, and
    - No more than 800 total bandwidth points per system
- Distribute port adapter bandwidth points evenly across both left and right system slots (buses).

NPE-100

- Port adapters are labeled as high, medium, and low.
- Bandwidth point rules:
    - No more than two high-bandwidth port adapters, and
    - No more than four total medium- and high-bandwidth port adapters, and
    - No more than 800 total bandwidth points per system
- Distribute port adapter bandwidth points evenly across both left and right system slots (buses).

All port adapters and service adapters installed in Cisco 7200 series routers connect to one of two Peripheral Component Interconnect (PCI) buses, mb1(left bus) or mb2 (right bus), on the router midplane that provide a path to packet I/O memory and the system (routing and switching) processor.

The optional ports on the I/O controller connect to a third PCI bus, mb0 (left bus), that connects to one of the PCI buses or to both of the PCI buses, depending on which network processing engine (NPE) or network services engine (NSE) is installed and supported in your system.

With an NPE-G1 or NPE-G2 installed, the I/O controller connects on the third PCI bus, mb0, which connects directly into the NPE-G1 or NPE-G2. When installed with the NPE-G1 or NPE-G2, the I/O controller does not take bandwidth from the two PCI buses (left and right) dedicated to the port adapters.

The Port Adapter Jacket Card, for use in the Cisco 7200 VXR routers and only with the NPE-G1 or NPE-G2, installs in the I/O controller slot on PCI bus mb0. Because the Port Adapter Jacket Card accepts only one port adapter, and the PCI bus provides another 600 bandwidth points, this bus cannot be oversubscribed because no port adapter is assigned more than 600 bandwidth points.

Portable Product Sheet – Port Adapters

CISCO SYSTEMS

Descriptions/Compatibility/Bandwidth Points

PA	7100	7200VXR	7301	7304	7401	VIP2-10/15/20	VIP2-40/50	VIP4/6	6182-2PA	6582-2PA	BW Points	EOS	Info.
Serial Adapters													
PA-2T3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	180	Sep-02	End-of-Sale
PA-2T3+	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	180	No	2 Port T3 Serial Port Adapter Enhanced
PA-CT3/4T1	N	N	N	N	N	N	N	N	N	N	90	Sep-00	End-of-Sale
PA-2E3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	180	No	2 Port E3 Serial Port Adapter with E3 DSUs
PA-T3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	90	Sep-02	End-of-Sale
PA-T3+	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	90	No	1 Port T3 Serial Port Adapter Enhanced
PA-E3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	90	No	1 Port E3 Serial Port Adapter with E3 DSU
PA-4E1G/120	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	No	4-Port E1 G.703 Serial Port Adapter (120ohm/Balanced)
PA-4E1G/75	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	No	4-Port E1 G.703 Serial Port Adapter (75ohm/Unbalanced)
PA-4T+	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	No	4 Port Serial Port Adapter, Enhanced
PA-8T-232	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	No	8-Port Serial, 232 Port Adapter
PA-8T-V35	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	No	8-Port Serial, V.35 Port Adapter
PA-8T-X21	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	No	8-Port Serial, X.21 Port Adapter
PA-2JT2	N	N	N	N	N	N	N	Y	N	N	N	N/A	Sep-00	End-of-Sale
Multi-Channel Adapters													
PA-MC-T3	N	Y	Y	Y	Y	N	Y	Y	Y	Y	90	No	1 port multichannel T3 port adapter
PA-MC-E3	N	Y	Y	Y	Y	N	Y	Y	Y	Y	90	No	1 port Multi-Channel E3 port adapter
PA-MC-T3-EC	N	Y	Y	Y	Y	N	Y	Y	Y	Y	90	No	1 Port Multichannel T3 Enhanced Capability
PA-MC-2T3+	N	Y	Y	Y	Y	N	Y	Y	Y	Y	180	No	Only a single PA-MC-2T3+ is supported in a VIP2-40.
PA-MC-2T3-EC	N	Y	Y	Y	Y	N	Y	Y	Y	Y	180	No	2 Port Multichannel T3 Enhanced Capability
PA-MC-8TE1+	N	Y	Y	Y	Y	N	Y	Y	Y	Y	0	No	8 port multichannel T1/E1 8PRI port adapter
PA-MC-8T1	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	0	May-04	End-of-Sale
PA-MC-4T1	Y	Y	Y	Y	N	N	Y	Y	Y	Y	0	No	4 port multichannel T1 port adapter with integrated CSU/DSUs
PA-MC-2T1	Y	Y	Y	Y	N	N	Y	Y	Y	Y	0	No	2 port multichannel T1 port adapter with integrated CSU/DSUs
PA-MC-8DSX1	Y	Y	Y	Y	N	N	Y	Y	N	N	0	Sep-00	End-of-Sale
PA-MC-2E1/120	Y	Y	Y	Y	Y	Y	Y	Y	N	N	0	No	2 port multichannel E1 port adapter with G.703 120ohm interf
PA-MC-8E1/120	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	May-04	End-of-Sale
PA-MC-STM-1MM	N	Y	Y	Y	N	N	N	Y	Y	Y	300	No	1 port multichannel STM-1multimode port adapter
PA-MC-STM-1SMI	N	Y	Y	Y	N	N	N	Y	Y	Y	300	No	1 port multichannel STM-1 single mode port adapter
PA-2CT1/PRI	N	N	N	N	N	N	Y	N	N	N	0	Jan-00	End-of-Sale
PA-2CE1/PRI-xxx	N	N	N	N	N	N	Y	N	N	N	0	Jan-00	End-of-Sale
PA-CT3/4T1	N	N	N	N	N	N	N	N	N	N	90	Sep-00	End-of-Sale
MIX-Enable Adapters													
PA-MCX-2TE1	N	Y	N	N	N	N	N	N	N	N	0	No	2 port MIX-enabled multichannel T1/E1 with CSU/DSU
PA-MCX-4TE1	N	Y	N	N	N	N	N	N	N	N	0	No	4 port MIX-enabled multichannel T1/E1 with CSU/DSU
PA-MCX-4TE1-Q	N	Y	N	N	N	N	N	N	N	N	0	No	TP Q703 SS7 High Speed Link (HSL) Port Adapter
PA-MCX-8TE1	N	Y	N	N	N	N	N	N	N	N	0	No	8 port MIX-enabled multichannel T1/E1 with CSU/DSU
PA-MCX-8TE1-M	N	Y	N	N	N	N	N	N	N	N	0	No	T1/E1 SS7 link PA for ITP

