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for change identified) + INCORPORATION OF TLS WG2
COMMENTS (ATN Status 'P' removed, Ken comment)**

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

WORKING GROUP 2

Toulouse, France 13-17 March 1995

**Defect Report and Change Proposal Material
related to ES-IS requirements**

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SUMMARY

This paper provides a consolidation of Defect Reports related to ES-IS SARPs and proposes associated Change Proposal material. This work was assigned as WG2 Action 2/32. If DR material is accepted, it will replace or supersede the following DRs: 95010012, 95010013, 95010033, 95010034, 95010036, 95010037.

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1. Introduction

Six different defect reports have been submitted that refer to section A11.1 on ES-IS. Discussions at CCB/1 and WG2/2 meetings showed that a further progression of these defects would require consolidation before an actual change proposal could be drafted.

The following DR material is intended to be ready for submission as a new DR. If this DR is accepted, it is proposed that the initial DRs be withdrawn, since this new DR replaces them. This will also simplify the progression of the associated CP.

2. Defect Report Material

2.1 Background

The defect reports related to ES-IS were submitted independently and were all accepted. Two of these had also associated change proposals which were rejected. Rejection was justified by the fact that correcting any of these defects would necessarily impact the others and that proposed changes were not sufficiently detailed.

Furthermore the issue of having SARPs for ES-IS at the intra-domain level was discussed at the WG2/2 meeting. The conclusion of the discussion was as follows:

- a) only the use of ES-IS on air-ground links (i.e. inter-domain scope) would be subject to detailed SARPs with PRL tables. This decision is expected to lead to important simplifications of the APRL status column values.
- b) use of ES-IS for intra-domain would be either guidance or recommended practices; exact status was to be determined with ICAO secretariat (action 2/33).
- c) as result of action 2/33 [e-mail, atn-internet-technical, 7/2/95], ES-IS operation for intra-domain routing exchange will be considered as recommended practices. Based on WG2/2 agreement, the SARPs will therefore recommend the use of ES-IS protocol in intra-domain routing exchange between ES's and IS's. No further detailed recommendations will be made on how to operate the protocol since this does not impact on the inter-domain routing exchange on the ground.

2.1 Overview of initial defects

- 95010012.DR This DR identifies overspecifications in the use of ISO 9542 Configuration and Route Redirection options in the context of ground subnetworks. Based on agreed decision stated in point c) above, these statements will now be deleted. Choice of options will be left to implementors.
- 95010013.DR As the previous DR, this DR identifies an overspecification in the use of ISO 9542 Configuration and Route Redirection options in the context of ground subnetworks. Based on agreed decision stated in point c) above, these statements will now be deleted. Choice of options will be left to implementors.
- 95010033.DR This DR identifies an improper use of predicates in ISO 9542 End System APRL. As stated in point a) above, the PRLs will address air-ground subnetworks only. This PRL will contain IS tables only, therefore this DR will be superseded.
- 95010034.DR This DR identifies a footnote error in ISO 9542 End System APRL. As stated in point a) above, the PRLs will address air-ground subnetworks

only. This PRL will contain IS tables only, therefore this DR will be superseded.

95010036.DR This DR identifies an incorrect predicate specification in ISO 9542 APRL. The problem is linked to the fact that tables currently apply to all types of subnetworks. As stated in point a) above, the PRLs will address air-ground subnetworks only. For this reason, conditional statuses are no longer required to differentiate between subnetworks in the PRL. This DR will be superseded.

95010037.DR This DR identifies incorrect use of predicates in ISO 9542 APRL. The problem is linked to the fact that tables currently apply to all types of subnetworks. As stated in point a) above, the PRLs will address air-ground subnetworks only. For this reason, conditional statuses are no longer required to differentiate between subnetworks in the PRL. This DR will be superseded.

