

SMSWG Meeting 25/11/2014

Adrian Murton

MoSSEC

**A new initiative for sharing
Modelling and Simulation
information in a collaborative
Systems Engineering Context**

Agenda

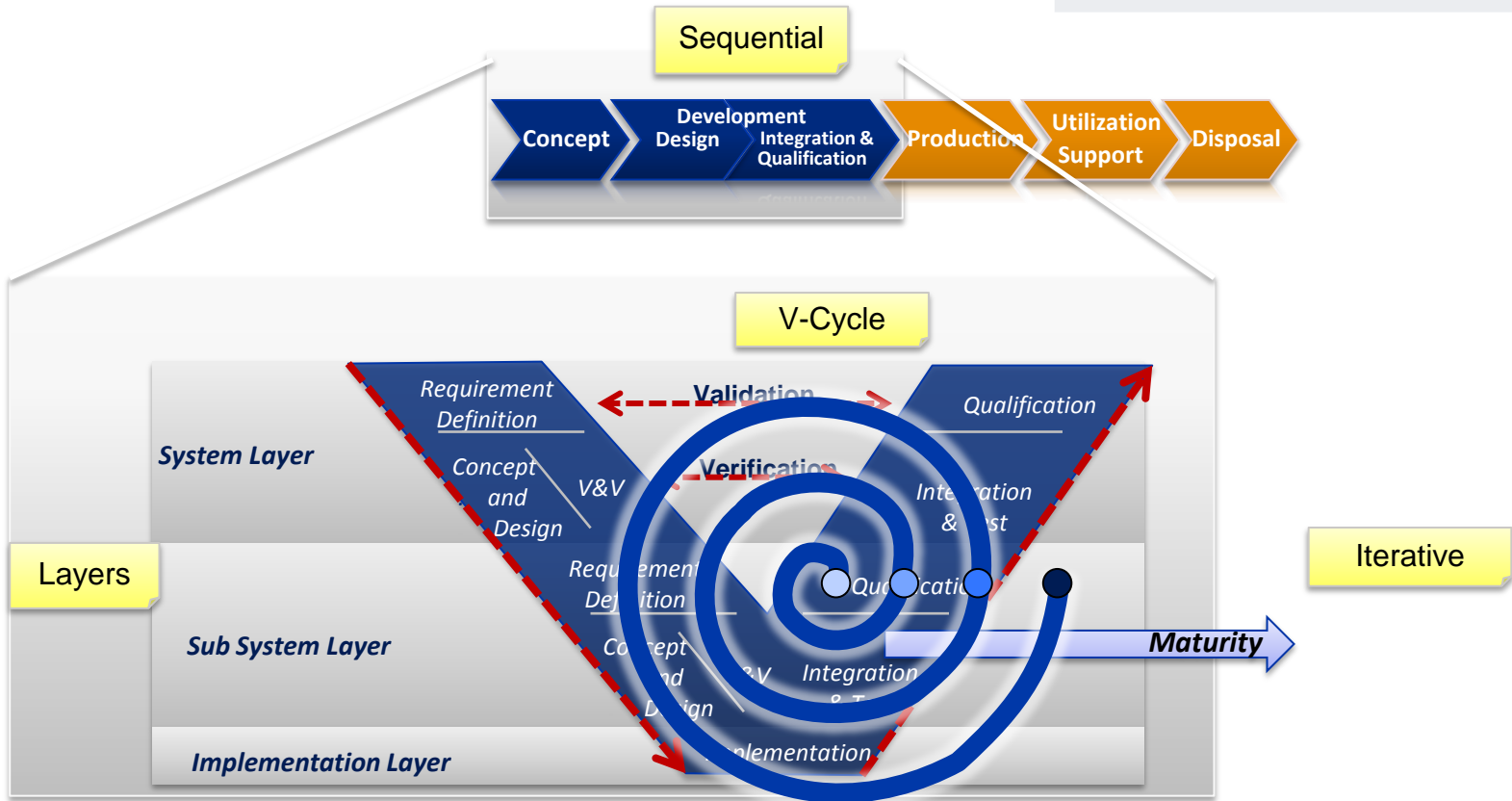
- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **How do I get involved in MoSSEC?**
- **Summary**

