MoSSEC
Adrian Murton
Airbus Operations Ltd

MoSSEC

A proposed standard for sharing **Mo**delling and **S**imulation information in a collaborative **S**ystems **E**ngineering **C**ontext

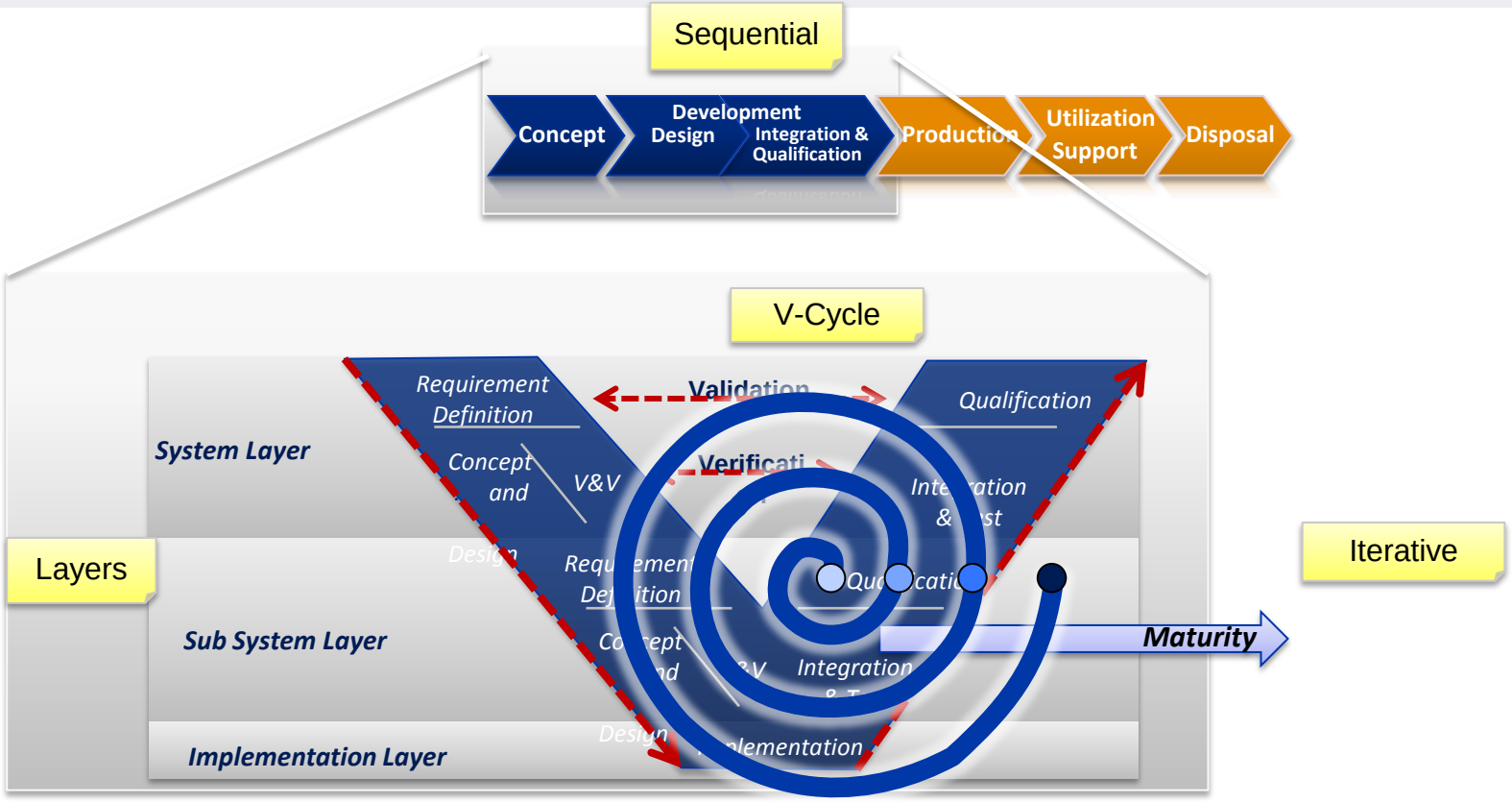
Agenda

- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **What is the status of MoSSEC?**
- **Summary**

