Space Integration with Advanced Battle Management System

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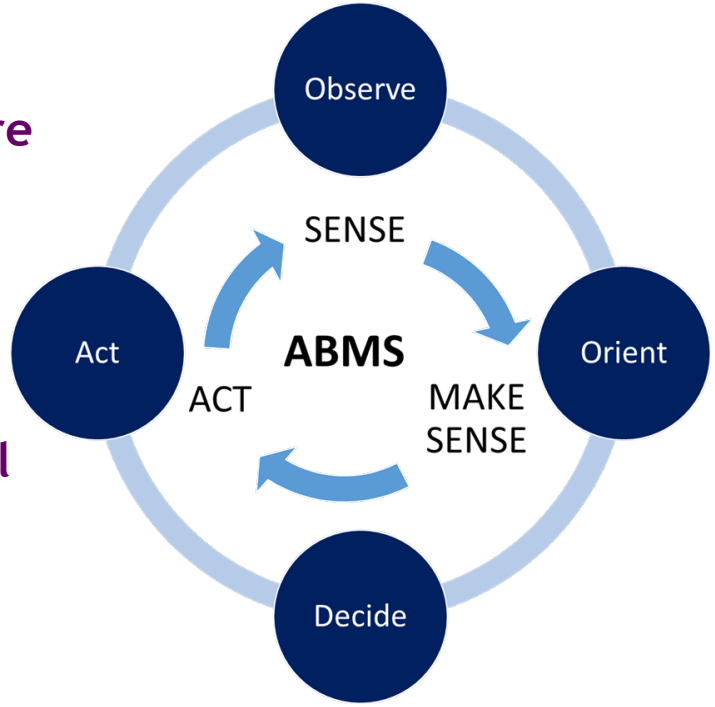
Advanced Battle Management System

Battle Management Infrastructure Problems…and Solutions

Today	*Solution*
Air-gapped, hard to maintain infrastructure	Resilient, distributed, multi-level security cloud and edge infrastructure
Fragile, unreliable comms	Managed, global transport across all means - commercial and military, ground and pLEO and GEO
Insecure, inaccessible data	Expose data APIs securely on a digital network supported by data tools
No machine-to-machine command and control	Secure digital network for machine enabled JADC2

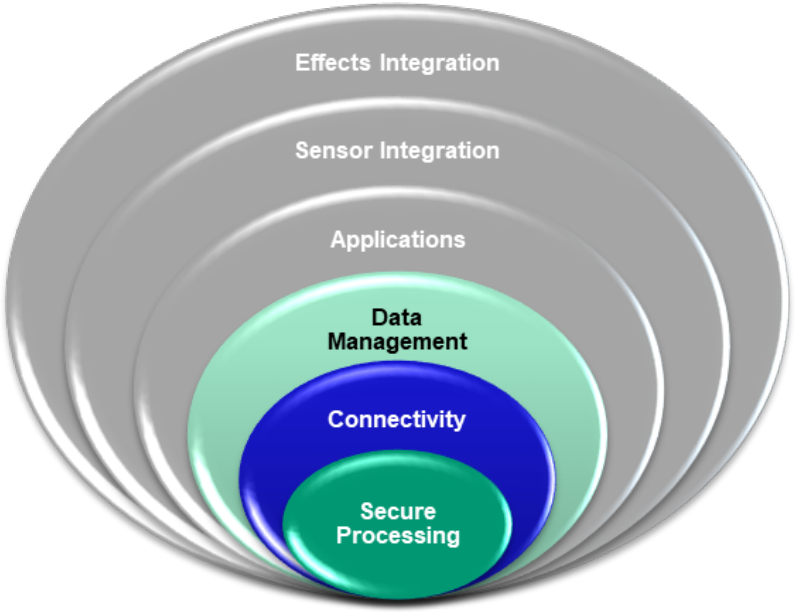


ABMS plans a 21st Century modernization of Battle Management leveraging best-of-breed Commercial technology

ABMS Program Overview

- Create secure military digital network environment leveraging proven digital infrastructure, commercial technologies, and applications
  - Build robust compute, network management, global data footprint for military applications
- Connect the joint force to enable All-Domain dynamic operations
  - Build the digital infrastructure that connects the Joint Warfighting force
  - Enable sharing of information across USAF, USSF, Joint, Allies/partners, and multi-domains
  - Provide decision superiority to tactical, operational, and strategic customers

