

# Overall Air Traffic Management & Communication Navigation Surveillance Target Architecture

**(OATA)**

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*European Organisation for the safety of Air  
Navigation*

**(Eurocontrol)**





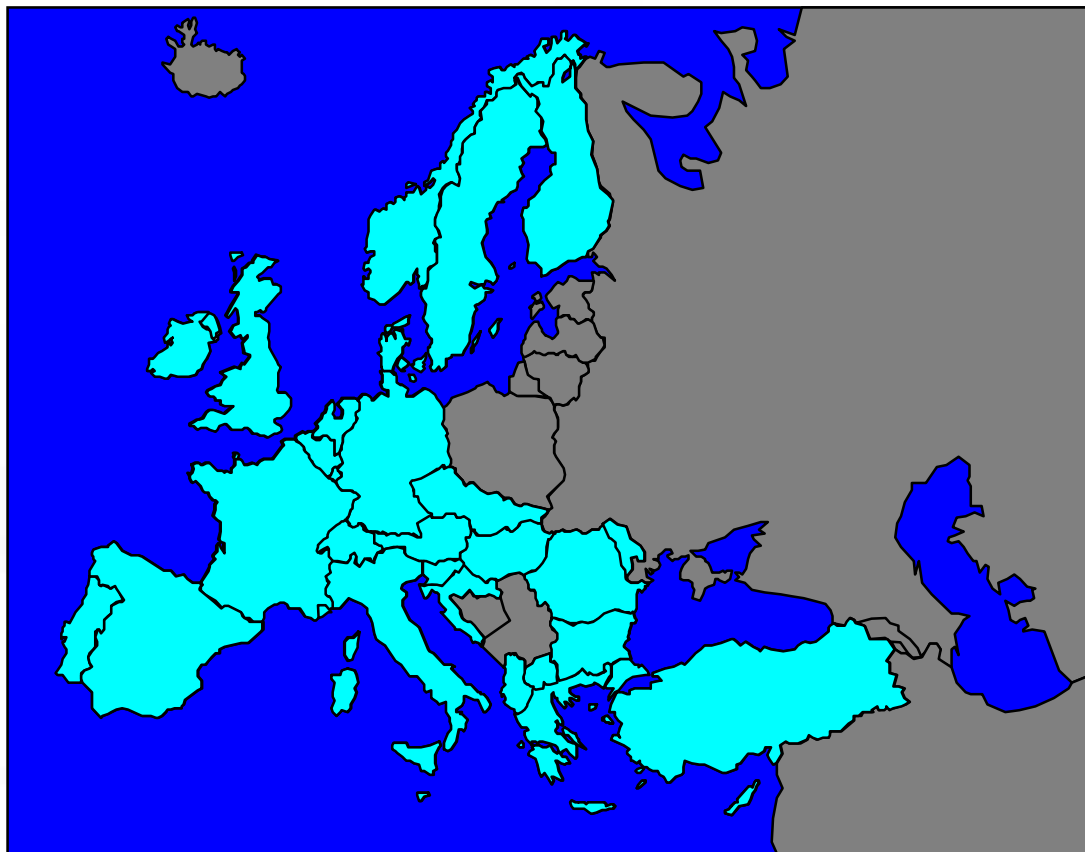
# EUROCONTROL Mission

To harmonise and integrate Air Navigation Services in Europe,  
aiming at the creation of a  
**uniform** Air Traffic Management System  
for **civil and military** users,  
in order to achieve the **safe, orderly, expeditious and economic**  
flow of traffic throughout Europe.  
*(Article 1 of the revised Convention)*





# EUROCONTROL



## 31 States

- ▶ Albania
- ▶ Austria
- ▶ Belgium
- ▶ Bulgaria
- ▶ Croatia
- ▶ Cyprus
- ▶ Czech Republic
- ▶ Denmark
- ▶ Finland
- ▶ France
- ▶ Germany
- ▶ Greece
- ▶ Hungary
- ▶ Ireland
- ▶ Italy
- ▶ Luxembourg
- ▶ FYROM
- ▶ Malta
- ▶ Moldova
- ▶ Monaco
- ▶ Netherlands
- ▶ Norway
- ▶ Portugal
- ▶ Romania
- ▶ Slovak Republic
- ▶ Slovenia
- ▶ Spain
- ▶ Sweden
- ▶ Switzerland
- ▶ Turkey
- ▶ United Kingdom





