

AERONAUTICAL TELECOMMUNICATION NETWORK PANEL

Working Group 2

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**Systematic Review of Certain Option Selections
for TP4 Timer Values**

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SUMMARY

This document reviews certain APRL requirements presented in SARPS ver 3.1 Section 5, Transport Service and Protocol Specification. There are parameters conveyed in the "variable part" of the COTP CR and CC TPDU whose presence is "optional" from the standpoint of the ISO 8073 standard. Certain of these parameters, however, must be viewed as mandatory from the standpoint of engineering an ATN system that will work in a reliable and efficient manner.

REVISION HISTORY

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Systematic Review of Certain Option Selections for TP4 Timer Values

1. Scope and Purpose of this Paper

This document is aimed at describing apparent anomalies contained within the APRLs related to Chapter 5, Transport Service and Protocol Specification of the Sub-Volume 5 Internet SARPS, version 3.1. Certain parameters conveyed in the “variable part” of the COTP CR and CC TPDU, whose presence is optional from the standpoint of the ISO 8073 standard, are in fact mandatory in the SARPS from the standpoint of engineering an ATN system that will work efficiently and reliably.

This paper presents recommendations for changing specific APRLs from “O” optional to “M” mandatory. In addition, certain statements and requirements are apparently in conflict with protocol requirements and changes are suggested for accuracy and clarity.

2. References

Please refer to the CNS/ATM-1 Package SARPS, Sub-Volume 5 - Internet Communications Service, Chapter 5, “Transport Service and Protocol Specification” for detailed listings of the APRLs referenced in this document.

Also refer to ISO/IEC 8073:1992 “Information Technology - Telecommunications and Information Exchange between Systems - Open Systems Interconnection - Connection Oriented Transport Protocol Specification” for the specific protocol requirements for providing such COTP service.

3. Acronyms

APRL	ATN Profile Requirements List
COTP	Connection oriented Transport Protocol
CR	Connect Request
CC	Connect Confirm
TPDU	Transport Protocol Data Unit
ED	Expedited Data
TS	Transport Service

4.0 Chapter 5 APRL Recommendations

4.1 Connection Mode Transport Priority

In reference to the discussion in section 5.2.2.1, *Connection Mode Transport Priority*, the optional conveyance of priority and the imposition of a default priority should occur in the interaction between the TS-user who is requesting a connection (in a CR TPDU) and the initiating TS-provider (via a CC TPDU). The conveyance of the selected priority to the responding TS-provider is therefore mandatory.

Consequently, in section 5.2.4.1.1.2, *Specific ATN Requirements*, Index Item ATN14, “Use of the Priority Parameter in CR TPDU?” is indicated to be “O” optional when, in fact, the protocol exchange

requirements in ATN COTP operation require this item to be “M” mandatory. Similarly, Index Item ATN22, “Use of the Priority Parameter in CC TPDU?” should be changed from “O” optional to “M” mandatory.

4.2 Acknowledgment and Inactivity Timer Values

The values if the Acknowledgment Timer and the Inactivity Timer parameters used by the other TS-provider on a particular connection are important for calculating the values of local timers used to manage the TP connection.

Either all TS-providers must use exactly the same values by common consent, or it must be mandatory to convey the values being used in the CR and CC TPDU. This latter approach is the safer and wiser one for efficient and reliable system operation.

Furthermore, in section 5.2.4.1.11, *Class 4 Timers and Protocol Parameters*, the following Index Items are indicated to be “M” mandatory:

TA3	Inactivity Time (L)	M
ATN-TA-6	Acknowledgment Time (L)	ATN15:M
ATN-TA7	Acknowledgment Time (R)	ATN15:M
ATN-TA8	Inactivity Time (R)	ATN17:M

Therefore, in section 5.2.4.1.1.2, *Specific ATN Requirements*, it is recommended to change the following Index Items from “O” optional to “M” mandatory:

ATN15	Use of the Acknowledgment Timer Parameter in CR TPDU?	M
ATN17	Use of Inactivity Time Parameter in CR TPDU?	M
ATN23	Use of the Acknowledgment Timer Parameter in CC TPDU?	M
ATN25	Use of Inactivity Time Parameter in CC TPDU?	M

4.3 Timer Settings

In section 5.2.4.1.1.2, *Specific ATN Requirements*, Index Item ATN32, “Timer Settings?” is indicated to be an optional parameter. While this may be optional from an ISO 8073 perspective, the use of the Acknowledgment and Inactivity Timers in CR and CC TPDU have been recommended in the sections above to be mandatory. Consequently, use of Timer Settings must also be mandatory to provide at least initial static values for these timers.