2.2 Consolidated defect

ATN Draft SARPs Version: 1.0

Category: MAJOR

SARPs/GM Document Reference: A11.1.2, A11.1.3

Summary of Defect:

Section A11.1 is devoted to the use of ISO 9542 protocol. This protocol has two different roles in the ATN: 1) as the recommended ES to IS routing exchange protocol to be used in intra-domain operation, and 2) as the mandatory IS to IS discovery mechanism to be used in route initiation over mobile subnetworks.

In role 1, being an intra-domain matter, the SARPs should not go further than a statement of recommendation. If supported, the choice of specific ISO 9542 options is really a matter of implementation since this will not impact the inter-domain dialogue. Furthermore, consistent profiling within a domain is more important for interworking than any specific choice of options.

In role 2, the protocol is used only in a very limited way. It only involves IS's, and does not require the support of Route Redirection Information.

Section A11.1.2.2 contains material that overspecifies ISO 9542 use on ground subnetworks. All this material should be replaced by a note stating that no further requirements are made.

Section A11.1.3 is at present a merge of all uses of ISO 9542 by means of predicated status values. Based on WG2 decision, this section should be restricted to the specification of ISO 9542 use over mobile subnetworks. This should clearly appear in the title as well as in the APRL status columns. As a consequence, section A11.1.4.1 (in principle A11.1.3.1) should be deleted as there is no ATN recommendation attached to ESIS operation over the air-ground link. Section A11.1.4.2 (in principle A11.1.3.2) should be replaced by a note saying that no ES's are intended to use this protocol over these subnetworks.

Status column in APRL tables should be simplified to take into account the choice made for CI and RI options over mobile subnetworks. In particular "CI:<status>" should be replaced by "<status>" and "RI:<status>" should be replaced by "—".

Detailed list of defects:

- A11.1.2.2 the body of the section should not constraint intra-domain implementations. It should be replaced by a note.
- A11.1.2.3 this section should be restricted to mobile subnetworks. In doing so, the resulting requirement would be redundant with APRLs. Therefore this subsection should be deleted.
- A11.1.3 the section should be restricted to mobile air-to-ground subnetworks in title and in first paragraph.
- A11.1.3 the subsections in A11.1.3 are erroneously numbered A11.1.4.n. They should be renumbered A11.1.3.n
- A11.1.4.1 this section is now irrelevant due to new scope of A11.1.3
- A11.1.4.2 this section describes ES operation although there is no ES foreseen on air-ground link. This section should be deleted or replaced by a note.
- A11.1.4.3 first para should be restricted to mobile subnetworks operation.
- A11.1.4.3, CI status is "M"
- A11.1.4.3, RI status is "X"
- A11.1.4.3 remaining statuses should be evaluated according to CI and RI statuses
- A11.1.4.3 references to ATN Manual sections should be revisited according to proposed changes.
- A11.1.4.3 ISH-<r> should be mandatory if two IS's are supposed to discover each other over an air-ground link

Conclusion:

The scope of the defect presented here has already been agreed by WG2 (see WG2/2 Report, section 6, item c). This defect report provides the detailed list of changes that result from this agreement. In performing this consolidation, all existing DRs pertaining to the same sections have been considered.

If this DR is accepted by the CCB, it is proposed that the CCB recommended action be that the following DR's are changed to status "WITHDRAWN" with the comment that they are "either replaced or superseded by DR nnn" (i.e. this new DR):

95010012.DR
95010013.DR
95010033.DR
95010034.DR
95010036.DR
95010037.DR

3. Change Proposal Material

Changes are presented below as excerpts of Draft SARPs and Guidance Material text, modified using change bars.

A11.1 End System to Intermediate System (ES-IS) Routing Protocol

Within the ATN, a means shall be provided to allow each ES or IS to discover the existence of neighbor systems attached to the same subnetwork. Furthermore, the NSAP addresses of neighbor ESs and the NET addresses of neighbor ISs, along with the corresponding SNPA addresses, shall be made available to each IS directly connected to the local subnetwork. In addition, a means shall be provided to allow each IS to dynamically monitor connectivity changes on the subnetwork.

