Global Harmonization Through Collaboration

An Enterprise Architecture Approach

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EUROCONTROL

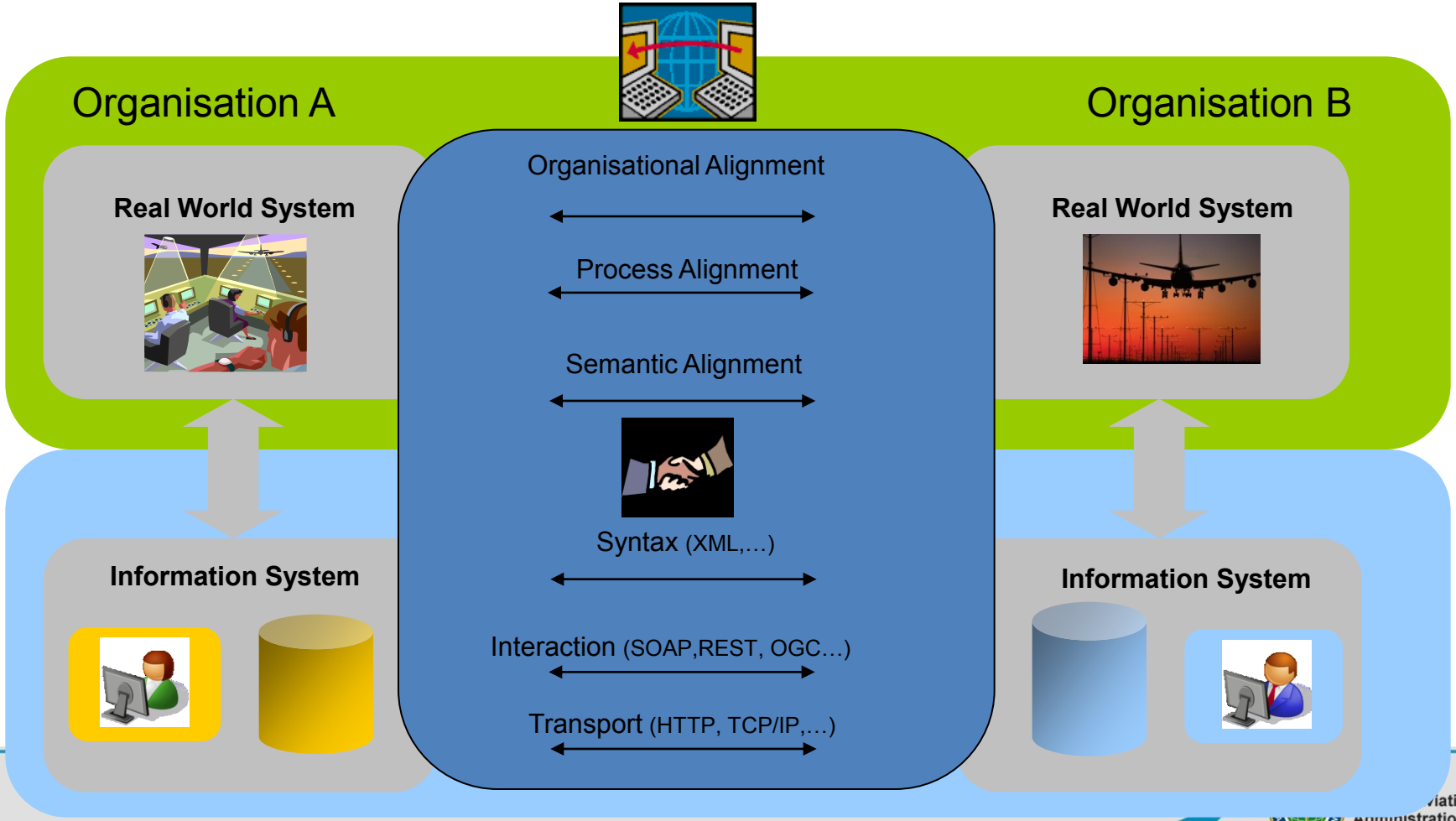
Federal Aviation Administration

AIR TRANSPORTATION INFORMATION EXCHANGE CONFERENCE - (FEATURING AIXM, WXXM AND FIXM)

August 28, 2012 - August 31, 2012
NOAA Auditorium and Science Center
Silver Spring, Maryland

The heart of SWIM: achieving ATM Interoperability

An Entreprise Architecture provides the key components and a governance structure to help achieve this goal.



