# Cisco VCO/4K Chassis Removal/Replacement Procedures

These instructions will guide you through removing an existing VCO/4K chassis from your system and replacing it with a new chassis. Read these instructions in their entirety before beginning.

# Before You Start

## VCO/4K Replacement Chassis

Unlike an entire VCO/4K system, which ships with all system components, your replacement VCO/4K chassis should only include the following components:

- VCO/4K system enclosure, including front door and universal compliance label (located horizontally above PEM—see Figure 3)
- Alarm Interface (AIC) midplane for AAC
- Fan cooling unit
- Power entry module (PEM), including safety cover/label that lists new system serial number
- Midplane—receives the circuit cards and I/O modules
- Internal Cabling (except IPRC cables), if any

Keep the packing supplies from your replacement VCO/4K chassis to ship back your existing chassis. If you have questions about return shipping, then contact Cisco Service Logistics at 408 526-5744 or send e-mail to *lsc-help@cisco.com*; be sure to include your RMA number.

Once you have verified that your replacement chassis is complete and undamaged, place it on a stable, level surface as close to your original chassis as possible for component switching between the two systems. Also, remove and set aside the front door and PEM safety cover and screws.

**Note** As an ESD precaution, connect a temporary earth ground to lug 3 of the PEM on your replacement chassis before performing any work on it. Ensure sufficient slack to allow for placement of this chassis into the location of the existing chassis.

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# Required Tools

In order to remove and replace your existing chassis, you will need the following tools:

- #1 Phillips-head screwdriver (to remove and replace card retainer bars located on the front of the chassis)
- # 2 Phillips-head screwdriver (to remove and replace the PEM safety cover(s))
- 1/4-inch bladed screwdriver (to remove and replace rear blank panels and I/O cards)
- 1/8-inch bladed screwdriver (to remove datacomm connectors)
- Diagonal cutters (to cut nylon cable ties)
- ESD ground strap(s) with banana plug (minimum 6-foot stretch length for ease of moving around the system while staying grounded)

# Supplies

You should also have the following supplies close at hand:

- Writing materials to chart VCO/4K card and module locations.
- Labeling materials (peel-and-stick labels, and/or permanent fine-line marker) to label interface cables.
- Nylon cable ties – various sizes to resecure PEM and interface cables.
- Up to 42 standard 16” x 18” anti-static bags, if you choose to store circuit cards and I/O modules while performing this procedure.

# Estimated Downtime

Your existing system will be powered down and out of service for 30 to 90 minutes, based on the number of interface circuits supported by the system.

These procedures should be performed during off peak hours to minimize service disruption.

# Recording Current Configuration

Before moving any components to your replacement chassis, you must first record all aspects of your current VCO/4K system.

**Step 1** Store a copy of your existing system database to floppy disk; store both sides if you have a redundant system. This is a precautionary measure. (Maintenance Menu – Disk Utilities – Database Store)

**Step 2** Remove and set aside your existing VCO/4K front door.

**Step 3** Record the location of all circuit cards (front panel) and I/O modules (rear panel) on your existing VCO/4K chassis, including blanks. Use Table 1 to record your circuit cards.

