UAS Control Segment (UCS)

Technical Overview

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August 18, 2011
Utilizing an Open, Standards-Based Service-Oriented Architecture (SOA) approach, the UCS Architecture will enhance:

- Operational and Acquisition Efficiencies
- System-to-System Interoperability
- Warfighter Capability

UCS Architecture does not currently cover:

- Low-level C2 interface between UAVs and ground stations as existing standards such as STANAG 4586 provide standardization path-forward in this area
- Human-Machine Interfaces (HMIs)
UCS Architecture Time Line

Structuring

Feb 2009 ADM

2009 Concept Exploration

Dec 2009 Version 0.5 Incl. AV-1

Architecture Definition and Demonstration

June 2010 Version 1.0

Nov 2010 IWP Demo
Mar 2011 JSIL Demo

Architecture Modeling

1QFY12 Version 2.1

Current Focus
### Executive Board Provides Mgmt & Guidance

#### UCS Working Group Executive Mgmt
- Integrated Master Schedule
- Working Group Scorecards
- Working Group Plenary Meetings
- Interface with OSD UCS Steering Group

#### AV-1
- Program of Work
- Terms of Reference
- Business Processes

#### Configuration Control Board (CCB)
- Change Request (CR) Management
- Document Release Approval

#### Architecture Guidance Document
- Architecture Overview and Rationale
- Implementation Guidance and Lessons Learned

#### External Communication
- Briefing Materials, Resources
- Public Website
- Presentations and Meetings
- Open Business Model (OBM)
Subcommittees Perform the Technical Work

Subcommittees form Task Groups to perform well-defined portions of their work. Task Groups exist until these tasks are completed.
Define and develop a common, open and scalable application architecture for command and control of Unmanned Aircraft Systems (UAS) Group 2 through Group 5 at Platform Independent Model (PIM) level using OMG™ Model Driven Architecture® (MDA)

**System Use Cases**
- Mission-Level Use Case and Scenario Textual Descriptions
- Mission-Level Use Case Diagrams (UML)
- System-Level Activity / Sequence Diagrams (UML)

**Data Model**
- Data Meta-Model (UML)
- Logical Data Model (UML)
- Logical Data Model to Interface Data Model Projections (UML)

**Domain Architecture**
- UCS Architecture partitioned into Domains based on Subject Matter
- Domain / Sub-domain Textual Descriptions
- Domain-Level Use Cases and Activity / Sequence Diagrams (UML)
- Service-Level Textual Descriptions
- Service-Level Interfaces (SOAML)
Define and develop an implementation architecture for a flexible, technology-neutral infrastructure for UCS that: Implements and distributes Application Service Interfaces and Data Models; Provides a safe/secured computer architecture, reusable PSM mappings to supporting middleware, OS, and hardware; Supports composability of mission services, reference implementation, and testing.

### Computing Infrastructure
- Core API Standards (CAPIS)
- DODAF viewpoint StdV-1 Standards Profile

### Security Management & Information Assurance
- Security and Information Management Use Cases (UML)
- System Security and Information Assurance Management Plans (IAMP)

### Infrastructure Services and Configuration
- Infrastructure Services PIM (UML)
- Definition of underlying Platform Technologies
- System Configurability Requirements

### MDA Process
- MDA Process Guidance
- PIM to PSM Transformation Examples
Certification Architecture Subcommittee

Identify the best technical approaches for Certification (Information Assurance, System Safety and Airworthiness) for the UCS Architecture relative to DoD Certification guidance; assess the UCS Architecture relative to these DoD Certification considerations; and propose changes to the UCS Architecture where Certification deficiencies are identified.

**Information Assurance (IA)**
- Information Assurance Management Plan (IAMP)
- Canonical Information Assurance Case (Goal Structured Notation)

**System Safety and Airworthiness**
- Data Meta-Model (UML)
- Logical Data Model (UML)
- Logical Data Model to Interface Data Model Projections (UML)
Architecture Implementation Subcommittee

Address aspects related to the implementation of the UCS architecture, including: Developing a reference architecture or architectures; Defining experiments to aid in the validation of the UCS architecture; Determining conformance of systems and services to the UCS architecture.

- **System Architectures**
  - Reference Architecture
  - Reference Implementations
    - Dismounted User
    - Transportable/Mobile System
    - Fixed Facility
  - Implementation Lessons Learned

- **Experiments**
  - Experiments defined to validate Architecture Quality Attributes in AV-1

- **Conformance**
  - Data Dictionary
  - Open Architecture Assessment Tool
  - Guidance on measuring Program of Record (PoR) compliance
  - Guidance on program ‘on-ramps’
  - Component Specification Template
Development Tools Subcommittee

Provides guidance, recommendations, and implementations of tools for use in the Model Driven Engineering approach adopted by the UCS-WG. This includes tools for specifying, analyzing, developing, and implementing the UCS 2.0 Architecture. The scope of this activity includes UML development tools, code generation capabilities, model import/export, and configuration management.

M3 Architecture

- Common Development Environment (tools) for UCS Architecture
- Based on OMG Model Driven Architecture (MDA) Approach

Configuration, Change and Data Management

- Architecture Governance Processes
Release 2.1 Scheduled for 1QFY12

Heterogeneous mix of 17 funded companies