



International Civil Aviation Organization

**AMHS/SWIM SEMINAR AND THE SEVENTH MEETING OF
AERONAUTICAL TELECOMMUNICATION NETWORK
(ATN) IMPLEMENTATION CO-ORDINATION GROUP OF
APANPIRG (ATNICG/7)**



Chiang Mai, Thailand, 5 – 9 March 2012

Agenda Item 5: Security and Applications

EUROPEAN DIRECTORY SERVICE (EDS)

(Prepared by EUROCONTROL and COMSOFT)

SUMMARY

This Information Paper gives an overview on the study on European Directory services performed on behalf of EUROCONTROL and summaries the European Directory Service (EDS) operational concept as the outcome of the study.

1 INTRODUCTION

1.1 Use of the ATN Directory is part of the Extended ATS Message Handling Service (ATSMHS). The ATN Directory is specified in ICAO Doc 9880 Part IV; previously specified in ICAO Doc 9705 Sub-Volume IV.

1.2 EUROCONTROL was invited by the Aeronautical Fixed Services Group (AFSG), a sub-group of the European Air Navigation Planning Group (EANPG), to take actions for development of an operational concept for the ATN Directory service for AMHS as defined in the European AMHS Community Specification. The AMHS Community Specification was developed by EUROCONTROL in the framework of the Single European Sky with the goal to harmonise European Air Traffic Management.

1.3 EURONCONTROL launched a call for tender for the analysis, development and validation of an operational concept for Directory services.

1.4 The contract on the study was awarded to COMSOFT GmbH.

2 WORK PACKAGES AND STATUS

2.1 The project is divided in 4 Work Packages (WPs) and started in January 2011.

2.2 The objective of Work Package 1 is the analysis in order to identify and evaluate potential directory architectures suitable for an European Directory Service (EDS) in support of the AMHS and further ATN applications. Work Package 1 is completed. It proposes to follow a centralised approach.

2.3 The objective of Work Package 2 is the development of an operational concept for the EDS. Besides technology considerations the EDS operational concept addresses operation, cooperation and transition and aims to give advice in support of implementation and operation of the EDS. The major focus is set on the exchange of information at the international level.

2.4 The objective of Work Package 3 is the validation of the EDS operational concept and to deliver the proof of concept. Work Package 3 is on-going; however initial tests show that the operational concept is plausible.

2.5 Work Package 4 is the final report providing a summary and outlook. The final report will be compiled following completion of Work Package 3.

2.6 In March 2012, the AFSG Planning Group decided to adopt the outcome of the study and to integrate the concept developed in WP2 into the EUR AMHS Manual (ICAO EUR Doc 020).

3 ANALYSIS

3.1 The analysis looked at various aspects of the ATN Directory including but not restricted to documentation (e.g. ICAO Doc 9880 Part IV), ATN applications especially at the ATS Message Handling System (AMHS), stakeholders, and co-operation with States and Regions. The analysis performed a survey on the existing environment of AMHS and Directory implementations as well as the AMHS address management and distribution function of the ATS Messaging Management Centre (AMC).

3.2 The analysis considered architectural characteristics which are partially contrary:

- Centralised vs. decentralised;
- Replicated vs. distributed; and
- Offline vs. online Directory service.

3.3 Following criterion have been selected for evaluation of potential Directory architectures:

- Expandability;
- Performance scalability;
- Automation;
- Centralised data management;
- AIRAC cycle based publication;
- Real-time publication;
- Level of standardisation;
- Reliance on network connectivity; and
- Consistent technology.

3.4 As a result, the analysis recommends the centralised online approach with distributed and replicated elements.

4 CONCEPT

4.1 Directory services are seen as a global function. However they are expected to be implemented at a regional and international level rather than on a global basis. The EDS is specified as a common European facility but is also open to support, to coordinate with and to integrate with States and Organisations outside Europe.

4.2 The EDS Operational Concept adopted and refined the approach of the ATN Directory as specified by ICAO Doc 9880 Part IV. The EDS is specified in support of ATN applications such as the AFTN/AMHS Gateway. In addition the EDS supports human users interfacing the EDS through their local Directory User Agent (DUA).

4.3 The architecture of the EDS allows for centralised management of information, versioning of information as well as periodic and automated distribution of information using X.500 Directory protocols. In parallel the EDS Operational Concept reduces the individual effort of States and Organisations for management and coordination.

4.4 The EDS Operational Concept takes into account the existing infrastructure for management and distribution of AMHS address information by the ATS Messaging Management Centre (AMC). Deployment of the EDS is proposed in three steps. In the first, initial step, the information is maintained and managed by AMC and distributed by AMC and EDS. In the second, intermediate step, the information is maintained by EDS, and managed and distributed by AMC and EDS. In the third, final step, the information is maintained, managed and distributed by EDS. The stepwise introduction of the EDS for AMHS address information ensures a smooth introduction of Directory services in Europe and a seamless operation of the AMHS.