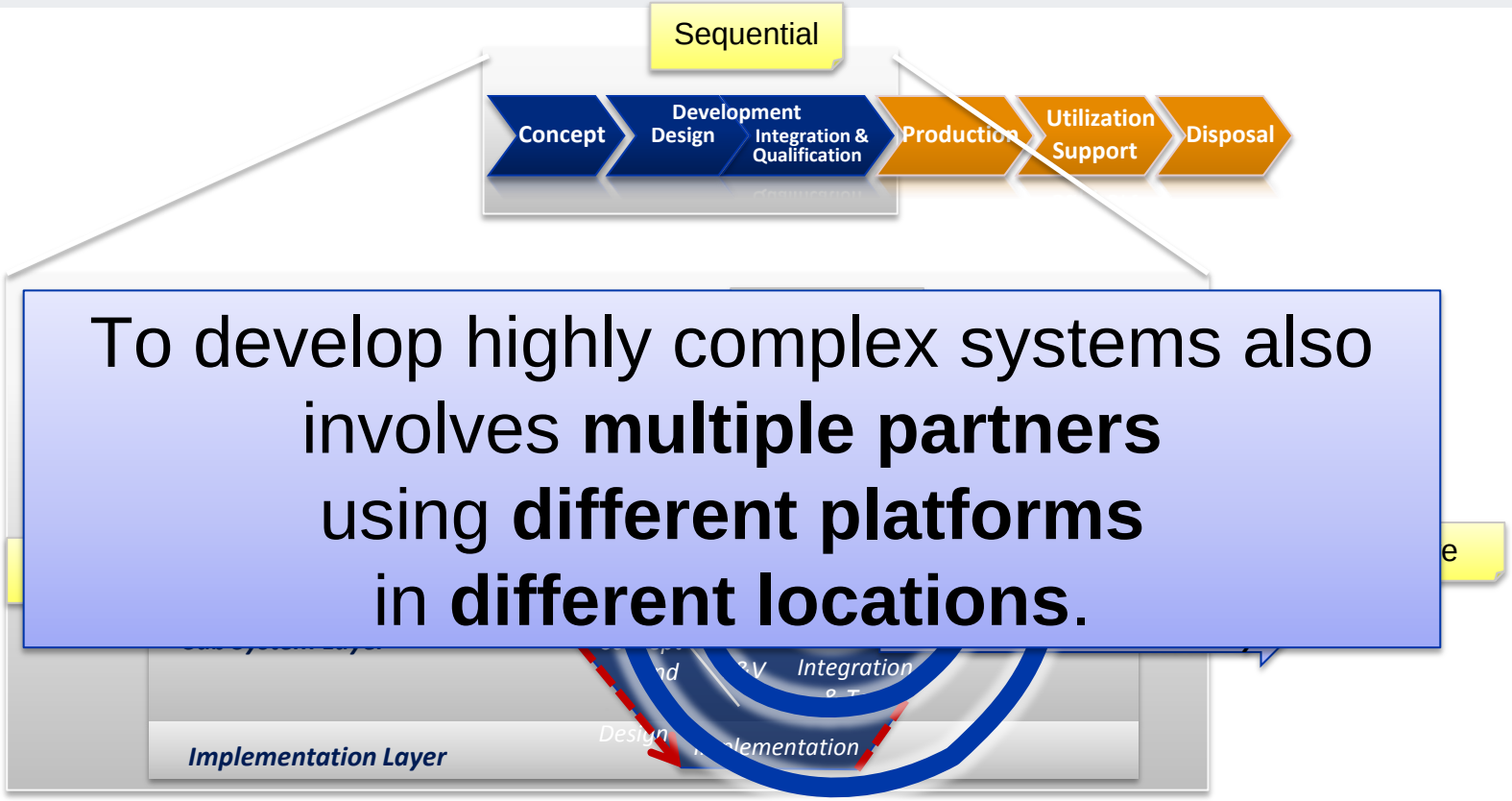
Agenda

- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **What is the status of MoSSEC?**
- **Summary**

Lifecycle of “System of Interest”

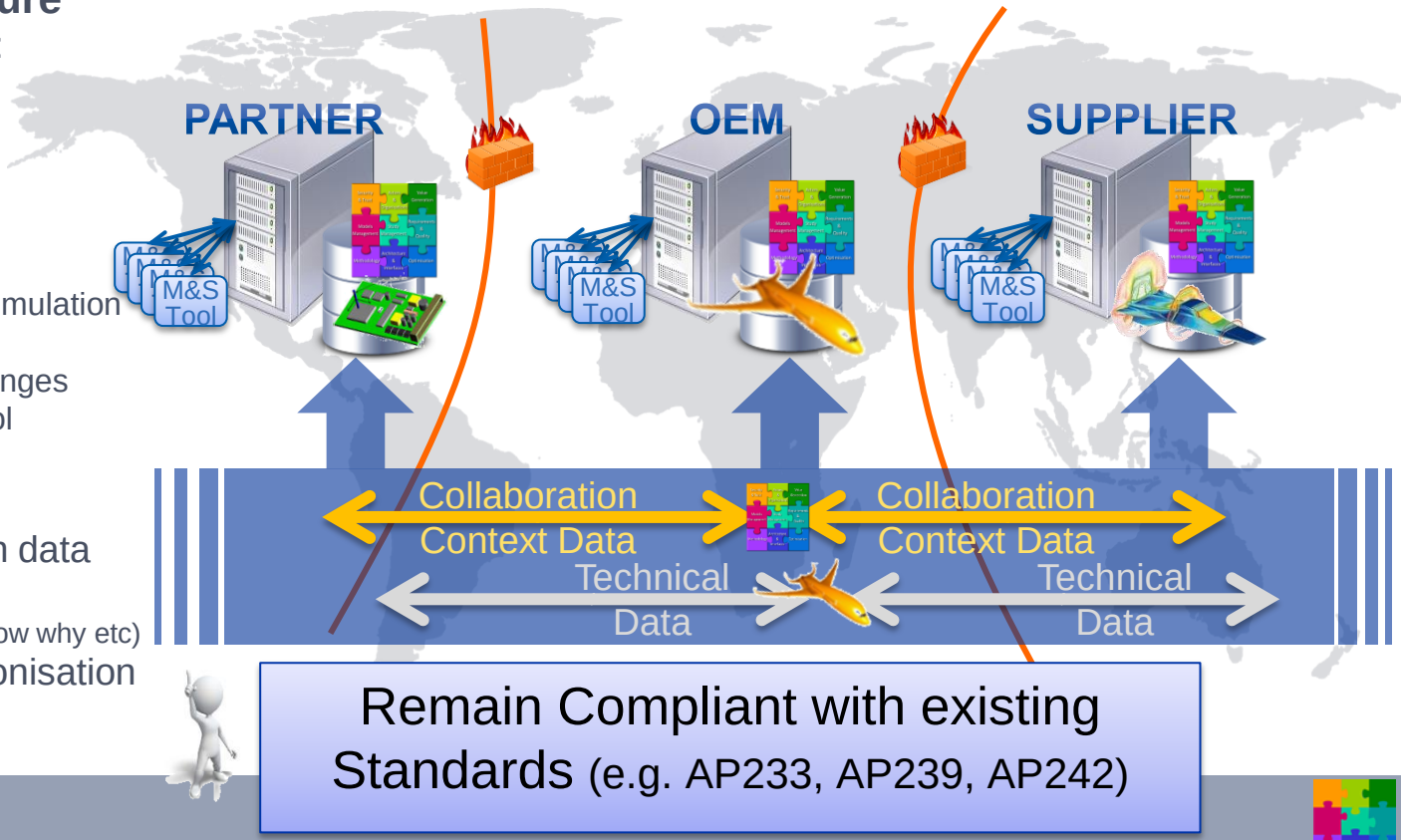


Lifecycle of “System of Interest”



