INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

ASIA/PACIFIC ATN NETWORK SERVICE ACCESS POINT (NSAP) ADDRESSING PLAN

Third Edition – September 2010

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SCOPE OF THE DOCUMENT

This document provides technical guidance on the Planning and the transition of Aeronautical Fixed Telecommunications Network (AFTN) communications to Aeronautical Telecommunications Network (ATN) within the Asia/Pacific Region. The material is intended for Regional Planning, although the plan itself is left to the States to proceed with planning and implementation.

Based upon the ATN SARPs as published in ICAO Annex 10 and Technical specifications as specified in ICAO Doc. 9705, ICAO Regions are expected to develop naming and addressing plans. This document provides guidance for the assignment of NSAP addresses within the Asia/Pacific Region. Each field of the NSAP address is presented with the recommended method of assigning values. Fields which are purely local State matters are identified.

DOCUMENT CONTROL LOG

Edition	Date	Comments	Section/pages affected
First	2001	This document was adopted by 12th meeting of APANPIRG held in 2001 for distribution to States in the Asia/Pacific and adjacent regions.	All
Second	March 2004	Re-issued as 2nd Edition of the Regional ATN Planning Document in March 2004.	All
Third	September 2010	i. Editorial updates – change of document version number ii. Updated table of contents iii. Creation of document control log iv. Inclusion of common address prefix for the Asia, Pacific and North America ICAO regions for the ADM field	All 2 3 9 to 11

1. INTRODUCTION

This paper presents the Network Service Access Point (NSAP) address assignment conventions for use in the Asia/Pacific Region.

The Asia/Pacific Regional ATN Addressing Plan consists of a set of recommendations for each State to assign regional NSAP addresses in a consistent manner. Using these recommendations, it should be possible to develop efficient routing policies that limit the amount of information exchange while providing comprehensive ATN services. Further, the application of this plan will permit simplified ATN service growth with a minimum of router re-configuration.

1.1 Objectives

The objectives of the document are to provide:

- Guidance in the specification of NSAP addresses,
- Guidance in the specification of routing domain identifiers (RDI) for Routing Domains (RD) and Routing Domain Confederations (RDC).

In providing guidance on the specification of NSAP addresses, each NSAP address field is described with the recommendations on how the field may be used. This is important so that consistency in the use of NSAP addresses is obtained and efficiency in routing is maintained.

The guidance on the specification of RD and RDC identifiers is a continuation to the specification of the NSAP address structure. By applying the rules of the address assignments to the addressing of RDs and RDCs, it will be ensured that the efficiency of the routing mechanisms is maintained.

1.2 Scope

The scope of the document includes:

- Describing the NSAP address format, and
- Recommending the values in the fields of the regional NSAP addresses.

The Asia/Pacific Regional ATN Addressing Plan will comply with the NSAP format as specified in ICAO Doc. 9705.

The Asia/Pacific Regional ATN Addressing Plan defines the method for assigning values to each of the fields of the NSAP address. States within the Region may choose to assign their NSAP addresses based upon the recommendations made here.

1.3 Document Structure

Section 2 contains the background information for the formulation of recommendations.
Section 3 contains the assumptions on which the recommendations are based upon.
Section 4 contains the NSAP address structure and the recommended values to be used in Asia/Pacific Region.

1.4 Terms Used

Network Addressing Domain – A subset of the global addressing domain consisting of all the NSAP addresses allocated by one or more addressing authorities.

Network Entity (NE) – A functional portion of an internetwork router or host computer that is responsible for the operation of internetwork data transfer, routing information exchange and network layer management protocols.

Network Entity Title (NET) – The global address of a network entity.

Network Service Access Point (NSAP) Address – A hierarchically organized global address, supporting international, geographical and telephony-oriented formats by way of an address format identifier located within the protocol header. Although the top level of the NSAP address hierarchy is internationally administered by ISO, subordinate address domains are administered by appropriate local organizations.

NSAP Address Prefix – A portion of the NSAP Address used to identify groups of systems that reside in a given routing domain or confederation. An NSAP prefix may have a length that is either smaller than or the same size as the base NSAP Address.

Routing Domain (RD) – A set of End Systems and Intermediate Systems that operate the same routing policy and that are wholly contained within a single administrative domain.

Routing Domain Confederation (RDC) – A set of routing domains and/or routing domain confederations that have agreed to join together. The formation of a routing domain confederation is done by private arrangement between its members without any need for global coordination.

