



AF Cyber Superiority Architecture

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Key Milestones

- **Late 2008 – AFSPC designated lead AF command for Cyber**
 - Jul 09 - AF Communications Agency becomes AF Network Integration Center
- **Aug 2009 – 24th Air Force activated**
- **May 2010 – USCYBERCOM Initial Operational Capability (IOC)**





AF Cyberspace Drivers

- **AF Core Function Master Plan for Cyberspace Superiority:** Enhance AF and Joint forces by cyberspace integration and mission assurance of operations.
- **24 AF's mission** – “extend, operate and defend the Air Force portion of the DoD network and provide full spectrum capabilities for the Joint warfighter in, through and from cyberspace.”
- **AF Single Integrated Network Environment Vision:** Provide enterprise core services, security and infrastructure to enable AF and Joint mission assurance by integrating across terrestrial, air and space networks.



AFSPC Architecture Relationships

Architect: DoD CIO/ASD NII

DoD Enterprise Architecture



Architect: SAF/A6P

Air Force Enterprise Architecture



Architect: HQ AFSPC/A6I

Space Domain

Architect: HQ AFSPC/A6II

Cyberspace Mission

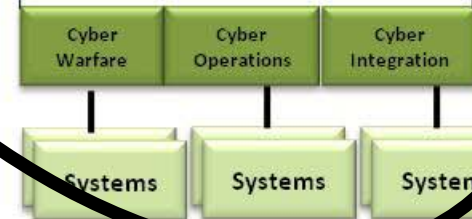
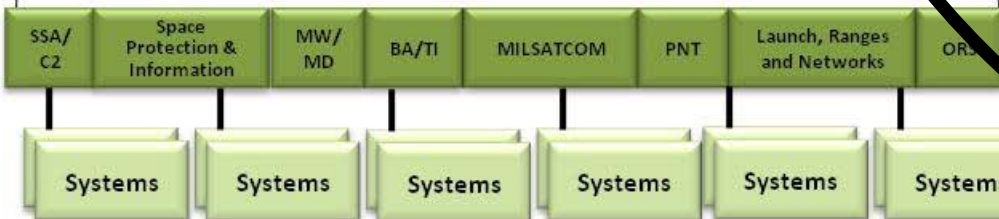
Architect: HQ AFSPC/A6II, AFNIC, 24AF, AFC2IC

AFSPC Enterprise Architecture

AFNET

Architect: AFNIC/EA

Reference Models



Mission Area Architectures - HQ AFSPC/A5

Solution Architectures - SMC/ESC



Some Assumptions

- **The AFNet is a vastly complicated, heterogeneous enterprise that cannot be absolutely secured**
- **The AFNet will continue to have dependencies and interconnections with DoD, industry, and other organizations**
 - **These relationships will introduce vulnerabilities into the AFNet.**
- **Industry will continue to drive much of the future cyber capabilities**
 - **AF must take a lead in defensive cyber technology**



24 AF Operational Strategies

- Layered defense
- Secure Enclaves
- Trust Management
 - Trusted systems
- Stealth
- Simplicity
- Cyber Maneuver

