> **REVISED ON 21 APRIL 1995 AGAINST VERSION 2.0**
> **(actually no modification was required)**

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

WORKING GROUP 2

Toulouse, France 13-17 March 1995

Change Proposal Material related to ATN TSAP handling

Prepared by Jean-Pierre Briand

SUMMARY

This paper provides Change Proposal material to cover Defect Report 95010023. This work was assigned as WG2 Action 2/34. The paper is provided before CP submission in order to allow for broad discussion at CCB and WG2 level.

TABLE OF CONTENTS

1.   Introduction

DR #23 (reference 95010023.DR) identified a number of defects in the handling of TSAP selectors by the transport protocols. This paper provides some clarifications about the identified defects and detailed change proposal material.

2.   Clarification of defect

Three distinct issues have been identified:

a) Requirements on TSAP selector vs. recommendation on TSAP Identifiers

TSAP selectors are mandatory in ATN transport addresses (as described in section 5.5.1 and as mandated in A8.1.1). As a consequence, an ATN compliant End System must exchange TSAP selectors with its peer at the transport level, in order to correctly address a remote ATN system. These TSAP selectors are conveyed in TSAP Identifier parameters in transport protocols.

Support for TSAP Identifiers is only recommended in current version of TP4 APRLs (see ATN10, ATN11, ATN 18, ATN19 in A8.2.4.1.2.2) which is inconsistent with the previous requirement.

Support for TSAP Identifiers must be made mandatory.

b) Requirements on ATN addresses vs. requirements on Protocol Addressing Information

All the requirements on ATN addressing in Appendix 7 (essentially TSAP selectors and NSAP structure) are requirements on the administration of ATN systems, i.e. they specify how the ATN systems' addresses should be defined/configured within the ATN. These requirements are not requirements on the Network/Transport Protocol Addressing Information parameters (PDU fields that convey addresses and selectors between peer entities), i.e. an implementation is not supposed to discard NPDUs if NSAP addresses do not comply to Appendix 7 nor refuse a TP4 connection if TSAP Ids are not 1 or 2 octets in length.

Imposing this strong interpretation would preclude interworking with non-ATN systems. Although this may be a valid choice in specific systems, it should not be enforced.

Chapter7/Appendix 7 should contain some guidance/note about this. Appendix 8 should make the difference between "local addresses" (necessarily ATN) and "remote addresses" (not necessarily ATN).

c) Interpretation of TSAP identifiers

ISO 8073 does not specify precise semantics for missing TSAP identifier parameters. The commonly agreed interpretation is as follows:

- In CR TPDUs, absent TSAP IDs are equivalent to TSAP IDs of length 0. This will not happen for ATN TSAPs but should not be precluded to allow connection to non-ATN systems.

- In CC TPDUs, absent TSAP IDs are equivalent to their corresponding TSAP IDs in the CR TPDU.

Use of TSAP identifiers (in addition to "support" addressed in a) above) must be further described in Appendix 8.

3.   Change Proposal Material

Changes are presented below as excerpts of Draft SARPs and Guidance Material text, modifed using change bars. The various sections impacted are separated using a double line bar.

7.8.   ISO OSI and ATN Transport Layer Addressing

7.8.1.   General

Note.— This section provides guidance on the format of transport service access point (TSAP) addresses.

7.8.2.   TSAP Fields

A TSAP address comprises two elements, the NSAP and the TSAP selector. A TSAP address uniquely identifies a given transport user.

Note 1. -- The TSAP selector field has local significance and uniquely identifies a transport user with respect to a particular transport protocol entity.

In ISO OSI standards, TSAP selectors are treated as octet strings, possibly empty. The standards do not specify any further the syntax and semantics of TSAP selectors. In the ATN, TSAP selectors are interpreted as unsigned integers in the range [0 - 65535].

7.8.3.   Transmission of TSAP Selectors

An ATN TSAP Selector should be transmitted using the minimum number of octets required to represent the assigned value of the TSAP Selector. That is, a TSAP Selector in the range [0 - 255] should be transmitted using a single octet; a TSAP Selector in the range [256 - 65535] is transmitted using two octets.

Note.-- The TSAP Selectors are transmitted within the header of the CR and CC TPDUs for the connection mode transport protocol and within the header of the UD TPDU for the connectionless mode transport protocol.

