USN C4I Migration to a Service Oriented Architecture and Common Computing Environment

PMW-120/*Distributed Common Ground System - Navy*

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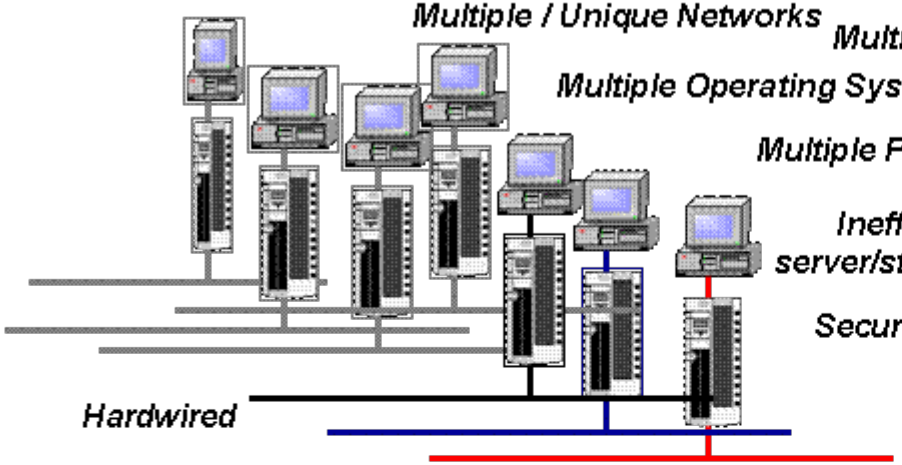
Background

- Early in DCGS-N development recognized need for COP for C2 and ISR
- Highlighted USN C4I system issues:
  - Information sharing constraints
    - Stovepiped PORs
  - Cost
    - Multiple support infrastructures (training, refresh and upgrades)
    - Overlap of requirements
  - Hardware footprint
  - Bandwidth constraints

Lack of Agility and Responsiveness

Consolidated Afloat Networks and Enterprise Services (CANES) Vision

Today's C4I Architecture



Multiple / Unique Networks

Multiple Classification Levels

Multiple Operating Systems

Multiple Protocols

Inefficient use of server/storage resources

Security Vulnerabilities

Hardwired

No enterprise network mgt

Network is not adaptable to the user (User must adapt to the network)