PA	7100	7200VXR	7301	7304	7401	VIP2-10/15/20	VIP2-40/50	VIP4/6	6182-2PA	6582-2PA	BW Points	EOS	Info.
Voice Adapter													
PA-VXA-1TE1-24+	N	Y	N	N	Y	N	Y	Y	N	N	0	No	1 Port T1/E1 Digital Voice Port Adapter with 24 Channels
PA-VXA-1TE1-30+	N	Y	N	N	Y	N	Y	Y	N	N	0	No	1 Port T1/E1 Digital Voice Port Adapter with 30 Channels
PA-VXB-2TE1	N	Y	N	N	N	N	N	N	N	N	0	Oct-00	End-of-Sale
PA-VXB-2TE1+	N	Y	N	N	N	N	N	N	N	N	0	No	2 port T1/E1 moderate capacity enhanced voice PA
PA-VXC-2TE1	N	Y	N	N	N	N	N	N	N	N	0	Oct-00	End-of-Sale
PA-VXC-2TE1+	N	Y	N	N	N	N	N	N	N	N	0	No	2 port TE1 hi-capacity enhanced voice PA
ATM Adapters													
PA-A3-8T1IMA	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	0	No	PA-A3's support up to 4,000 VC's. PA-A6's support up to 8,000 VC's.
PA-A3-8E1IMA	Y	Y	Y	Y	N	N	Y	Y	Y	Y	0	No	PA-A3's support up to 4,000 VC's. PA-A6's support up to 8,000 VC's.
PA-A6-T3	N	Y	N	N	Y	N	N	Y	Y	Y	90	No	1Port Enh ATM DS3 Port Adapter
PA-A6-E3	N	Y	N	N	N	N	N	Y	Y	Y	90	No	
PA-A6-OC3MM	N	Y	N	N	Y	N	N	Y	Y	Y	300	No	
PA-A6-OC3SMI	N	Y	N	N	Y	N	N	Y	Y	Y	300	No	
PA-A6-OC3SML	N	Y	N	N	Y	N	N	Y	Y	Y	300	No	
PA-A1-OC3-xx	Y	Y	N	N	N	Y	Y	Y	N	N	300	Sep-02	End-of-Sale
PA-A2-4E1XC-OC3SM	N	Y	N	N	N	N	N	N	N	N	300	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A2-4E1XC-E3ATM	N	Y	N	N	N	N	N	N	N	N	90	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A2-4E1YC-OC3SM	N	Y	N	N	N	N	N	N	N	N	300	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A2-4E1YC-E3ATM	N	Y	N	N	N	N	N	N	N	N	90	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A2-4T1C-OC3SM	N	Y	N	N	N	N	N	N	N	N	300	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A2-4T1C-T3ATM	N	Y	N	N	N	N	N	N	N	N	90	Dec-04	PA-A2's are dual-width, and take their bandwidth points from mb2, the bus for slots 2/4/6.
PA-A3-OC3-xxx	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	300	Yes	PA-A3's support up to 4,000 VC's. PA-A6's support up to 8,000 VC's.
PA-A3-OC12-xxx	N	N	N	N	N	N	N	Y	N	N	N/A	Yes	PA-A3-OC12 is dual-width, and is only supported in the VIP4-80 and VIP6-80.