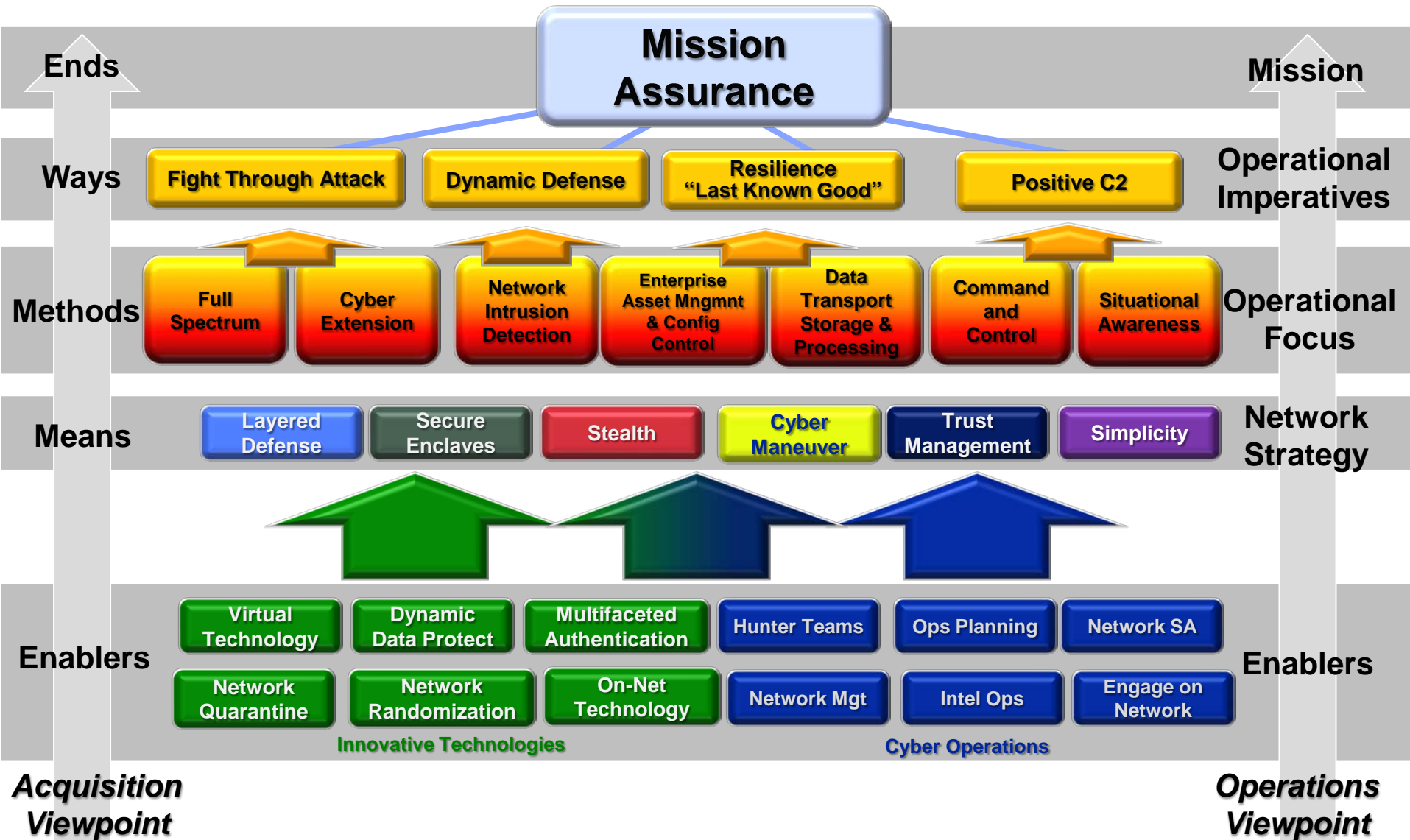
Commanders Objectives

- 1) Advance situational awareness, network mapping and Command and Control (C2) capabilities
- 2) Identify and secure high value enclaves as identified by United States Cyber Command (USCC) and the AF
- 3) Implement cyber maneuver to complicate and increase the cost of enemy attack planning
- 4) Increase resilience - architecture that enables us to fight through an attack
- 5) Leverage leading edge technology to make quantum changes in defendability of the AFNET
- 6) Simplify the AFNET
- 7) Implement Strategy based Architecture