What is an Entreprise Architecture?

- An Enterprise is a collection of organisations that share a common set of goals

- An Architecture is the fundamental of organising:
  - Components,
  - their Relationships,
  - Principles governing their Design and Evolution.

The European A

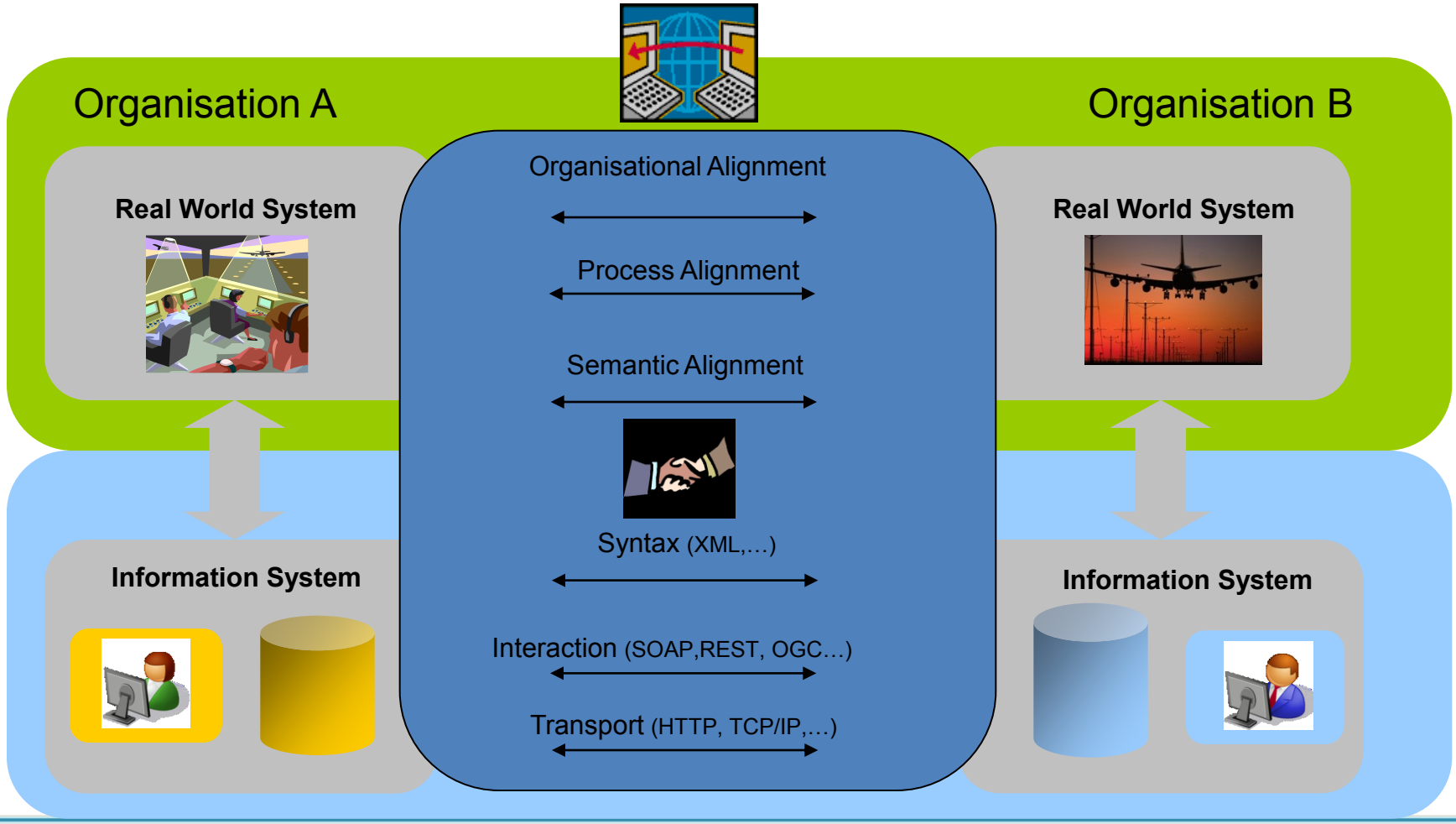
Many things actually already exist!
EA technique simply helps to link them and to keep them consistent.