PA-A3-T3 (or E3)	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	90	Yes	PA-A3's support up to 4,000 VC's. PA-A6's support up to 8,000 VC's.
Packet-over-Sonet Adapters													
PA-POS-2OC3	N	Y	Y	Y	Y	N	N	Y	N	Y	600	No	
PA-POS-1OC3	N	Y	Y	Y	Y	N	N	Y	N	Y	300	No	
PA-POS-OC3-xxx	Y	Y	Y	Y	Y	N	Y(50)	Y	Y	Y	300	Jul-06	End-of-Sale
HSSI Adapters													
PA-2H	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	200	No	
PA-H	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100	No	
LAN Adapters													
PA-GE	Y	Y	N	Y	Y	N	N	N	N	N	400	No	
PA-2FE-FX	Y	Y	Y	Y	Y	Y	Y	Y	N	N	400	No	
PA-2FE-TX	Y	Y	Y	Y	Y	Y	Y	Y	N	N	400	No	
PA-4E	Y	Y	Y	Y	Y	Y	Y	Y	N	N	40	No	
PA-8E	Y	Y	Y	Y	Y	Y	Y	Y	N	N	80	No	
PA-12E/2FE	N	Y	N	N	N	N	N	N	N	N	300	Oct-00	PA-12E/2FE is a dual-width PA and auto-selects the bus with the most bandwidth on boot.
PA-2FEISL	Y	Y	N	N	N	Y	Y	No	N	N	300	Apr-01	End-of-Sale
PA-5EFL	Y	Y	Y	N	N	Y	Y	No	N	N	50	Jul-03	End-of-Sale
PA-FE-TX/FX	Y	Y	Y	Y	Y	Y	Y	Y	N	N	200	Oct-03	End-of-Sale
PA-100VG	N	N	N	N	N	Y(40)	N	N	N	N	200	Jul-99	End-of-Sale
PA-F-MM/SM	N	N	N	N	N	Y	Y	Y	N	N	100	Oct-00	End-of-Sale
PA-F/FD-MM/SM	N	N	N	N	N	Y	Y	Y	N	N	200	No	
Token-Ring Adapters													
PA-4R-DTR	Y	Y	N	N	N	Y	Y(40)	N	N	N	120	No	
PA-4R	N	N	N	N	N	Y	Y(40)	N	N	N	60	Jul-99	End-of-Sale
PA-4R-FDX	N	N	N	N	N	Y	Y(40)	N	N	N	120	Jul-99	End-of-Sale
ISDN Adapters													
PA-4B-U	Y	Y	Y	N	N	N	N	N	N	N	0	Yes	End-of-Sale
PA-8B-S/T	Y	Y	Y	N	N	N	N	N	N	N	0	No	
PA-MC-8TE1+	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	0	No	
PA-2CE1/PRI-xxx	N	N	N	N	N	N	Y	N	N	N	0	Jan-00	End-of-Sale
Services Adapters													
C7200-VSA	N	Y	N	N	N	N	N	N	N	N		No	
SA-ISA	Y	Y	N	N	N	N	N	N	N	N	200	Apr-04	End-of-Sale
SA-VAM	Y	Y	N	N	N	N	N	N	N	N	300	Nov-06	End-of-Sale
SA-VAM2	N	Y	N	N	N	N	N	N	N	N	600	Nov-06	End-of-Sale
SA-VAM2+	N	Y	Y	Y	N	N	N	N	N	N	600	No	
SA-COMP/x	N	N	N	N	N	N	Y	N	N	N	0	Oct-01	End-of-Sale
SA-ENCRYPT	N	N	N	N	N	N	Y(50)	N	N	N	60	Oct-00	End-of-Sale
I/O Controllers													
I/O	N	Y	N	N	N	N	N	N	N	N	0	No	
I/O-FE	N	Y	N	N	N	N	N	N	N	N	200	Yes	End-of-Sale
I/O-FE-MII	N	Y	N	N	N	N	N	N	N	N	200	Yes	End-of-Sale
I/O-2FE/E	N	Y	N	N	N	N	N	N	N	N	400	No	
I/O-GE+E	N	Y	N	N	N	N	N	N	N	N	400	No	