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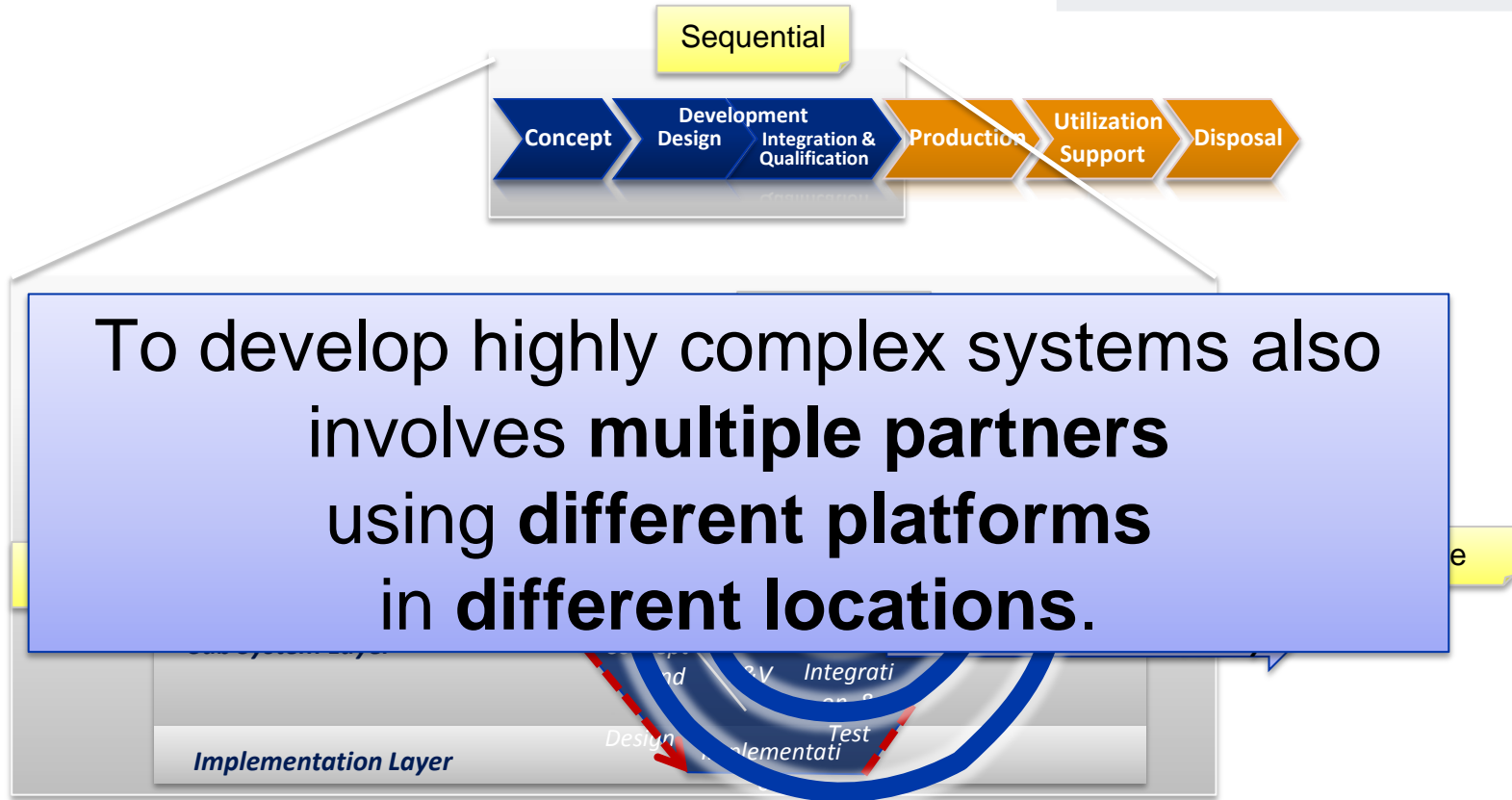
Why do I need MoSSEC?

- **What is MoSSEC?**
- **How do I get involved in MoSSEC?**
- **Summary**

Lifecycle of "System of Interest"



Lifecycle of “System of Interest”



Challenges for distributed systems engineering

- **Distributed Infrastructure**

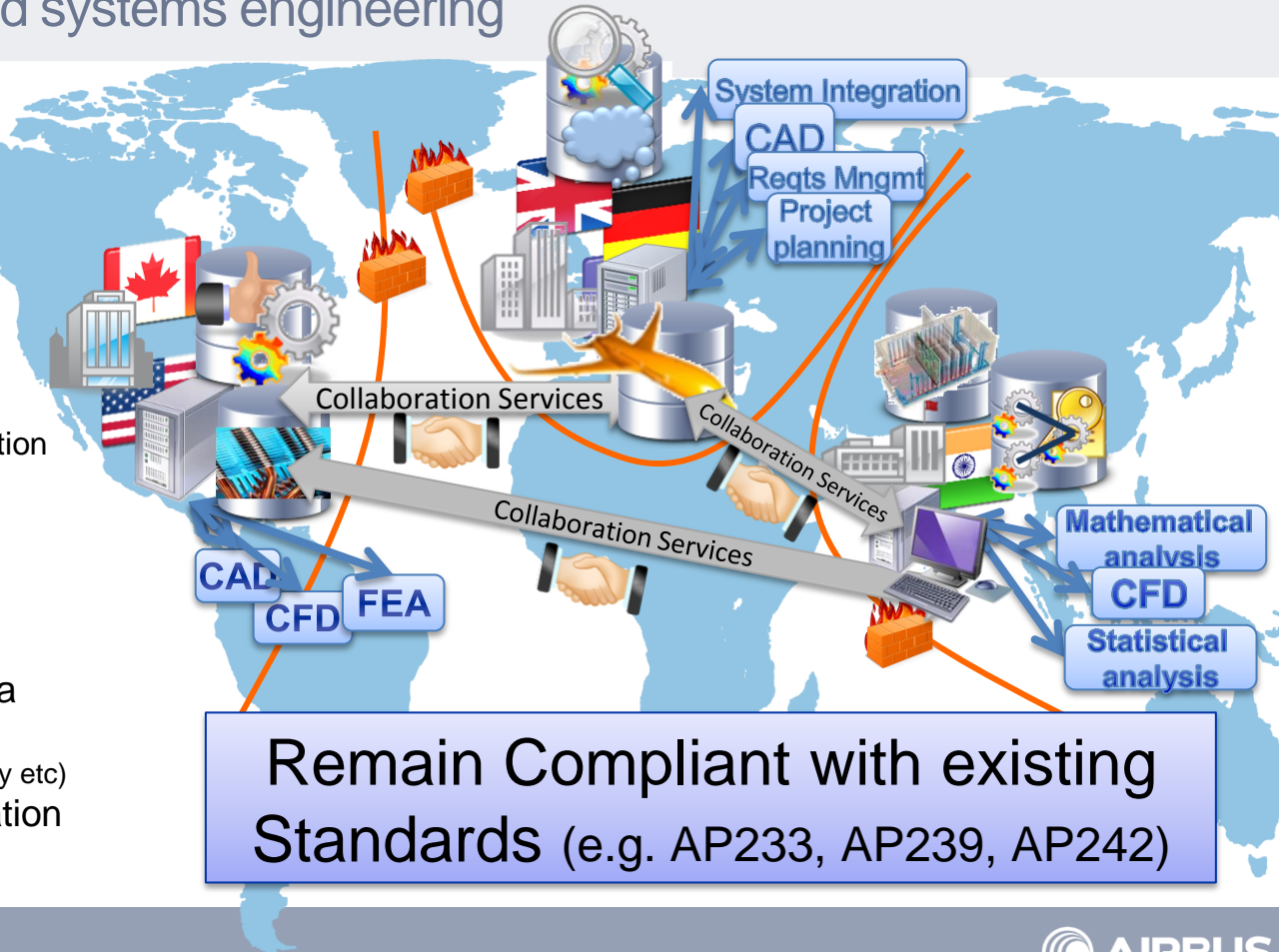
- Secure Collaboration for:
 - Locations
 - Organisations
 - Software Platforms