Operational Focus Area
OFA01.01.01 LVPs using GBAS
OFA01.01.02 Pilot enhanced vision
OFA01.02.01 Airport safety nets
OFA01.02.02 Enhanced situational awareness
OFA01.03.01 Time Based Separation
OFA01.03.02 Dynamic Vortex Separation
OFA01.03.03 Brake to Vacate
OFA02.01.01 Optimised RNP Structures
OFA02.01.02 Point Merge in Complex TMA
OFA02.02.01 CDA
OFA02.02.03 CCD
OFA02.02.04 Approach Procedures with Vertical Guidance
OFA03.01.01 Trajectory Management Framework
OFA03.01.03 Free Routing
OFA03.01.04 Business and Mission Trajectory
OFA03.01.07 Cruise climb
OFA03.01.08 System Interoperability with air and ground data sharing
OFA03.02.01 ASPA S&M
OFA03.02.03 ATSA-ITP
OFA03.02.04 ASEP

CODE	TITLE	ATM SERVICE LEVEL	INITIAL OPERATING CAPABILITY	FULL OPERATING CAPABILITY
AO-0101	Reduced Risk of Runway Incursions through Improved Procedures and Best Practices on the Ground	0	2007	2013
AO-0102	Automated Alerting of Controller in Case of Runway Incursion or Intrusion into Restricted Areas	0	2010	2017
AO-0103	Improved Runway-Taxiway Lay-out, Signage and Markings to Prevent Runway Incursions	1	2012	2019
AO-0201	Enhanced Ground Controller Situational Awareness in all Weather Conditions	0	2012	2021
AO-0202	Detection of FOD (Foreign Object Debris) on the Airport Surface	1	2010	2015

Achieving ATM Interoperability

How does the EAEA actually help?



Achieving ATM Interoperability

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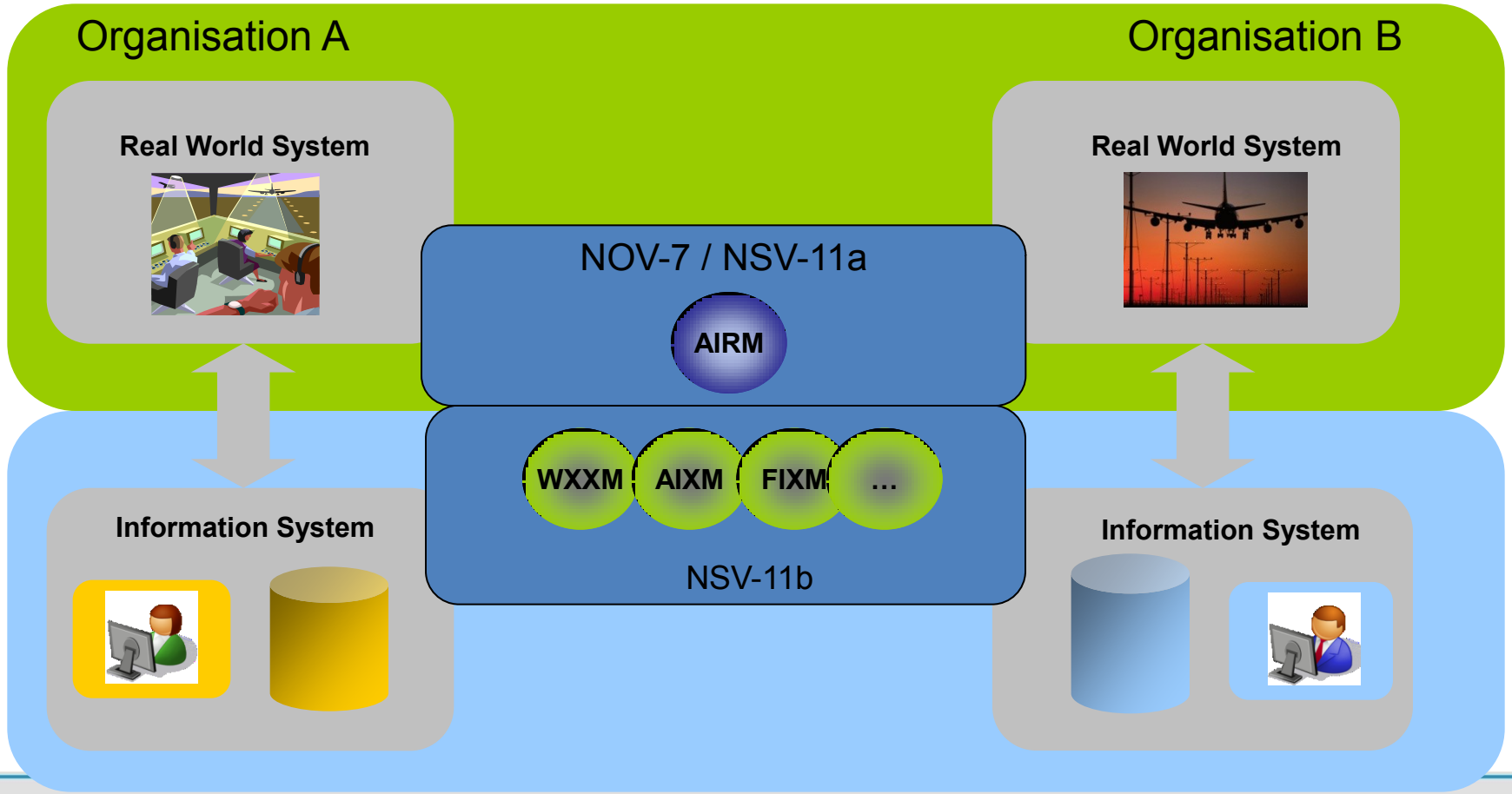
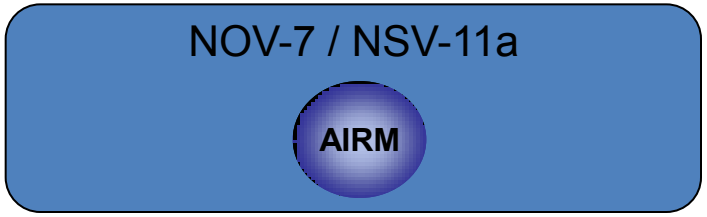