PA	7100	7200VXR	7301	7304	7401	VIP2-10/15/20	VIP2-40/50	VIP4/6	6182-2PA	6582-2PA	BW Points	EOS	Info.
Miscellaneous Adapters													
PA-1C-P	N	Y	N	N	N	N	N	N	N	N	0	Jan-02	End-of-Sale
PA-1C-E	N	Y	N	N	N	N	N	N	N	N	100	Aug-01	End-of-Sale
PA-4C-E	N	Y	N	N	N	N	N	N	N	N	100	No	
PA-FC-1G	N	Y	N	N	Y	N	N	N	N	N	400	No	
PA-SRP-OC12xxx	N	Y	N	N	N	N	N	Y	N	N	150	No	
C7200-JC-PA	N	Y	N	N	N	N	N	N	N	N	0*	No	

PA-SRP-OC12 is dual-width, and uses 150 points from **both** buses (i.e. 150 from 0/1/3/5, 150 from 2/4/6).

SA-VAM2+ has the following encryption support:
DES, 3DES, AES-128, AES-132, AES-256 bit keys

* The **C7200-JC-PA** Port Adapter Jacket Card Allows a high-bandwidth port adapter-such as the hardware based
security encryption module SA-VAM2+ and the 2-Port Packet/SONET OC3c/STM1 Port Adapter-to be moved onto
a dedicated Peripheral Component Interconnect (PCI) bus that the Cisco NPE-G1 or NPE-G2 provides.

The **C7200-VSA** requires the Cisco 7200 Series NPE-G2 Network Processing Engine.
 It fits only in the I/O controller slot on the Cisco 7204VXR or 7206VXR chassis, conserving valuable bandwidth points for other port adapters.
The Cisco VSA supports DES, 3DES, and AES IPsec encryption at up to 500 Mbps (at 300-byte packets). VSA will support a maximum of
5000 simultaneous IPSEC tunnels. The Cisco VPN Services Adapter will initially be available in Cisco IOS Software 12.4(4)XDy where y will be
a later on build number and will be integrated in the future 12.4(10)T release. The IOS 12.4(4)XDy release will be at feature parity with the existing 12.4(4)T release.

Cisco 7200 Series Port Adapter Hardware Configuration Guidelines
http://www.cisco.com/univercd/cc/td/doc/product/core/7206/port_adp/config/3875.pdf

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Note: All I/O controllers with Bandwidth Points take points on the "odd" bus - with PA's in slots 1, 3, and 5. The only exception to this is the NPE-G1, where there is no I/O controller as a separate entity - the three 10/100/1000 ports on the NPE-G1 have their own bus and therefore do not "compete" for bandwidth on the backplane with any PA slot. You may still use a I/O card in the I/O slot, with its ports on their own bus, if desired. In this case, some functionality (such as CON/AUX ports) revert back to the I/O controller.

NPE-400(Memory)

End-of-Sale Product Part Number	Product Description	Replacement Product Part Number	Replacement Product Description
MEM-NPE-400-D-128M	128MB Memory for NPE-400 in 7200 Series	MEM-NPE-400-256MB	256MB Memory for NPE-400 in 7200 Series

Customers are encouraged to migrate to the 256 MB DRAM Memory for the NPE-400 for the Cisco 7200VXR Series. Information about this product can be found at:
http://www.cisco.com/go/7200.

