ATNP/WG2-17
WP 500
18 January 1999

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

Working Group 2

17th Meeting

Honolulu, Hawaii, USA

19 - 22 January 1999

SME V (Internet Communications Service) Status Report

Information Paper

Presented by Thomas Schade
Prepared 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 5).

There are currently two accepted and one submitted PDRs concerning the ATN ICS SARPs waiting for final resolution. Draft SARPs amendment text has been prepared in response to the accepted PDRs and is currently under review by the WG 2 SDM team.

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 WG 2 members.

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 January 1999. Column 4 indicates the version of the ATN ICS SARPs in which the agreed technical solution of the resolved PDR has been included.

PDR Number	PDR Title	CCB Status	Resolved in
97060028	Transport Timers Configuration	RESOLVED	ICAO Version 2.2
97060029	Various Editorial Defects (1)	RESOLVED	ICAO Version 2.2
97060030	IDRP Timers	RESOLVED	ICAO Version 2.2
97100001	Incomplete specification for use of V.42bis by Mobile SNDCF	RESOLVED	ICAO Version 2.2
97100002	SNDCF Call Request/Confirm User Data Length Indicator	RESOLVED	ICAO Version 2.2
97100003	Various Editorial Defects (2)	RESOLVED	ICAO Version 2.2
97100048	LREF Directory Management	RESOLVED	ICAO Version 2.2
98040003	X.25 Address Extension Facility	RESOLVED	*)
98050001	IDRP Update Receive Process	RESOLVED	*)
98060003	Predicates in ISO/IEC 8473 APRL	RESOLVED	*)
98060004	Support of IDRP by Airborne Router implementing optional non-use of IDRP	RESOLVED	*)
98060005	Air/Ground Route Initiation APRL	RESOLVED	*)
98060006	Correlation of ATSC Class with A/G Subnetwork Type in Airborne Router	ACCEPTED	
98060007	Symmetry of Mobile SNDCF APRL and Route Initiation APRL	RESOLVED	*)
98060008	IDRP Traffic Typing	RESOLVED	*)
98080001	Segmentation of Error Report PDU	RESOLVED	*)
98090002	Incorrect term "24-bit ICAO Aircraft Identifier"	RESOLVED	*)
98090003	Downgrading of ATSC Class	RESOLVED	*)
98090004	Backbone Hides Optimal Route to Off-Backb. BISs	REJECTED	
98090010	Value of SNCR in X.25 Call Request Packets	RESOLVED	*)
98100002	Deflate Frame Checksum	RESOLVED	*)
98100003	End-of-Block Code in Deflate Data Block	RESOLVED	*)

98100004	Deletion of Trailing Zero-Octet	RESOLVED	*)
98100005	Deflate Backwards Window Size	RESOLVED	*)
98100007	Handoff Event	ACCEPTED	
99010001	Overspecification of Minimum SNSDU Size	SUBMITTED	

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

*): scheduled for Amendment 1 of ACAO Doc 9705 in November 1999

As illustrated in Table 1, a total of 26 PDRs have been raised against the ICS SARPs over the last 21 months. All these PDRs have been accepted by the ATNP CCB as potential defects and have been forwarded to the WG 2 SARPs Development Mechanism (SDM) for resolution.

2.1 Resolved PDRs

Twenty-two of these PDRs have been resolved by the WG 2 SARPs Development Mechanism (SDM) and the proposed technical solutions approved by the CCB.

Concerning seven of these twenty-two 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). This document currently contains the most mature and correct technical specification of the ATN Internet Communications Service.

The agreed technical solutions of the remaining sixteen resolved PDRs are scheduled for inclusion in Amendment 1 of ICAO Doc 9705-AN/956 which is expected for publication around November 1999.

2.2 Non-resolved PDRs

There are 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 98060006 and PDR 98100007.

For both PDRs a draft SARPs amendment text has been prepared as a result of the discussions at the last WG 2 meeting and is currently in the review phase by WG 2 SDM team members. An agreed resolution for these PDRs is expected to be available until the end of January 1999.

2.3 Editorial Corrections

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 meetings), and ICAO Doc 9705 (distributed at the Utrecht 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 sub-volumes, including sub-volume V. These are summarised in the following table:

PDR Number	PDR Title	CCB Status	Resolved in
97060001	Corrections to ICAO V2.0 produced by ICAO secretariat	RESOLVED	ICAO Version 2.1
97110001	Corrections to ICAO V2.1 produced by ICAO secretariat	RESOLVED	ICAO Version 2.2
98040005	Corrections to ICAO V2.2 produced by ICAO secretariat	RESOLVED	ICAO Doc 9705
98070003	ICAO 9705 – Engineering Version Discrepancies and Editorial Errors	RESOLVED	*)

Table 2: Status of PDRs Documenting Editorial Defects of Sub-Volume V

*): scheduled for Amendment 1 of ACAO Doc 9705 in November 1999

3 New PDRs

There is currently one new Submitted PDR against the ATN ICS SARPs (Subvolume 5) titled ”Overspecified SNSDU Requirement” (Attachment A).

