ATNP/2-WP/ __
11/4/96

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL
SECOND MEETING

Montreal 4th - 15th November 1996

Agenda Item 3: Development of the CNS/ATM-1 Package (SARPs and Guidance Material)

Internet Communications Service Draft SARPs

(Presented by ATNP WG2 Rapporteur)

WORKING PAPER

SUMMARY

This paper briefly outlines the development of Internet Communications Service draft SARPs since ATNP/1. The work was based on the proposed Second Edition of the ATN Manual as presented at ATNP/1. It recommends that the attached material be included in the SARPs being developed by the ATNP.

REFERENCES

1. Introduction

1.1 This Working Paper introduces the draft SARPs (Appendix A) for the Internet Communications Service. This includes a high level description of the SARPs structure, a functional description of the SARPs and an indication of the System Level Requirements contributed to by the detailed requirements in the Internet Communications Service draft SARPs.

2. Background

2.1 At ATNP/1 WG2 was tasked with the development of draft SARPs and guidance material for the "CNS/ATM-1" Package based upon its terms of reference as reproduced below:

7.3.3 ***ATN Internet Working Group***

7.3.3.1 *The ATN Internet Working Group (WG/2) would conduct the following activities, in a manner consistent with the working strategy defined above:*

a) *development of draft SARPs and guidance material for the ATN Internet (i.e. the network and transport layers of the ATN) to support both fixed and mobile aeronautical data communications;*

b) *development of draft SARPs and guidance material for the ATN Internet management features, including the definition of lower layers (up through transport) managed objects (already contained in the ATN Manual), within the framework of the systems management concepts defined by the Working Group 1;*

c) *development of draft SARPs and guidance material for the ATN Internet security features within the framework of the security concepts defined by the Working Group 1;*

d) *over-all assessment of the on-going activities supporting the validation of the ATN Manual, second edition (i.e. ATN Internet draft SARPs); and*

e) *development and validation of draft SARPs for encoding rules and data compression functions, where appropriate.*

2.2 Since ATNP/1 the WG has focused efforts on:

- item a) above (*i.e. "draft SARPs and guidance material for the ATN Internet ..."*) and
- item d) (i.e. *"overall-assessment of the on-going activities supporting the validation of the .. ...."*).

2.3 The development of draft SARPs and guidance material for the ATN Internet, i.e. the Internet Communications Service draft SARPs, has been based upon the proposed Second Edition of the ATN Manual as presented at ATNP/1 as a Working Paper. Section 3 of this paper provides an overview of these SARPs in terms of structure and high level content. The draft SARPs themselves are at Appendix A to this paper. It should be noted that, since the submission of the draft SARPs material to ICAO a number of proposed amendments have been proposed by Working Group 2 and are attached to a working paper presented to ATNP/2 as a SARPs defect report.

2.4 The WG has devoted considerable efforts to the co-ordination of the global validation of the draft SARPs and this is reported in the Appendix to the Validation working paper.

2.5 Based upon guidance provided by Working Group 1 for the "CNS/ATM-1" Package the WG has not specifically developed draft SARPs related to:

- item b) (i.e. " the development of SARPs and guidance material for the ATN internet Management features") and
- item c) (i.e. "*development of draft SARPs and guidance material for the ATN Internet Security features ….*").

2.6 The Working Group has recommended that the development of material related to the above be considered as a part of the Working Groups future work programme as proposed in the ATNP/2 WP on the future work programme.