Customers can use the Cisco Technology Migration Plan (TMP) to trade in products and receive credit toward the purchase of new Cisco equipment.
For more information on the TMP program, please go to: http://www.cisco.com/go/tradein/

Cisco 7200 Port Adapters (Documentation)
http://www.cisco.com/en/US/products/hw/modules/ps2033/prod_module_series_home.html

Cisco 7200 Series Routers

### End-of-Life and End-of-Sale Notices
http://www.cisco.com/en/US/products/hw/routers/ps341/prod_eol_notices_list.html

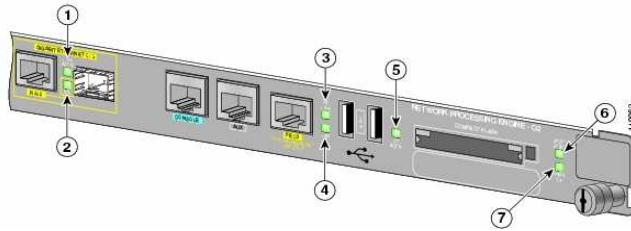## Network Processor Engine (NPE) Overview, Installation, and Configuration

http://www.cisco.com/en/US/products/hw/routers/ps341/products_installation_guide_book09186a0080551c34.html

NPE-G2 Processor for the Cisco 7200VXR Series Routers

Cisco 7200VXR Series NPE-G2 Ports
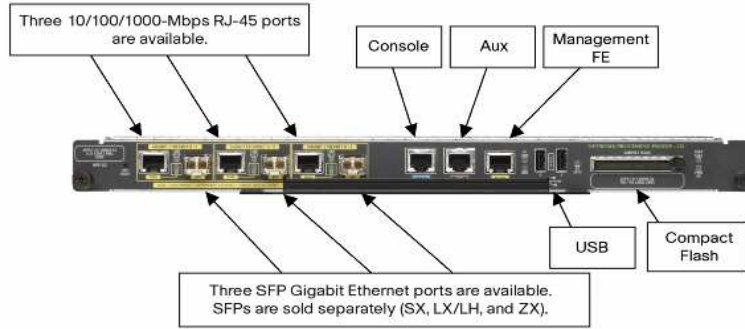
NPE-G2 (LEDs)

No.	LED Label	LED	Color	In the Power Up state, the LED is
1	LINK ACTV (Interfaces 0/1, 0/2, 0/3)	RJ-45 and SFP ports	Solid green	Link with no activity
			Flashing green	Link with activity
			Off	No link
2	EN (Enable) (Interfaces 0/1, 0/2, 0/3)	RJ-45 ports only	Solid green	RJ-45 port is selected.
			Off	SFP port is selected.
3	FE LINK	Fast Ethernet Management port	Solid green	Link with no activity
			Flashing green	Link with activity
			Off	No link
4	USB	USB ports	Flashing green	Activity
			Off	No activity
5	CF ACTV	CompactFlash Disk	Flashing green	Activity
			Off	No activity
6	SYST STAT	System status	Solid green	Cisco IOS has successfully booted.
			Blinking yellow	ROMmon is loading.
			Solid yellow	ROMmon has successfully booted.
			Blinking green	Cisco IOS is loading.
7	PWR OK	Power	Green	The NPE-G2 has powered on.
			Off	No activity

Connectivity

- Gigabit Ethernet ports-Three 10/100/1000-Mbps ports are available on the Cisco NPE-G2 (Figure 2). Each of these ports provides either copper or optical connectivity (via Small Form Factor Pluggable optics (SFP)).
- Gigabit Ethernet port features-All three ports support the IEEE 802.1Q standard.
- The Cisco NPE-G2 supports three types of Small Form Factor Pluggable optics (SFP) interfaces-Short wave (SX), long wave/long haul (LX/LH), and extended wavelength (ZX) for varying fiber length requirements.
- Console and auxiliary ports-The Cisco NPE-G2 has a console port, and an auxiliary port, and it handles the other functions of the I/O controller, the need for an I/O controller is eliminated. However, an I/O controller can still be used, if desired. If an I/O controller is detected in the I/O controller slot, the I/O controller function defaults to the I/O controller (with the exception of NVRAM and bootflash memory). The console and auxiliary ports of the Cisco NPE-G2 are then disabled.
- Management 10/100 Mbps Ethernet port-This Ethernet port is strictly dedicated for management purposes.

