

AF Satellite Control Network Architectural Approach



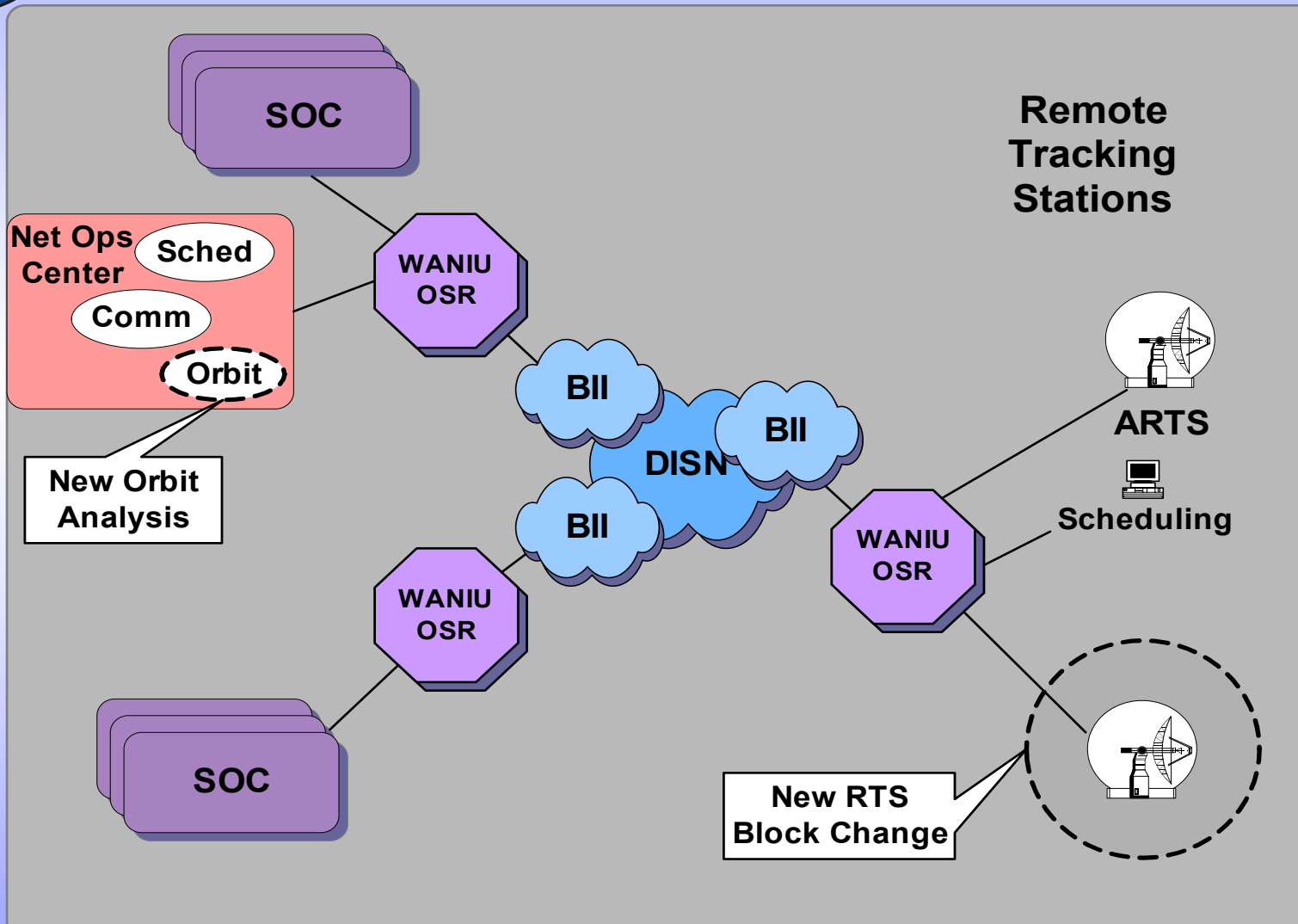
**Ground System
Architectures Workshop
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Presented by:

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SCNC Chief Architect
Northrop Grumman Mission Systems**



Current Architecture





AFSCN Evolution Objectives

- **Maintain operations and current capabilities while upgrading**
- **Shift network system boundary from within SOC to outside SOC**
- **Integrate user interface to all functional elements (comm, scheduling, RTS)**
- **Increase use of terrestrial network (vs. SATCOM links)**



