EUROCONTROL

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

WORKING GROUP TWO

Bordeaux 30.9.98-2.10.98

ATN Internet SARPs Version Control

Presented By Tony Whyman

Prepared by Tony Whyman

SUMMARY

There appears to be a small stream of changes to the ATN Internet SARPs. Some of these are necessary bug fixes, while others are significant enhancements, such as security. Such changes are creating issues amongst implementers on which is the correct version of SARPs to implement and concern over possible interworking problems.

This paper proposes a strategy for handling the resulting version control and interworking problems.

1. Introduction

1.1 Background

There appears to be a small stream of changes to the ATN Internet SARPs. Some of these are necessary bug fixes, while others are significant enhancements, such as security. Such changes are creating issues amongst implementers on which is the correct version of SARPs to implement and concern over possible interworking problems.

1.2 Scope

This paper proposes a strategy for handling the resulting version control and interworking problems.

2. Issues

Currently:

1. A number of minor bug fixes are working their way through the system

2. Proposals are being progressed for enhancements including Multicast, Security and Systems Management

3. Implementers need to freeze on specific versions of the ATN Internet SARPs for stable and certifiable systems

4. Bug fixes and enhancements need to be implemented in a controlled way that avoids interworking and/or safety problems.

5. We are unable to make use of Version Control numbers in ISO Standard Protocols for our own version control purposes as these are controlled by ISO and not ICAO.

6. We need to retain the possibility of interworking with (e.g.) COTS Routers for intra-domain traffic.

Considering this, the ATNP needs:

1. to identify a baseline version of the SARPs for implementers to work to, and

2. to provide a mechanism for the introduction of bug fixes and enhancements which are not backwards compatible. These may apply to the direct interaction between two Routers or a Router and End System; at the Internetworking level (i.e. CLNP); or to the end to end transport protocol.

3. Proposal

1. The version of the ATN Internet SARPs known to WG2 and version 2.3 is believed to be the *de facto* baseline of most implementers. It is thus proposed that this should be endorsed by WG2 as the baseline version of the ICAO SARPs for implementation purposes. It may become known as the "ATN '98" Specification.

2. The Utrecht meeting's Flimsy #2 proposed a mechanism for declaring Router capabilities using additional ISH PDU options parameters. This enables new capabilities to be declared using a mechanism that is ignored by earlier and COTS systems. The same mechanism can also be used to enable End Systems to declare

new capabilities through additional options parameters on ESH PDUs.

This mechanism can be used to introduce new features that affect the direct communication between two Routers or a Router and an End System.

It is proposed that whenever ATNP/WG2 introduces a bug fix or enhancement that is incompatible with the agreed baseline including preceding bug fixes and enhancements, and applies to communication between two Routers or a Router and an End System that:

a) a new capability is defined to match this change.

b) a means to declare support of this capability in the ISH or ESH PDU is defined.

c) a system that implements the capability declares this fact in every ISH and/or ESH PDU that they transmit.

d) a system that implements the capability will not apply it unless its peer system is known also to support the capability through receipt of an ISH or ESH PDU that declares support. It will otherwise work in a baseline compliant manner.

3. ISO also developed a similar enhancement mechanism for CLNP, whereby new options could be added that were ignored by legacy systems. Such a mechanism could also be used by ICAO to add any new features to CLNP that were required. However, this mechanism is a relatively recent addition to ISO/IEC 8473 and may not be widely implemented. This needs further investigation before adoption by ICAO.

4. The ISO Transport Protocol specified in ISO/IEC 8073 also provides for the encoding of options parameters in the variable length portion of the PDU header. Furthermore, it specifies that unrecognised options parameters in a CR TPDU shall be ignored. It is thus possible to add new features to the transport protocol provided that there use is proposed by a new options parameter in the CR TPDU and accepted in the CC TPDU.

It is therefore proposed that any bug fixes and enhancements to the transport protocol that are not backwards compatible are always proposed by including a new options parameter in the CR TPDU and only used if explicitly accepted by another new options parameter in the returned CC TPDU.

5. ISO/IEC 8602 specifies that all unrecognised options parameters in the CLTP are treated as protocol errors. It is therefore difficult if not impractical to extend the CLTP in a negotiable manner. If non-backwards compatible extensions are ever needed to the CLTP then they will always have to be invoked in the sense of "if no response is received after a set number of retries then the sender reverts to the baseline specification".

4. Recommendations

WG2 is recommended to consider the need for version control and:

1. To agree on Version 2.3 as an appropriate freeze level for the ATN Internet SARPs as the implementation baseline.

2. Introduce the proposed ISH/ESH PDU mechanism for declaring new capabilities between two Routers or a Router and an End System, and hence as a means to introduce bug fixes and enhancements in a backwards compatible manner.

3. Investigate the possible use of the CLNP options extension mechanism to determine if it is a possible mechanism for backwards compatible CLNP extension.

4. Introduce any non-backwards compatible bug fixes and enhancements to the transport protocol through a negotiation mechanism based on new options parameters in the CR and CC TPDUs.