- **Distributed Processes**

- Multitude of Modelling and Simulation tools
- Simulation driven design changes traced and under PLM control

- **Distributed Data**

- Modelling and Simulation data
- V-cycle meta-data
 - (who what when where how why etc)
- Efficient sharing, synchronisation and integration



Challenges for distributed systems engineering

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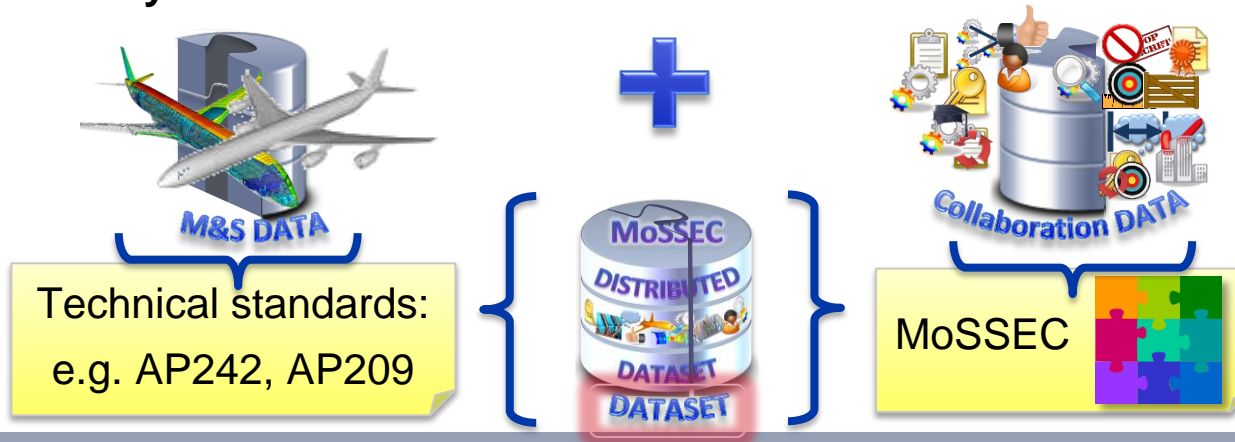
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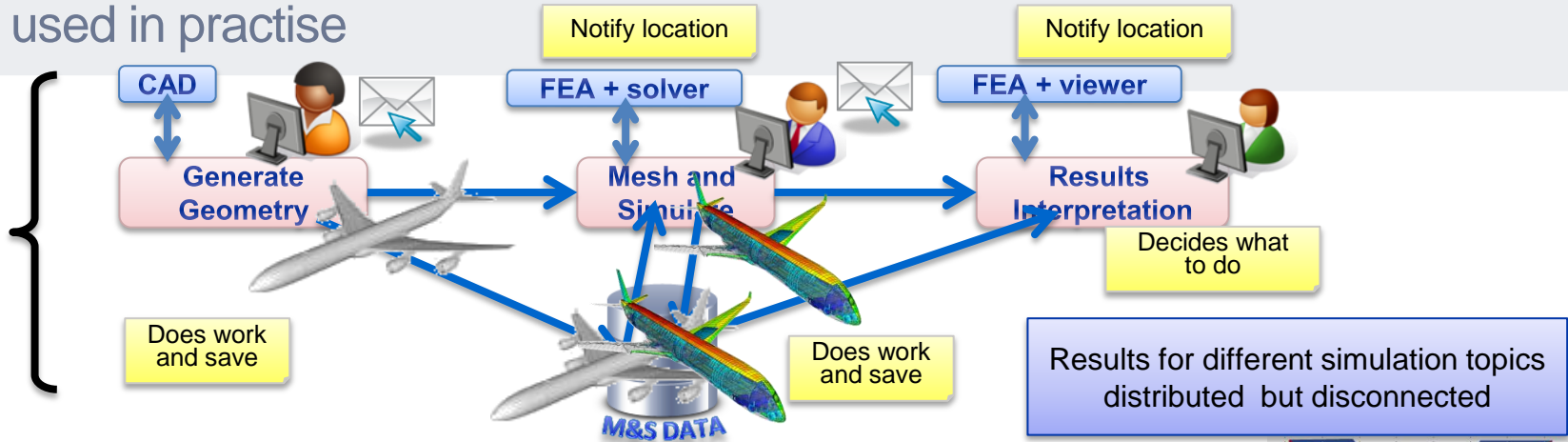
Collaboration vs Modelling & Simulation Data

- **Modelling and Simulation data**
 - Managed in the PLM/M&S systems
 - Exchanged with technical standards
- **Collaborative SE context data**
 - Managed by MoSSEC Compliant Tools
 - Exchanged with MoSSEC services
- **Together they enable the distributed dataset**

