Accredited Standards Committee
X3, INFORMATION PROCESSING SYSTEMS

X3S3.3/92-79
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David T. Marlow
Naval Surface Warfare Center
Technology Branch, Code N35
Dahlgren, VA. 22448
703.663.1571
dmarlow@relay.nswc.navy.mil

To: X3S3.3

From: D. Marlow (NSWC)

Re: Text for a note on multicast extensions to CLNP (ISO 8473) for identifying multicast NPDUs.

This is a proposed contribution to the interim SC6 meeting on "enhanced transport mechanism guidelines" in Paris on February 10-13, 1992. Provided is a means to readily identify a PDU as multicast via the PDU format. This was discussed and agreed to in principle at the Orlando meeting. U.S. discussion on this input was held at the ANSI X3S3.3 committee's January 1992 meeting in Tucson, Arizona.

Accredited Standards Committee*
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X3S3/92-_____
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2 February, 1992

A. Lyman Chapin
BBN Communications 20/5b
150 Cambridge Park Drive
Cambridge, MA 02140
617. 873.3133
lyman@bbn.com

To: X3S3

From: X3S3.3

Re: Note on multicast extensions to the Protocol for providing the connectionless-mode network service

Task group X3S3.3 has prepared this working draft of a note on multicast extensions to the Protocol for providing the connectionless-mode network service (ISO 8473). This note is additional information to U.S. submission on multicast extensions to ISO 8473 which have been forwarded to SC6. This note has been prepared for discussion at the interim SC6 meeting on "enhanced transport mechanism guidelines" in Paris on February 10-13, 1992.

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ISO/IEC JTC1/SC6
TELECOMMUNICATIONS AND INFORMATION EXCHANGE BETWEEN SYSTEMS
Secretariat: U.S.A. (ANSI)

Title: **Note on multicast extensions to the Protocol for providing the connectionless-mode network service**

Source: **USA**

Project(s): **[new]**

Status: **For discussion at the interim meeting of SC6 on "enhanced transport mechanism guidelines" in Paris on February 10-13, 1992.**

This contribution presents an approach that is currently being evaluated within the US for high performance networking. After further review, the services presented in this document may undergo significant changes.

This note provides additional information to the previous U.S. contribution proposing modifications to ISO 8473 to support multicast transfer. This note adds a means for identifying NPDUs as supporting multicast transfer.

Requested Action:

Attachments:

Distribution:

Preface

This contribution provides the changes needed to identify a PDU used for multicast transfer. This contribution proposes to create a new PDU type (the Multicast Data (MD) PDU) in a multicast amendment to the Protocol for providing the connectionless-mode network service (ISO 8473). The U.S. has previously provided a contribution for an amendment to ISO 8473 to support connectionless-mode multicast transfer. The contribution contained here provides additional functionality to the earlier contribution and does not replace it.

This contribution calls out a new CLNP PDU type to clearly identify a PDU used for multicast transfer. In addition it may be possible to identify a multicast PDU via the destination address field; however, there is a benefit to having a separate identification possible via the PDU format itself, such a capability provides:

a) It is expected that cut-through switches which support multicast will need to make decision based on whether a PDU is multicast or not prior to the address being received.

b) It provides a means to ensure that a level 1 router without the optional multicast extensions does not just get sent to a level 2 router. Such an action might black out large segments of multicast users in such a level 1 router's area. Given the new PDU format such a router is forced to ignore such PDUs and this will avoid non-deterministic actions.

c) Provides additional safeguards to preventing multicast problems.

There are benefits to having "easily distinguishable" group addresses in addition to marking the PDU as multicast, this is covered in other on-going standardization proposals. Other reasons for identifying a PDU as multicast exist which do not require explicit PDU format but which need some mechanism (e.g. via the PDU format, address or other). Examples of such reasons are:

a) The eventual IS-IS routeing algorithms for multicast transfer will utilize different algorithms than those currently defined and thus a means of determining whether a PDU is multicast or not is needed. For example, the behavior of an IS upon receiving a PDU with an unknown destination address may differ given a group address versus a non-group address.

b) The development of congestion control algorithms which make use of the fact that a PDU is multicast in selecting which PDUs to forward during a period of congestion.

c) The mechanism for mapping from a group NSAP address to a group SNPA address will be different from that used for a unicast mapping of a NSAP address to a SNPA address.

d) The development of different policies for multicast and unicast use of error reports.

Two approaches were considered for changing ISO 8473 to provide for identifying multicast PDUs: (1)Add a new PDU type (MD PDU) or (2)Take the top from the Version/Protocol Identifier Extension Field as a "multicast bit". The initial decision was to take the first approach since it does not affect any of the existing field definitions while the second approach does.

Date: 1992-02-02

Information processing systems - Data communications - Protocol for providing the connectionless-mode network service

Note on multicast NPDU identification

0 Introduction

This note provides changes to ISO 8473 to support the identification of PDUs sent via multicast transfer. This note is an addition to a previous U.S. contribution "Proposed multicast extensions to ISO 8473". The intention is to incorporate the points in this note into a future version of the previous contribution.

1 Scope and field of Application

2 References

3 Definitions

4 Abbreviations

5 Overview of the Protocol

6 Protocol Functions

Add a sentence into the third paragraph of 6.10.1, between the first and second sentences:

Such Data PDUs may be either normal Data (DT) PDUs or Multicast Data (MD) PDUs.

EDITORS NOTE: There appears to be 25 references in section 6.10 to Data PDUs in all cases this should now imply either DT or MD PDUs.

7 Structure and Encoding of PDUs

Change the two occurrences of "Data PDU" in section 7.2.6.3 to:

Data or Multicast Data PDU

Add a line to table 5:
MD PDU a b c d e
EDITORS NOTE: bit values for the Multicast Data PDU will be determined at a later time.

Retitle Figure 10:
DT and MD PDU

Change the three occurrences of "Data PDU" in section 7.9.1 (7.9.1.1, 7.9.1.4 and 7.9.1.5) to:
Data or Multicast Data PDU

Add a Section 7.10:

7.10 Multicast Data (MD) PDU

7.10.1 Structure

The MD PDU has the format illustrated in figure 10.

7.10.1.1 Fixed Part

1) Network Layer Protocol Identifier see 7.2.2
2) Length Indicator see 7.2.3
3) Version/Protocol Id Extension see 7.2.4
4) Lifetime see 7.2.5
5) SP, MS, E/R see 7.2.6
6) Type Code see 7.2.7
7) Segment Length see 7.2.8
8) Checksum see 7.2.9

7.10.1.2 Addresses

See 7.3

7.10.1.3 Segmentation

See 7.4

7.10.1.4 Options

See 7.5

7.10.1.5 Data

See 7.6

8 Provisions for the Underlying Service

9 Conformance