Working Group Outbrief

Ground System Architectures Workshop

Session 11F
Lessons Learned from Developing Net-Centric and Service-Oriented Ground Systems

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Session Goals

• Working Group is a forum for practitioners to share experiences and lessons learned in implementing fielded and fieldable net-centric (NC) and service oriented architectures (SOA) as a means of “Expanding Access to Information”
  – Structure a forum for formal and informal presentations by panelists and attendees
  – Encourage energetic Q&A and discussions

• Identify lessons learned and guidelines on effective use of NC/SOA

• Identify challenges and mitigations applying NC and SOA

• Provide lessons learned to “Architecture-Centric Evolution (ACE): Software Architecture Recommendations for Net-Centric and Service-Oriented Ground Systems” Working Group evening session (Session 12)
Questions Used to Trigger Discussion

• Was NC/SOA an explicit mandate or an architecture decision to satisfy existing requirements?
• What resistance was encountered from technical, non-technical, and the programmatic sides?
• What was the governing body coordinating the system with its customer?
• How was legacy software or systems integrated into NC/SOA framework?
• Where did promises pay off? What were the pitfalls?
• How were the following addressed?
  – Cost of Ownership, Evolvability, Reliability, Scalability, Extensibility, Interoperability
• Were the COTS products and standard protocols mature and satisfactory?
• What standards, technologies, products have taken hold, which are diminishing?
• What would be done differently next time?
• How was the users' experience managed?
• What performance issues were encountered and how were they resolved?
Working Group Agenda

- Formal presentations by panelists
- Attendees will be given opportunity to share their experiences and lessons learned in five minute short talks — please sign up during presentations

13:00 Introduction
13:15 Presentations by Panelists
   “By the Book“ NC/SOA Implementations
   “Off-the-Rails” NC/SOA Implementations
15:00 Break
15:15 Participant Short Talks and Discussion
17:00 Adjourn
Ground System Architectures Workshop

Presenters/Panelists

• Moderator
  Daniel Balderston, The Aerospace Corporation

• Presenters
  – “OCX Lessons Learned”
    Murray Conary, Raytheon
  – “DCGS-IC Lessons Learned”
    Michael Loomis, The Aerospace Corporation
  – “Architecting Net-Centric Access to Environmental Intelligence”
    Morris Brill, Northrop Grumman
  – “GMSEC Overview”
    LaMont Ruley, NASA
  – “GPS User Equipment”
    David Goldstein, The Aerospace Corporation
Lessons Learned

• Reuse or creation of services must be incentivized or mandated
  – PMs must be motivated to create services
    • Incentives do not exist when the benefit of SOA is reuse for some other program not within the funding line
    • PMs do what is best for their program and what they can afford given continued shrinking budgets across the DoD

• User engagement is vital; drives relevancy, buy-in
• Prototype or demonstrate early and often for buy-in and success
• Definitions are important. Ensure all participants agree on a common definition. e.g., net-centricity
• Granularity of services is an issue and must be actively managed. Governance must be designed in, early
• Data must be properly marked or tagged to be usable (but there is no effective enforcement of this)
Observations

• SOA and net-centricity continue to mature, evolve
  – NC promised many benefits to users 15 years ago, but today we do not have a Global Information Grid and we still use Integrated Broadcast Service and Link 16 to push data to users

• Definitions of net-centricity and SOA are still converging
  – Some say that net-Centricity remains ill-defined*

• SLA necessary to meet expectations
  – SLAs are hard to implement

• Enterprise SOAs have yet to be realized

• Commercial business models are playing a role in developing approaches to delivering services, apps, data, to users and other endpoints
  – There are significant differences between the commercial marketplace and the DoD minimizing chances that the DoD will follow commercial industry (for example, security)

• Shortfalls in exposing services and data may be limiting the benefits of net-centricity and SOA
  – The paradigm shift from Need to Know to Need to Share has not been fully realized
• Net-centricity ≠ SOA
• SOAs are still stove-piped
• Services are not applications
• Users and developers view and use services (and apps) differently
• SOA is a paradigm
• ICDs as services
• There is a difference between commercial and government “business” models. Commercial marketplace is open, the Government “marketplace” is closed.
  - So will apps marketplaces work?
  - So will this minimize chances that DoD will follow commercial models (e.g., security)
Questions for Thought

- Why invest in data and services no one is using?
- Why, after all these years, are there no enterprise adoption of services? (Why are SOAs still stove-piped?)
- How can we reconcile increasing (exponential?) security demands and requirements with making progress with SOA and net-centric systems?
- Is net-centricity the true enterprise paradigm? (e.g., vs. SOA)
Tweets from the Panelists: Take-Aways

• “GPS User Equipment”  
  *David Goldstein, The Aerospace Corporation*  
  *Net-centricity is desirable and valuable*

• “DCGS-IC Lessons Learned”  
  *Michael Loomis, The Aerospace Corporation*  
  *Progress is being made. Participate. Contribute.*

• “SOA Experience: GPS OCX”  
  *Murray Conary, Raytheon*  
  *There are challenges with NC and SOA. Programs are overcoming them.*

• “Architecting Net-Centric Access to Environmental Intelligence”  
  *Morris Brill, Northrop Grumman*  
  *Know your customer, Know Your User. Enable access to the data users need*