



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

**Maritime C2 Strategy
An Innovative Approach to System Transformation**

**22 June 2010
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PEO C4I





Maritime C2 Strategy Agenda



- PMW 150 Introduction
- Current Maritime C2 Situation
- Strategy Objectives
 - Mission Management Capabilities
 - Net-Centric Operations Transition
 - Software Acquisition Process Changes
- Summary



PMW 150 Organization



Civilian – 15
Military – 13

Program Manager
CAPT Steve McPhillips

Deputy Program Manager
CAPT D.A. LeGoff

Programmatic

Maritime C2
PAPM
CDR PAT MACK

GCCS-M
GCCS-J

Support C2
PAPM
KEVIN ALLEN

NTCSS
(with
OOMA)

Tactical C2
PAPM
PAUL BOBROWICH

C2P
ADSI
LINK-16
LINK-11

NILE
PAPM
MANUEL GOMEZ

NATO
Improved
Link
Eleven

Defensive C2
PAPM
SCOTT WHITE

JWARN
JEM

Functional

Acquisition
Manager
DAVE NORD

Business Financial
Manager (4)
DR. MIKE NAKADA

Technical
Director
PAT GARCIA

Director of
Operations
CINDY TAYLOR

APM (E)
3 EMBEDDED

APM (C)
1 EMBEDDED

APM (L)
4 EMBEDDED

Transforming operational needs into effective and affordable Command and Control capabilities for Navy, Marine Corps, Joint and Coalition warfighters.
The pre-eminent authority and provider of choice for Command and Control capability. 3



PMW 150 Program Portfolio



Active ACAT Programs

Maritime C2

- Global Command and Control System-Maritime (GCCS-M)
 - ACAT IAC

Tactical C2

- Link-16 Network
 - ACAT II
- Command and Control Processor (NGC2P)
 - ACAT II

Support C2

- Naval Tactical Command Support System (NTCSS)
 - ACAT IAC

Defensive C2

- Joint Warning and Reporting Network (JWARN)
 - ACAT III
- Joint Effects Model (JEM)
 - ACAT III

Other Programs and Projects

Maritime C2

- GCCS-J – DISA ACAT IAM
- Maritime Tactical Command & Control (MTC2)
 - FY12 proposed new start
- Global-Theater Security Cooperation Management Information System (G-TSCMIS)
 - Pending assignment to PEO C4I

- Joint Command and Control Portfolio

Tactical C2

- Air Defense System Integrator (ADSI)
- Link 22
 - POM 12 issue

Support C2

- Maintenance Figure of Merit (MFOM)
 - Transition from USFF N43 01OCT10
- Bar Code Supply Logistics Maintenance Automated Information System (BCS LMAIS)
 - Assume responsibility 01OCT10

Technical Director

- Command and Control Rapid Prototype Continuum (C2RPC)
 - ONR funded initiative

NATO Improved Link Eleven (NILE)



Navy GCCS-M Force Structure

As of 19 MAR 2010



CONUS Sites (20 qty)

- USJFCOM
- COMUSNAVSO / C4F
- COMNAVSPECWARGRU2
- COMNAVSPECWARGRU4
- COMEXSTRIKGRU2
- COMSOCJFCOM
- COMNAVFACENCOM
- NOLSC
- CBC
- COMEXSTRIKGRU3
- NFELC
- COMFIRSTNCD
- CNO
- Alt Navy CMD Center
- USFF
- COMTHIRDFLT
- COMSECONDFLT
- COMNAVSPECWARCOM-West
- COMSUBFOR
- COMSUBRON-11

OCONUS Sites (14 qty)

- USFJ
- USPACOM
- COMNAVFORJAPAN
- COMEXSTRIKGRU7
- CTF-72
- CTF-73 / COMLOG WESTPAC
- PA-RSC
- COMPACFLT
- COMUSNAVCENT/C5F
- COMUSNAVEUR / COMSUBGRU 8
- CTF74 / COMSUBGRU 7
- COMSUBPAC
- CTF-34
- COMSUBGRU 8 Rep

Training Sites (8 qty)