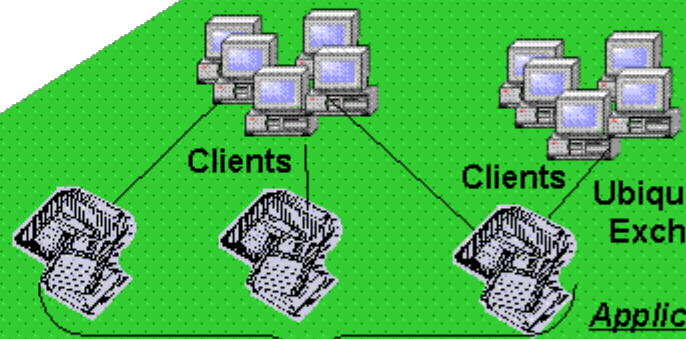
CANES Afloat C4I Architecture

Common POR Network

Inoculated Network

Cross Domain Interoperability

Service Levels



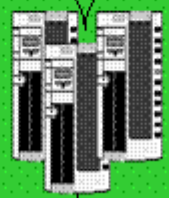
Clients

Clients

Ubiquitous Information Exchange using SOA

Applications just bring software

Wireless



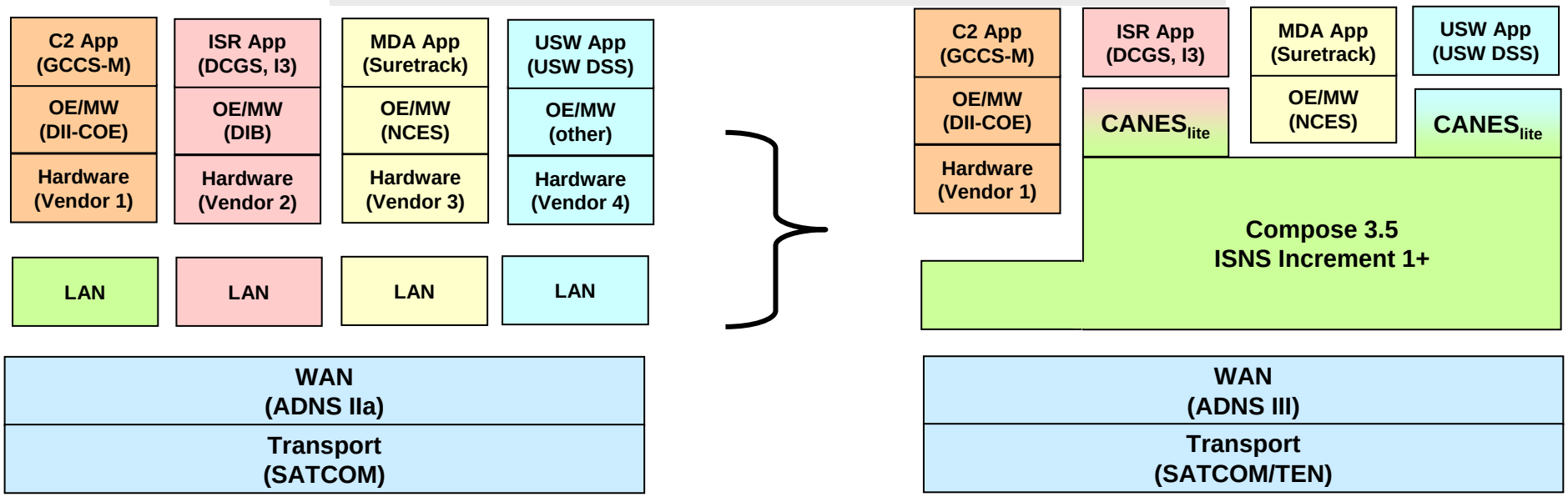
Hotel Services (Core Services)

Network Operations Center

CANES adapts to users with role-based ID mgt

CANES Transformational 2 Year Strategy

ISNS Increment I+ and Compose 3.5 Integrates Core Hardware Infrastructure, Application Re-Aggregation TBD



25-65 Racks	Hardware Racks	*6-10 Racks*
12-36 Sailors	SYS ADMIN	*6-18 Sailors*

CANES 5 Year Vision

Current Programs (e.g. GCCS-M, DCGS-N) Are Dis-Aggregated Into Smaller Programs

Mission/COI Decision Support Services Represent A New "Requirements" Approach

Need to Define New Program around information/data domains and prepare for Software Integration and Test of Navy and Joint (e.g. I3, NECC, JMPS) Programs into CANES.

USW/ASuW/MDA/BMD/STRIKE/Riverrine/SOF DECISION SUPPORT SERVICE (Mission Applications)

C2 APP | C2 APP | C2 APP | C2 APP | ISR APP | ISR APP | ISR APP | ISR APP | ISR APP | MDA APP | MDA APP | MDA APP | USW APP | USW APP | N1 APP | N1 APP | LOG APP

COI INFORMATION/INTEGRATION SERVICEs

C2 App (GCCS-M)
OE/MW (DII-COE)
Hardware (Vendor 1)

ISR App (DCGS, I3)
CANES$_{lite}$

MDA App (Suretrack)
OE/MW (NCES)