**Step 4** Label all datacomm, LAN, analog and digital lines/trunk cables interfacing with the current VCO/4K.

***Figure 1 Front of VCO/4K Without Door***

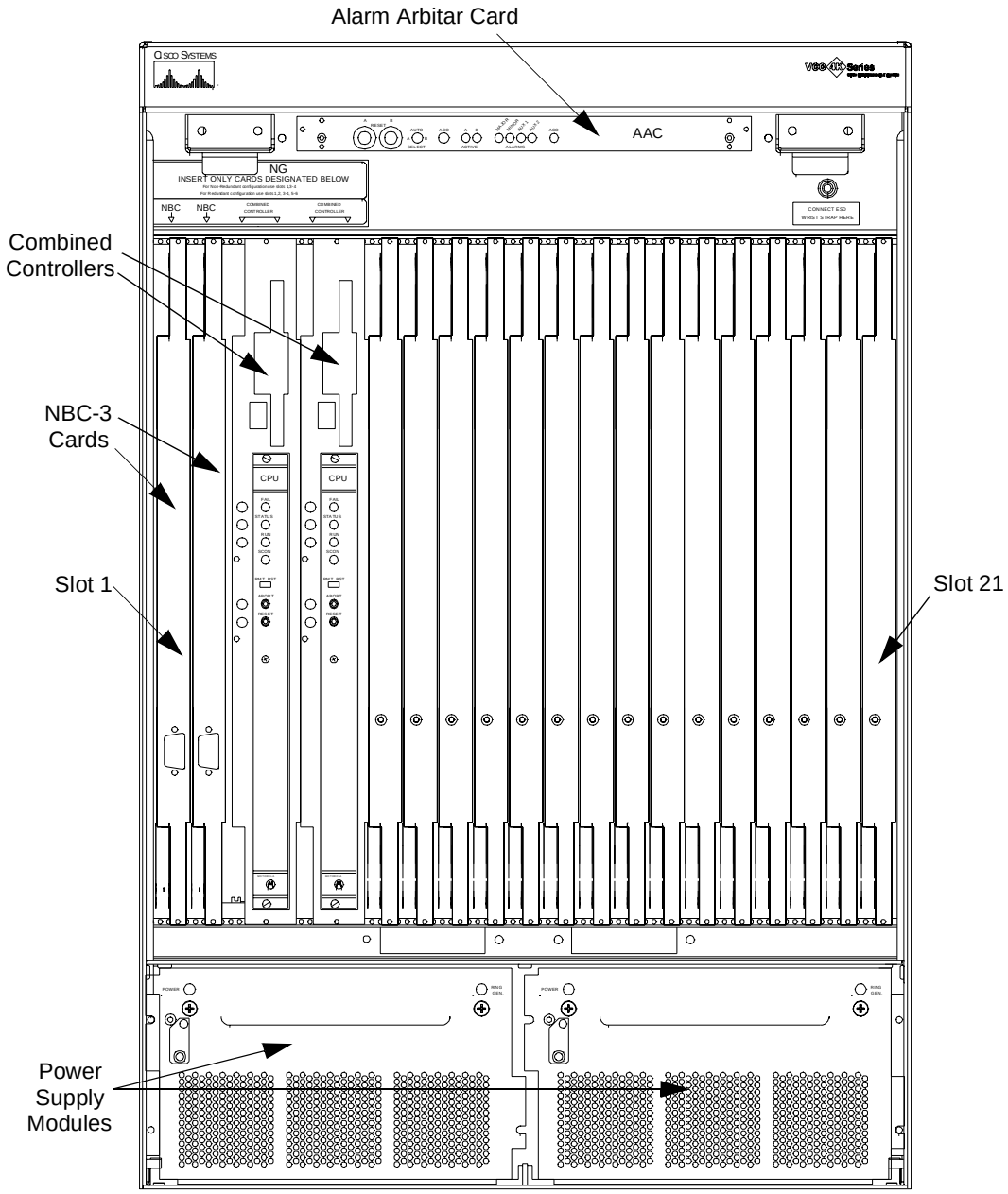

*Table 1 Current VCO/4K Card Slot Assignments*

| Slot No. | Card Type |
|---|---|
| 1 | NBC-3 - Network Bus Controller (Side A) |
| 2 | NBC-3 - Network Bus Controller (Side B) |
| 3 | CPU - Combined Controller (Side A) |
| 4 | CPU - Combined Controller (Side A) |
| 5 | CPU - Combined Controller (Side B) |
| 6 | CPU - Combined Controller (Side B) |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |

**Note** If you have IPRC card(s), then you will have to move the associated internal IPRC cables. These cables are in the rear of the chassis behind the I/O modules.