4.5 In support of the AMHS, the EDS provides and distributes in the initial step information to support the messaging functions name resolution, user capabilities and AFTN/AMHS address conversion. The EDS is prepared to support further ATN applications and functions such as AMHS security.

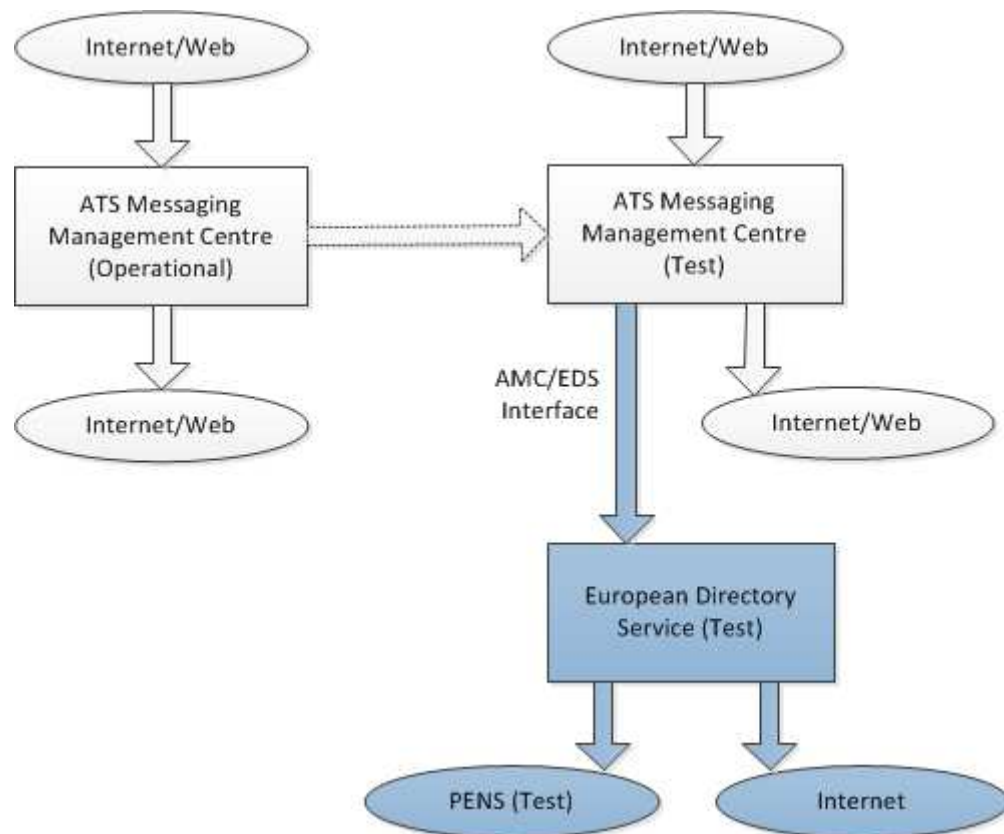
4.6 The EDS operational concept document is attached to this Information Paper.

5 VALIDATION

5.1 The concept that has been developed as a result of the analysis is currently under validation. Validation comes in two steps:

- a) Establish proof of concept in a clean room environment ensuring that the procedures and functions are implementable. The environment consists of several DSAs and DUAs simulating the roles set up by the concept.
- b) Establish a validation platform open to States, Organisations and manufacturers for compatibility and inter-operability testing of step 1. The validation platform is expected to provide connectivity through the Pan-European Network Service (PENS) as well as through the Internet.

5.2 The following figure outlines the validation platform and integration with the AMC in the initial step of the EDS.



5.3 Completion of validation including establishment of a validation platform is tentatively scheduled for the end of October 2012.

6 INTER-REGIONAL ASPECTS

6.1 Even though the focus is Europe, the study is performed in an open way also considering coordination with States and Organisations outside Europe as well as other Regions.

6.2 The EDS operational concept reduces effort for management and coordination not only for participating States and Organisations, but also for States and Organisation as well as other Regions exchanging information with the EDS. Implementation of operational concept reduces the number of Directory communication paths, enables versioning of information and ensures consistency of inter-related data.

6.3 The EDS is designed to act on behalf of participating States and Organisations, to provide information of participating entities to other States and Organisations and to receive individual information from other States and Organisations. The EDS operational concept proposes Directory replication for the exchange of information. It introduces no additional attribute types or object classes ensuring compatibility with ICAO Doc 9880.

6.4 In case other Regions adopt a similar operational concept for Directory services, the EDS is prepared to send European Directory information and to receive consolidated information from other Regions.

7 ACTION BY THE MEETING

7.1 The ATNICG is invited to note the on-going work on the European Directory Service.
