Preparing for Installation

This chapter describes the general equipment, safety, and site preparation requirements for installing the VPN Acceleration Module (VAM). This chapter contains the following sections:

Required Tools and Equipment

You need the following tools and parts to install a VAM. If you need additional equipment, contact a service representative for ordering information.

- VAM
- Number 2 Phillips screwdriver
- Your own electrostatic discharge (ESD)-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares
- Antistatic mat
- Antistatic container

Minimum Hardware and Software Requirements

This section describes the minimum software and hardware requirements for the VAM.

Hardware Requirements

Specific hardware prerequisites that ensure proper operation of the VAM follow:

- The Cisco 7100 series routers support one SM-VAM installed in service module slot 5, or one SA-VAM installed in any single-width port adapter slot.

- The Cisco 7200 series routers support only one SA-VAM installed in any single-width port adapter slot.

Note In the Cisco 7200 series routers, the VAM requires a network processing engine 225 (NPE-225) or above. We recommend NPE-400 for optimal performance.

- The Cisco 7401ASR router supports one SA-VAM installed in the only port adapter slot.

Software Requirements

Table 2-1 lists the recommended minimum Cisco IOS software release required to use the VAM in supported router or switch platforms. Use the **show version** command to display the system software version that is currently loaded and running.

Table 2-1 VAM Software Requirements

Platform	Recommended Minimum Cisco IOS Release
Cisco 7100 series router[1]	Cisco IOS Release 12.1(9)E or a later release of Cisco IOS Release 12.1 E
Cisco 7200 series router	Cisco IOS Release 12.1(9)E[2] or a later release of Cisco IOS Release 12.1 E Cisco IOS Release 12.2(13)T or a later release of Cisco IOS Release 12.2(13)T Cisco IOS Release 12.2(14)SU or a later release of Cisco IOS Release 12.2(14)SU
Cisco 7401ASR router[1]	Cisco IOS Release 12.2(9)YE or a later release of Cisco IOS Release 12.2 YE

1. The Cisco 7100 series and the Cisco 7401ASR routers are no longer sold.
2. Support for dual VAMs with NPE-G1 is available in Cisco IOS Release 12.2(15)T, 12.1(14)E, and 12.3 Mainline only.

Memory Requirements for the Cisco 7200 Series Routers

The following Cisco 7200 series routers NPE memory requirements correspond to the maximum configured tunnels.

NPE Memory	Maximum Configured Tunnels
64MB	800
128MB	1500
256MB	3000
512MB	5000

Interoperability Between VAM and ISA/ISM

Note The integrated services adapter (ISA) is the predecessor of the SA-VAM, and the integrated services module (ISM) is the predecessor of the SM-VAM.

The Cisco 7100 series routers support ISA/ISM and the SA-VAM/SM-VAM; the Cisco 7200 series routers support ISA and SA-VAM; however, the Cisco 7401ASR routers do not support more than one port or service adapter.

Note The Cisco 7100 series and the Cisco 7401ASR routers are no longer sold.

Table 2-2 describes the interoperability between ISA/ISM and VAM. You can use VAM with ISA/ISM, provided you observe the following conditions:

- The system supports two VAMs in the same chassis. If one VAM is enabled at system bootup, and a second VAM is added later, the second VAM becomes active immediately, and depending on the configuration, the system attempts to load-balance between the two VAMs.
- If VAM and ISA/ISM are in the same chassis at system bootup, and the **encryption mppe** command is *not* in the router's running configuration, the router supports the newer version, in this case, VAM, and the ISA/ISM remains inactive.
- If ISA/ISM and VAM are in the same chassis at system bootup, and the **encryption mppe** command is in the router's running configuration, then both ISA/ISM and VAM are enabled at system bootup. The ISA/ISM card supports MPPE, and the VAM supports ISAKMP/IPSec. You can enable **encryption mppe** by following the steps in "Configuring IPSec" section on page 4-6. To disable MPPE on an ISA/ISM card, use the **no encryption mppe** command. This disables the ISA/ISM.
- To disable a card, use the **no crypto engine accelerator** *type slot/port* (port-adapter-slot-number/interface-port-number) command.

Table 2-2 Interoperability Between VAM and ISA/ISM

VAM with ISA/ISM	VAM with VAM
• Supports MPPE	• Does not support MPPE
• Supports ISAKMP/IPSec	• Supports ISAKMP/IPSec
• If ISA/ISM and VAM are enabled in the chassis at power up, ISA/ISM is used for MPPE, and VAM is used for ISAKMP/IPSec, provided the router's running configuration includes the **encryption mppe** command.	• If two VAMs are enabled in the chassis at power up, then both modules support ISAKMP/IPSec.
• If ISA/ISM is enabled in the chassis at bootup, and VAM is added later, the VAM remains inactive until the next reboot, or until the configuration is changed to enable the VAM.	• If VAM is enabled in the chassis at bootup, and another VAM is added later, the second VAM immediately becomes active and depending on the configuration, the system attempts to load-balance between the two VAMs.

Checking Hardware and Software Compatibility

Hardware Compatibility

The Cisco 7100 series, Cisco 7200 series, and Cisco 7401ASR routers support up to two VAM cards. VAM cards can interoperate with the port and service adapters, and service modules supported on the Cisco 7100 series, Cisco 7200 series, and Cisco 7401ASR routers.

Software Compatibility

To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Advisor tool on Cisco.com. Registered Cisco Direct users can access the Software Advisor. This tool does not verify whether modules within a system are compatible, but it does provide the minimum Cisco IOS software requirements for individual hardware modules or components.

Note Access to this tool is limited to users with Cisco.com login accounts.

Safety Guidelines

This section provides safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

Warning **This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Waarschuwing **Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.**

Varoitus **Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).**

Attention **Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.**

Warnung **Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.**

Avvertenza **Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.**

Advarsel **Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.**

Aviso **Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.**

¡Advertencia! **Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.**

Varning! **Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förkommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.**

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe; carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Port adapters and processor modules comprise printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, use a preventive antistatic strap during handling.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to an unfinished chassis surface.
- When installing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component, use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.

- Place a removed board component-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.
- For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 Mohm.

FCC Class A Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Warning **This product has been designed to meet these requirements. Modifications to this product that are not authorized by Cisco Systems, Inc. could void the various approvals and negate your authority to operate the product.**

Compliance with U.S. Export Laws and Regulations Regarding Encryption

This product performs encryption and is regulated for export by the U.S. government. Persons exporting any item out of the United States by either physical or electronic means must comply with the Export Administration Regulations as administered by the U.S. Department of Commerce, Bureau of Export Administration. See http://www.bxa.doc.gov/ for more information.

Certain “strong” encryption items can be exported outside the United States depending upon the destination, end user, and end use. See http://www.cisco.com/wwl/export/encrypt.html for more information about Cisco-eligible products, destinations, end users, and end uses.

Check local country laws prior to export to determine import and usage requirements as necessary. See http://cwis.kub.nl/~frw/people/koops/lawsurvy.htm as one possible, unofficial source of international encryption laws.