## CORE BUSINESS

- Management of **pan-European Programmes**
- Operation of a **Central Flow Management** Unit
- **Research & Development** work aimed at increasing Air Traffic Control capacity and safety in Europe
- **Collection of Route Charges** on behalf of Member States and through bilateral agreements with non-Member States - *4.4 B € billed in 2001*
- **Provision of Air Traffic Services**
  - Management of an international (4 States) ATC Centre: Maastricht
  - Development of an international (8 States) ATC Centre: CEATS
- **Provision of training**, education and knowledge transfer in Air Navigation Services inside and outside Europe



# OATA Objectives

## ◆ Primary Goals

- To define and maintain an Overall ATM/CNS Target Architecture (OATA) that is accepted as a target throughout the EUROCONTROL Organisation (Agency + Member States);
- To contribute to the future European-wide processes for the industry-standardisation of ATM system components and regulation of interoperability requirements.

## ◆ Secondary Goals

- To achieve alignment between the EUROCONTROL OATA, and those of the USA and other ICAO Member States outside EUROCONTROL;
- To achieve global interoperability for users.





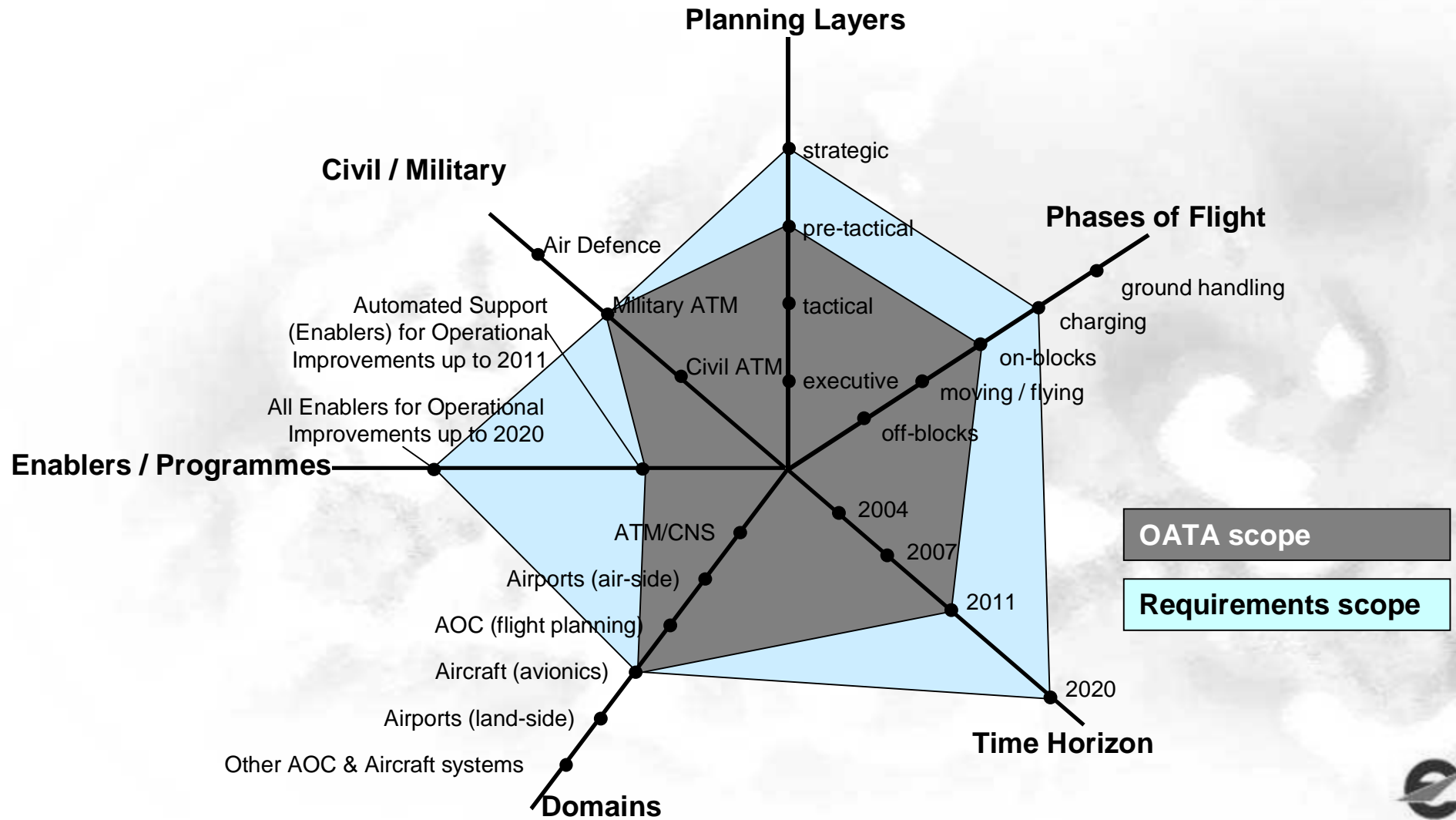
## Current PSG Members

- ◆ AECMA
- ◆ AENA
- ◆ Austro Control
- ◆ Avinor
- ◆ Belgocontrol
- ◆ BOEING
- ◆ Bulgarian Air Traffic Services Authority
- ◆ CEC/DGTREN
- ◆ Deutsche Bundeswehr
- ◆ DFS
- ◆ DNA/STNA
- ◆ ENAV
- ◆ EUROCAE
- ◆ FAA
- ◆ IAOPA
- ◆ IATA
- ◆ IFATCA
- ◆ Italian Airforce
- ◆ Lufhansa
- ◆ Lennuliiklusteeninduse Aktsiaselts (Estonian ANSP)
- ◆ LFV Sweden(Swedish CAA)
- ◆ NATAM (Norwegian ANSP)
- ◆ NATO (NACMA)
- ◆ NATS
- ◆ NAVIAIR (Danish ANSP)
- ◆ NAV-Portugal
- ◆ Phare-X
- ◆ Skyguide
- ◆ UKSATSE (Ukrainian ANSP)





# Scope



# OATA Architecture Main Characteristics

- ◆ **Logical** – de-couples technology from application
- ◆ **Component-based** – simplifies development and incremental evolution
- ◆ **Scenario driven** – developed from Operational Concepts to ensure architecture meets operational needs
- ◆ **Distributed system services** – to support geographic distribution and heterogeneous stakeholder population
- ◆ **Common vocabulary** – data dictionary to ensure consistency

