Office of the Undersecretary of Defense for Research and Engineering [USD(R&E)]

ANSI Commercial Space Industry Standardization Coordination

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USD(R&E)/Advanced Capabilities

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USD(R&E) Mission

- **Ensure Technological Superiority for the U.S. Military**

  - Set the technical direction for the Department of Defense

  - Champion and pursue new capabilities, concepts, and prototyping activities throughout the DoD research and development enterprise

- **Bolster Modernization**

  - Pilot new acquisition pathways and concepts of operation

  - Accelerate capabilities to the warfighter
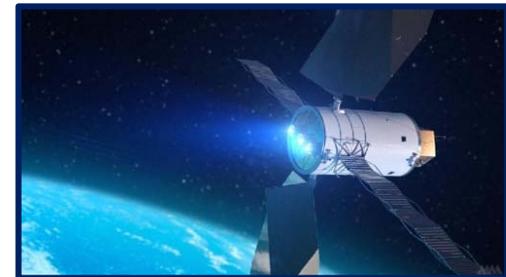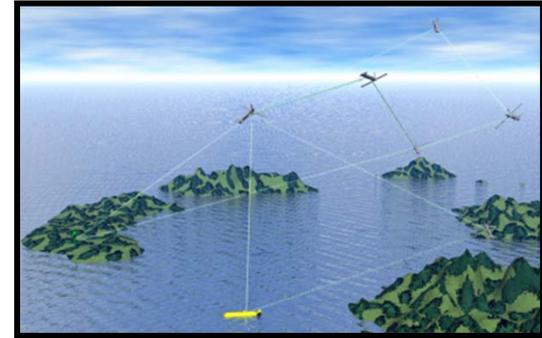
"Our mission is to ensure that we, if necessary, reestablish and then maintain our technical advantage."
– Under Secretary Griffin, April 2018

USD(R&E) Scope

- **Directorates for**
  - Research and Technology
  - Modernization
  - Advanced Capabilities
- **Missile Defense Agency**
- **Defense Advanced Research Projects Agency (DARPA)**
- **Space Development Agency (SDA)**
- **Strategic Intelligence Analysis Cell**
- **Defense Innovation Unit**
- **Defense Technical Information Center (DTIC)**

DDR&E/AC Modernization Priorities

"We cannot expect success fighting tomorrow's conflicts with yesterday's weapons or equipment."
– National Defense Strategy

- Hypersonics
- Fully Networked Command, Control, and Communications
- Directed Energy
- Cyber
- 5G

- Quantum Science
- Machine Learning / Artificial Intelligence
- Microelectronics
- Autonomy
- Biotechnology

For each modernization priority there is an Assistant Director of Research & Engineering who is an independent expert voice and is responsible for establishing the DoD-wide mission-focused strategy and shaping the portfolio.

DDR&E/AC Engineering Framework

- **Digital Engineering Strategy for Systems and Software**

- **Specialty Engineering: Human Systems, Quality, RMA, Safety, Value Engineering**

- **Standardization**
  - DoD Instruction 4120.24, Defense Standardization Program (DSP)
  - DoD Manual 4120.24, Defense Standardization Program (DSP) Procedures

- **Modular Open Systems Approach (MOSA)**

- **Modeling and Simulation**

SDA OVERVIEW

Dr. Derek Tournear
Director, SDA
OUSD (R&E)

Space Development Agency Overview

Defining and monitoring the Department's future, threat-driven space architecture and accelerating the development and fielding of next-generation space capabilities

