AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

Working Group 2

18th Meeting

Napoli, Italy

18 - 21 May 1999

SME V (Internet Communications Service) Status Report

Working Paper

Presented by Klaus-Peter Graf (Subvolume V SME)

Summary

This paper provides a summary on the status of the PDRs which have been submitted against the ATN ICS SARPs (Subvolume V).

There are currently two accepted PDRs concerning the ATN ICS SARPs waiting for final resolution. These PDRs are attached to this paper.

WG 2 members are invited to note the current status, to review the attached PDRs and to contribute to the development of appropriate technical solutions for the non-resolved PDRs.

1 Introduction

This paper provides a summary on the status of Proposed Defect Reports (PDRs) raised against the ATN Internet Communications Service (ICS) SARPs for information of the WG2 members.

Furthermore it presents two ICS PDRs accepted by the CCB and waiting for a technical solution by the WG2 SDM process. A third PDR which has been progressed from the SUBMITTED status to the RESOLVED status at the CCB-9 meeting (Naples) is at Attachment C for information.

2 PDR Status

Table 1 presents the list of those PDRs which have been submitted to the ATNP Configuration Control Board (CCB) since its establishment in spring 1997 and which apply to the Internet Communications Service (ICS) SARPs. Column 3 of Table 1 lists the status of these PDRs in the ATNP CCB process as of 17th May 1999. Column 4 indicates the version of the ATN ICS SARPs in which the agreed technical solution of the resolved PDR has been included (marked by "(I)") or is scheduled for inclusion (marked by "(S)") respectively.

PDR Number	PDR Title	CCB Status	Included (I) in ... Scheduled (S) for ..
97060028	Transport Timers Configuration	ADOPTED	ICAO Version 2.2 (I)
97060029	Various Editorial Defects (1)	ADOPTED	ICAO Version 2.2 (I)
97060030	IDRP Timers	ADOPTED	ICAO Version 2.2 (I)
97100001	Incomplete specification for use of V.42bis by Mobile SNDCF	ADOPTED	ICAO Version 2.2 (I)
97100002	SNDCF Call Request/Confirm User Data Length Indicator	ADOPTED	ICAO Version 2.2 (I)
97100003	Various Editorial Defects (2)	ADOPTED	ICAO Version 2.2 (I)
97100048	LREF Directory Management	ADOPTED	ICAO Version 2.2 (I)
98040003	X.25 Address Extension Facility	RESOLVED	Doc 9705 Amend 1 (S)
98050001	IDRP Update Receive Process	RESOLVED	Doc 9705 Amend 1 (S)
98060003	Predicates in ISO/IEC 8473 APRL	RESOLVED	Doc 9705 Amend 1 (S)
98060004	Support of IDRP by Airborne Router implementing optional non-use of IDRP	RESOLVED	Doc 9705 Amend 1 (S)
98060005	Air/Ground Route Initiation APRL	RESOLVED	Doc 9705 Amend 1 (S)
98060006	Correlation of ATSC Class with A/G Subnetwork Type in Airborne Router	RESOLVED	Doc 9705 Amend 1 (S)
98060007	Symmetry of Mobile SNDCF APRL and Route Initiation APRL	RESOLVED	Doc 9705 Amend 1 (S)
98060008	IDRP Traffic Typing	RESOLVED	Doc 9705 Amend 1 (S)
98080001	Segmentation of Error Report PDU	RESOLVED	Doc 9705 Amend 1 (S)
98090002	Incorrect term "24-bit ICAO Aircraft Identifier"	RESOLVED	Doc 9705 Amend 1 (S)
98090003	Downgrading of ATSC Class	RESOLVED	Doc 9705 Amend 1 (S)

98090004	Backbone Hides Optimal Route to Off-Back-bone BISs	REJECTED	----
98090010	Value of SNCR in X.25 Call Request Packets	RESOLVED	Doc 9705 Amend 1 (S)
98100002	Deflate Frame Checksum	RESOLVED	Doc 9705 Amend 1 (S)
98100003	End-of-Block Code in Deflate Data Block	RESOLVED	Doc 9705 Amend 1 (S)
98100004	Deletion of Trailing Zero-Octet	RESOLVED	Doc 9705 Amend 1 (S)
98100005	Deflate Backwards Window Size	RESOLVED	Doc 9705 Amend 1 (S)
98100007	Handoff Event	RESOLVED	Doc 9705 Amend 1 (S)
99010001	Over-specification of SNSDU Requirement	ACCEPTED	
99010005	Loss of IDRP Connection	ACCEPTED	
99010008	References to ISO/IEC 8802-2 Broadcast Subnetworks	RESOLVED	Doc 9705 Amend 1 (S)
99030001	Parameter Setting in CLNP Echo Response PDU	RESOLVED	Doc 9705 Amend 1 (S)
99030002	Emergency Use of a Mobile Subnetwork	RESOLVED	Doc 9705 Amend 1 (S)
99050001	Echo NPDUs Supported By ISs	RESOLVED	Doc 9705 Amend 1 (S)

Table 1: Status of ICS PDRs in the ATNP CCB Process

As illustrated in Table 1, a total of 31 PDRs have been raised against the ICS SARPs over the past 24 months.