AFSCN Evolution Objectives, Continued



- **Reduce development through use of standards and COTS products**
- **Increase interoperability and broaden customer base**



Use of Architecture Methods

- **Integrate Requirements Analysis**
- **Create C4ISR views of current system and its evolution**
- **Define Integrated Network Management Database**
- **Create project roadmap to guide budgeting and prioritization (POM)**



Requirements Flowdown Process

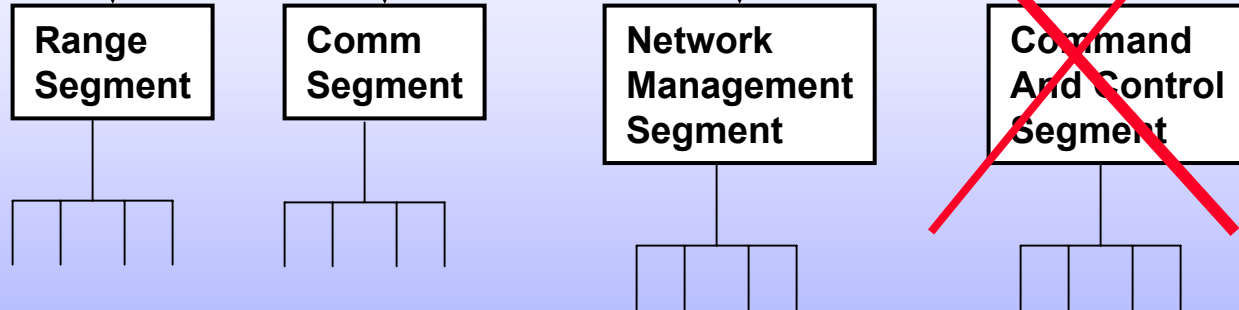
Customer Requirements

HQ Operational Req's Doc (ORD)
User Req's Doc's (PRD)
Operator Change Requests

Revised System Requirements

System SPEC

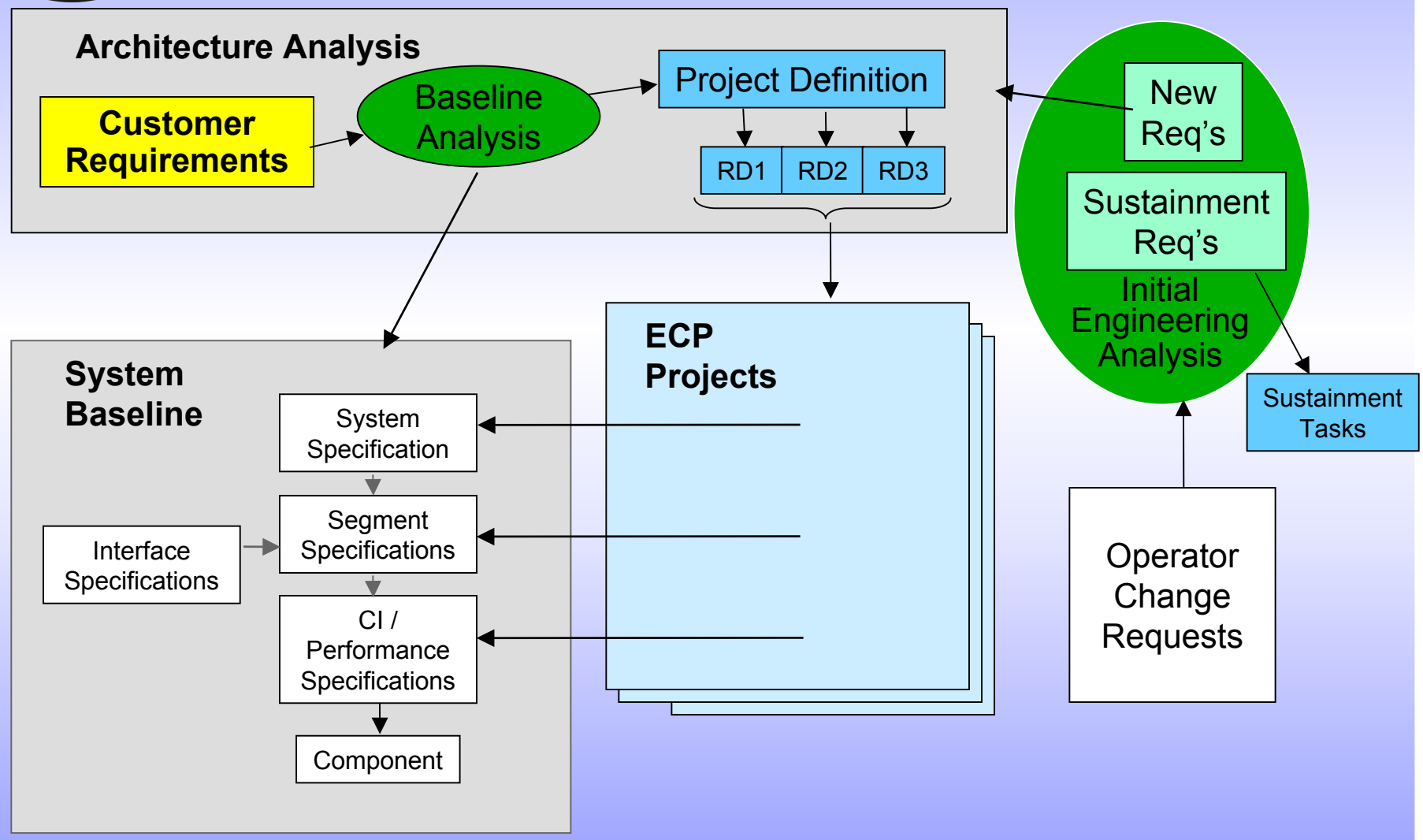
New Segment Requirements



• A complete requirements traceability is being conducted using Rational requirements tools

