



# Space Integration with Advanced Battle Management System

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# Battle Management Infrastructure Problems...and Solutions

## Today

Air-gapped, hard to maintain infrastructure



Fragile, unreliable comms



Insecure, inaccessible data



No machine-to-machine command and control



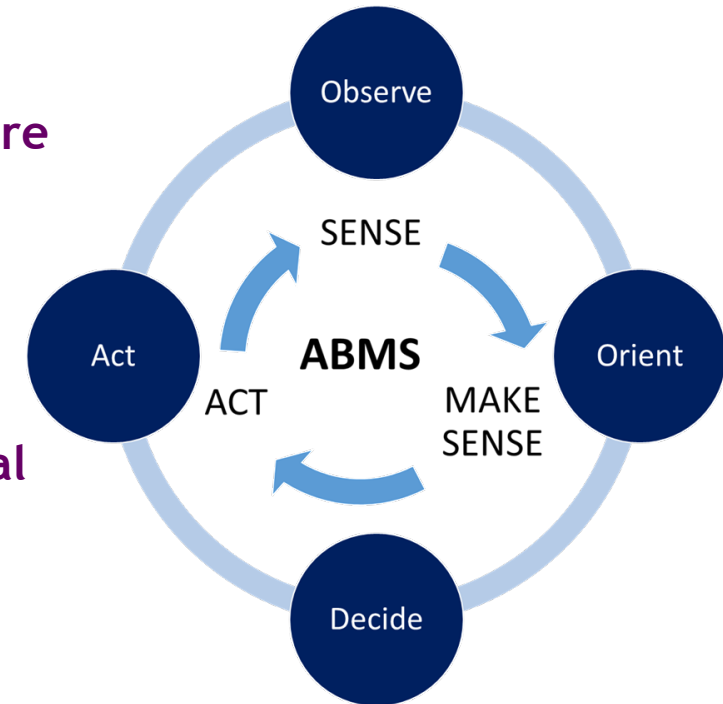
## Solution

Resilient, distributed, multi-level security cloud and edge infrastructure

Managed, global transport across all means - commercial and military, ground and pLEO and GEO

Expose data APIs securely on a digital network supported by data tools

Secure digital network for machine enabled JADC2

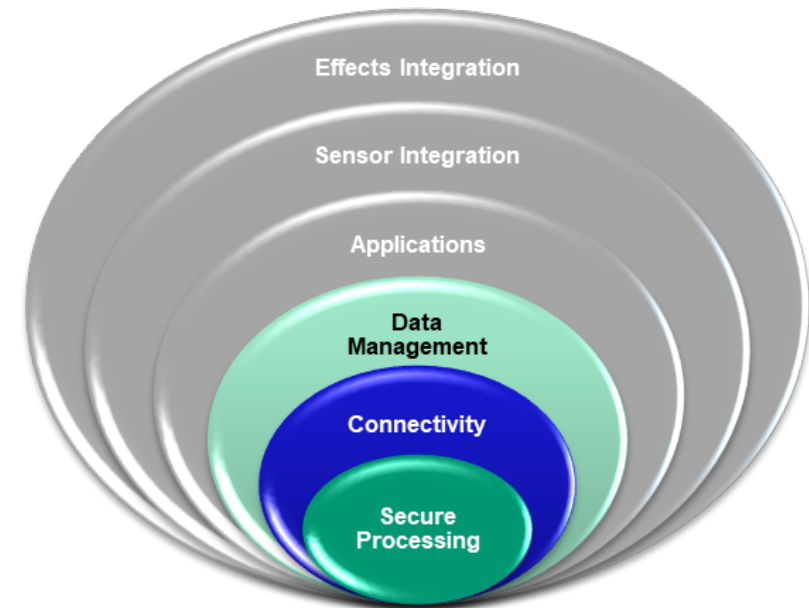


ABMS plans a 21<sup>st</sup> Century modernization of Battle Management leveraging best-of-breed Commercial technology



# 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 21<sup>st</sup> Century warfighting capabilities:
  1. \*Secure Processing
  2. \*Connectivity
  3. \*Data Management
  4. Applications
  5. Sensor Integration
  6. Effects Integration