A11.1.1 Use of ISO 9542 in the ATN

The ISO 9542 End-System to Intermediate-System Routing Information Exchange Protocol (ES-IS) shall be operated over air-ground subnetworks for initialization of air-ground IDRP connection.

Recommendation.— *ISO 9542 should be used over ATN fixed ground subnetworks requiring dynamic discovery of ESs and/or ISs.*

Note.— *ISO/IEC 10589 requires the use of ISO 9542.*

A11.1.2 Selection of ISO 9542 Options

A11.1.2.1 ISO 9542 over mobile air-to-ground subnetworks

Airborne and ground ISs directly connected to a mobile subnetwork (Mode S, AMSS or VDL) shall operate ISO 9542 over each such mobile subnetwork.

Configuration Information shall be exchanged by both ground and airborne ISs connected to a mobile subnetwork.

Note.— *The use of ISO 9542 Configuration Information over mobile subnetworks is specified in Appendix 6.*

A11.1.2.2 ISO 9542 over fixed ground subnetworks

Note.— *No further requirements are specified for ATN Systems that operate ISO 9542 over fixed ground subnetworks.*

~~A11.1.2.2.1 Broadcast subnetworks~~

Recommendation.— *Ground ISs and ESs attached to a fixed ground broadcast subnetwork should operate ISO 9542.*

~~In cases where ISO 9542 is operated, both Configuration Information, Route Redirection Information shall be exchanged.~~

~~A11.1.2.2.2 General Topology Subnetworks~~

Recommendation.— *Ground ISs and ESs attached to a fixed ground general topology subnetwork should operate ISO 9542.*

~~In cases where ISO 9542 is operated, Route Redirection Information shall be supported and used. Configuration Information shall not be used.~~

~~When ISO 9542 is operated over a general topology subnetwork used as a point to point link between ISs and/or ESs, both Configuration Information and Route Redirection Information shall be supported and used.~~

~~A11.1.2.2.3 Point to Point Subnetwork~~

~~**Recommendation.**— Ground ISs and ESs attached to a fixed ground point to point subnetwork should operate ISO 9542.~~

~~In cases where ISO 9542 is operated, both Configuration Information and Route Redirection Information shall be supported and used.~~

~~A11.1.2.3 Selection of ISO 9542 Functions~~

~~Airborne and ground ESs and ISs which support ISO 9542 Configuration Information shall implement the Configuration Notification function.~~

A11.1.3 ATN Protocol Requirements List - ISO 9542 over mobile air-to-ground subnetworks

~~When ISO 9542 is supported, then the protocol implementation of ISO 9542 over mobile air-to-ground subnetworks shall conform to the following APRL.~~

~~Note.— The requirements for ISO 9542 are provided in the form of a Protocol Requirements List.~~

A11.1.4.1 Support of ATN Specific Recommendations

~~Note.— The ATN recommendations for use of optional ISO functionality are presented below. If a recommendation is accepted, the index predicate indicates the specific features required to support the recommendation.~~

~~Does the implementation support the following ATN specific features:~~

Index	Recommendation	ATN Status	Support
ESISB	Does the ES implement ISO 9542 over broadcast subnetworks?	Ø	Yes No
ESISG	Does the ES implement ISO 9542 over general topology subnetworks?	Ø	Yes No
ESISP	Does the ES implement ISO 9542 over point to point subnetworks?	Ø	Yes No

~~ESISB:: Note.— This option is recommended in A11.1.2.2.1~~

~~ESISG:: Note.— This option is recommended in A11.1.2.2.2~~

~~ESISP:: Note.— This option is recommended in A11.1.2.2.3~~

A.11.1.34.12 ISO 9542 - End System

Note.— End Systems are not foreseen over mobile air-to-ground subnetworks. .

When ISO 9542 is supported, then the protocol implementation shall conform to the following APRLs.

