A.6 Character based DSP allocation

This Amendment makes no changes to clause A.6 of ISO/IEC 8348 | CCITT Recommendation X.213.

A.7 Reference publication format

This Amendment makes no changes to clause A.7 of ISO/IEC 8348 | CCITT Recommendation X.213.

A.8 Network entity titles

Add a new paragraph to the end of clause A.8:

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.

B. Annex B.

This Amendment makes no changes to Annex B of ISO/IEC 8348 | CCITT Recommendation X.213.

C. Annex C.

This Amendment makes no changes to Annex C of ISO/IEC 8348 | CCITT Recommendation X2.13.

Provide a new Table A-X between the present Table A-1 and Table A-2:

Table A-X - Relationship of AFI Unicast and Group values

Unicast	*Group*	*Unicast*	*Group*	*Unicast*	*Group*
10	*A0*	*40*	*BE*	*70*	*DC*
11	*A1*	*41*	*BF*	*71*	*DD*
12	*A2*	*42*	*C0*	*72*	*DE*
13	*A3*	*43*	*C1*	*73*	*DF*
14	*A4*	*44*	*C2*	*74*	*E0*
15	*A5*	*45*	*C3*	*75*	*E1*
16	*A6*	*46*	*C4*	*76*	*E2*
17	*A7*	*47*	*C5*	*77*	*E3*
18	*A8*	*48*	*C6*	*78*	*E4*
19	*A9*	*49*	*C7*	*79*	*E5*
20	*AA*	*50*	*C8*	*80*	*E6*
21	*AB*	*51*	*C9*	*81*	*E7*
22	*AC*	*52*	*CA*	*82*	*E8*
23	*AD*	*53*	*CB*	*83*	*E9*
24	*AE*	*54*	*CC*	*84*	*EA*
25	*AF*	*55*	*CD*	*85*	*EB*
26	*B0*	*56*	*CE*	*86*	*EC*
27	*B1*	*57*	*CF*	*87*	*ED*
28	*B2*	*58*	*D0*	*88*	*EE*
29	*B3*	*59*	*D1*	*89*	*EF*
30	*B4*	*60*	*D2*	*90*	*F0*
31	*B5*	*61*	*D3*	*91*	*F1*
32	*B6*	*62*	*D4*	*92*	*F2*
33	*B7*	*63*	*D5*	*93*	*F3*
34	*B8*	*64*	*D6*	*94*	*F4*
35	*B9*	*65*	*D7*	*95*	*F5*
36	*BA*	*66*	*D8*	*96*	*F6*
37	*BB*	*67*	*D9*	*97*	*F7*
38	*BC*	*68*	*DA*	*98*	*F8*
39	*BD*	*69*	*DB*	*99*	*F9*

Note: The abstract syntax for unicast AFI values is two decimal digits
The abstract syntax for group AFI values is one binary octet

A.3 Concepts and terminology

Add to the third paragraph, first sentence of A.3.1.1 right after "another real subnetwork,":

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

Add a new paragraph at the end of A.3.1.2:

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 Network 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 Network addresses. Source addresses are never permitted to be group Network addresses.

A.4 Principles for creating the OSI Network addressing scheme

This Amendment makes no changes to clause A.4 of ISO/IEC 8348 | CCITT Recommendation X.213.

A.5 Network address definition

Replace the first sentence in the second paragraph of A.5.2.1:

The abstract syntax of the AFI is decimal digits for unicast addresses and binary octets for group addresses. The abstract syntax for the IDI is decimal digits.

Replace the entire clause of A.5.2.1.1:

Each AFI has two syntaxes one for unicast addresses and the other for group addresses. For unicast addresses, the AFI consists of an integer with a value between 0 and 99 with an abstract syntax of two decimal digits. For unicast addresses, the values of the AFI are allocated or reserved as shown in Table A-1. For group addresses, the AFI has an abstract syntax of one binary octet with values and relationship to the unicast AFI values shown in Table A-X.

Add a new paragraph at the end of A.5.2.1.2

This amendment restricts the allocation of group addresses to be only from the AFI values allocated for the assignment of group addresses in Table A-X. The decision to assign group addresses is under the control of the applicable registration authority of the corresponding unicast AFI value. Addresses assigned using the group syntaxes are only to be used for group addresses.

Add a phrase to the beginning of A.5.3 point (a) of the preferred binary encoding (this is the second point (a) of this clause):

when the AFI is to be used for a unicast address,

Add a new point b between points (a) and the present point (b) of the preferred binary encoding and increment the letters of the present point (b) and the subsequent items of section A.5.3.1 (this is the second point (b) of this clause):

b) when the AFI is to be used for a group address, representing the AFI as one binary octet by mapping the AFI to the binary value shown in Table A-X.

4. Abbreviations

This Amendment makes no changes to clause 4 of ISO/IEC 8348 | CCITT Recommendation X.213.

5. Conventions

This Amendment makes no changes to clause 5 of ISO/IEC 8348 | CCITT Recommendation X.213.

6. Overview and general characteristics

Change point (e) of clause 6 from "(NSAP addressing)" to:

(NSAP addressing and group Network addressing)

7. Types and classes of Network Service

This Amendment makes no changes to clause 7 of ISO/IEC 8348 | CCITT Recommendation X.213.

