AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

Working Group 2

17th Meeting

Honolulu, Hawaii, USA

19 - 22 January 1999

SME Inputs on PDR 98060006

Working Paper

Presented by Stephane Tamalet

Summary

This paper provides a proposed SARPs amendment for the Defect Report 98060006 and The associated Email exchange for information of WG 2 members.

------------------------------ Contenu du message ------------------------------
Dear Klaus Peter,

I have the following additional (minor) comments on PDR98060006:

1) Should not there be a slight modification in paragraph
5.3.5.2.12.3.2 a) and b) ?

for exemple to replace "determined from locally known information" by
"determined from the Mobile Subnetwork Capabilities Parameter, if any,
contained in the options part of the received ISH PDU, or from locally
known information if such a parameter is not present in the received
ISH PDU"

2) (I am not sure) It is proposed to modify the proposed new
paragraph 5.3.5.2.6.10 as follows:

5.3.5.2.6.10   If a Mobile Subnetwork Capabilities Parameter is
present in the options part of the received ISH PDU, the Airborne
Router shall use the subnetwork capability information, to update its
local configuration data concerning the permissible traffic type(s)
and the supported ATSC Class of the Mobile Subnetwork over which the
ISH PDU was received."

Best Regards,
Stephane

Dear Klaus-Peter,

Yes, we have problems with these additional changes.

The first problem is purely formal. We consider that changes A6) and
B5) are related to the VDL fringe coverage problem, which is a
different problem from the one raised in PDR98060006. We would then
prefer to consider these changes in the context of a new PDR (if
further investigations demonstrate that these changes are actually
required) as this was agreed at the Bordeaux WG2 meeting.

Note that, as far as change A6) is concerned, this is not the proposed
new text which is cumbersome for us, but the 'replace' action. The
replace action would remove the current paragraph 5.3.5.2.10.5 which

states:

"Furthermore, the Air/Ground Router shall readvertise all routes affected by the change in subnetwork connectivity ...."

The second problem is technical. It is apparently not so easy to modify our IDRP implementation, so that after invocation of the Routing Decision process, the advertisement of route over a mobile adjacency be disabled. The Routing decision process may be invoked for other reasons than the changes in subnetwork connectivity, and consequently the implementation will have to consider cases where routes needs to be advertised (e.g. ground link failures which isolate the A/G BIS from other ground RD) and other cases where routes will not need to be advertised (the mobile subnetwork connectivity changes). Also, blocking the advertisement of routes is a new ATN specific features (a new divergence from the IDRP standard), which will need to be implemented as additional specific lines of codes in the "standard" code. The implementors are worried about unforeseen possible "side effects" of these new line of codes on the behaviour of the router when it is used as G/G router.

The third problem is related to inter-operation issues raised by this modification: an A/G BIS cannot know whether an airborne BIS implements the PDR or not. We need to consider what are the effects of not re-advertising the routes when there is a change of subnetwork connectivity, if the airborne BIS does not implement the PDR and is therefore not able to decode the new ISH PDU parameters.

Note, finally that we are not totally opposed to the change. I have personally a lot of sympathy on the fact that we can reduce further the overhead of routing information exchange on the air-ground link. But we would prefer to consider these changes in the context of a new PDR, or as an "enhancement" to the SARPs.

Best Regards,
Stephane

Date: Fri, 15 Jan 1999 11:22:04 +0100
From: Klaus-Peter Graf <klaus.graf@unibw-muenchen.de>
To: TAMALET_Stephane@stna.dgac.fr
CC: CRENAIS_Jean-Michel@stna.dgac.fr,
    PAGES_Pierre-Henri_at_GWSMTP@gwsmtp.stna.dgac.fr,
    DFS_SET@compuserve.com
Subject: Re: P1DR 98060006 ANSWERED

Dear Stephane,

I haven't had the VDL fringe coverage problem in mind, when I was proposing the changes A6) and B5) in the proposed SARPs amendment of PDR 98060006. Tony has reviewed the proposed change text and agreed it, but he hasn't asked me to include anything related to the VDL fringe coverage problem.