- SWOSCOLCOM
- CSCS U Dam Neck
- CID LS Dam Neck
- NMITC
- FLEASWTRACEN
- CID LS San Diego
- FITCPAC
- NSAWC Fallon

68 Submarines

50 SSNs

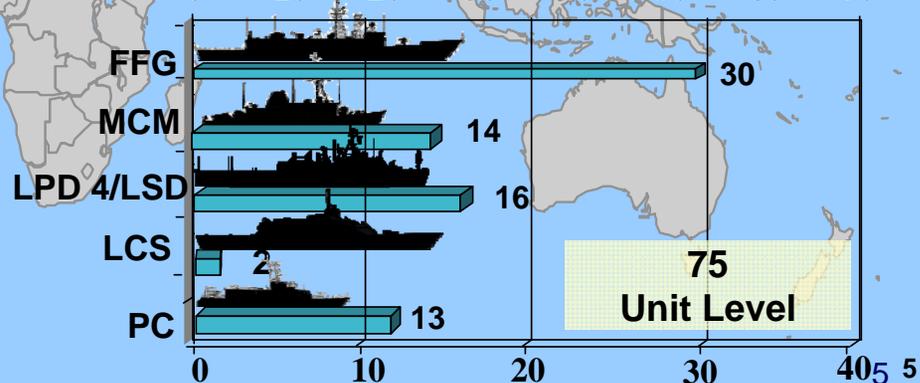
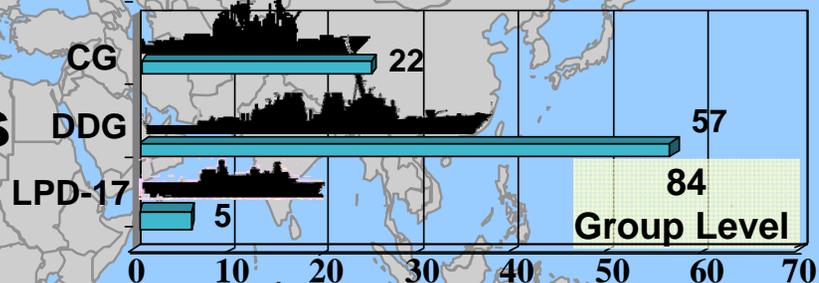
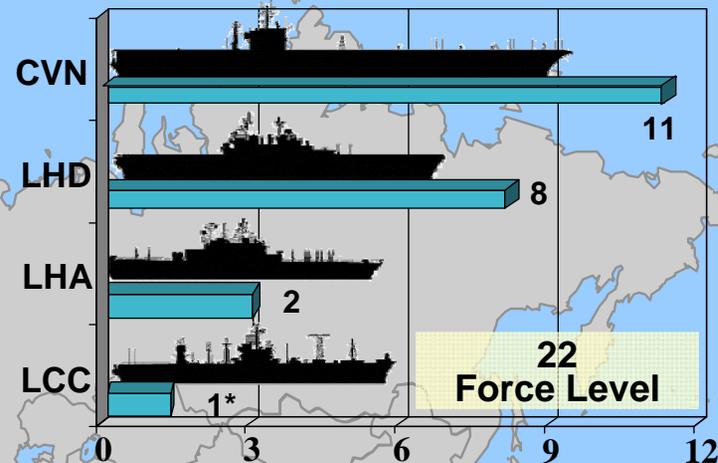
14 SSBNs

4 SSGNs

10 Allied/Coalition Partners



- GCCS-M systems installed; does not account for SCN Hulls
- Sites in purple have Navy installed GCCS-J systems
- Sites in blue have Navy installed GCCS-M/GCCS-J systems
- Sites in black have Navy installed GCCS-M systems
- * LCC19 has GCCS-J 4.1.0.4 GENSER, GCCS-M 4.0.1.2 SCIC