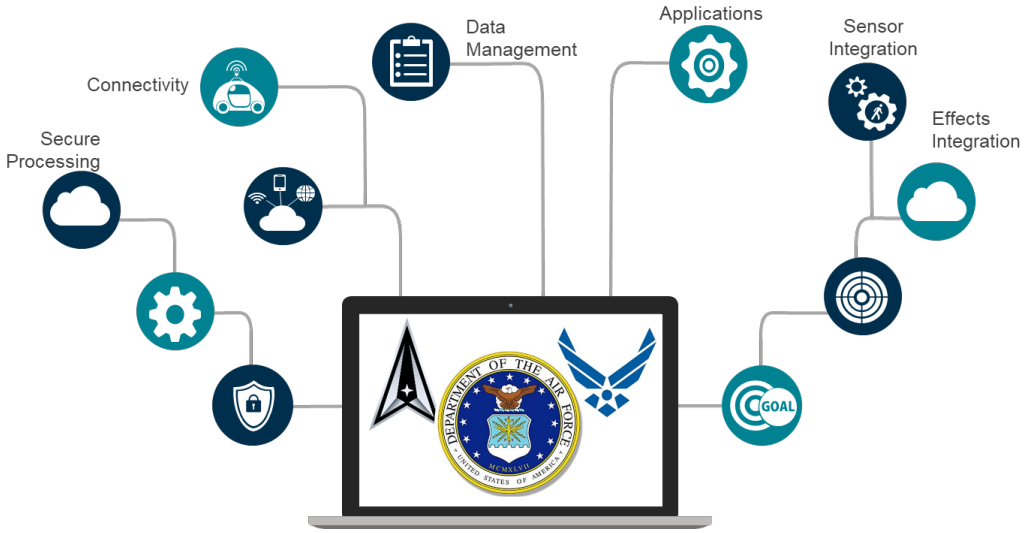
- Attributes to provide 21st Century warfighting capabilities:
  1. *Secure Processing
  2. *Connectivity
  3. *Data Management
  4. Applications
  5. Sensor Integration
  6. Effects Integration