My line of thinking for the change A6) was as follows:
As a result of the proposed changes A1) - A3) and B1) - B4), an airborne Router can now receive the ATSC class information associated with a given a/g subnetwork. According to change A4) the airborne router will use this information to update its local configuration data base. The PDR 98060006 however raised the problem that the airborne router does

not know which a/g subnetwork it should select when it has to downlink
an NPDU asking for a certain ATSC class. Therefore, it was my intention
in the change A6) to force the airborne router to update its FIB in
order to reflect the newly received information about the ATSC class
also in its routing table in order to be in the position to make the
correct (i.e. ATSC-class compliant) routing decision when an NPDU is to
be downlinked. That is the whole story behind this change and it was not
intended to be related to the VDL fringe coverage problem.

My line of thinking for the change B5) was as follows:
As a result of the proposed changes A1) - A6) and B1) - B4), an airborne
Router can now receive and use the ATSC Class and Permissible Traffic
Type information associated with a given a/g subnetwork. Therefore there
is no longer a need for the a/g Router to send the same information in
the Security Path Attribute to the airborne Router. It was my intention
to avoid this redundancy, when I was proposing the change B5). Again,
this is not related to the VDL fringe coverage problem.

In summary, you are right that WG2 agreed to implement the changes 1a,
1b, 2c and 2d outlined in WP 471. However, as explained above, when
preparing the proposed SARPs amendment I thought that additional changes
are required to resolve this PDR. Is there a problem with these
additional changes for you ?

Regards
Klaus-Peter

TAMALET Stephane wrote:
>
>   Dear Klaus-Peter,
>
>   I have reviewed the Proposed SARPs amendment of PDR98060006. You did a
>   very good job and I wanted to congratulate you for this work.
>
>   I have however a remark related to the proposed changes on SARPs
>   sections 5.3.5.2.10.5 (change number A6) and 5.8.3.2.4.1.1 (i.e.
>   change number B5).
>
>   In my opinion these 2 changes relate to the problem raised by Tony on
>   the subject of aircraft experiencing frequently changing subnetwork
>   connectivity (for instance when flying on the fringe of a VDL
>   coverage, with a satellite connection already established).
>
>   Related to this problem and the PDR98060006, Tony presented the WP471
>   at the Bordeaux meeting, including changes referenced 1a, 1b, 2c, 2d,
>   3 and 4.
>
>   The proposed changes 3, and 4 in the WP471 were those related to the
>   problem of aircraft with frequently changing subnetwork connectivity.
>
>   It was my understanding that we agreed in Bordeaux to inmplement only
>   the changes referenced 1a, 2c and 2d, for the resolution of
>   PDR98060006.In parallel Tony had an action (16/6) to investigate
>   further the problem of the retransmission of UPDATE PDU over the
>   air/ground link.
>
>   It appears that in your proposed changes for resolution of
>   PDR98060006, you eventually took into account the changes referenced 3
>   and 4 in the Tony's proposal (cf the changes A6 and B5 in the PDR).
>

Proposed SARPs Amendment in response to PDR 98060006
(Correlation of ATSC Class with a/g subnetwork type in Airborne Router)

The following text provides a proposed SARPs amendment for the Proposed Defect Report (PDR) 98060006 along the outline solution agreed by WG 2 during its Bordeaux meeting in October 1998 (action 16/8).

A)   In Chapter 5.3:

A1)   Add the following new note to paragraph 5.3.5.1:
"Note 6.— The ATSC Class assigned to an Air/Ground Subnetwork and the traffic type(s) allowed to pass over this Air/Ground Subnetwork are known a priori to the Air/Ground Router attached to each such subnetwork. They are communicated to an Airborne Router using the options part of an ISO/IEC 9542 ISH PDU which is uplinked to the Airborne Router as part of the route initiation procedure as described in 5.3.5.2."

A2)   Add the following new paragraph 5.3.5.2.6.5:
"5.3.5.2.6.5   An ATN Air/Ground Router shall include the Mobile Subnetwork Capabilities Parameter, as defined in 5.8.2.1.3, in the options part of the uplinked ISH PDU. The Mobile Subnetwork Capabilities Parameter shall indicate any restrictions on traffic types permitted to pass over the Mobile Subnetwork and the ATSC Class of the Mobile Subnetwork, if the ATN Operational Communications traffic type – Air Traffic Service Communications traffic category is among the permissible traffic types for this Mobile Subnetwork.