Strategy Drives the Architecture

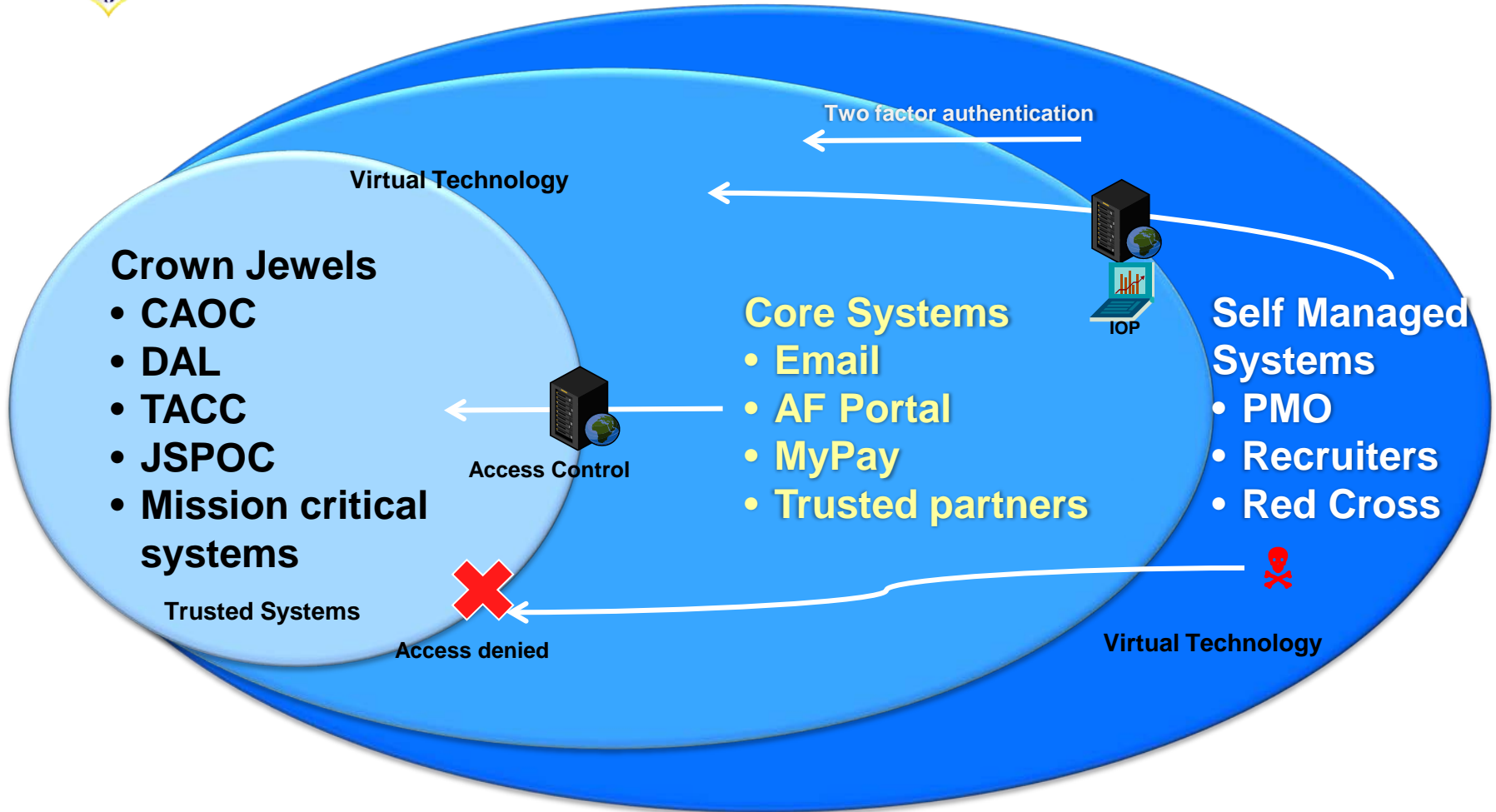


Relationship Between Operations, Strategy & Technology





Secure Enclaves

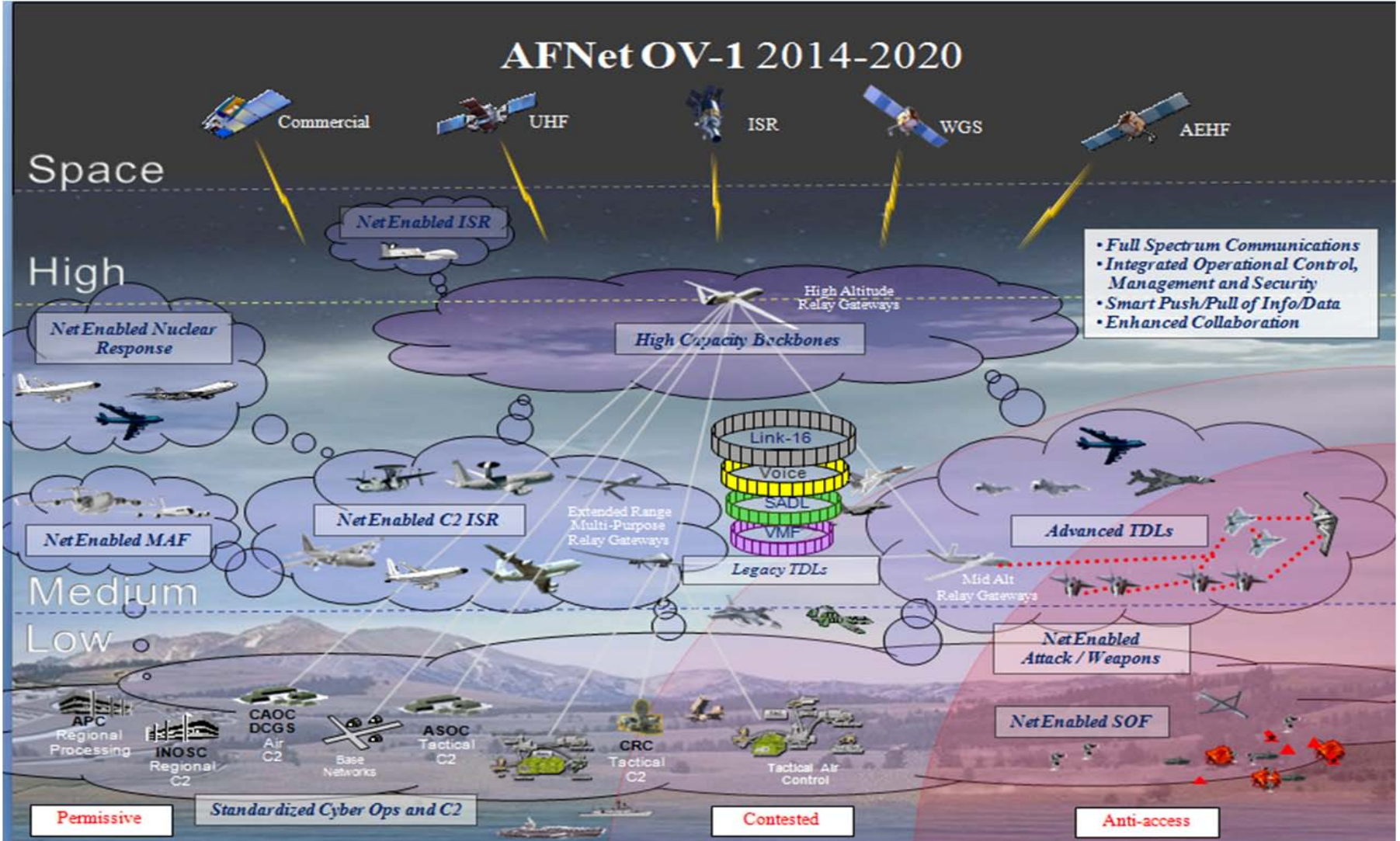


Must Evolve From Perimeter Defense



Strategy-based Architecture

AFNet OV-1 2014-2020





Air Force Network Desired Operational End State