USW App (USW DSS)
CANES$_{lite}$

Compose 3.5
ISNS Increment 1+

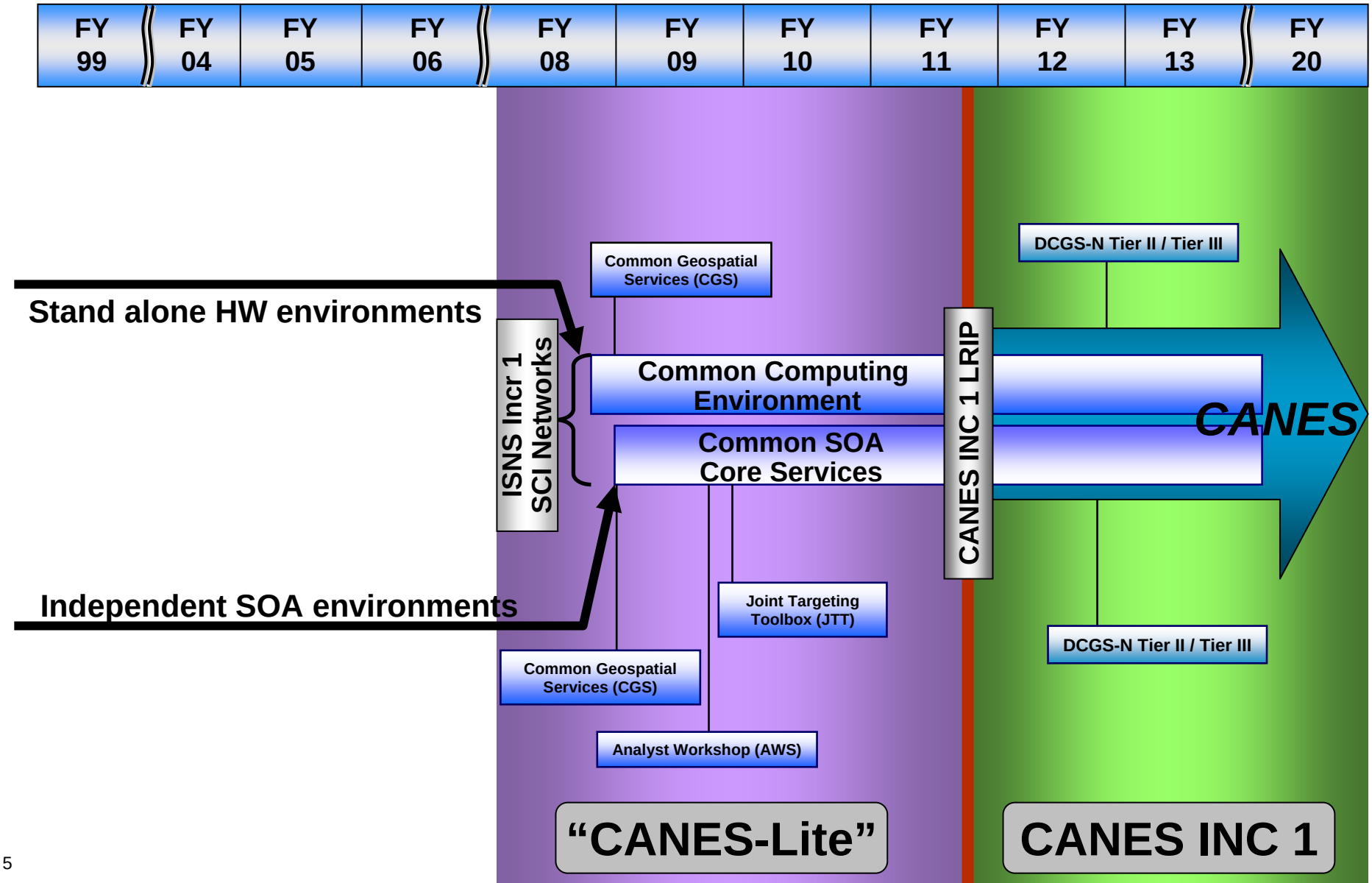
CANES Increment 1
[ENTERPRISE SERVICE BUS]

WAN
(ADNS III)
Transport
(SATCOM/TEN)

WAN
(ADNS III/IV)
Transport
(SATCOM/JTEN/TDLs)

6-10 Racks	Hardware Racks	*6-10 Racks*
6-18 Sailors	SYS ADMIN	*3-12 Sailors*

Leaning Forward - (PR 09)



Risks

- **Issue:** Gov't Integration Agent
  - **Mitigation –** Compete Enterprise Integrator role
- **Issue:** System Integration Complexity
  - **Mitigation –** Total system approach to business logic, mission threads, data and information management, COI integration, and information presentation to user – Who is responsible?
- **Issue:** Test and Evaluation Complexity
  - **Mitigation –** Requires new T&E Strategy & COTF Buy-in
- **Issue:** Resource Allocation Rules
  - **Mitigation –** Prioritize functions and capabilities recovery
- **Issue:** Integrated Logistic Support
  - **Mitigation –** Develop new operator and maintenance strategy

Challenges

- Requires organizational change and leadership commitment
- Leveraging and aligning efforts
  - Significant opportunity but increases external risk and dependencies
- Cost avoidance needs to be reinvested
- Infrastructure and application reduction and rationalization
  - Follow PEO IWS ARCI model for Submarines
- Governance process for introducing new services or hardware into Afloat environment
  - Leverage lessons learned from NMCI and FAMs
- Timing and transition of programs into common environment
  - Need to avoid all or nothing approach
- Lack of documentation, training and CONOPs
  - Leverage and work with Industry partners

