UPDM – Unified Profile for DoDAF/MODAF

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UPDM Co-Chair

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UPDM Group

- Adaptive
- Artisan Software
- ASMG
- BAE Systems
- DoD
- DND
- Generic
- General Dynamics
- IBM
- Lockheed Martin Co
- Mega
- Mitre
- Northrop Grumman
- L3 Comms
- MOD
- NoMagic
- Raytheon
- Rolls Royce
- Sparx Systems
- VisumPoint
- Selex SI
- Thales
- Unisys

January, 2011

UPDM GROUP

OMG OBJECT MANAGEMENT GROUP

What is UPDM? - Summary

- UPDM 1.0 is a standardized way of expressing DoDAF 1.5 and MODAF 1.2 artefacts using UML and SysML
  - UPDM is ***NOT*** a new Architectural Framework
  - UPDM is not a methodology or a process
- UPDM 1.0 was developed by members of the OMG with help from industry and government domain experts.
- UPDM 1.0 has been implemented by multiple tool vendors.
  - Tools supporting UPDM 1.0 are available now.
- UPDM 2.0 supports DoDAF 2.0, MODAF 1.2, NAF 3.x, and DNDAF 1.7

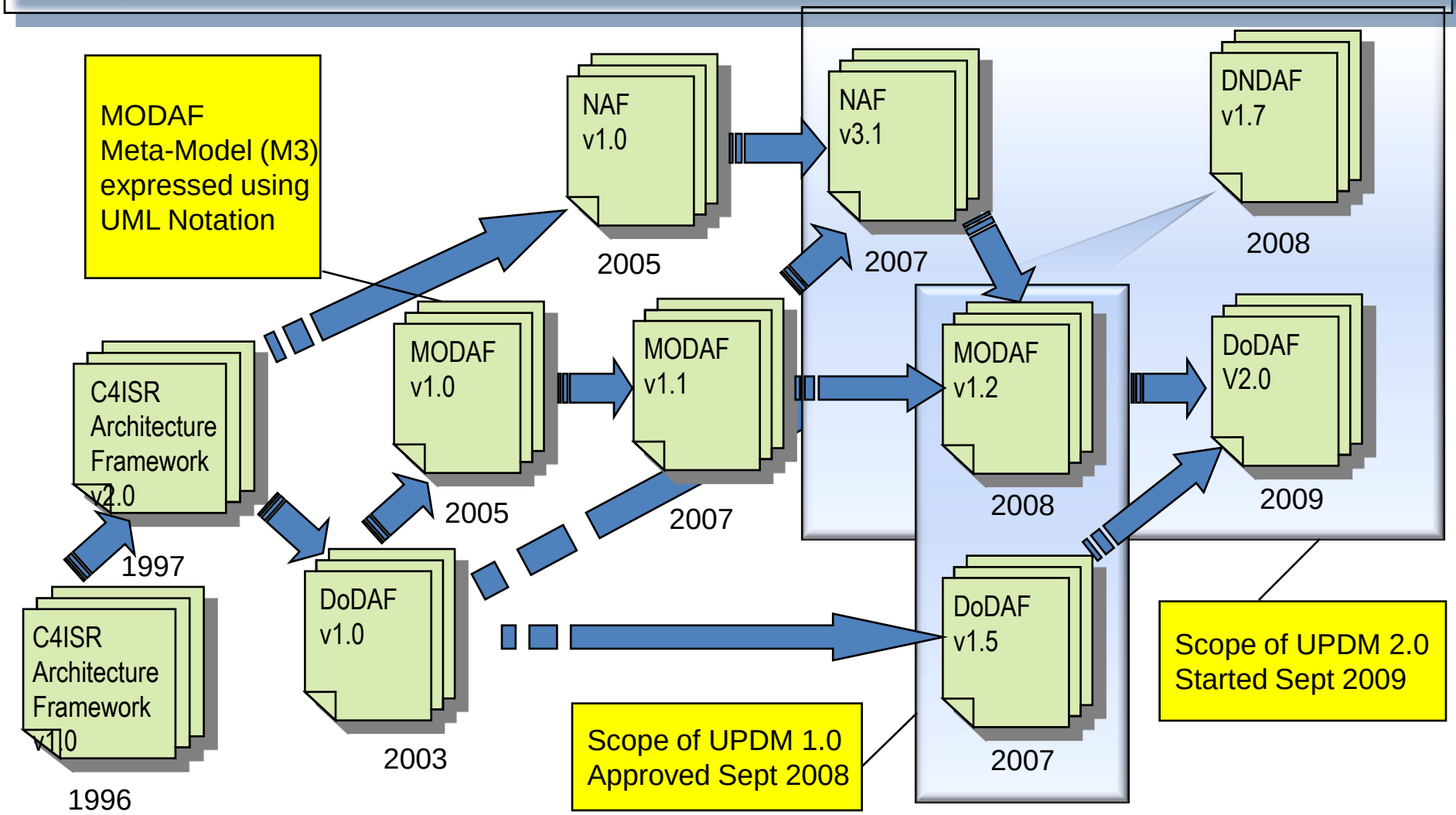
Outline

- Why?
  - The need for UPDM.
- When?
  - The history and projected timetable for UPDM.
- Who and Where?
  - Who is in the UPDM RFC Group?
- How?
  - How was the specification created?
- What?
  - What is UPDM in general?
  - A detailed look at a few things.
- Questions and answers?

Why? The need for UPDM.

- Motivation
  - US DoD and UK MOD interested in leveraging commercial standards for their Military Architecture Framework
  - Military Architecture Framework Tool Interoperability
    - Key Goal for DoD, MOD, Enterprise and System Architects and Engineers
  - Formal MetaModel basis for the Military Architecture Framework
    - Critical to Interoperability Objectives
    - Critical to Understanding Profile Requirements
- Proliferation of Military Architectural frameworks
  - DoDAF, MODAF, DNDAF, NAF, AGATE, ADOAF, MDAF, etc.
  - Defence organizations, contractors and tool vendors are hoping to find a way out of the alphabet soup.

Why and When: Historical Development of AF's.



Why: Architecture Interchange Requirements

- What is Interchange? (Many different viewpoints)
  - Across Lifecycle Transformation (UPDM ↔SysML ↔UML ↔Code)
    - Enterprise Architecture ↔ Segment Architectures
  - DoD Interchange with Partners, Subcontractors and Customers
    - Common Single Tool
    - Predefined Tool Pairs (Import/Export)
    - Range of Different Tools (Import/Export)
  - Tool (and Tool Vendor) Migration, Delivering on the Promise
- What is Interchanged?
  - Requirements
  - Model Meta-Data
  - Meta-Data and Diagrams for UPDM (clone and own?)
  - Tools Working Together – Transform and/or Trace

Why: Architecture Interchange

- XMI Standards Compliance is a good foundation, but not enough
  - Real Interchange is Being Proven by the OMG MIWG
- Range of 9 Different UML/SysML/UPDM Tools
- Founding Member OMG Model Interchange Working Group
  - XMI basis
  - Test Cases from Basic UML, through SysML to UPDM
  - Public OMG Connect-a-thon (March 2011)
- Leveraging Physical Exchange Specification (PES)
  - Investigating translation to/from PES-XMI

Who and Where: UPDM Team Members

- US DoD Liaison - DoD/DISA, OSD CIO, Mitre, Silver Bullet
- UK MOD Liaison - UK MOD, ModelFutures
- Canada DND Liaison – DND and ASMG Ltd
- NATO – Generic AB on behalf of SwAF and on contract by FMV
- Tool Vendors – Adaptive, Atego (Co-Chair), EmbeddedPlus, IBM (Co-Chair), Mega, NoMagic (Co-Chair), Sparx Systems, Visumpoint
- Aerospace – BAE Systems, General Dynamics, L3 Communications, Lockheed Martin, Northrop Grumman, Raytheon, Rolls-Royce, Selex SI, Thales, Unisys
- Advisors – Decisive Analytics
- Distributed multi national team (US, UK, France, Sweden, Lithuania, Australia, Canada, Thailand, Italy)

How: UPDM 1.0 Requirements

- Mandatory Requirements
  - Domain Metamodel
  - Metamodel (abstract syntax and constraints)
  - Profile
  - Notation (concrete syntax)
  - DoDAF 1.5 and MODAF 1.2 artifacts
  - Support for custom views and viewpoints
  - Element taxonomy reference
  - Data interchange
- Optional Requirements
  - Extensibility to Other Architecture Frameworks
  - Representation of Architectural Patterns

How: UPDM Features

- Integrates with SoaML – The Service Oriented Architecture Modelling Language
- SysML Extensions with UPDM level 1
  - Facilitates integration of DoDAF and MODAF models for system of systems modeling with SysML models for systems modeling
  - Enables UPDM to fully leverage SysML features

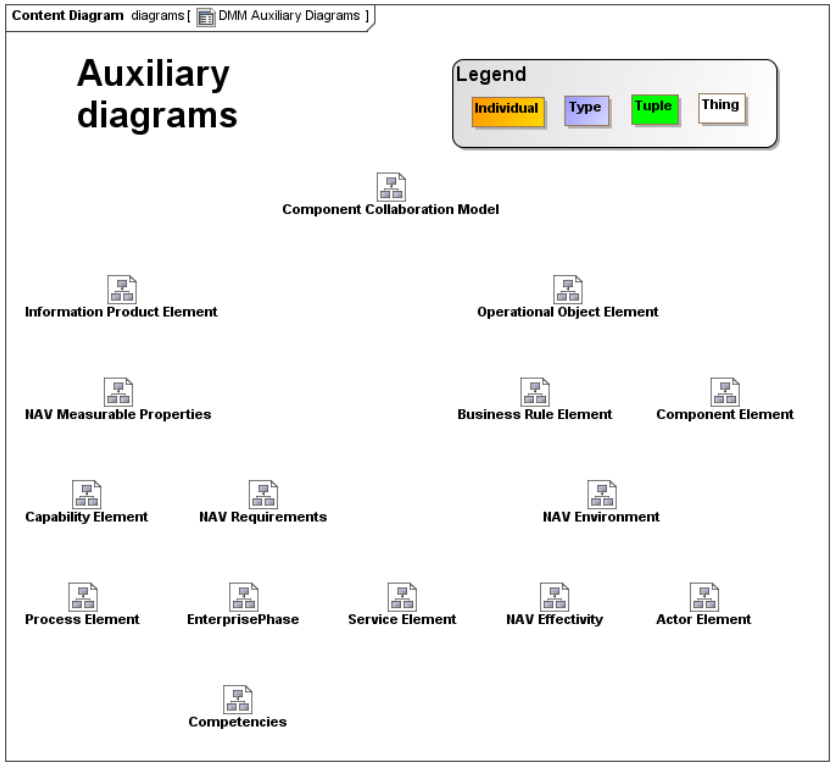
How: UPDM Level 1 Compliance SysML Extensions

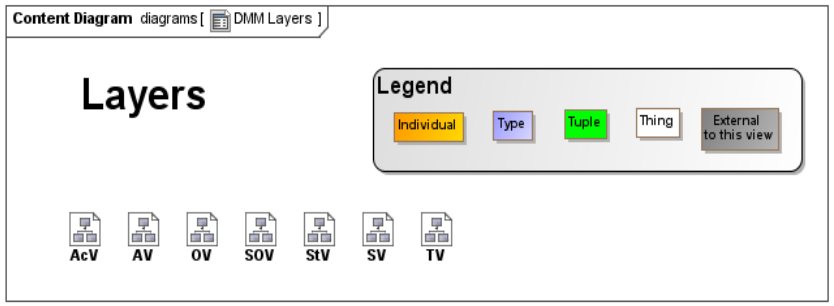
- Enables UPDM to leverage SysML features
  - SysML blocks to represent structural elements such as operational nodes, artifacts (systems), capability configurations, which enable the use of flow ports, item flows, and value properties with units and distributions
  - SysML activities to support continuous flow modeling, activity hierarchies, and support for enhanced functional flow block diagrams
  - SysML parametrics to enable the integration of engineering analysis with the architecture models (e.g., performance parameters in an SV-7 can be captured in parametric equations)
  - SysML allocations to support various types of mappings such as an SV-5 that maps system functions to operational activities
- Other SysML Features
  - SysML requirements enable text based requirements to be captured and traced to other model elements using the satisfy, derive, verify and refine relationships
  - SysML view and viewpoint enable provide for multiple perspectives of the model, and to manage, control, and organize information.
  - Callout notation

