Homeland Defense
and Civil Support
Capabilities-Based Assessment
(HD/CS CBA)

Integrated Architecture (IA)

- **HD/CS CBA Tasking**

- **Role of Integrated Architectures (IA) in a CBA**

- **Utilizing DODAF 2.0 - "Fit for Purpose" to support CBA**

- **Architecture Development Methodology**

- **Architecture Overview**

- **Demo Scenario Animation Capability**

- **Sharing the Integrated Architecture with interested stakeholders**

- **Architecture Utility Beyond the CBA**

- **Summary**

HD&CS CBA Tasking

- **NORAD/USNORTHCOM tasked by DepSecDef SEP07 to lead a 14 month CBA for HD/CS**

- **HD/CS CBA identified as one of DOD's Top 25 Transformational Initiatives to be completed by DEC08**

- **CBA Purpose:**
  - **Examine DOD Homeland Defense and Civil Support missions**
  - **Identify DOD required capabilities and tasks to successfully perform the HD/CS missions (*Functional Area Analysis*)**
  - **Utilize approved scenarios as the backdrop to measure DOD's ability to perform the mission**
  - **Determine mission area capability gaps (*Functional Needs Analysis*)**
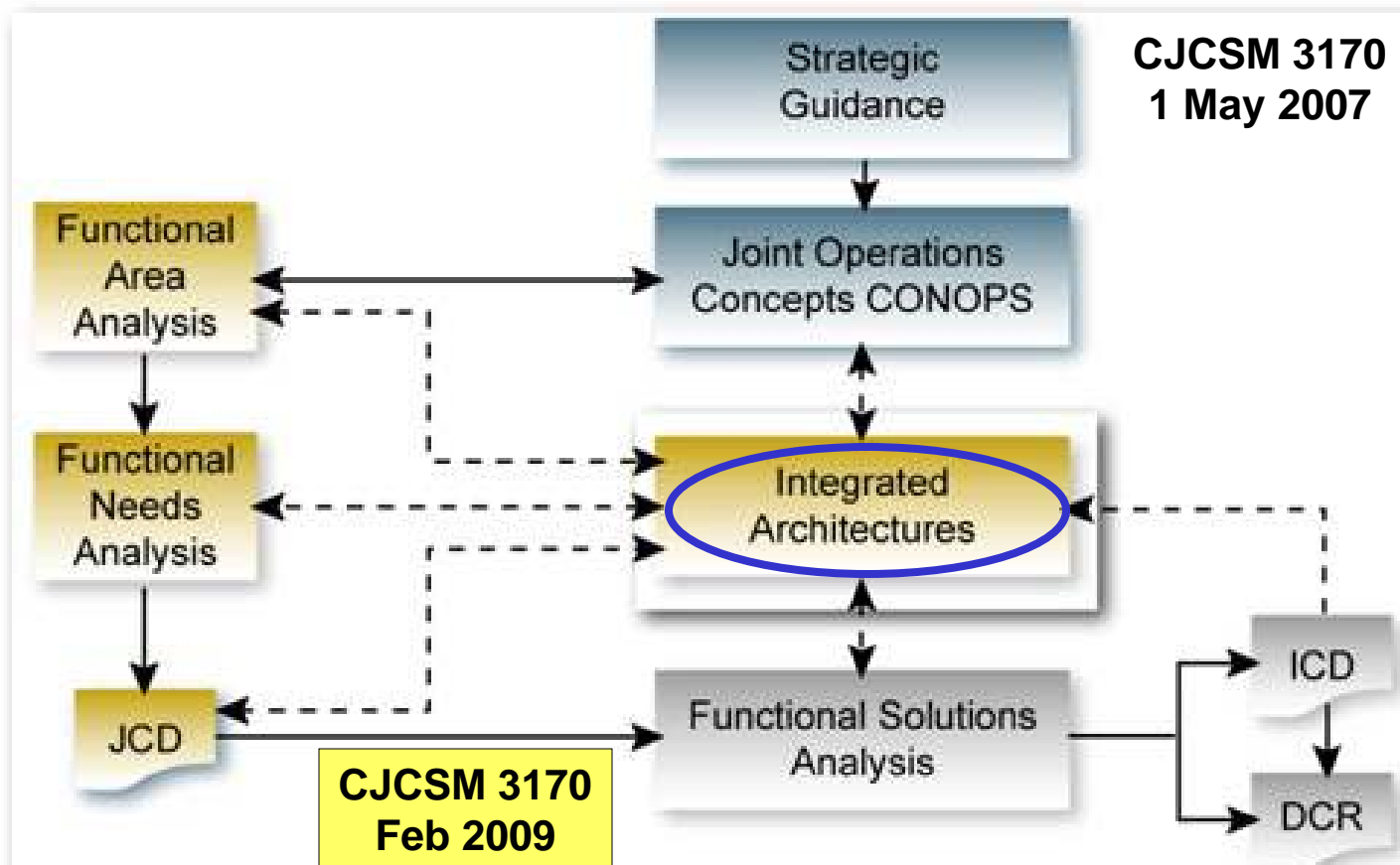 - **Develop recommendations for gap closure**

