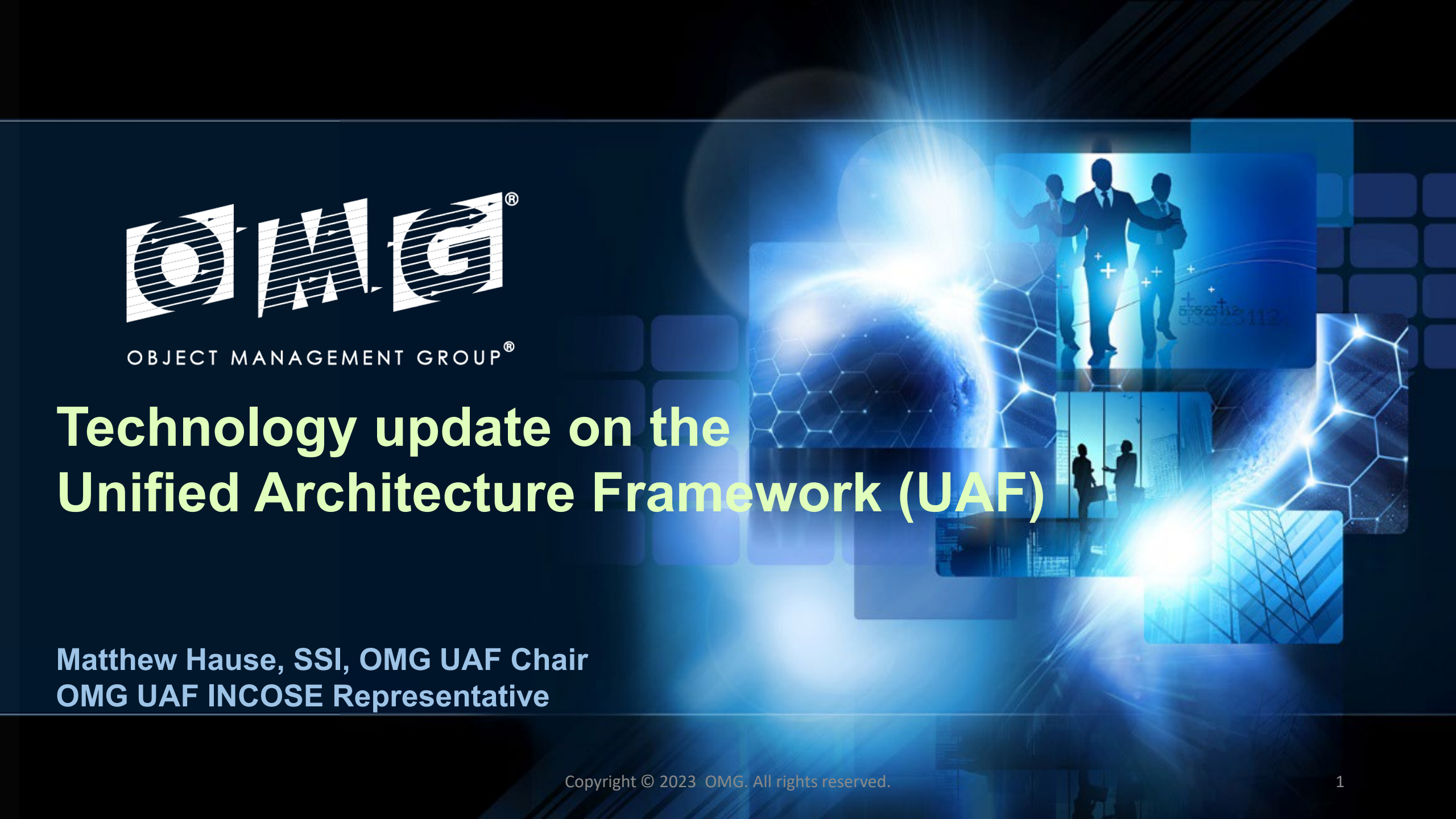


OBJECT MANAGEMENT GROUP®

Technology update on the Unified Architecture Framework (UAF)