Memory

- SDRAM-The Cisco NPE-G2 ships with the highest default memory available on all of the Network Processing Engines (NPEs) on the Cisco 7200 VXR series available, 1-GB SDRAM. There is only one memory slot. The type of memory on the Cisco NPE-G2 is double data-rate (DDR) memory, which provides high-performance memory access rates. Note: The NPE-G1 SDRAM memory module is not compatible with the NPE-G2 SDRAM memory module.
- Compact Flash memory-The 256-MB Compact Flash memory used on the Cisco NPE-G2 is the same Compact Flash memory used with the Cisco NPE-G1, Cisco 7401, and Cisco 7300 Series routers.
- 2-MB NVRAM
- 1-MB Layer 2 cache
- 64-MB bootflash-The 64-MB internal flash memory is large enough to hold multiple boot helper images and logging files.
- USB ports-The USB Flash feature provides an optional secondary storage capability. Images, configurations, or other files can be copied to or from the Cisco USB Flash memory with the same reliability as storing and retrieving files using the Compact Flash card. Cisco USB Flash memory is available in 64-, 128-, and 256-MB sizes.

Processor

1.67-GHz Motorola Freescale 7448 processor

System Requirements

| Feature	Description
Chassis	The Cisco NPE-G2 is supported on the Cisco 7204VXR chassis and the Cisco 7206VXR chassis.
I/O Controllers	Although not required, an I/O controller can still be used. The Cisco NPE-G2 is supported with the Cisco 7200VXR Series I/O controllers with the following part numbers: C7200-I/O, C7200-I/O-2FE, and C7200-I/O-GE+E.
Port Adapters	The Cisco NPE-G2 is supported with all port adapters that can be ordered with the Cisco 7200VXR chassis with the following exceptions: · Fibre Channel over IP Port Adapter (PA-FC-1G; this Port Adapter is End-of-Sale as of Dec 3, 2004) · One-Port OC-12, dual width DPT Port Adapter (PA-SRP-OC12; this Port Adapter is End-of-Sale as of July 15, 2005) · VPN Acceleration Module (SA-VAM; this Service Adapter is End-of-Sale as of April 28, 2006), · Cisco VPN Acceleration Module 2 (SA-VAM2; this Service Adapter is End-of-Sale as of April 28, 2006)
Software	At the time of first customer shipment, the Cisco NPE-G2 is supported in Cisco IOS Software Release 12.4(4)XD. In the future, it will also be supported in the 12.4T, 12.5M as well as 12.2SB Cisco IOS Software Releases.

Product Ordering Details

Product Number	Product Description
NPE-G2	Cisco NPE-G2, including 1-GB default DRAM and 256-MB default flash memory
NPE-G2=	Cisco NPE-G2, including 1-GB default DRAM and 256-MB default flash memory, spare
MEM-NPE-G2-1GB	One 1-GB memory module for the Cisco NPE-G2
MEM-NPE-G2-1GB=	One 1-GB memory module for the Cisco NPE-G2, spare
MEM-NPE-G2-FLD256	256-MB Compact Flash disk for the Cisco NPE-G2
MEM-NPE-G2-FLD256=	256-MB Compact Flash disk for the Cisco NPE-G2, spare
IO-CONTROLR-BLANK=	I/O controller slot blank, spare
MEMUSB-64FT	64-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series
MEMUSB-64FT=	64-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series, spare
MEMUSB-128FT	128-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series
MEMUSB-128FT=	128-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series, spare
MEMUSB-256FT	256-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series
MEMUSB-256FT=	256-MB USB flash token for Cisco 1800, 2800, 3800, and 7200 series, spare

Cisco 7200VXR Series NPE-G2 Network Processing Engine - Q&A

http://www.cisco.com/en/US/partner/products/hw/routers/ps341/products_qanda_item0900aecd80471791.shtml

NPE-G1 (Interfaces)
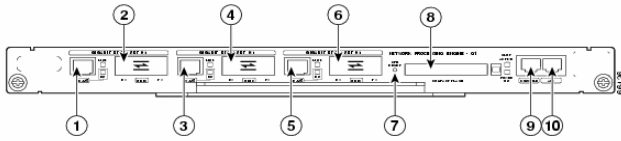
1	Fast Ethernet/Gigabit Ethernet RJ-45 port 0/1	6	Gigabit Ethernet port 0/3
2	Gigabit Ethernet port 0/1	7	CPU Reset
3	Fast Ethernet/Gigabit Ethernet RJ-45 port 0/2	8	CompactFlash Disk slot disk2
4	Gigabit Ethernet port 0/2	9	Console port
5	Fast Ethernet/Gigabit Ethernet RJ-45 port 0/3	10	Auxiliary port

