



# ***SMC/SCNG Compatible Satellite C2 (Sat C2)***

## ***2010 GSAW Briefing***

***Capt Stephen Arnott  
SMC/SCNG***

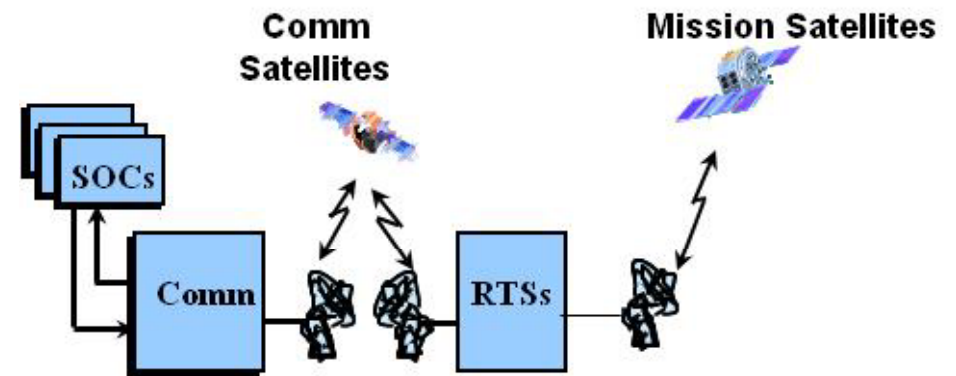


# Overview

**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



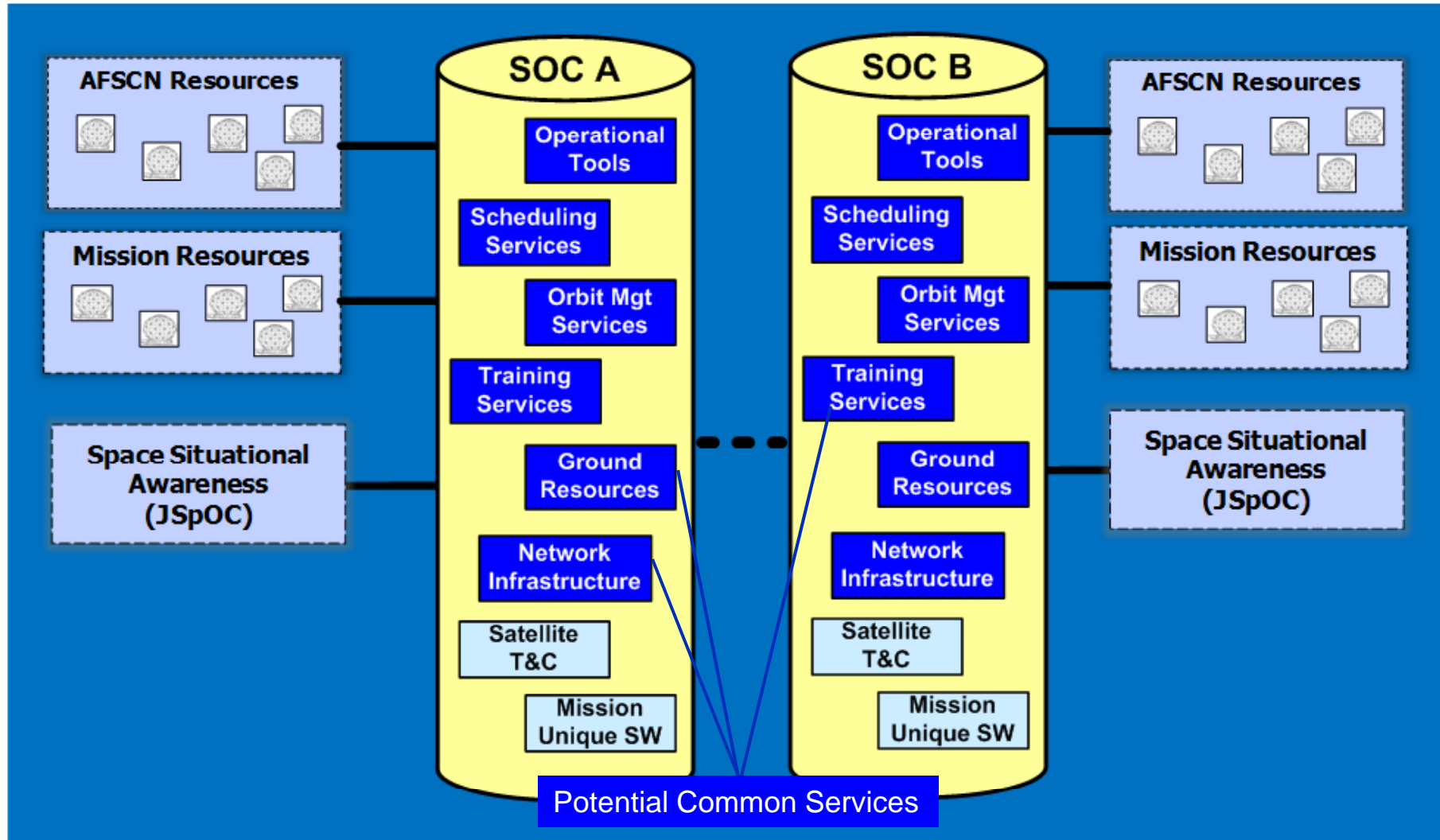


# *History of Satellite C2*

- **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**