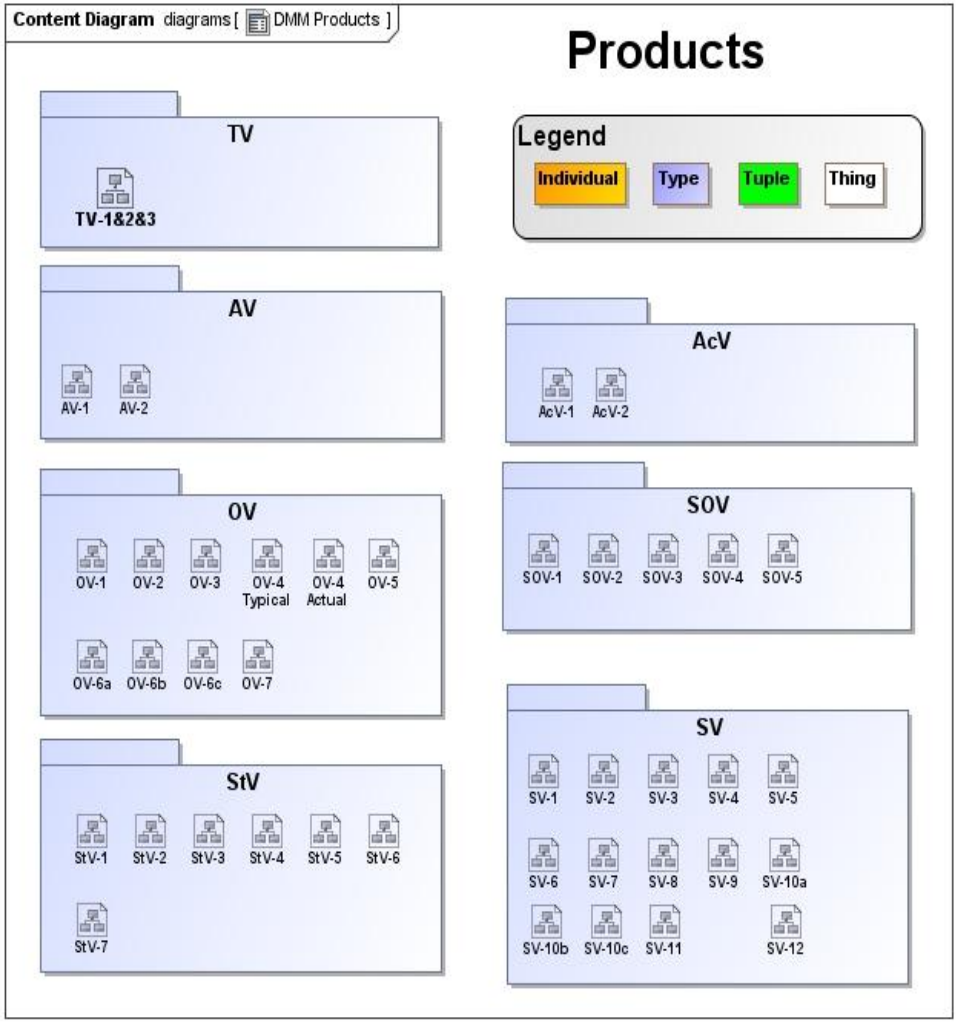
What is UPDM?

UPDM - Domain Meta Model

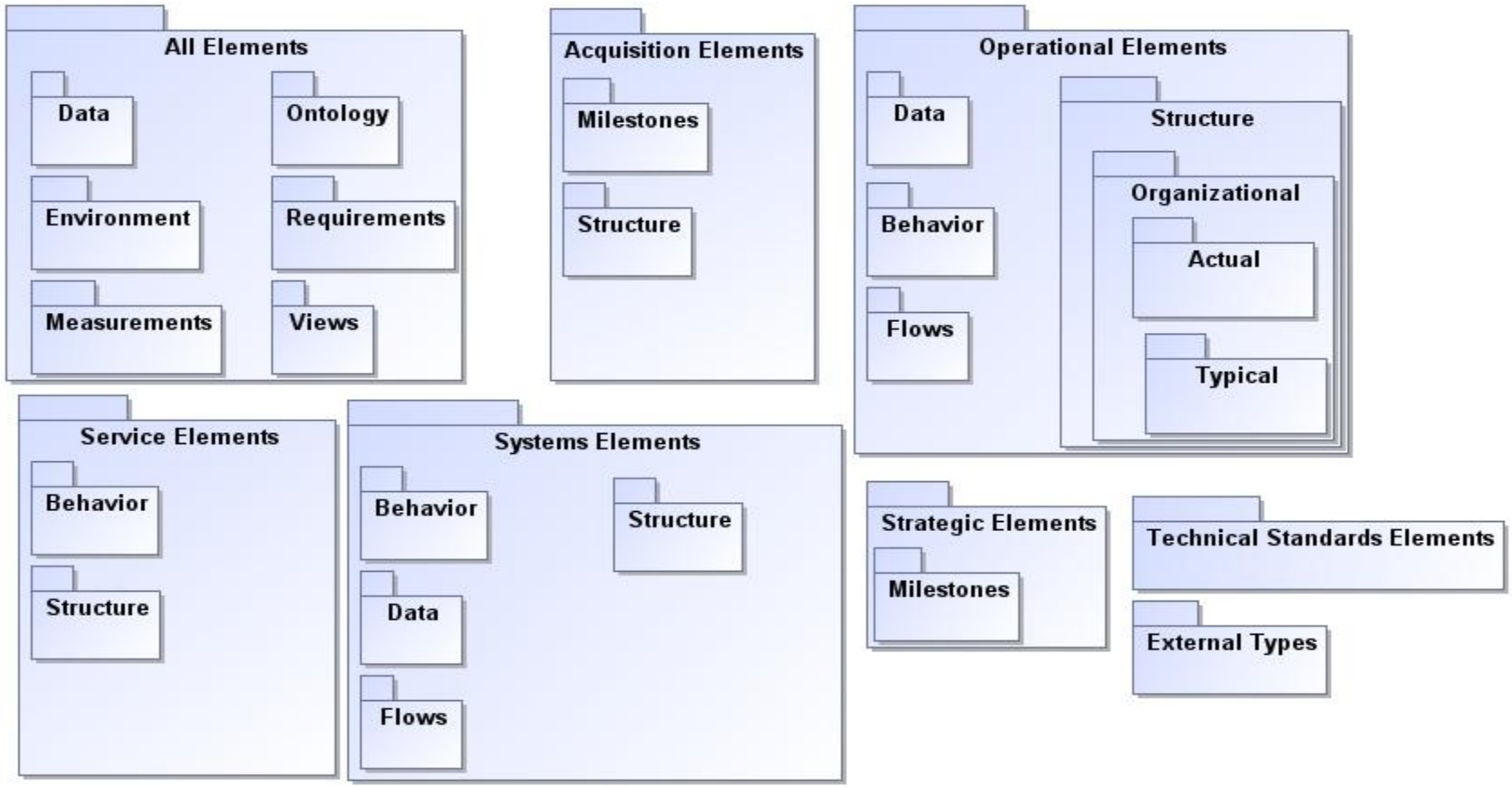
UPDM RFC - Domain Meta Model Summary





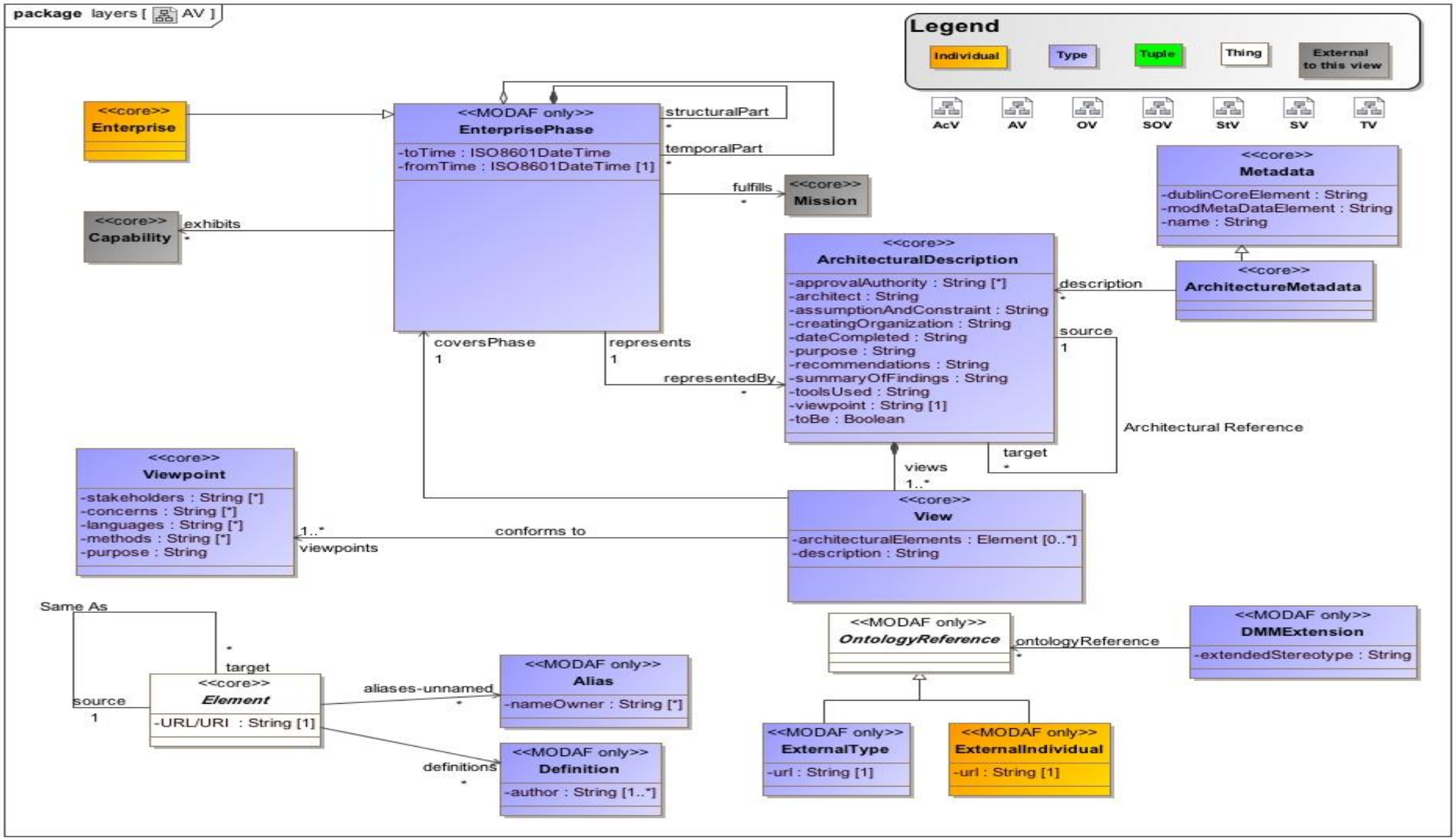


UPDM RFC - Domain Meta Model Summary (Packages.)

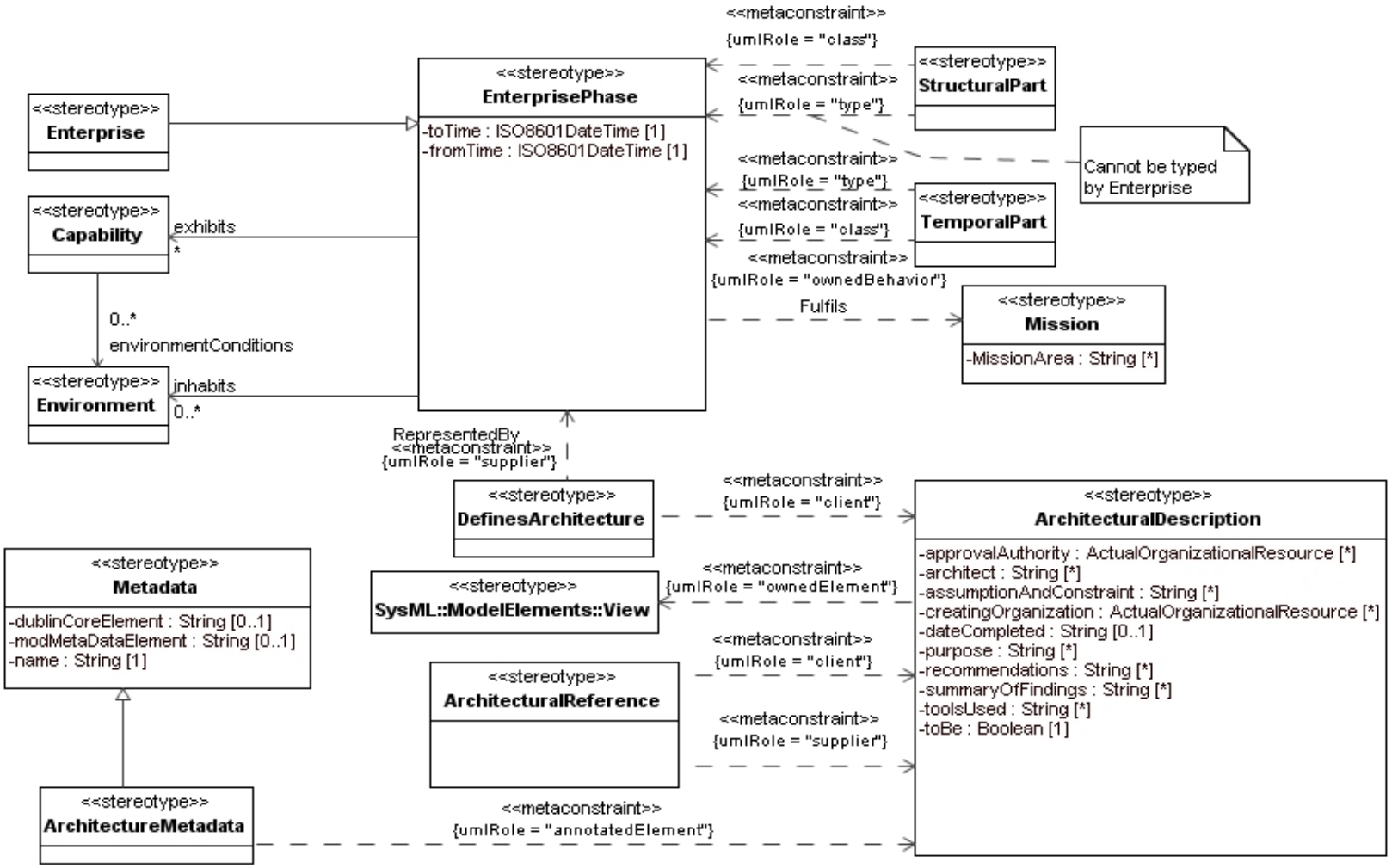


- Package structure organizes stereotypes by viewpoint
- Multiple viewpoints manage model complexity