Matthew Hause, SSI, OMG UAF Chair
OMG UAF INCOSE Representative

UAF is a Standard…

- To develop architectural descriptions in **commercial industries**, **federal governments** and **military organizations**
- Has many different use cases from **Enterprise as a System** to **SoS** and **Cyber-Systems engineering** or enabler for **Digital Transformation planning**
- Developed by Object Management Group (OMG)
- Is an international ISO standard *ISO/IEC 19540:1 and ISO/IEC 19540:2*
- Current version of UAF specification is 1.2 https://www.omg.org/spec/UAF/1.2/About-UAF/
- UAF version 2.0 is already under development

UAF Team Members

Tool vendors:

- Dassault Systemes
- IBM
- KDM
- MEGA
- Orbus Software
- PTC
- Sparx Systems
- Tom Sawyer

Contributors:

- Airbus
- Aerospace Corporation
- BAE Systems
- Boeing
- Department of Navy (US)
- Lockheed Martin
- MITRE
- Northrop Grumman
- Rolls-Royce Corporation
- Syntell
- Thales
- INCOSE and GfSE

Leadership

Laura E. Hart

Dr. Aurelijus Morkevicius

Matthew Hause

Who Uses UAF?

1. Aerospace Corp.
2. Airbus
3. BAE Systems
4. Boeing
5. Bundeswehr
6. Deloitte
7. DISA
8. DGA
9. Leonardo
10. Lockheed Martin
11. MITRE
12. NATO
13. Northrop Grumman
14. Norwegian Air Traffic Control
15. Raytheon
16. Rolls Royce
17. SAAB
18. Swedish Defense Materiel Administration
19. US Airforce
20. US Navy
21. US Army
22. Vencore
23. Volvo Construction Equipment

- selected list

UAF specification at a glance

UAF
OMG UNIFIED ARCHITECTURE FRAMEWORK ™

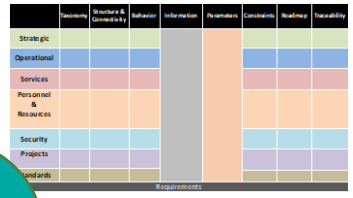
Specification

EA guide (EAG)

UAF v1.2

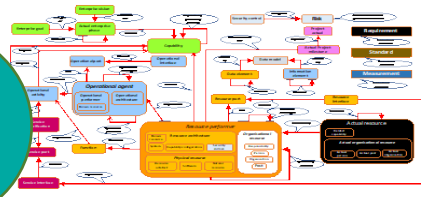
4

View specifications organized in viewpoints and aspects (Grid)



1

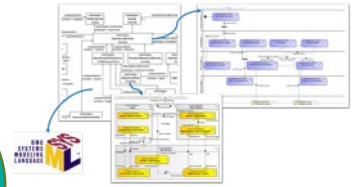
Domain MetaModel (DMM)



2

Modeling Language based on SysML ~~(UAFP)~~ (ML)

UAF v1.2



3

UAF Grid

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Model Kinds (aspects)

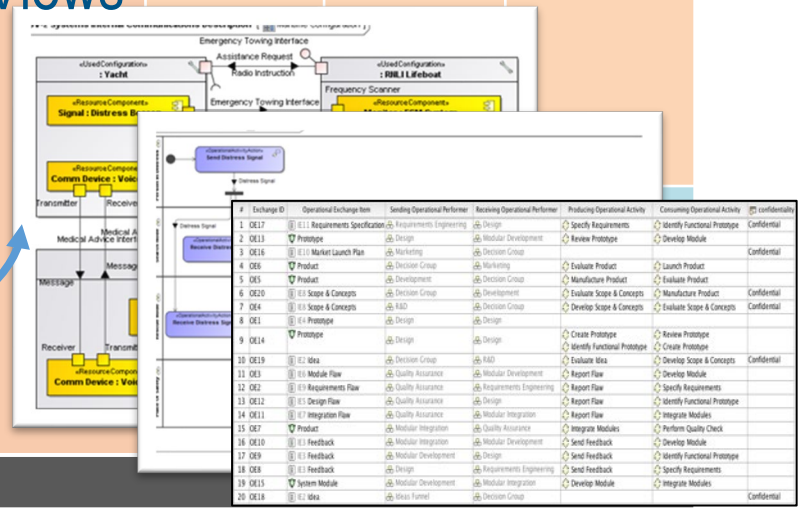
1

Domains (viewpoints)