Note 1.— The ATSC Class assigned to a Mobile Subnetwork and the traffic type(s) allowed to pass over this Mobile Subnetwork are uplinked to the Airborne Router to enable this router to make the appropriate routing decision when downlinking packets over an air/ground adjacency which is made up of more than one Mobile Subnetwork.

Note 2.— The ISH PDU is only ever sent in the context of a single Mobile Subnetwork between the Air/Ground and Airborne Router. Thus the capability information carried in the Mobile Subnetwork Capabilities Parameter is unambiguously associated with this subnetwork."

A3)   Renumber the existing paragraphs 5.3.5.2.6.5 through 5.3.5.2.6.7 to become paragraphs 5.3.5.2.6.6 through 5.3.5.2.6.8.

A4)   Add the following new paragraphs 5.3.5.2.6.9 and 5.3.5.2.6.10:
"5.3.5.2.6.9   Whenever an ISO/IEC 9542 ISH PDU is received by an Airborne Router, this router shall evaluate the Mobile Subnetwork Capabilities Parameter contained in the options part of the received ISH PDU.

5.3.5.2.6.10   The Airborne Router shall use the received subnetwork capability information to update its local configuration data concerning the permissible traffic type(s) and the supported ATSC Class of the Mobile Subnetwork over which the ISH PDU was received."

A5)   Renumber the existing paragraph 5.3.5.2.6.8 to become paragraph 5.3.5.2.6.11.

A6)   Replace the existing text of the paragraph 5.3.5.2.10.5 by the following new text:
"5.3.5.2.10.5 If a BIS-BIS connection was already established with the remote ATN Air/Ground Router, then the IS-SME of the Airborne Router shall cause the IDRP Routing Decision Function to be invoked in order to rebuild the FIB, the Loc_RIB and relevant Adj-RIB-Out(s) taking into account the additional subnetwork connectivity."

B)   In Chapter 5.8:

B1)   Add the following new section 5.8.2.1.3:
"5.8.2.1.3   The Mobile Subnetwork Capabilities Parameter

5.8.2.1.3.1   ATN Air/Ground and Airborne Routers shall support the Mobile Subnetwork Capabilities Parameter in the options part of an ISO/IEC 9542 ISH PDU.

5.8.2.1.3.2   The Mobile Subnetwork Capabilities Parameter shall be used in the ATN to convey information about the ATSC Class and the traffic type(s) supported by an ATN Mobile Subnetwork.

5.8.2.1.3.3   The Mobile Subnetwork Capabilities Parameter shall consist of three fields, as illustrated in Figure 5.8-1, and shall not occur more than once in the options part of an ISO/IEC 9542 ISH PDU.

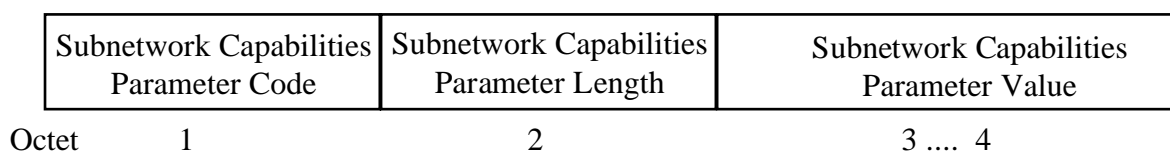| Subnetwork Capabilities Parameter Code	Subnetwork Capabilities Parameter Length	Subnetwork Capabilities Parameter Value
Octet 1	2	3 4

Figure 5.8-1: The Mobile Subnetwork Capabilities Parameter

5.8.2.1.3.4   Encoding of the Mobile Subnetwork Capabilities Parameter

5.8.2.1.3.4.1   The Mobile Subnetwork Capabilities Parameter code field shall be one octet in length and shall always be encoded as binary [1000 0001] to indicate the Mobile Subnetwork Capabilities Parameter.

Note.— The above parameter code and its associated semantics are defined by this specification for the ATN in addition to the parameter codes specified by ISO/IEC 9542. ISO/IEC 9542 only uses eight bit parameter codes with bits 8 and 7 set to one and has reserved a parameter code of 255 for possible future extensions. The future use of the above ATN parameter code by an ISO standard cannot be ruled out but is highly unlikely.