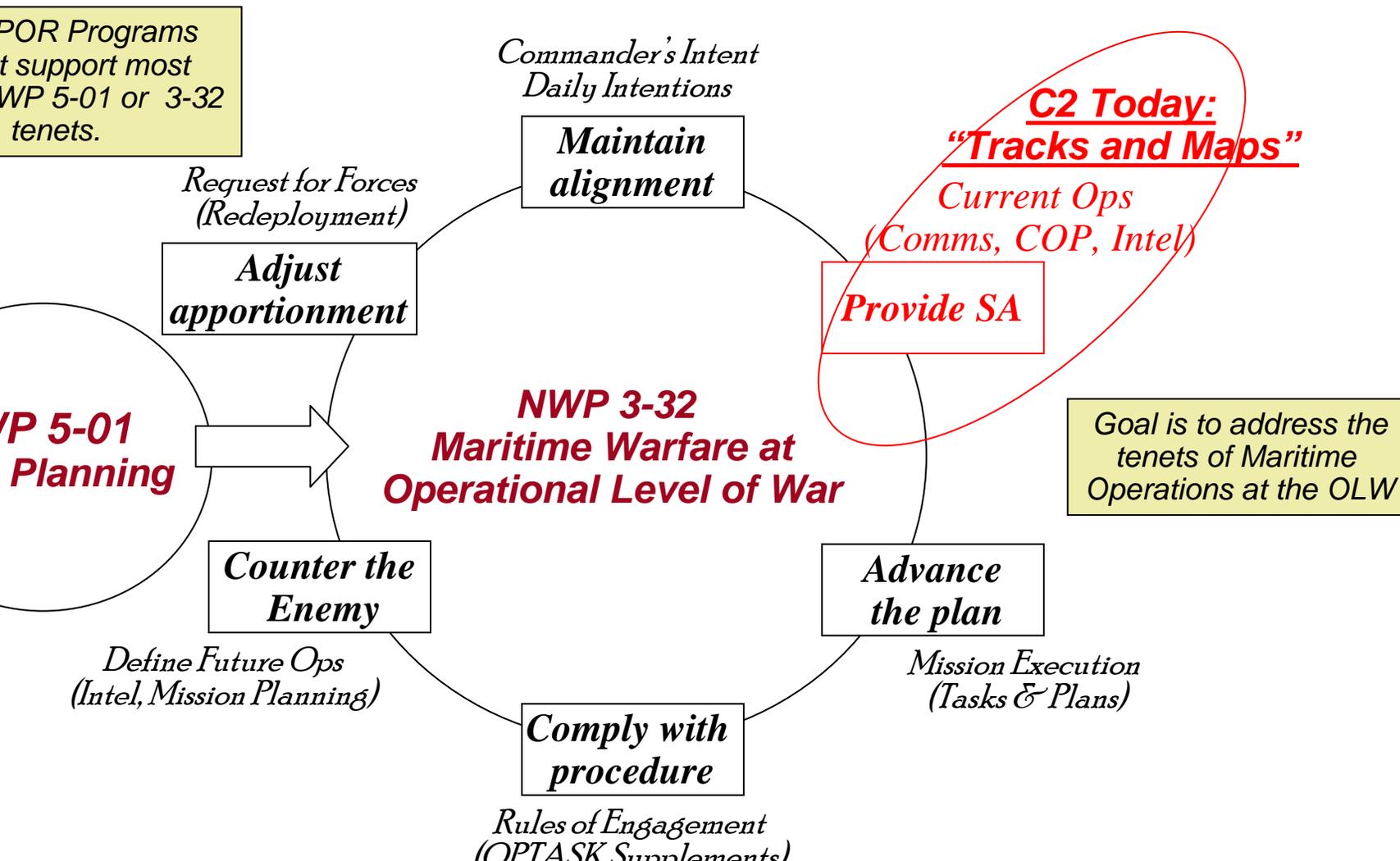


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Maritime C2 Situation: Where are we now?