	Taxonomy	Structure & Connectivity	Behavior	Information	Parameters	Constraints	Roadmap	Traceability
Strategic								
Operational								
Services								
Personnel & Resources								
Security								
Projects								
Standards								
Requirements								

View Specifications

Views



UAF OMG UNIFIED ARCHITECTURE FRAMEWORK	Motivation Mv	Taxonomy Tx	Structure Sr	Connectivity Cn	Processes Pr	States St	Sequences Sq	Information[c] If	Parameters[d] Pm	Constraints Ct	Roadmap Rm	Traceability Tr
Architecture Management[a] Am	Architecture Principles Am-Mv	Architecture Extensions Am-Tx[e]	Architecture Views Am-Sr	Architecture References Am-Cn	Architecture Development Method Am-Pr	Architecture Status Am-St		Dictionary Am-If	Architecture Parameters Am-Pm	Architecture Constraints Am-Ct	Architecture Roadmap Am-Rm	Architecture Traceability Am-Tr
Summary & Overview Sm-Ov												
Strategic St	Strategic Motivation St-Mv	Strategic Taxonomy St-Tx	Strategic Structure St-Sr	Strategic Connectivity St-Cn	Strategic Processes St-Pr	Strategic States St-St		Strategic Information St-If	Environment En-Pm-E and Measurements Me-Pm-M and Risks Rk-Pm-R	Strategic Constraints St-Ct	Strategic Deployment, St-Rm-D Strategic Phasing St-Rm-P	Strategic Traceability St-Tr
Operational Op	Requirements Rq-Mv	Operational Taxonomy Op-Tx	Operational Structure Op-Sr	Operational Connectivity Op-Cn	Operational Processes Op-Pr	Operational States Op-St	Operational Sequences Op-Sq	Operational Information Op-If		Operational Constraints Op-Ct		Operational Traceability Op-Tr
Services Sv		Services Taxonomy Sv-Tx	Services Structure Sv-Sr	Services Connectivity Sv-Cn	Services Processes Sv-Pr	Services States Sv-St	Services Sequences Sv-Sq			Services Constraints Sv-Ct	Services Roadmap Sv-Rm	Services Traceability Sv-Tr
Personnel Ps		Personnel Taxonomy Ps-Tx	Personnel Structure Ps-Sr	Personnel Connectivity Ps-Cn	Personnel Processes Ps-Pr	Personnel States Ps-St	Personnel Sequences Ps-Sq	Resources Information Rs-If		Competence, Drivers, Performance Ps-Ct	Personnel Availability Ps-Rm-A Personnel Evolution PS-Rm-E Personnel Forecast Ps-Rm-F	Personnel Traceability Ps-Tr
Resources Rs		Resources Taxonomy Rs-Tx	Resources Structure Rs-Sr	Resources Connectivity Rs-Cn	Resources Processes Rs-Pr	Resources States Rs-St	Resources Sequences Rs-Sq			Resources Constraints Rs-Ct	Resources evolution Rs-Rm-E Resources forecast Rs-Rm-F	Resources Traceability Rs-Tr
Security Sc	Security Controls Sc-Mv	Security Taxonomy Sc-Tx	Security Structure Sc-Sr	Security Connectivity Sc-Cn	Security Processes Sc-Pr					Security Constraints Sc-Ct		Security Traceability Sc-Tr
Projects Pj		Projects Taxonomy Pj-Tx	Projects Structure Pj-Sr	Projects Connectivity Pj-Cn	Projects Processes Pj-Pr						Projects Roadmap Pj-Rm	Projects Traceability Pj-Tr
Standards Sd		Standards Taxonomy Sd-Tx	Standards Structure Sd-Sr								Standards Roadmap Sd-Rm	Standards Traceability Sd-Tr
Actual Resources Ar			Actual Resources Structure, Ar-Sr	Actual Resources Connectivity, Ar-Cn	Simulation[b]					Parametric Execution/ Evaluation[b]		