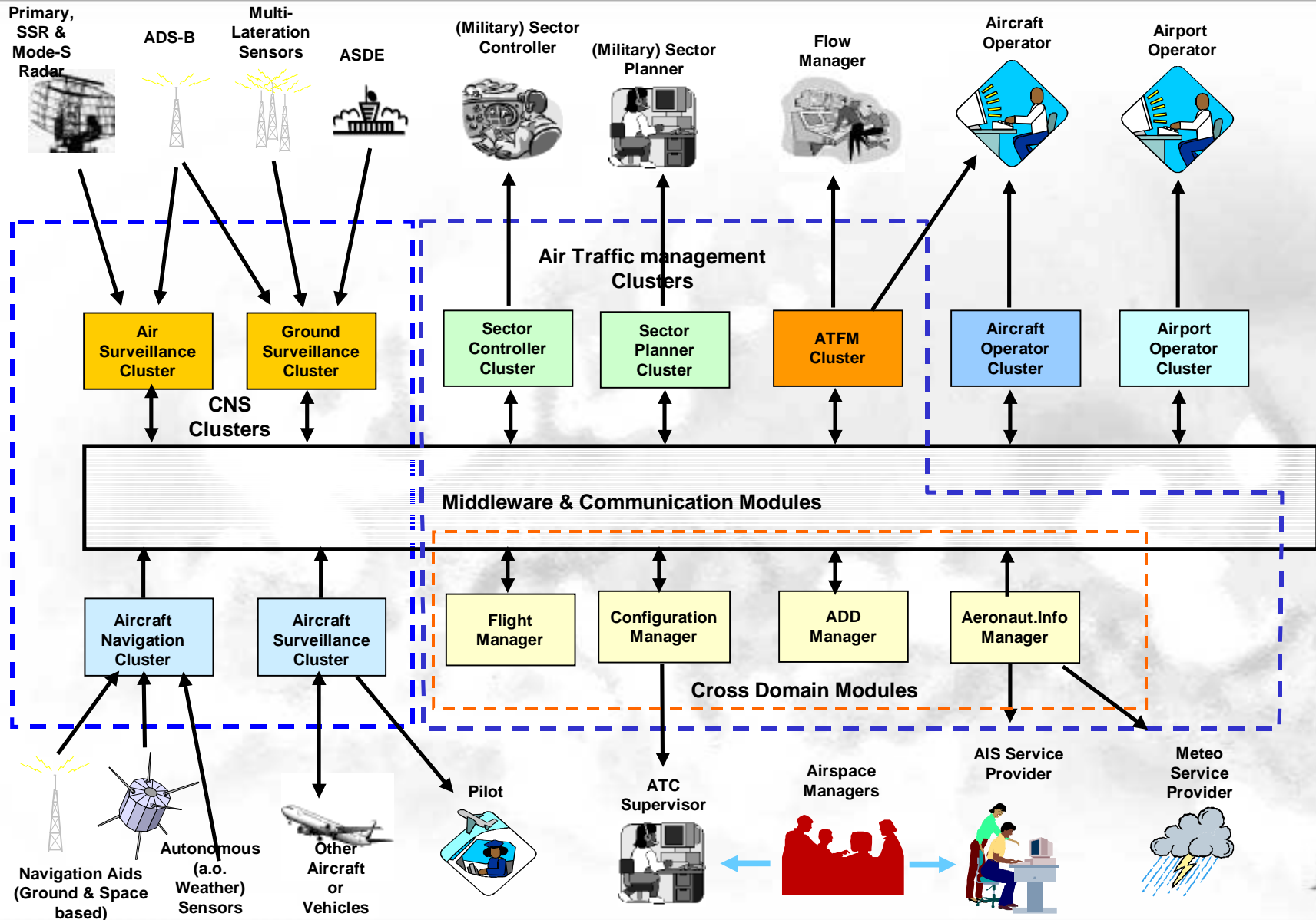


# Notation and Tool Choices

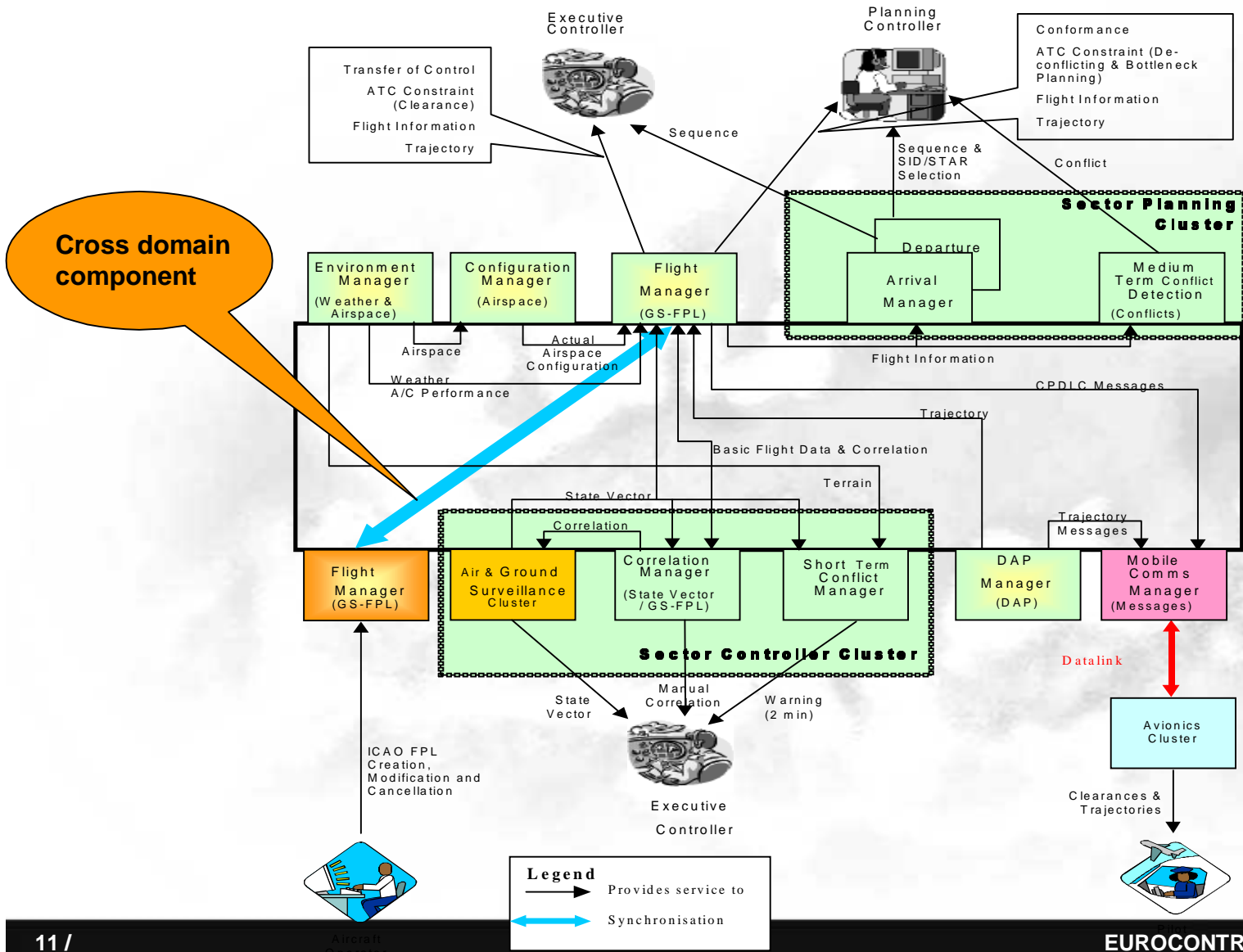
- ◆ UML
  - Model in Rational Rose
- ◆ Document Production
  - Rational Rose for HTML version of model
  - Rational SoDA or in-house XML-based tool chain or other for production of Word versions
- ◆ Configuration Management
  - Rational ClearCase LT + ClearQuest



# Overall Architecture: Overview



# Air Traffic Control Module Architecture





# Cross-Domain Modules

(built in interoperability)

- ◆ Ensure that everybody has the same information
  - System-Wide Information Management (SWIM)
- ◆ Communicate updates immediately, everywhere
- ◆ Ensure data ownership rights, etc.
- ◆ Are not just data stores but provide *services*
  - standardise the services that will access the shared data, rather than standardising the data, avoiding the risk that data will be used in a different way.
- ◆ Consequently everybody interprets the data in the same way





## Start-up of OATA Technical Review Group

- ◆ Representatives of 22 Stakeholders organisations :
  - the major Air Traffic Service Providers, System and Aircraft Manufacturers;
  - Military organisations including NATO.
- ◆ First Technical Review Groups meetings in February and May 2003;
- ◆ Review of OATA Phase 1 completed
  - accepted as the starting point for Phase 2 work;
  - issues to be resolved during Phase 2 identified.
- ◆ Study report comparing Phase 1 and Avenue architectures
  - reviewed by Technical Review Group
  - delivered to EUROCAE WG61 and AVENUE Consortium members;