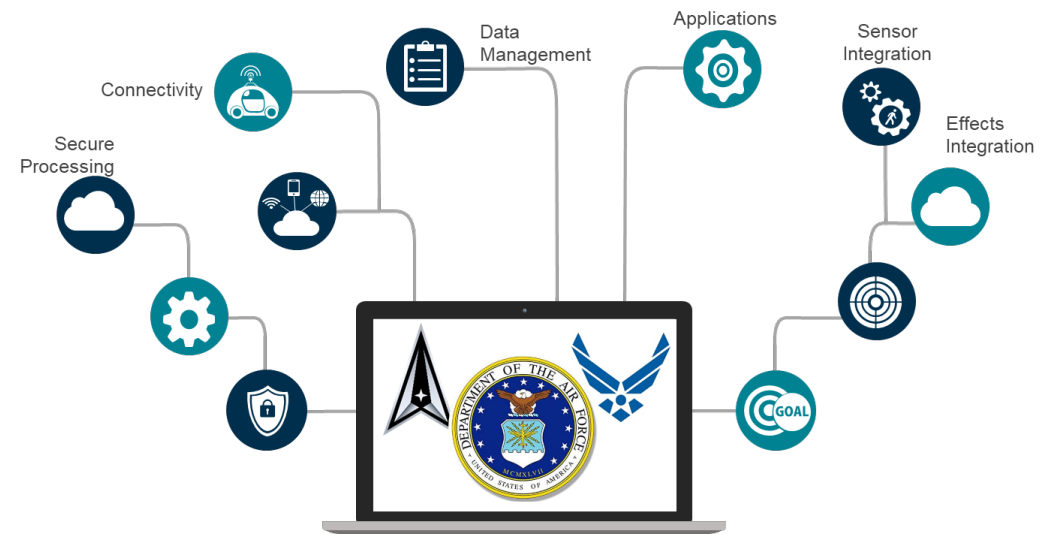


\*Digital Infrastructure



# ABMS Acquisitions Attributes

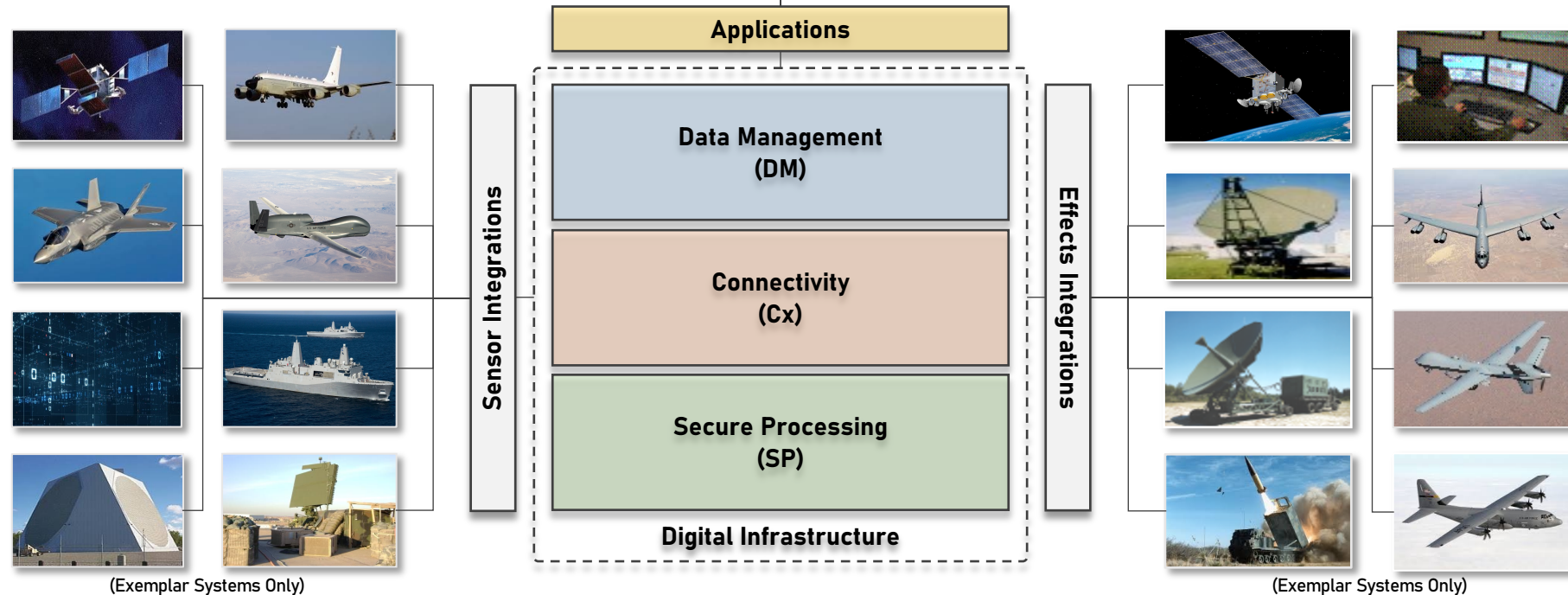
- **Secure Processing**: Enterprise elastic compute capability that meets all applicable DoD standards for cyber-security, data storage, data transfer and rapid software development
- **Connectivity**: Secure Network manager intelligently routes data to appropriate user across all domains while managing 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