*Digital Infrastructure

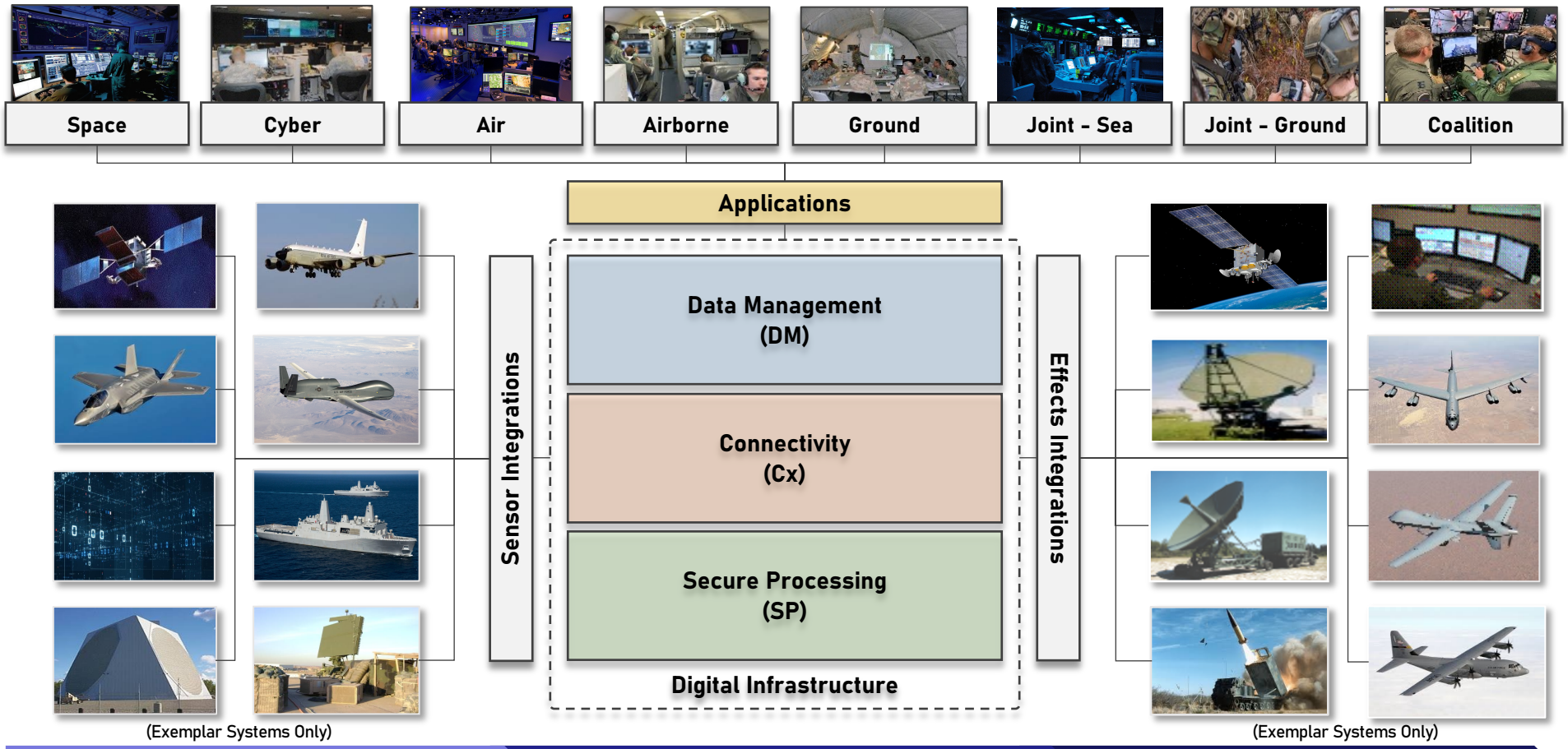
ABMS Acquisitions Attributes

- Secure Processing: Enterprise elastic compute capability that meets all applicable DoD standards for cyber-security, data storage, data transfer and rapid software development
- Connectivity: Secure Network manager intelligently routes data to appropriate user across all domains while managing data across networks
- Data Management: Expose data across Air and Space Force systems in multi-level security cloud infrastructure & leverage service-oriented Application Programming Interfaces (APIs)
- Applications: Create an environment to enable best-of-breed development of Artificial Intelligence (AI) / Machine Learning (ML) applications and services
- Sensor Integration: Standards for integrating existing and future sensor data into a network that provides automated tasking
- Effects Integration: Standards for integrating digital pathways expediting decision to effectors



Acquisition Efforts focused on these attributes build a digital infrastructure enabling information sharing across multi-domains & decision superiority for strategic, operational, and tactical customers