7.9   Addressing outside the ATN

ATN TSAP addresses are defined in the framework of the OSI Naming and Addressing model (ISO 7498-3). In that context, they ensure the unambiguous identification of Transport Service Users within ATN End Systems. Adherence to the model guarantees that this remains valid outside the ATN, i.e. a non-ATN system will unambiguously identify an ATN TSAP address as a valid Transport Service User address located into the ATN domain.

The conditions necessary for ATN and non-ATN systems to interwork and establish end-to-end dialog appear at three levels, each being a prerequisite to the next:

    a) both ATN and non-ATN systems should recognise each other's addresses syntax and be capable of representing them locally, e.g. local representation and storing of addresses, address passing across local service boundary, etc.

    b) the protocol profiles must be interoperable,

    c) network management (in its broad sense: system management, routing policy, routing topology, network operation, etc.) must enable the communication. The capability of communication may exist while being prevented by specific access control rules or routing policies.

The capacity of an ATN system to interwork with non-ATN systems is an issue to be considered by implementors. If a given system is restricted for access by ATN systems only, optimisations and simplifications may be decided in protocol implementations based on ATN addressing requirements (e.g. restrict TSAP Identifier parameters to 2 octets in length).

If a system potentially requires communication with non-ATN systems, it is preferable that its addressing capabilities are wider than those specified for the ATN. The actual capability of communication will still be controlled by routing policies and system management.

A7.6 Transport Layer Addressing

A7.6.1 General

Note 1.— This section provides requirements on the format of ATN TSAP addresses. An ATN TSAP address is an NSAP address and a TSAP selector.

Note 2.— The requirements in this section apply to the administration of transport addresses local to an ATN End System. They do not apply to all systems in a global OSI Environment. An ATN System may allow remote transport addresses to obey different standards, e.g. when interworking with a non-ATN system is required.

A7.6.2 ATN TSAP Selector

An ATN TSAP selector shall be either one or two octets in length.

A7.6.3 Format

The TSAP Selector field shall be interpreted as an unsigned binary integer.

A7.6.4 Administration

The TSAP Selector field shall be administered on a local basis.

A7.6.5 Range

Valid TSAP Selector field values shall be in the range **[0] - [65535]**.

A7.6.6 Encoding

The TSAP Selector field shall be encoded using binary rules, as defined in A7.4.5.

Recommendation.— TSAP selector values in the range **[0] - [255]** should be encoded using one octet, higher values should be encoded using two octets.

A8.1 General

1. The COTP shall be used to provide an end-to-end reliable data transfer service between transport service users on two ATN ESs.

2. In ATN ESs, the implementation of the COTP shall conform to ISO 8073:1992 and the mandatory requirements given in this appendix.

3. The CLTP shall be used to provide a CL data transfer service between TS-users on two ATN ESs.

4.   In ATN ESs, the implementation of the CLTP shall conform to ISO 8602:1987 and the mandatory requirements given in this appendix.

Note.— The transport protocols specified for use in ATN ESs provide both CO and CL communication services. The implementation and use of a particular mode of the transport layer service depends on the requirements of the application(s) supported by a given ATN ES.

A8.1.1 Transport Service Access Point Addresses

1.   A TSAP address shall comprise two elements, a NSAP address and a TSAP selector.

2.   The NSAP address and the TSAP selector shall conform to the provisions in Appendix 7.

A8.1.2 Network Service Specification

1.   The COTP shall operate using the CLNS as specified in Appendix 9.

Note 1.— TPDUs are sent via the N-UNITDATA request primitive.

Note 2.— The transport layer also assumes that the network layer provides a mechanism for reporting when there is congestion on the path between the local transport layer and the remote transport layer.

A8.1.3 Exchange of TSAP-ID parameters

Note.— TSAP Selectors are transmitted in Calling and Called TSAP-ID parameters in COTP, and in Source and Destination TSAP-ID parameters in CLTP.

The transport entity shall support TSAP-ID parameters to accomodate the ATN TSAP selector syntax and encoding requirements as specified in Appendix 7.

Recommendation.—   The transport entity should support remote TSAP-ID parameters of variable size from 0 up to 32 octets using any encoding and any value.