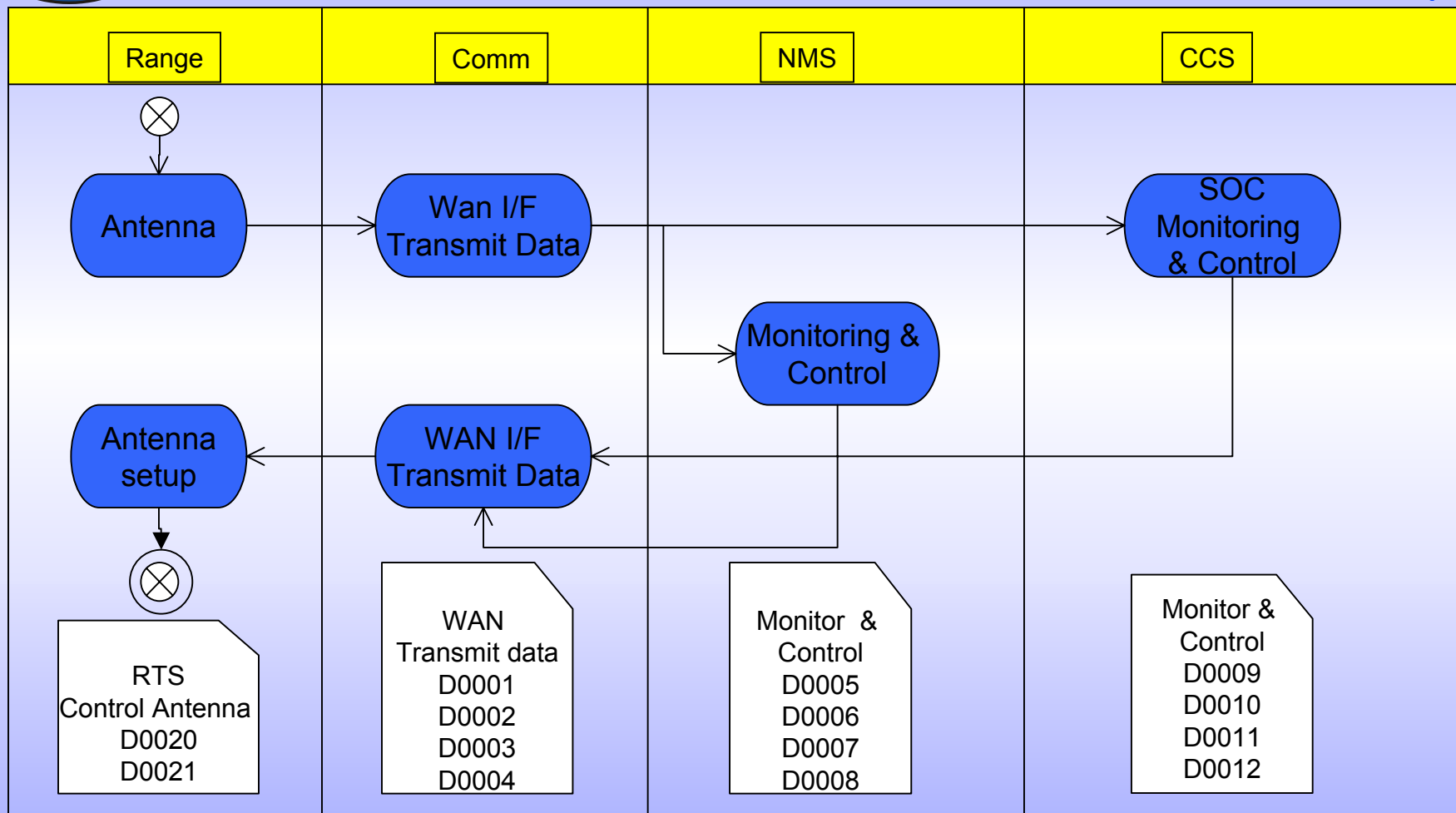


Requirements Analysis and Project Definition