Routing Domain Identifier (RDI) – A generic network entity title as described in ISO/IEC 7498 and is assigned statically in accordance with ISO/IEC 8348. An RDI is not an address and cannot be used as a valid destination of an ISO/IEC 8473 PDU. However, RDIs are like ordinary NETs, assigned from the same addressing domain as NSAP addresses.

1.5 References

Reference 1	Manual of Technical Provisions for the ATN (Doc 9705-AN/956) Third Edition.
Reference 2	Comprehensive Aeronautical Telecommunication Network (ATN) Manual (Doc 9739-AN/961) Second Edition 2002.
Reference 3	ACCESS - ATN Compliant Communications European Strategy Study Define Network topology – Addressing Plan Addressing Plan of the European ATN Network
Reference 4	ICAO Location Indicators – Document 7910
Reference 5	Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services - Document 8585

2. BACKGROUND

2.1 System Level Requirements

The ATN SARPs are divided into a set of System Level Requirements. These requirements are found in the ICAO Annex 10 text and are repeated in ICAO Doc. 9705 (Reference 1), Sub-Volume 1. The System Level Requirements detail specific requirements that all ATN compliant systems must meet and form the basis for the technical specifications. Some of the System Level Requirements may best be satisfied through Regional Planning and Regional specification of procedures.

The following list presents the important System Level Requirements and Recommendations that form the basis of the NSAP Addressing Plan.

- System Level Requirement #11 (Annex 10) presents the basis for the definition of NSAP addresses: "The ATN shall provide a means to unambiguously address all ATN end and intermediate systems."
- System Level Requirement #13 (Annex 10) presents the basis for the need of Regional Planning: "The ATN addressing and naming plans shall allow State and organizations to assign addresses and names within their own administrative domains."

System Level Requirement #11 forms the basis for assigning at least one unique NSAP address for each end system and intermediate system. The assignment of NSAPs to systems enables the unambiguous identification of ATN components and applications.

System Level Requirement #13 forms the basis for Regional Planning in the area of NSAP address assignment. The establishment of Regional plans for assigning addresses assists States and Organizations within a Region to develop consistent address assignment procedures that will result in more efficient routing policies.

2.2 Basis for ATN Address Planning

2.2.1 Regional Planning

At the second meeting of the ATN Panel, it was recognized that the establishment of naming conventions and registration procedures were necessary for the successful deployment of the ATN. Two specific Recommendations were developed at that meeting and subsequently approved by the Air Navigation Commission.

Recommendation 4/1 Advice to States on ATN addressing issues
"That ICAO advise States and international organizations to take the necessary actions for the assignment, administration, and registration of ATN names and addresses within their allocated name/address space, using the information provided."

Recommendation 4/2 Setting up an ICAO ATN addressing process
"That ICAO take the necessary actions to provide a facility for maintaining an up-to-date repository of ATN addresses and names registered in the Air Traffic Services Communication (ATSC) domain, and publish the repository entries at usual regular intervals."

2.2.2 Asia/Pacific Regional Planning

The APANPIRG agreed that a consistent plan for naming and addressing is required to simplify the transition to ATN.

3. ASSUMPTIONS

In developing the recommendations for the Asia/Pacific Regional ATN Addressing Plan, several assumptions were made about the structure of the Region's ATN implementation. Some of these assumptions may appear unnecessary, but they tend to guide the development of the recommendations presented in Section 4.

- The Asia/Pacific Regional ATN Addressing Plan will comply with the rules in ICAO Doc. 9705 (Reference 1). This means that the syntax, semantics and encoding rules of the NSAP address fields as specified in ICAO Doc. 9705 must be observed.
- There will be a number of ATN routers deployed in the Region. This assumption drives the need for multiple routing domains within the Region and the need to develop a plan that allows for efficient routing.
- The regional routing architecture will eventually include RDCs such as Island RDCs and Backbone RDCs. Therefore the Asia/Pacific Regional ATN Addressing Plan must allow for the addressing of these RDCs.
- The Region will have at least one ATN router in each defined routing domain. This assumption is based on the ATN requirement for the establishment of routing domains.
- The Region will support both ground-ground and air-ground services and applications.

4. NSAP ADDRESSING PLAN

4.1 Introduction

The Asia/Pacific Regional ATN Addressing Plan provides guidance to the States within the Region in assigning NSAP addresses to their ATN systems. The Plan addresses the need for consistency within the Region for address assignment.