5.8.2.1.3.4.2   The Mobile Subnetwork Capabilities Parameter length field shall be one octet long and shall define the length in octets of the Mobile Subnetwork Capabilities Parameter value field.

5.8.2.1.3.4.3   Mobile Subnetwork Capabilities Parameter Value Field

5.8.2.1.3.4.3.1 The first octet of this field shall indicate the traffic type(s) allowed to pass over the Air/Ground Subnetwork over which the ISO/IEC 9542 ISH PDU is exchanged.

5.8.2.1.3.4.3.2 This octet shall comprise a bit map, where each bit corresponds to a different traffic type.

5.8.2.1.3.4.3.3 The assignment of bits to traffic types shall be according to Table 5.8-4, where bit 0 is the low order bit.

5.8.2.1.3.4.3.4 Setting a bit to one shall indicate that the corresponding traffic type is allowed to pass over the air/ground subnetwork.

5.8.2.1.3.4.3.5 The semantics of bits 5 to 7 shall be reserved for future use and shall always be set to one.

Note 1.— A value of FFh is used to imply no restrictions.

Note 2.— The first octet of the Mobile Subnetwork Capabilities Parameter Value field has the same encoding and semantics as the second octet of the Air/Ground Subnetwork Type Security Tag Set of the IDRP Security Path Attribute which is defined in 5.8.3.2.3.2.3.

5.8.2.1.3.4.3.5 If bit 0 of the first octet of the Mobile Subnetwork Capabilities Parameter Value field is set to one, then this field shall contain a second octet which defines the ATSC Class supported by that Air/Ground Subnetwork.

Note.— Bit 0 of the first octet set to one indicates that the Air/Ground Subnetwork is available to the ATN Operational Communications traffic type – Air Traffic Service Communications traffic category.

5.8.2.1.3.4.3.6 If present, the second octet of the Mobile Subnetwork Capabilities Parameter Value field shall be encoded according to Table 5.8-1.

Table 5.8-1: Encoding of Supported ATSC Class

Value	ATSC Class
0000 0001	A
0000 0010	B
0000 0100	C
0000 1000	D
0001 0000	E
0010 0000	F
0100 0000	G
1000 0000	H

Note.— ATSC Class "H" is the lowest and Class "A" is the highest class.

B2)   Renumber the existing paragraph 5.8.2.1.3 to become paragraph 5.8.2.1.4.

B3)   In the existing Table 5.8-1 add a new line following the "SNMk-s" line with the following entries:
Item = MSNC-s
Protocol Function = <s> Mobile Subnetwork Capabilities
Clauses = ATN SARPs Ref: 5.8.2.1.3, 5.3.5.2.6.5
ISO Status = --
ATN Support = ISH-s: M

B4)   In the existing Table 5.8-1 add another new line following the above new line with the following entries:
Item = MSNC-r
Protocol Function = <r> Mobile Subnetwork Capabilities
Clauses = ATN SARPs Ref: 5.8.2.1.3, 5.3.5.2.6.9
ISO Status = --
ATN Support = ISH-r: M

B5)   In the existing paragraph 5.8.3.2.4.1.1 bullet a) delete "either advertised or"

B6)   Renumber the Tables 5.8-1 through 5.8-7 to become Tables 5.8-2 through 5.8-8.

B7)   In the existing paragraph 5.8.2.2.1 replace "Table 5.8-1" by "Table 5.8-2".

B8)   In the existing paragraph 5.8.3.2.3.2.2 replace "Table 5.8-2" by "Table 5.8-3".

B9)   In the existing paragraph 5.8.3.2.3.2.5 replace "Table 5.8-3" by "Table 5.8-4".

B10)   In the existing paragraph 5.8.3.2.3.3.6 replace "Table 5.8-4" by "Table 5.8-5".

B11)   In the existing paragraph 5.8.3.2.8.1 replace "Table 5.8-5" by "Table 5.8-6".

B12)   In the existing paragraph 5.8.3.3.2.1.1 replace "Table 5.8-6" by "Table 5.8-7".