Synchronizing the World of Maritime C2



C2 Objective

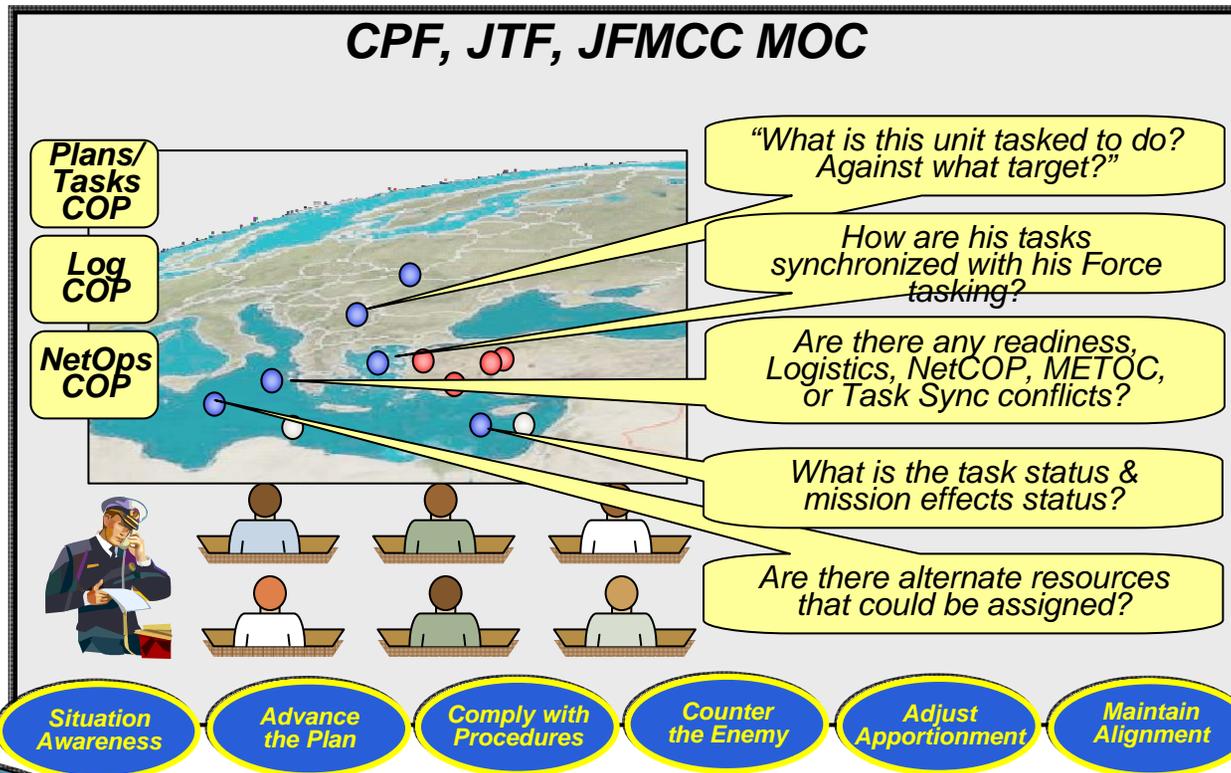
Force a shared situation
 that includes not
 only force/unit locations but
 also unit tasks, task status,
 and progress toward
 achieving overall
 objectives.

or, in other words,
 move from ...

"Who, & Where?"

...to...

**What, Where, When,
 Why, & How?"**



Commander's Control Measures



Maritime C2 Strategy Objectives



Provide Expanded Mission Management Capabilities

- Add “What”, “When”, “Why”, and “How” to currently provided “Who” and “Where” information
- Needed to fulfill NWP 3-32 and NWP 50-1* requirements

Transition from Stove-Pipe Solutions to Net-Centric Operations

- Implement “component portfolio” approach to C2 system development
- Use rapid prototyping and technology insertion to speed change and engage warfighter

Establish Government Management and Governance of IT Software Acquisition Processes

- Implement agile IT acquisition and Test & Evaluation (T&E) processes “modeled on successful commercial practices for the rapid acquisition and continuous upgrades and improvement of IT systems.” (National Defense Acquisition Act of FY2010)
- Execute agile performance-based contracting strategy by reducing vendor’s “*Institutional Knowledge Lock*”
- Synchronize Government testing with private-industry development – testing early and often

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Pillars of Future C2 system



Intelligence & CM

- GCCS- I³
- Analysis products & IPOE
- Red Force Service
 - Units/Sites & Capabilities
 - Enemy COAs
 - NAI Characteristics
 - Targets
- Info Req's
- Collection Req's