3. Discussion

3.1 As indicated above, the Internet Communications Service draft SARPs have been based on the proposed Second Edition of the ATN Manual. To support the evolution of that document in a structured and manageable way Working Group 2 established a sub-group referred to as the "Change Control Board" (CCB). The CCB comprised membership of at least one technical expert from most delegations and was responsible for reviewing proposed change requests, identified defects, their proposed resolutions and making appropriate recommendations to Working Group 2. Extensive use was made of the commercial internet to expedite the resolution of identified proposed change requests, identified defects etc. which was an totally open system providing interested members of the aeronautical industry with full visibility of all activity. It has been recommended, in the ATNP/2-WP entitled "Proposed Amendments to Internet Communications Service Draft SARPs", that the CCB continue to operate after ATNP/2 under the appropriate Working Group. In order to facilitate configuration control the Working Group adopted a numbering system for each version of the draft SARPs e.g. Version 0.0 was the first version shortly agreed after ATNP/1 and Version 6.0 was the final text submitted to ICAO for language translation. In between these two initial and final versions of the draft SARPs the WG had agreed Versions 1,2,3,4 & 5. All changes introduced in each sucessive version has been recorded and an audit trail back to the Second Edition of the ATN Manual can be readily followed.

3.2 The proposed Second Edition of the ATN Manual was structured into "Chapters" and "Appendices" with the former containing guidance material and the latter draft SARPs type material. In its development of the draft SARPs the working group agreed to relocate all Chapters (i.e. guidance) into a separate guidance material document. All appendices were collated and comprised the first set of draft SARPs for the Internet Communications Service, i.e. Version 2.0.

3.3 The Internet Communications Service is defined in terms of ISO\OSI Transport and Network Layer requirements on End Systems (i.e. Host Computer Systems such as a Flight Data Processing System) and Intermediate Systems (i.e. Routers) as applicable. The requirements facilitate the provision of an end-to-end communications service to the "User", i.e. the Upper Layer Communications Service as introduced in ATNP/2-WP for Sub-Volume 4. In addition, the requirements facilitate the integration of ICAO defined air/ground (i.e. AMSS, VDL, Mode S) and ground/ground (e.g. CIDIN) subnetworks as well as commercially provided ground/ground networks e.g. PTT X.25 services.

3.4 The draft SARPs are structured as follows:

•5.1 contains introductory material to the remainder of the "Appendix" to the Chapter 3 proposed high level SARPS as introduced in the ATNP/2-WP for Sub-Volume 1.

•5.2 contains pertinent definitions of the Internet Communications Service Routing Architecture and its components, i.e. End Systems and Intermediate Systems. In addition, this section contains material related to the use of priority and the Quality of Management and Security concepts which have the requirements for which have been detailed in subsequent sections of the document.

•5.3 defines the detailed provisions related to the deployment of ATN components within an overall Routing Architecture. It also highlights the use of routing information, the definition of routing policies, and the procedures for initiating the exchange of routing information between air/ground and ground/ground Intermediate Systems and between ground/ground Intermediate Systems.

•5.4 contains provisions related to the Internet Communications Service (network and transport layer) addressing architecture and definition of responsibilities related to the allocation of address fields.

•5.5 contains End System provisions applicable to the ISO/OSI Transport Layer service interface and its associated communications protocols, these being the connection oriented (class 4) and the connectionless protocols.

•5.6 contains End System and Intermediate system provisions applicable ISO/OSI Network Layer service and its associated communications protocol, this being the connectionless Network Protocol (CLNP).

•5.7 contains Intermediate System provisions applicable to the ISO/OSI Network sub-layer (i.e. the Subnetwork Dependent Convergence layer) necessary to facilitate the inetegration of air/ground and ground/ground subnetworks into the overall internet architecture. In addition provisions are defined to support the efficient use of the bandwidth limited air/ground subnetworks through definition of appropriate compression techniques.

•5.8 contains End System and Intermediate System provisions related to the ISO/OSI network layer concerned with the exchange of routing information in order to ensure that the network as whole maintains up-to-date information on the reachability of both aircraft and ground systems.

•5.9 contains recommendations related to the implementation of Systems Management solutions on local and/or regional basis in the absence of a global set of SARPs for Systems Management.

3.5 The Internet Communications Service draft SARPs define requirements that contribute towards the System Level Requirements as defined in Appendix A.1.

4. Recommendations

It is recommended that the ATN Panel accept the proposed Internet Communications Service material for inclusion in the ATN SARPs.