To find a suitable ATN addressing convention that would be acceptable for use in the Asia/Pacific Region requires a routing architecture that minimizes routing updates and overheads within the ground ATN infrastructure for both ground-ground and air-ground services and applications.

The ATN addressing convention must allow for an addressing scheme that is:

- Practical - to provide autonomous administration of ATN addresses for States and Organizations, and
- Flexible - to allow for future expansion and/or routing re-configuration of the ground ATN infrastructure with minimal re-assigning of ATN addresses.

The recommendations made in the Asia/Pacific Regional ATN Addressing Plan are based on the work performed by the European ACCESS[1] Project (Reference 3).

4.2 NSAP Address Format

The NSAP address format is defined in ICAO Doc. 9705 (Reference 1), Sub-Volume 5. The format is based upon the requirements specified in the base standard (ISO/IEC 8348) and incorporates the specific ATN requirements for addressing both ground and mobile systems.

The structure of the Network Service Access Point (NSAP) address is depicted in Figure 4.2-1.

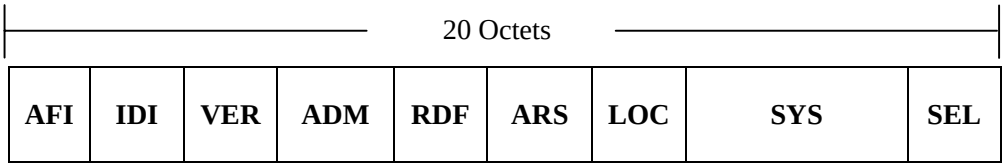


Figure 4.2-1 NSAP Address Format

The NSAP address structure contains 9 fields, which are described in Table 4.2-1.

Field Name	Field Description	Size	Syntax	Number of Characters/ Digits	Field Encoding
AFI	Authority and format Identifier	1 Octet	Decimal	2 Digits	BCD
IDI	Initial domain Identifier	2 Octets	Decimal	4 Digits	BCD
VER	Version	1 Octet	Hex	2 Digits	Binary
ADM	Administration Identifier	3 Octets	Alpha or Hex/Alpha	3 Characters 2 Digits character	IA-5 Binary/ IA-5
RDF	Routing Domain Format	1 Octet	Hex	2 Digits	Binary
ARS	Administration Region Selector	3 Octets	Hex	6 Digits	Binary
LOC	Location	2 Octets	Hex	4 Digits	Binary
SYS	System Identifier	6 Octets	Hex	12 Digits	Binary
SEL	NSAP Selector	1 Octet	Hex	2 Digits	Binary

Table 4.2-1 – Encoding Rules for the ATN NSAP

4.3 Recommended values for NSAP Address Fields assignment

4.3.1 The AFI and IDI Fields

The ATN Internet SARPs (Reference 1) require allocation of the following values:

- Decimal for the AFI field to indicate the type of NSAP being used. This value has been assigned the character sequence “47”.

[1] ACCESS (ATN Compliant Communications European Strategy Study) is a project funded by the European Commission and jointly produced by the following companies and administrations: National Air Traffic Services (NATS), Deutsche Flugsicherung (DFS) and Service Technique de la Navigation Aerienne (STNA).

- Decimal for the IDI field to designate ICAO. This value has been assigned the character sequence "0027".

As recommended in Reference ATN NSAP addresses and NETs will be written as the character sequence "470027+" where the "+" is used to separate the Binary Coded Decimal (BCD) fields from subsequent Hexadecimal fields. Hence the AFI and IDI fields will be set to 470027.

4.3.2 The VER Field

The VER field is used to partition the ATN Network Addressing domain into a number of sub-ordinate Addressing Domains.

The values currently specified in Reference for the VER field are summarized in Table 4.3.2-1.

VER Field Value	Network Addressing Domain	Common NSAP Address Prefix for Domain	Values to be used by States of Asia/Pacific Region
[0000 0001]	Fixed AINSC	470027+01	
[0100 0001]	Mobile AINSC	470027+41	
[1000 0001]	Fixed ATSC	470027+81	470027+81 (ATSO ISs and ESs)
[1100 0001]	Mobile ATSC	470027+C1	470027+C1 (General Aviation)

Table 4.3.2-1 – Defined Values for the VER Field

4.3.3 The ADM Field

The ADM field is used to further partition the ATN Network Addressing Domain. The field designates a single State or Organization. Depending on what the VER field is set to will determine what values should be used in the ADM field.