ISR Data Fusion

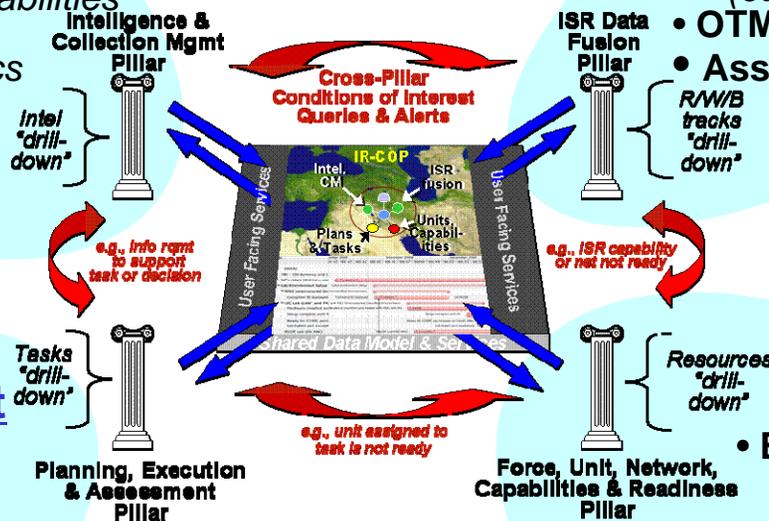
- Conditions of Interest Alerts
 - Area entry
 - Task execution deviations
 - (others TBD)
- OTM (new track mgr)
- Associate GCCS- I³ info w/ OTM reporting

Planning, Execution, Assessment

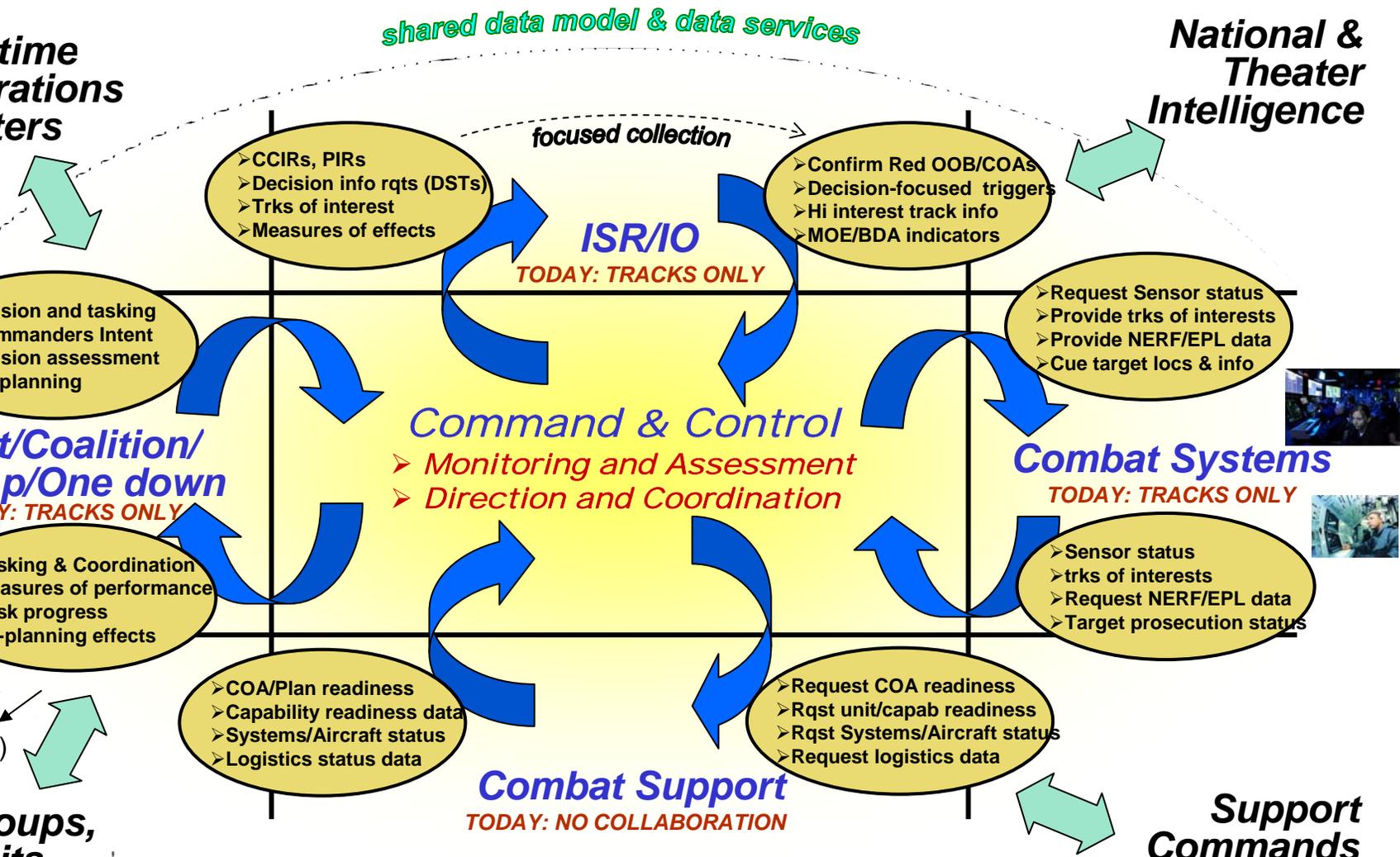
- Plans/Tasks Data Service
 - Unit tasking & task status
 - Authoritative plans data
- Planning
 - Mission management
 - Decision Points, LOO
 - CMD relationships, COA sketch
- Execution
 - Synchronization