Layered Defense

Dynamic Architecture

Secure Data Discovery and Access

Dynamic Configuration

Cyber Maneuverability

Air

Space

Land

Seamless C2/SA
Secure Infrastructure
Assured Mission

Speed of Need Operational Capabilities

Standardization

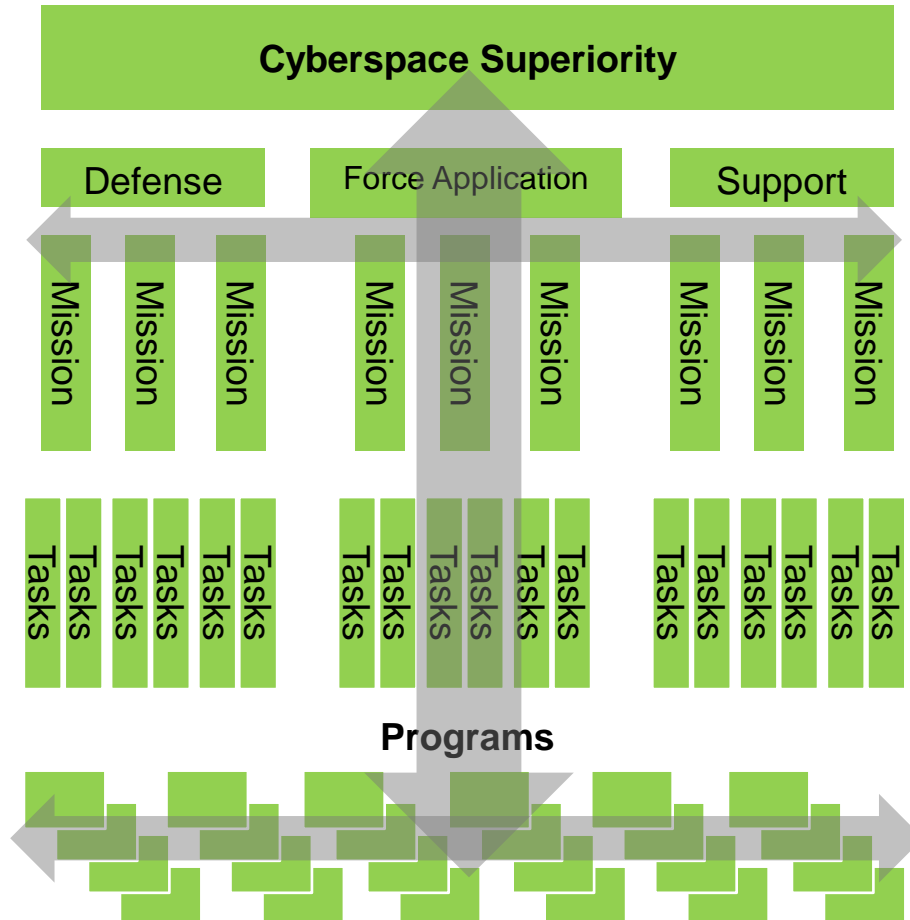
Secure Enclaves