Analytical Methodology for the HD/CS CBA

- **Size (DOD-wide) and scope (breadth of missions involving Homeland Defense and Civil Support) were significant challenges**

- **CBA Team organization - Six Working Groups: Air and Space, Defense Support to Civil Authorities, Cyber, Land, Maritime and Mission Assurance**

- **Integrated Architecture Team role: Provide analytical rigor to support the CBA development and support post-CBA resource allocation decisions**

- **Views developed (ideally suited for DODAF 2.0 "Fit for Purpose") :**
  - **13 Operation Concept Graphics (OV-1s)**
  - **135 Operational Activity Models (OV-5s)**
  - **13 Operational-Event Trace Descriptions (OV-6Cs)**
  - **13 Scenario Animations (e.g. cyber attack, asymmetric ballistic missile defense, earthquake, etc.) *(Our "Fit-for-Purpose" example of "executable architecture" from DODAF 2.0)***

Role of Integrated Architectures in CBA

Strategic Guidance

Joint Operations Concepts CONOPS

Functional Area Analysis

Functional Needs Analysis

Integrated Architectures

JCD

Functional Solutions Analysis

ICD

DCR

CJCSM 3170 1 May 2007

CJCSM 3170 Feb 2009

"The CBA should use the existing DOD Enterprise Architecture and related solution architectures as means of assessing the capability gaps and proposed approaches to mitigate them".

Asymmetric Ballistic Missile Defense Scenario OV-1

Per JCIDS, this single OV-1 would have met Integrated Architecture requirements

DSP/SBIRS

N

UEWR (Cape Cod)

Launch ID

EDS

LAUNCH INDICATIONS

WAS

Launch ID

Landbased Missile

UNKNOWN

District of Columbia JADOC

Delaware

Detect Launch

N2C2 Center (Colorado Springs)

Launch ID

Track/Discrimination Radar

AFNORTH (Tyndall AFB)

