**Program Executive Office
Command, Control, Communications,
Computers and Intelligence (PEO C4I)**

Policy, Governance and Performance Management in a Services Oriented Architecture

**14 May 2009
Chris Miller
PEO C4I
858 537-8779
chris.miller@navy.mil**

*Information Dominance
Anytime, Anywhere…*

Maritime Strategy

A Cooperative Strategy for 21st Century Seapower

- **The Maritime Strategy is about**
  Security, Stability and Seapower
  - ➢ **Expanded Core Capabilities Of Maritime Power**
    - – **Forward Presence**
   - – **Deterrence**
    - – **Sea Control**
    - – **Power Projection**
    - – **Maritime Security**
    - – **Humanitarian Assistance and Disaster Response**

Unique Maritime Challenges

- **Expansive Physical Environment**
  - From the ocean floor to outer space and everything in between
- **High Volume of Data**
  - Linking Vessel, People, Cargo, Infrastructure data from multiple and disparate sources,
  - Then getting it to the tactical edge in a relevant format
- **New Partners**
  - Traditional: Coalition Partners and Interagency organizations drive Cross Domain and Releasable Solutions
  - Non-Traditional: new International and Interagency partners drive Non-classified solutions
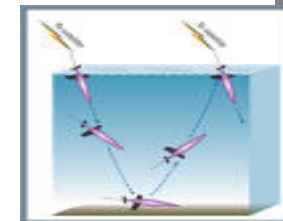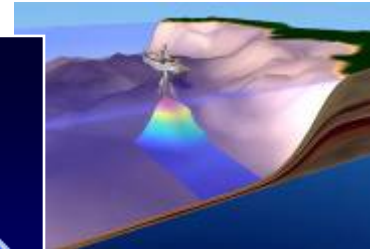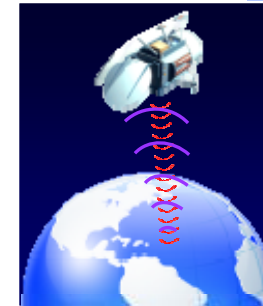
"The area the ship was taken in, is not where the focus of our ships has been…The area we're patrolling is more than a million miles in size. Our ships cannot be everywhere at every time."

— *LT Nathan Christensen, 5th Fleet spokesperson, describing the challenge of anticipating pirate attacks after a US-flagged vessel was seized on 8 April 2009*

Acquisition Challenges

- Demand For Jointness and Interoperability
  - Driven by national defense strategy
  - Driven by operations in the maritime environment
- Demand for Faster Delivery
  - Driven by operations
  - Driven by commercial innovation
- Demand to Deliver More "Bang For The Buck"
  - Driven by tighter budgets
  - Drive by increased accountability
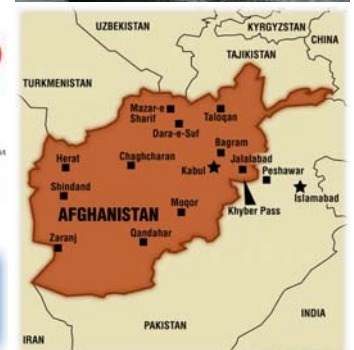
Current State of Navy C4I


NAVMACS Suite

WSC-3 UHF SATCOM and LoS Transceiver

- **Avg. time to market:** 2-3 years for new C4I capabilities

- **Avg. server age:** 3+ years ISNS, 7+ years GCCS-M

- **Avg. network age:** 6.7 years

- **Network FOC Timeline:** 4-9 years (some w/no refresh)

- **642** legacy systems aboard 300-plus ships

- **297** Integrated Shipboard Network System (ISNS) versions

- **151** Combined Enterprise Regional Information Exchange Systems

- **144** Sensitive Compartmented Information Network systems

- **50** SubLAN systems

- **15** legacy facilities support those networks
  - Three help desks - seven training sites - two supply-support units to handle spares – and three engineering sites

Challenge: Creating policy that can be realistically implemented

Law begets Policy, Directives, and Guidance

Law (Titles 10, 40, 44, …)