UPDM RFC - Domain Meta Model Summary (AV)



UPDM RFC - Profile Summary (AV-1)



When: UPDM 2.0 Roadmap

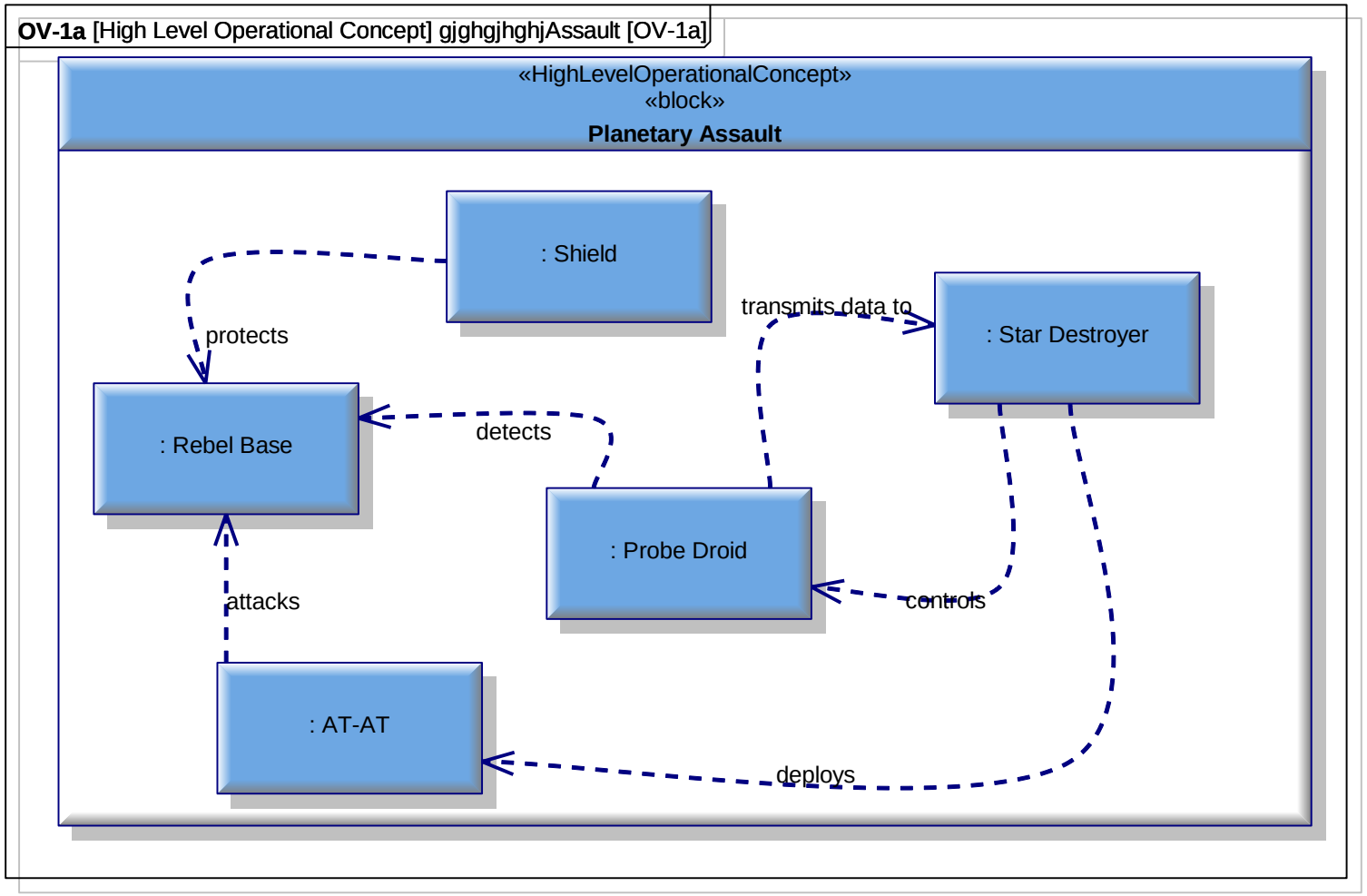
- Signed and Released DoDAF 2.0 in June 2009
- Preparation of RFP for UPDM 2.0 (Next Slide)
- Issue UPDM 2.0 RFP Sept 2009
- ….

When: UPDM 2.0 Roadmap

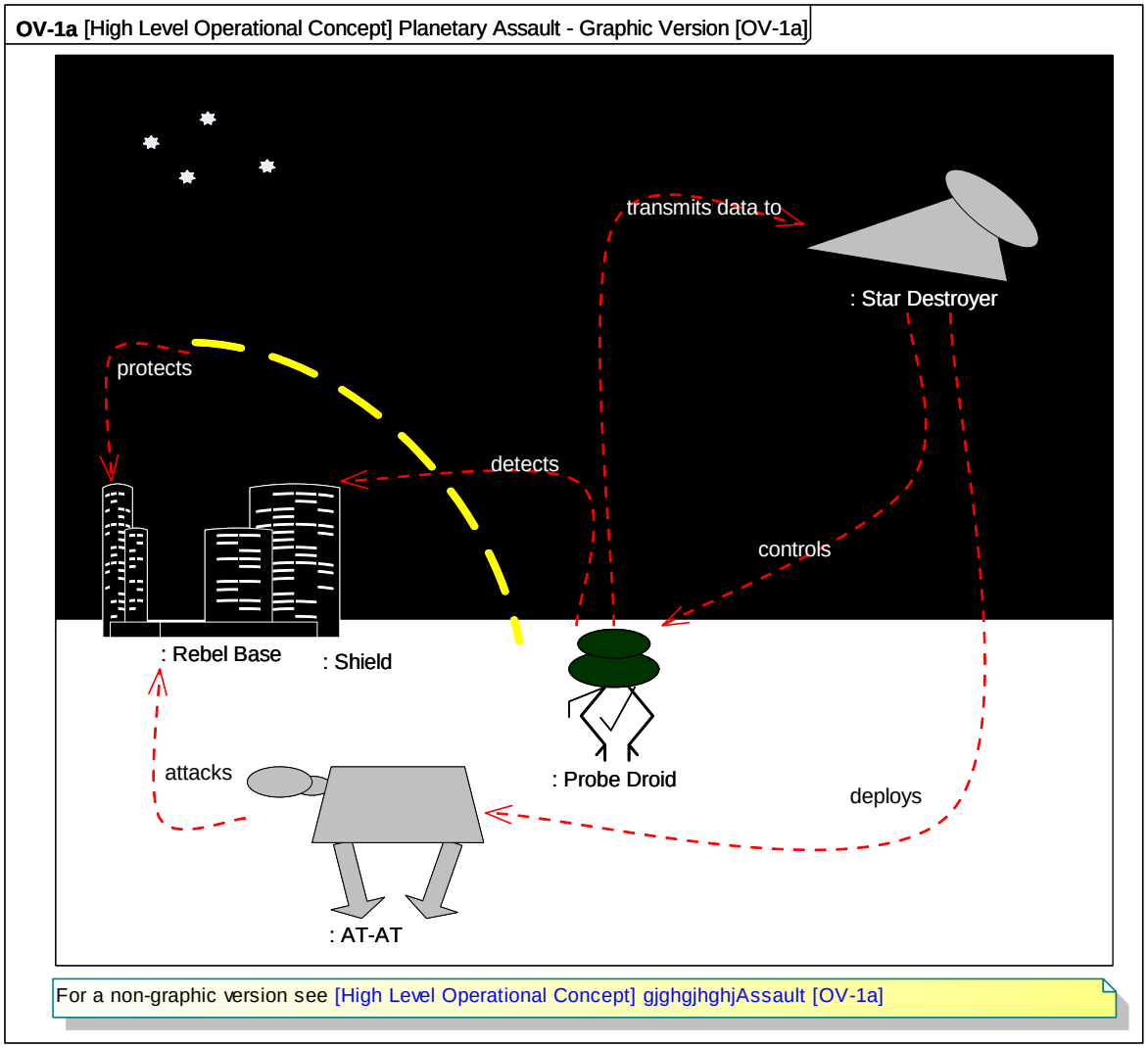
- RFP for UPDM 2.0
  - Inclusion of DoDAF 2.0
  - Continuing support for MODAF 1.2
  - Support for NAF 3
  - Support for DNDAF including the Information and Security views
  - Human Factors Views based on MODAF and DNDAF
  - Business Motivational Modeling/SBVR profile integration
  - Business process Modeling Notation
    - UPDM v2 optionally could use BPMN to model operational views
  - Others?