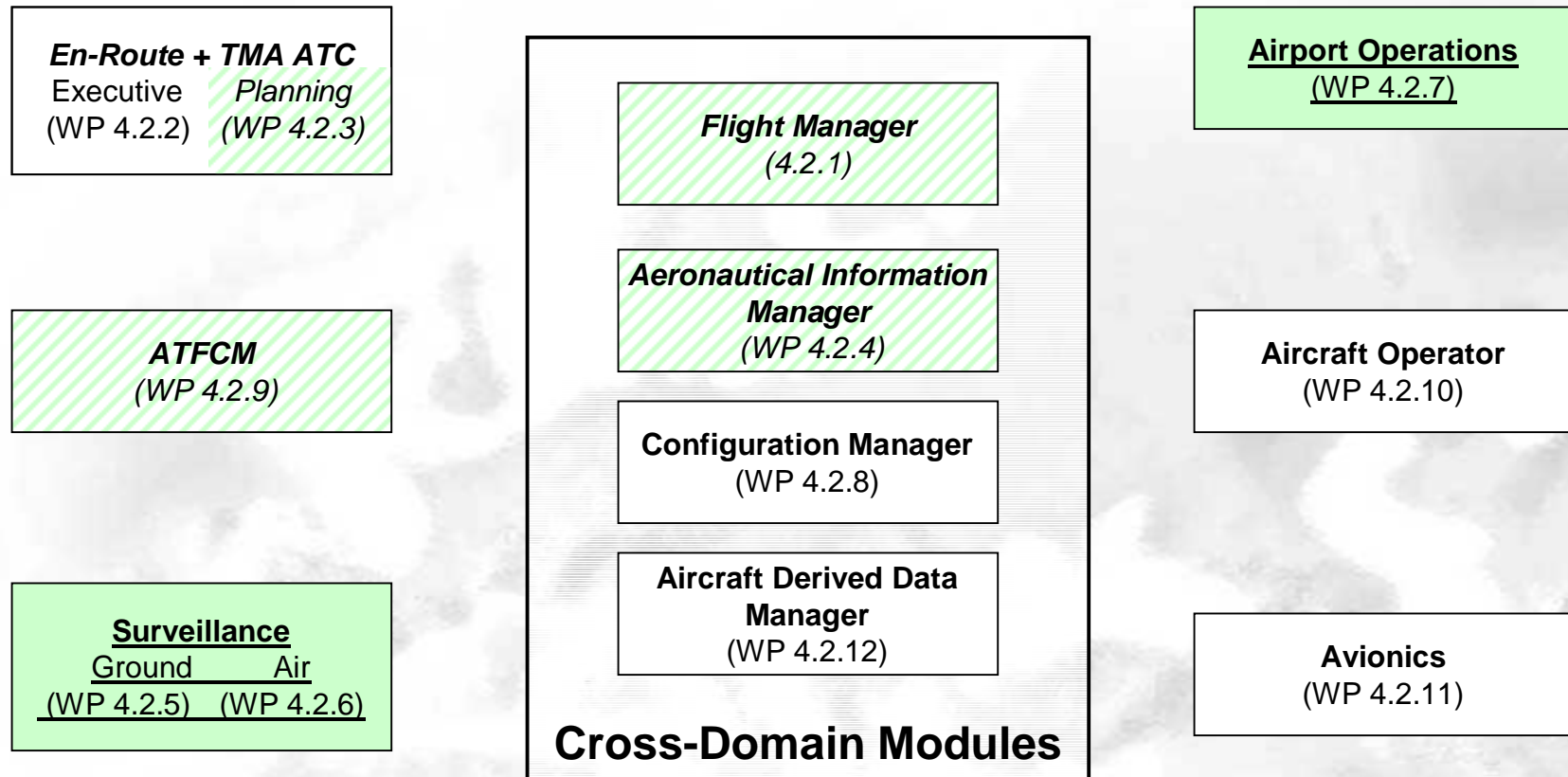


The following documentation has been reviewed:

- Use Cases:
  - File a Flight Plan;
  - Obtain Pre Flight Update Briefing;
  - Taxi-In of an Aircraft;
  - Submit Regional Airspace Reservation Plan for Feedback;
  - Change Flight Intent to Resolve Conflict;
- OATA Models:
  - Airspace Management;
  - Flight Briefing;
  - Airport Operations;
  - Change Flight Intent to Resolve Conflict;
  - Flight Management;
- WP 5.1 Report - Review and Categorisation of existing Non Functional Requirements
- Legacy Systems Modelling Methodology;