UNCLASSIFIED

Operational (*yellow*) / System (*orange*) Nodes
N2C2 – NORAD/NORTHCOM Command Center
UEWR – Upgraded Early Warning Radar
WAS – Wide Area Surveillance Radar (Future Capability)
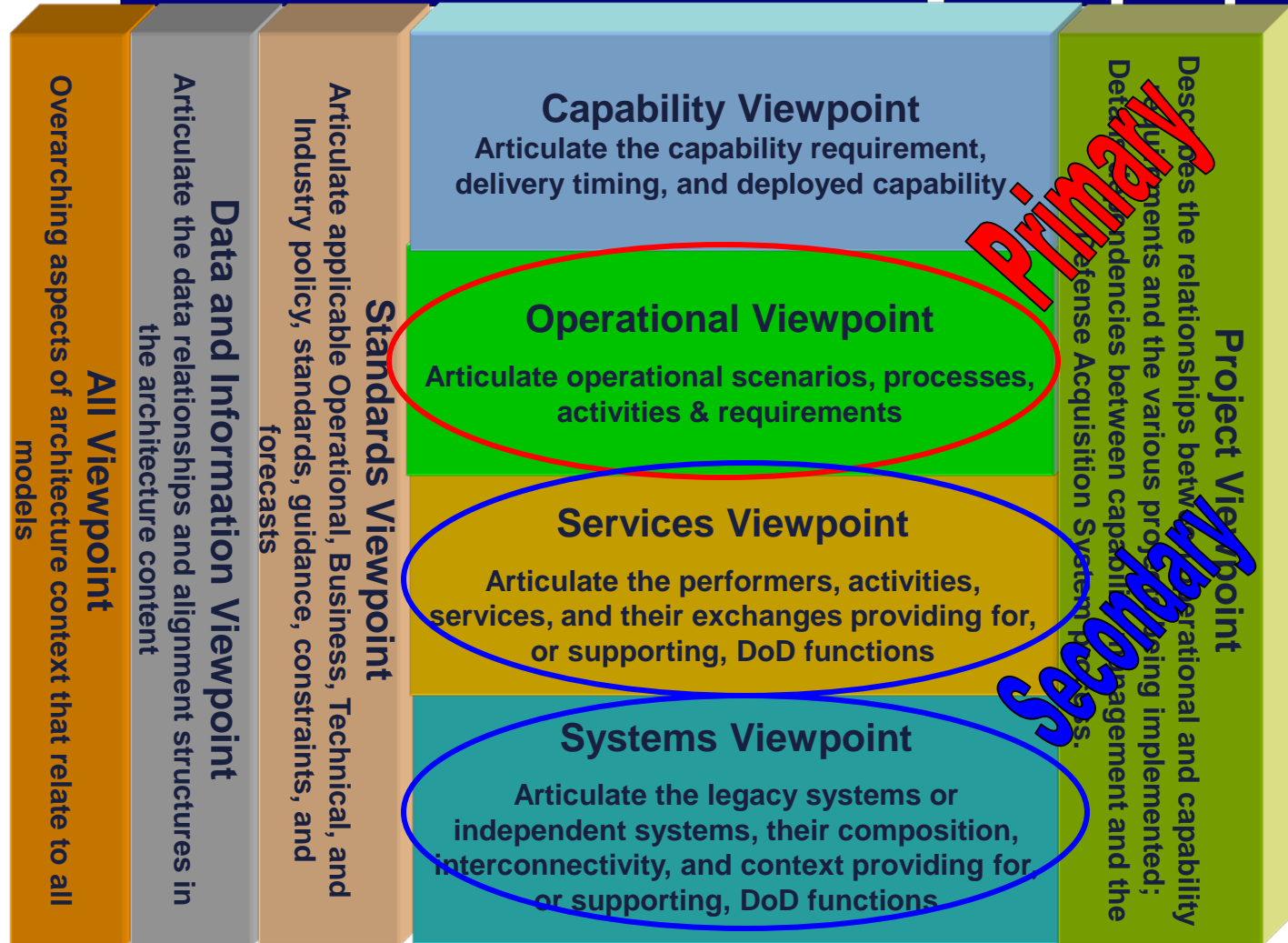**EDS** – NORAD Eastern Defense Sector
AFNORTH – Air Forces Northern
DSP/SBIRS – Defense Support Program / Space Based Infrared System
JADOC – Joint Air Defense Operating Center
*Note – **Multiple** additional information exchanges and C2 nodes are involved in this scenario; these are critical nodes/IEs only.*

DODAF 2.0 Viewpoints That "Fit-the-Purpose: for the HD/CS CBA

All Viewpoint
Overarching aspects of architecture context that relate to all models

Data and Information Viewpoint
Articulate the data relationships and alignment structures in the architecture content

Standards Viewpoint
Articulate applicable Operational, Business, Technical, and Industry policy, standards, guidance, constraints, and forecasts

Capability Viewpoint
Articulate the capability requirement, delivery timing, and deployed capability

Operational Viewpoint
Articulate operational scenarios, processes, activities & requirements

Services Viewpoint
Articulate the performers, activities, services, and their exchanges providing for, or supporting, DoD functions

Systems Viewpoint
Articulate the legacy systems or independent systems, their composition, interconnectivity, and context providing for, or supporting, DoD functions

Project Viewpoint
Describes the relationships between operational and capability requirements and the various projects being implemented; Details dependencies between capability management and the Defense Acquisition System process.

Primary

Secondary

Architecture viewpoints are composed of data that has been organized to facilitate understanding.