Capabilities & Readiness

- Blue Force Service
 - Units data (Admin, Op)
 - Platf's/Systems Capab
 - Networks Config
- Readiness COP
 - Platforms/Systems Status
 - NetOps Status
- Capabilities
- Conditions of Interest Heuristics & Alerts
 - Plan/Task readiness



Establish C2 Relationships and Strategy for Deployment of Capabilities



Unifying Maritime Missions into a Navy Mission Planner View



Maritime Missions

Ballistic Missile Defense
 Maritime Interdiction Operations (MIO)

- Law Enforcement Operations
- Visit, Board, Search and Seizure
- Blockade

UnderSea Warfare (USW)

Anti-Surface Warfare (ASUW)

- Anti-Submarine Warfare (ASW)

Mine Warfare (MIW)

- Mine Hunting
- Mine Clearance
- Offensive Mining

Amphibious Operations

Strike Operations Cruise missile

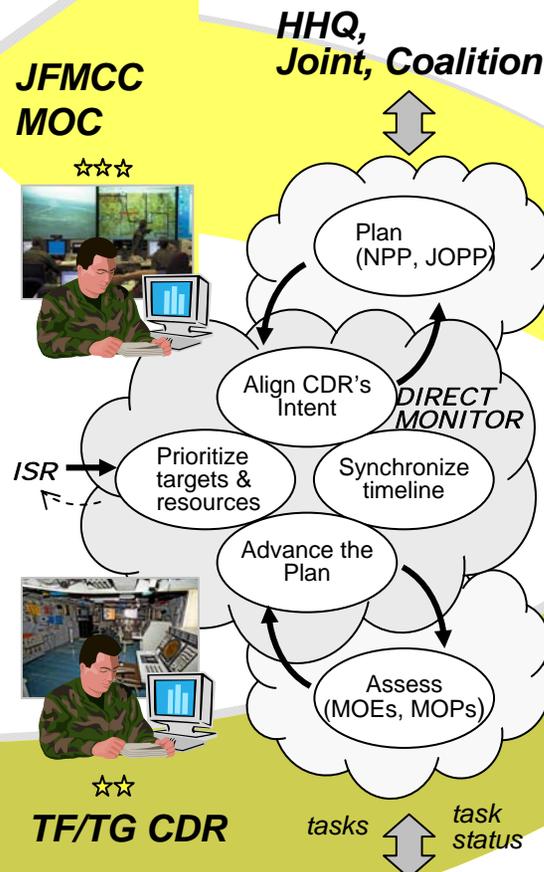
- Manned Aircraft
- Naval Fires

Humanitarian Assistance / Disaster Relief (HA/DR)