AIRM - There's a lot in the name…



ATM
Information
Reference
Model

'Now, no-one to my knowledge has ever accused AIRM of being "sexy" but it is crucial. It's vital for global interoperability…' David McMillan
(see http://www.eurocontrol.int/articles/need-speed)

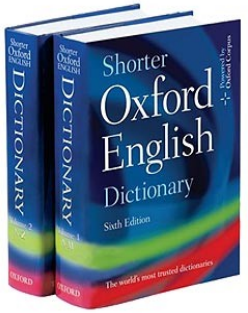
AIRM Goals

NOV-7 / NSV-11a

AIRM

Semantics

Semantics



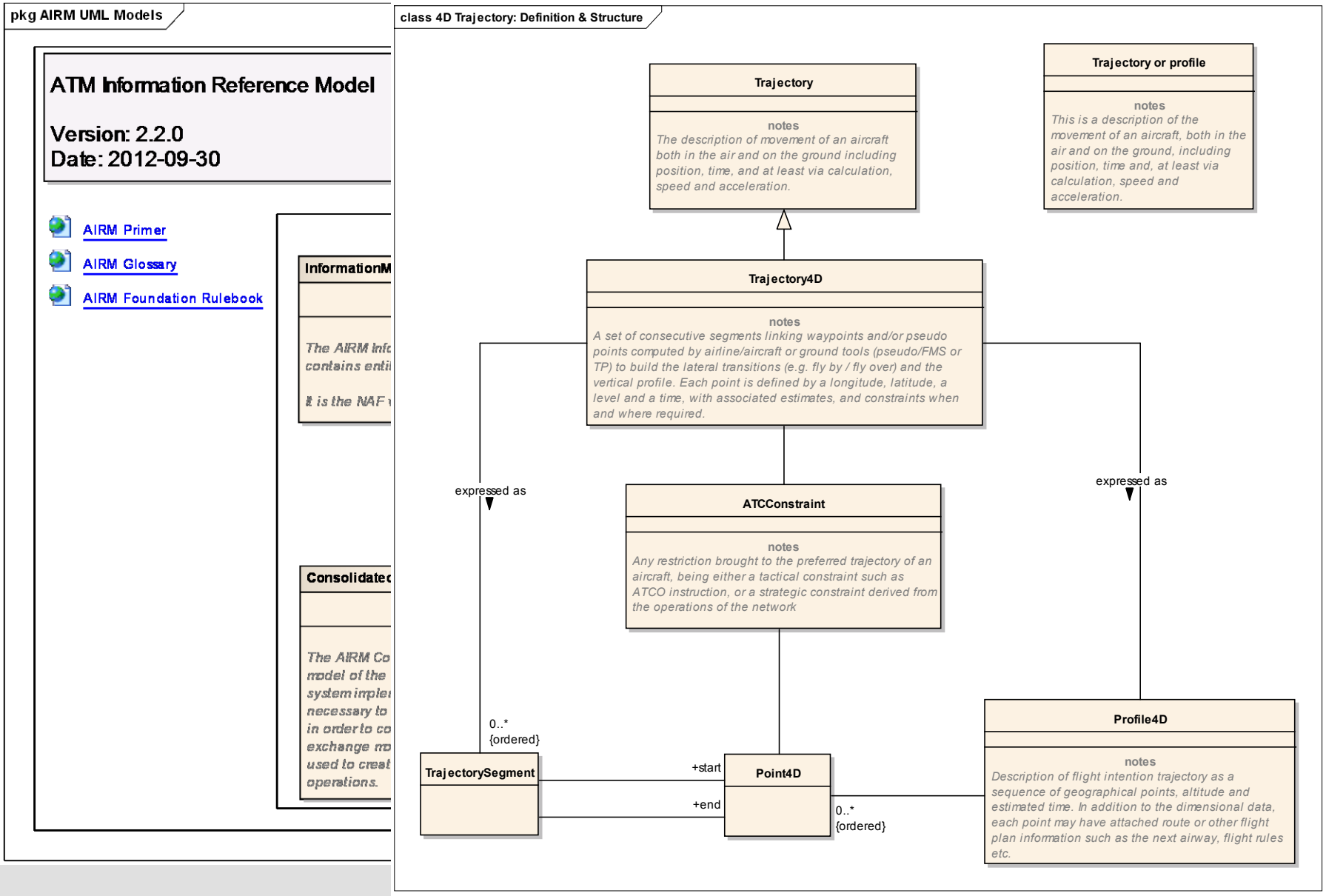
+ Promote ATM Information Standards, European and Globally

Semantics

How does the AIRM look like?