2.1 Resolved PDRs

Twentyeight of these PDRs have been resolved by the WG 2 SARPs Development Mechanism (SDM) and the proposed technical solutions approved by the CCB. One PDR has been rejected.

Concerning 7 of these 28 resolved PDRs the relevant technical modifications have been included in the ICAO Version 2.2 of the ATN SARPs and also brought forward to the Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) - ICAO Doc 9705-AN/956 (first edition, 1998). The agreed technical solutions of the remaining 21 resolved PDRs are scheduled for inclusion in Amendment 1 of ICAO Doc 9705-AN/956.

2.2 Accepted PDRs

There are currently two ICS PDRs which have been accepted by the ATNP CCB but which have not yet led to an agreed technical solution. These are PDR 99010001 and PDR 99010005. These PDRs are at Attachment A and B of this report for consideration by WG2.

2.3 Editiorial PDRs

In addition to the PDRs listed in Table 1 a substantial number of editorial defects has been identified during the review of the ATN SARPs ICAO Version 2.0 (distributed at the Langen ATNP meetings), ICAO Version 2.1 (distributed at the Redondo Beach ATNP meetings), ICAO Version 2.2 (distributed at the Rio ATNP meetings), and ICAO Doc 9705 (distributed at the Utrecht ATNP meetings). These editorial defects have been introduced by the ATN

SARPs editing process within ICAO. These defects have been documented in three editorial PDRs which apply to multiple Subvolumes, including Subvolume V. These are summarised in the following table:

PDR Number	PDR Title	CCB Status	Included (I) in ... Scheduled (S) for ..
97060001	Corrections to ICAO V2.0 produced by ICAO secretariat	RESOLVED	ICAO Version 2.1 (I)
97110001	Corrections to ICAO V2.1 produced by ICAO secretariat	RESOLVED	ICAO Version 2.2 (I)
98040005	Corrections to ICAO V2.2 produced by ICAO secretariat	RESOLVED	ICAO Doc 9705 (I)
98070003	ICAO 9705 – Engineering Version Discrepancies and Editorial Errors	RESOLVED	Doc 9705 Amend 1 (S)
99010004	ICAO 9705 Edition 1 Editorial Errors	ACCEPTED	Doc 9705 Amend 1 (S)

Table 2: Status of PDRs Documenting Editorial Defects of Subvolume V

3 Amendment 1 of Doc 9705

A draft of Amendment 1 of Subvolume V of Doc 9705 has been prepared for review by the CCB. This draft Amendment 1 is an update of Doc 9705 (Edition 1, 1998) along the agreed solutions of those RESOLVED PDRs which are labeled "Doc 9705 Amend 1 (S)" in the fourth column of Table 1. Revision marks have been used in order to clearly highlight and track changes and amendments from Edition 1 of Doc 9705.

The draft Amendment 1 is contained in the accompanying working paper WG2/WP514 and will also be available in softcopy (WordPerfect 8) on the PC archive of this meeting and on the ATNP archive at Toulouse.

4 Recommendation

The working group is invited to
- note the above reported status
- note the availability of Draft Amendment 1 of the ICS SARPs
- review the attached PDRs and propose technical solutions as appropriate.

Attachment A

Title: Overspecified SNSDU Requirement
PDR Reference: 99010001
Originator Reference:
SARPs Document Reference: ICS SARPs, Section 5.2.5.1.6
Status: ACCEPTED
Severity: C (Clarrification)
PDR Revision Date: 18/1/99 (Submitted → Accepted)
PDR Submission Date: 4/1/99
Submitting State/Organization: U.S. Federal Aviation Administr.
Submitting Author Name: Signore, T.
Submitting Author E-mail Address: signoret@mitre.org
Supplemental Contact Information: The MITRE Corporation Center for Advanced
                                                    Aviation System Development
                                                    1820 Dolley Madison Blvd
                                                    McLean, Virginia 22101-3481
                                                    TEL 703 883-7919   FAX 703 883-1367
SARPs Date: ICAO Version 2.3
SARPs Language: English