Summary

- Collaborate on afloat (ashore) SOA way forward
  - Quantify key items/actions to promote
  - Synchronize the artifacts to share/leverage
  - SOA governance
  - Leverage previous and on-going efforts
    - DDG-1000 TSCE, NMCI, ARCI
  - Lowest TOC the goal (reduced O&S $$& manpower)
- We all agree SOA is good
  - Must distill the essential details
- The Devil is in the details…

Back-Up Slides

Migration Strategy for SOA/CCE

MIGRATE TO SOA

- ✓ **Targeting application complete (CGS)**
- ✓ **Non-segmented I3 application (Analyst Workstation/Joint Targeting Toolbox)**
  - Working with JDISS Program Office
- **SHARP Display System (SDS) candidate FY10/11**
- **IPL/IESS Cohost FY10/11**
- **Gale Lite (ELINT) client candidate FY10/11**
- **Navy DCGS-N multi-node enterprise development underway**
  - Existing modeling tools and engineering may extend to C4 domain

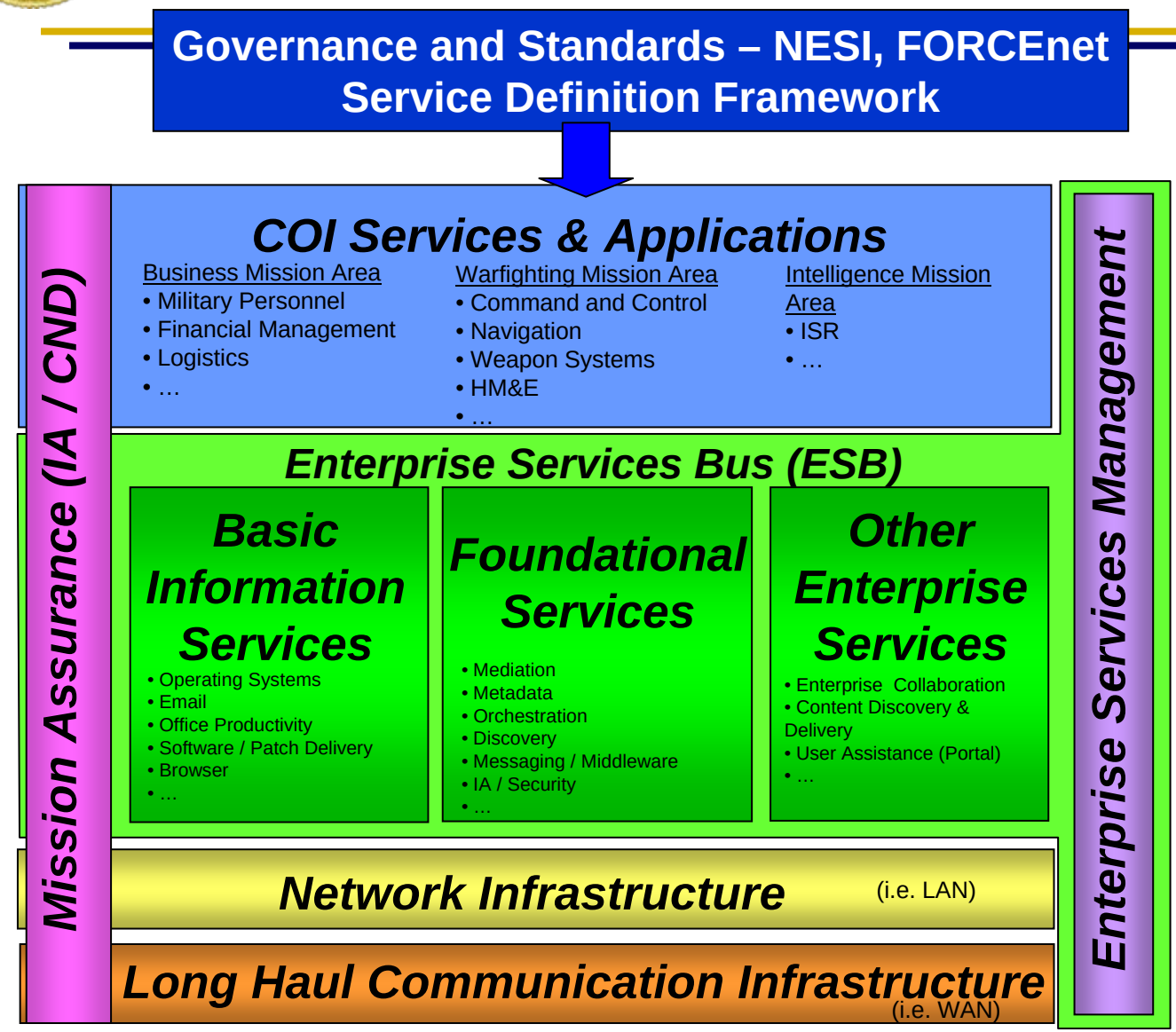
MIGRATE TO CCE

- **CGS and I3 applications (AWS/JTT) hosted on CCE in FY09**
- **IPL and NGA products**