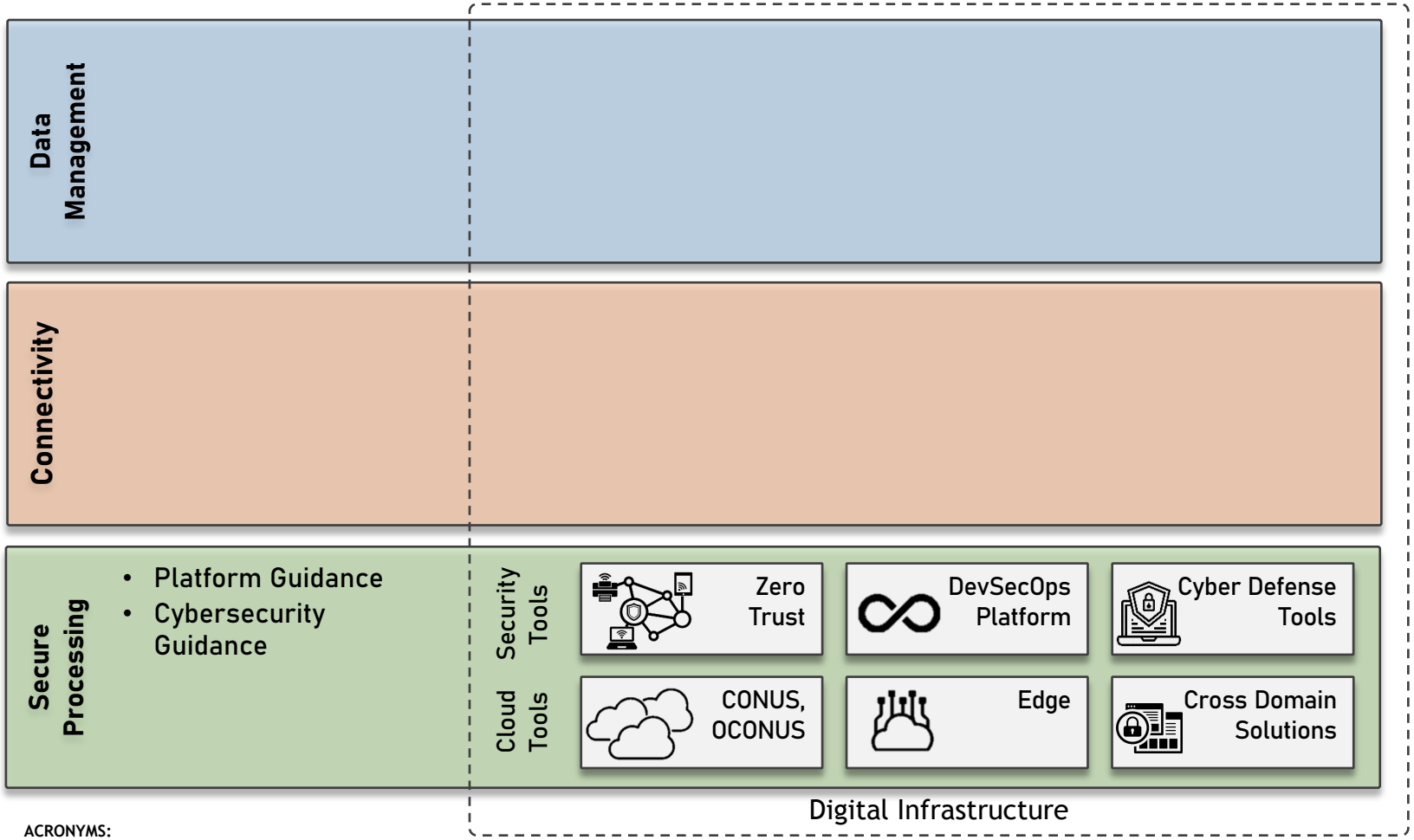
ABMS Architecture



Secure Processing

ABMS Guidance

Reference Architecture



Potential Implementations

KOBAYASHI MARU

- DevSecOps agile development and rapid integration with operations
- Defensive cyber capabilities for space-specific operations

ACRONYMS:
CONUS – Contiguous United States
OCONUS – Outside Contiguous United States

Connectivity

ABMS Guidance

Reference Architecture

Data Management

Connectivity

- Network & Waveform Standards

Transport Links

- Global BM Transport
- Network C2
- QoS Tools
- Software Skills

Physical

- MILSATCOM
- COMMSATCOM
- Cellular/5G
- TDLs
- Fiber
- SCN

Secure Processing

- Platform Guidance
- Cybersecurity Guidance

Security Tools

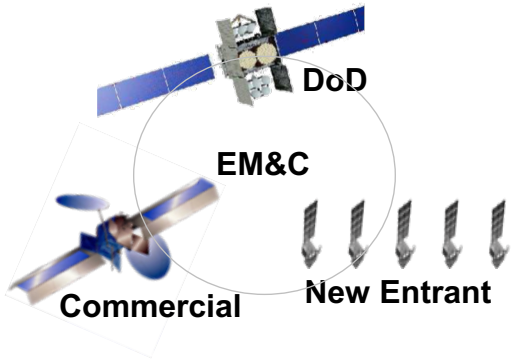
- Zero Trust
- DevSecOps Platform
- Cyber Defense Tools

Cloud Tools

- CONUS, OCONUS
- Edge
- Cross Domain Solutions

Digital Infrastructure

Potential Implementations



- Enterprise Management and Control (EM&C)
- Advanced DoD waveforms
- Enterprise ground networks

EGS

MESH ONE TERRESTRIAL

ACRONYMS:
API - Application Programming Interface
BM - Battle Management
C2 - Command and Control
CONUS - Contiguous United States
OCONUS - Outside Contiguous United States
QoS - Quality of Service
SCN - Satellite Control Network
TDL - Tactical Datalink