When the VER field is set to "01" (Fixed AINSC) or "41" (Mobile AINSC), three alphanumeric characters derived from Doc. 8585 should be used.

When the VER field is set to "81" (Fixed ATSC) or "C1" (Mobile ATSC), the ATN SARPs permits two possible ways for encoding the ADM field.

The first method recommends that the State's three character alphanumeric ISO country code is used, as defined in ISO 3166. States may choose this method, however it will provide less flexibility than the second method for the addressing of regional entities (e.g. regional RDCs or regional organizations that are not country specific).

The second method that is recommended for use in the Asia/Pacific Region is to use the first octet of the field to define the ICAO region. Individual regions may be indicated or a combined Asia, Pacific, North America (NAM) region may be used. This would permit the reduction of the routing information that would otherwise be generated. It is recommended that the remaining two octets of the field will further identify the country, RDCs and the regional organizations that are not country specific as follows:

- For the identification of a country, it is recommended that States use the ICAO two letter location indicator (Reference 4) instead of the two character alphanumeric ISO 3166 country code. The structure of the ICAO two letter location indicator allows for a more efficient identification of a location. For example, indicators starting with the same letter "V" designate several countries in the same local region (e.g. Thailand, Sri Lanka, India, Cambodia etc). The second letter will actually define the specific country within this local region (e.g. "VT" for Thailand, "VC" for Sri Lanka etc.). Where a country has several ICAO two letter location indicators allocated to it, the assigning authority of the ADM field will be responsible in determining the preferred location indicator to represent that country. For example, the indicators "VA", "VI", "VO", "VE" are assigned to India and one of these indicators will be selected to represent India. The encoding of the ICAO two letter location indicators will be upper case alphanumeric values.

- For regional organizations that are not country specific, it is recommended to allocate a lower case alphanumeric value so as there will be no conflict with the ICAO two letter location indicators.

- For the addressing of RDCs (e.g. Island RDCs, Backbone RDCs), in particular for those that are not country specific, it is recommended to allocate codes with the most significant bit set to 1 in the second octet. Valid values would be in the hexadecimal range [8000 – FFFF].

ICAO Asia/Pacific Regional Office would be the allocation authority of the ADM field. In summary, the values allocated for the ADM field is indicated in Table 4.3.3-1.

VER Field Network Addressing Domain	**ADM Field Values**
Fixed AINSC	Derived from the set of three-character alphanumeric characters from Doc. 8585 (Reference 5).
Mobile AINSC	Derived from the set of three-character alphanumeric characters from Doc. 8585.
Fixed ATSC	To allow for efficient routing information to be exchanged, it is proposed that the ICAO Regional code be used in the first octet of the ADM field followed by the ICAO two-letter location indicator for countries. The Regional codes are shown below. Regional Codes: [1000 0000] Africa [1000 0001] Asia [1000 0010] Caribbean [1000 0011] Europe [1000 0100] Middle East [1000 0101] North America [1000 0110] North Atlantic [1000 0111] Pacific [1000 1000] South America [1001 0001] Asia/Pacific/NAM For example Thailand would be represented as part of the Asia region by the hexadecimal sequence "815654" or as part of the combined Asia/Pacific/NAM region by the hexadecimal sequence "915654". Table 4.3.3-2 provides further examples

	for a selected number of countries. Where a two letter country code is not applicable, the following rules would apply: ICAO would assign lower case alphanumeric characters using a two letter value to organizations that wish to be based in a particular region. For example, if an organization is to be based in the Pacific region and wanted to be represented by the characters 'sa', this would be represented by the following hexadecimal sequence: 877361. ICAO would assign regional codes for RDCs where a country code or organization code is not applicable. Values would be assigned with the most significant bit set to 1 in the second octet. For example a RDC established in the Pacific region would be represented by the following hexadecimal sequence: 878100.
Mobile ATSC	Same for Fixed ATSC