UPDM - Profile Example

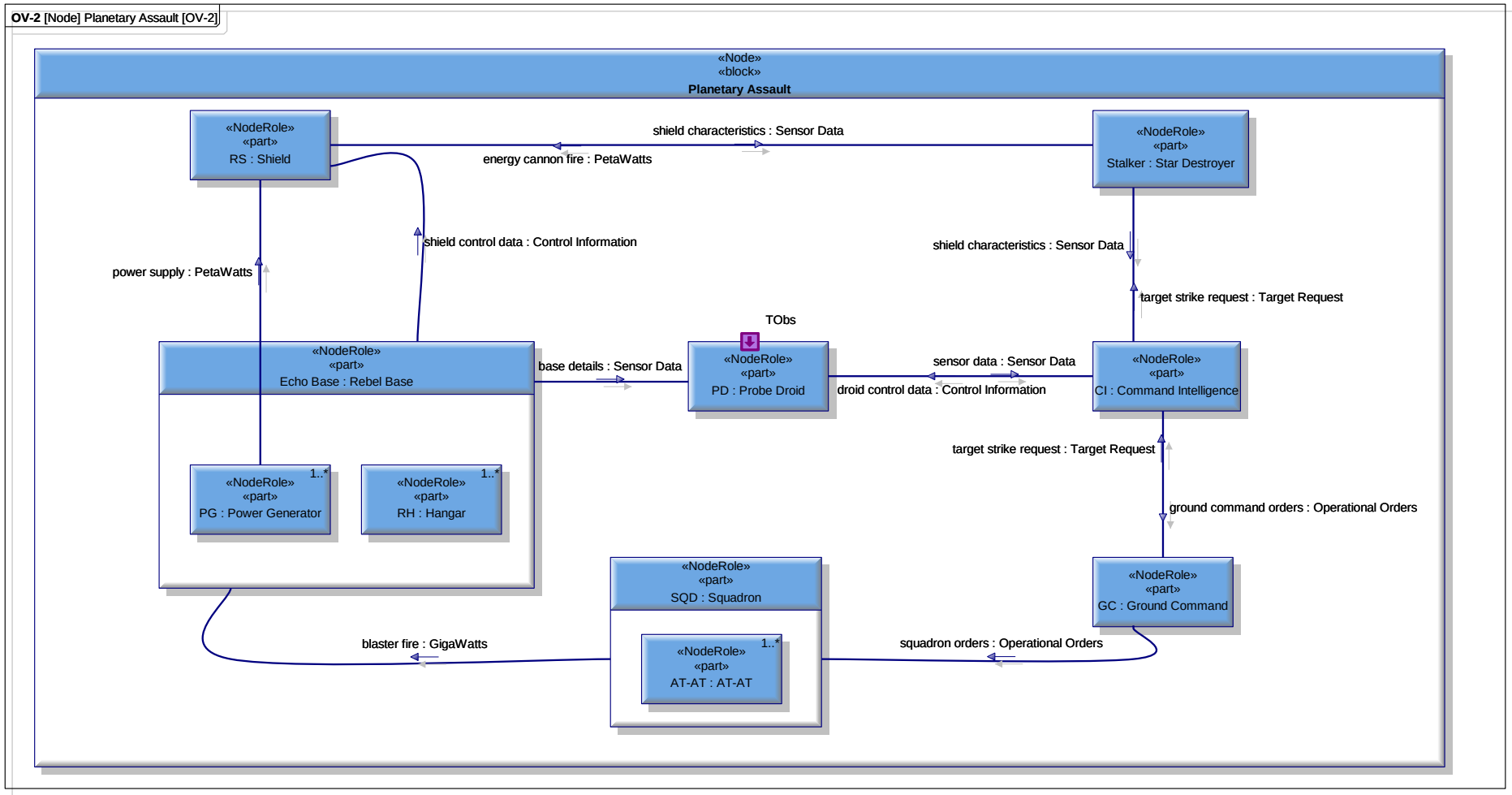
OV-1a: Operational Context Graphic



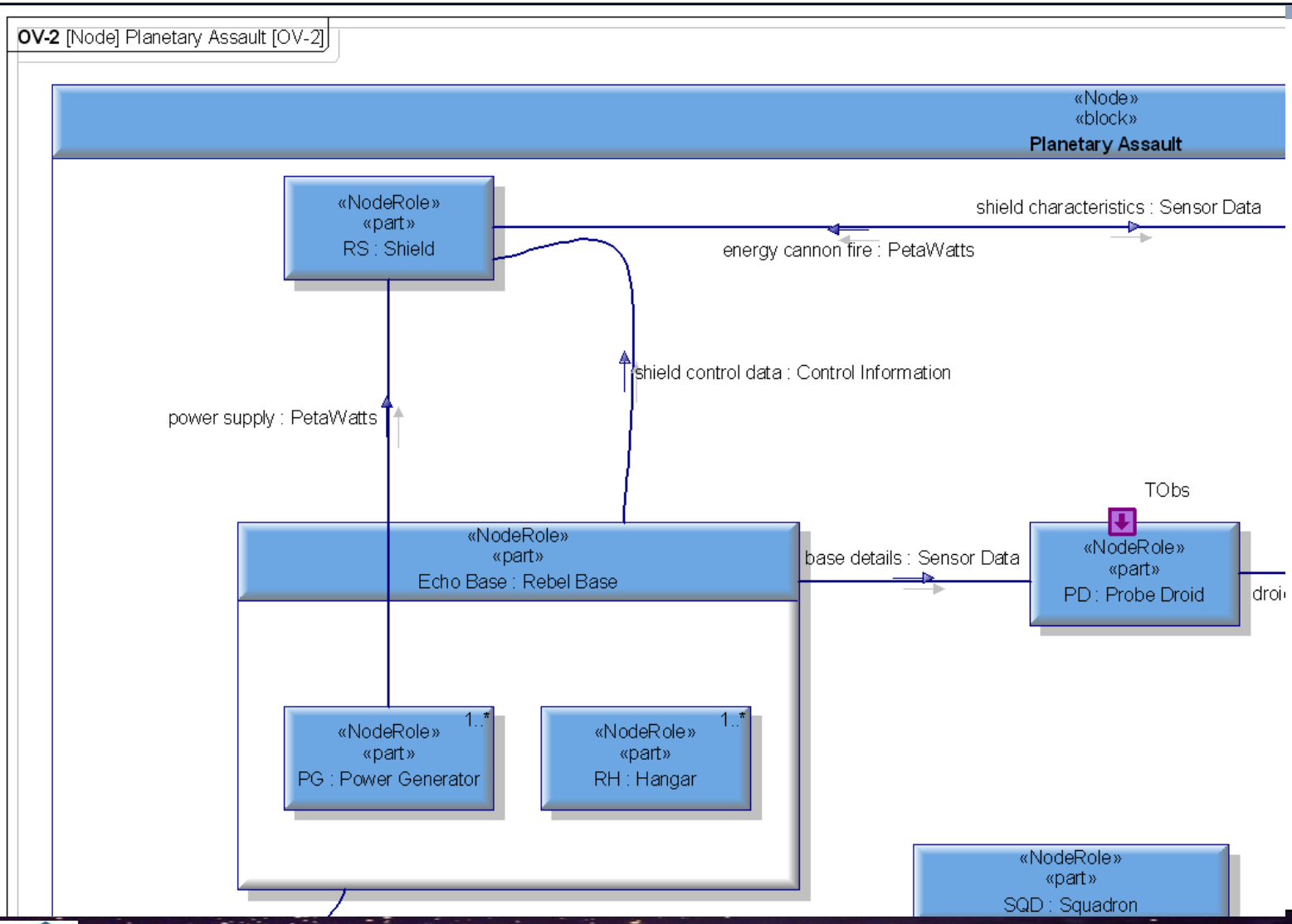
OV-1: Operational Context Graphic



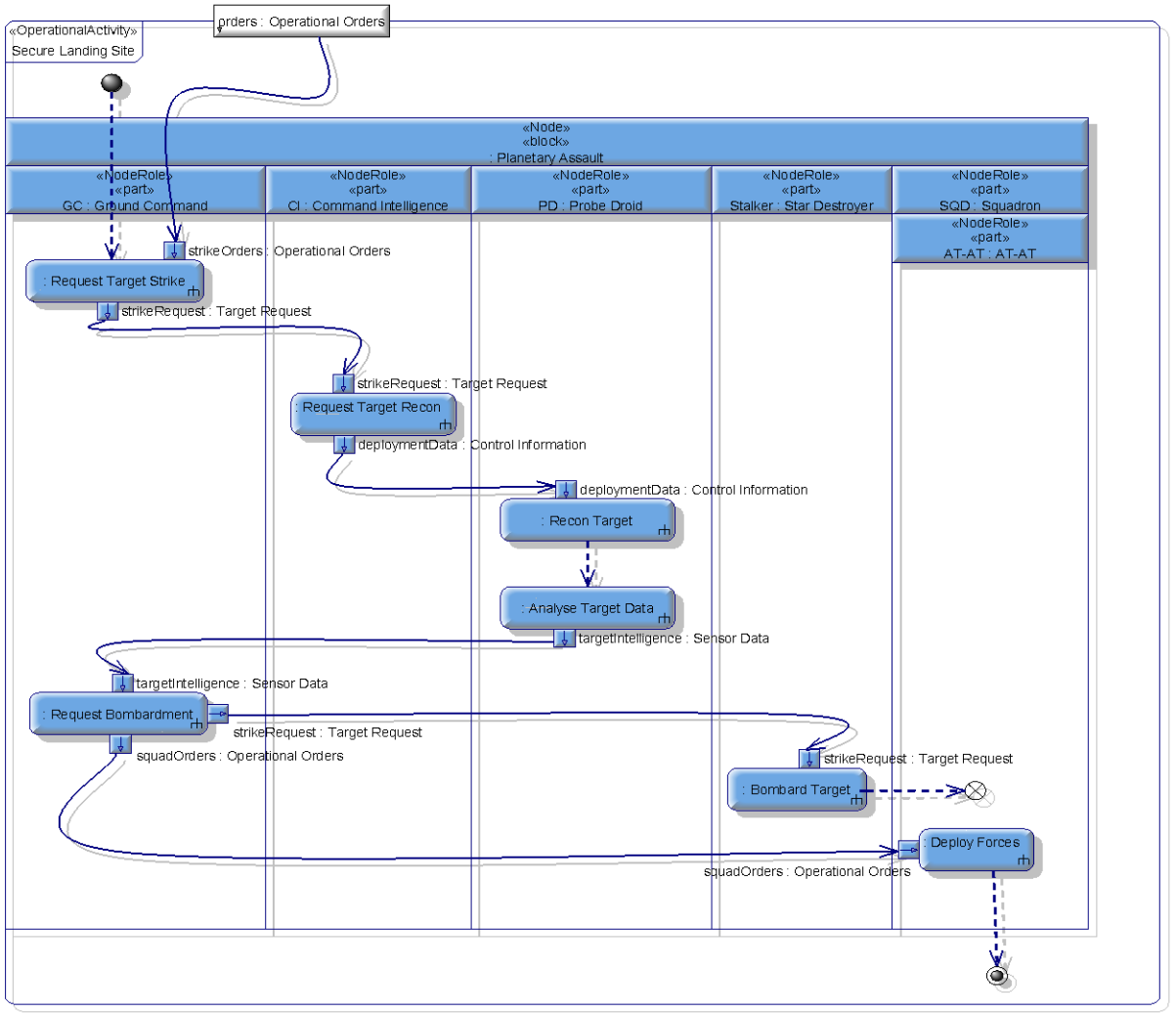
OV-2 Operational Nodes



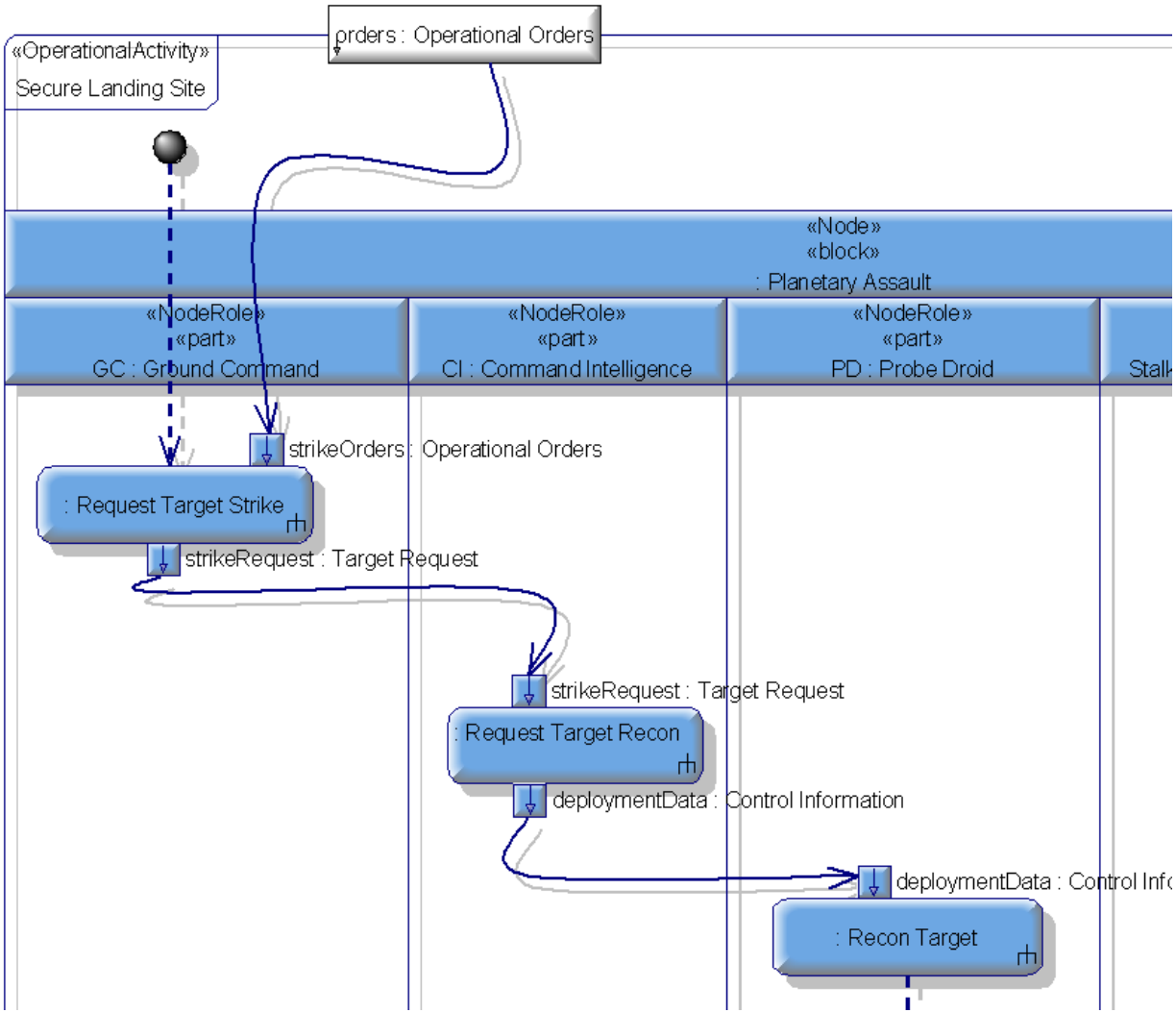
OV-2 Operational Nodes - Detail



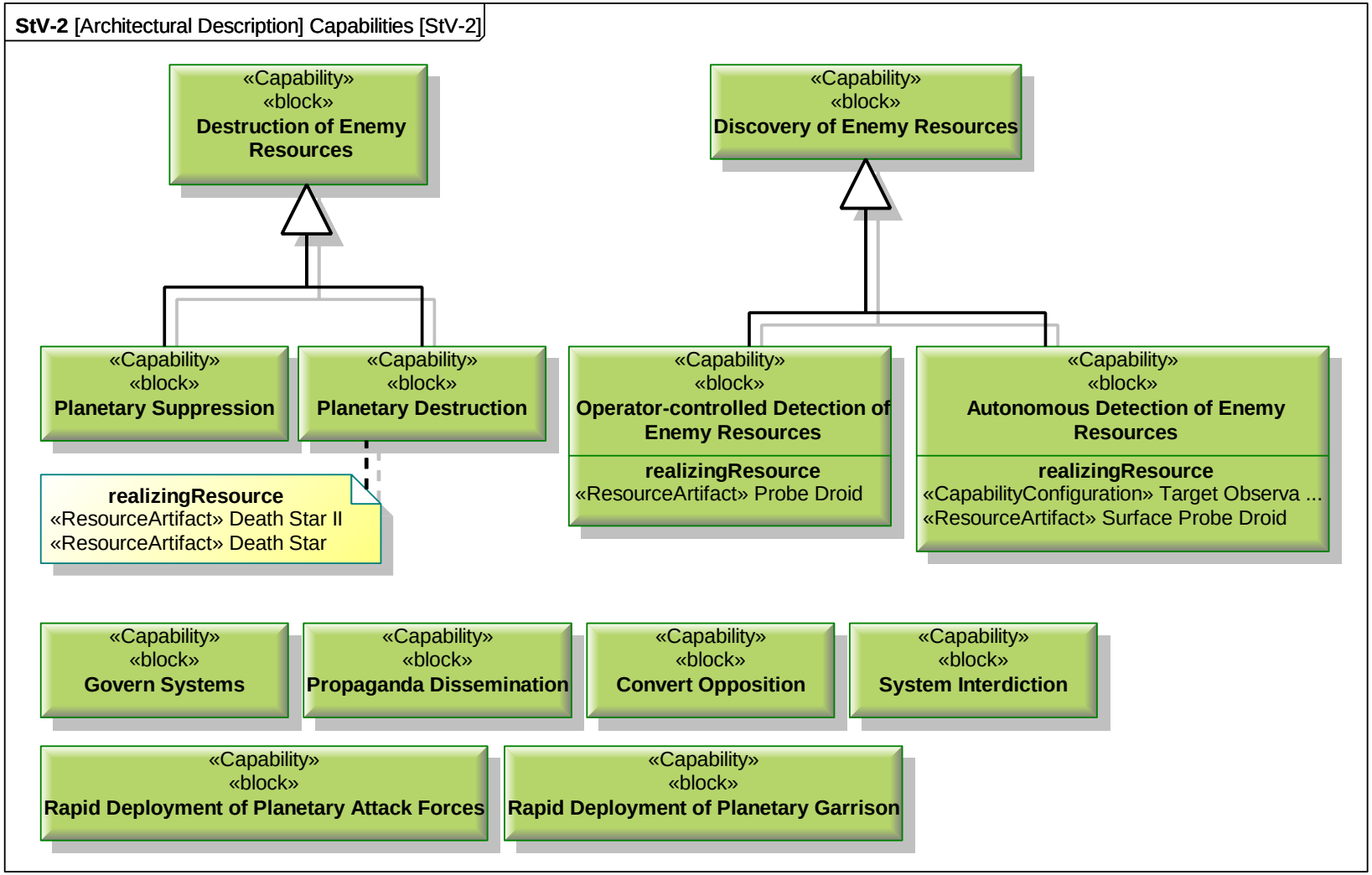
OV-5 Activity Diagram



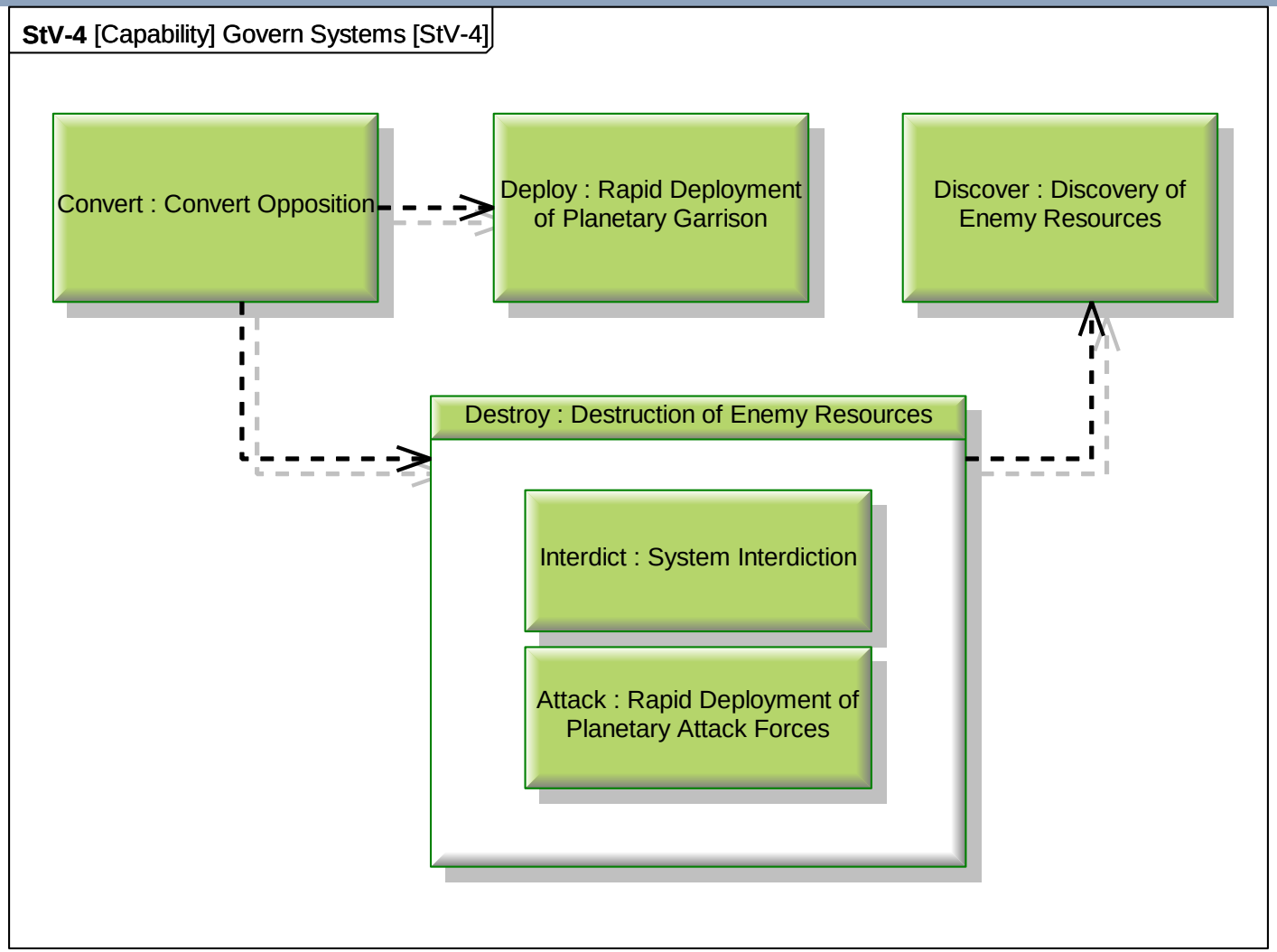
OV-5 Activity Diagram



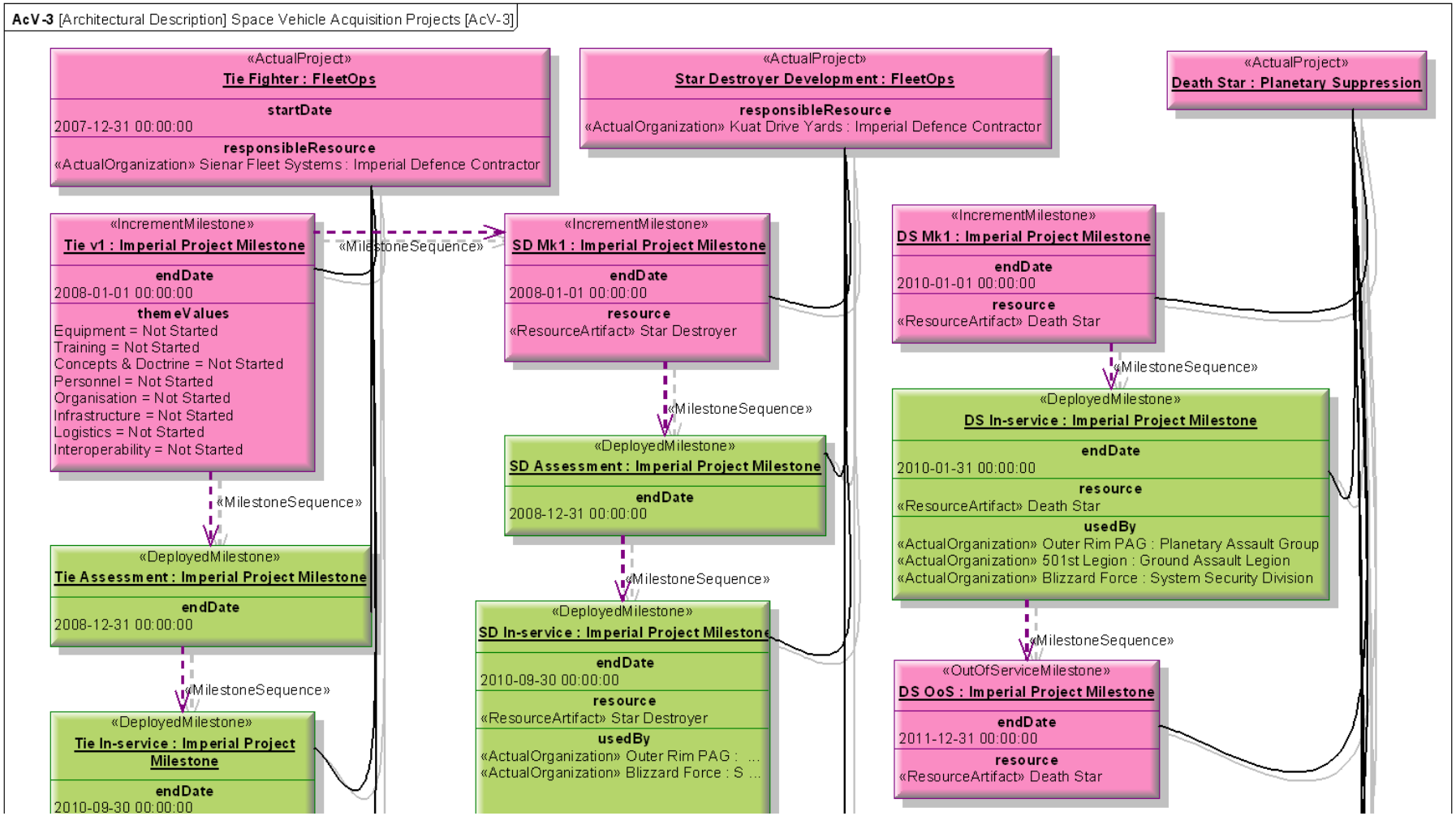
StV-2: Capability Taxonomy



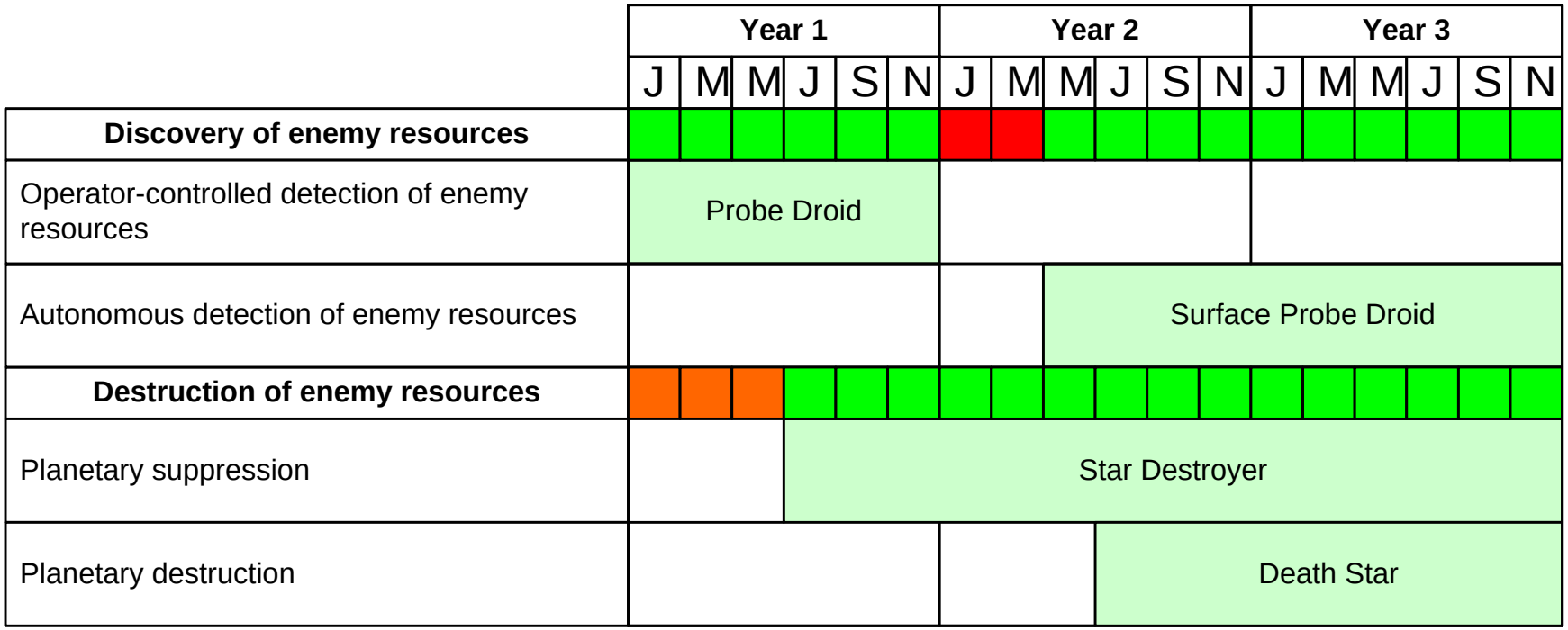
StV-4: Capability Dependencies



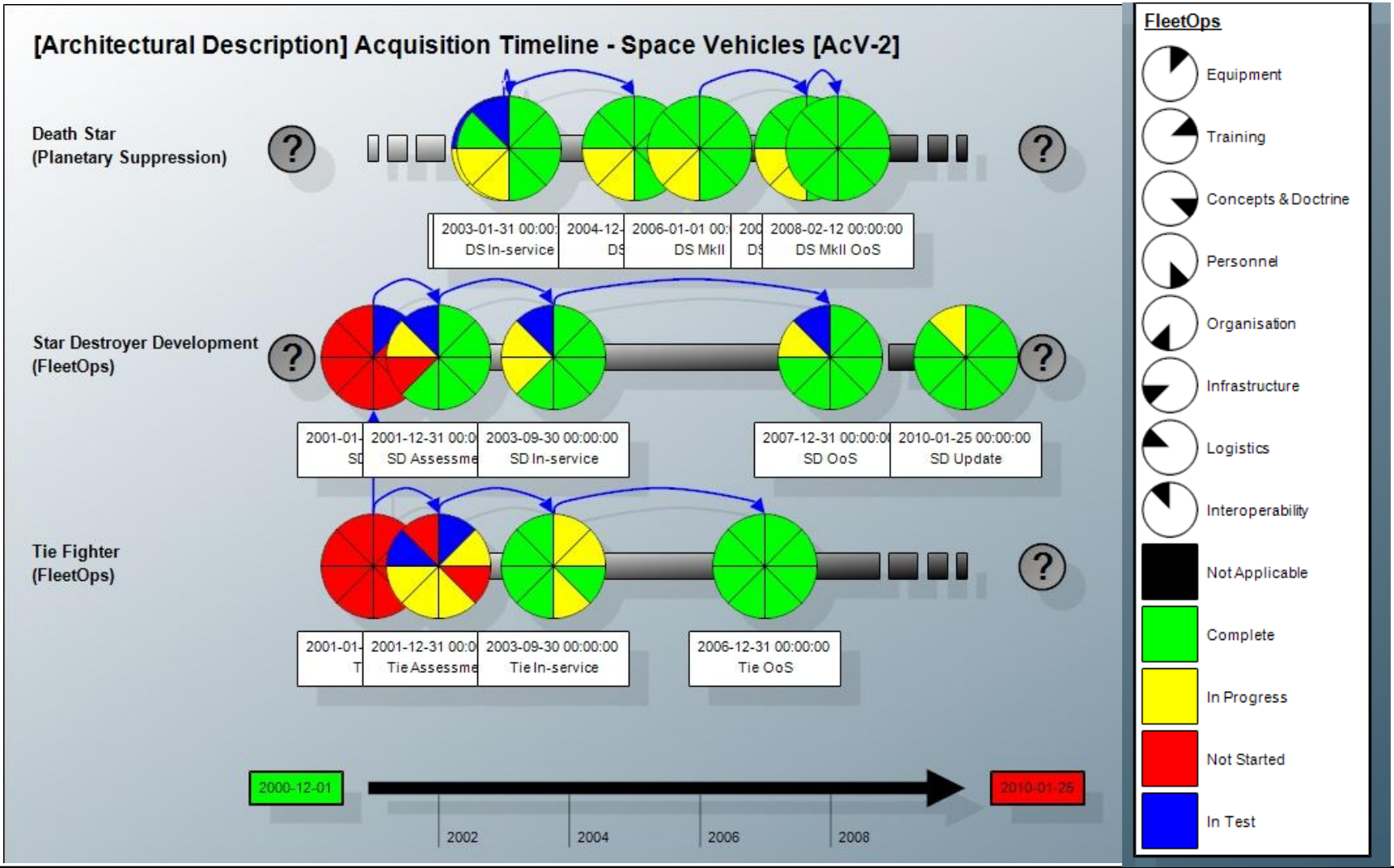
AcV-2 Project Views - Milestones



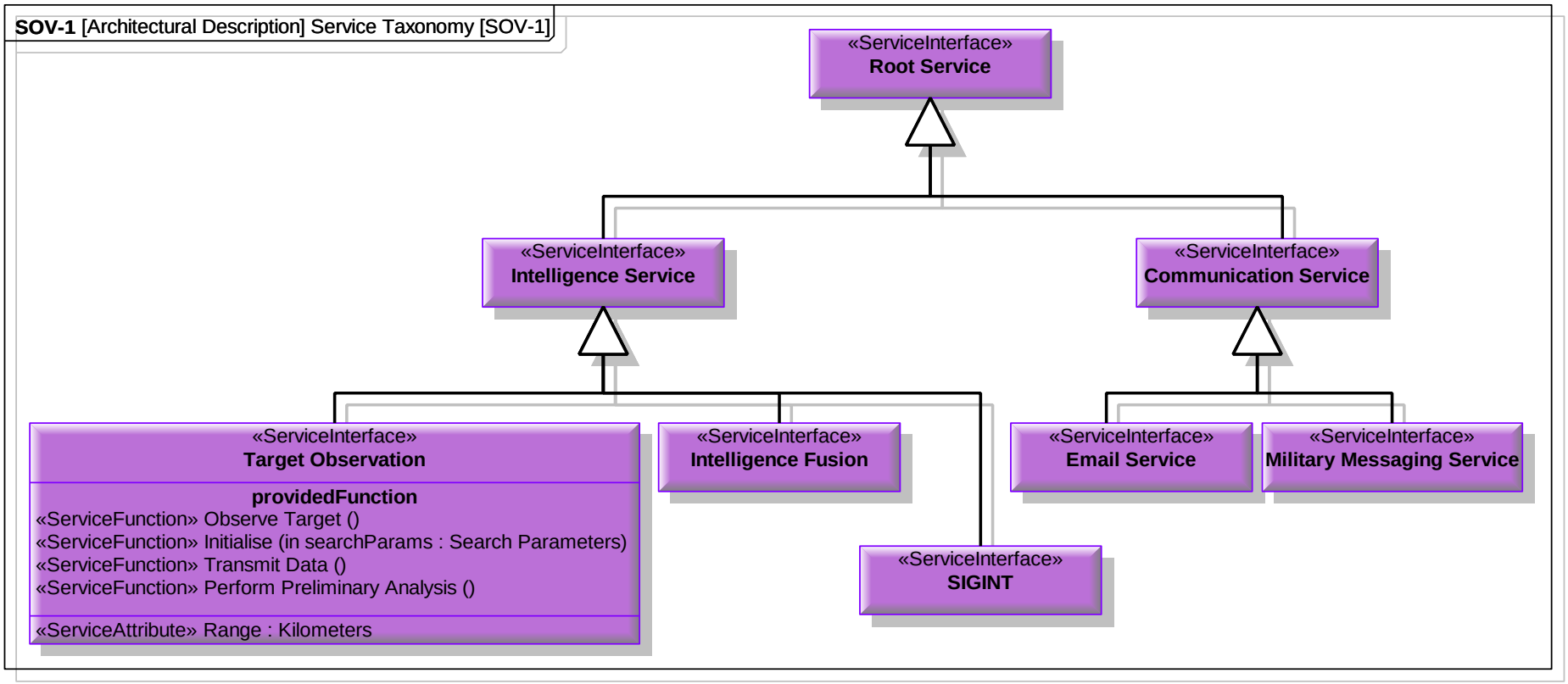
StV-3: Table/Gantt Chart



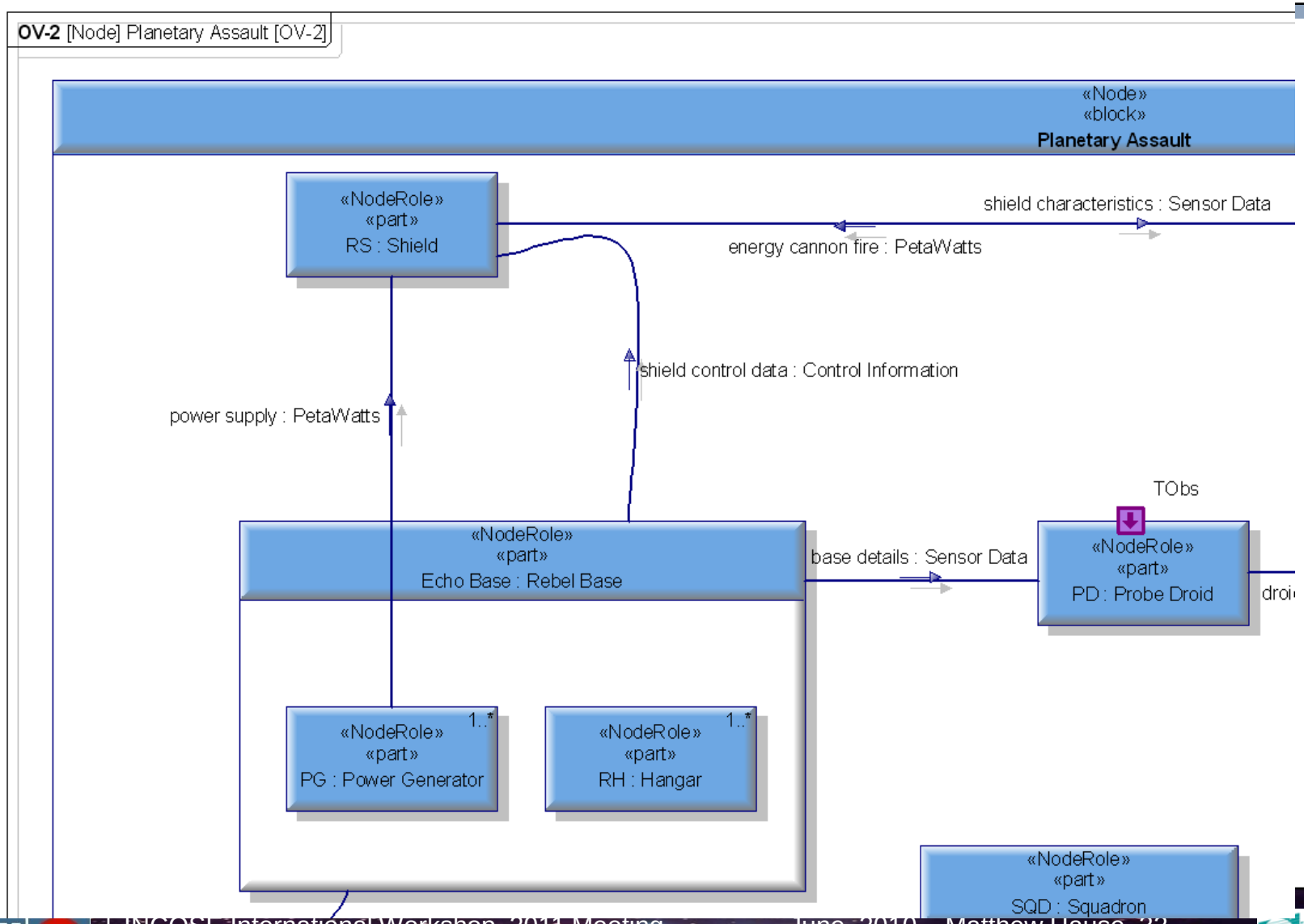
AcV-2 Project Views - Milestones



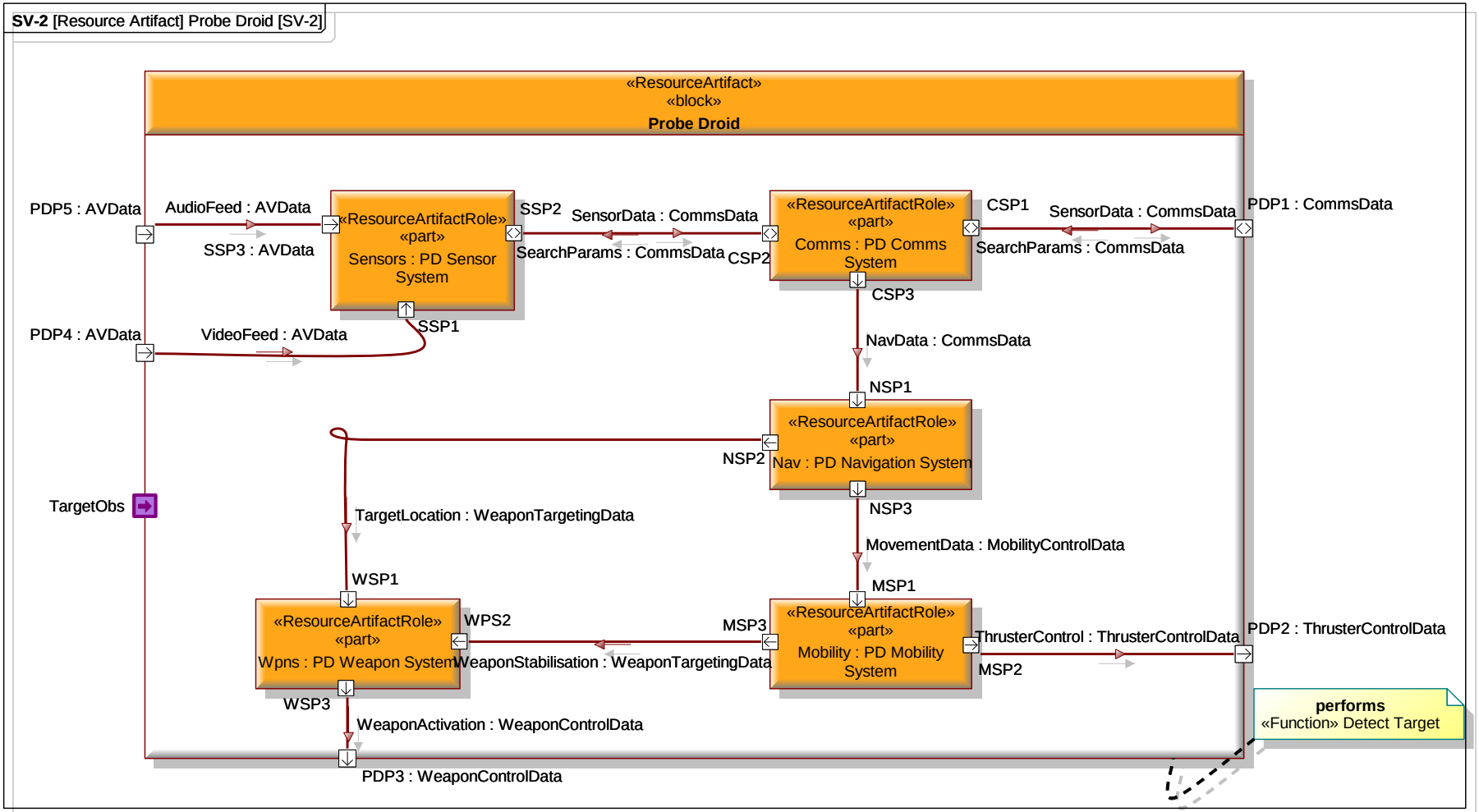
SoV-1: Service Taxonomy