Global Connectivity/ Availability

A Single Integrated Network Environment



Core Function Master Plan Architecture

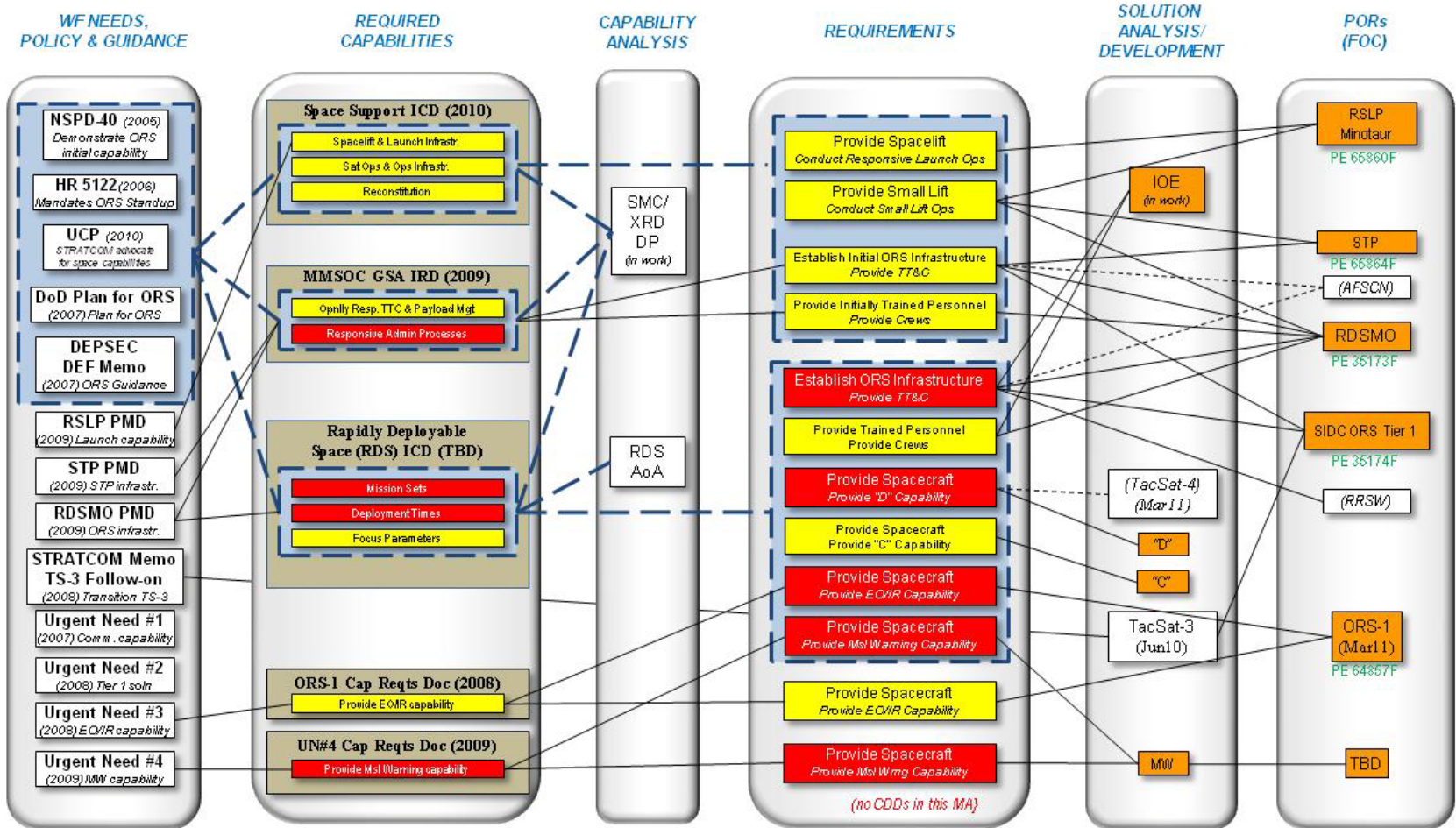


Understanding the vertical links enables the horizontal analysis

“Every program we execute should be visible on the tapestry and connected up all the way thru the