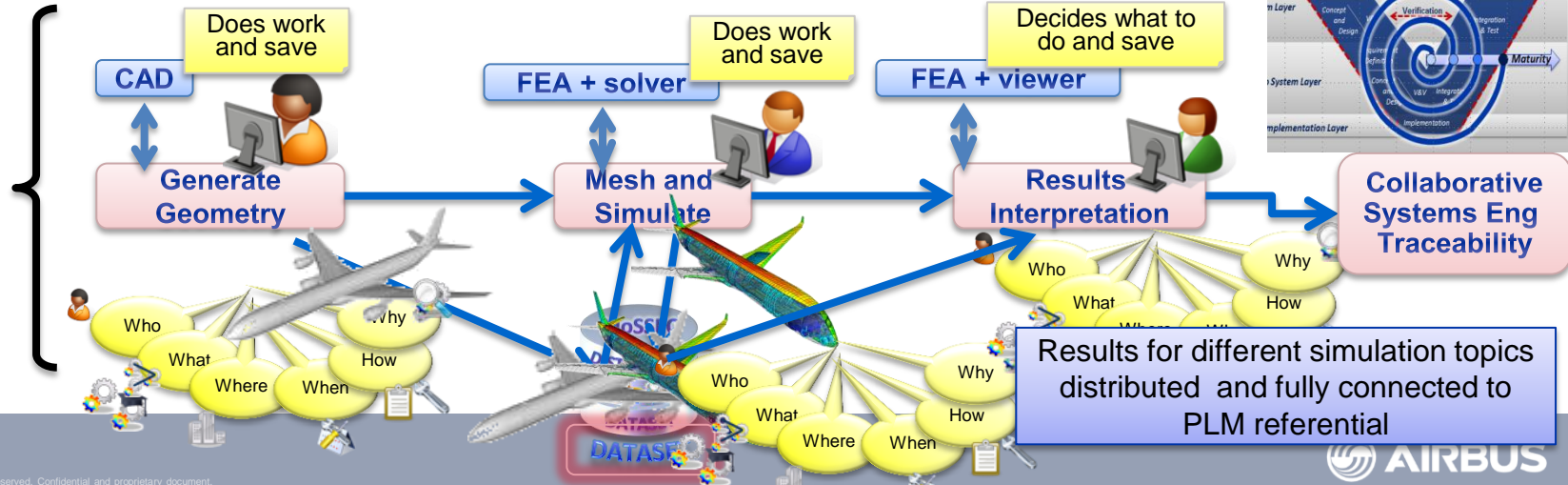


How is it used in practise

Typical process



Typical process with MoSSEC



How is it used in practise - distributed

• Distributed Infrastructure

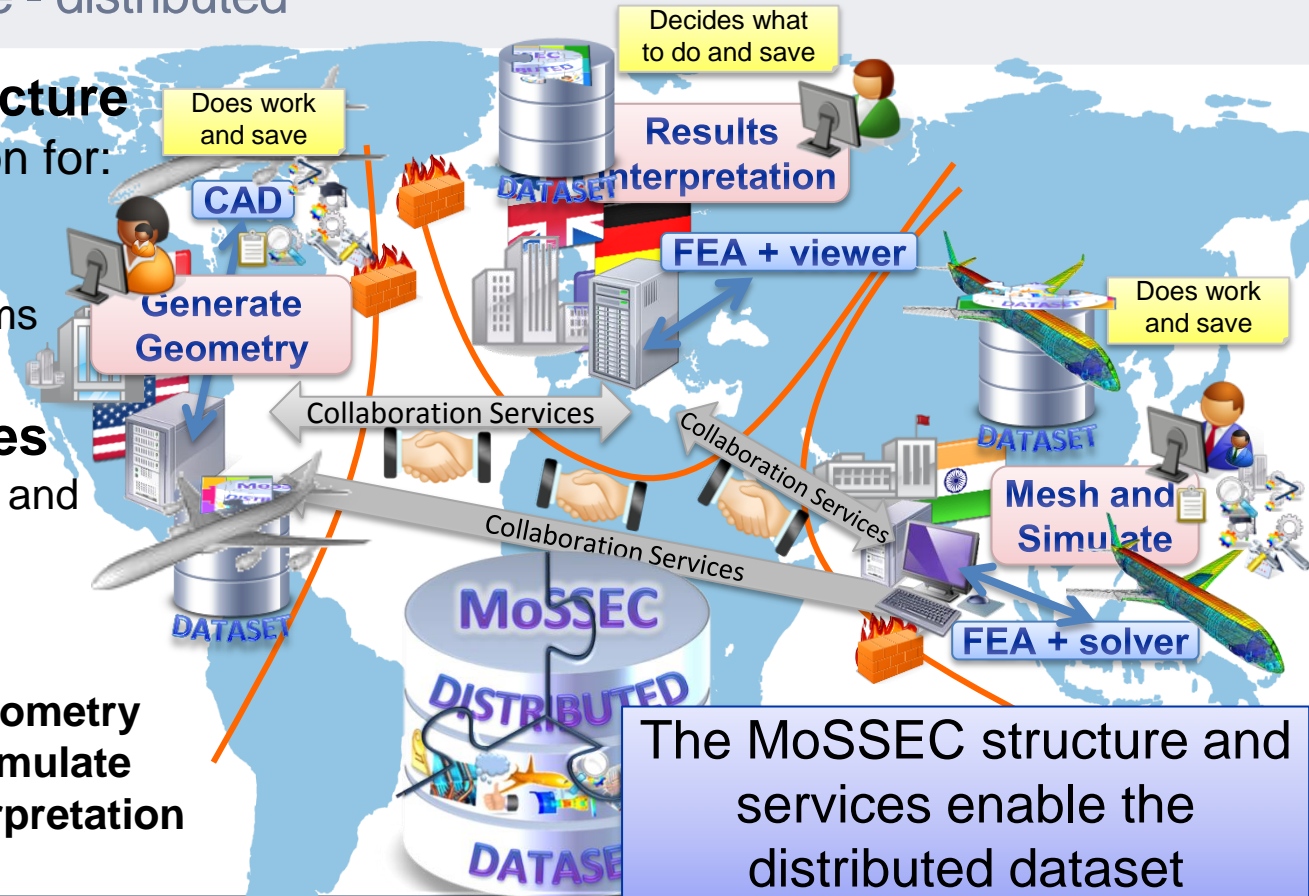
- Secure Collaboration for:
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• Distributed Processes

- Multitude of Modelling and Simulation tools

• Distributed Dataset

- Step1 – Generate Geometry
- Step2 – Mesh and Simulate
- Step3 – Results Interpretation