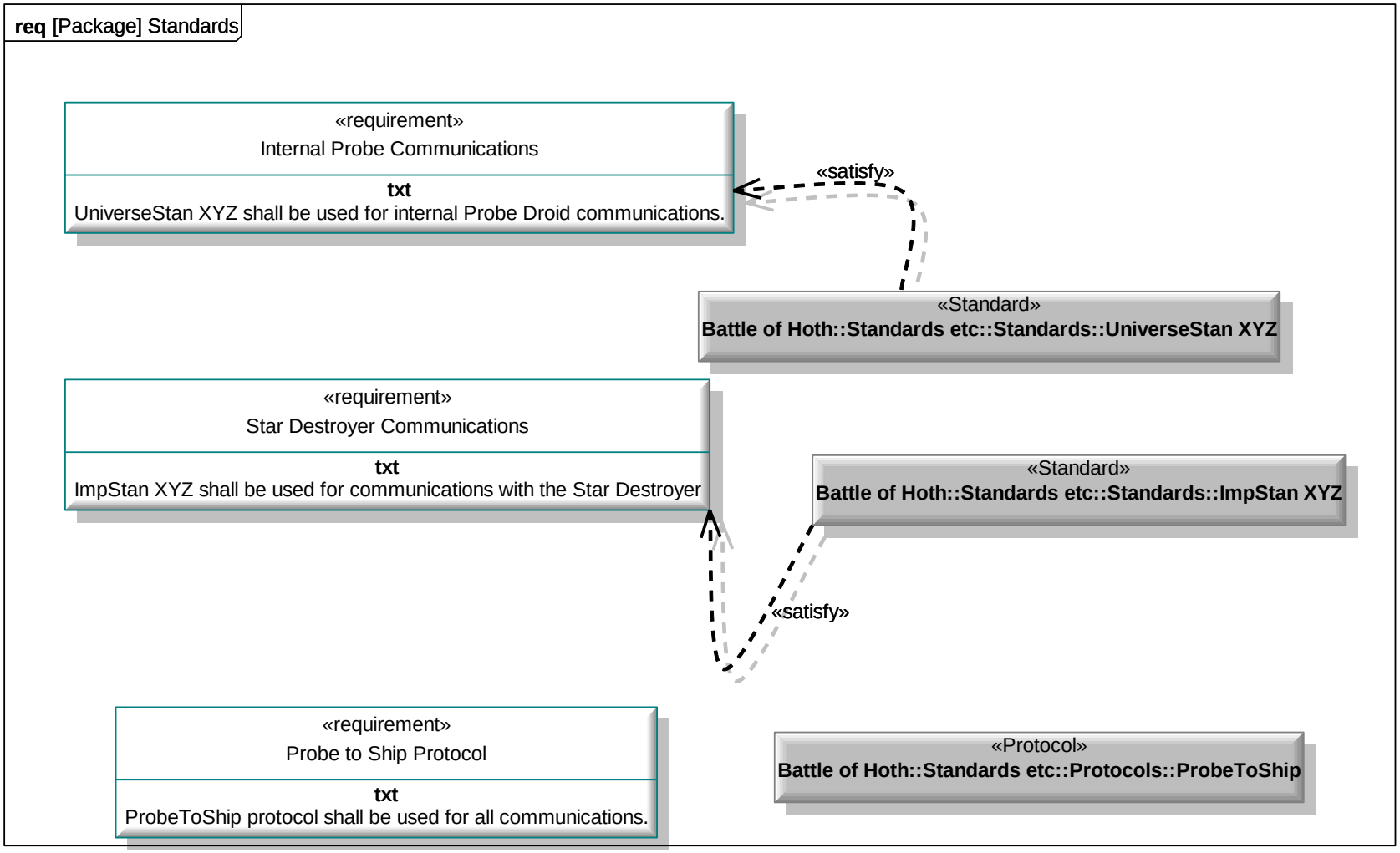
OV-2 Operational Nodes - Detail



SV-2: System Detail



SysML Example: Requirements Traceability



International Adoption of UPDM

- United States
  - DoD statements of support issued
  - Vendor presentations given to DoD, Industry, conferences
  - UPDM being used on both bids and projects
- Great Britain
  - MOD statements of support issued
  - Vendor presentations given to MOD, Industry, conferences
  - UPDM being used on both bids and projects
- France
  - DGA favoring NATO NAF over AGATE; investigating UPDM
  - Vendor presentations given to DGA, Industry, conferences

DoD at OMG

DoD and MOD Recommended the C4i TF to vote and recommend formal Issuance of the UPDM Request For Comment (RFC):

- **Critical Role for Enterprise Architecture**
- **Time is now for Baseline Requirements**
- **Sound Methodology - UPDM RFC**
- **DoD long standing policy on standards**