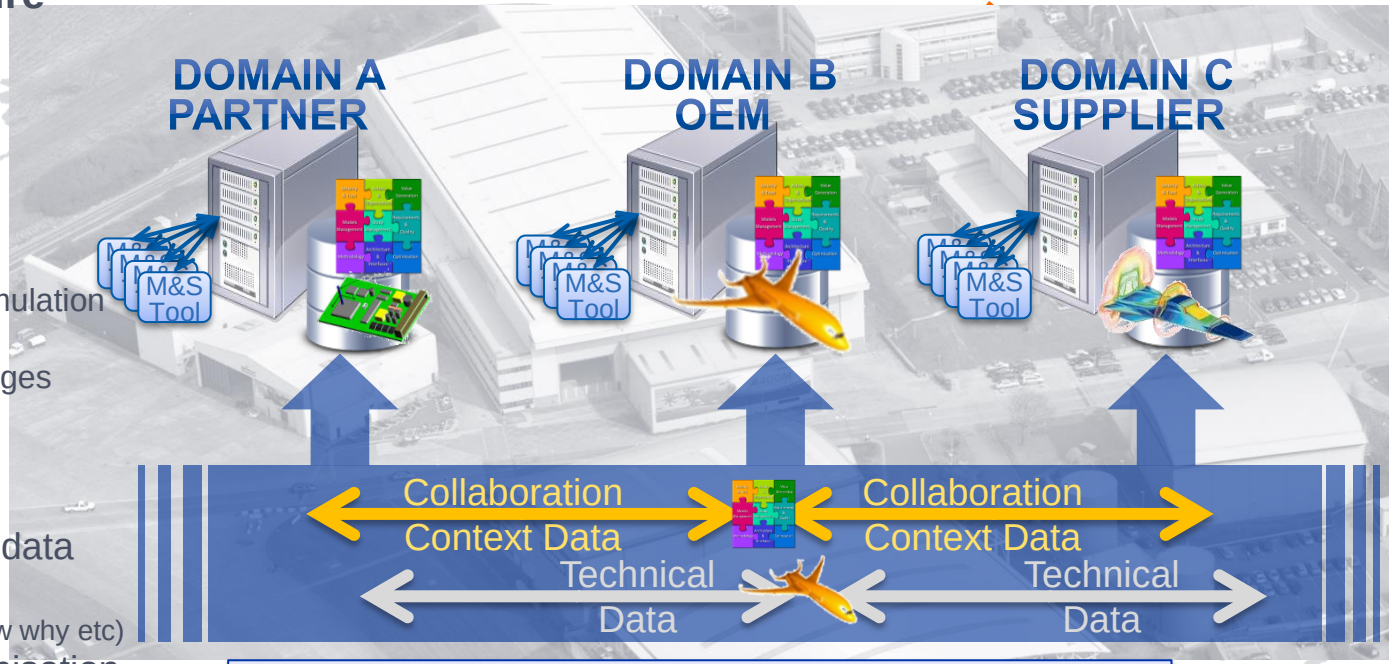
Challenges for distributed systems engineering

- **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

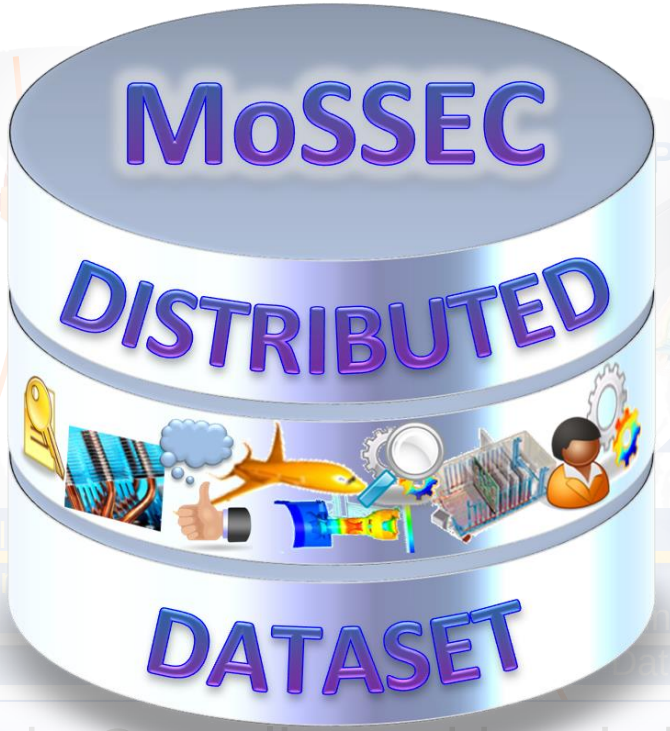
- **Distributed Infrastructure**
  - Secure Collaboration for:
    - Locations
    - Organisations
    - Software Platforms
- **Distributed Processes**
  - Multitude of Modelling and Simulation tools
  - Simulation driven design changes traced and under PLM control
- **Distributed Data**
  - Modelling and Simulation data
  - V-cycle meta-data
    - (who what when where how why etc)
  - Efficient sharing, synchronisation and integration