Digital Infrastructure facilitates Sensing, Sense Making, & Acting within the Joint All-Domain Context

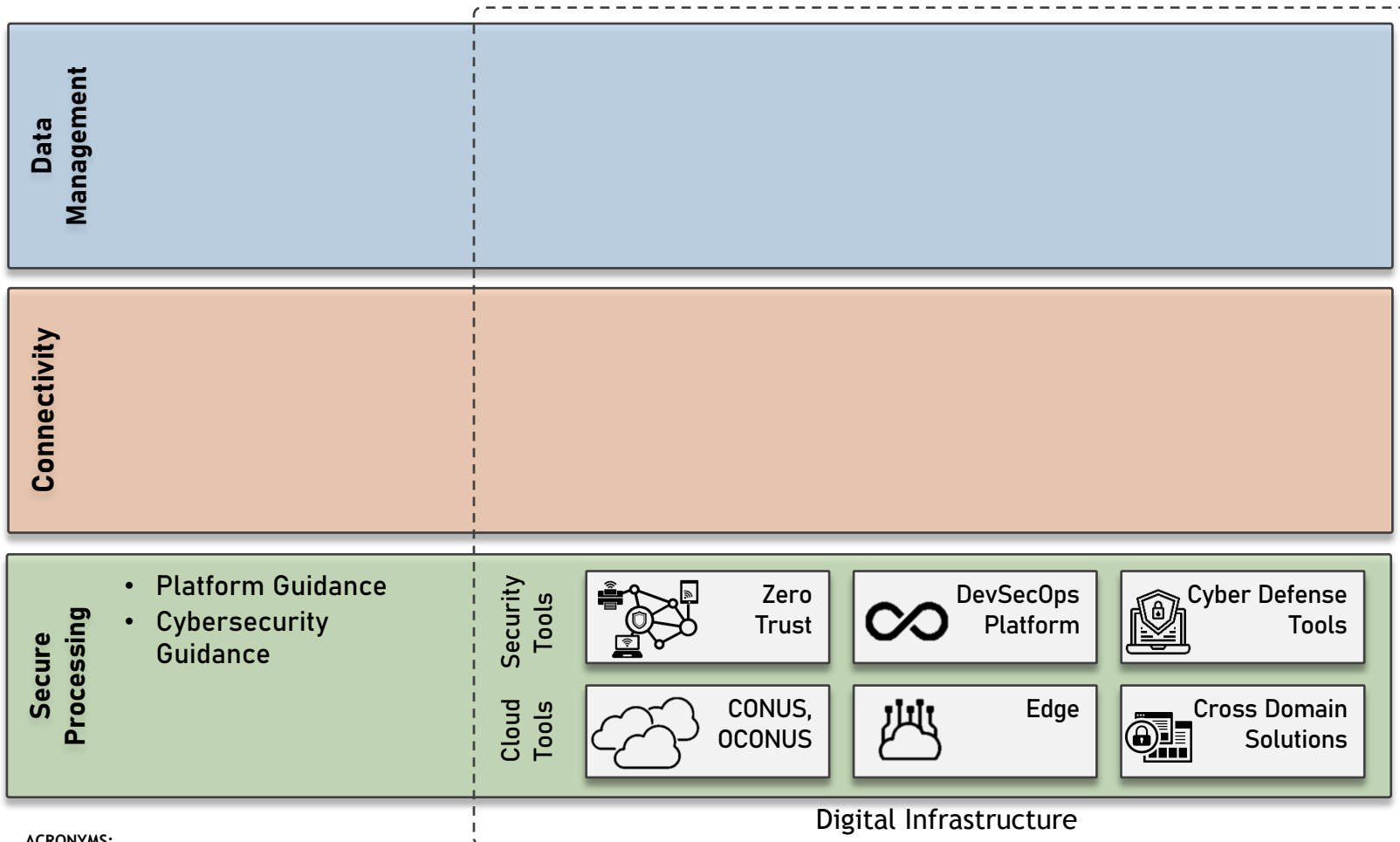


# Secure Processing

## ABMS Guidance

## Reference