Policy (3170, 6212, 4630, 5000, …)
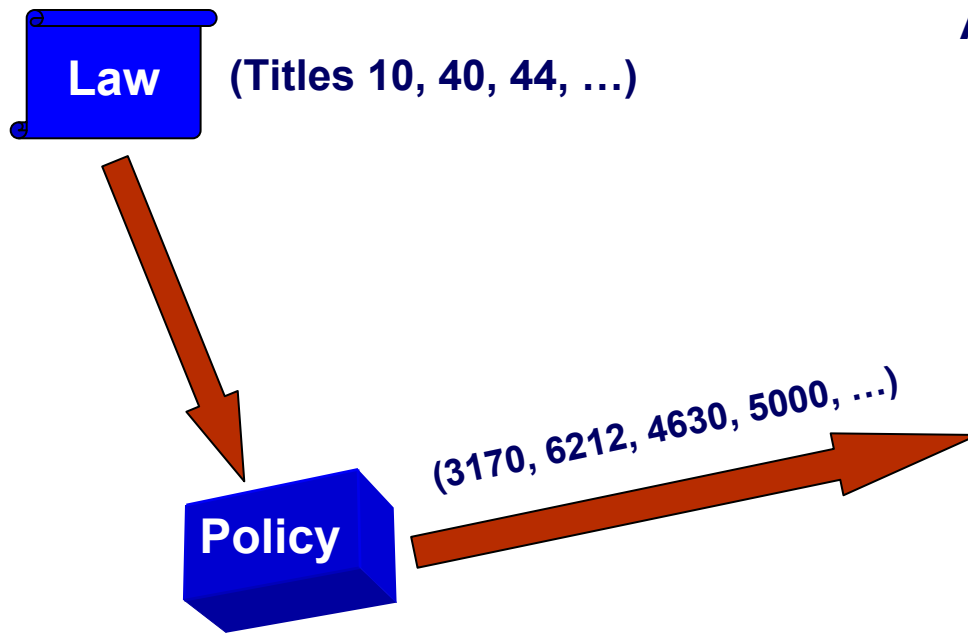
Development, complexity, and interpretation of Policy is overwhelming

Are we providing too much "help"?

Is he managing the Program, or the paperwork?

PEO C4I Strategy for Meeting the Challenges

ACQUISITION GOALS
- Streamline processes by doing accelerated acquisition and RDCs
- More interaction with user communities
- Partnering for Cost, Schedule and Performance

PROGRAM / TECHNICAL GOALS
- Reduce applications
- Reduce servers, but increase utilization
- Transform application programs into community of interest service providers
- Increase bandwidth utilization and capacity

OPERATIONAL BENEFITS
- More responsive to Fleet readiness requirements
- Increased supportability and standardization
- Increased system interoperability & network security
- Increased joint alignment

● **Jointness / Interoperability**   ● **Faster Delivery**   ● **Bang For The Buck**

Innovative Acquisition:
Addressing Faster Delivery

1995 **2000** **2005** **2010**

OOMA
- Client-Server
- Multiple Tests/Certs
- ACAT I Program

Program Initiation — Development Began — Multiple DT/OT Events — Fielding Decision — FOC

GCCS-M 4.0
- Client-Server
- Multiple Tests/Certs
- Interdependencies

ORD — OPEVAL — Full-Rate Production — FOC

AIS
- RDC Approach
- Reused ONR Software
- Initial Delivery < 2 Years

CNO Guidance — Fielding — QRA #1 — MS C

MDA Spiral 1
- 8 Physical sites
- 8 Web Access sites
- 4 NCE Web Access sites

MDA Development Initiated — R3B — QRA — POR Initiation — FRP

Windows OS

NT — WIN 2K — XP — Vista — Windows 7

CPU

486 — Pentium — Pentium II — Pentium 4 — Core 2 — Quad Core — Medfield

Need innovative acquisition to keep pace with technology

7

What is SOA?

"Service oriented architecture (SOA) is a software design discipline in which application and infrastructure functionality are implemented as shared, reusable services."

