CHAPTER 9

Corrective Maintenance—Host Communications

Communications between the host computer and the VCO/4K are supported through Ethernet DB-15 interface on the Storage/Control I/O Module. The connecting cable, host I/O hardware/software, and the VCO/4K host control software comprise host communications links.

This chapter describes general corrective maintenance procedures for host communications links. Refer to the following documents for additional information about VCO/4K Ethernet configuration and communications:

- *Cisco VCO/4K System Administrator's Guide*
- *Cisco VCO/4K Extended Programming Reference*
- *Cisco VCO/4K Standard Programming Reference*
- *Cisco VCO/4K Ethernet Guide*

Other reference materials include the OEM manuals supplied with the host computer I/O package and modems employed for remote access (optional), and any documentation related to the communication and application packages to be run on the host computer.

Overview

In a VCO/4K, the CPU card in the system controller initializes and deinitializes the host link(s) and data transfer to/from the host. All control sequences are initiated by the CPU card; the Storage/Control I/O Module is merely a connector panel which provides physical connectivity between EIA cables and the CPU card.

Before a host communication channel can be initialized, you must first define it from the master console using the Host Configuration menu. (For more information, refer to the *Cisco VCO/4K System Administrator's Guide.*) This menu is used to configure host interfaces and software overlays (TeleRouter) and indicate the status of alarm conditions for host interfaces. You can configure up to eight host computer interfaces (sockets) for the system. In general, the larger the number of host interfaces defined, the more system processing time is dedicated to host interface processing.

Configure the internal interface only if the TeleRouter software overlay is to be used. If you do not configure the internal interface, TeleRouter call routing is not performed.

Table 9-1 lists the host communication parameters to be defined.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

Table 9-1   Host Interfaces and Applicable Parameters

Interface	Parameters
Ethernet	Host Name
	Connect Password (for local port)—optional
	Loc. Port (logical port number of local port)
	Rem.Inet.Addr (Remote Internet Address)
	Rem. Port (logical port number of remote port A)
	Trace
	Protocol (fixed at TCP)
	Reset Time

To minimize reconnection times, always set the Rem Port value to 0 and the Reset Time value to 1 second.

A reset deinitializes the link (if it was already in service) and then initializes it and applies the configuration parameters stored in the database. The following events can cause a link reset:

- A system reset occurs on the VCO/4K (system reboots or is powered up)
- The link configuration is modified with from the Host Configuration menu
- An error occurs on the link (polling timeout, signaling error, etc.)

Problem Isolation Techniques

VCO/4K administrative software continuously monitors host communications links. The VCO/4K acts as a subordinate node in a network configuration, and expects the host (master) to poll/check the communications channels at regular intervals for message exchanges.

Error and status messages reflect the status of the data links between the VCO/4K and the host computer. If a communication channel fails, the appropriate message is sent to the VCO/4K error log (stored to disk and/or printed on the local printer, depending on the File System Configuration selections). Messages with the HST prefix indicate errors or status changes in host communication. Refer to the *Cisco VCO/4K System Messages* whenever a host error or status message appears on the local system printer.

The following sections offer general troubleshooting instructions for remedying the cause of a host communications link failure. Because of the uniqueness of each VCO/4K application, these procedures only serve as a guideline for analyzing and correcting communications problems.

Host Communications Failure on Power-On

If the system experiences a general failure of host communications at initial system power-on, check for the following:

- Verify proper installation and connection of communications cables. Refer to the *Cisco VCO/4K Hardware Installation Guide* and *Cisco VCO/4K Card Technical Descriptions* for detailed information.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

- The host computer should be on-line and equipped with appropriate I/O hardware and software. Be sure that the host computer operating system and associated applications programs have been properly loaded and started.

- The VCO/4K should be powered-on and system software loaded on the system.

- If a VCO/4K is equipped with redundant system controllers, try switching from side A to side B. Monitor the system log for network messages. If host communication is restored, service the standby controller. If communication is not restored, recheck the I/O circuitry at the host computer.

- Enable the trace facility of the VCO/4K. Refer to the *Cisco VCO/4K System Administrator's Guide* for information on setting message trace bits and using the System Trace Configuration utility. If the trace and message facilities fail to demonstrate data communications with the VCO/4K, insert a protocol analyzer in the communication links to determine whether the VCO/4K (no responses sent) or host (no commands sent) is at fault.

Cables

The *Cisco VCO/4K Hardware Installation Guide* describes possible host communication configurations supported by the VCO/4K. Cables between the host and the VCO/4K are determined by the desired system implementation.

Use the following recommendations to detect and correct cable problems:

- The cable used for the link should be of such quality as to ensure proper electrical performance in accordance with electrical specifications.

- Connectors should be selected and installed on the cable in accordance with the pinout specifications detailed in the *Cisco VCO/4K Hardware Installation Guide* and/or the *Cisco VCO/4K Site Preparation Guide* and the OEM specifications for the I/O port on the host computer. Physical Ethernet connections are determined by the network environment.

- Cables should be routed away from sources of EMI and RFI noise which might induce spurious signals. Induced noise can cause erratic system performance, including loss of service.

- Breakout boxes or other similar adapters/line analyzers should be removed from communications links as soon as possible. This is especially true when long cable runs are used between the host and the VCO/4K. Such devices increase the chance of errors caused by propagation delay of signals and low signal voltages.

Modems

Modem setup parameters are dictated by the type of interface, communication protocol, cabling requirements, and answering mode required for the intended application.