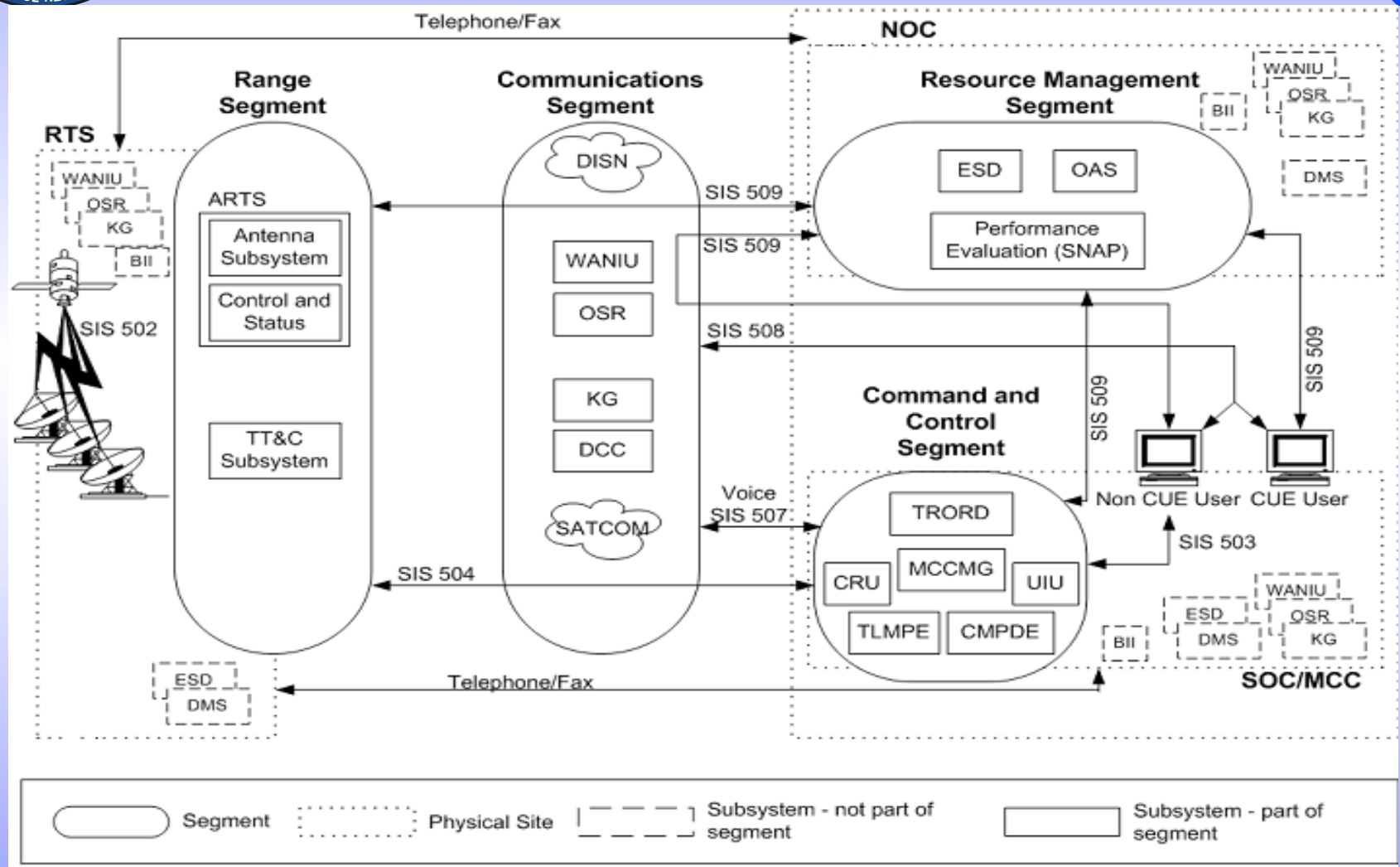
USE CASE Analysis Notional Activity Diagram Example