- **Strong Inter-Governmental Support**

DoD and MOD Position

- **Joint Statement (18 Sep 08)**
  - **Brian G. Wilczynski, Director, Enterprise Architecture & Standards, Office of the Department of Defense Deputy Chief Information Officer**
  - **John Keefe, United Kingdom Ministry of Defence**
  - **“UK MOD fully endorses and supports the position stated by the US DoD”.**

International Adoption of UPDM cont'd

- Sweden
  - FMV statements of support issued
  - Swedish SwAF have now adopted MODAF as standard
  - Vendor presentations given to SwAF, Industry
- Canada
  - DND participation in UPDM effort at OMG
  - Evaluating its use to support DNDAF
  - Provided security views
  - Vendor presentations given to DND, Industry, conferences
  - Public safety looking to adopt (Homeland Security)
- Norway
  - Vendor presentations given to defence dept, industry

International Adoption of UPDM cont'd

- NATO
  - UPDM update presentation given at NATO C3A briefing
  - UPDM group coordinating with NATO C3A for UPDM 2.0 oversight and support
- Italy
  - Vendor presentations given to Italian Armed forces, Industry, conferences
  - UPDM being used on both bids and projects
- Holland
  - Vendor presentations given to Dutch Armed forces, Industry, conferences

International Adoption of UPDM cont'd

- Israel
  - Vendor presentations given to Israeli Armed forces, Industry, conferences
- Use of UPDM for non-military applications
  - Disaster planning, event planning, space missions: satellites, manned missions, non-military government departments, humanitarian relief operations, industry infrastructure planning, banking, etc.

- <u>All of the above cited standardization and interchange as essential reasons for considering UPDM</u>

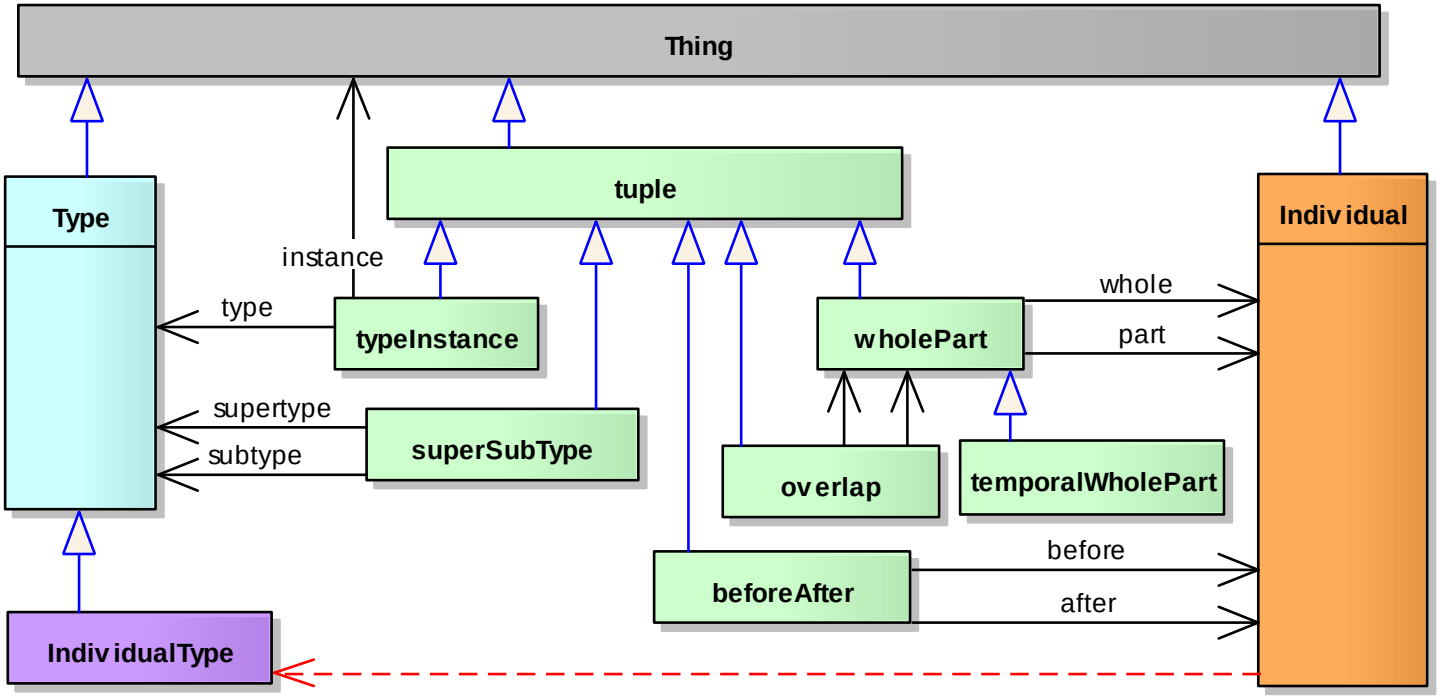
Discussion

Questions?