decomposition to the capabilities purported by the CFMP. Things need to thread together. No orphans.” –BGen Haywood



Notional Mission Area Architecture



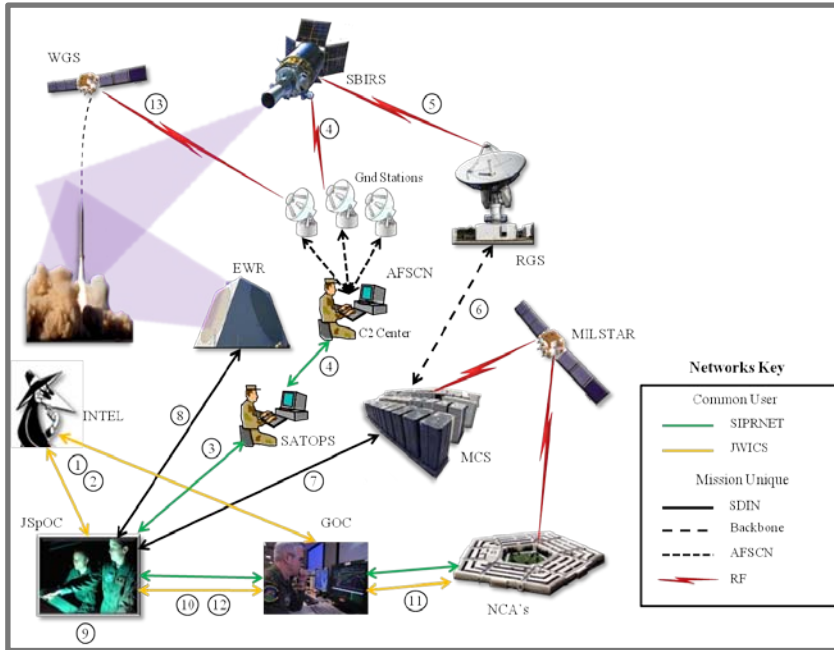
Capability assessment as of FY12 POM:
 Capability Fully Achieved ■
 Capability Partially Achieved ■
 Capability Not Addressed ■

