

Working Group Outbrief

Ground System Architectures Workshop



Session 11F

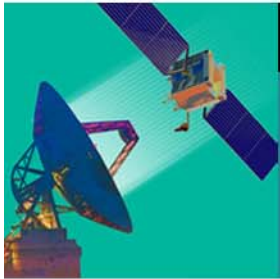
**Lessons Learned from Developing
Net-Centric and Service-Oriented
Ground Systems**

Mary Nichols, The Aerospace Corporation

Daniel Balderston, The Aerospace Corporation

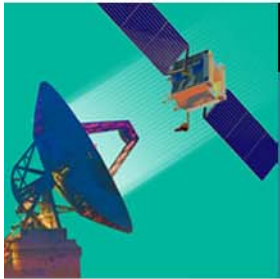
Eltefaat Shokri, The Aerospace Corporation

Morris Brill, Northrop Grumman



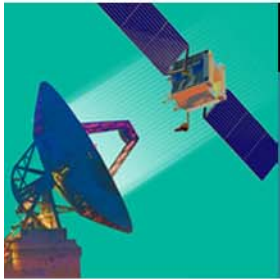
Session Goals

- 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

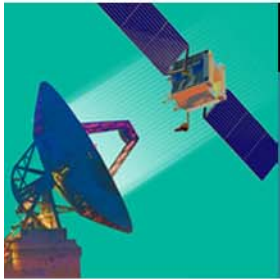
“Off-the-Rails” NC/SOA Implementations

15:00 Break

15:15 Participant Short Talks and Discussion

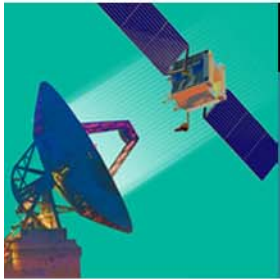
17:00 Adjourn

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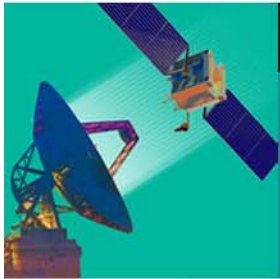
Presenters/Panelists

- **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



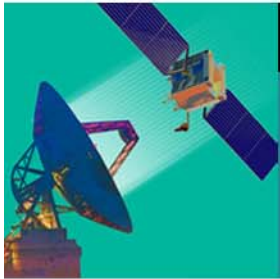
Lessons Learned

- 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)



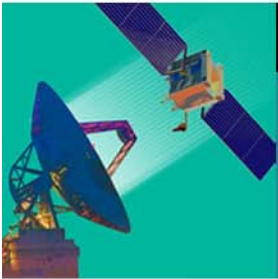
Observations

- 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



Intriguing Points Made During Discussion

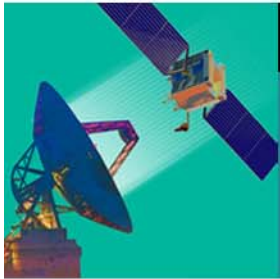
- Net-centricity \neq SOA
- SOAs are still stove-piped
- Services are not applications
- Users and developers view and use services (and apps) differently
- SOA is a paradigm
- ICDs as services
- There is a difference between commercial and government “business” models. Commercial marketplace is open, 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)

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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