Distributed SE challenges are applicable to in-house organisations

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

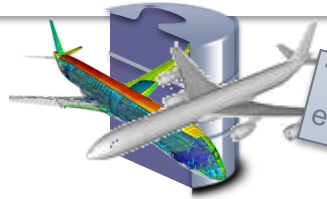


Remain Compliant with existing Standards (e.g. AP233, AP239, AP242)

Collaboration vs Modelling & Simulation Data

Modelling and Simulation data

- Managed in the PLM/M&S systems
- Exchanged with technical standards



Technical Standards
e.g. AP242, AP209, FMI

MoSSEC who, what, where, when, how, why

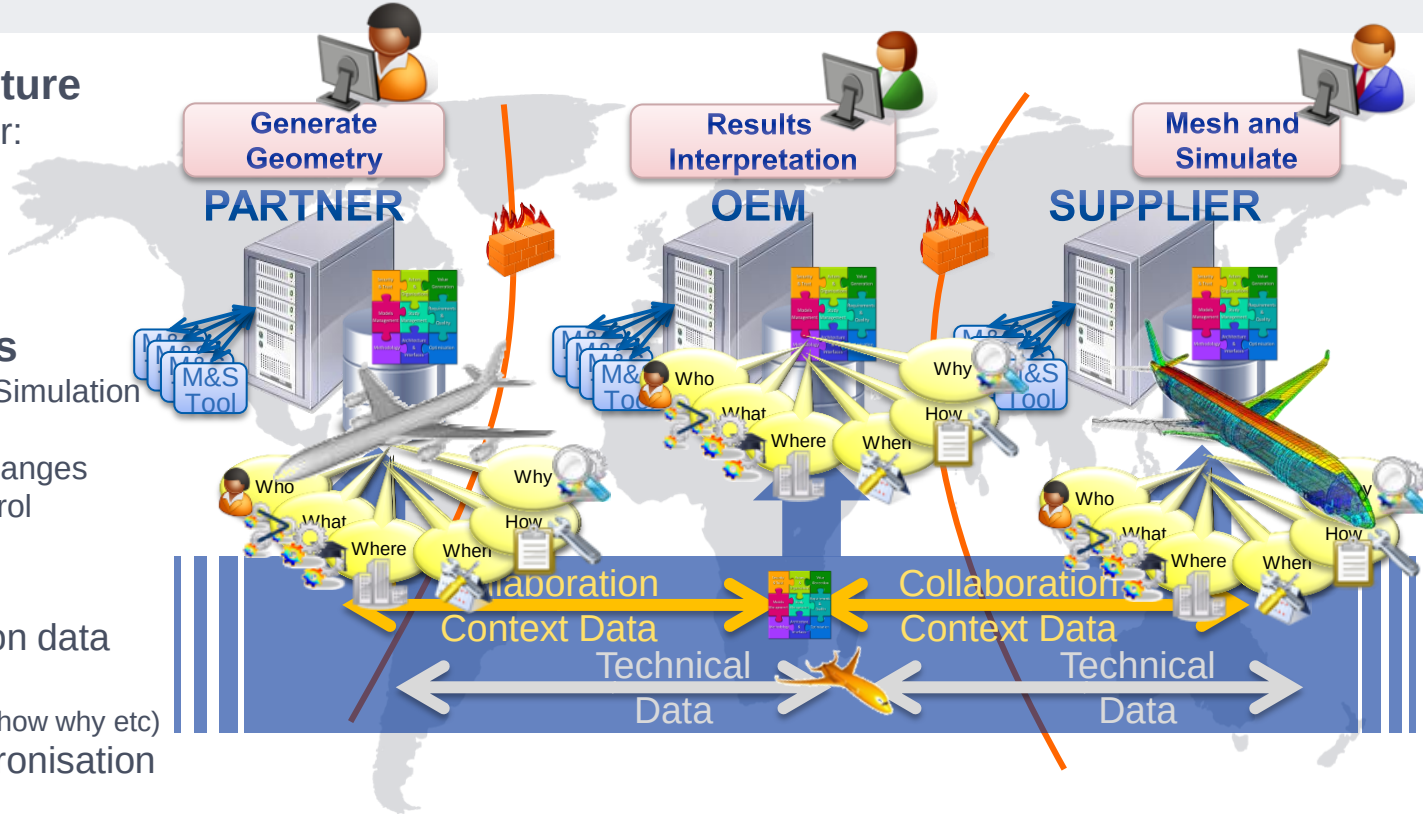
Together they enable the distributed dataset