Table 4.3.3-1 – Defined Values for the ADM Field

Fixed or Mobile Asia/Pacific ATSC Addressing Domain	Hexadecimal Code of the ADM Field	Comment
Australia	915942	Asia/Pacific/NAM Region + 'YB'
China	915A42	Asia/Pacific/NAM Region + 'ZB'
India	915649	Asia/Pacific/NAM Region + 'VA'
Fiji	914E46	Asia/Pacific/NAM Region + 'NF'
Japan	91524A	Asia/Pacific/NAM Region + 'RJ'
New Zealand	914E5A	Asia/Pacific/NAM Region + 'NZ'
Singapore	915753	Asia/Pacific/NAM Region + 'WS'
Thailand	915654	Asia/Pacific/NAM Region + 'VT'
United States	915553	Asia/Pacific/NAM Region + 'US'
Viet Nam	915656	Asia/Pacific/NAM Region + 'VV'

Table 4.3.3-2 – Example of Proposed ADM Value Assignment for Selected Asia, Pacific, and North America Entities

4.3.4 The RDF Field

The RDF field is historical and is not used. Therefore the RDF field shall be set to [0000 0000].

4.3.5 The ARS Field

The ARS field is used to:

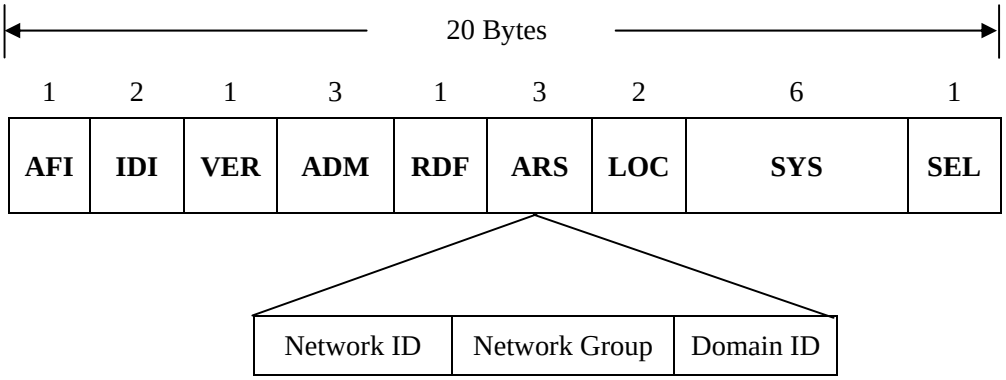
- Distinguish Routing Domains operated by the same State or Organization (in Fixed Network Addressing domains); and
- Identify the aircraft on which the addressed system is located (in Mobile Network Addressing Domains).

Each State or Organization identified in the ADM field will be responsible for assigning the values for the ARS field.
In accordance with the SARPs, for a Mobile Network Addressing Domain, the 24-bit ICAO Aircraft Identifier is inserted in the ARS field. However, no specific values have been specified for Fixed Network Addressing Domains.

The ARS field shall be assigned in a manner that simplifies the routing of data and makes provision for any potential lower level organizational units that could, in the future, operate an ATN Routing Domain.

The Asia/Pacific Regional ATN Addressing Plan recommends the ARS field be decomposed into three subfields as shown in Figure 4.3.5-1: Network ID, Network Group ID and Domain ID.

Figure 4.3.5-1 Recommended structure for ARS field



4.3.5.1 Network ID

Potential future operators of an ATN Routing Domain could be:

- A national Air Traffic Service Organization(s) (ATSO);
- A national military organization;
- A national meteorological organization; and
- An airport operator.

At present it is assumed that military organizations and meteorological organizations will not start up their own ATN Routing Domains and will be located within a national ATSO ATN Routing Domain. The same may apply to airport operators.

However in planning for the long term it is deemed necessary that provision is made available for these future possibilities.

In allowing for this possible expansion, it is recommended that the different ranges of values for the Network ID sub-field be allocated to the different national organizations as follows:

- Hexadecimal values [00 – 1F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national ATSO.
- Hexadecimal values [20 – 3F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national military organization.
- Hexadecimal values [40 – 5F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national airport operators. (Note: this range matches the ASCII range of alphabetical upper case characters).
- Hexadecimal values [60 – 7F] of the first octet of the ARS field is reserved for the addressing of domains and systems operated by the national meteorological organization.
- Hexadecimal values [80 – FF] are reserved.

A national organization would then be able to register one or several values for the Network ID sub-field within the range that has been reserved for its organization category.