The MoSSEC structure and services enable the distributed dataset

Agenda

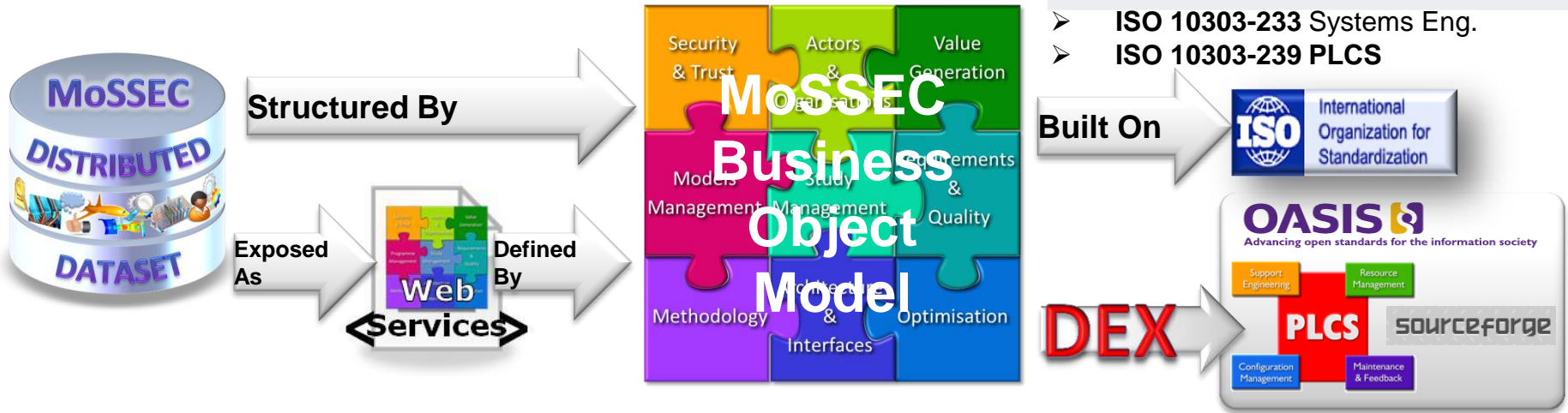
- **Why do I need MoSSEC?**



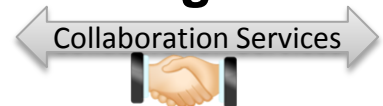
What is MoSSEC?

- **How do I get involved in MoSSEC?**
- **Summary**

MoSSEC: a common approach based on standards



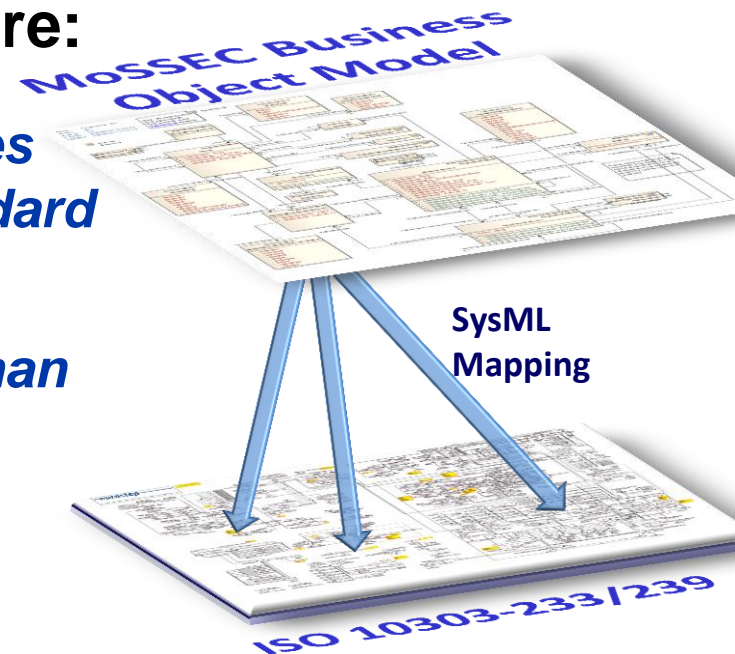
- **MoSSEC provides a common approach for:**
 - Structuring the Distributed Dataset
 - Structuring the Information Services for Dataset Management
- **MoSSEC is built on ISO standards**



Why not just use the ISO standards?

PLCS (ISO 10303-239) is generic, flexible, and designed to be extended and specialised therefore:

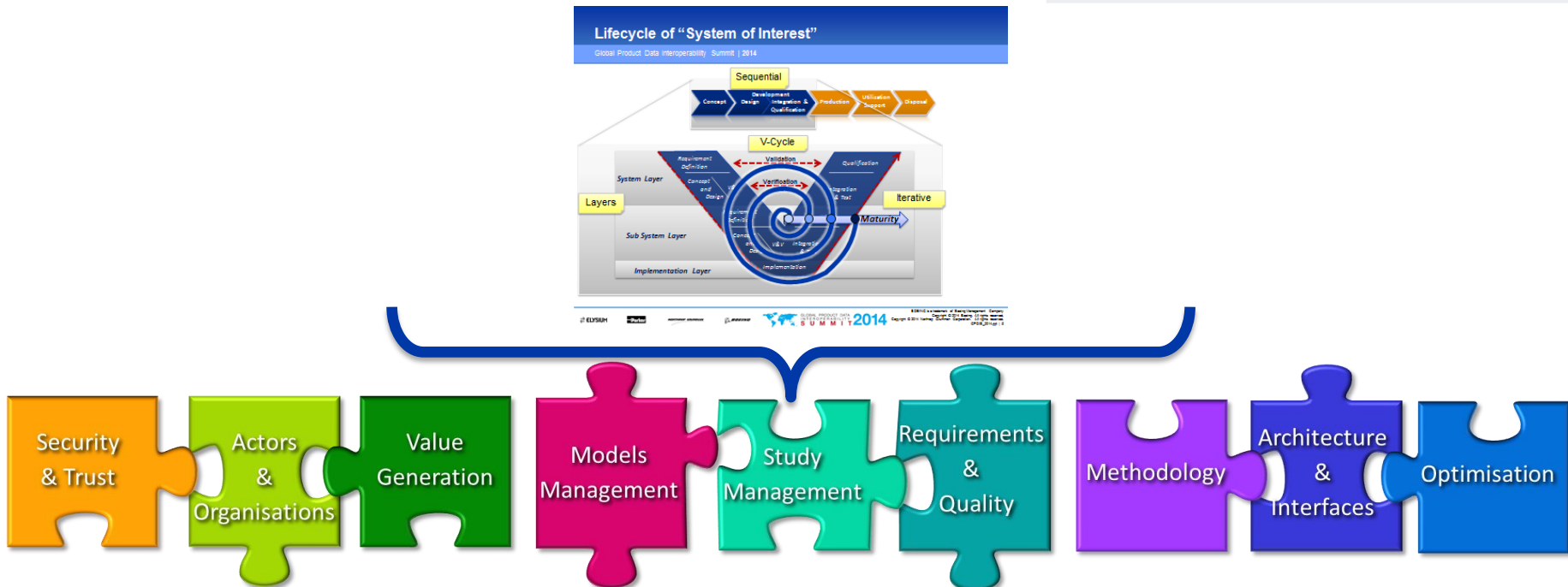
- *MoSSEC Business Object Model provides usage guidance to explain how the standard is used in context*
- *MoSSEC Services are at a higher level than the standard, so are more efficient*



