DCMP Specification

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About This Manual

This is the Runtime Library Release 2.4 version of the *DCMP Specification* manual.

DCMP provides an error notification scheme which is designed to improve the reliability of DECI2.

Changes Since Last Release

None

Related Documentation

Note: the Developer Support Web site posts current developments regarding the Libraries and also provides notice of future documentation releases and upgrades.

Typographic Conventions

Certain Typographic Conventions are used throughout this manual to clarify the meaning of the text:

Convention	Meaning
`courier`	Indicates literal program code.
italic	Indicates names of arguments and structure members (in structure/function definitions only).
medium bold	Indicates data types and structure/function names (in structure/function definitions only).
blue	Indicates a hyperlink.

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Overview

The DECI2 protocol does not perform error detection and is, therefore, not completely reliable. For that reason, DCMP provides an error notification scheme which is designed to improve the reliability of DECI2. The protocol number for the DCMP protocol is DCMP=0x1.

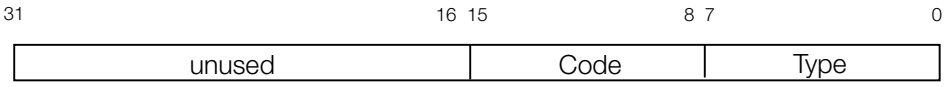
When the DECI2 Manager/dsnetm discovers an error in a DECI2 packet operation, a DCMP message is used to notify the application or the protocol driver. There is generally no need for applications or protocol drivers to send DCMP messages. DCMP message notification is performed even if a high-level protocol lock is active. To prevent endless error report loops, there is no notification for errors relating to DCMP messages.

In addition to error notification, DCMP messages are also used to notify applications and protocol drivers of status changes in individual nodes.They are also used when a communication path is being established between dsnetm and the DECI2 Manager.

Message Format

In DCMP messages, the DECI2 header is followed by a DCMP header as shown below, which is then followed by data. The DCMP header format is as follows.

Figure 1: The DCMP header



The following message types are available.

DCMP_TYPE_CONNECT	0
DCMP_TYPE_ECHO	1
DCMP_TYPE_STATUS	2
DCMP_TYPE_ERROR	3

DCMP_TYPE_CONNECT is used when a communication path is to be established between dsnetm and the DECI2 Manager. This message is not sent or received by applications or protocol drivers.

DCMP_TYPE_ECHO is a message used to test whether a communication path is still up. Applications and protocol drivers generally do not need to use this message.

DCMP_TYPE_STATUS is a message sent from the DECI2 Manager/dsnetm to all applications and protocol drivers when there is a change in status in a node.

DCMP_TYPE_ERROR is a message sent when an error is generated from the DECI2 Manager/dsnetm to the application or protocol driver that generated the error.

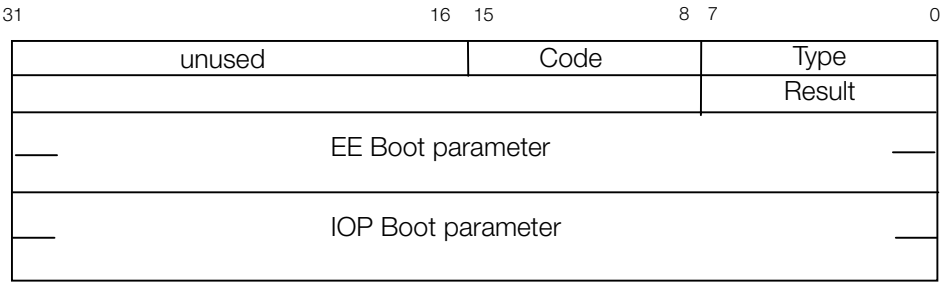
Messages

The following is a detailed description, by type, of the DCMP messages.