Item	Protocol Function	Clauses	Status	ATN Requirement
CI	Is configuration information supported?	ATN Manual Ref.: A11.1.2.2	Ø	ESISB:M ESISG:X ESISP:M
RI	Is redirection information supported ?	ATN Manual Ref.: A11.1.2.2	Ø	ESISB:M ESISG:M ESISP:M
	Are the following functions supported ?			
CfRs	Configuration Response	6.6	M	M
ErrP	Protocol Error Processing	6.13	(CIvRI):M	(CI):M
HCsV	PDU Header Checksum Validation	6.12	(CIvRI):M	(CI):M
HCsG	PDU Header Checksum Generation	6.12	Ø	Ø
RpCf	Report Configuration	6.2, 6.2.1	CI:M	CI:M
ReCf	Record Configuration	6.3, 6.3.2	CI:M	CI:M
FlCf	Flush Old Configuration	6.4	CI:M	CI:M
QyCf	Query Configuration	6.5	CI:M	CI:M
ReRd	Record Redirect	6.9	RI:M	M
FlRd	Flush Old Redirect	6.11	RI:M	M
RfRd	Refresh Redirect	6.10	RI:Ø	Ø

CfNt	Configuration Notification	6.7 ATN Manual Ref.: A11.1.2.3	CI:O	CI:M	
CTPr	ESCT Processing	6.3.2	CI:O	CI:O	
AMPf	Address Mask (only) Processing	7.4.5	RI:O	Ø	
SMPf	Address Mask and SNPA Mask Processing	7.4.5, 7.4.6	RI:O	Ø	

Item	Protocol Function	Clauses	Status	ATN Requirement	
	Are the following PDUs supported ?				
ESH-s	<s> End System Hello	7.1,7.5	M	M	
ESH-r	<r> End System Hello	7.1,7.5	CI:M	CI:M	
ISH-r	<r> Intermediate System Hello	7.1,7.6	CI:M	CI:M	
RD-r	<r> Redirect	7.1,7.7	RI:M	RI:M	
Item	Protocol Function	Clauses	Status	ATN Requirement	
	Are the following PDU fields supported?				
FxPt	<s> Fixed Part	7.2.1-7.2.7	M	M	
FxPt	<r> Fixed Part	7.2.1-7.2.7	(CIvRI):M	(CI):M	

SA-sl	<s> Source Address, one NSAP only	7.3.1	O:1	O:1	
SA-rl	<r> Source Address, one NSAP only	7.3.2	CI:M	CI:M	
SA-sm	<s> Source Address, two or more NSAPs	7.3.3	O:1	O:1	
SA-rm	<r> Source Address, two or more NSAPs		CI:M	CI:M	
NET-r	<r> Network Entity Title	7.3.1/2/4	(CIvRI):M	(CI):M	
DA-r	<r> Destination Address	7.3.1/2/5	RI:M	M	
BSNPA-r	<r> Subnetwork Address	7.3.1/2/6	RI:M	M	
Sety-s	<s> Security	7.4.2	O	O	
Sety-r	<r> Security	7.4.2	O	O	
Pty-s	<s> Priority	7.4.3	O	O	
Pty-r	<r> Priority	7.4.3	O	O	
QosM-r	<r> QOS Maintenance	7.4.4	RI:O	O	
AdMk-r	<r> Address Mask	7.4.5	RI:O	O	
SNMk-r	<r> SNPA mask	7.4.6	RI:O	O	
ESCT-r	<r> Suggested ES Configuration Timer	7.4.7	CI:O	CI:O	
OOpt-r	<r> (ignore) unsupported or unknown options	7.4.1	M	M	
OOpt-s	<s> Other options		P	P	
	Parameter Ranges				
HTv	What range of values can be set for the holding time field in transmitted PDUs ?	6.1, 6.1.2	M	M	

CTv	If configuration information is supported, what range of information can be set for the Configuration Timer ?	6.1, 6.1.1	CI:M	CI:M	
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0.1: Delete if inapplicable

A11.1.34.23 ISO 9542 - Intermediate System

When ISO 9542 is supported, then ~~the~~ protocol implementation of ISO 9542 over mobile air-to-ground subnetworks shall conform to the following APRL.

