SMC/SCNG Compatible Satellite C2 (Sat C2)

2010 GSAW Briefing

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Overview

BLUF: SCNG is prototyping a compatible infrastructure to capitalize on inherent similarities within satellite command and control

Topics
• History of Satellite C2
• Sat C2 Framework
  • Current, Future
• Definition/Benefits
• SCNG Approach
History of Satellite C2

• 1980-1996: Satellite Operations Centers used common systems for TT&C
  • Early successes streamlined operations
  • Unique mission requirements became expensive and difficult to upgrade
  • Abandoned when follow-on program was terminated

• 1996-today: Each mission area created separate C2 systems
  • Responsive to unique mission requirements
  • Common functions duplicated, unique user interfaces increase training
  • Acquisition, O&M, and sustainment costs continue to increase

• 2006: SMC/CC tasked SCNG to identify a Satellite C2 architecture based on accepted standards that can be applied to SMC missions

• 2008: AFSPC/CC announced intent for AF Satellite Operations Enterprise Architecture Transformation

• 2009: SMC/CC tasked SCNG to prototype a Compatible Sat C2 Architecture
Current SATOPS Enterprise

Current Infrastructure Promotes Duplication and Unique Interfaces
Compatible Satellite Control Architecture

Enterprise Resources
Common/Dedicated
(includes AFSCN, commercial, other)

Legacy Programs
Migration via Sustainment

New Programs
Build to Standard Comm. Infrastructure

Standard Communications Infrastructure
(Standard C2 Interfaces, Messaging & Data Formats)

Shared C2 Services/Tools
- Operational Tools
- Orbit Mgt Services
- Scheduling Services

Shared SATOPS Framework
- Ground Resources
- Training
- Network Infrastructure

Space Situational Awareness (JSpOC)
Ground Situational Awareness & Control (EMS/ NMS)
• **Compatible Sat C2** -
  - Standard communication infrastructure developed for satellite ground systems
    - Uses common messaging and data standards
    - Hybrid approach between stovepipes and 1-size-fits-all

• **Benefits/Implications**
  - Facilitates integration of legacy, future, and commercial ground systems/products
  - Reduces development, O&M, sustainment costs
  - Facilitates access to space and ground asset C2 data
  - Enables flexible CONOPS
  - Allows best products from multiple vendors
SCNG Approach & Way Forward

• Develop Compatible Sat C2 Prototype in FY10/FY11 to validate approaches and reduce risks
  • Leverage NASA Goddard Mission Service Evolution Center (GMSEC) Framework as a starting point
• Conduct 3 phase prototype development/evaluation:
  1. Design prototype, develop long lead Infrastructure (including Information Assurance & common ground interfaces)
  2. Integrate select legacy systems, simulate external interfaces, incorporate common displays, common services, and mission data
  3. Prototype Computer Network Defense (CND) & Ops automation concepts
• Evaluate prototype concepts for SMC TT&C missions with 50SW & Space Development & Test Wing (SDTW)
• Provide feedback and recommendations to SMC/CC
Industry Participation

• Selected legacy system capabilities will be integrated at Schriever AFB and the Aerospace Corporation’s lab in Chantilly, VA
  • Contractors will be needed to support integration

• RFI for applicable industry research & comments
  • White papers on proposed architecture, approach, and cost savings
  • Industry research capabilities that can support prototyping objectives
  • RFI expected by April 2010
QUESTIONS
ADDITIONAL CHARTS
Joint SATOPS Compatible Committee (JSCC)

- Multiple organizations have recognized common evolutionary challenges
  - Reduce life cycle costs
  - Increase interoperability of satellite control between systems and organizations
  - Provide enterprise-wide space and ground situational awareness
  - Enhance current SATOPS capabilities & availability

- JSCC collaboration formed among AFSPC, NRO, ORS and NASA organizations
  - Investigate methodologies & architectures to address challenges
  - Need mature technical alternatives and industry acceptance

JSCC shares lessons learned on defining a SATOPS framework and associated standards that foster compatibility