DCMP_TYPE_CONNECT

Connect/disconnect message from dsnetm to the DECI2 Manager

Figure 2: The DCMP_TYPE_CONNECT message



Code

DCMP_CODE_CONNECT	0	// connect request
DCMP_CODE_CONNECTR	1	// connect reply
DCMP_CODE_DISCONNECT	2	// disconnect request
DCMP_CODE_DISCONNECTR	3	// disconnect reply

Result

0 if the reply message was successful. If an error occurred, one of the following values is returned.

DCMP_ERR_INVALDEST	1	// destination invalid
DCMP_ERR_ALREADYCONN	2	// already connected
DCMP_ERR_NOTCONNECT	3	// not connected

EE/IOP Boot Parameter

Initialization parameters for the EE (first two words) and the IOP (the second two words).

Currently, the specifications for this parameter have not been finalized so no description will be provided.

The DCMP_CODE_CONNECT and DCMP_CODE_DISCONNECT messages are sent from dsnetm to the DECI2 Manager to request connection and disconnection. dsnetm sends this message at startup and when a reset takes place.

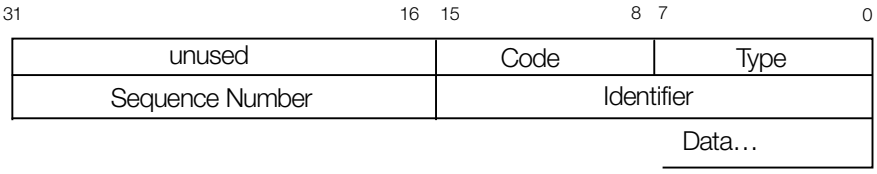
When a DCMP_CODE_CONNECT message is received, the DECI2 Manager returns a DCMP_CODE_CONNECTR message to dsnetm. A similar operation is performed for the DCMP_CODE_DISCONNECT message.

The DECI2 Manager assumes that a connection path to dsnetm is still up until a DCMP_CODE_DISCONNECT message is received.

DCMP_TYPE_ECHO

Message for testing communication path.

Figure 3: The DCMP_TYPE_ECHO message



Code

DCMP_CODE_ECHO	0	// echo
DCMP_CODE_ECHOR	1	// echo reply

Identifier/Sequence Number

Data to assist in checking correspondence between DCMP_CODE_ECHO messages and DCMP_CODE_ECHOR messages.

Data

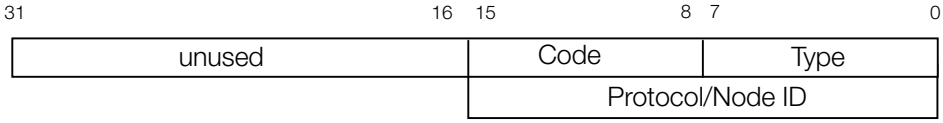
Up to 32 bytes of arbitrary data.

The DCMP_CODE_ECHO message is used to test whether the communication path is still up. When this message is received, the DECI2 Manager swaps the source and destination of the DECI2 header, changes Code to DCMP_CODE_ECHOR, and sends the message back as the reply.

DCMP_TYPE_STATUS

Status notification message

Figure 4: The DCMP_TYPE_STATUS message



Code

DCMP_CODE_CONNECTED	0	// !NOCONNECT
DCMP_CODE_PROTO	1	// !NOPROTO
DCMP_CODE_UNLOCKED	2	// !LOCKED
DCMP_CODE_SPACE	3	// !NOSPACE
DCMP_CODE_ROUTE	4	// !NOROUTE

Protocol/Node ID

If Code is DCMP_CODE_PROTO, the Protocol/Node ID field indicates the protocol number.

If Code is DCMP_CODE_CONNECT or DCMP_CODE_ROUTE, the Protocol/Node ID field indicates the Node ID.

For all other cases, the Protocol/Node ID field is set to 0.

DCMP_TYPE_STATUS messages are used to notify applications and protocol drivers of the status of the DECI2 environment. Applications or protocol drivers that were suspended due to an error are able to attempt retry through this message.