What's New in UAF 1.2

- UAF EA Guide
- UAF Grid and Metamodel Improvements
  - Architecture Management Domain
  - Improvements in Strategic and Services Domains (clarify semantics, add new concepts, improve exposition)
  - Support of Value Streams and updates to the Strategic Phasing
  - Risk becomes cross-cutting construct
- Future Roadmap

DoD Positioning

Defense Information Standards Registry (**DISR**) record

Standard Reference Number	Standard Identifier	Standard Title	Standard Class	DoD Status
301131	OMG UPDM v2.1	Unified Profile for the Department of Defense Architecture Framework (DoDAF) and the Ministry of Defence Architecture Framework (MODAF), Version 2.1, formal/2013-08-04	DISR	Retired
302737	OMG UAFP v1.0	Unified Architecture Framework Profile (UAFP) v1.0, OMG formal/2017-12-01, November 2017 including all normative appendices.	DISR	Emerging

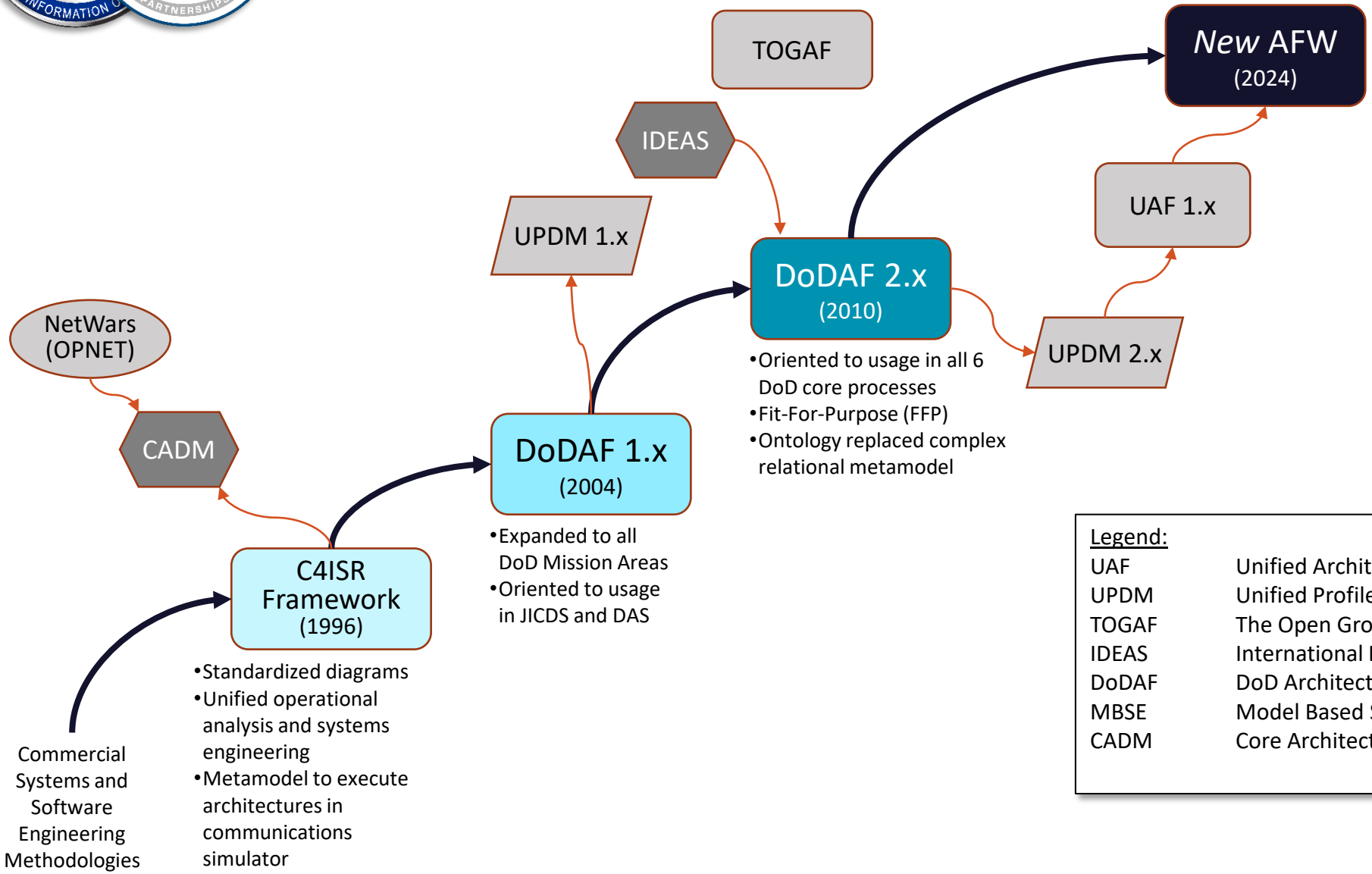
Mandated November 10, 2021

New Architecture Framework

Briefing to OMG UAF Task Force

7 December 2022

DoD AFW History

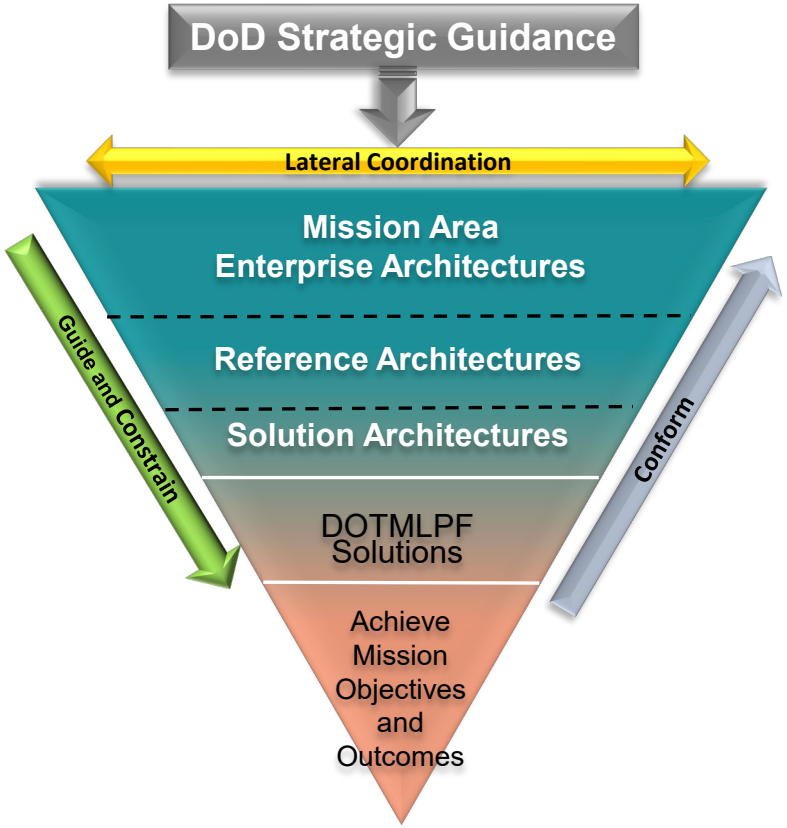


Legend:

UAF	Unified Architecture Framework
UPDM	Unified Profile for DoDAF and MODAF
TOGAF	The Open Group Architecture Framework
IDEAS	International Defence Enterprise Architecture Specification
DoDAF	DoD Architecture Framework
MBSE	Model Based Systems Engineering
CADM	Core Architecture Data Model

