October 2012

INTERIM PROGRESS REPORT

NDIA System Engineering Division 2012 Task #4

USE OF DODAF FOR SYSTEMS INTEGRATION: AN NDIA SE DIVISION ARCHITECTURE SUBCOMMITTEE UPDATE

OVERVIEW

- Tasking Statement
- Architecture Subcommittee Members
- DoDAF Background
- Findings to Date
- Audience Input
- Next Steps

TASKING STATEMENT

Questions posed by the SE Committee to the Architecture Subcommittee

- Is the use of authoritative DoDAF-like architectures critical for a successful systems integration effort? (Navy).
- Does the DoDAF provide reusable architectures, environments and system hierarchies? (AF)

TASKING ANALYSIS

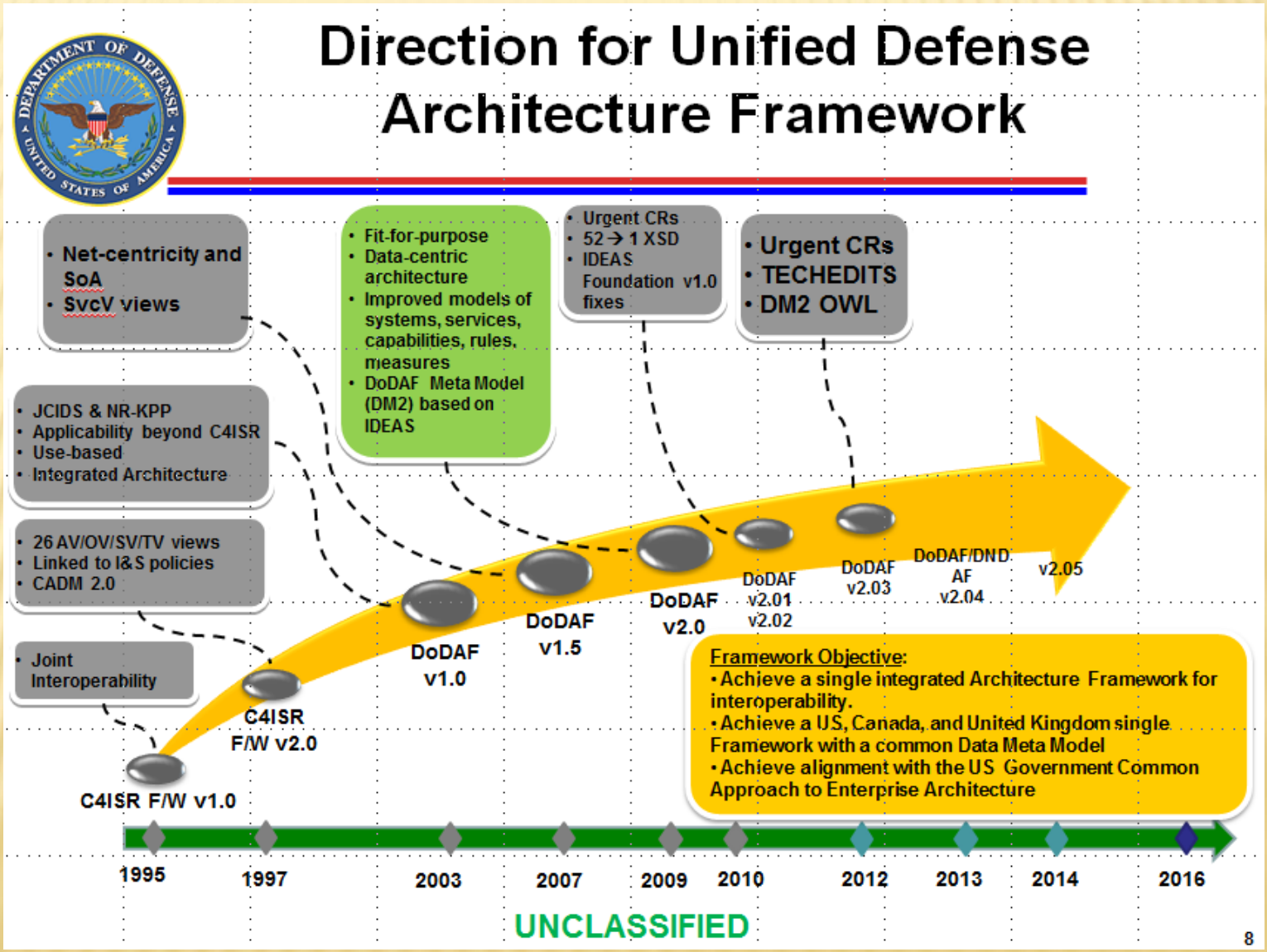
- **Input from Steve Henry (Chair, SE Committee):**
  - "The Navy is concerned about ***Enterprise integration*** across their mission threads."
  - "..what level of architecture is needed to ensure successful integration." (Navy)
  - "Air Force interested in architecture ***reuse*** to ***save cost***"
- **Input from John Palmer (Co-chair, SoS Committee):**
  - "USAF wants to be able to ***re-use architecture models***, and be able to link the models developed among different technical disciplines"
  - "... architecture ***tools to better support*** sustainment issues"
  - "The Navy was questioning the effective value of the DoDAF ... and asking for better ways"
- **Input from John Lohse (Chair, M&S Committee):**
  - Navy "stated the DoDAF artifacts don't allow for things to ***change over time***."
  - Navy "also addressed the desire to tie them to the Navy NMETLs and UJTLs."
  - Navy "requested some help in understanding the ***role of mission advocates and platform advocates*** in Development Planning"