DCMP_CODE_CONNECTED is a message indicating that a communication path has been established between dsnetm and the DECI2 Manager. The message is sent directly from dsnetm to all applications and from the DECI2 manager to all protocol drivers.

DCMP_CODE_PROTO is a message sent when an application or protocol driver is newly registered. The message is sent to all other nodes. If the DECI2 Manager/dsnetm of the receiving nodes have applications or protocol drivers that use the same protocol, the message is sent there.

As a special case, protocol drivers that are always registered on startup by targets implemented by SCE will not issue DCMP_CODE_PROTO.

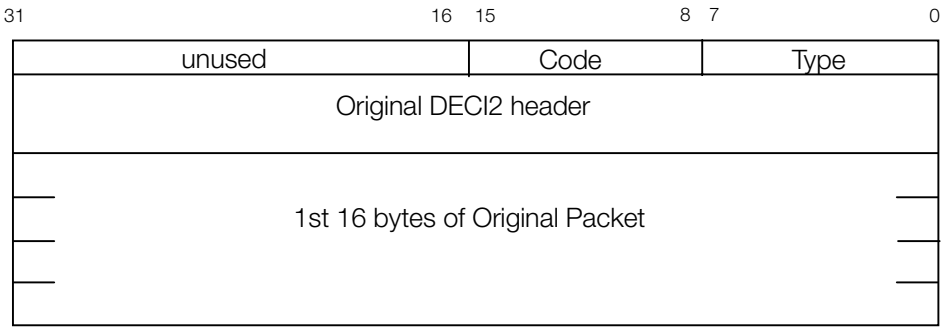
DCMP_CODE_UNLOCKED is a message indicating that a locked state has been deactivated. DCMP_CODE_SPACE is a message indicating that a DECI2 Manager/dsnetm NOSPACE state has been eliminated. These messages are broadcast to other nodes and applications and protocol drivers registered in these nodes.

DCMP_CODE_ROUTE is a special message only sent and received between dsnetm and the DECI2 Manager. This message is not sent to applications or protocol drivers. This message is used when dsnetm is establishing a communication path.

DCMP_TYPE_ERROR

Error notification message

Figure 5: DCMP_TYPE_ERROR message



Code

DCMP_CODE_NOROUTE	0	// no route to node
DCMP_CODE_NOPROTO	1	// protocol unreachable
DCMP_CODE_LOCKED	2	// locked
DCMP_CODE_NOSPACE	3	// deci2 manager/dsnetm buffer full
DCMP_CODE_INVALHEAD	4	// invalid header
DCMP_CODE_NOCONNECT	5	// not connected

The DCMP_TYPE_ERROR message is sent when an error occurs during the processing of a DECI2 packet. The message is sent from the DECI2 Manager/dsnetm to the application or the protocol driver that issued the packet. The Destination field in the DECI2 header contains the Source field of the packet that generated the error. Errors that can be immediately recognized are sent back to the protocol driver as the return value of the function, but in all other cases this message is used. This message is used to provide notification of all errors between dsnetm and applications.

The DECI2 Manager/dsnetm determines which application or protocol driver should receive the error notification based on the Source field and the Protocol field of the DECI2 header from the packet generating the error.

DCMP_CODE_NOROUTE is a special message sent and received only between dsnetm and the DECI2 Manager. This message is not sent to applications or protocol drivers.

DCMP_CODE_NOPROTO is a message indicating that a protocol driver having the specified protocol number is not registered in the destination node.

DCMP_CODE_LOCKED is a message indicating that the destination node is locked by an application or protocol driver that uses another protocol.

DCMP_CODE_NOSPACE is a message indicating that the destination node or a broadcasting node could not allocate the memory needed to send a DECI2 packet.

DCMP_CODE_INVALHEAD is a message indicating that there is an error in the DECI2 header information. This message is sent only from dsnetm to applications. In all other cases, the header information is unreliable, making it impossible to determine a destination for the notification. Thus, no notification is issued.

DCMP_CODE_NOCONNECT is a message indicating that a communication path has not been established with the destination node.