***Figure 2 Back of VCO/4K***

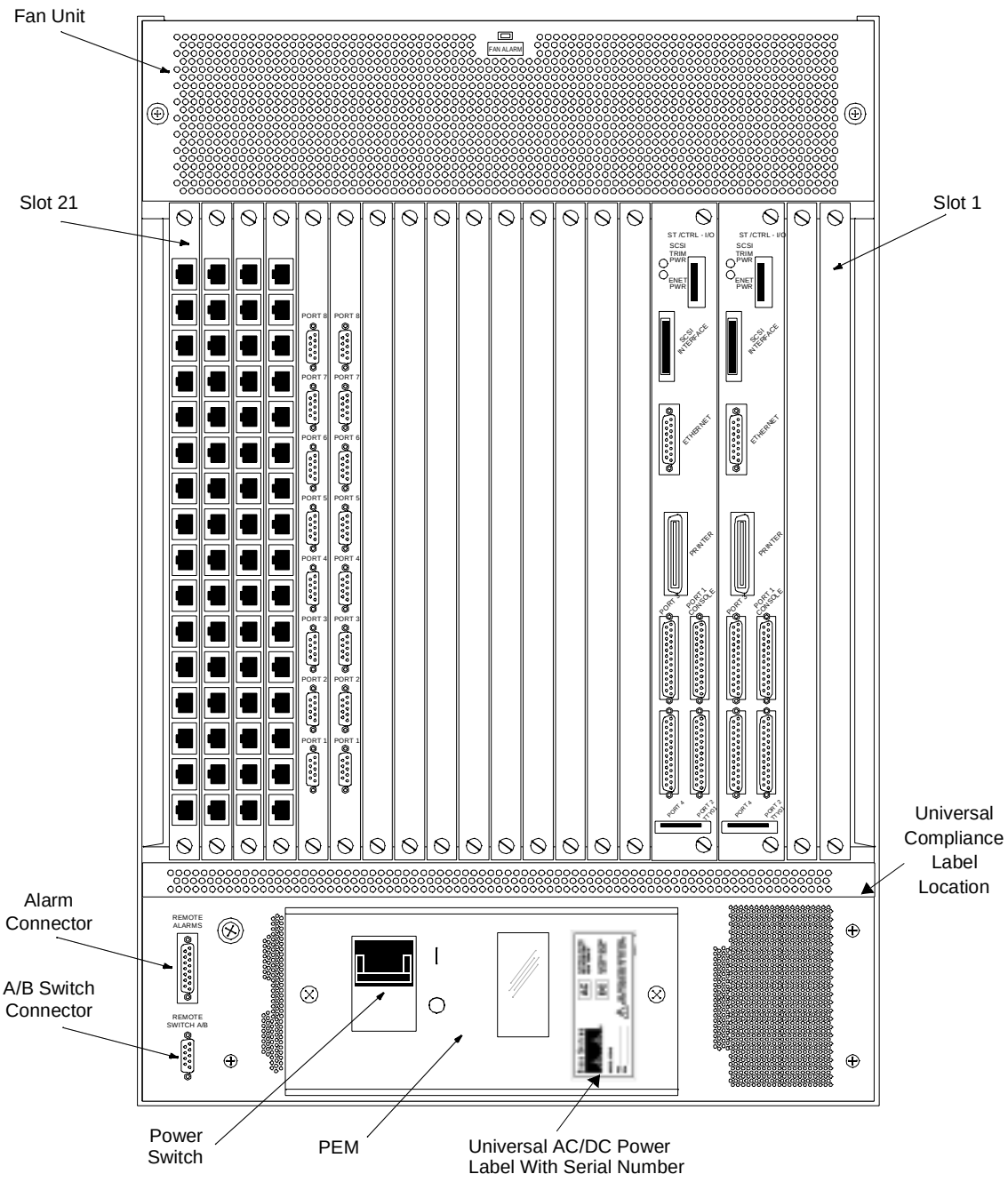


***Figure 3 Universal Compliance Label Sample***

*Table 2 Current I/O Module Slot Assignments (left to right)*

| Slot No. | Card Type |
|---|---|
| 21 | |
| 20 | |
| 19 | |
| 18 | |
| 17 | |
| 16 | |
| 15 | |
| 14 | |
| 13 | |
| 12 | |
| 11 | |
| 10 | |
| 9 | |
| 8 | |
| 7 | |
| 6 | Storage Control I/O (Side B) |
| 5 | Storage Control I/O (Side B) |
| 4 | Storage Control I/O (Side A) |
| 3 | Storage Control I/O (Side A) |
| 2 | Blank Panel or BITS Clock Cable I/O |
| 1 | Blank Panel or BITS Clock Cable I/O |

# Site Survey

As with any procedure that involves system downtime, a site survey is highly recommended while reviewing this procedure in detail to avoid any otherwise unforeseen circumstances.

## System Redundancy Check and AAC Selector Switch

### Redundant System Considerations

Before fully powering down any redundant system (as this procedure requires), ensure there are no ALM08x Update Channel Failure alarms as seen from the SYSTEM ALARMS/Minor or Major screen (log into each side of the system and inspect this). In the rare event that these alarms are present, then these alarms are most likely NOT in the chassis itself but rather in the hardware that you will be re-using in the new replacement chassis. If these alarms are present, simply make a note of which side is in the ACT state.

### If No ALM08x Alarms Were Present

Before fully powering up any redundant system (as this procedure requires), ensure that the AAC card selector switch is in the AUTO (default) position – provided that there were no ALM08x Update Channel Failure alarms previously present. Upon power turn up of the new chassis, the A side will come into the active state and the B side will come up as standby (by design).

### If ALM08x Alarms Were Present

If there was an ALM08x Update Channel Failure alarm present on the system that you are replacing, set the AAC selector switch to the side that was previously indicated to be in the ACT state before fully powering up the new system. Upon power restoration, the side so selected will come into the active state and the other side will come up as standby.