Architecture

## Potential Implementations



- 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

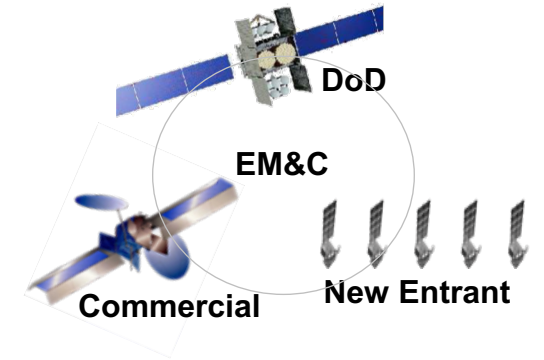
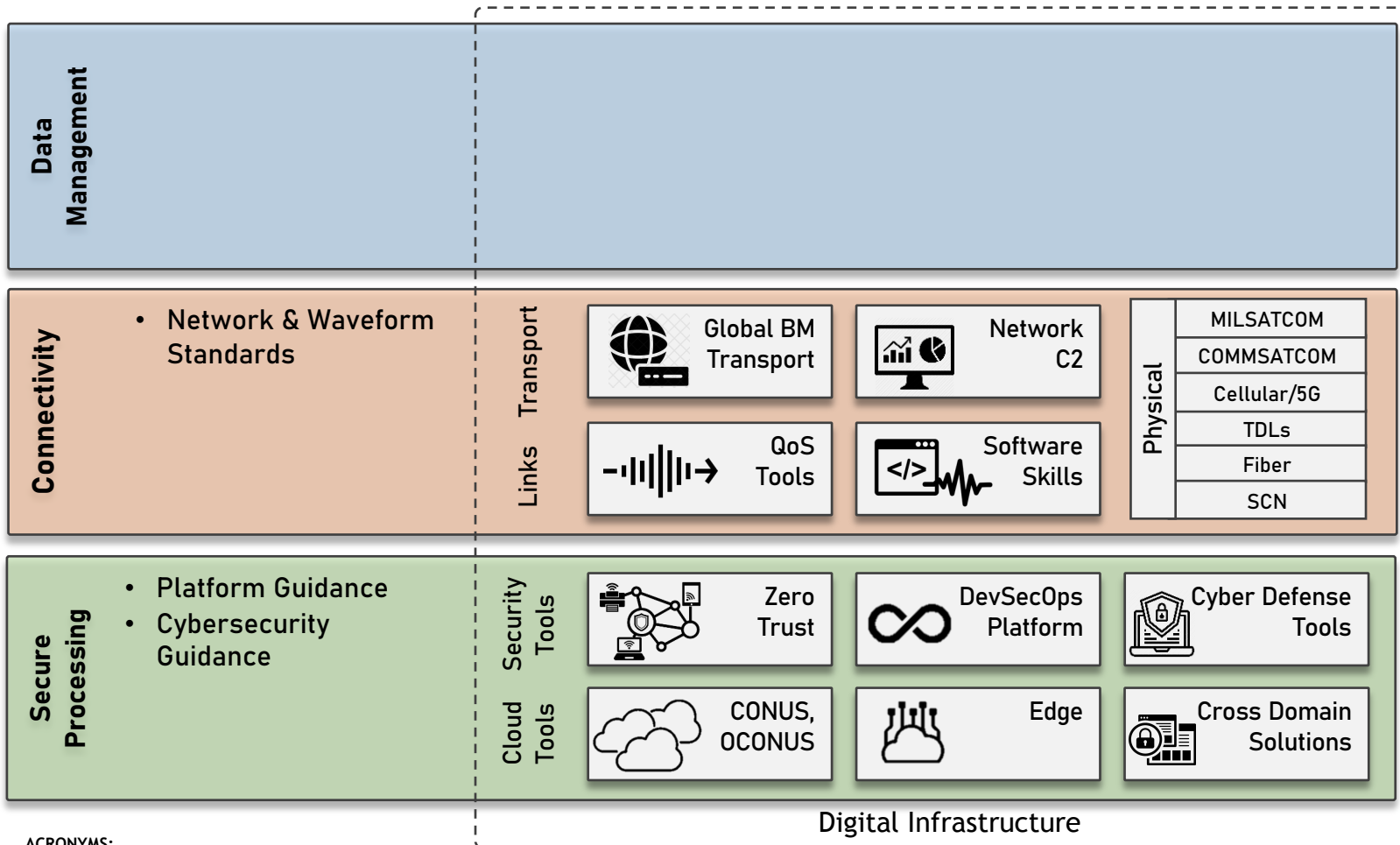