- **Identify DOD required HD/CS capabilities and tasks to respond to scenarios (*organization and system agnostic*)**

- **Leverage existing overarching Concept Plans, Concept of Operations, EXORDS and Subject Matter Expert inputs to put capabilities and tasks in time-sequence**

- **Identify primary DOD operational nodes and critical information exchanges for successful scenario execution**

- **Insert 2015 Family of Systems (where applicable) into the scenario**

- **Add absolute measures to tasks (proficiency, sufficiency, timeliness, etc.) to assist in capability gap identification**

- **Utilize the architecture as gap analysis tool; include identified gaps into IA model *and Joint Capabilities Document***

- **Apply unique architecture animation capability to provide a dynamic visualization of scenarios**

Overview of HD/CS Integrated Architecture & Scenario Animation Demo

" **Dynamic Analyses –** *sometimes referred to as executable models…examine performance aspects through dynamic simulations.*"

"Presenting the architectural data to varied audiences requires transforming the architectural data into meaningful presentations for decision-makers"

DODAF 2.0---Architecture Methodology/Presentation Techniques

Asymmetric Ballistic Missile Defense Scenario OV-1

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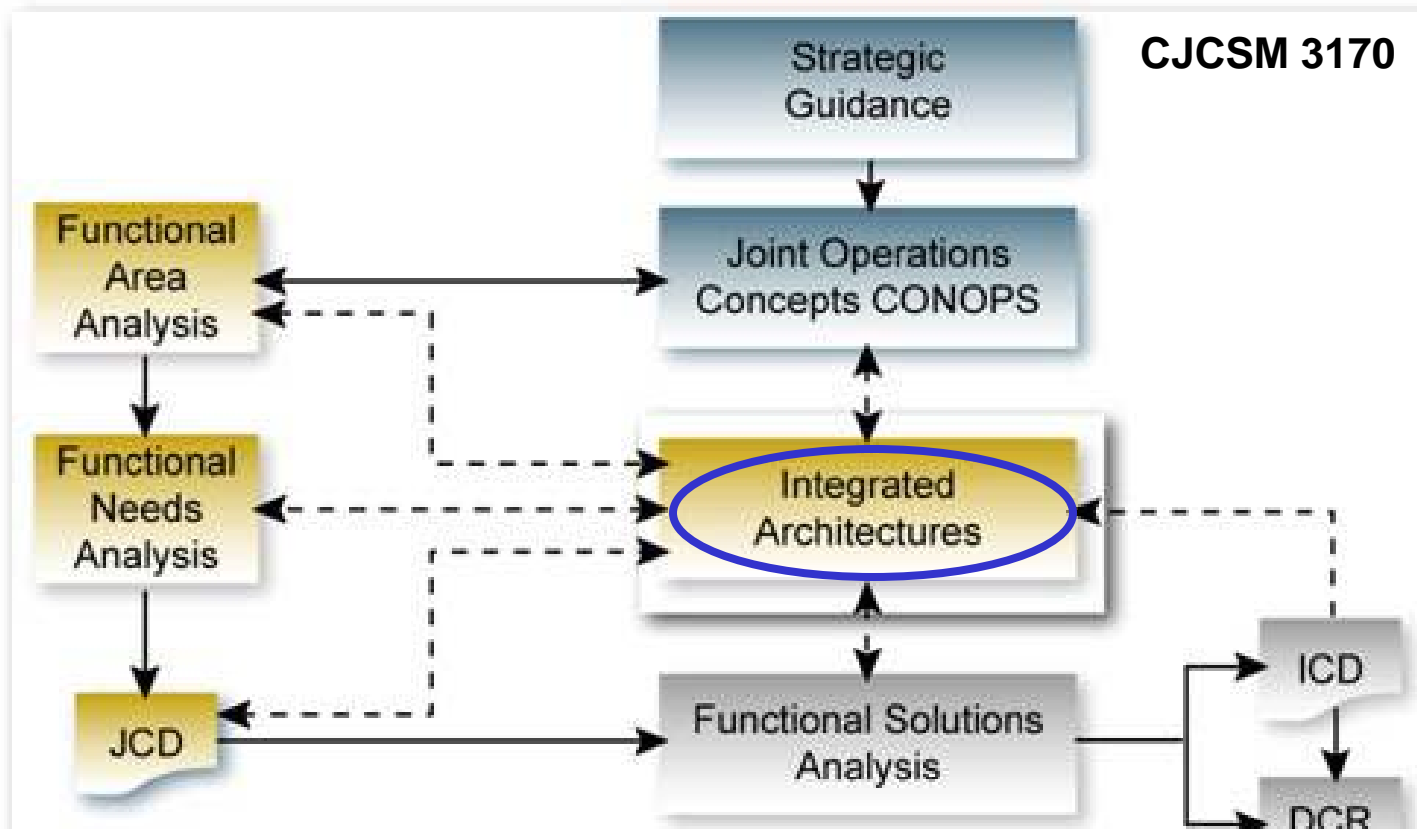are critical nodes/IEs only.*