In COTP, on receipt of CR TPDU, the absence of a Calling or Called TSAP-ID shall be treated as equivalent to a zero length Calling or Called TSAP-ID. The absence of a Calling or Called TSAP-ID in a received CC TPDU shall indicate that Calling or Called TSAP-ID is equivalent to the corresponding parameter specified in the sent CR TPDU. When present in a received CC TPDU, Calling and Called TSAP-ID parameters shall be identical in length and value to the corresponding parameter specified in the sent CR TPDU.

In CLTP, on receipt of UD TPDU, the abscence of a Source or Destination TSAP-ID shall be treated as equivalent to a zero length Source or Destination TSAP-ID.

A8.2.4.1.1 Index of indices used in the APRL

Index	Description	Clause
Index	*Description*	*Clause*
ATN1	Initiate CR TPDU	A8.2.4.1.3
ATN2	Respond to CR TPDU	A8.2.4.1.3
ATN3	Extended TPDU Numbering	A8.2.4.1.4.1.3
		A8.2.4.1.10.4
ATN4	Non-use of checksum	A8.2.4.1.4.1.3
		A8.2.4.1.10.6
ATN5	Concatenation	A8.2.4.1.4.1.3
ATN6	Selective Acknowledgement	A8.2.4.1.4.1.3

ATN7	Request of Acknowledgement	A8.2.4.1.4.1.3
ATN8	Reduction of credit window	A8.2.4.1.6.2.6
ATN9	ER TPDU Transmission	A8.2.4.15
~~ATN10~~	~~Called TSAP-ID in CR~~	~~A8.2.4.1.6.2.1~~
~~ATN11~~	~~Calling TSAP-ID in CR~~	~~A8.2.4.1.6.2.1~~
ATN12	TPDU size in CR	A8.2.4.1.6.2.1
ATN13	Additional options in CR	A8.2.4.1.6.2.1
ATN14	Priority in CR	A8.2.4.1.6.2.1
ATN15	Acknowledgement time in CR	A8.2.4.1.6.2.1
ATN16	Preferred maximum TPDU size in CR	A8.2.4.1.6.2.1
ATN17	Inactivity timer in CR	A8.2.4.1.6.2.1
~~ATN18~~	~~Called TSAP-ID in CC~~	~~A8.2.4.1.6.2.2~~
~~ATN19~~	~~Calling TSAP-ID in CC~~	~~A8.2.4.1.6.2.2~~
ATN20	TPDU size in CC	A8.2.4.1.6.2.2

(...)

A8.2.4.1.2.2 Specific ATN Recommendations.

Note.- The ATN recommendations for use of optional ISO functionality are presented below. If the recommendation is accepted, the indexed predicate indicates the specific implementation features required to support the recommendation. The index of indices indicates where the features for each recommendation are found.

Does the implementation support the ATN recommendation on:

(...)

| ~~ATN10~~ | ~~Use of Called TSAP-ID Parameter in CR TPDU?~~ | ~~O~~ | ~~Yes No~~ |
| ~~ATN11~~ | ~~Use of Calling TSAP-ID Parameter in CR TPDU?~~ | ~~O~~ | ~~Yes No~~ |

(...)

| ~~ATN18~~ | ~~Use of Called TSAP-ID Parameter in CC TPDU?~~ | ~~O~~ | ~~Yes No~~ |
| ~~ATN19~~ | ~~Use of Calling TSAP-ID Parameter in CC TPDU?~~ | ~~O~~ | ~~Yes No~~ |

(...)

A8.2.4.1.6.2.1 Optional Parameters for a Connection Request TPDU.

The ATN COTP shall implement the features marked "M" in the table.

Index	Supported parameters	References	ISO Status	ATN Support
I4CR7	Called TSAP-ID	13.3.4 a)	O	~~ATN10:~~M
I4CR8	Calling TSAP-ID	13.3.4 a)	O	~~ATN11:~~M

(...)

A8.2.4.1.6.2.2 Optional Parameters for a Connection Confirm TPDU. *ISO Note. - The following parameters are optional if a CC TPDU is issued in class 4:*

Index	Supported parameters	References	ISO Status	ATN Support
I4CC6	Called TSAP-ID	13.4.4	O	~~ATN18:~~M
I4CC7	Calling TSAP-ID	13.4.4	O	~~ATN19:~~M

4.   Recommendation

It is recommended that:

- WG2 reviews and discusses the draft change proposal material presented in section 3 and makes a decision as to their correctness and appropriateness, and

- formal change proposal is submitted as a result of the WG2 review.