Accredited Standards Committee
X3, INFORMATION PROCESSING SYSTEMS

X3S3.3/92-78
2 February, 1992

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To: X3S3.3

From: D. Marlow (NSWC)

Re: Proposed text for the group NSAP Addressing project

NSWC has prepared this working draft of proposed text for the Group NSAP Addressing project. This is a candidate as the U.S. input for text accompanying the U.S. “yes” vote on this ballot.

In addition, this is a proposed contribution to the interim SC6 meeting on “enhanced transport mechanism guidelines” in Paris on February 10-13, 1991. U.S. discussion on this input was held at the ANSI X3S3.3 committee’s January 1992 meeting in Tucson, Arizona.

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To: X3S3

From: X3S3.3

Re: Proposed text for the group NSAP project

Task group X3S3.3 has prepared this working draft of an Amendment to the Addressing addendum of the Network service definition (ISO 8348 Addendum 2) to permit group addressing for discussion at the interim SC6 meeting on "enhanced transport mechanism guidelines" in Paris on February 10-13, 1992.

In addition this is to be forwarded as a contribution to the NWI on group addressing.

1992-02-02

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

Title: **Proposed changes to the addressing addendum of the Network service definition to permit group addresses**

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.

Requested Action:

Attachments:

Distribution:

Preface

This contribution provides the changes needed to define group Network addresses. The amendment provided proposes to create a corresponding AFI for all AFIs presently defined in ISO 8348 Addendum 2. The intention in providing a new AFI for every existing AFI is to ensure that PDUs sent via multicast transfer can be “easily distinguished” and to make it possible to define a group address for any addressing situation. Another intent for creating an AFI for each existing AFI is to reduce the burden of address administration since the authority for these new addresses will be the addressing authority for the corresponding current AFI and thus there is no need to define new addressing authorities.

The advantages sought in having “easily distinguishable” group addresses are listed in the following points:

a) An easily distinguishable group address is the most straight forward means to support checks (i.e. in the ISO 8473 extensions) to ensure that a group address is never placed into the source address field. In addition checks are incorporated to prevent the forwarding of any PDU found with a group address in the source address field and to ensure that a multicast address never cause the generation of another multicast PDU. Checks such as these are to prevent the occurrence of “broadcast storms”.

b) Functionality is needed to support the maintenance of forwarding tables which for group addresses may have multiple entries. A simple sanity test function is provided by being able to determine that an address contained in a number of entries in a forwarding table is in fact a group address.

c) It permits the development of level 1 routers, fully multicast capable, which make forwarding decisions solely based on the address. To permit this design and prevent defaulting to the level 2 router, the address needs to be recognizable as multicast (or not). [Note, this is based on a processing model where the forwarding logic is strictly address based and done separately from the message type and options checking.]

There are benefits to marking the PDUs transferred as multicast in addition to having “easily distinguishable” group addresses, this is covered in other on-going standardization proposals. Other reasons for identifying an address as multicast exist which do not require an “easily distinguishable” group addresses but which need some mechanism (e.g. via the address, PDU format 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.

This Amendment is one component of a number of standardization actions on-going to support an OSI connectionless-mode multicast capability. Additional efforts are on-going to provide additions to the connectionless-mode Transport protocol, the connectionless-mode Network layer Protocol, the ES-IS routeing protocol as well as the Network service definition addendum of the same standard that this Amendment covers.

Date: 1992-02-02

Information processing systems - Data communications - Network service definition

Amendment Y: Addition of group NSAP addressing

0. Introduction

This Amendment to ISO 8348 adds the capability to define group NSAP addresses. The definition of NSAP addresses is contained in ISO 8348 / Addendum 2.

ISO 8348 / Addendum 2 restricts the Network Service Access Point address to identify a particular (i.e. one) Network Service Access Point. Subnetwork standards exist that support the transfer of a SDU from one entity to a number of other entities in a single logical operation. Experience in other networking environments has shown the utility of supplying multicast service capabilities to the network protocols employed. While the capability for the various subnetworks to directly support multicast has a number of advantages to the efficiency of the multicast networking service, other techniques can be employed and still make use of the advantages of using multicast via the network service.

This Amendment adds the capability to define group Network level addresses. The amendment creates a corresponding AFI for all AFIs presently defined in ISO 8348 Addendum 2. The intention in providing a new AFI for every existing AFI is to ensure that PDUs sent via multicast transfer can be “easily distinguished” and to make it possible to define a group address for any addressing situation. This Amendment restricts group addresses to the AFIs allocated solely for group addresses.

1. Scope and field of application

This Amendment makes no changes to clause 1 of ISO 8348/Addendum 2.

2. References

This Amendment makes no changes to clause 2 of ISO 8348/Addendum 2.

3. Definitions

Add a new paragraph 3.4.11:

3.4.11 group network address: An address which identifies zero or more Network entities which receive NPDUs with this address as the destination.

4. Abbreviations

This Amendment makes no changes to clause 4 of ISO 8348/Addendum 2.

5. Conventions

This Amendment makes no changes to clause 5 of ISO 8348/Addendum 2.