  - Working with NGA for non-hardware specific application
  - Likely will not migrate until full CANES in FY11
- **Providing PMW-160 multi-function workstations requirements**
  - Stereo workstations will likely still be hardware specific buys
- **If CIP required onboard that too will be hardware specific in the interim until NGA fields alternative solutions or migrates to a software-based CIP**
  - Need Sponsor help with CIP P.O.

Notes: Requires CARRIERS and Large Deck AMPHIBS be among first for ISNS Inc 1 installation

Accurate cost savings estimate cannot be projected until we have a final Tier 2 configuration

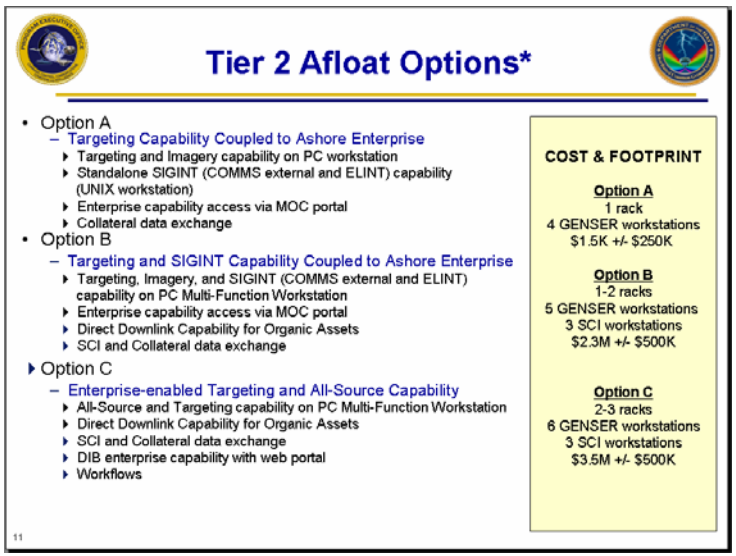
PEO C4I SOA Reference Architecture

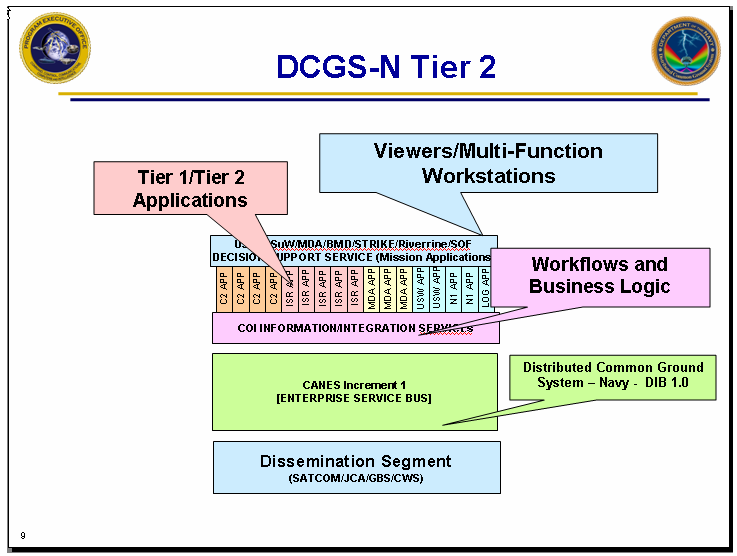


- **Key Characteristics**
- **Plug and Play**
- **Maximum Reuse**
- **Ubiquitous Info Access**
- **Open Standards Based**
- **Data Sharing and Discovery**
- **Systems Consolidation**
- **Managed Risk**
- **Meets Security Standards**
- **Supports all Sources**
- **Visualization Neutral**