Collaborative SE context data

- Managed by MoSSEC Compliant Tools
- Exchanged with MoSSEC standard

How is it used in practise - distributed

- **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

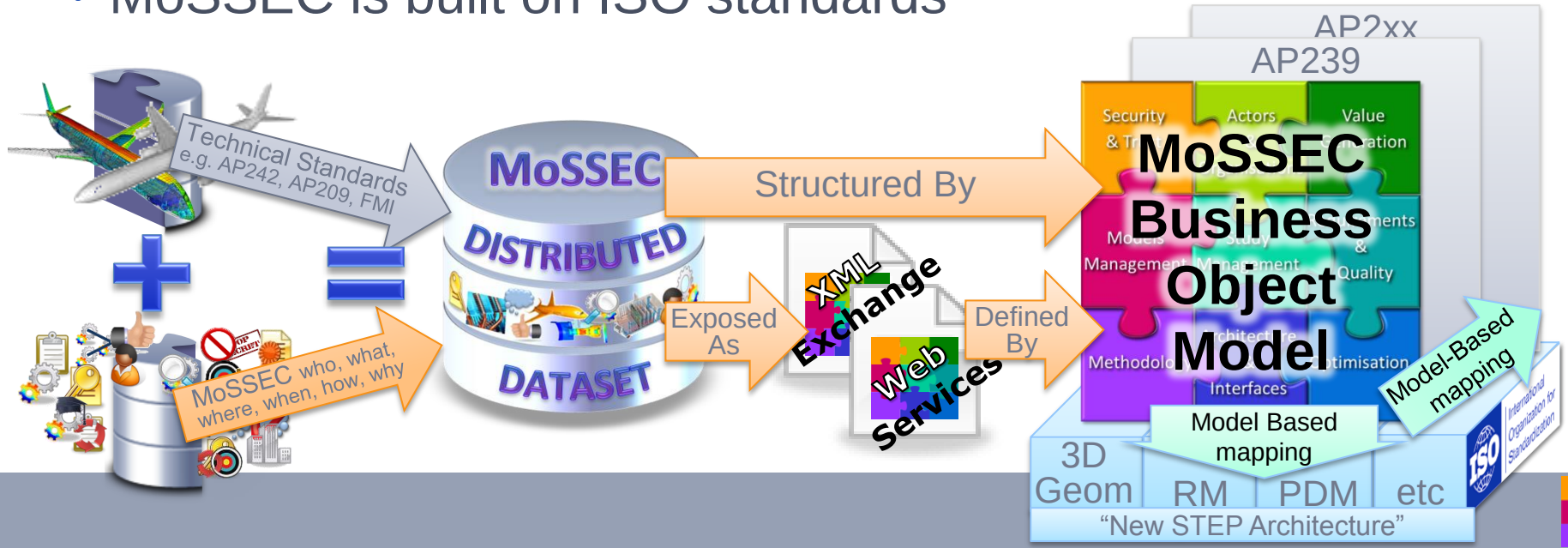


Agenda

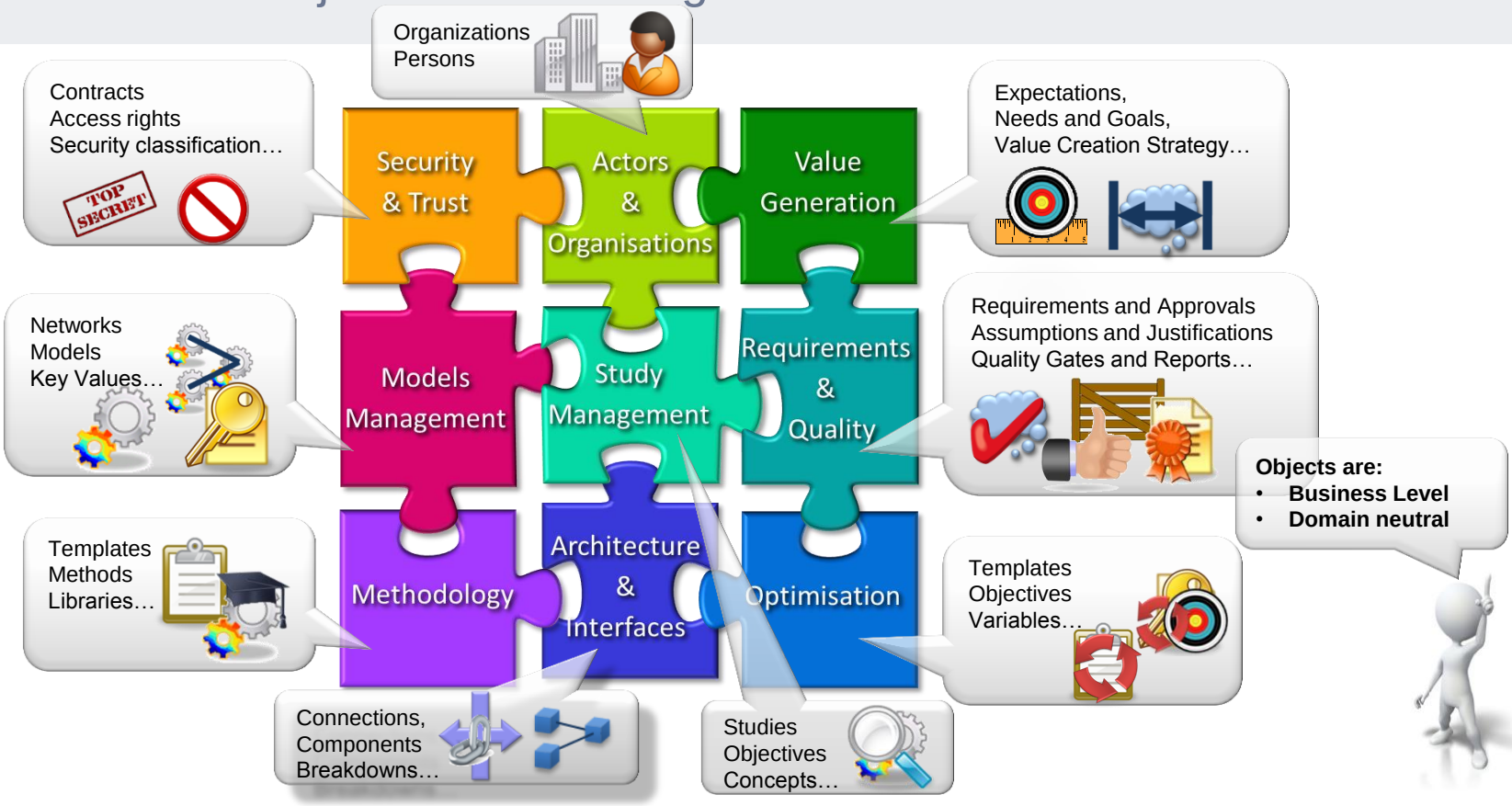
- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **What is the status of MoSSEC?**
- **Summary**

