Common MSDL Features

Richard Black

25th February, 25th September 1992
4th February 1993

1 Introduction

This document describes the common aspects of the EDL, MDL and FDL implementations of MSDL. It does not describe the purpose or architecture of MSDL.

2 Description

Virtual circuits are established and cleared by sending messages on a separate control circuit. There is one control circuit for each network interface. Control circuits are permanently configured, rather than established using the circuit control protocol.

The control circuit operates in MSNL promiscuous mode: there can be multiple senders and multiple receivers. As cells from different senders may be interleaved on a promiscuous circuit, all messages sent must fit into a single cell.

Connections are requested or acknowledged based on the MSNL address and MSNL port.

Control messages typically contain or convey the following information not all of which is appropriate for each command.

- Command. Sometimes known as "arptype"
- Originator's VCI
- Responder's VCI
- Originator's MSNL Address and Port
- Responder's MSNL Address and Port
- Argument

The following commands are defined.

0 Connection request

1 Connection reply

2 Connection close

3 Wait

4 Redirect

7 Rarp request based on 6 bit MDL value

8 Rarp reply for all request types

10 Rarp request based on 48 bit 802.2 Mac address value

11 Rarp request based on 16 bit Port Controller serial number

12 Topology beacon

13 Trivial topology response

14 Rarp request based on ORL allocated identifier

15 Allocated to ORL for experimentation.

16 Allocated to ORL for experimentation.

Commands 5, 6 and 9 are obsolete.

3 Command description

3.1 Fundamental commands

Commands 0-2 must be implemented by all EDL,MDL and FDL entities. The description of these commands follows. For information on the QoS fields please refer to the MSQoS document.

3.1.1 Connect Request

This datagram is sent to establish a virtual circuit. Its delivery is not guaranteed, so the connect request must be retransmitted if no acknowledgement is received within a time-limit. The retransmissions should be separated by a sane time limit. The Wanda policy is one retry within about 20ms followed by one every 4s until the requested timeout is reached. It is considered permissible to broadcast a connection request where necessary.

The following fields contain valid information in a Connect Request message:

- The Originator's VCI
- Originator's MSNL Address and Port
- Responder's MSNL Address and Port - ie requested destination
- Argument - contains the required QoS

3.1.2 Connect Confirm

The Connect Confirm datagram is used to confirm a Connect Request, and hence accept a virtual circuit. If the requested circuit cannot be established, a Disconnect Request should be sent instead of Connect Confirm. There is no justification for broadcasting a reply since the sender *must* know who the recipient is.

The following fields are used in a Connect Confirm message:

- The Originator's VCI
- The Responder's VCI
- Originator's MSNL Address and Port
- Responder's MSNL Address and Port - ie requested destination
- Argument - contains the nominal QoS

3.1.3 Disconnect Request

This is used in two cases, it can close an existing connection, or it is sent if a cell arrives on an invalid connection. In the former case it can be sent directed and should not be broadcast. In the latter case it is necessary to broadcast it.

The following fields are used in a Disconnect Request message:

- The Originator's VCI - that is the VCI that the sender of the kill packet receives on for the connection to be killed.

3.2 Unimplemented commands

Commands 3-4 have never been implemented and so at present there is no description for these commands. No representation or semantics should be adopted without consulting an authority.

3.3 Address lookup

The address lookup or "Rarp" procedure is used to allow a stateless entity to discover its MSNL address using some local hardware feature. There is one reply which includes the address of the entity and the location of *its* boot server. There are three different types of request depending on whether an 802.2 Address, an MDL Station address, or a Port Controller Serial Number is being lookup up.

Note that any entity sending a reply must guarantee that the specified boot-server is reachable by the requesting machine on the interface which the reply is sent on. This stipulation is required because the receiver of a reply will set its only routeing information to use the interface on which it received the reply for its boot-server.

3.3.1 Address Request - MDL Address

The following fields are used:

- origVCI - the station address (and channel) of the sender.

There is an additional weirdness in that the associd is not set correctly in this request and must be set to all ones to reply correctly.

3.3.2 Address Reply

The following fields are used:

- Originator's MSNL Address - address of the host being replied to
- Originator's MSNL Port - *address* of the host sending the reply
- Responder's MSNL Address - address of the boot server for that host

The origAddress field contains two MSNL Addresses. The first one is the address being allocated to the requesting host. The second one is address of the entity sending the reply. It is recommended that a host receiving any reply whether requested or not should print out or log all these fields so that the correctness of tables may be ensured.

3.3.3 Address Request - 802.2 Address

The following fields are used:

- origAddress - contains the 802.2 address in the first six octets!

Care should be taken to send the reply to the correct place.

3.3.4 Address Request - Fairisle serial number

The following fields are used:

- Argument - the first two octets contain the serial number

Additionally the VCI for returning the reply is sent in the manner appropriate for the data link.

3.4 Topology determination

Commands 12 and 13 are defined for the purposes of topology determination. At the time of writing they have been implemented on FDL networks only.

Nota Bene: The topology determination mechanisms are defined for the purpose of router-router discovery and for cases of flat "bridge-type" routeing within a MSNA subnetwork which is unsuitable for conventional routeing due to small host to data link ratios (point to point switch environments). It is not acceptable to use topology gathering mechanisms for situations which ought to be solved using correct subnet routeing tables.

3.4.1 Topology beacon

The exact use of this MSDL command is as yet not precisely specified for the case of topology searching entities which react with each other. The definition here given is for the interaction between a topology searching entity and entities which are not involved in such topology determination.

The following fields are used:

- The Originator's VCI - the VCI of the promiscuous association of the entity which sent the topology beacon.
- Originator's MSNL Address and Port - the MSNL SAP on which the topology discussion entity is prepared to accept connections from other topology discussion entities for the purposes of such discussions
- Argument - this field shall contain sequencing, nonce, or control information as appropriate, necessary for a connecting entity to contextualise such a connection subsequent to its being made. This field is defined to be opaque except to the sender but should be initialised to zeros if not used.

3.4.2 Trivial topology response

This is the response to the above command of an MSNL entity which cannot become involved in topology discussions. It is forbidden for a MSNL entity to send this command except in response to a topology beacon. It is forbidden for a MSNL entity to send this command if it is capable of being involved in topology discussions.

The following fields are used:

- Originator's MSNL Address - this is set to the MSNL address of the host sending this command

3.5 Commands used by ORL

Although the commands have been allocated to ORL no exact semantics or behavioural documentation has been received from them and so is not included here. As a result these commands are not considered valid on the general MSNA internet and may only be used at ORL.