The three interfaces on the NPE-G1 consist of three Gigabit Interface Converter (GBIC) ports and three 10/100/1000 Fast Ethernet/Gigabit Ethernet ports. The rules for using these ports are:

- Only one port per interface can be used at any one time. For example, for interface Gigabit Ethernet 0/1, either the RJ-45 port can be used or the GBIC port, but not both.
- A total of three ports on any of the three interfaces (0/1, 0/2, or 0/3) can be used at any one time; for example, 0/1 GBIC, 0/2 GBIC, and 0/3 RJ-45.
- The port-numbering for the interfaces on the NPE-G1 start with 0/1 and not with 0/0, as is typical for other interface cards. This is to avoid conflicts with the Ethernet and FastEthernet ports on an I/O controller, if it is also installed.

NPE-G1 (LEDs)
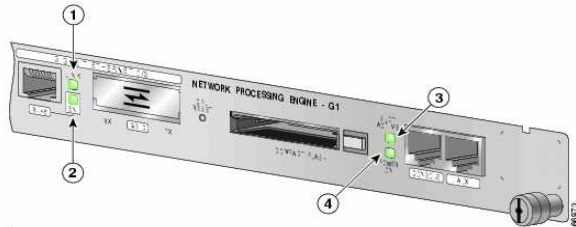
No.	LED Label	LED	Color	In the Power Up state, the LED is	LED flashes when there is traffic
1	LINK (Interfaces 0/1, 0/2, 0/3)	RJ-45 and GBIC ports	Green	On, indicating that a link has been established	No
2	EN (Enable) (Interfaces 0/1, 0/2, 0/3)	RJ-45 ports only	Green	On if the RJ-45 port is selected. Off if the GBIC port is selected	—
3	SLOT ACTIVE	CompactFlash Disk	Green	On when the slot is being used	—
4	POWER ON	Power	Green	On and stays on	No

Cisco 7200VXR Series Port Adapter Jacket Card

Features and Benefits Overview

Features	Benefits
Additional Port and Slot Density	Increases the slot capacity of the chassis by 1 slot for single additional port adapter
Dedicated PCI Bus	Allows a high-bandwidth port adapter to be moved into the I/O slot, saving up to 3 port adapter slots
Port Adapter Support	High bandwidth point Port- and Service Adapter support offered: Cisco VPN Acceleration Module 2 (SA-VAM2), VPN Acceleration Module 2+ with AES wide key crypto card (SA-VAM2+), 2-Port Packet/SONET OC3c/STM1 Port Adapter (PA-POS-2OC3), 2-Port T3 Serial Port Adapter Enhanced (PA-MC-2T3+), and 1-Port multichannel STM-1 multi- and single mode port adapter (PA-MC-STM-1MM, PA-MC-STM-1SMI)
LED Indicators	"Pwr" LED indicates whether the jacket card is powered up; "Enabled" LED indicates whether it is discovered by the system and its readiness
Online Insertion and Removal (OIR)	Allows the port adapter to be removed or inserted into the jacket card without rebooting the router; the jacket card, on the other hand, should not be removed unless the system is powered down

Supported Network Processing Engines
NPE-G1 and higher.

Supported Port Adapters
The Cisco 7200VXR Series Port Adapter Jacket Card supports the following port adapters:

- Cisco VPN Acceleration Module 2 (SA-VAM2)-Supported only in combination with NPE-G1
- AES wide key crypto card (SA-VAM2+)
- 2-Port Packet/SONET OC3c/STM1 Port Adapter (PA-POS-2OC3)
- 2 Port T3 Serial Port Adapter Enhanced (PA-MC-2T3+)
- 1 port multichannel STM-1 multi- and single mode port adapter (PA-MC-STM-1MM, PA-MC-STM-1SMI)

Note: The Cisco Mix-Enabled T1/E1 Port Adapters for the Cisco 7200VXR Series router are not compatible with the Port Adapter Jacket Card.

Software
The Cisco 7200VXR Series Port Adapter Jacket Card is supported in the following Cisco IOS® Software versions at the time of first customer shipment:

- For NPE-G1
  - 12.4(7)
  - 12.4(6)T1
- For NPE-G2
  - 12.4(4)XD

Product Ordering Details

Product Number	Product Description
C7200-JC-PA	Cisco 7200VXR Series Port Adapter Jacket Card
C7200-JC-PA=	Cisco 7200VXR Series Port Adapter Jacket Card, spare

USB eToken and USB Flash Features Support

One of the many architectural enhancements specific to the next-generation integrated services routers as well as the Cisco 7200 VXR Series Services Aggregation Routers is the integration of USB ports. Two new features are available to take advantage of these USB ports-USB eToken support and USB Flash support. A USB is a low-cost, bidirectional, dynamically attachable serial interface.

