AFNIC/NIA Architecture as a Service

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• What Do We Do?
• Why Model?
• How We Do It (Examples)
• What’s The Way Ahead?
• Where is it?
• Other Questions?
Why Model?

- All forms of engineering rely on models to understand complex, real-world systems
- Models facilitate the communication of key system characteristics and complexities to various stakeholders
- Models provide abstractions of a physical system that allow engineers to reason about the system by ignoring extraneous details while focusing on relevant ones
- Models are used to reason about specific properties of the system when aspects of the system change and can assist in predicting system qualities
- Depending on the context, different elements can be modeled which provide different views which ultimately facilitates:
  - analyzing problems
  - proposing solutions
- Applying different kinds of models provides a well-defined style of development, providing ability to re-use common approaches

Sashi Thangaraj (SAIC), "Introduction to Model Driven Architecture (MDA), NCICB Software Development Processes Facilitating Systems Interoperability"
Why Model? Uses Of Architectures

1. CAPABILITY BASED PLANNING
   - Supporting operational planners analyses by defining ops activities, system functions, info/data needs and their relationships (e.g., CRRA HPTs)

2. RESOURCE PLANNING & MGMT
   - Who should buy what, i.e., PPBE support to Capital Planning and Investment Control (CPIC) process; comparative analyses of proposed investment strategies

3. SYSTEM DEVELOPMENT & ACQUISITION
   - Required functionality, interfaces, information exchanges, services and information infrastructure, including technical standards

4. PORTFOLIO MANAGEMENT
   - Applying Reference Models to promote std descriptions of activities, orgs, systems, data, technologies, and functionality for redundancy ID and reuse

5. OTHER USES
   - 1. Education and Training
   - 2. Exercise/Innovation
   - 3. Test and Evaluation
   - 4. …etc.
If these things are important to your enterprise, they should be in your architecture.
The Domain Model captures a description of what the software knows about the domain and the objects it contains.

SparX Enterprise Architect V12
Incorporating Operational Needs Into DoDAF Architecture
Cyberspace Weapon Systems
Use Cases and Mission Threads

- Process Models
- Sequence Diagrams
- Data Models
- Roles & Responsibilities

Configuration Management
Data Model

Approve Change
Sequence Diagram

Manage Change Activity Model

Cyberspace Superiority Infrastructure (CSI)
Architecture

Operator Involvement Critical for Accurate/Current Mission Threads
<table>
<thead>
<tr>
<th>Use Case</th>
<th>CCIR</th>
<th>System Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>JS/J6 Focus DTIC Test Plan</td>
<td>NR KPPs</td>
<td>Performance</td>
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<tr>
<td></td>
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<td>Architecture Provides Key Input To Testing Criteria</td>
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How We Do It
System Nodes w/ System Function Overlay

Where are the Policy Enforcements Points?
Who Controls Them? With What?
Cyberspace Superiority Enterprise Architecture (CSEA) Portal

DoDAF-compliant Architectures for:
- Cyberspace Superiority 2012, 2016, 2024
- Defensive Cyber Ops
- Six (6) Cyberspace Weapons Systems
- Enterprise IT Service Management
- Knowledge Operations
- AF Network (AFNet)
- SIPR Modernization (AFNet-S)
- Cyber Range
- ISR Information
- JIE Joint Regional Security Stacks
- JIE Installation Services Nodes
- 50+ UML Cyber Ops Use Cases

Requirements Traceability
- Joint Capabilities Areas
- DoD Information Environment Arch
- Joint Common System Functions

~ 1,500 REGISTERED USERS

Your Brain on Architectures