USE Cases are being developed at all levels of requirements



C4ISR System View 1





SOC Interface Evolution



- **Now have separate**

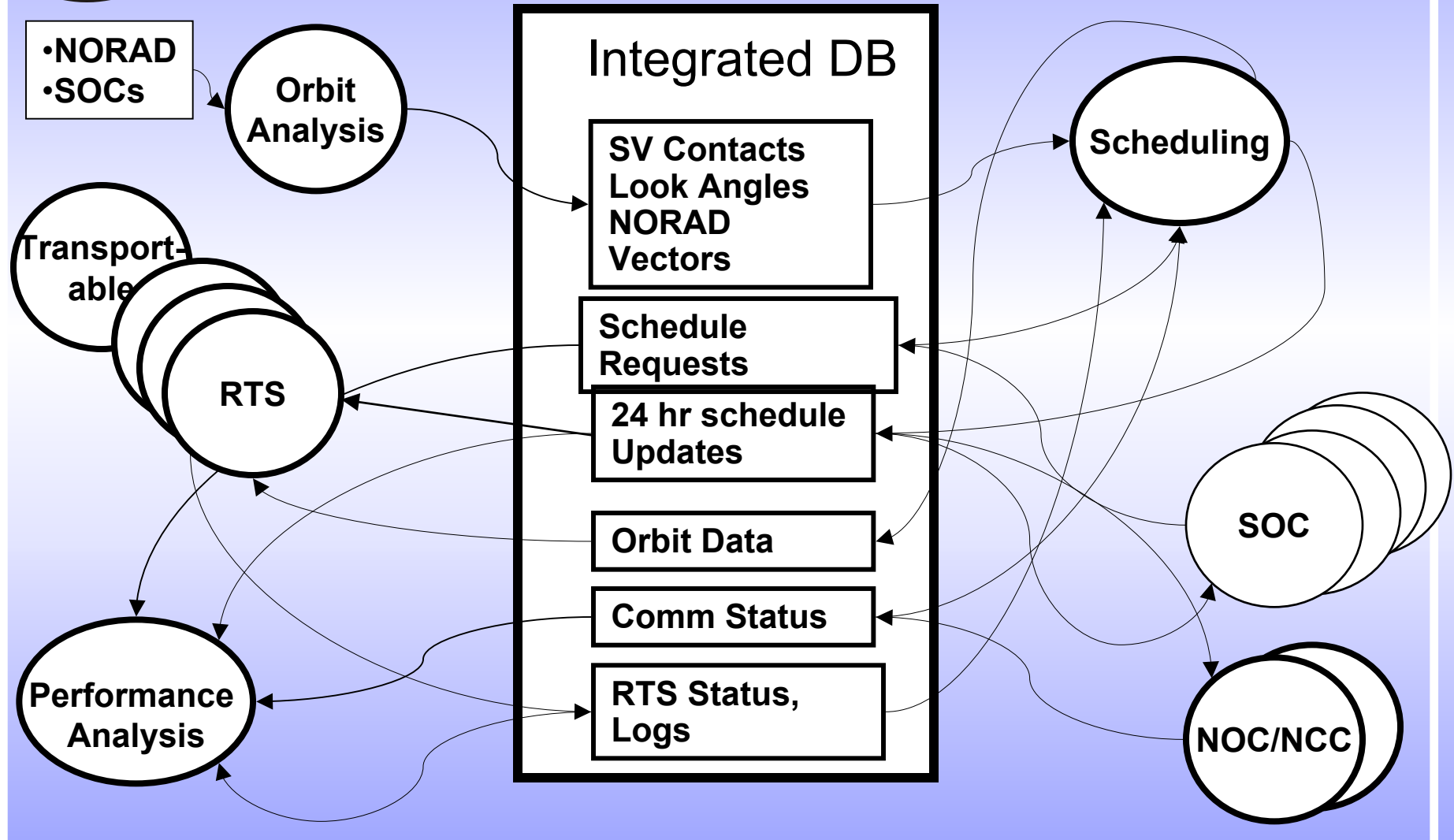
- **Schedule**
- **Comms**
- **RTS Control workstations**
- **Bitstream telem/command**
- **AFSCN unique formats**