Since the last WG 2 meeting, three potential problems have been reported informally. Two of these reported problems are not considered relevant for the ”Package-1 SARPs” and are consequently beyond the scope of the ATNP CCB process. The associated Email exchange is reproduced in an attachment to this report for information of WG 2 members (Attachment B). One further problem which deals with the Loss of IDRP connection with maintained mobile SNDCF connection is a candidate for a new PDR. A description of this problem is summarised in the Attachment C.

4 Recommendation

WG 2 members are invited to note the status information on the ICS SARPs provided above.

Attachment A

Title:	Overspecified SNSDU Requirement
PDR Reference:	99010001
Originator Reference:	
SARPs Document Reference:	ATN Technical Requirements, Section 5.2.5.1.6
Status:	SUBMITTED
PDR Revision Date:	
PDR Submission Date:	4/1/99
Submitting State/Organization:	U.S. Federal Aviation Administration
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 703 883-7919 FAX 703 883-1367
SARPs Date:	IV2.3 (Doc 9705 Ed1)
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:

Proposed SARPs Amendment:

Delete in their entirety sections 5.2.5.1.6 and 5.2.5.1.6.1.

SME Recommendation to CCB:

CCB Decision:

Attachment B

Subject: RE: Two more PDRs?
Date: Sat, 5 Dec 1998 14:29:45 -0000

Klaus,

I agree with your proposals. The main purpose of raising the PDRs is to make sure that these issues are not forgotten and are on the agenda for WG2.

Tony

On Friday, December 04, 1998 9:06 AM, Klaus-Peter Graf [SMTP:klaus.graf@unibw-muenchen.de] wrote:
>
> Tony,
>
> thank you for raising the issues and accept my appologies for the long
> delay in answering your email.
>
> Concerning the first issue, I agree that the CLNP Echo Request function
> should become mandatory if fault management becomes a feature of the ATN
> specification. This will probably be the case in "Package-2" and this
> will be the right point to change the current spec concerning the
> requirement w.r.t. the Echo Request function. The existing requirement
> on its own is not a defect in the current spec. What I could do,
> according to the current procedures, is to raise a PDR which would then
> be forwarded to WG2 to wait for "Package-2". The same is achieved
> without running through the CCB process, if the issue is directly raised
> in one of the next WG 2 meetings. I would prefer the second approach as
> it has less overhead.
>
> Concerning the second issue, I would have no problem to remove the
> existing requirement as it is an operational requirement and not a
> technical one. However, I am not clear about the justification for a
> PDR, as we cannot claim operational experience so far. Therefore, I
> would propose to discuss this issue in WG2 first to get potentially a
> mandate by the WG to raise a PDR, but I would not recommend to
> immediately raise a PDR based on the rationale presented below.
>
> Best Regards
> Klaus-Peter
>
> Tony Whyman wrote:
> >
> > Klaus,
> >
> > We have been reviewing the Convergent MIB, with particular emphasis on
> > fault management, at a meeting in Brussels the last two days. As a result,
> > there appear to be two more PDRs that will need to be raised.

> >
> > 1. The CLNP Echo Request function should be mandatory (it's currently
> > optional). This is because it is the basic fault diagnosis tool. PDU
> > discards indicate possible problems, which need to be investigated by
> > ping/traceroute and analysis of RIB information. It is important to be able
> > to launch a ping/traceroute from any point in the network and hence the
> > need for mandatory support of CLNP ECHO.
> >
> > 2. Route Initiation "Emergency Mode" should probably be removed. This
> > mechanism permits route initiation by an unrecognised aircraft if they
> > repeatedly try to log into an air/ground network. The proper response to
> > loss of ATN communications should always be a fall back to voice mode,
> > and this applies (perhaps even more so) to emergencies. Hence, the emergency
> > log in, which has attendant security risks is probably unnecessary and
> > should be deleted.
> >
> > Regards
> >
> > Tony

Attachment C

Date: Fri, 15 Jan 1999 14:42:33 +0100
From: Jean-Pierre Briand <bri@eurocontrol.fr>
To: atnp_wg2@cenatoulouse.dgac.fr
Cc: dferguson@atmdc.nats.co.uk, whyman@mwassocs.demon.co.uk
Subject: Candidate PDR: Loss of IDRP connection with maintained mobile SNDCF connection

Dear all,

we have come across the following situation 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) 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: mobile connection is established for an indefinite time but no traffic can be routed over the link.

SARPs do not define any requirement/recommendation to handle this case.
Questions:
- is this a SARPs issue? defect? clarification?
- or is this a Guidance issue?

Technical Discussion

There are 2 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)

Discussion:

- 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.

What are WG2/SME views on this?

Regards