Sharing the HD/CS IA with Stakeholders

- **DOD Architecture Framework Products**
  - **13 OV-1s** *(*Animated Scenarios*)*
  - **135 OV-5 Activity Diagrams**
  - **13 OV-6C Operational-Event Trace Descriptions**
- **Mapping to 442 HD/CS Functional Area Analysis (FAA) tasks, 105 Task Level Gaps and 31 Capability Gaps**
- **Process/Methodology "videos"**
  - **CBA Methodology**
  - **FAA Task to Architecture Mapping**
  - **FNA Task Level and Capability Gap Mapping**
- **CBA Documents (Study Plan, FAA, FNA, JCD)**
- **Other relevant JCIDS efforts integrated within the architecture**
  - **Homeland Air and Cruise Missile Defense FAA/FNA/JCD/FSA**

Over 320 of these disks have been requested and provided to DOD and DHS external stakeholders

2007

Architecture Utility Beyond the HD/CS CBA

- **Next phase of JCIDS**
  - **Utility for DOTMLPF Change Requests (DCRs)**
  - **Support follow on Wide Area Air Surveillance Analysis of Alternatives**
  - *Results in traceability from mission capability/task identification, gap analysis to solutions implementation (whether materiel / non-materiel)*
- **Mission CONOPS Development**
- **Exercise scenario/vignettes and visualizations**
  - **NORAD and Coast Guard Exercise support**
- **Office of Management and Budget (OMB) Enterprise Architecture Assessment**
  - **HD/CS IA utilized as a segment architecture for 3 mission areas in FY 11 Budget Guidance**
- **Supporting other HD/CS-related Initiatives**
  - **Integrated Unit, Base and Installation Protection (IUBIP) Analysis of Alternatives, National Guard Bureau Study, etc.**

Summary

CJCSM 3170

Strategic Guidance → Joint Operations Concepts CONOPS

Functional Area Analysis → Functional Needs Analysis → JCD

Integrated Architectures

Functional Solutions Analysis → ICD → DCR

We believe this methodology results in defensible resource allocation decisions using an IA as the foundation as envisioned by JCIDS

Questions?

Col Jimmie Schuman
N/NC J58 Capabilities
Jimmie.Schuman@northcom.mil
719-554-3399

Guy Varland
Serco Inc.
guy.varland@serco-na.com
719-235-4384
Twitter handle: @guyvarland

Sharing the HD/CS IA with External Stakeholders

DRAFT

NORAD and USNORTHCOM Homeland Defense & Civil Support (HD/CS)
Capabilities Based Assessment (CBA) Architecture
Version 2.0
30 September, 2008

Distribution authorized to DOD/DHS organizations.
Other requests shall be referred to
NORAD and USNORTHCOM J8C: (719) 554-4435

Resources on this CD:

Architecture Model
HD/CS CBA Architecture (contains DOD Architecture Products)

Process/Methodology Presentations
HD/CS CBA Architecture Overview (movie that describes overall CBA methodology)
Architecture Navigation Instructions (describes how to navigate the CD)
FAA Task to Architecture Mapping (methodology specific to the FAA)
FNA Architecture Methodology (methodology specific to the FNA)

Scenario "Animations"
Scenario Architecture Animations (13 animated CBA scenarios)