### Non-Redundant System Considerations

Before fully powering up any non-redundant system (as this procedure requires), ensure that the AAC card selector switch is in the A (default) position, not in the AUTO or B position. A non-redundant system has no cards in slots 2, 5, and 6 (i.e. no B side), except for the required blank panels.

# Removal/Replacement Procedures

**Caution** The following procedures are intended for VCO/4K-qualified technicians only.

**Caution** Two or more people are required to lift or position the VCO/4K system. The Occupational Safety and Hazards Administration (OSHA) recommends a lifting weight limit of 40 pounds for women and 75 pounds for men. (Refer to the *VCO/4K Installation Manual* for a full list of safety precautions and procedures.)

Observe local, regional, and national safety codes, as well as your company's safety rules and regulations.

## Shutting Down Your Current System

**Step 1** Gracefully prevent new traffic from entering your system:

**a.** Place all VCO/4K interface spans to Maintenance state from the Maintenance Menu – Card Maintenance.

**b.** Use the Diagnostic Card Display screen "On(0) / Off(1)" field, or protocol analyzer, to monitor the span until all voice traffic ceases.

**Note** The "On(0) / Off(1)" field does not function with interface spans configured as "clear channel" (used in SS7 and ISDN NFAS applications), so definitely use a protocol analyzer in these instances.

**c.** Once all voice traffic ceases, transition the state of each interface span to "Out-of-Service."

**Note** If there are calls on any given interface span, the system will give you no warning prompt when you transition that span to "Out-of-Service." (Refer to issue CSCdp23008 by logging into *www.cisco.com/tac*.)

**d.** Transition all service circuit cards to "Out-of-Service." *Do NOT transition the state of the NBC-3 or DTG-2 cards.*

**Note** Refer to the *VCO/4K System Administrator's Guide* for detailed information on system administration.

**Step 2** Wait for all call traffic to cease.

**Step 3** If you have a hosted system, shut down and power off your system host.

**Step 4** If you also have an SS7 subsystem, first shut down the cktint (or SEPT) and EBS stacks using the stop-ss7.sh command. Then, power off your SS7 subsystem. (Refer to your Integrated SS7 System Supplement for detailed instructions.)