MoSSEC: a common approach based on standards

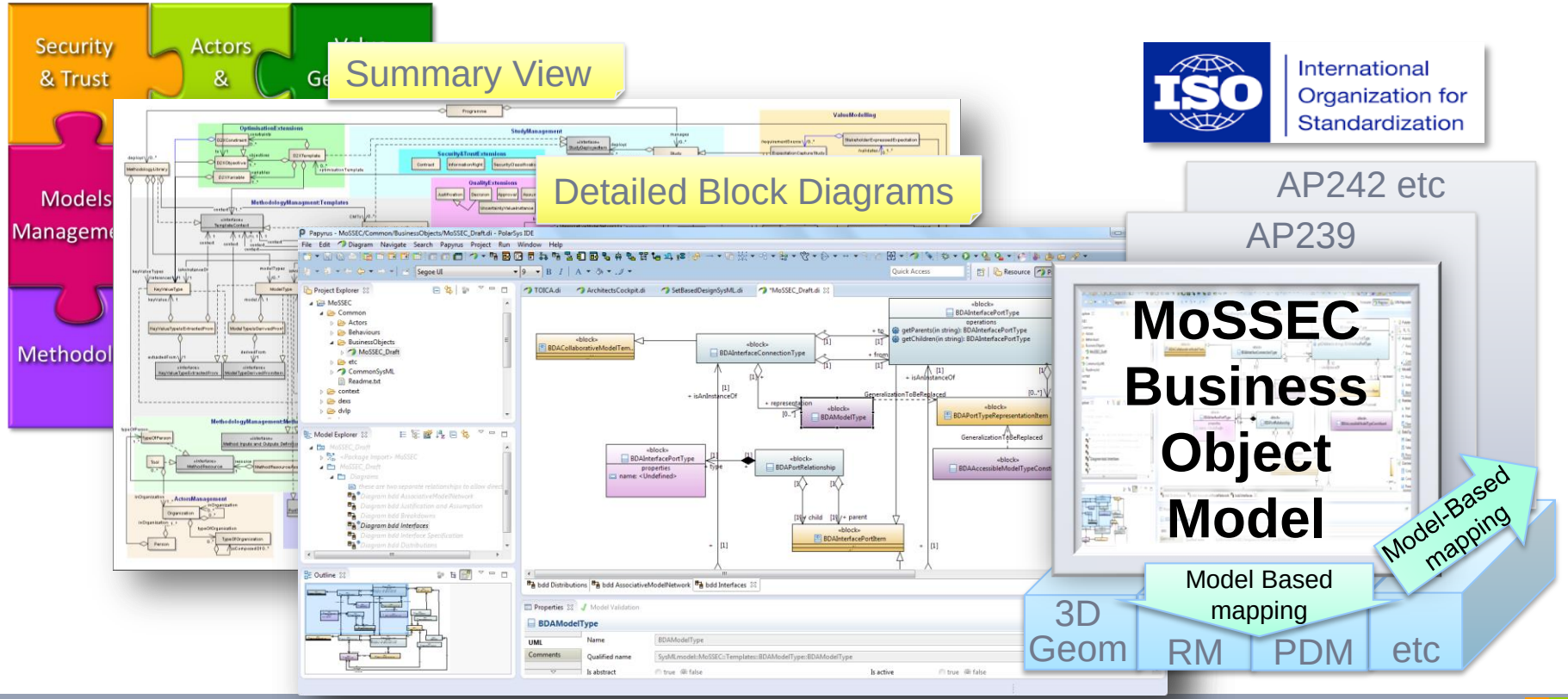
- MoSSEC provides a common approach for:
  - Structuring the Distributed Dataset
  - Structuring the Information Services for Dataset Management
- MoSSEC is built on ISO standards



MoSSEC Business Object Model coverage



MoSSEC Business Object Model defined with SysML

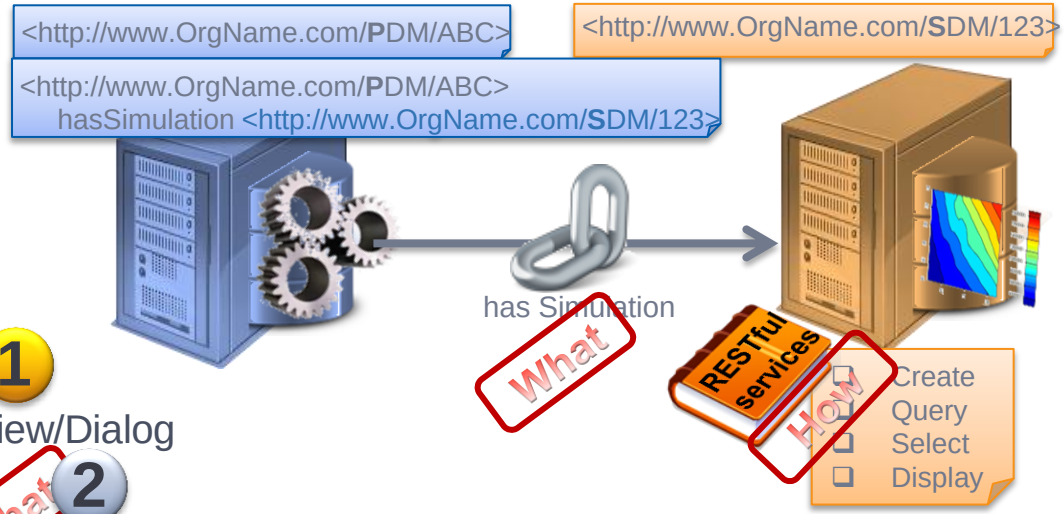


SysML use in MoSSEC

- MoSSEC standardisation team
  - ➔Use SysML to define the MoSSEC standard
- Capability Developers
  - ➔Read SysML definition to develop the MoSSEC enabled client/server capabilities
- Capability End Users
  - ➔Use the capabilities
  - ➔No SysML knowledge required