Data Management

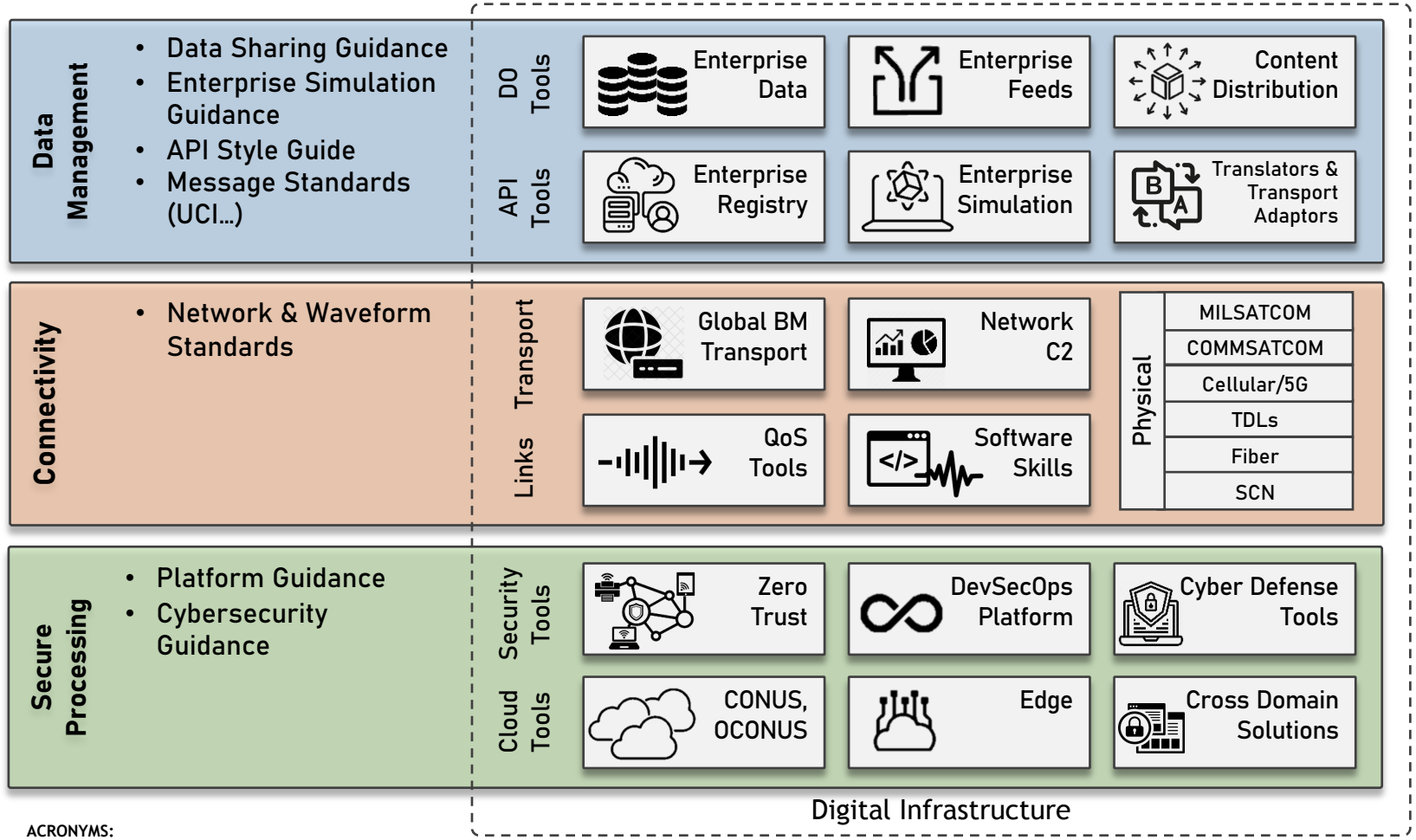
ABMS Guidance

Data Management
- Data Sharing Guidance
- Enterprise Simulation Guidance
- API Style Guide
- Message Standards (UCI…)

Connectivity
- Network & Waveform Standards

Secure Processing
- Platform Guidance
- Cybersecurity Guidance

Reference Architecture



Potential Implementations

Unified Data Library

WARP CORE

- Single environment to integrate and unify space operational data

ACRONYMS:
API - Application Programming Interface
BM - Battle Management
C2 - Command and Control
CDS - Cross-Domain Solution
CONUS - Contiguous United States
DO - Data Orchestration
OCONUS - Outside Contiguous United States
QoS - Quality of Service
SCN - Satellite Control Network
TDL - Tactical Datalink
UCI - Universal C2 Interface

Architecture Principles

- Loosely-couple the System
  - Separate concerns between the layers in order to simplify management and enable simpler tech refresh
- Maintain Options
  - Manage (security, technical, program) risk by maintaining options
  - Manage more than one option at critical functions, where possible
- Own the Baseline
  - Government will own the technical baseline
- Provide Standards and Governance
  - Plan leverage of existing Department of the Air Force standards
    - For example Open Missions Systems and Universal Command and Control Initiative
  - Working with SAF/AQ, Air and Space Staff, Joint Staff, and others on additional emerging guidance

Contact Information

Thank you!

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