In addition to the Network ID sub-field being used for distinguishing the different national organizations, it is proposed that this sub-field also be used for the identification of the particular role of the addressed domain. For example, setting the Network ID sub-field to the hexadecimal value “01” would represent the set of operational Routing Domains of the national ATSO. Setting the Network ID sub-field to hexadecimal “11” would represent the set of non-operational Routing Domains of the national ATSO. In using the Network ID sub-field in this manner, allow national ATSOs to provide for a duplicate non-operational network to be used for trials and pre-operational testing. Similar arrangements could be used for the other national organizations.

4.3.5.2 Network Group ID

This sub-field can be used to subdivide a ground ATN network into smaller groups. This field is unique within a particular network. This may be useful for future expansion by allowing regions to be formed within a particular network as defined by the Network ID. The formation of regions may be useful for the routing traffic exchanged within the network.

This sub-field is also used to designate an RDC. RDCs can also be used to assist in the formation of regions within an Administrative Domain and they offer an additional level of flexibility when used to combine RDs into a confederation. RDCs are designated by setting the uppermost bit of this sub-field to “1”.

4.3.5.3 Domain ID

This sub-field is a unique identifier assigned to each Routing Domain in the Network Group.

Table 4.3.5.3-1 shows possible examples on how the ARS field could be used. In the table two Network Groups "01" and "02" are defined. These two Network Groups can, for example, represent two FIRs in a country. One of the two Network Group contains two RDs and the other one contains three RDs. These two Network Groups can also address the initial RDs in a country (i.e. two RDs) with a planned expansion towards five RDs.

Network ID	Network Group ID	Domain ID	Comment
01	01	01	Network ID "01" indicates an ATSO operational network that contains two Network Groups "01" and "02". Network Group "01" contains two RDs "01" and "02". Network Group "02" contains three RDs "01", "02" and "03".
		02	
	02	01	
		02	
		03	

Table 4.3.5.3-1 – Example of ARS Value Assignment

4.3.5.4 Addressing RDCs in the ARS field

The Network Group ID sub-field is used to segregate the addressing space of actual RDs and RDCs. When the uppermost bit of the Network Group ID sub-field is set to "1" the second and third octets of the ARS field are assigned from the RDC addressing space (i.e., 8000-FFFF) and must be unique within that addressing domain. Otherwise, the sub-fields are assigned from the NSAP Address Space as described above for the Network Group ID and Domain ID sub-fields.
Similar principles as explained in sections 4.3.5.2 and 4.3.5.3 for the addressing of RDs can be applied to the addressing of RDCs, as required:

- The second octet of the ARS field may identify a group of RDCs.
- The third octet of the ARS field identifies RDCs.

4.3.6 The LOC Field

The LOC field is used to:

- Distinguish Routing Areas within Fixed Routing Domains, identified by the ARS field; and
- Distinguish Routing Areas and Routing domains within aircraft identified by the ARS field.

The assignment of the LOC field value is the responsibility of the State or organization that is the addressing authority for the routing domain in which the identified routing area is contained.
To assist States or organizations, it is recommended that the LOC field be divided into two sub-fields as shown in Figure 4.3.6-1: Sub-domain Group ID and Sub-domain ID.

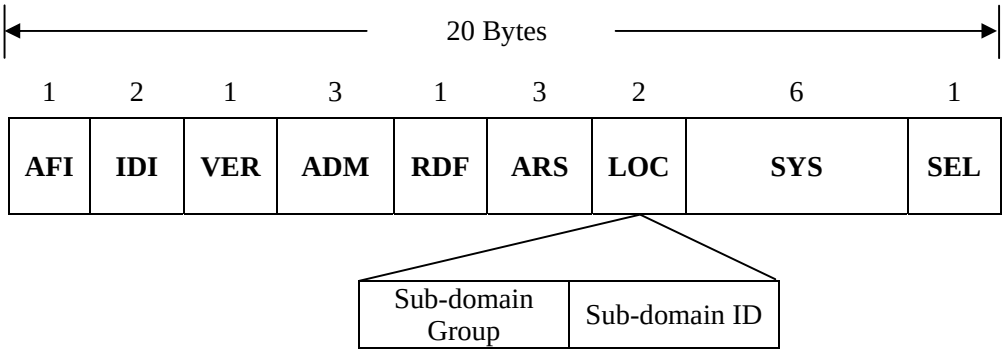


Figure 4.3.6-1 Proposed LOC Field Format

4.3.6.1 Sub-domain Group ID

This sub-field can be used to subdivide a domain into separate groups. For example, each control centre could define as a routing domain. A control centre may contain an En-Route facility, Terminal facilities, and Tower facilities. Each of these facilities can be classified as a different Sub-domain Group allowing addressing to be delegated to each facility, if desired. For this example, this sub-field can be assigned as shown in the Table 4.3.6.1-1.