To determine the actual modem setup requirements, review the following documents:

- *Cisco VCO/4K System Administrator's Guide*

- OEM operation manual supplied with the modem

- I/O port driver specifications for the application software on the host computer

- Application throughput and load requirements

If the modems are connected over the switched public network or leased data lines, you must also contend with problems of noise, line losses, and other problems common to data communications over analog networks.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

Host Computer I/O Communications

Host computer I/O consists of hardware and software components which control data communications to and from the VCO/4K. The complexity of the data communications requirement is directly proportional to the number of channels between a host computer and the VCO/4K, the telecommunications traffic throughput expected for the intended application, the number of messages per call scenario, and the communications type/protocol selected for the links.

Requirements and Limitations

The following specific requirements and limitations apply to all host computer I/O communications:

- The redundancy required between the host computer(s) and VCO/4K system controllers determines the number of host communications links in the system implementation. Refer to the *Cisco VCO/4K Ethernet Guide* for an analysis of possible link configurations.

- Traffic throughput requirements affect the CPU overhead required in the host computer. CPU overhead must also be provided for I/O processing of the communications links. In all cases, the required overhead can be reduced by the selection of intelligent I/O hardware which offloads communications link processing. However, the host computer can become I/O bound if it is expected to support multiple data communications links to the VCO/4K, even with intelligent I/O controllers on both the VCO/4K and the host computer.

- The host computer must be loaded with appropriate communications software. This software includes drivers for the I/O ports. I/O performance is controlled by the sophistication of the communications package running on the host.

- If excess CPU overhead is expended from running the call processing application, the I/O rate of the data links may be insufficient to prevent timeouts or resets at the interface ports of the VCO/4K. The host may be unable to receive, process, and return a command to the VCO/4K to prevent such autonomous timeouts or resets.

- Host communications links must be operated and serviced in real time. All VCO/4K events and transitions are initiated over these links. Any delays in response affect the timely execution of the application.

- If the call processing application requires sending/receiving a relatively large number of commands and reports over the communications links, the host I/O hardware/software should be selected to accommodate this requirement.

Recommendations

The following recommendations are offered as guidelines to reduce problems resulting from the handling of data communications between the host computer and the VCO/4K:

- Select the host computer and I/O hardware/software based on an analysis of the traffic and I/O requirements of the intended application, specifically the number of interrupts per second and network packets received/transmitted per minute, and buffering requirements to support these throughputs. Large system configurations with relatively complex call processing scenarios will require more powerful CPUs, intelligent I/O controllers, and sophisticated communication protocols.

- Multiple active and redundant data link configurations also greatly affect the selection and configuration of the host computer. Dual host computers are recommended for large system configurations requiring full control redundancy.

- Strictly observe the interconnection and driver specifications for the selected host computer I/O hardware/software. Data communications problems often result from improper connection to, and control of, host I/O ports.

- The call processing application running on the host should incorporate the ability to monitor data communications to/from the VCO/4K. Refer to the *Cisco VCO/4K Standard Programming Reference* or *Cisco VCO/4K Extended Programming Reference* for recommended use of commands and reports supported by the system software.

Corrective Maintenance Procedures

If checking the cables, modem setup, and CPU status does not quickly resolve a host communications link failure, the problem is most likely the result of initial assumptions made when selecting the host computer and data communications options. This is particularly true when link failure occurs as traffic increases through the system. Cisco Systems recommends that physical host communications lines not be multiplexed or data compressed through statistical multiplexers. These devices induce transmit and receive latencies which cause timeouts between the VCO/4K and the host computer.

The steps to be taken to correct host communications problems vary according to the suspected cause. Table 9-2 lists corrective procedures. For more information, refer to the *Cisco VCO/4K Troubleshooting Guide.*

Table 9-2   Host Communication Troubleshooting Procedures

Possible Cause	Erratic or Lost Data Communications at Initial Power-on	Erratic or Lost Data Communications After Successful Power-on
	Corrective Procedure	
Cables	1. Inspect all connections between the host and the VCO/4K.	
	2. Verify that pinouts meet signaling requirements of the host and the Storage/Control I/O Module.	
CPU card	1. Verify that the CPU card operates at normal parameters.	
	2. Use the Host Configuration Screen to verify link parameters.	
	3. Reboot the system.	
	4. If you are unsuccessful, refer to *Cisco VCO/4K Card Technical Descriptions*.	
Nonredundant controller failure	1. Reboot the system.	
	2. If you are unsuccessful, service the controller and reboot.	
Redundant controller failure	1. Switch Active to Standby.	
	2. If you successful, service the Standby controller.	

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

Table 9-2   Host Communication Troubleshooting Procedures (continued)

Possible Cause	Erratic or Lost Data Communications at Initial Power-on	Erratic or Lost Data Communications After Successful Power-on
Modem setup	Refer to the OEM modem manual and verify setup parameters against desired communication protocols and signaling parameters. Verify the integrity of the analog data link.	
Host I/O failure	1. Reboot the host computer and load application and communications software. 2. Reboot the VCO/4K. 3. If you are unsuccessful, verify host computer I/O performance via a protocol analyzer or other in-circuit device.	1. Verify the operational performance of the host computer and its I/O ports. 2. Enable the message trace facility to determine whether messages are being passed over the communication links. 3. If you are unsuccessful, insert a data communications analyzer in the link. Look to see whether messages are being sent by the host and/or the VCO/4K. Failure to send a command or report isolates the cause to either the host or the VCO/4K. 4. Review the host I/O driver and application package to assure that VCO/4K commands/reports are being properly handled, without excessive delay.