PMW-120/DCGS-N Transition Overview

- DCGS-N 1.1 (Tier 1)
  - Implemented DIB and enterprise
  - SOA migration over time reduces cost and risk
  - Common Geospatial Service (CGS) developed with SOA in mind
  - Some applications may not easily convert to a SOA environment
- DCGS-N Tier 2*
  - Reduce risk with ISNS Early Adopters and EDMs in FY09
  - Implement in CANES environment

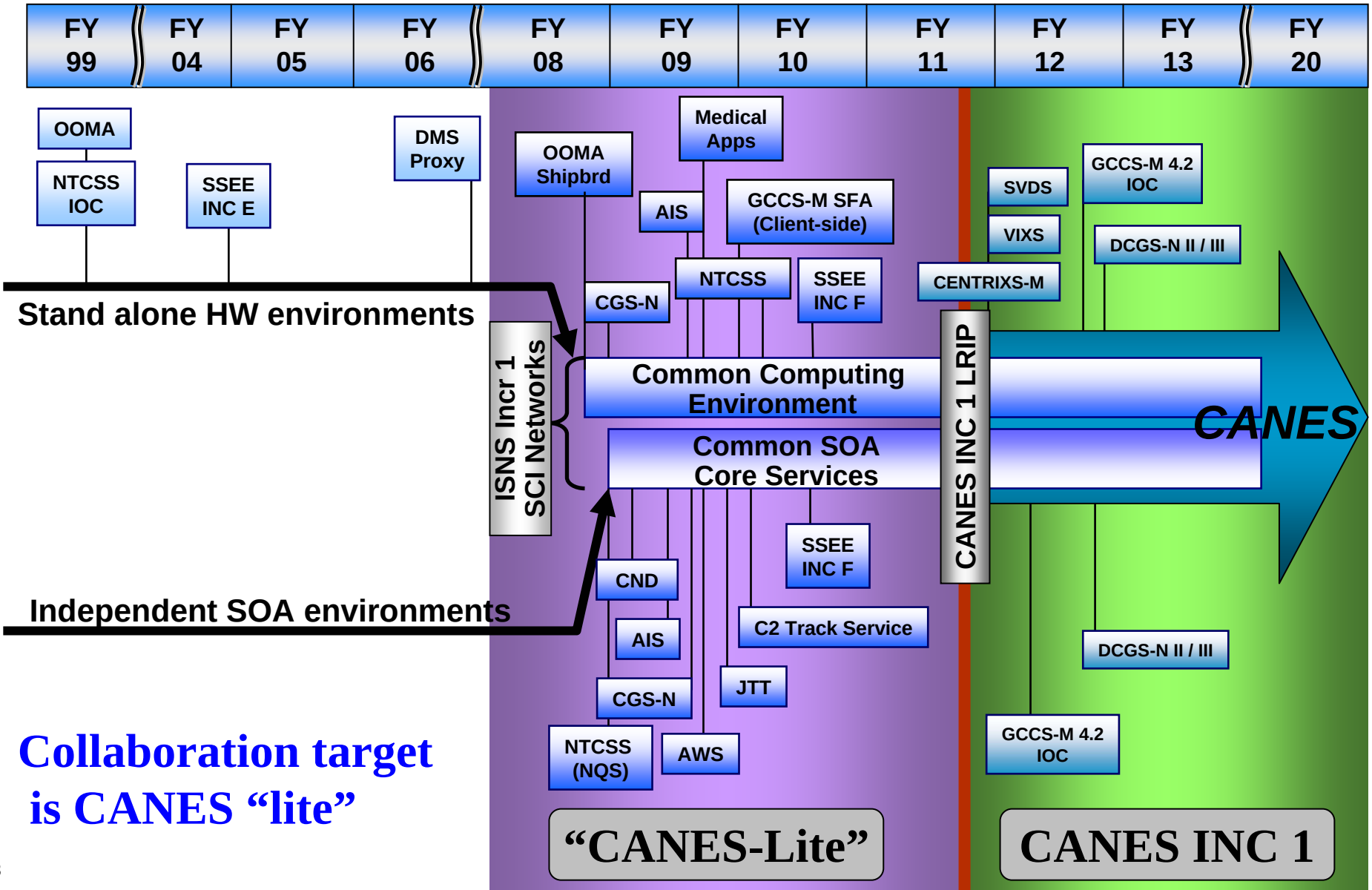




DCGS-N maps well to CANES SOA architecture

Accelerated Migration Timeline

FY 08/09 Early Adopter "Quick Wins"



Collaboration target is CANES "lite"