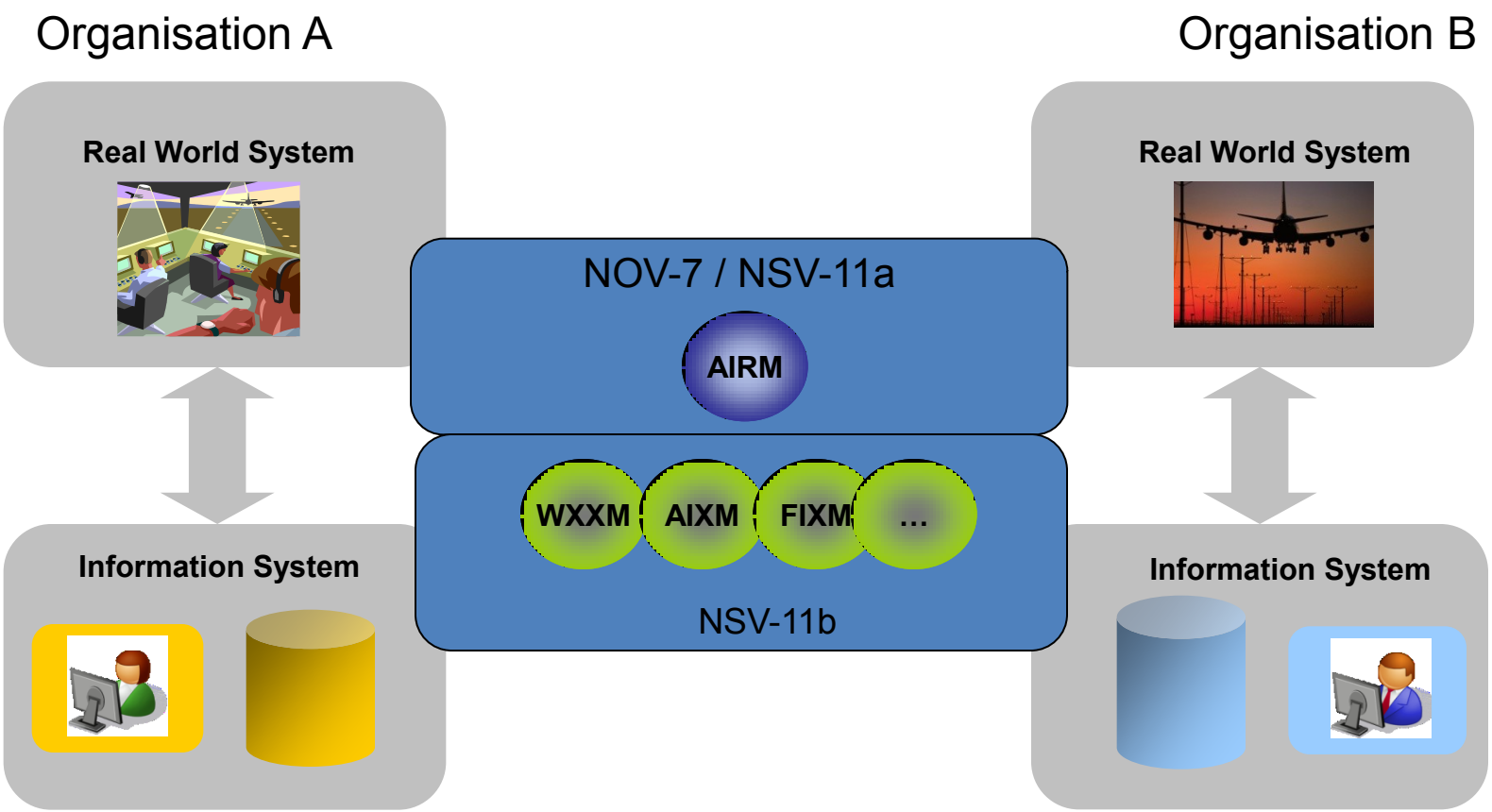
NOV-7 / NSV-11a

AIRM

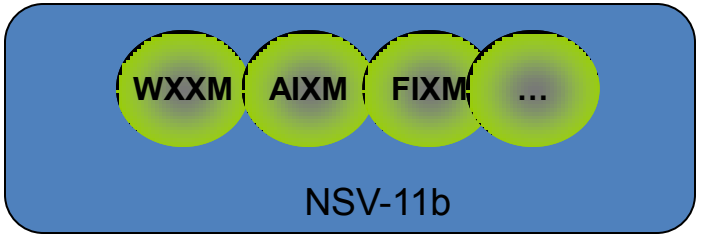


Achieving ATM Interoperability

How does the EAEA actually help?



Adapting the AIRM to a Specific Use



NOV-7 / NSV-11a (AIRM)

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters.

Runway
designator: CharacterString
nominalLength: Distance

runway — associatedAirport

Aerodrome
designator: CharacterString
name: CharacterString
locationIndicatorICAO: CharacterString

UNIFIED MODELING LANGUAGE

Derivation rules | Business rules

NSV-11b

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters.