Legend:
 One - One Trace —
 Many - Many Trace ---
 Less than fully funded (FY12) ■

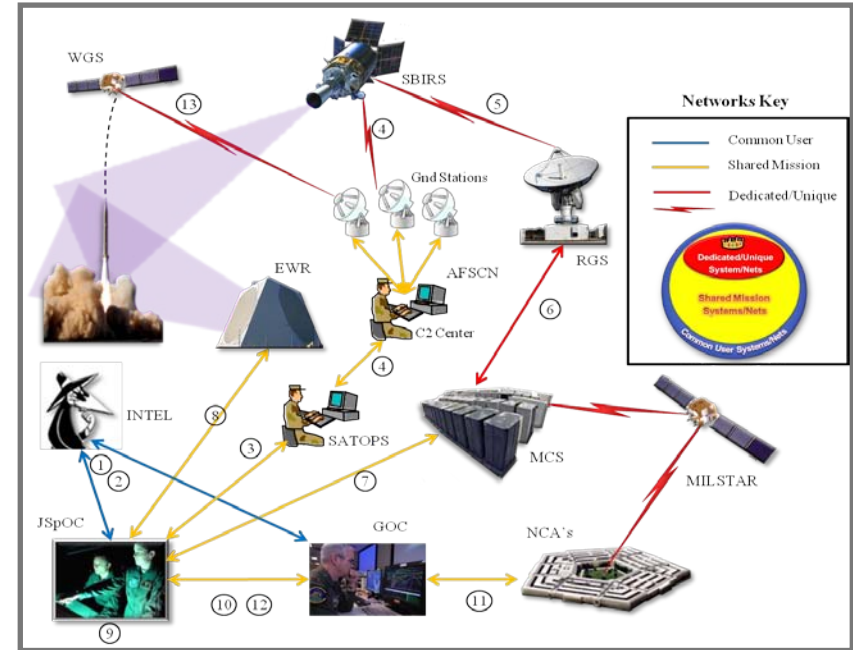


Delivering Network Services to Assure the Mission

Direct Ascent Anti-Satellite (ASAT) Mission thread



Current Networks



Objective Network

Attributes:

- Multiple Networks
- Network C2 based on “mission” system
- Limited SA

Attributes:

- Dynamic Defense in Depth
- Virtual Network Environment
- Centralized AF Network C2
- Prioritized Network Resource Realignment
- Increased Mission Impact Assessment



Conclusion

- **AFSPC is actively engaging in the complex domain of Cyberspace through the use of architecture**
- **While addressing impacts of:**
 - **DoD/AF IT Efficiencies**
 - **CFMP Lead Integrator/Architect Roles**
 - **Space Superiority Missions (Space Control, Space Force Enhancement, Space Support)**
 - **Cyberspace Superiority Missions (Cyberspace Support, Cyberspace Defense, Cyberspace Force Application)**
 - **Network Integration**
 - **Joint Aerial Layer Network / Aerial Layer Network (JALN/ALN) - Air Staff/ACC**
 - **Joint Space Communications Layer (JSCL) – AFSPC**
 - **Single Integrated Network Environment (SINE) – AFNIC/AFSPC**
 - **Consolidated Enterprise IT (CEIT) Baseline for the AF – SAF/US(M)X**
 - **Mission System/Business System Data & Service Integration**



AF Cyber Architecting:

https://www.intelink.gov/wiki/Air_Force_Cyber_Architecture

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https://www.intelink.gov/wiki/AFSPC_Enterprise_Architecture_and_Integration