Burton Group

or

"A collection of core and enterprise services and an associated framework that enable Community of Interest (COI) services to be accessed via open standards, independently of their underlying platform implementation."
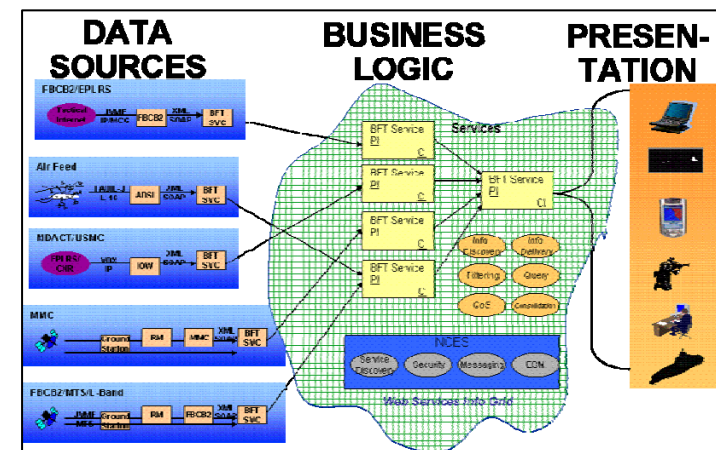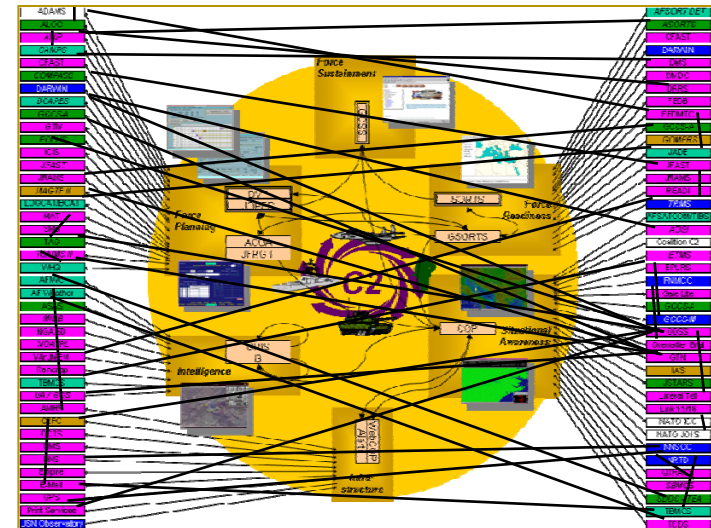
A New System Architecture

Client Server Architectures

- Each link is a tightly engineered pair
- Typical n^2 problem – More connections means much more time/money
- *Programs* are the centers of gravity, and all data is stored within them
- You have to test/accredit every link

