Preparing for Installation

This chapter describes the general equipment, safety, and site preparation requirements for installing the ISA and the ISM.

This chapter contains the following sections:

Required Tools and Equipment

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

- SA-ISA(=) service adapter or SM-ISM(=) service module
- 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

Software and Hardware Requirements and Compatibility

Table 2-1 lists the recommended minimum Cisco IOS software release required to use the ISA/ISM in supported router or switch platforms.

Note The Cisco 7100 series VPN routers do not support an ISM and an ISA in the same chassis. The Cisco 7200 series routers do not support the ISM.

The ISA and the ISM are the same board, but differ in their outside appearance.

Note The Cisco IOS Release 12.1 Mainline does not support the ISA/ISM.

Table 2-1 Minimum Cisco IOS Software Releases

Platform	Recommended Minimum Cisco IOS Release
Cisco 7100 series • Cisco 7120 series and Cisco 7140 series	Cisco IOS Release 12.0(5)XE or a later release of Cisco IOS Release 12.0 XE Cisco IOS Release 12.1(1)E or a later release of Cisco IOS Release 12.1 E Cisco IOS Release 12.2(2)T or later release of Cisco IOS Release 12.1T Cisco IOS Release 12.2M or later release of Cisco Release 12.2M.
Cisco 7200 series (for ISA only) • Cisco 7202, Cisco 7204, and Cisco 7206	Cisco IOS Release 12.0(5)XE or a later release of Cisco IOS Release 12.0 XE Cisco IOS Release 12.1(1)E or a later release of Cisco IOS Release 12.1 E Cisco IOS Release 12.2(2)T or a later release of Cisco IOS Release 12.1 T Cisco IOS Release 12.2M or a later release of Cisco IOS Release 12.2M Cisco IOS Release 12.2(4)B or a later release of Cisco IOS Release 12.2 B

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 at:http://www.cisco.com/cgi-bin/Support/CompNav/Index.pl. 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.

Interoperability Between ISA/ISM and VAM

Note The Cisco 7100 series routers support ISM and the SA-VAM; the Cisco 7200 series routers support ISA and SA-VAM; and the Cisco 7200 series routers support two ISAs in the same chassis.

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

- The system supports two ISAs in the same Cisco7200 series router chassis. If one ISA is enabled at system bootup, and a second ISA is added later, the second ISA becomes active immediately, and depending on the configuration, the system attempts to load-balance between the two ISAs.
- If ISA and VAM are in the chassis at system bootup, the Cisco 7200 series router supports the newer version, in this case, VAM, provided the Cisco IOS Release supports VAM; and the ISA remains inactive.

- If ISA and VAM are in the chassis at system bootup, and the **encryption mppe** command is in the router's running configuration, then both ISA and VAM are enabled at system bootup. The ISA card supports MPPE, and the VAM supports ISAKMP/IPSec.

Note The ISA does not support MSCHAP-v2.

- You can enable **encryption mppe** by following the steps in "Configuring IPSec" section on page 4-4.
- To disable MPPE on an ISA card, use the **no encryption mppe** command. This disables the ISA.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 ISA and VAM

ISA and ISA	ISA with VAM
• Supports MPPE	• Supports MPPE
• Supports ISAKMP/IPSec	• Supports ISAKMP/IPSec
• If two ISAs are enabled in the chassis at power up, then both modules support both MPPE and ISAKMP/IPSec.	• If ISA and VAM are enabled in the chassis at power up, ISA is used for MPPE, and VAM is used for ISAKMP/IPSec, provided the router's running configuration includes the **encryption mppe** command.
• If ISA is enabled in the chassis at bootup, and another ISA is added later, the second ISA immediately becomes active and depending on the configuration, the system attempts to load-balance between the two ISAs.	• If ISA 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.

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.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohm).

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/crypto/ 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://www.kub.nl/faculteiten/frw/outdated.html as one possible, unofficial source of international encryption laws.