

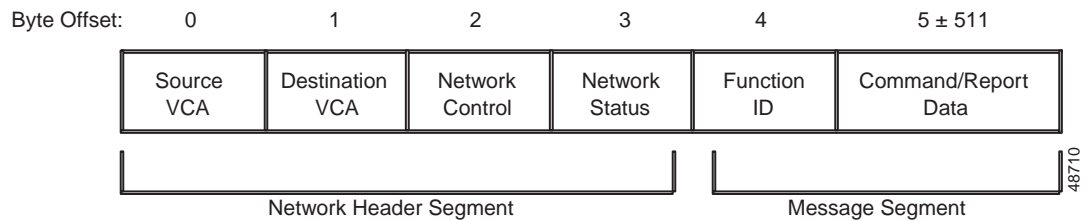


# Message Structure Overview

Data between the system and the host computer is passed over one or more communications links. Regardless of the protocol chosen by the application designer, the format of the message data transferred over the links remains the same. This section provides an overview of the system message structure.

A system message can consist of as few as 6 and as many as 512 bytes of information, depending on the command or report type. In spite of this variation in length, the message structure is consistent, as shown in Figure 3-1.

**Figure 3-1 System Message Structure**



Each message consists of a Network Header Segment and a Message Segment. The sections that follow explain the bytes contained in the Network Header Segment. The Message Segment (Function ID and Command/Report Data) is discussed in Chapter 4, “System Commands,” and Chapter 5, “System Reports.”

## Source VCA (Byte Offset 0)

The Source Virtual Communications Address (VCA) is the hex representation of the logical identifier assigned to the equipment that originated the message. This address is independent of any station identifiers required by the protocol.

### Source VCA: System

Messages sourced by the system use the global VCA \$DF unless that value has been changed by the receipt of a Configure VCA/Set System Clock (\$C0 00) command. The new VCA remains set through system reset and power-down cycles.

## Source VCA: Host

Messages that originate from the host computer should have a source VCA different from any that has been assigned to the system.

## Destination VCA (Byte Offset 1)

The destination virtual communications address (VCA) is the hex representation of the logical identifier assigned to the equipment to which the message is sent. This address is independent of any station identifiers required by the protocol.

## Destination VCA: System

A received message is not processed unless the Destination VCA matches the VCA assigned to that particular system. Every system responds to the global VCA \$DF, regardless of any address assignments.

## Destination VCA: Host

The system assigns a Destination VCA to messages to the host. This address, which is determined by the report type, is summarized in Table 3-1. Host network layer processing can use the destination VCA to route reports to specific tasks.

In systems that use more than one link between the system and the host, the system network layer chooses the links over which the message is broadcast based on report type and call status. The three options—requesting link, controlling link, and all links—are described below. The applicable reports are shown in Table 3-1.

- Requesting (R)—The report is sent back to the link from which the request for information was received (generally allocation or statistics). Also returned to the requesting port are commands with a Network Control Message Return setting of Return All (all commands returned to requesting port) or Return Error Only (commands returned to requesting port if error detected).
- Controlling (C)—When Enable Host Control of Call Load feature is set to Y, report (resource control) is sent to the link that was first to respond to initial call report (considered the controlling link). If there is no controlling link (feature is set to N), the report is sent to all active links. Refer to the *Cisco VCO/4K System Administrator's Guide* for instructions on enabling and disabling system features.
- All (A)—The report is sent to all active links. Includes system status reports indicating an error condition and resource control reports with no controlling link.

**Table 3-1** Destination VCAs for System Reports

Report	VCA	Link
Resource Allocation (\$80)	Variable <sup>1</sup>	R
Hardware Allocation (\$81)	Variable <sup>1</sup>	R
MF Digit Report (\$D0)	\$40	C
DTMF Digit Report (\$D1)	\$40	C
Permanent Signal Condition (\$D2)	\$44	A