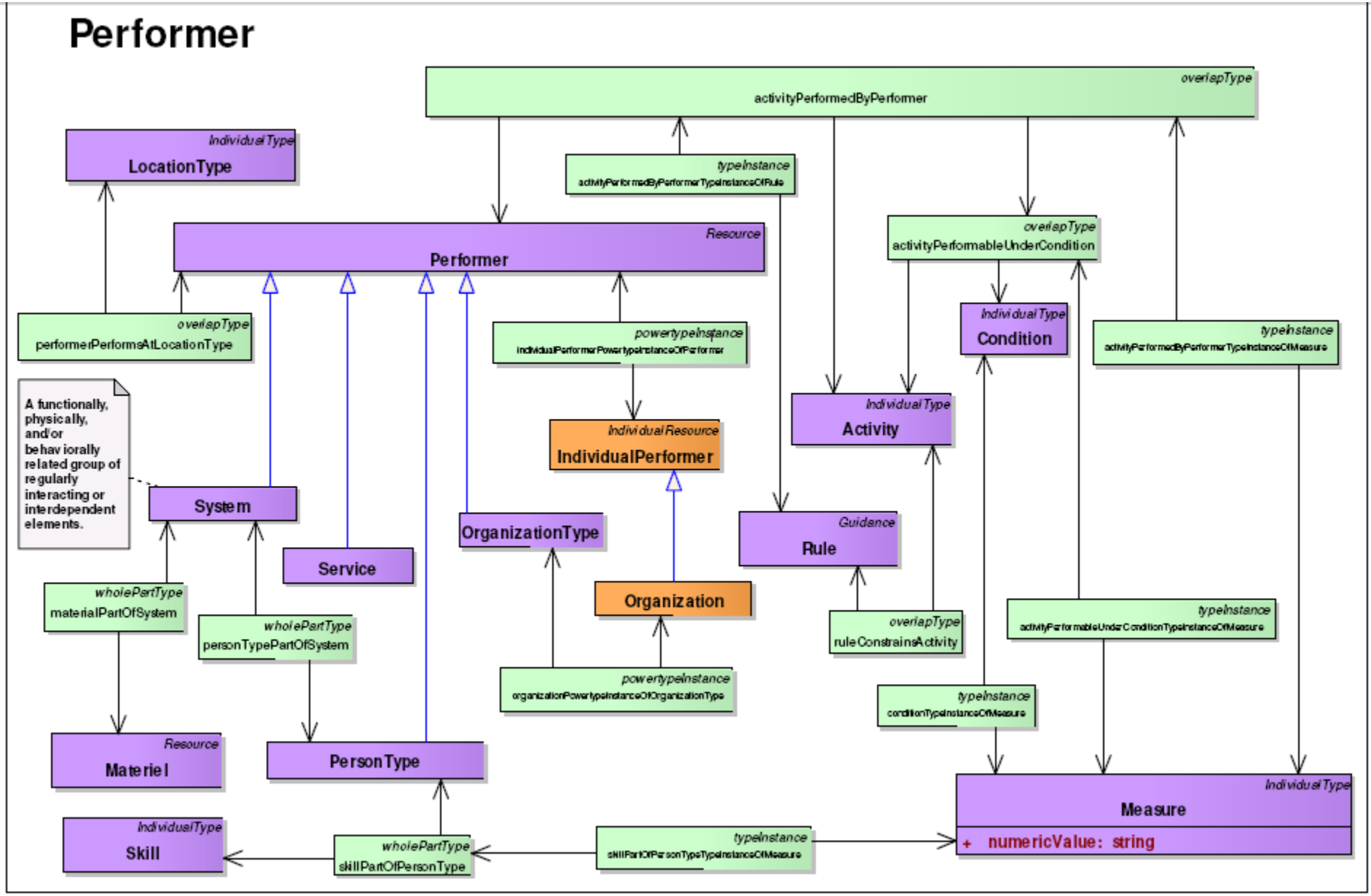
Backup Slides

IDEAS Recap - Top-Level Foundation

- Developed by an international group of computer scientists, engineers, mathematicians, and philosophers under defense sponsorship.
- See http://www.ideasgroup.org or http://en.wikipedia.org/wiki/IDEAS_Group



UPDM – Unified Profile for DoDAF and MODAF



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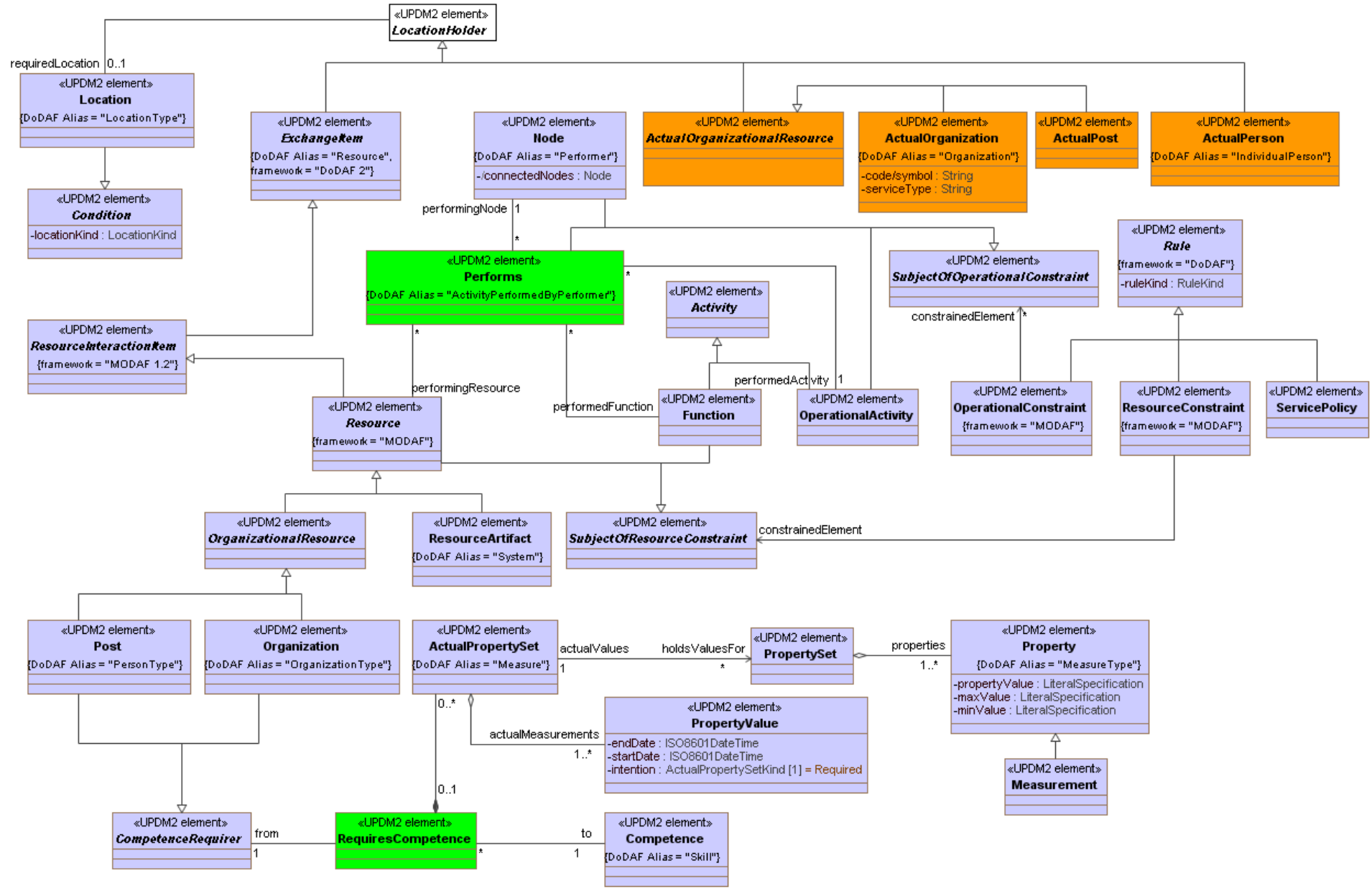

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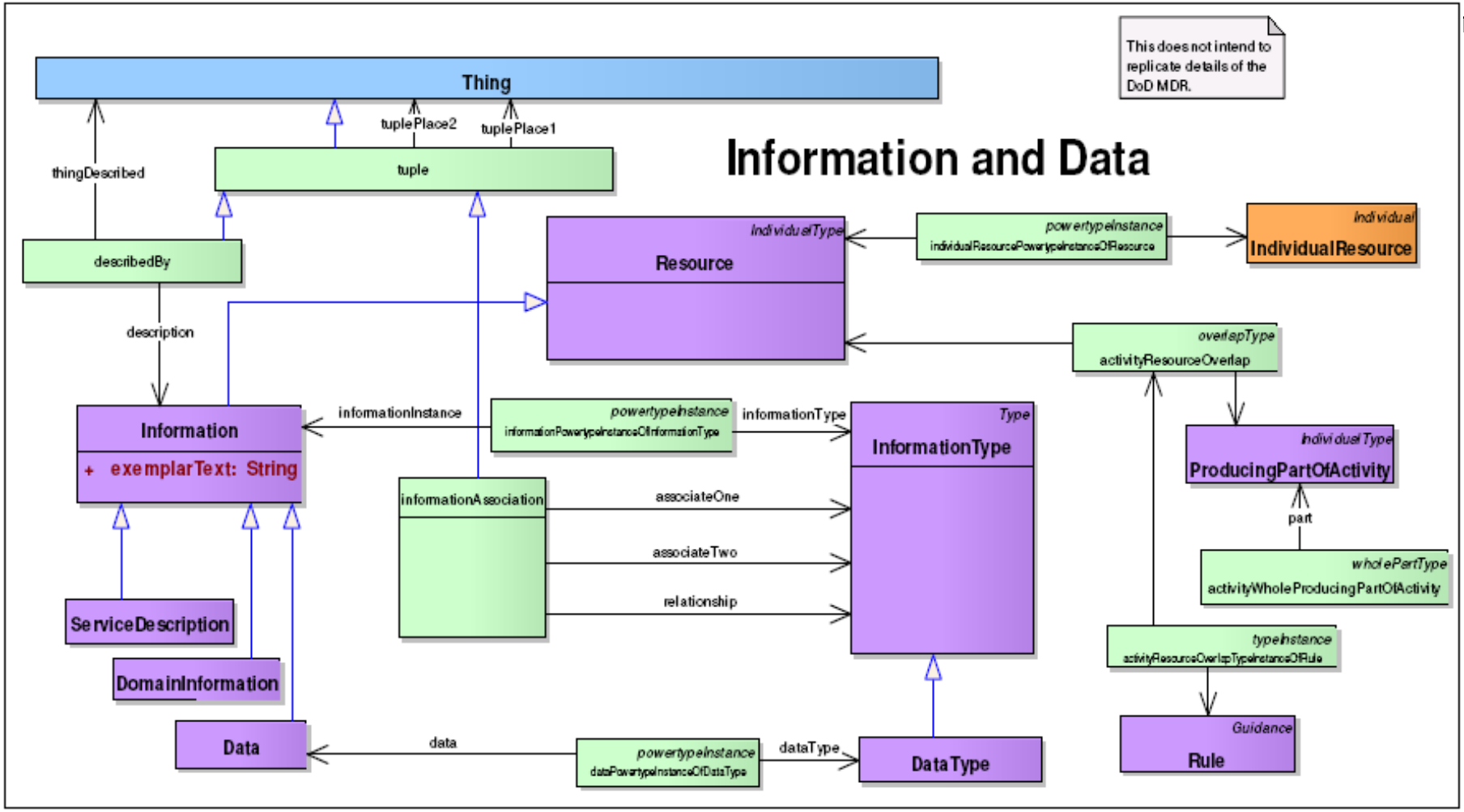

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