TIME-SENSITIVE GROUND TARGETS

HYPERSONIC & ADVANCED MISSILE THREATS

Resilient military sensing and low-latency data transport by means of a proliferated low-earth space architecture
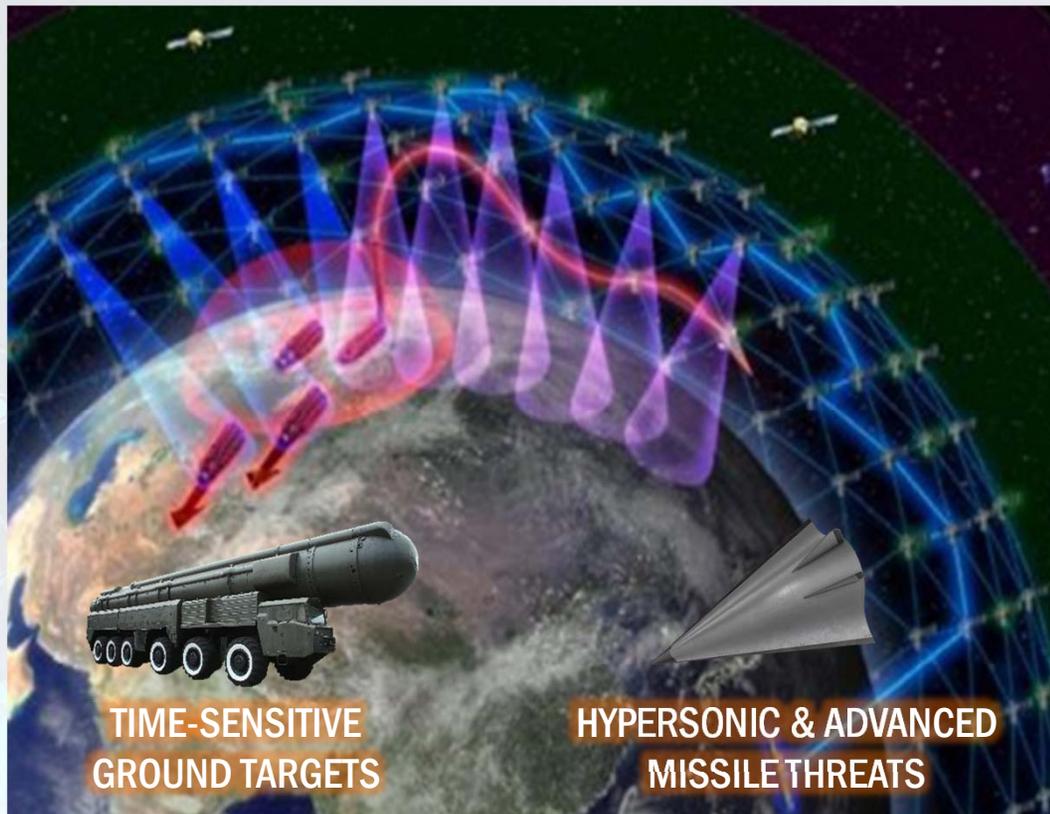
THREAT-DRIVEN TO DELIVER CAPABILITIES TO WARFIGHTER AT THE SPEED OF RELEVANCE

IMPROVED RESILIENCY AND RESPONSIVENESS THROUGH PROLIFERATION
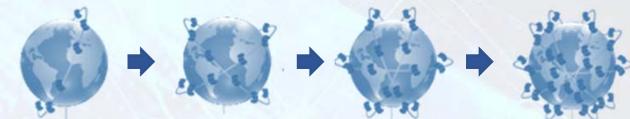
AGILE DEVELOPMENT AND FIELDING – CAPABILITIES IN TWO-YEAR TRANCHES