**Step 5** Power off your VCO/4K by pulling down the power switch (O position) on the power entry module (PEM) in the rear of the system (see Figure 2).

# Chassis Removal

**Warning** **A licensed electrician must perform all power-related tasks.**

**Step 1** Disconnect the power supplying the feed circuit(s), usually at the circuit breaker box, that enter your VCO/4K. *Tag the circuits at the disconnect points to warn others not to turn the power on while work is being completed.*

**Step 2** Make certain you are properly ESD grounded. Use a wrist strap, attached to the ground connector located in the front, inside of the VCO/4K. The ground connector can be identified by the label: CONNECT ESD WRIST STRAP HERE

**Step 3** Remove the power module(s) from the front panel of your VCO/4K and leave in an ESD-protected area until reinstallation.

**Note** Refer to the VCO*/4K Mechanical Assemblies* for detailed instructions on removal and replacement of power modules.

**Step 4** Disconnect all interface cables from the rear panel of your VCO/4K (make sure they are clearly labeled for re-installation).

**Step 5** Use a #2 Phillips-head screwdriver to remove the two screws holding the power protection cover to the PEM and discard the cover (do not confuse with new cover, which details your new system serial number).

**Step 6** Disconnect the power feed cables entering the VCO/4K PEM (make sure they are clearly labeled for re-installation).

**Caution** Be aware that this will leave your chassis without ESD protection until you establish a temporary earth ground.

**Step 7** Disconnect your ESD wrist strap. If your system is mounted in a cabinet or rack, unbolt and remove the VCO/4K chassis from the rack frame.

**Note** Refer to the *VCO/4K Installation Manual* for detailed instructions on mounting the VCO/4K system in a cabinet or rack.

**Step 8** Set your current chassis on a stable, level surface next to your replacement chassis. The front door should already be removed from the replacement chassis.

**Caution** As an ESD precaution, be sure to connect a temporary earth ground with sufficient slack to lug 3 of the PEM on both VCO/4K chassis.

# Component Switching Between Chassis

**Step 1** Make certain you are properly ESD grounded again. Use a wrist strap attached to the ground connector located in the front, inside of either VCO/4K chassis. The ground connector can be identified by the label: CONNECT ESD WRIST STRAP HERE

**Step 2** If your system was mounted in a cabinet or rack, remove the rack mounting brackets from your original chassis and install them on your replacement chassis.

**Step 3** Use a #1 Phillips-head screwdriver to remove the mounting screws/washers from the top and bottom circuit card retainer bars on the front of your existing chassis. Keep the retainers and screws together in a safe place for replacement later.

**Step 4** One by one, remove each circuit card and blank panel, including the AAC, from the front panel of your existing chassis and replace each in the corresponding slot of your replacement chassis. If you must set down any removed card, set it in an anti-static bag or on an anti-static mat.

**Note** Refer to the *VCO/4K Card Technical Descriptions* for detailed instructions on card removal and replacement.

If your system has an NBC3 BITS clock cable kit, then move that and the NBC3(s) first.

**Step 5** Refer to the information you recorded in Table 1 to make sure you reinstalled all circuit cards in their original configuration.

**Caution** If your existing system arrived with blank card assemblies (blank faceplate and blank metal blade) installed, these assemblies must be replaced in the same locations on your replacement chassis, unless you replaced them with a functional system card. These blank card assemblies are carefully configured to compartmentalize the system for safety reasons and are critical to maintain EMI and NEBS compliance.

**Step 6** Install the top and bottom circuit card retainer bars on your replacement chassis. Use a #1 Phillips-head screwdriver to replace the mounting screws/washers.

**Caution** The circuit card retainer bars must be installed for the system to meet NEBS Zone 4 Earthquake compliance.

**Step 7** One by one, remove each I/O module from the rear panel of your existing chassis and replace each in the corresponding slot of your replacement chassis. If you must set down any removed module, set it in an anti-static bag or on an anti-static mat.