6. Concepts and terminology

Add to the third paragraph, first sentence of 6.1.1 right after "another real subnetwork,":

a particular group of real end systems on this real subnetwork,

Add a new paragraph at the end of 6.1.2:

In addition to an NSAP address being the information that the Network service provider needs to identify a particular single Network service access point, a group NSAP address identifies a group of access points for different Network entities. The values of the called address of the N-CONNECT primitive and the destination address parameter of the N-UNITDATA primitive are permitted to be group NSAP addresses. Source addresses are never permitted to be group NSAP addresses.

7. Principles for creating the OSI Network addressing scheme

This Amendment makes no changes to clause7 of ISO 8348/Addendum 2.

8. Network address definition

Add a sentence to the end of the first paragraph of 8.2.1:

Future allocation of new AFI values will be done in pairs, one value for non-group addresses and one value for group addresses both under the control of a single authority.

Update Table 1 to show a new AFI corresponding to each current AFI's assigned.

Table 1 - AFI allocations

00-09	Reserved - will not be allocated
10-19	Reserved for future allocation by joint agreement of ISO and CCITT
20-35	Allocated for assignment to new non-group IDI formats by joint agreement of ISO and CCITT
36-59	Allocated and assigned to the non-group IDI formats defined in clause 8.2.1.2
60-75	Allocated for assignment to new group IDI formats by joint agreement of ISO and CCITT
76-99	Allocated and assigned to the group IDI formats defined in clasue 8.2.1.2

Update Table 2 to show the new Binary DSP syntax AFI values.

Table 2 --- Allocated AFI values

IDI format \ DSP syntax	Decimal	Binary	Character (ISO 646)	National Character
X.121	36, 52	37, 53		
X.121 Group	76, 92	77, 93		
ISO DCC	38	39		
ISO DCC Group	78	79		
F.69	40, 54	41, 55		
F.69 Group	80, 94	81, 95		
E.163	42, 56	43, 57		
E.163 Group	82, 96	83, 97		
E.164	44, 58	45, 59		
E.164 Group	84, 98	85, 99		
ISO 6523-ICD	46	47		
ISO 6523-ICD Group	86	87		
Local	48	49	50	51
Local Group	88	89	90	91

NOTE: - The Local IDI format is provided to accommodate the coexistence of OSI and non-OSI network addressing schemes, particularly in the context of a transition from non-OSI to OSI protocols. To provide the greatest flexibility in these environments, character and national character DSP syntaxes are defined for the Local IDI format.

Add a new paragraph at the end of 8.2.1.2

This amendment restricts the allocation of group addresses to be only from the defined group IDI Formats designated within ISO 8348. The decision to allocate addresses from the group IDI formats is under the control of the applicable registration authority of the corresponding (non-group) IDI format. The IDI formats defined as a “Group” format is restricted to use only for group addresses.

Update Table 3 to show that two new Binary DSP syntax AFI values:

Table 3 --- Maximum DSP length

IDI format \ DSP syntax	Decimal digits	Binary octets	ISO 646 Characters	National Characters
X.121	24	9		
X.121 Group	24	9		
ISO DCC	35	14		
ISO DCC Group	35	14		
F.69	30	12		
F.69 Group	30	12		
E.163	26	10		
E.163 Group	26	10		
E.164	23	9		
E.164 Group	23	9		
ISO 6523-ICD	34	13		
ISO 6523-ICD Group	34	13		
Local	38	15	19	7
Local Group	38	15	19	7

NOTES:
1. The values for the "Local" IDI format assume a National Character representation of one character as two binary octets (see clause 8.3.1 and clause 8.3.2).

2. These maximum values are dictated by the requirement that all entries in table 5 be less than or equal to 40 decimal digits or 20 binary octets.

Update Table 5 to show that two new Binary DSP syntax AFI values:

Table 5 --- Maximum NSAP address lengths

IDI format	DSP Syntax	Binary DSP encoding (octets)
X.121	Decimal	20
	Binary	17
X.121 Group	Decimal	20
	Binary	17
ISO DCC	Decimal	20
	Binary	17
ISO DCC Group	Decimal	20
	Binary	17
F.69	Decimal	20
	Binary	17
F.69 Group	Decimal	20
	Binary	17
E.163	Decimal	20
	Binary	17
E.163 Group	Decimal	20
	Binary	17
E.164	Decimal	20
	Binary	18
E.164 Group	Decimal	20
	Binary	18
ISO 6523-ICD	Decimal	20
	Binary	16
ISO 6523-ICD Group	Decimal	20
	Binary	16
Local	Decimal	20
	Binary	16
	Character	20
	Nat'l Character	15
Local Group	Decimal	20
	Binary	16
	Character	20
	Nat'l Character	15

NOTE - These values assume a national character representation of one character as two binary octets.:

9. Character based DSP allocation

This Amendment makes no changes to clause 9 of ISO 8348/Addendum 2.

10. Reference publication format

This Amendment makes no changes to clause 10 of ISO 8348/Addendum 2.

A. Annex A

Add a new paragraph to the end of Annex A

A Network Entities Group Title identifies a group of Network entities at a particular point in time. Group Network addresses are used to identify either such a title or a group of NSAPs.