Summary of Defect:

The specification that "[A]n ATN subnetwork shall support a minimum Subnetwork Service Data Unit (SNSDU) size of 1100 octets" unnecessarily constrains implementations and overspecifies what is actually required to achieve interoperability. There are three reasons to support this conclusion. First, the VDL Mode 3 subnetwork, which is presently in prototype production and intended to replace the U.S. Federal Aviation Administration's analogue air traffic control voice system, provides an SNSDU size of 923 octets. The value of 923 octets is optimal for all forms of VDL Mode 3 data operations and is the largest value possible, dictated by the timing constraints of a TDMA system. The 923-octet figure is large enough to allay any concerns about network operation efficiency, which is the primary reason for the ATN 1100 octet specification. Removal of the 1100 octet SNSDU requirement allows the VDL Mode 3 CLNP interface option to be used within the ATN system.

Secondly, the removal of the requirement does not translate into additional complexity for an ATN router, as the 923-octet requirement only specifies a lower bound for a subnetwork interface. ATN routers would still need to provide for different SNSDU values for each interface. As such, the removal of the requirement should represent no change in ATN router design or operations. Thirdly, the 1100 octet number is calculated based on a specific assumption, a CLNP header size of 76 octets, which has the possibility of changing. The CLNP security classification tag is not included within the 76-octet calculation. But this field is specifically defined by the SARPs with the intention of using it in the future. Quoting the note in section 5.6.2.2.6.8.2, "The purpose of this field is to permit the later extension of the ATN to handle classified data." Whenever invocation of the security classification tag option becomes necessary, applications that assume 1024 octets of user data (the maximum allowed with an SNSDU of 1100 octets), will either have to be modified to account for a reduced user data size, or will have their 1024 octets of user data segmented by the ATN router. The former should not be necessary in a layered communication architecture. The latter would result in exactly the inefficient operation that the 1100-octet requirement intended to avoid.

Assigned SME: Sub-Volume V SME (K.-P. Graf)

SME Comment:

ATNP WG2 has reviewed and discussed the above problem at its 17th meeting (Honolulu). As a result of this discussion WG2-17/Flimsy 4 was prepared and agreed by WG2. It can be retrieved from http://www.cenatoulouse.dgac.fr/atnp/wg2/WPs/w2-17fl.zip. This Flimsy recommends that a complete analysis of the impact on the relaxation of the SNDCF SNSDU length requirement be undertaken including an analysis of the number of TPDUs approaching the maximum of 1024 octets as compared to TPDUs with smaller user data lengths. In particular the analysis proposed in Flimsy 4 will consider the impact of the following proposed changes in response to the reported problem:

a) removing the existing recommendation that ATN End Systems should use the non-segmenting CLNP subset for NSDUs of 1024 octets or less (ICS SARPs, section 5.6.3.1.3)

b) replacing the existing requirement that SNDCFs support a minimum SNSDU size of 1100 octets by a corresponding recommendation (ICS SARPs, section 5.2.5.1.6.1).

SDM team members and other interested parties are invited to contribute to this analysis by offering contributions on the atnp_wg2_sdm mailing list until 15th March 1999 at the latest.

Proposed SARPs Amendment:
To be provided.

SME Recommendation to CCB:

CCB Decision: PDR ACCEPTED (18/1/99)

Attachment B

Title: Loss of IDRP connection
PDR Reference: 99010005
Originator Reference:
SARPs Document Reference: ICS SARPs,Section 5.3.5.2.10 and 5.3.5.2.13
Status: ACCEPTED
Severity: C (Clarification)
PDR Revision Date: 16/3/99 (Submitted → Accepted)
PDR Submission Date: 16 January 1999
State/Organization: EUROCONTROL
Submitting Author Name: Jean-Pierre Briand
Submitting Author E-mail Address: jean-pierre.briand@eurocontrol.fr
Submitting Author Supplemental
Contact Information: EUROCONTROL Experimental Centre
                                                91222 Bretigny-sur-Orge France
                                                Tel: +33 1 69 88 7619
SARPs Date: ICAO Version 2.3
SARPs Language: English

Summary of Defect:
During pre-operational testing of ATN Routers the following situation was observed which points to a potential source of defect:

- An Airborne BIS and an Air-Ground BIS are connected, IDRP is established.
- For some reason out of IS-SME or Local Management scope (e.g. protocol error) the IDRP connection is terminated.
- Nothing else happens because: a) the mobile connection (X.25) is sane and no leave event occurred, b) there is no trigger to force either side to restart IDRP BIS-BIS connection.
- Consequence: The mobile connection is established for an indefinite time but no traffic can be routed over the link because no active IDRP connection is available between the pair of BISs.