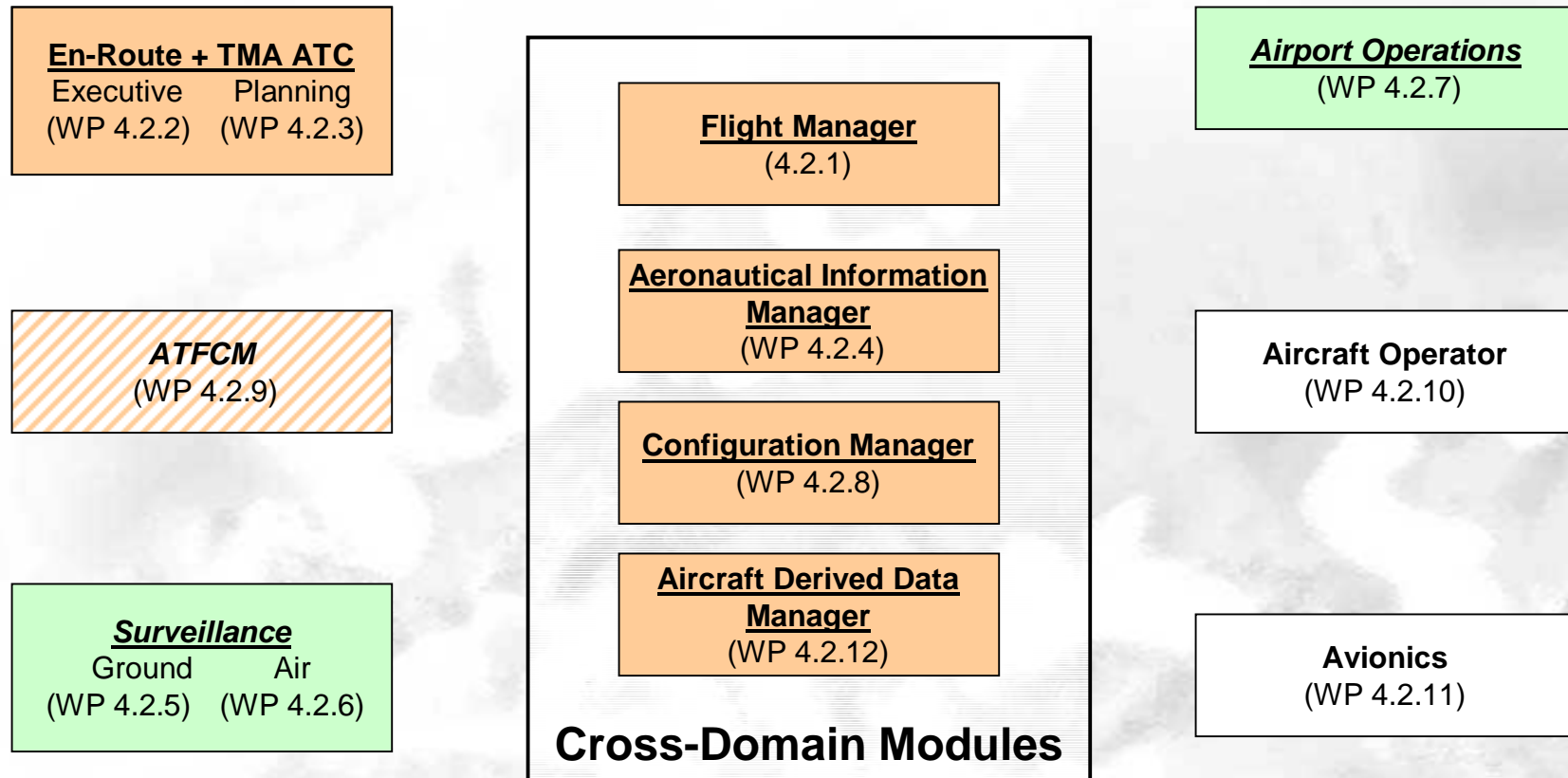
# Main Areas of Iteration 1






-  *initial developments*
-  more than 2 thirds complete



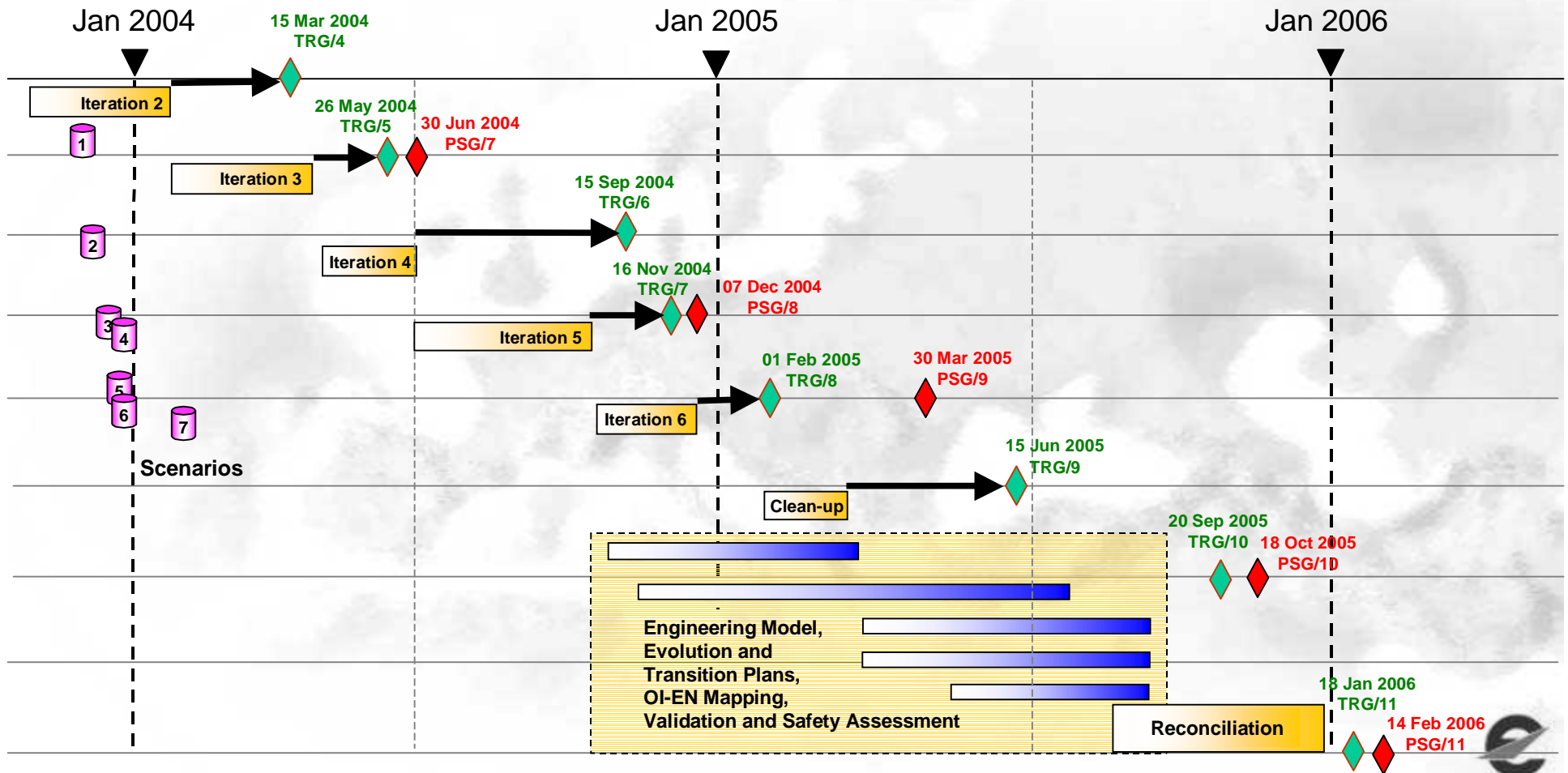
# Foreseen Deliveries for Iteration 2



-  *some further developments*
-  **substantial development**
-  *completion of bottom-up work*



## Completion of Phase 2 Summary Schedule





# European ATM system Standardisation

- ◆ European Commission + Eurocontrol regulation process will use an Architecture as a baseline for European standardisation
- ◆ EUROCAE (sister organisation is RTCA)
  - Previously known for standardisation of avionics equipment .. Now Air Traffic Management Systems
  - Working Group 59 : Standardisation of Flight data processing interoperability
  - Working Group 61 : standardisation of interfaces within an Air Traffic Control Centre.
    - ⇒ Logical design, data model, service definitions.





## European/US coordination

- ◆ US equivalent is FAA's TSD (Target System description)
- ◆ FAA/Eurocontrol Memo of cooperation
  - R&D coordination activities
    - ⇒ Architecture comes under Action Plan 4 (AP4)
    - ⇒ Joint activities, workshops, etc



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<http://www.eurocontrol.int/eatmp/library/documents/oata/>

