Working Group Outbrief

Ground System Architectures Workshop
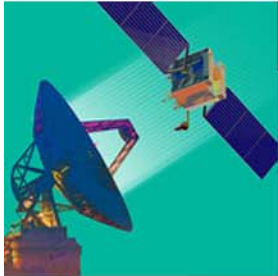
Session 11C

Practical Lessons Integrating Net-Centric and Legacy Ground Systems
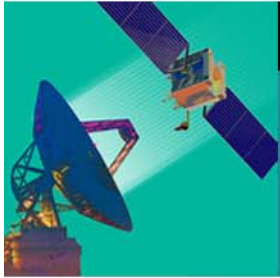
Jeff Waters, SPAWAR

Mary Nichols, The Aerospace Corporation

Session Goals

- Net-Centricity (and by association, Service-Oriented Architecture) are mandated by the DoD.
  - Emerging expertise and successes exist in the commercial arena
  - DoD and other mission critical system domains lag and, at times, struggle to separate hype from true benefit.
- WG goal was to share experience of practitioners in
  - Integration of net-centric satellite and ground systems
  - Adaptation of legacy systems to net-centric requirements
- Focus on bringing together commercial, government, military and intelligence ground system developers, integrators and maintainer/operators

Presenters/Panelists

Introduction – Jeff Waters

Foundations - Standards, Community, & Networked Services

"**JSpOC Mission System Common Data Model**" (Maryann Hutchison, Aerospace)

"**The CCSDS Navigation Working Group and Space Situational Awareness**" (David Berry, JPL/CCSDS)
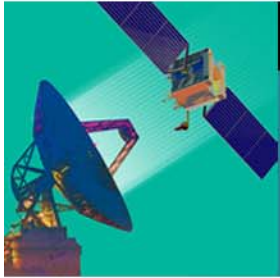
"**METERON Operations Environment And Prototype Robotic Services**" (Mehran Sarkarati, ESA)

Example Scenario & Applications

"**Reference Implementation Working Group Demo Scenario**" (Brendan Callahan, MTSI)*

"**Enabling Interoperability in Space Situational Awareness**" (Steve Bygren, MITRE) *

Presenters/Panelists (2)

Example of Need & Application

"**Dynamic Optical Telescope System**" (Lisa Thompson/ Laura Ulibarri, Air Force Research Lab, Maui)*

"**Common Data Model / WSDL / SOAP Demonstration**" (Mahan Hajianpour, Aerospace)

"**A Comms Data Processor For ISS Ground Systems Using Standards and Software-Based Architectures**" (Rob Andzik, Amergint)

"**Evolution of Net-Centric Data Services at AFWA**" (Andy Sedlacek, Northrop Grumman)

Note: We had intended to have a Panel Discussion led by Morris Brill (Northrop-Grumman) to address questions from the Audience, but were constrained by lack of time after the technical presentations

* Presenting remotely over phone
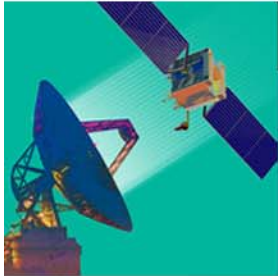
Key Points

Lessons Learned and State of the Practice:

- Data models currently being developed under a number of enterprise umbrellas to foster interoperable information sharing

- Net-Centric Community is following a "start small, learn and adapt" strategy using reference implementations and prototyping efforts.

- Early signs point to importance of pub/sub compared to 1-1 interactions (such as SOAP request/response approaches).
  - Workshop noted the potential efficiencies presented by REST implementation

- Standards are essential for interoperability and early-adoption / integration
  - However, evolving and competing standards still hinder the adoption of net-centricity.
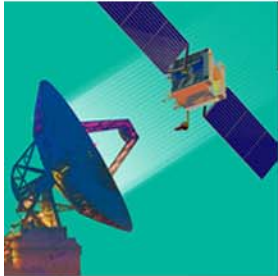
Conclusions

- Integrating legacy systems into a net-centric enterprise is much more challenging than initially envisioned by many people in government and industry.

- Early investment in net-centricity (via up-front architectural work or domain-specific bench-marking) will pay off during later development /test phases.

- When introducing a common data model, focus on showing it is implementable

- Establish a Community of Interest with active working groups to bring together stakeholders who share the vision and to provide outreach and support to those looking for support as they tackle net-centricity and interoperability