**Note** Refer to *VCO/4K Mechanical Assemblies* for detailed instructions on removal and replacement of I/O modules and BITS clock installation.

**Step 8** Refer to the information you recorded in Table 2 to make sure you reinstalled all I/O modules in their original configuration, including blank panels.

# Chassis Replacement

**Step 1** If you need to mount your new system into a cabinet or rack, leave the temporary earth ground on lug 3 of the PEM, if at all possible, and mount your replacement chassis in your rack.

**Caution** Be aware that if you remove the temporary earth ground this will leave your chassis without ESD protection until you re-establish a permanent chassis ground connection.

**Step 2** When your replacement chassis is in its final location, reinstall power feed cables to your VCO/4K PEM. This re-establishes permanent chassis ground connection.

**Caution** Make sure the PEM circuit breaker is off and the power feed circuit disconnect points are still tagged to warn others not to turn the power on while work is being completed.

**Step 3** Make certain you are properly ESD grounded. Use a wrist strap attached to the ground connector located in the front, inside of either VCO/4K chassis. The ground connector can be identified by the label: CONNECT ESD WRIST STRAP HERE

**Step 4** Attach the power protection cover *from your replacement chassis PEM*. Use a #2 Phillips-head screwdriver to replace the two retainer screws.

**Step 5** Reinstall all pre-labeled interface cables at I/O modules.

**Step 6** Reinstall the original power modules.

**Step 7** Reconnect the power supplying the feed circuit(s) that enter your VCO/4K.

# Restoring System Operation

**Step 1** Power up your replacement VCO/4K by pushing up the power switch (| position) on the PEM.

**a.** Observe LEDs to verify that the system is fully operational.

**b.** Check that the fan cooling unit is moving air.

**Note** All cards in the system should automatically come back into service once they take their download. If not, place all interface cards "In Service." (Maintenance Menu – Card Maintenance)

**Step 2** If you have an SS7 subsystem, power up your SS7 subsystem. *Be aware that SS7 software autostart can take up to 20 minutes.* (Refer to your Integrated SS7 System Supplement for detailed instructions.)

**Step 3** If you have a hosted system, power up your system host.

**Step 4** Place test calls.

**Step 5** Place system back in service.

**Step 6** Ensure that call traffic resumes properly.

**Step 7** Replace the front door on your replacement VCO/4K system. **The front door must remain on during system operation for EMI compliance.**

# Original Chassis Return

**Step 1** Once you have verified that your replacement chassis is operating properly, package your original chassis in the shipping material your replacement chassis arrived in.

**Step 2** Find the RMA Return Directions that arrived with your replacement chassis. Carefully follow these directions in order to receive credit for your returned chassis.

**Note** Pay special attention to the Ship-To Address included in your return instructions.

If you have questions about return shipping, then contact Cisco Service Logistics at 408 526-5744 or send e-mail to *lsc-help@cisco.com*; be sure to include your RMA number.

**Step 3** Check with your Cisco sales representative to make sure your service contract(s) have been updated with your new chassis serial number.

# Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to warranty or maintenance contract customers who need technical assistance with a Cisco product that is under warranty or covered by a maintenance contract.

To display the TAC web site that includes links to technical support information and software upgrades and for requesting TAC support, use www.cisco.com/tac.

To contact by e-mail, use one of the following:

| Language | E-mail Address |
|---|---|
| English | tac@cisco.com |
| Hanzi (Chinese) | chinese-tac@cisco.com |
| Kanji (Japanese) | japan-tac@cisco.com |
| Hangul (Korean) | korea-tac@cisco.com |
| Spanish | tac@cisco.com |
| Thai | thai-tac@cisco.com |

In North America, TAC can be reached at 800 553-2447 or 408 526-7209. For other telephone numbers and TAC e-mail addresses worldwide, consult the following web site: http://www.cisco.com/tac/contacts/.