LEVERAGE PARTNERSHIPS WITHIN DOD AND COMMERCIAL TO ACHIEVE SUCCESS

Notional Architecture
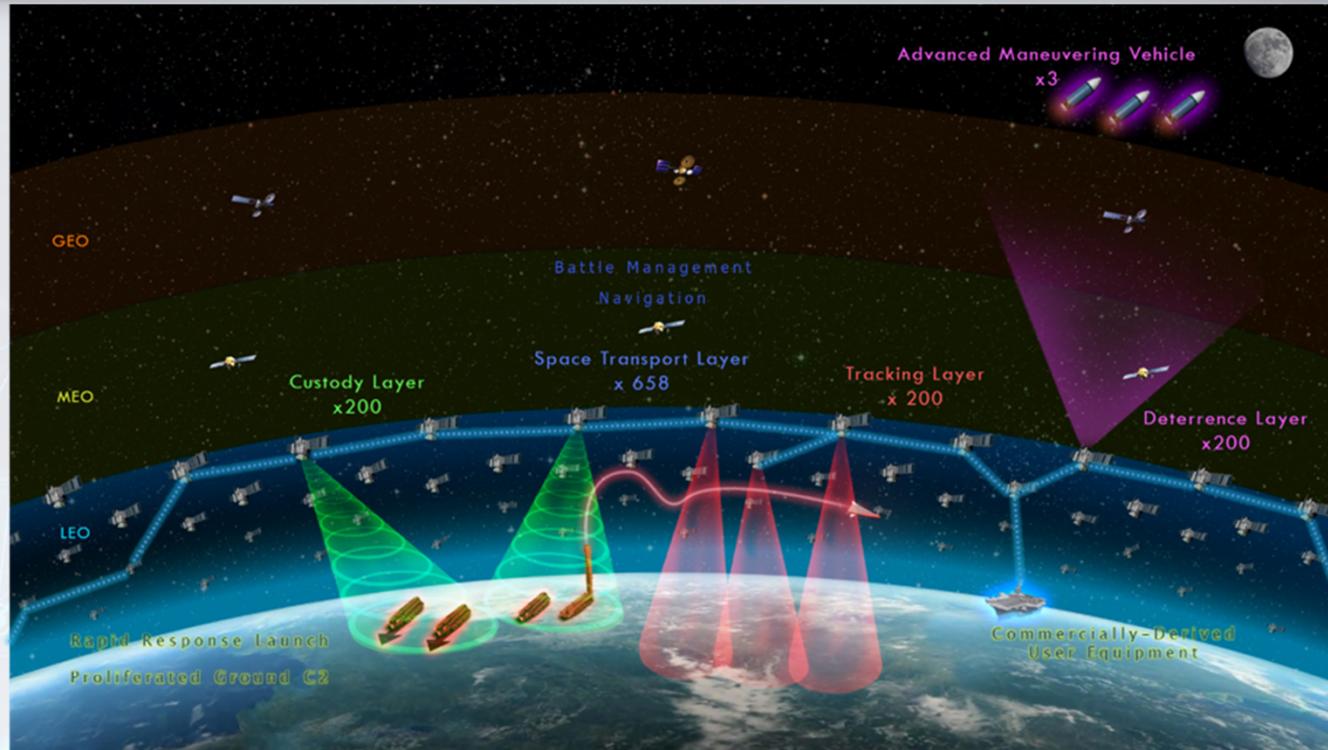
- Integrated architecture
- Multiple constellations or architecture "layers"
- Each layer addresses a critical, unmet gap in the national security space enterprise
- Predicated on a global, persistent, low-latency data and communications "mesh network"
- Leverages industry best practices and commercial development models
- Considering the use of transport layer spacecraft as substrates for other layers
- Proliferated, distributed approach enables resiliency (to direct threats) and responsiveness (to emerging terrestrial threats)

SDA will orchestrate the <u>development</u> and <u>fielding</u> of the future National Defense Space Architecture

Layered Architecture Approach
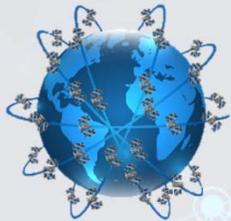
A global, persistent, low-latency data and communications transport layer

Low-latency battle management to enable time-sensitive kill chain closure

Indications, warning, tracking, and targeting of advanced missile threats

Space situational awareness and rapid access for deterrence in cislunar volume
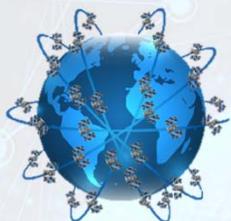
24x7, all-weather constant custody of time-sensitive targets

Alternate position, navigation, and timing for GPS-denied environments

Delivering space-based capabilities at the speed of relevance for our evolving threat environment

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SPACE DEVELOPMENT AGENCY

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