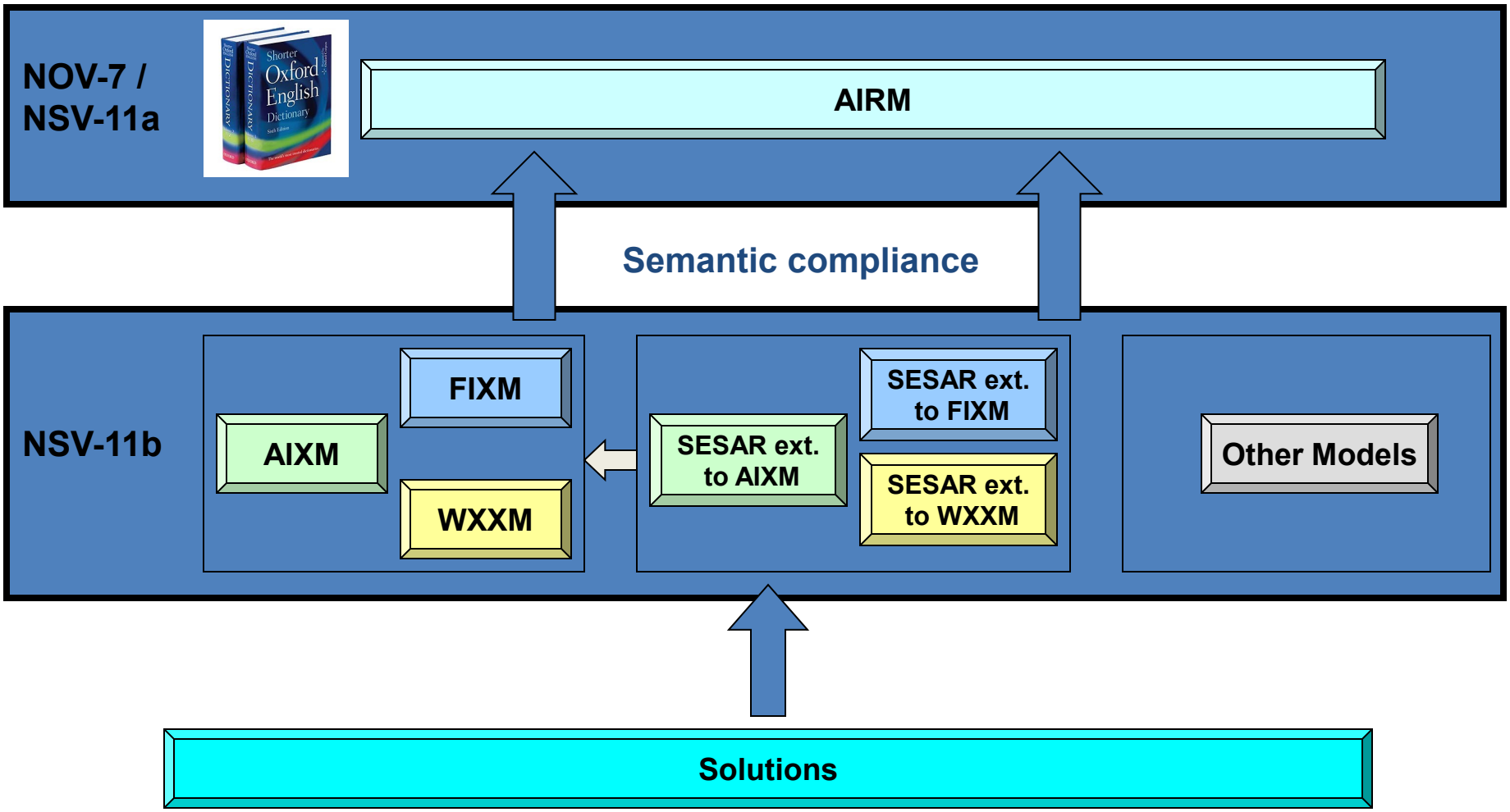
Runway
designator: CharacterString 0..1

0..1 associatedAirport

Aerodrome
designator: CharacterString
name: CharacterString
locationIndicatorICAO: CharacterString [4]

UNIFIED MODELING LANGUAGE

ONE LOGIC, MULTIPLE SOLUTIONS !



EAEA, AIRM, AIXM, WXXM, FIXM…

Key Points

Air Transportation Information Exchange Conference - (featuring AIXM, WXXM and FIXM)

- **EAEA**
  - Provides key components and a governance structure to achieve ATM interoperability within SESAR
  - Acts as a management tool
- **AIRM**
  - Is a key component of the EAEA
  - Achieves ATM semantic interoperability
  - Standardises the operational language and provides a seamless reference data model for builders
- **AIXM, WXXM, FIXM**
  - Are key components of the EAEA
  - Define & specialize the AIS, Met and Flight information elements to be exchanged between systems
  - Remain semantically compliant with the AIRM
- **Within SWIM**
  - As a minimum, achieve semantic interoperability (AIRM compliance)
  - Achieve a better level of interoperability whenever possible, through common –XMs and shared service models
  - Solutions based on XMs, XM extensions, or newly defined payloads.

Towards a global Information Management Framework…

Note: Inspired by the EC European Interoperability Framework

Questions