



Preface

Objective

The *Cisco VCO/4K Troubleshooting Guide* provides information that will enable you to properly diagnose and resolve many of the problems that you may encounter with the VCO/4K system. Problems that cannot be resolved with the information in this guide must be elevated to a Cisco TAC (Cisco Technical Assistance Center). Procedures to ensure accuracy and timeliness of your input are also contained in this guide.

The guide provides users and technicians with information on performing corrective maintenance routines for peripheral equipment, power subsystem, interface circuits, service and control circuits, and host communication links. It also serves as a reference guide on the diagnostic tools incorporated in the system.

This guide concentrates on fault isolation and refers to descriptions, procedures, and tools used to remedy a problem within a specific system component. It contains first-level troubleshooting information for the VCO/4K system and associated components. Procedures reference additional information contained in various other documents in the VCO/4K documentation set. Corrective maintenance procedures for individual VCO/4K system components may be called upon from more than one source within this guide (that is, a troubleshooting procedure may apply to several symptoms). These internal cross-references tie sections of this guide together.

Original equipment manufacturer (OEM) documents contain details on maintaining the peripheral equipment (console, printer, and modems) connected to a VCO/4K system. Specialized OEM telecommunications equipment (such as voice response units, voice store-forward subsystems, telsets, etc.) are also available with similar documentation. Refer to these OEM documents when performing preventive and corrective maintenance.

Audience

This manual is intended for VCO/4K system users and third-party support personnel. If you are unfamiliar with the VCO/4K system, refer to one or more of the related documents listed in the “Related Documentation” section on page xiii.

This manual assumes that the host application (if it is a hosted system) is written to conform to the *VCO API Programming Reference Manual*. However, that does not preclude problems occurring between the application and the VCO/4K system.

Each release of the VCO/4K Generic is described in the *Cisco VCO/4K Release Notes* that contain detailed information on changes from one release to the next. If your VCO/4K System includes the SS7 subsystem, refer to the *SS7 Release Notes*.

Document Organization

This document is organized as follows:

- Chapter 1, “How to Use This Guide,” explains how to use this guide as an aid in resolving system problems.
- Chapter 2, “Problem Scenarios,” lists by category (system, VCO, SS7, etc.) failure descriptions and corresponding resolutions.
- Chapter 3, “System Troubleshooting,” addresses fault isolation from a top-down approach starting with the larger environment in which the switch exists. The goal is to as quickly as possible isolate the problem to either the VCO/4K subsystem (switch) and/or the SS7 subsystem or to a problem external to the switch/SS7 subsystems.
- Chapter 4, “VCO Subsystem Troubleshooting,” addresses fault isolation within the VCO subsystem and associated software and peripheral equipment that exists to support the subsystem.
- Chapter 5, “SS7 Subsystem Troubleshooting,” addresses fault isolation within the SS7 subsystem and associated software.
- Chapter 6, “Host Communications Troubleshooting,” describes the host communications interface to the VCO/4K System from a troubleshooting perspective.
- Chapter 7, “Peripheral Equipment Troubleshooting,” addresses fault isolation for each peripheral that may be associated with a VCO/4K system.
- Appendix A, “Diagnostic Tools,” describes the diagnostics that Cisco Systems provides to facilitate troubleshooting the VCO/4K system.
- Appendix B, “Checklists,” contains detailed checklists that enable you to record the information a TAC engineer will need to resolve an issue that you could not resolve at your site.
- Appendix C, “System Reconfiguration Procedures,” contains procedures for reconfiguration of your system. These procedures are referenced as appropriate from elsewhere in the guide.
- Appendix D, “Expected Outputs,” contains examples of system outputs from a system known to be operating normally. These are an aid to be compared to suspected erroneous output.

Documentation Conventions

This document uses the following conventions:



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Warning

Means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Related Documentation

The following third-party documents are recommended by Cisco:

- International Telecommunications Union ITU-T Q.931 ISDN documentation
- ANSI T1.113-1992, SS7 ISUP documentation
- OEM manuals supplied with peripheral equipment installed as part of the system configuration
- The documentation set produced for the host computer system
- Documentation for the application software package developed to run on the host

You should also have knowledge of PSTN communication protocols.

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

Documentation Feedback

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You can e-mail your comments to bug-doc@cisco.com.

To submit your comments by mail, for your convenience many documents contain a response card behind the front cover. Otherwise, you can mail your comments to the following address:

Cisco Systems, Inc.
Document Resource Connection
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

To access Cisco.com, go to the following website:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

<http://www.cisco.com/tac>

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

<http://www.cisco.com/register/>

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

<http://www.cisco.com/tac/caseopen>

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