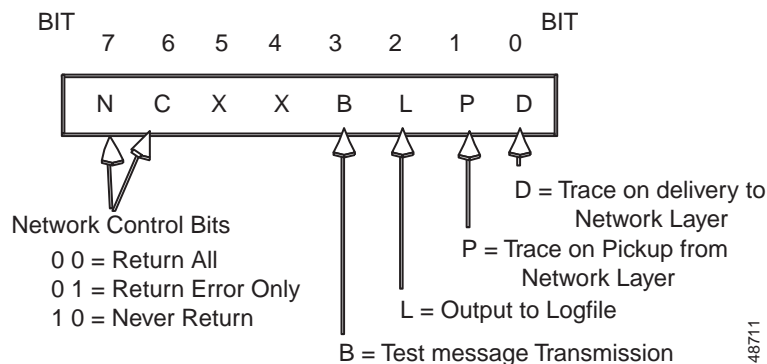
*Table 3-1 Destination VCAs for System Reports (continued)*

Report	VCA	Link
System Port Status (\$D3)	\$40	A
Spoken Digit (\$D4)	\$40	C
Resource Limitation (\$D6)	\$44	A
System Card Status (\$D9)	\$40	A
Outgoing Port Change of State (\$DA)	\$40	C
Incoming Port Change of State (\$DB)	\$40	C
Active/Standby Mode (\$DC)	\$40	A
Inpulse Rule Complete (\$DD)	\$40	C
Voice Port Status (\$DE)	\$40	C
Alarm Condition (\$F0)	\$44	A

1. The destination VCA for these reports is the same as the source VCA in the command requesting the report.

## Network Control (Byte Offset 2)

Use the Network Control byte to debug and fine-tune system operation. Figure 3-2 shows assignments for this byte.

*Figure 3-2 Network Control Byte Bit Assignments*

## Message Return (Bits 7 and 6)

Use the Message Return bits to specify when a command sent to the system is returned to the host. When a message is returned, the network status byte indicates whether the command was processed successfully. Bit settings have the following effects:

- NC = 00—Return All. All messages sent to the system are returned to the host. This setting is recommended when a command specifies that a resource should be chosen by hunting a resource group; the port address of the resource selected is returned to the host (refer to Chapter 4, “System Commands,” for more information). The network status byte indicates successful processing or an error condition.

- NC = 01—Return Error Only. The message sent to the system is returned to the host only if the command cannot be processed. The network status byte indicates the error condition. This setting is recommended for effective tracking of system status; the host application should include error recovery routines that interpret the network status byte and take appropriate action (error messaging, logging, etc.).
- NC = 10—Never Return. The message sent to the system is never returned to the host, regardless of whether it was processed.

## Test Message Transmission (Bit 3)

Use the Test Message Transmission bit to verify that the system is receiving commands over the network. If you set this bit to 1, the system returns the command without processing it.

## Output to Logfile (Bit 2)

Use the Output to Logfile bit in conjunction with either the Trace on Pickup from Network Layer or Trace on Delivery to Network Layer bit. If you set both the Output to Logfile and one of the trace bits to 1, the entire message to/from the system is saved to the day's logfile on the system disk, and output to the system printer. This bit is useful for initial system debugging and diagnostic purposes only. For information on accessing and using the system logfile, refer to the *Cisco VCO/4K System Administrator's Guide*.

## Trace on Pickup from Network Layer (Bit 1)

If you set the Trace on Pickup from Network Layer bit to 1, a message from the host to the system is output to the system printer when it is received by the system.

An additional trace facility allows tracing of all messages between the host and the system. Contact the Cisco Systems Customer Response Center for more information.

## Trace on Delivery to Network Layer (Bit 0)

If you set the Trace on Delivery to Network Layer bit to 1, a message marked Return All (Message Return bits = 00) is output to the system printer when it is returned by the system. The message is also output to the system printer if it cannot be processed (Network Status byte not equal to \$00) and the message is marked Return Error Only (Message Return bits = 01) or Return All (Message Return bits = 00).

## Network Status (Byte Offset 3)

The Network Status byte indicates the processing status of a message from the system. All event reports from the system (such as an Inpulse Rule Complete report) have a Network Status byte = \$00. This value should also be used in any command sent by the host to the system.

Network Status bytes are the only way for the system to alert the host of a processing error for a specific command. All commands processed by the system set the Network Status byte. When the system returns a command to the host, the host interprets this byte to determine how a command was processed. To use

this error indication effectively, commands from the host should have the Message Return bits set to Return All (00) or Return Error Only (01). Refer to Appendix D, “Network Status Byte Definitions,” for a list of the network status byte values and a description of each.