The USB versions supported are:

- USB 1.1 on the Cisco 1841, 2800 Series, and 3800 Series routers, and Cisco 7200 VXR Series routers (with NPE-G2)

- USB 2.0 on the Cisco 871, 1811, 1812, and Cisco 7200 VXR Series routers (with the Network Processing Engine NPE-G2)

The new eToken and USB Flash features are supported on all routers that have built-in USB ports. This includes Cisco 871, 1811, 1812, and 1841 routers, as well as the Cisco 2800 Series and Cisco 3800 Series integrated services routers and Cisco 7200 VXR Series routers (with NPE-G2).

The USB eToken and Flash features provide Cisco routers with built-in USB ports to support eTokens and USB Flash memory. The USB eToken feature provides secure configuration distribution and allows users to store VPN credentials for deployment. The eTokens are supplied by Aladdin Knowledge Systems and can be ordered by going to http://www.aladdin.com/etoken/cisco. The USB Flash feature allows users to store images and configurations via USB Flash memory. USB Flash memory can be ordered from Cisco Systems (Table 1).

eToken USB Feature
- Removable credentials allow remote provisioning of routers.
- Security credentials are physically separated from the chassis of the router.
- The eToken can be used for security purposes that require the user to enter a PIN to access the stored information. This adds to the security of the application because it requires both the smart card itself (something you have) and a password (something you know), providing a two-factor authentication for added security enforcement. This greatly reduces the possibility of a third party being able to access the information on the card if it is lost or stolen.
- From a provisioning perspective, customers will see value in being able to order routers directly from Cisco (or a reseller) with a desired Cisco IOS image installed, to have the routers shipped directly to the customer premises, and to provide configuration files in a touchless or low-touch manner by distributing an eToken device. This allows the customer or service provider to use deployment technicians of a lower skill set for router installations.

USB Flash Feature
- Customers can store configurations and images on USB token Flash devices.
- The USB Flash drive provides an alternative mechanism to Compact Flash for storing files and images. Since the USB form factor is ubiquitous, customers can see value in using such a device over a Compact Flash.

The USB eToken and USB Flash features are supported in the following Cisco IOS Software Releases:

- For the Integrated Services Routers - Cisco 871, 1811/1812, 1841, 2800, 3800: As of 12.3(14)T

- For the Cisco 7200 VXR Services Aggregation Routers: With NPE-G2 as of 12.4(4)XD (in the future: also in 12.4T and 12.2SB)

For more details on USB eToken and USB Flash features, please go to the link below:

http://www.cisco.com/go/USB

Differences between the USB Flash and USB eToken:

Function	USB eToken	USB Flash
Accessibility	Used to securely store and transfer digital certificates and router configurations from the eToken to the router.	Used to store and deploy router configurations and images from the USB Flash to the router.
Storage Size	32Kb	• 64MB • 128MB • 256MB
File Types	• Typically used to store bootstrap data, digital certificates and configurations for Firewalls and IPSec VPNs • eTokens cannot store Cisco IOS images	Stores an file type that might be stored on a compact flash
Security	• Files can encrypted and accessed only with a user PIN • Files can also be stored in a non-secure format	Files can only be stored in a non-secure format.
Boot Images and Configurations	• Configuration can be booted from the eToken to the router. • Secondary configuration can be booted from the eToken to the router. Secondary configuration allows users to load their IPSec configuration.	Configuration file is automatically transferred from the USB Flash to the router.

USB Flash Memory Part Numbers

Part Number	Description
MEMUSB-64FT	64 MB USB Flash
MEMUSB-64FT=	64 MB USB Flash (spare)
MEMUSB-128FT	128 MB USB Flash
MEMUSB-128FT=	128 MB USB Flash (spare)
MEMUSB-256FT	256 MB USB Flash
MEMUSB-256FT=	256 MB USB Flash (spare)

USB eToken and USB Flash - Data Sheet
http://www.cisco.com/en/US/partner/products/hw/routers/ps341/products_data_sheet0900aecd80232473.html