UCS Architecture

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UCS Architecture

UAS Control Segment (UCS) Architecture

- OUSD(AT&L) ADM for DoD UAS Groups 2-5, February 2009.
- OUSD(AT&L) funded development through April 2015.
- Public Release of R3.4

Emerging as DoD information architecture for controlling Robotic and Autonomous Systems (RAS) in all domains

- Currently managed by SAE AS-4 (Unmanned Systems). Portfolio now includes both JAUS and UCS Architecture.
- Extended by Navy for surface and subsurface RAS (UCS-M).
- NAMC extension for small UAS, ground vehicles, and unattended sensors (soldier/marine common controller).
Why is UCS different?

**Conceptual Interoperability** - *how things relate*

UCS provides a comprehensive **Conceptual Data Model (CDM)** of the resources in the RAS domain and their objectives, missions/tasks, data products, and environment. *All information architectures must interact with the same real-world objects. This is how SoS integration becomes possible.*

**Pragmatic Interoperability** – *accessing capabilities*

UCS defines a **Service Oriented Architecture (SOA)**, which exposes RAS the capabilities via message exchanges. *Exchanged messages project to the CDM and therefore are conceptually related. The SOA ties these messages to real-world effects/actions*

**Semantic Interoperability** - *messages/data*

UCS provides an extensive **Logical Data Model (LDM)**, which defines how the state values in message exchanges (e.g. vehicle position) are to be interpreted within a particular system. *The LDM provides a machine-readable definition of state information and any required conversions between systems.*
UCS roadmap under SAE
Plan for AS6512 Rev A, end FY17

**Information Architecture**
Platform Independent Model

**Strategy:** extend UAS into multi-domain RAS.

**Common, Air**

**Maritime**

**Ground**

**Data Model**

**Data Model Framework** & Data Dictionary

**Strategy:** Add autonomy services

**Strategy:** Joint SAE and Open Group (FACE) standard

**Strategy:** Partner with Joint Staff J6

**Software**
Registries, Repositories

**Service Interfaces, Messages**

**Ext. C2/COP Support**

**NAVAIR** policy to adopt

**Army** policy to adopt

**Software PLA Support**

**SOA**

- Primary Mission Control
- Mission Planning
- Sensor Product PED
- Situation Awareness
- System Support
- External Messaging & Comms

**Strategy:** Leverage NAMC CCA.

**UoS Domain in NIEM MilOps**

**Strategy:**
- NAVAIR policy to adopt
- Army policy to adopt