A more detailed discussion of timer values, with specific usage recommendations, is provided in WP219, *Need for More Complete Definition of TP4 Timer Settings and Usage*, presented at this WG2/7 meeting.

4.4 Use of Selective/Request Acknowledgment

In section 5.2.4.1.3.1.3, *ISO 8073 Optional Functions*, the following Index Items are indicated to be “M” mandatory:

T4F31	Retention & acknowledgment of TPDU - Use of selective acknowledgment	ATN6:M
T4F32	Retention & acknowledgment of TPDU - Use of request acknowledgment	ATN7:M

In the recommendations relating to these items, there appears to be a conflict in the requirements since these two items are recommended to be used for more efficient system operation. It is not clear whether these recommendations refer to implementation in the CNS-ATM-1 Package 1 timeframe or whether they are generally recommended for use.

In any event, an "M" mandatory indication for these specified Index items with following recommendations for use seems to be contradictory. These recommendations should be phrased as explanations of actual system requirements.

4.5 TPDU Size Parameters

In section 5.2.4.1.5.2.1, *Optional Parameters for a Connection Request TPDU*, the following Index items are indicated as being mandatory for CNS/ATM-1 support:

I4CR9 TPDU Size ATN12:M

I4CR18 Preferred Maximum TPDU size ATN16:M

In the recommendation at the end of this section, however, the following statement is indicated: "*The transport layer should use the TPDU size parameter rather than the preferred maximum TPDU size parameter.*" This recommendation appears to be in conflict with the "M" status for implementation of both of these parameters. If such a recommendation is to be made, Index Item I4CR18 (and possibly also I4CR9) should more logically be indicated as "MO."

4.6 TPDU Size Negotiation

In section 5.2.4.1.9.3, *TPDU Size Negotiation*, there are several potentially confusing notes and recommendations relating to TPDU sizes. Index Items TS3 and TS4 refer to the largest value of the preferred maximum TPDU size in both CR and CC TPDUs. Required mandatory CNS/ATM-1 support is any multiple of 128 octets.

The note for both TS3 and TS4 indicates: "*Note.-An implementation of the transport layer can support a preferred maximum TPDU size larger than 1024 octets.*" The recommendation for both TS3 and TS4, however, indicates that: "*1024 octets is the recommended minimum maximum-TPDU size.*"

The second recommendation relating to TS3 and TS4 (and also T4S1 and T4S2) indicates that: "*The supported TPDU size of 1024 octets is recommended to support efficient transmission of anticipated application data exchanges.*" The second note for TS3 and TS4 (and also T4S1 and T4S2) indicates: "A given transport implementation may support a smaller TPDU size."

To clear up this multitude of "suggestions," the following Recommendation is proposed:

"TS3, TS4, T4S1, T4S2:: **Recommendation.**- To support efficient transmission of anticipated application data exchanges, a maximum TPDU size of at least 1024 octets is recommended."

This statement is proposed to replace all four notes and recommendations.

5.0 Concluding Remarks

The changes indicated in this paper are proposed to clarify and correct the various APRL references indicated. The larger issues relating to TP4 timers, however, still remain to be decided by the Working Group.

These issues include whether or not to:

- propose “static” timer values with easily changed settings;
- develop “sets” of such static timer values chosen to be compatible with the differing sub-network types;
- establish a “dynamic” set of values using a common algorithm;

In addition, the closely related issue of how to handle congestion avoidance is of concern in the CNS/ATM-1 timeframe.

A detailed discussion of these issues, together with suggested recommendations, is presented in WP 219.