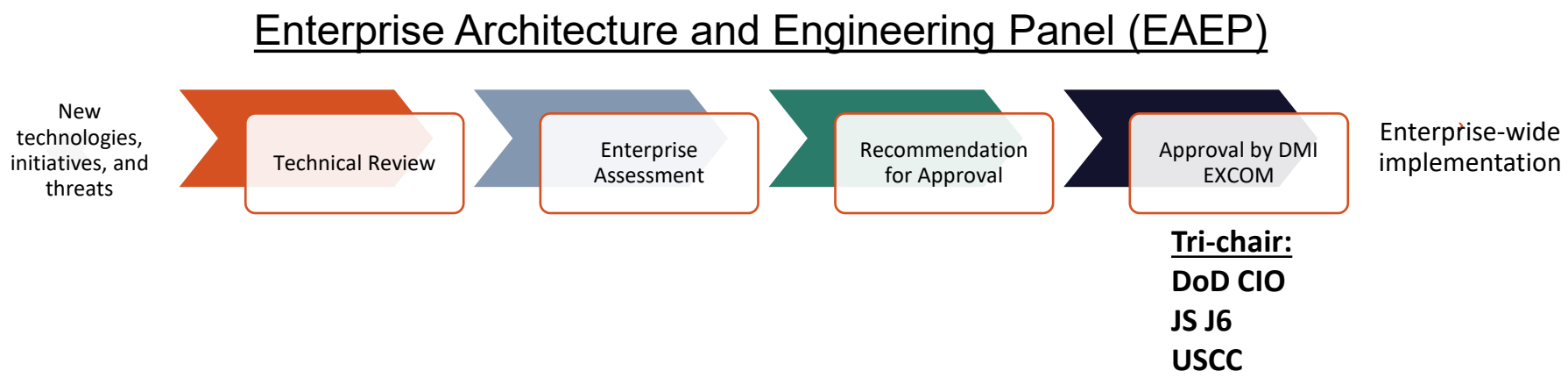
Sample Goals for New AFW

- General:
  - Not just another update with more views
  - Support modernization, optimization, and integration
  - Dovetail with R&E's digital engineering / MBSE
  - Fit into DevSecOps
- Specific:
  - No books, a digital model and a readme
  - Model accessibility for M&S and analytics such as ADVANA, Portfolio Management tools, …, simpler than XMI
  - Solve the Integrated architecture problem
  - Force/encourage Fit For Purpose (FFP)
  - Eliminate "the administrative burden of architectures"
  - Eliminate checkbox architecting
  - Break away from view-based template filling → Usage focus –
  - But still be accessible to operators/users, analysts, as well as systems and software engineers and usable by specialties, e.g.,
    - RMA
    - CS vulnerability
    - BPR
    - Workflow analysts
    - Capacity analysts



Orchestrating Development of New AFW Across DoD

- After each OMG quarterly TC, DoD CIO rep reports back to EAEP
  - CIO reps from most DoD Components
- Collect requirements and feedback on our approach and progress
- Submit incremental drafts for formal comment (via DoD's tasking system)
- OMG adjudicate comments
- Upon final, EAEP recommends to two-star tri-chair (DoD CIO, JS J6, and USCC)
- Issue as guidance



Areas of Improvement

- Mission Modeling / Mission Engineering
- Addition of Use Cases
- Services Modeling Review
- Portfolio concept
- Architecture vs. Configuration
- Revisit Value Streams
- Model-based Acquisition (MBAcq) Support

Future Roadmap UAF 2

- Update to SysML V2
- Research on SysML V2 API
- Research on UAF V1 to UAF V2 transformation
- Update example model and traceability by adding SysML V2 based concepts/diagrams
- Provide Model-Based Acquisition (MBAcq) guide
- Address DoD EAEP requirements
- Push to ISO
- Align with ISO style guide

Annual events

1. UAF and MBSE Information Day, 2015, Reston, VA
2. UAF and MBSE Summit, 2016, Reston, VA,
3. UAF and MBSE Summit, 2017, Reston, VA,
4. UAF, UPDM, and MBSE tutorials, 2017, Reston, VA,
5. UAF and MBSE Summit, 2017, Brussels, Belgium
6. UAF and MBSE tutorials, 2017, Brussels, Belgium
7. UAF and MBSE Summit, 2018, Reston, VA
8. UAF and MBSE tutorials, 2018, Reston, VA
9. MBSE-inspired Actionable Enterprise Architectures Summit, 2018, Ottawa, Canada
10. MBSE-inspired Actionable Enterprise Architectures Tutorials, 2018, Ottawa, Canada
11. MBSE-inspired Actionable Enterprise Architectures Summit, 2019, Reston, VA
12. UAF in the context of the NATO Architecture Framework (NAF), 2019, Amsterdam, Netherlands
13. UAF Summit: Actionable Architecture in the 21st century, 2020, Virtual
14. UAF Summit: Actionable Architecture in the 21st century and beyond, 2021, Virtual
15. UAF Summit: Actionable Architecture in the 21st century - Hybrid event, 2022, Reston, VA

Thank You!

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Unified Architecture Framework (UAF)
https://www.linkedin.com/groups/8878655/