- **Future will integrate**

- **Schedule**
- **Comms**
- **RTS Control functions**
- **Offer packet telem/command**
- **Standard formats/protocols**



Integrate Database Access Across Projects





Status of RBC Equipment

- **The NOC, SOCs, and the RBC Operators have full status of RBC equipment enabling remote operations**

--RBC Schedule Execution

Provides High Level Schedule monitoring for 16 RBCs on one display

--Multi-RBC Summary

Provides roll up summary of 16 RBCs

Operator can effectively monitor G/Y/R status by watching the color of the antenna icons

--Single RBC Summary

Gives the operator the capability to drill down to a single RBC display

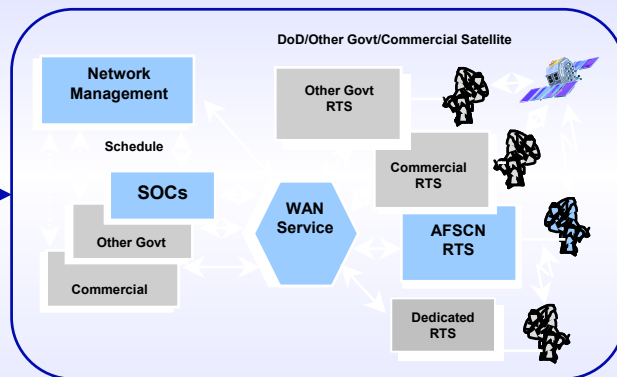
--Space for additional displays (DCC, RBC, ETC.)



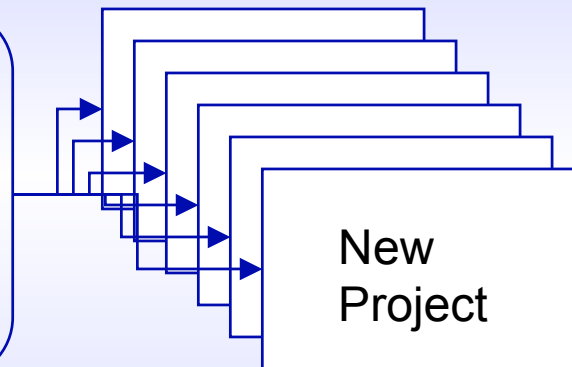
All requirements will be assigned projects and be placed on Roadmap