MoSSEC Business Object Model coverage

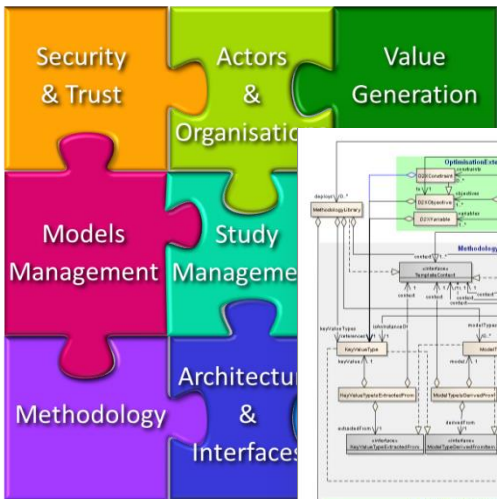


MoSSEC Business Object Model coverage

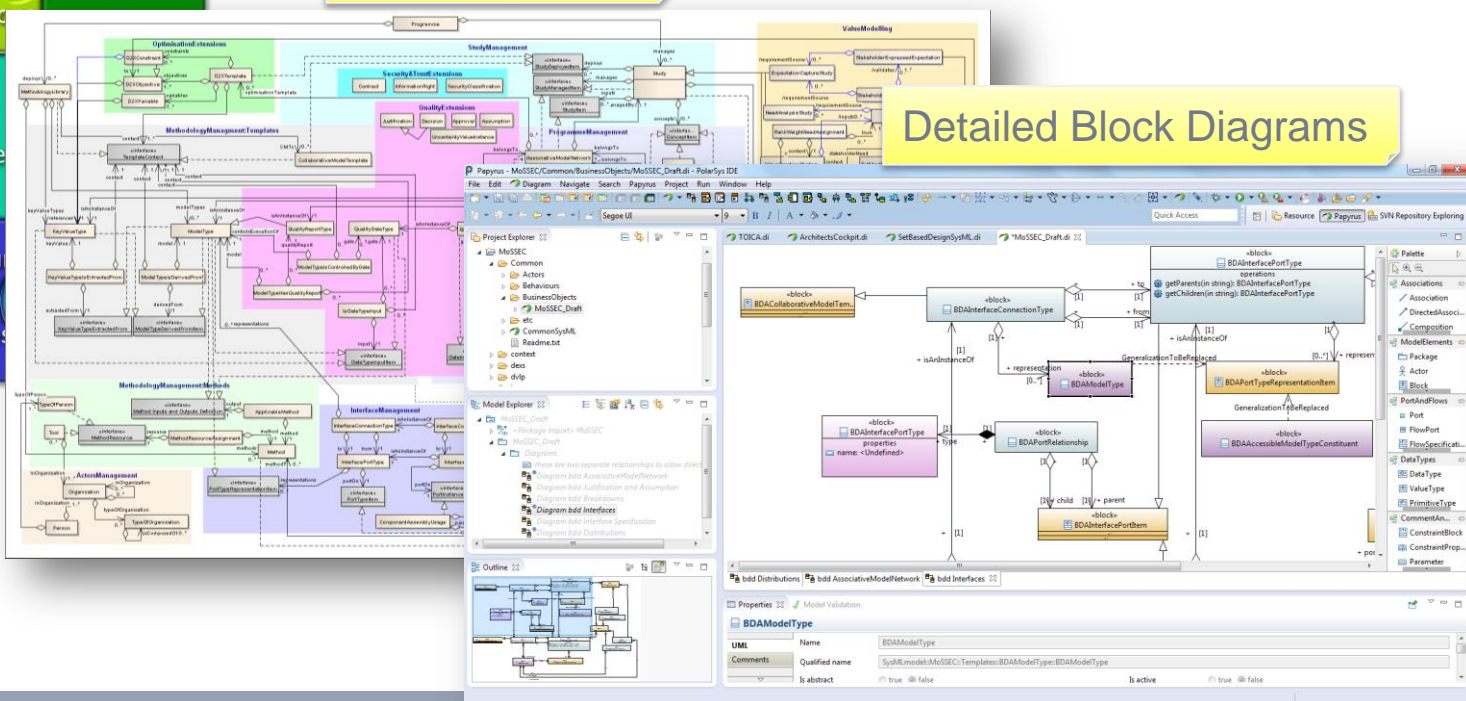


MoSSEC enables capture of data throughout the Lifecycle of the "System of interest"

MoSSEC Business Object Model defined with SysML

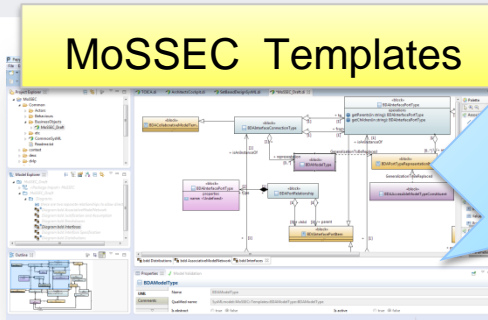


Summary View



MoSSEC Data Sharing approach

MoSSEC Templates



MoSSEC Web Services specification

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...London, Heath Stn, 2012
...: oasiscs-support@oasiscs.org