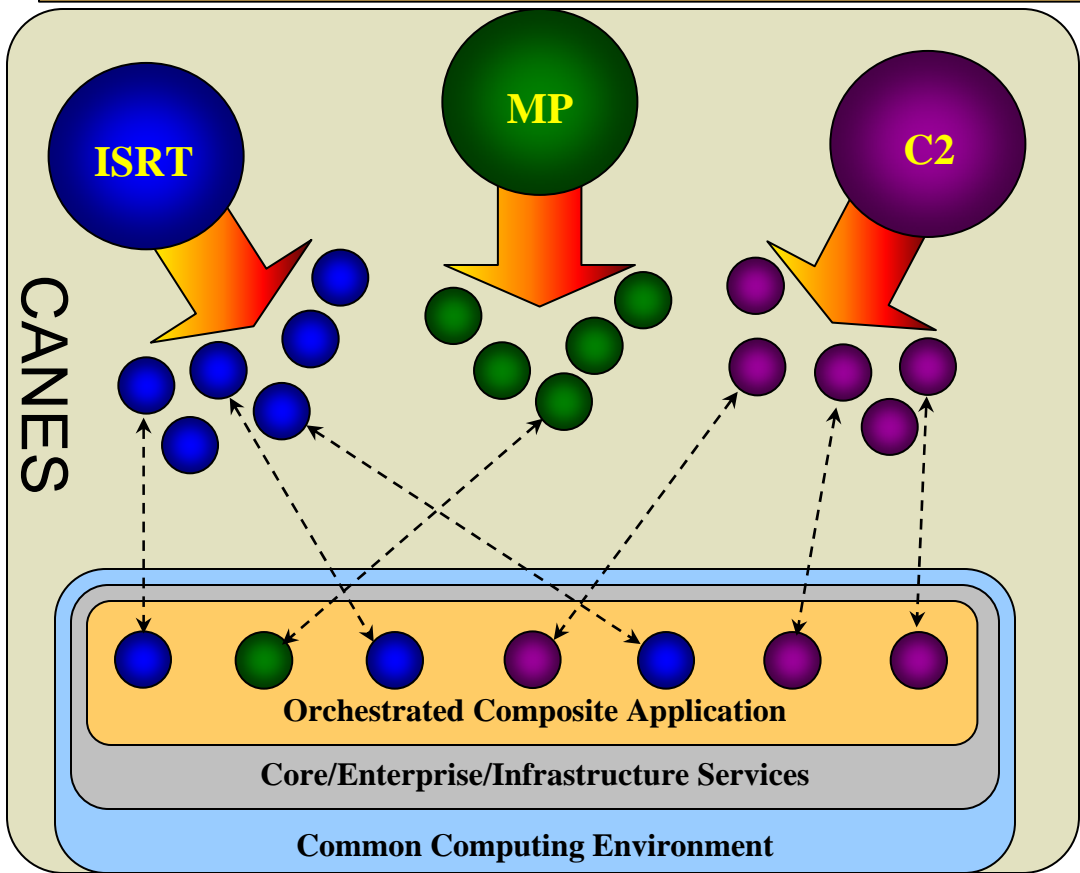## Service Oriented Architectures

- Less connections; Each program connects to a central "bus"
- Much less connections, much less cost
- *Data Sources* are the centers of gravity, all data is stored within data enclaves
- Focus is task or operational function

- 3 separate engines: *Data*, *Logic*, visual *Presentation*

Multiple Applications in GCCS

Vision

| PLAN | FIND | FIX | TRACK | TARGET | ENGAGE | ASSESS |

CANES

- ISRT
- MP
- C2

Orchestrated Composite Application

Core/Enterprise/Infrastructure Services

Common Computing Environment

- Deliver components rather than systems
- Components are provided as information services
- Components can be arranged in any way to provide overall composite application
- Component design provides flexibility, higher re-use, and better manageability

Consolidated Afloat Network Enabled Services (CANES)

Overarching Concept

➢ Consolidating networks by providing a Common Computing Environment (CCE), and Cross Domain Solution (CDS) with integrated Voice, Video, and Data.

Today

FY11

CANES CCE+ACS
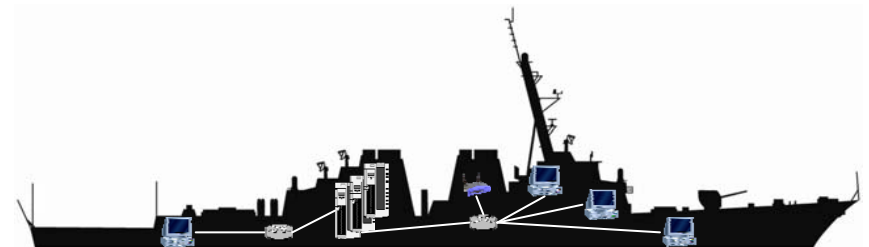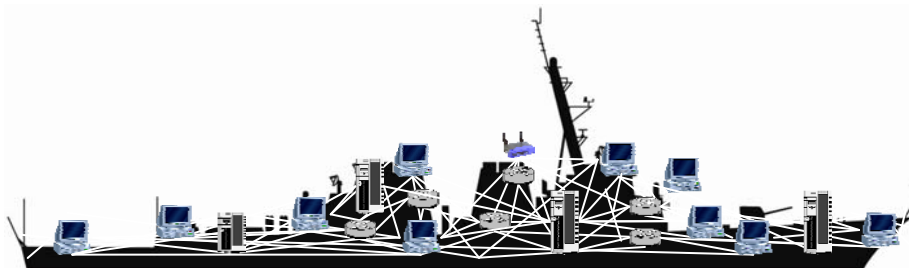
+

Application testing, onboard workstation installation and installation verification and testing

Application unique hardware

Application easily loaded on CCE

ISR Then and Now
from "nice to have" to "mission critical"

"I think there is a world market for maybe five computers."
Thomas Watson, Chairman of IBM, 1943

"640K ought to be enough for anybody."
Bill Gates. 1981

"The war was won by chat."
Admiral Vern Clark, 2003

"I never, ever want to see a Sailor or a Marine in a fair fight. I always want them to have the advantage."
Admiral Gary Roughead, 2008

We get it.

We also integrate it, install it and support it. For today and tomorrow.