PART 2 - DEFINITION OF CONNECTION-MODE SERVICE

This Amendment makes no changes to clauses 8 through 14 of ISO/IEC 8348 | CCITT Recommendation X.213.

PART 3 - DEFINITION OF CONNECTIONLESS-MODE SERVICE

This Amendment makes no changes to clauses 15 through 19 of ISO/IEC 8348 | CCITT Recommendation X.213.

A. Annex A.

A.1 General

Add a paragraph to the end of clause A.1:

In addition this annex defines the abstract syntax and semantics of the group Network address. The group Network address is used to support multicast services and is the address that may appear in the primitives of the connection-mode Network service as the called address parameter, and in the primitives of the connectionless-mode network service as the destination address parameter.

A.2 Scope

This Amendment makes no changes to clause A.2 of ISO/IEC 8348 | CCITT Recommendation X.213.

Date: 1992-10-31

Information processing systems - Data communications - Network service definition

Amendment 5: Addition of group Network addressing

0. Introduction

This Amendment to ISO/IEC 8348 | CCITT Recommendation X.213 adds the capability to define group Network addresses. The definition of Network addresses is contained in ISO/IEC 8348 | CCITT Recommendation X.213.

ISO/IEC 8348 | CCITT Recommendation X.213 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 abstract syntax for all AFIs presently allocated or reserved for allocation in ISO/IEC 8348 | CCITT Recommendation X.213. The intention in providing a new abstract syntax 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 abstract syntax values allocated solely for group addresses.

1. Scope

This Amendment makes no changes to clause 1 of ISO/IEC 8348 | CCITT Recommendation X.213.

2. References

This Amendment makes no changes to clause 2 of ISO/IEC 8348 | CCITT Recommendation X.213.

3. Definitions

Add a definition as 3.4.X (after the present 3.4.10) within clause 3 of ISO/IEC 8348 | CCITT Recommendation X.213 with the following text (no other changes to clause 3 of ISO/IEC 8348 | CCITT Recommendation X.213):

3.4.X group Network address: an address which identifies zero or more Network entities which receive NPDUs with this address as the destination.

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 exist for identifying a PDU as multicast which could be accomplished via a group address which is “easily distinguishable”. While other means may be used (e.g. via the PDU format) the use of an “easily distinguishable” address may be used to support the following multicast development items:

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 unicast 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 development of a mechanism for mapping from a group Network address to a group SNPA address. This is anticipated to be different from that used for a unicast mapping of an NSAP address to an 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 Network layer Protocol, the ES-IS routeing protocol as well as the connectionless-mode Network service definition which is also covered in ISO/IEC 8348 | CCITT Recommendation X.213.

Preface

This amendment provides the changes needed to define group Network addresses. The amendment provided proposes to "mark" all group addresses to make them "easily distinguishable". 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.]

In the development of this effort many techniques have been considered to implement the means by which such addresses are "easily distinguishable". The only unequivocal method found to identify an address as a group address is to have the authority and format identifier (AFI) of the address allocated solely from an AFI reserved for group addresses. Use of both the initial domain identifier (IDI) and the domain specific part (DSP) were considered but no acceptable means were found.

Upon identifying that a group AFI was needed, a number of proposals were considered for allocating a small number (e.g. one or two) of group AFIs with the same addressing authorities as used by existing address formats. This method was rejected since it supported group addresses in some addressing families and not others. The view was that group addressing in support of multicast has the potential for widely affecting addressing requirements. One critical concern identified is that there was a recognition that while new AFIs appeared needed there was a desire not to create new addressing authorities, thus the new AFIs must be coupled in some means to existing address administrations.

One means that was also considered was to utilize one octet in the initial domain part of the address to identify the address as a group address and utilize the remainder of the address as it is presently called out in ISO/IEC 8348 | CCITT Recommendation X.213. This was also rejected since there was no ready means to add an extra octet to the initial domain part and even if this were possible, many of the addressing formats used utilize the maximum number of octets. Thus a very radical change to addressing structure appears to be required by this alternative.

The amendment provided proposes to create a second abstract syntax for all AFIs presently allocated or reserved for future allocation in ISO/IEC 8348 | CCITT Recommendation X.213. The new abstract syntax values will be used 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. No changes to the present address structure is needed. No new addressing burden is introduced since the authority for the new abstract syntax values is identified as the addressing authority for the corresponding current AFI.

Accredited Standards Committee
X3, INFORMATION PROCESSING SYSTEMS

X3S3.3/92-420
31 October, 1992

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To: X3S3.3

From: D. Marlow (NSWC)

Re: Proposed text for the group Network Addressing project

NSWC, Dahlgren Division has prepared this draft of proposed text for the Group Network Addressing project (JTC1.06.32.01.05). This is a planned contribution from the project editor to WG2. While X3S3.3 does not need to take any action, comments on this would be appreciated. It is planned to send this to the SC6 secretariat in early December so that it will be circulated prior to the London meeting.

This contribution is a reformatting of the current PDAM text contained in SC6N7551 to put it in line with the current text (Version 2) of ISO 8348 | CCITT Recommendation X.213.