UNMET DRIVING RQMTS FROM:
 Sustainment
 RBC
 OAS F/O
 SSS
 NMS
 'O2 SCS ORD
 CRFS
 PRDs

Incorporate into AFSCN Architecture



Allocate to Existing/ New Projects



Conduct Architectural Analyses

- High Level CAIV
- Technical Trades

Create Project Descriptions

Prioritize with HQ & Incorporate into AFSCN Roadmap

POM Input



AFSCN Evolution Plan

**SOC
& SV**

USB Uplink RTS Control Onboard GPS Packet Mode

**Remote
Ground
Stations**

Antenna Replacement

RTS Block Change

USB Uplink

RTS Control and Status

BW Efficiency

Civil/Commercial Interoperability Demo's

Studies and Test Beds

Comm

ATM Comm Upgrades

External User Comm

WAN Services and SLE

**Network
Management**

Orbit Analysis

Net Mgmt Infrastructure

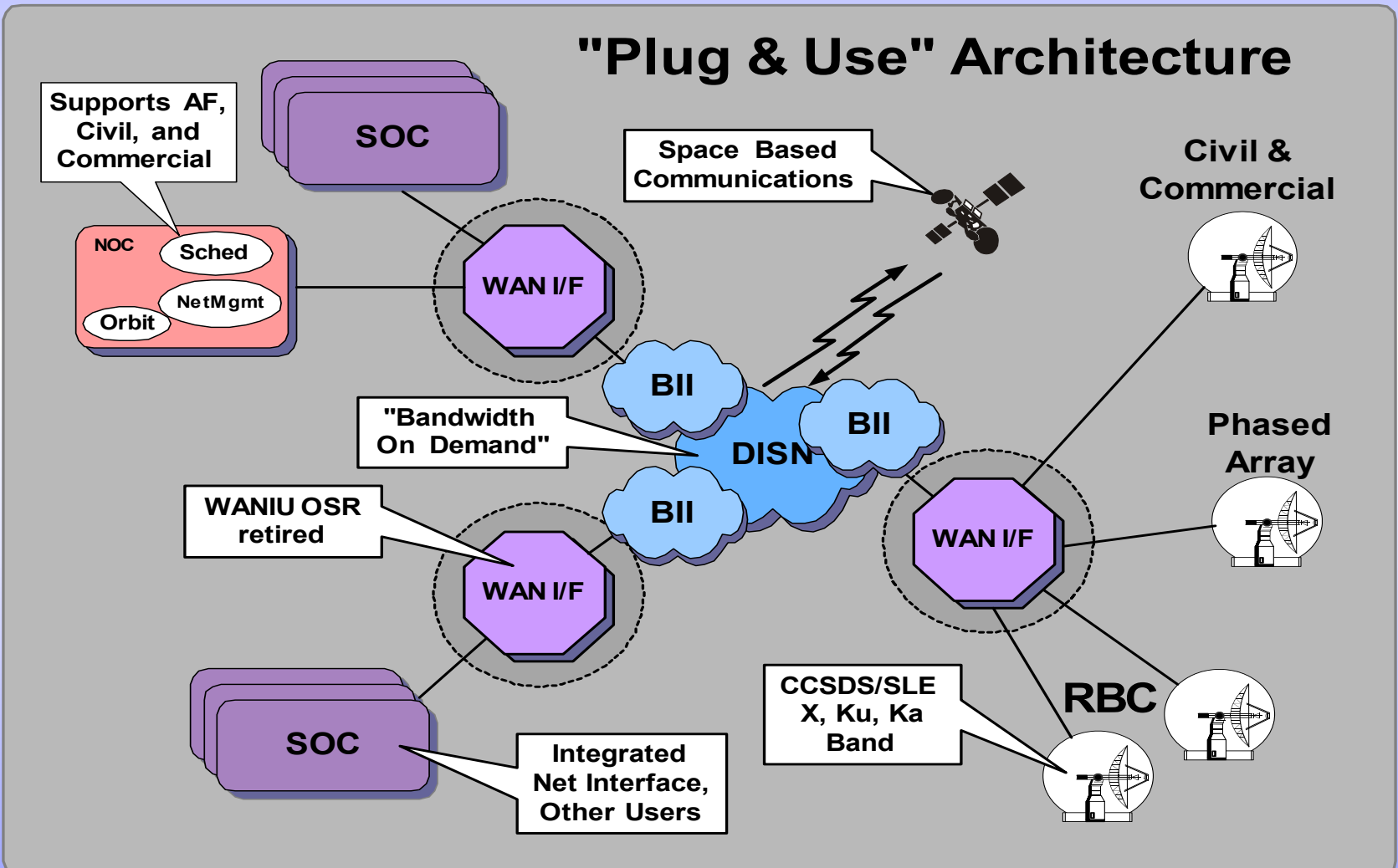
Scheduling

1999 2000 2001 2002 2003 2004 2005 2006 2007



Future Architecture

"Plug & Use" Architecture





Architecture Summary

- **SCNC is using strong architecture processes to go from requirements to projects**
- **AFSCN will evolve to a Network Management System with an integrated database access**
- **AFSCN will provide remote control and status information, allowing reduced staffing**
- **AFSCN will support open data transport standards and increased interoperability**

Acknowledgements: SMC-CW and SCNC Team!