Item	Protocol Function	Clauses	Status	ATN Requirement
CI	Is configuration information supported over the associated subnetwork?	ATN Manual Ref.: A11.1.2.1; A11.1.2.2	O	M (ESISP):M (ESISM):M (ESISG):M (ESISB):M
RI	Is redirection information supported over the associated subnetwork?	ATN Manual Ref.: A11.1.2.2	O	X (ESISM):X (ESISG):M (ESISB):M (ESISP):M
	Are the following functions supported ?			
ErrP	Protocol Error Processing	6.13	M	M
HCsV	PDU Header Checksum Validation	6.12	M	M
HCsG	PDU Header Checksum Generation	6.12	O	O
RpCf	Report Configuration	6.2,6.2.2	CI:M	CI:M
RcCf	Record Configuration	6.3,6.3.1	CI:M	CI:M
FlCf	Flush Old Configuration	6.4	CI:M	CI:M
RqRd	Request Redirect	6.8	RI:M	RI:M

CfNt	Configuration Notification	6.7 ATN Manual Ref.: A11.1.2.3	CI:O	CF:M	
CTGn	ESCT Generation	6.3.2	CI:O	CF:O	
AMGn	Address Mask (only) generation	6.8	RI:O	RI:O	
SMGn	Address mask and SNPA Mask generation	6.8	RI:O	RI:O	
	Are the following PDUs Supported ?				
ESH-r	<r> End System Hello	7.1,7.5	CI:M	CF:M	
ISH-<r>	<r> Intermediate System Hello	7.1,7.6	CI:O	MCI:O	
ISH-<s>	<s> Intermediate System Hello	7.1,7.6	CI:M	CF:M	
RD-s	<s> Redirect	7.1,7.7	RI:M	RI:M	
RD-r	<r> (ignore) Redirect	6.9,7.1,7.7	M	M	
	Are the following PDU fields supported ?				
FxPt	<s> Fixed Part	7.2.1-7.2.7	M	M	
	<r> Fixed Part	7.2.1-7.2.7	M	M	
SA-r	<r> Source Address, one or more NSAPs	7.3.1/2/3	CI:M	CF:M	
NET-s	<s> Network Entity Title	7.3.1/2/4	M	M	
NET-r	<r> Network Entity Title	7.3.1/2/4	ISH-r:M	ISH-r:M	
DA-s	<s> Destination Address	7.3.1/2/5	RI:M	RI:M	
BSNPA-s	<s> Subnetwork Address	7.3.1/2/6	RI:M	RI:M	
Scty-s	<s> Security	7.4.2	O	O	
Scty-r	<r> Security	7.4.2	O	O	
Pty-s	<s> Priority	7.4.3	O	O	
Pty-r	<r> Priority	7.4.3	O	O	
QoSM-s	<s> QOS Maintenance	7.4.4	RI:O	RI:O	

AdMk-s	<s> Address Mask	7.4.5	RI:O	RI:O
SNMk-s	<s> SNPA Mask	7.4.6	RI:O	RI:O
ESCT-s	<s> Suggested ES Configuration Timer	7.4.7	CI:O	CI:O
ESCT-r	<r> (ignore) Suggested ES Configuration Timer	7.4.7	ISH-r:M	ISH-r:M
OOpt-r	<r> (ignore) unsupported or unknown options	7.4.1	M	M
OOpt-s	<s> Other options		P	XP
	Parameter Ranges			
HTv	What range of values can be set for the Holding Time Field in transmitted PDUs ?		M	M
CTv	If configuration information is supported, what range of values can be set for the Configuration Timer ?		CI:M	CI:M

4. Recommendation

It is recommended that:

- WG2 reviews and discusses the defect report and change proposal material presented in sections 2 and 3, and makes a decision as to their correctness and appropriateness, and
- formal defect report is submitted as a result of the WG2 review.