...
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xmlns="http://www.oasiscs-fp7.eu/schemas/BDA/Bda_ProgramManagement" elementForm
fp7.eu/schemas/BDA/Bda_BaseObject" xmlns="http://www.oasiscs-fp7.eu/schemas/BDA/
<!-- import schemaLocation="Bda_BaseObject.xsd" namespace="http://www.oasiscs-fp7.eu/sche
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<!-- complexType name="BdaBaseInstance">
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<!-- extension xmlns="http://www.oasiscs-fp7.eu/schemas/BDA/Bda_BaseObject" base
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<!-- sequence
<!-- element name="executorOf" type="baseObjectReference" nillable="true" />
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</xsd:sequence>
</xsd:extension>

```

- **Data Sharing (Web services)**
 - Defined using WSDL + XSD
 - **Management of WSDL: To be Defined**
 - (e.g. OASIS PLCS, OASIS OSLC, OMG, ISO TC184SC4)

Data shared
using Web
services

Collaboration Services

MoSSEC Data Sharing approach

MoSSEC Data Exchange [DEX] specification

MoSSEC Templates





MoSSEC Web Services specification

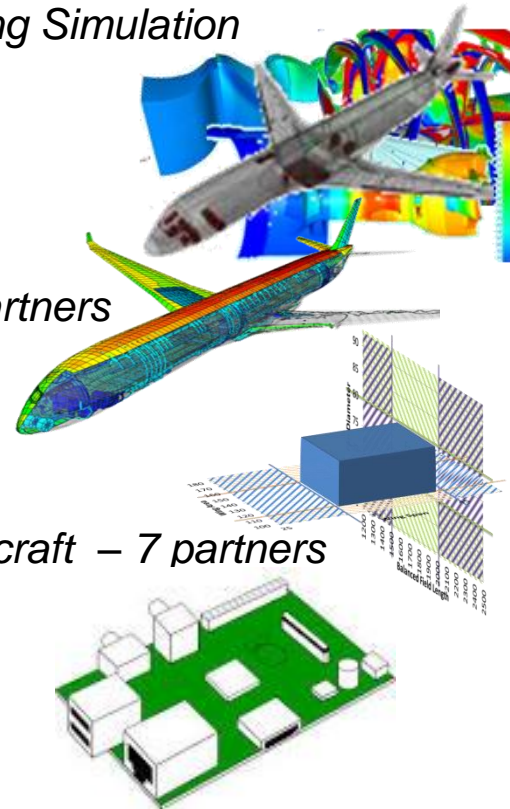
Data exchanged using e.g. file transfer

Collaboration Exchange

- **Data Exchange (file based)**
 - **Baseline: DEXs to use OASIS PLCS PSM templates**
 - **Recommended practices (formal mapping of information model to underlying OASIS PLCS Standard)**
 - **Target: DEXs to be based on ISO AP239 Ed 3 (organization of an international workshop in the next 6 months to finalize the white paper)**

MoSSEC: Current and previous case studies

- 
CRESCENDO *Collaborative and Robust Engineering using Simulation Capability Enabling Next Design Optimisation – 59 partners*
 - Thermal Aircraft
 - Power-plant integration
- 
TOICA *Thermal Overall Integrated Concept Aircraft – 30 partners*
 - Dynamic Aircraft Thermal Architectures
 - functional, physical, zonal, logical...
- 
CONGA *Configuration Optimisation of Next Generation Aircraft – 7 partners*
 - Set Based Design
- 
SAVI *System Architecture Virtual Integration – 11 partners*
 - Printed Circuit Boards



Vendor involvement

- **Vendors are active in evolving and implementing the standard as part of ongoing research projects**
- **Vendors involved include:**
 - **Dassault Systèmes**
 - **Eurostep**
 - **MSC Software**
 - **Siemens PLM**

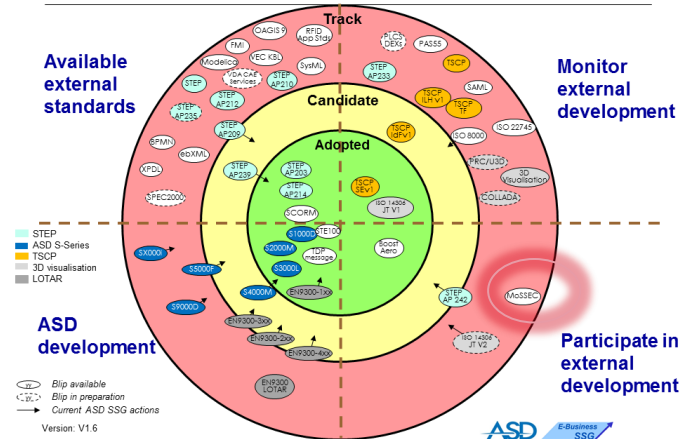
A MoSSEC distributed dataset will only happen if vendors implement clients and servers

MoSSEC: Status

- **Baseline version released through:**
 - CRESCENDO project
- **Utilised and evolved through:**
 - TOICA, CONGA and SAVI projects
- **Presented to:**
 - PDES & ProSTEP
- **Support for MoSSEC from:**
 - *AeroSpace and Defence Industries Association of Europe Strategic Standardization Group [ASD SSG]*

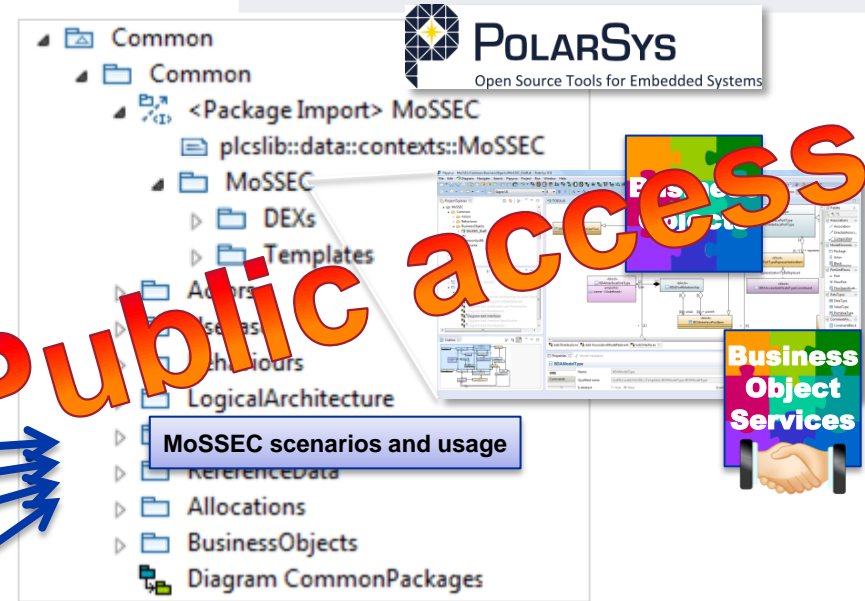


Radar screen



MoSSEC Evolution and Development

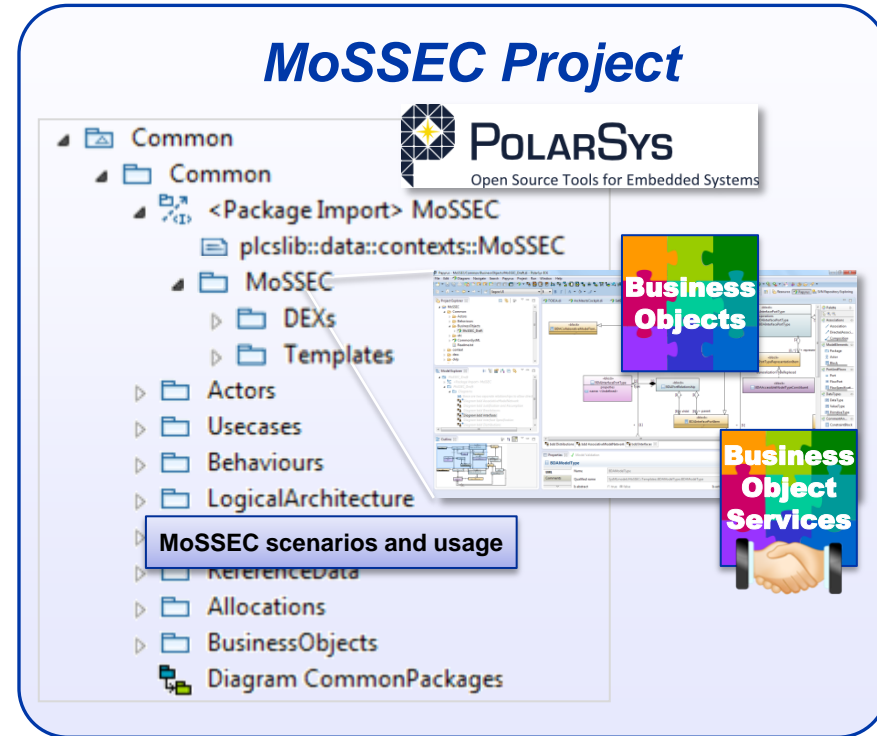
- Using an MBSE approach
 - Captured using Polarsys