ARCHITECTURE SUBCOMMITTEE MEMBERS WORKING THIS TASK

- Barbara Sheeley, The Boeing Company (Subcommittee Chair)
- Dr. Steven Dam, SPEC Innovations
- Jack Zavin, OSD/USD(AT&L)
- Fatma Dandashi, MITRE
- Ron Williamson, Raytheon
- Bruce Brown, Northrop Grumman
- John Palmer, The Boeing Company
- Kevin Agee, Army Research Laboratory
- Dave McDaniel, Silver Bullet Solutions
- Raschid Muller, DISA

DODAF BACKGROUND

From presentation to NDIA SED Architecture Committee, May 18, 2012 by Mr. Walt Okon, Senior Architect Engineer in charge of DoDAF, Architecture & Interoperability Directorate, DoD CIO



Perceived Benefits of DoDAF

- Common vocabulary, semantics and viewpoints
- Support for JCIDS
- Emphasis on
  - architecture related DOTMLPF concerns
  - operational/business concerns
  - standards
  - operational and system structure/behavior
  - data and information
  - traceability among viewpoints

Perceived Limitations of DoDAF

- Relation between DoDAF and SE unclear
- Use case and requirements support missing
- Framework, not a methodology
- Data model still very complex at PES level
- Lack of metrics
- No DoDAF certification process for training courses
- No executable architecture support
- Limited tool integration support
- Large number of views
- No predefined templates
- No common sub-domain viewpoints
- No emphasis on quality attributes

Initial Observations

- Significant user resistance to DoDAF continues
- Architectures often being developed to meet requirement, then ignored
- Data-centric approach may miss key part of design: form, fit, and function
- Visualization now a major issue – “fit-for-purpose” may lead to lack of standardization making comparisons more difficult
- Moving to single coalition architecture framework has pros and cons
- Many Architects do not consider themselves as doing systems engineering – following potentially duplicative paths
  - ***This is the focus of our recommendation paper***

ARCHITECTURE & SYSTEMS ENGINEERING (SE) INITIAL THOUGHTS ON SE

- SE 101 from INCOSE
  - Manage Complexity, Reduce Risk (Cost, Schedule, Technical)
  - Big Picture and Common Sense
- Successful SE Features
  - ***Understand the Problem***
  - Assess Alternatives
  - ***Define System Architecture***
  - Manage Requirements
  - ***Manage Interfaces***
  - Prepare Test, Training and Support Capabilities
  - ***Track Progress Against Plan***

Core Architect Roles
(in part and whole)

Source: INCOSE Transportation Working Group www.incose.org/practice/techactivities/wg/transport

DODAF & SYSTEMS ENGINEERING
INITIAL THOUGHTS ON DODAF VALUE TO SE

- Understand the Problem
  - Who, What, Where, When, Why, How…Common Vocabulary
  - DoDAF Capability and Operational Viewpoints address the problem domain needs (current & objective)
- Define System Architecture
  - DoDAF Systems, Services, Data/Information, Standards Viewpoints address the solution domain (current & objective)
- Manage Interfaces
  - DoDAF core Systems and Services views focus on interfaces, flows and traceability to Operational Needs
- Track Progress Against Plan
  - DoDAF AV-1 defines the architecture plan and should be integrated with the SEMP (Systems Engineering Management Plan)

Audience Input

- Your DoDAF experience?
- Recommendations?

Next Steps

- Continue to gather information about DoDAF's use today
- Deliver a recommendations report to SE Committee
- Long-term: develop a survey to obtain quantitative data on use and usability of DoDAF in architecture and SE development