Value (hex)	Description
00	Reserved
01	No specific group. Used for RDs that do not require subdivision
02	En-Route Sub-domain
03 – FF	Assigned as required

Table 4.3.6.1-1 – Example of Sub-domain Group ID Value Assignment

4.3.6.2 Sub-domain ID

This sub-field is a unique identifier assigned to each routing area within a Sub-domain Group. This sub-field allows multiple areas to exist within a sub-domain group and must be unique within the sub-domain. This subfield could be assigned as shown in the Table 4.3.6.2-1.

Value (hex)	Description
00	Reserved
01	No specific area. Used for Sub-domains that do not require subdivision
02 – FF	Assigned as required by the Sub-domain Group Addressing Authority

Table 4.3.6.2.1 – Example of Sub-domain ID Value Assignment

4.3.7 The SYS Field

The SYS field is used to uniquely identify an End-System or Intermediate-System. The allocation of the SYS field value is the responsibility of the organization that is the addressing authority for the routing area that contains the identified ATN End-System or Intermediate-System.

The type of values or structure for the SYS field is for individual authorities to choose, as appropriate.

It has been suggested that the 48-bit LAN address of a device attached to an IEEE 802 local area network that is being used as an ATN ES or IS, could be used in this field. However, this may have ramification if the SYS field is tied to a sub-network dependent information such as the physical network address (e.g. 48-bit LAN address) that is associated with a particular device. The problem will occur when the device is replaced by another device which will use a different 48-bit LAN address, requiring the NSAP address of the ATN ES or IS to be changed.

It is therefore recommended that the SYS field be used to identify the system without any dependency on physical information. Possible examples of this is to define whether the system is an IS or an ES, the type of function or role the system is used for (e.g. primary system, hot standby system, cold standby system, etc.), or the type of applications that are running on the system (e.g. AMHS, AIDC, ADS, CPDLC, Network Management, etc.).

A requirement found in Section 7.1.4.b.1 of ISO 10589 IS-IS states that all Level 2 ISs within a Routing Domain must have a unique SYS field value. In order to enforce this requirement related to IS-IS Level 2 addressing, it is recommended that the values assigned to the LOC sub-fields also be assigned to the upper two octets of the SYS field. Using this approach enables the addressing authority for each Sub-domain Group the flexibility to assign addresses without conflicting with addresses of other groups within the same Routing Domain.

4.3.8 The SEL Field

The SEL field is used to identify the End-System or Intermediate-System network entity or network service user process responsible for originating or receiving Network Service Data Units (NSDUs).

Table 4.3.8-1 identifies the defined values that shall be used in this field in accordance with Reference.

SEL Field Value	Usage
[0000 0000]	Used for an IS network entity except in the case of an airborne IS implementing the procedures for the optional non-use of IDRP.
[0000 0001]	Used for the ISO 8073 COTP protocol in the Ground or Airborne End-systems.
[0000 0010]	Used for the ISO 8602 CLTP protocol in the Ground or Airborne End-systems.
[1111 1110]	Used for an IS network entity belonging to an airborne IS implementing the procedures for the optional non-use of IDRP.
[1111 1111]	Reserved

Table 4.3.8-1 – Defined Values for the SEL field

4.4 Authority Responsible for NSAP Field Assignments

The responsibility for the assignment of values to each of the NSAP address fields is held by only one organization. This is to ensure that each NSAP address is unique within the ATN. Table 4.4-1 identifies which organization is responsible for the assignment of each field.

NSAP Field	Assignment Authority
AFI	ITU-T and ISO
IDI	ITU-T and ISO
VER	ICAO – defined in Doc. 9705
ADM	States or Organizations identified by the VER field and according to rules found in Doc. 9705 – Recommended values and responsible authority are provided in this plan.
RDF	Reserved
ARS	States or Organizations at the discretion – Recommended values in this plan
LOC	States or Organizations
SYS	States or Oganizations
SEL	ITU-T and ISO for standard transport protocol, States and Organizations for other values/uses

Table 4.4-1 – NSAP Address Field Assignment Responsibility