# Connectivity

## ABMS Guidance

## Reference Architecture

## Potential Implementations



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



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

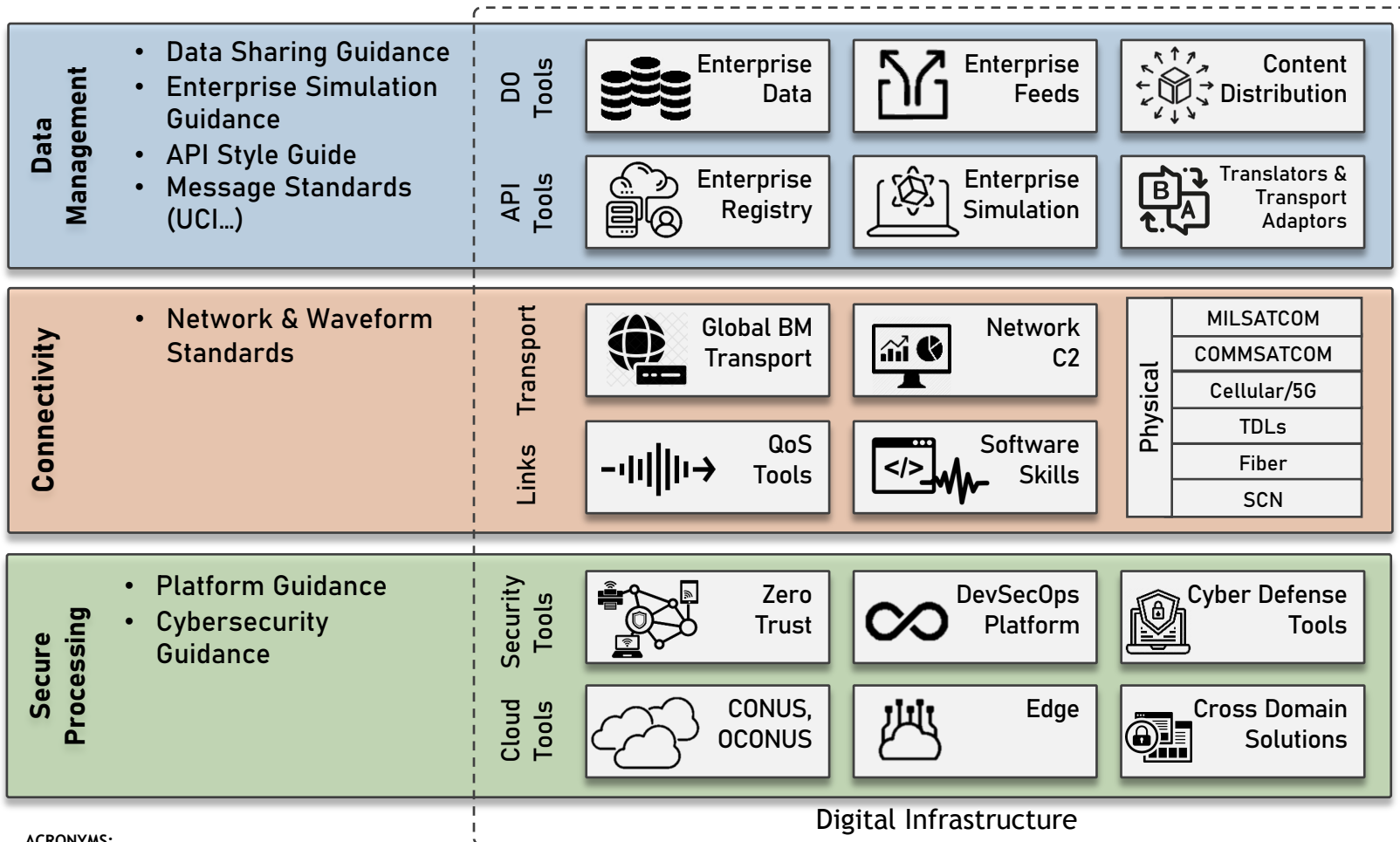


# Data Management

## ABMS Guidance

## Reference Architecture

## Potential Implementations



- 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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