CBA Products

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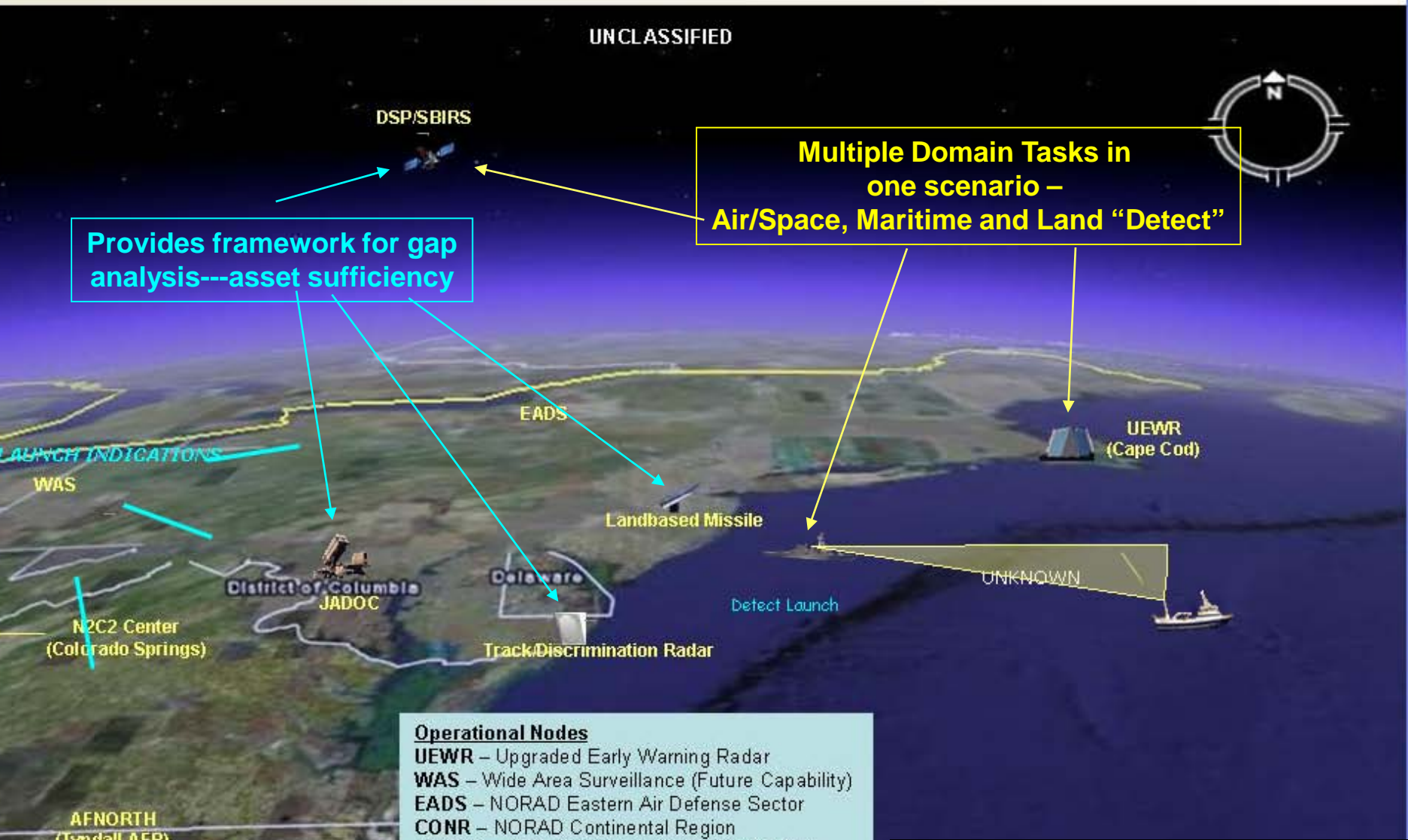
Example IA Benefits

UNCLASSIFIED

DSP/SBIRS

**Multiple Domain Tasks in one scenario –
Air/Space, Maritime and Land "Detect"**

Provides framework for gap analysis---asset sufficiency

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UEWR
(Cape Cod)

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<u>Operational Nodes</u>
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WAS – Wide Area Surveillance (Future Capability)
EADS – NORAD Eastern Air Defense Sector
CONR – NORAD Continental Region
JADOC – Joint Air Defense Operating Center
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AFNORTH
(Tyndall AFB)

Screen Capture from Integrated Architecture Scenario Animation

File   View   Actions   Help

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mMap
View

State Actor Scenario

** **Cyber Attack (#15)**

** **Nuclear-tipped 10 kT SLBM (#**

** **10 kT response (#1)**

Nuclear-tipped ICBM (#1)

Bio Attack response (#2)

** **SLCM w/ non-cont. bio agent (#3)**

CHDS – Homeland Defense

NPS – Civil Support

SSSP

** **Maritime Domain – Homeland Defense (#4-04)**

Cyber Domain – Homeland Defense (#4-05)

Air Domain – Homeland Defense (#4-06)

Land Domain – Homeland Defense (#4-07)