Linked Data, OSLC and MoSSEC – How and What

- Linked Data
  - Resources in different repositories
  - Link stored as <http> with role
- OSLC
  - Defines standard services (RESTful)
    - E.g. Create, Query, Select, Display Preview/Dialog
  - Defines **OSLC-specific** domain language
- MoSSEC
  - Defines domain language **based on ISO standard AP239**
  - Services defined as per ISO-10303 architecture
    - So far for shared data, could also use Linked data



	1 Primary	2 Secondary
OSLC	How	What
MoSSEC	What	How

Agenda

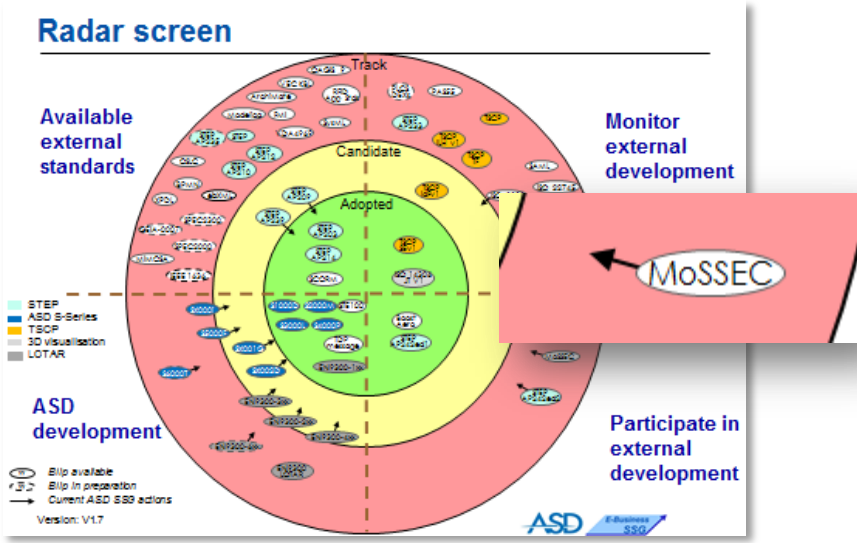
- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **What is the status of MoSSEC?**
- **Summary**

MoSSEC: Status

- Created and utilised on EU, UK and International research projects

- Gained Support for MoSSEC from:
  - *AeroSpace and Defence Industries Association of Europe Strategic Standardization Group [ASD SSG]*

- Launched International Project
  - Industrial and Vendor participation
  - Agreed standardisation under ISO
  - Website created (www.mossec.org)
  - Preliminary Work Item submitted
  - New Work Item and White Paper to be submitted 4th October



ISO International Organization for Standardization

MoSSEC project - participants

- **Project Co-chairs**:
  - Adrian Murton (Airbus Operations Ltd)
  - Greg Pollari (Rockwell Collins)

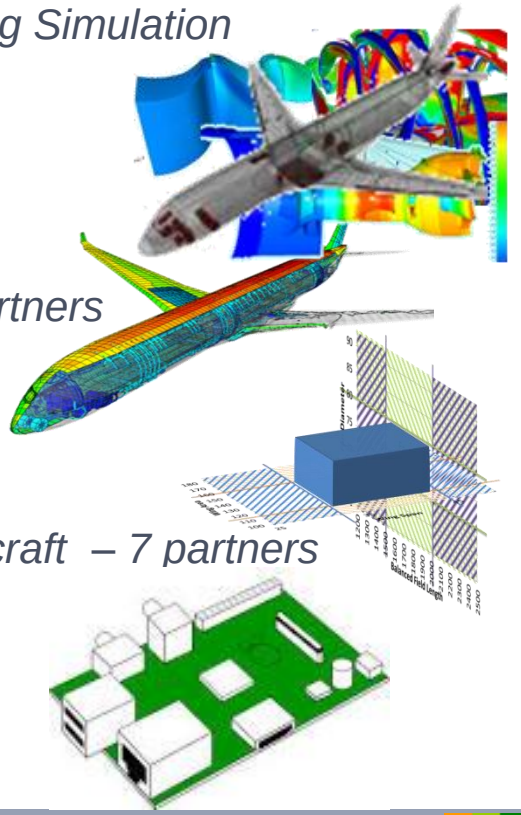
- **Industrial**:
  - Airbus Group, Boeing, Rockwell Collins, Honeywell, GKN Aerospace, BAE Systems…
- **Vendors**:
  - Dassault Systèmes, Eurostep, MSC Software, Siemens PLM Software…
- **Organisations**:
  - ASD SSG, AFNET, UKCeB, AVSI/SAVI, PDES Inc. (to be confirmed), AIA (to be confirmed),

MoSSEC White Paper (associated with New Work Item)

- MoSSEC Business Aspects
  - Overview of business context
  - Synthesis of business requirements
  - Business use case example
- MoSSEC Technical Aspects
  - Definition of technical content
  - Development principles
  - Interdependencies with related standards
- MoSSEC Project and Risk Management
  - Deliverables
  - Financial aspects
  - Scheduling

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*
  - **Consistency Checking between domains**