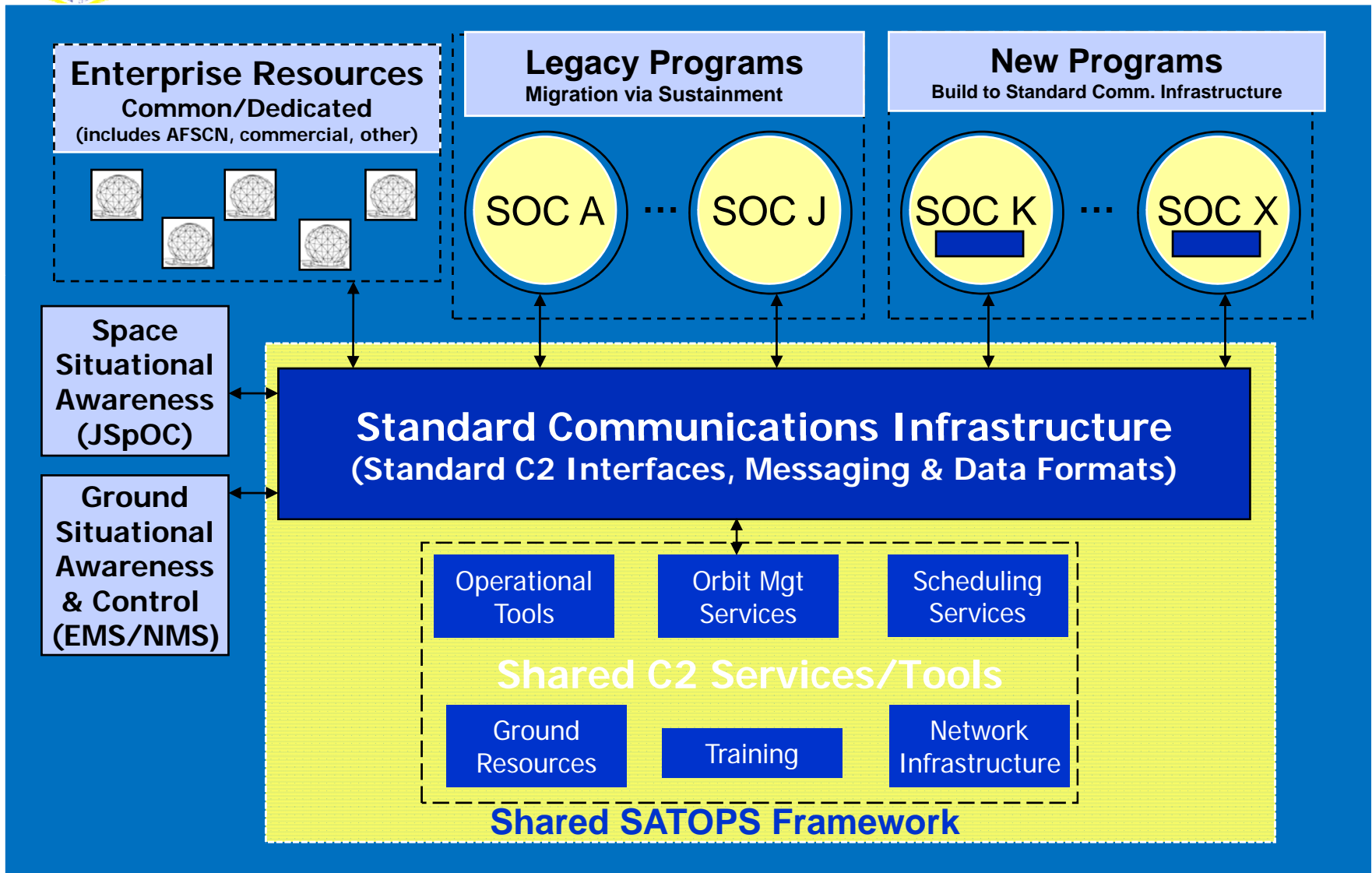
# Current SATOPS Enterprise



**Current Infrastructure Promotes Duplication and Unique Interfaces**



# Compatible Satellite Control Architecture





## ***Definition/Benefits***

- **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**

