EUROCONTROL

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AERONAUTICAL TELECOMMUNICATION NETWORK PANEL

WORKING GROUP 3 (APPLICATIONS AND UPPER LAYERS)

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Model of the Upper Layers SARPs

INFORMATION PAPER

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SUMMARY

This paper describes the interim model of the upper layers produced in SDL on the GEODE tool as part of the Eurocontrol CNS/ATM-1 validation effort. This interim version contains models for ACSE and the presentation service.

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1. INTRODUCTION

1.1 Scope

The ATNP/WG3/SG3 (Architecture subgroup) within ICAO has produced draft SARPs for ATN Upper Layers for the CNS/ATM-1 Package [1]. As part of the validation of that SARPs, a model of the protocol machine is being produced using SDL (Structured Design Language) using the GEODE tool.

This document presents an interim model, containing approximately 50% of the model, that has been developed so far. Later versions of this document will be contain the completed model. This document also contains defect reports on the model found so far.

1.2 References

[1] Draft SARPs and Guidance Material for ATN Upper Layers for the CNS/ATM-1 Package, Sub-volume IV of CNS/ATM-1 Package SARPs, Version 2.0, 21 March 1996.

[2] ACSE Protocol Specification, Edition 2,ISO/IEC DIS 8650

1.3 Abbreviations

ACSE	Association Control Service Element
ADS	Automatic Dependent Surveillance
ASE	Application Service Element
ATN	Aeronautical Telecommunications Network
CF	Control Function
CNS/ATM	Communications, Navigation and Surveillance / Air Traffic Management
GEODE	SDL editor and simulation tool, manufactured by Verilog
ICAO	International Civil Aviation Organisation
SARPs	Standards and Recommended Practices
SDL	Specification and Description Language

2. MODEL DESIGN

The model of the upper layers, as shown in figure 1.4 of [1], describes the following components:

- ACSE (Association Control Service Element) - conforming to ACSE edition 2;
- A future ASE - not specified in [1] and not modelled here;
- An ATN application ASE - e.g. ADS - this is also not modelled here;
- CF (Control Function) - defined in [1].

ACSE is modelled directly from the protocol description given in [2]. It accepts ACSE primitive calls invoked from the control function, and Presentation service calls also invoked from the control function. In response it generates ACSE and Presentation service calls back to the control function. The ACSE model does not cover the following conditions:

- ACSE protocol machine does not accept the association, since this has little effect on the CF;
- Presentation resynchronisation, since this is not permitted using the fast byte mechanism which used in the upper layers;
- Presentation exception report, since this is not permitted using the fast byte mechanism which used in the upper layers.

The CF will be modelled from the protocol description given in [1]. The model does not include that part of the CF that handles the transfer of primitive calls between the ATN application ASE (e.g. ADS ASE) and the user, since this is a simple pass through function mapping primitive calls directly one-to-one, and has no state information whatsoever. The CF model will accept dialogue service primitive invocations (e.g. D-START request - see chapter 2 of [1]), ACSE service primitives and Presentation service primitives, and will invoke Dialogue service primitives, ACSE service primitives or Presentation service primitives in response.

In order to allow the model to simulate two upper layers communicating with each other, the upper layers model also includes that part of the Presentation service which is used by the upper layers. This accepts Presentation service primitives invoked by one control function and invokes Presentation service primitives at the other (and vice versa). It can also simulate network failure and recovery.

Thus, the working model contains two upper layer modules, each with its own ACSE and CF processes, as well as a single Presentation service module, with its Presentation service process. The main signals between the different processes map directly onto the service primitives.

The model is presented in full in Annex B.

3. DEFECTS

All defects are reported in full in Annex A.

At the current stage of development, little work has been done on the CF process where the majority of defects are expected to be found.

ANNEX A - DEFECT REPORTS

ATN AIR/GROUND APPLICATIONS

DEFECT REPORT ON SARPs

Defect Number (to be supplied by SARPs editor):		UL SARPs DR 20	
SARPs affected:	Upper Layers	SARPs Version/Date	V2.0, 21 March 1996
Originator Name:	Tim Maude		
Originator Reference:	5042/DEL/01-1		
Date Raised:	1 April 1996		
Location of Defect (including Section Number): Table 3.4 (CF state table) 3.3.3.3 D-START response primitive			
Summary of the Defect: The state machine allows D-START response primitive to be invoked immediately after a D-START request. This is because STA1 is overloaded - it is performing two functions: a) being the association pending state for the originator and b) being the association pending state for the responder.			
Proposed solution or assumptions made (if any): State STA1 (assoc pending) should be split into “Assoc Pending (initiator)” and “Assoc pending (responder)”.			
Editors Comment: Registered as UL SARPs DR 20. The same comment applies to D-END/STA 3. The ACPM would reject the out-of-sequence primitive. Predicates will be added to the CF State Table to make this explicit. resolved in UL SARPs V3.0p			
Date of Resolution:	10.04.96		

ANNEX B - UPPER LAYERS MODEL

The following pages are the output from the GEODE tool. They are the model of the upper layers developed so far, written in SDL and presented in the SDL graphical format.