- Utilised by projects
- Contributions from projects consolidated




More projects are welcome to join and contribute.

What's next – International MoSSEC Project created

- **Agree scope of MoSSEC releases**
- **Agree the relevant modelling, documentation and usage guidelines**
- **Push through the relevant standards bodies**
- **Agree the governance for the standard**
- **Promote approach**
 - Internal to your companies
 - With your vendors



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Involvement: Where to access MoSSEC information

- **ASD-SSG website**

- www.asd-ssg.org/mossec
- **Overview**
- **WSDL + XSD**



- **CRESCENDO public deliverables**

- www.crescendo-fp7.eu
- **Technical documentation downloads**
 - [UML model](#)
 - [Descriptive documentation](#)
 - [Deployment guide](#)



- **GPDIS Presentation**

- www.gpdisonline.com/presentations2014/SE_6_0_Airbus-AdrianMurton-MoSSEC.pdf

- **Contact:** adrian.murton@airbus.com

Involvement: Review the MoSSEC information

- **Do you agree with the scope of MoSSEC?**
 - **What is missing?**
- **Do you agree with the Object Model definitions?**
 - **How can they be improved?**
- **Do you agree with the way information is modelled?**
 - **How can it be improved?**
- **Does the user documentation make sense?**
 - **What topics could be improved?**
- **Discuss the approach with your vendors**
 - **Do they support it?**

Involvement: Join International MoSSEC Project

- **Kick off meeting held October 29th 2014**
 - **Attendees:**
 - Industrial – Airbus, Boeing, Rockwell Collins, GKN Aerospace, Honeywell
 - Vendors - Eurostep, Dassault Systemes, MSC, Siemens
 - Academia/Research Partners – NLR, UI Labs
- **Agreed to hold bi-weekly meetings to progress standardisation topics such as:**
 - **Governance of the standard**
 - **Coverage of the Business Object Model**
 - **Overall planning of the standard versions**
- **Contact adrian.murton@airbus.com to be added to invite list**
- **Aim to hold kick off international MoSSEC workshop Q1 2015**

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Summary

- **Why do I need MoSSEC?**

- **Industrialists:**

- To provide a platform independent approach to structure and access simulation and decision data in the evolving distributed product dataset.
- To enable Modelling and Simulation in a collaborative Systems Engineering Context

- **Vendors:**

- To provide access to data and processes in other vendor platforms with one set of services

Summary

- **What is MoSSEC?**

- A SysML based definition of business objects and services extending/specialising ISO 10303-233 (*Systems Engineering*) and -239 (*PLCS*)
- A proposed project launched to formalise and publish as a standard

- **How do I get involved in MoSSEC?**

- Use and contribute to the evolving publicly available definitions and usage guides
- Join the kick off meeting(s) of the proposed MoSSEC project
- Contact adrian.murton@airbus.com to be added to invite list

Any Questions?