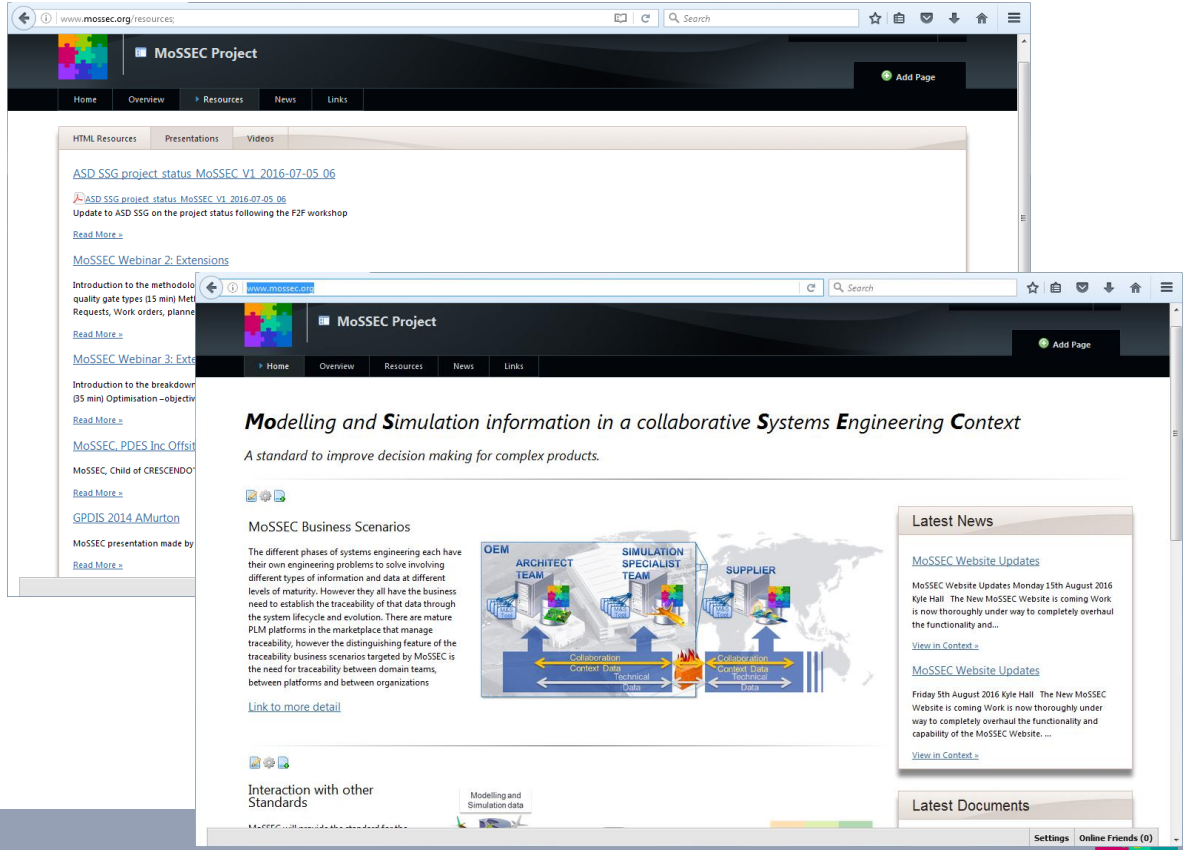
Vendor involvement

- 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 is being enabled as vendors implement clients and servers

Further MoSSEC information

- **MoSSEC website**
  - http://www.mossec.org/
  - **Overview**
  - **Resources**
  - **News**
  - **Links**



- **Members website**
  - http://private.mossec.org

Participate in the International MoSSEC Project

- **To be added to the members list contact:**
  - Gregory.Pollari@rockwellcollins.com
  - Adrian.Murton@airbus.com

- **Participate in bi-weekly Teleconference**

Agenda

- **Why do I need MoSSEC?**
- **What is MoSSEC?**
- **What is the status of MoSSEC?**
- **Summary**

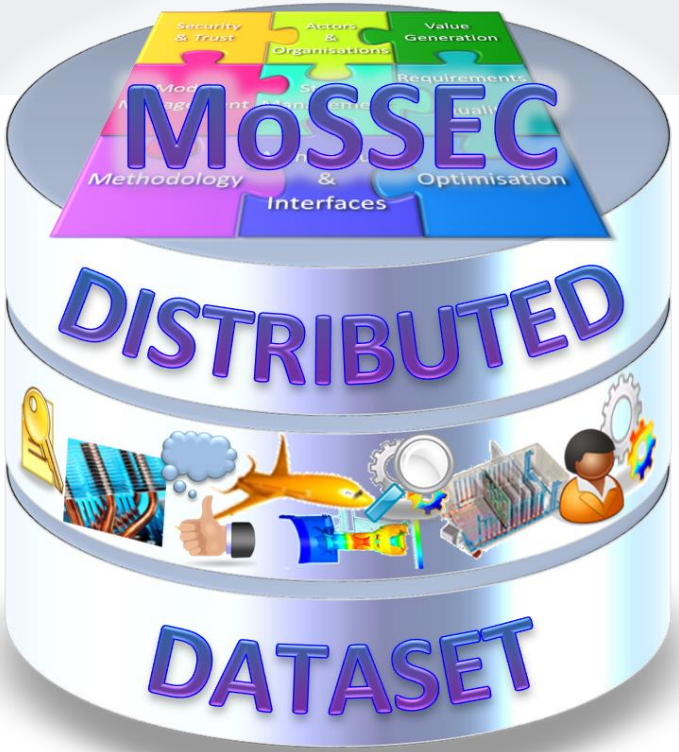
MoSSEC: *Modelling and Simulation information in a collaborative Systems Engineering Context*

A proposed ISO standard:

- To improve decision making for complex products.
- For sharing the systems engineering context *(Who, What ,Where, When, How, Why)* of modelling and simulation data between Internal teams/domains and Extended Enterprise
- Supported by industrial partners (e.g. Airbus, Rockwell Collins, Boeing, BAE Systems) and vendors (e.g. Eurostep, Dassault Systèmes, MSC Software, Siemens)

Status:

- A first definition used extensively on EU research projects
- “New Work Item” and associated white paper to be submitted to ISO October 2016
- www.mossec.org



Any Questions?