The ICS SARPs do not define any requirement/recommendation to handle this case.

Assigned SME: Subvolume V SME (K.-P. Graf)

Discussion:
There are 2 possible approaches for resolving this problem:

1) On entering IDRP CLOSED state, all (still) open mobile X.25 connections supporting the adjacency are cleared, forcing IS-SMEs to start route initiation procedure from scratch.

2) On entering IDRP CLOSED state, if at least one mobile X.25 connection remains open, IS-SME re-attempts IDRP connection irrespective of which side first initiated the BIS-BIS connection. If this attempts fails, apply solution 1)

Solution 1) looks simpler to specify and implement but has the downside of terminating all mobile connections, which may involve several subnetworks.

Solution 2) requires specification of additional procedures leading to more complex implementations.

If the cause of the error is truly IDRP related, solution 2 appears more efficient since first reconnection attempt is likely to succeed. If both sides enter CLOSED state about the same time, both OPEN will also be sent about the same time, thus reducing the connection establishment time.

If the cause of the error is subnetwork related, solution 2 is likely to end up as solution 1 after *some* time. This is the worst case but may also be the likeliest.

Solution 2) suggests to send an OPEN irrespective of which side was the initiator to force the peer to respond in case IDRP states were out of sync. This happens for instance when one side detects hold time expired while the other does not.

SME Comment:
ATNP WG2 has reviewed the above problem at its 17th meeting (Honolulu). WG2 felt that the reported problem presents a SARPs defect to be resolved via the CCB process.
Concerning the technical solutions offered above in the discussion section, WG2 felt that the first approach is not a desirable solution and other alternative solutions should be investigated and pursued. SDM team members and other interested parties are invited to offer such alternative solutions for discussion on the atnp_wg2_sdm mailing list.

Proposed SARPs amendment:
To be provided

SME Recommendation to CCB:

CCB Decision: PDR ACCEPTED (16/3/99)

Attachment C

Title:	Echo NPDUs Supported by ISs
PDR Reference:	99050001
Originator Reference:	
SARPs Document Reference:	ICS SARPs, Section 5.6.4.13
Status:	RESOLVED
Severity:	C (Clarrification)
PDR Revision Date:	17/5/99 (Submitted → Accepted)
PDR Submission Date:	6 May 1999
Submitting State/Organisation:	DFS/Germany
Submitting Author Name:	Klaus-Peter Graf
Submitting Author E-mail Address	klaus.graf@unibw-muenchen.de
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Contact Information:	Fax: +49/89/680 735 13
SARPs Date:	ICAO Version 2.3
SARPs Language:	English

Summary of Defect:

In the context of resolving PDR 99030001 (Parameters setting in the CLNP Echo Response PDU) the following inconsistencies have been identified in Table 5.6.4.13 (Intermediate System - Supported NPDUs):

1) Whereas the support of the Echo Response (ERP) Function is mandatory for both ATN ESs and ISs, and the receipt of Echo Response PDUs is mandatory for both ATN ESs and ISs, only ATN ESs are required to transmit Echo Response PDUs, while the transmission of Echo Response PDUs is left optional for ATN ISs.

The optional support for the transmission of Echo Response (ERP) PDUs by ATN ISs may result in non-delivery of an Echo Response PDU to an ATN ESs which has generated the Echo Request (ERQ). This is considered to be a deficiency in the current standard.

2) Whereas the support of the Echo Request (ERQ) Function is optional for both ATN ESs and ISs, and the receipt of Echo Request PDUs is mandatory for both ATN ESs and ISs, only ATN ESs are required to transmit Echo Request PDUs, if they support the Echo Request (ERQ) Function, while the transmission of Echo Request (ERQ) PDUs is left optional for ATN IS.

For consistency reasons, an ATN IS should be required to transmit Echo Request (ERQ) PDUs, if it supports the Echo Request (ERQ) Function.

Assigned SME: Sub-Volume V SME (K.-P. Graf)

Proposed SARPs amendment:

In the ATN Support column of Table 5.6.4.13 change
1) the current entry from "O" to "iErsp:M" for the item "iERP-t"
2) the current entry from "O" to "iEreq:M" for the item "iERQ-t"

SME Recommendation to CCB:

CCB Decision: PDR ACCEPTED (17/5/99)
                      PDR RESOLVED (17/5/99)