- Non-combatant Evacuation Operations (NEO)

Protection of Shipping at Sea / Freedom of Navigation

Maritime Planning & OLW Execution



Maritime C2 Strategy Agenda

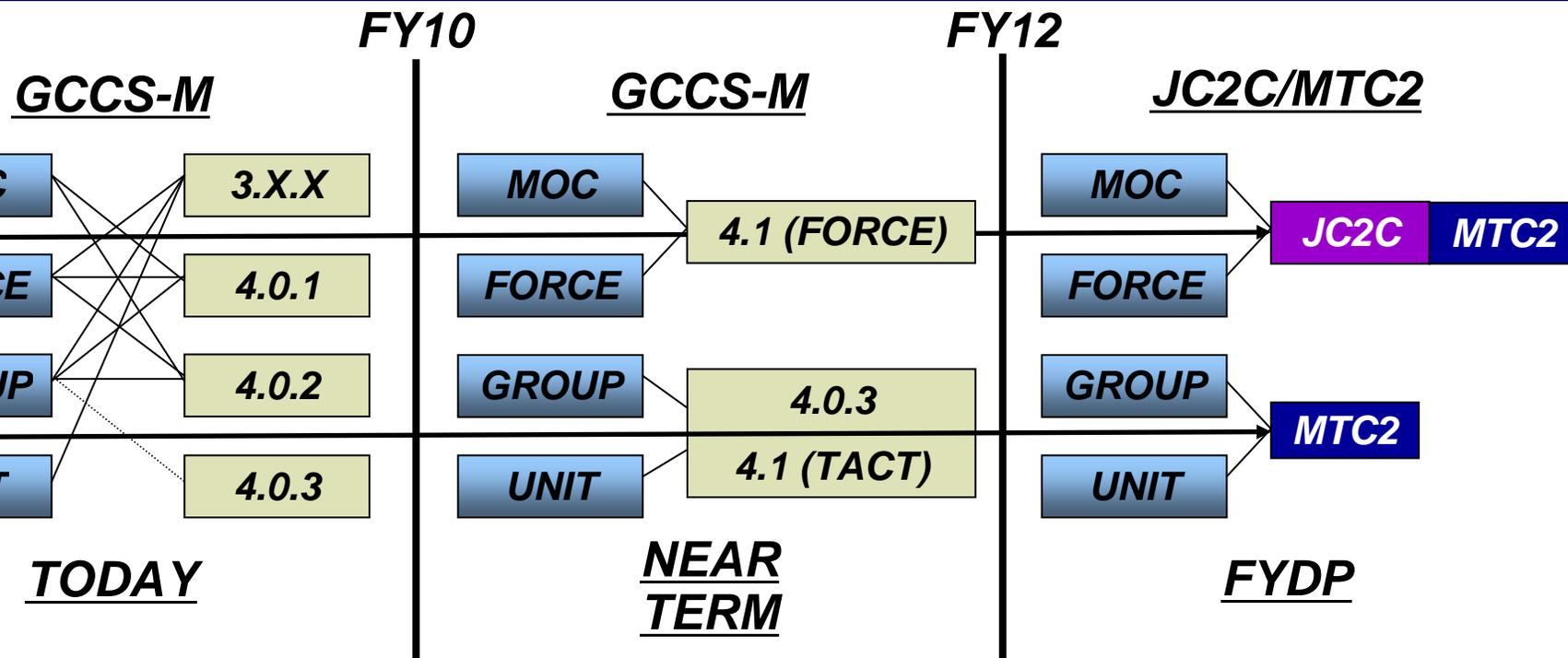


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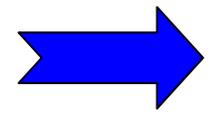


Maritime C2

Program of Record Migration



GCCS-M provides a robust Operational Awareness of **Who** and **Where** across the Wide Area Network



MTC2 will address **Who, What, When, Where, Why, How** in Mission Management Planning, Assessment, and Monitoring tools

New Start Maritime Tactical C2 (MTC2) Program will deliver required new capabilities which will not be addressed in any Joint C2 Program



C2 Rapid Prototyping Continuum (C2RPC) Origins

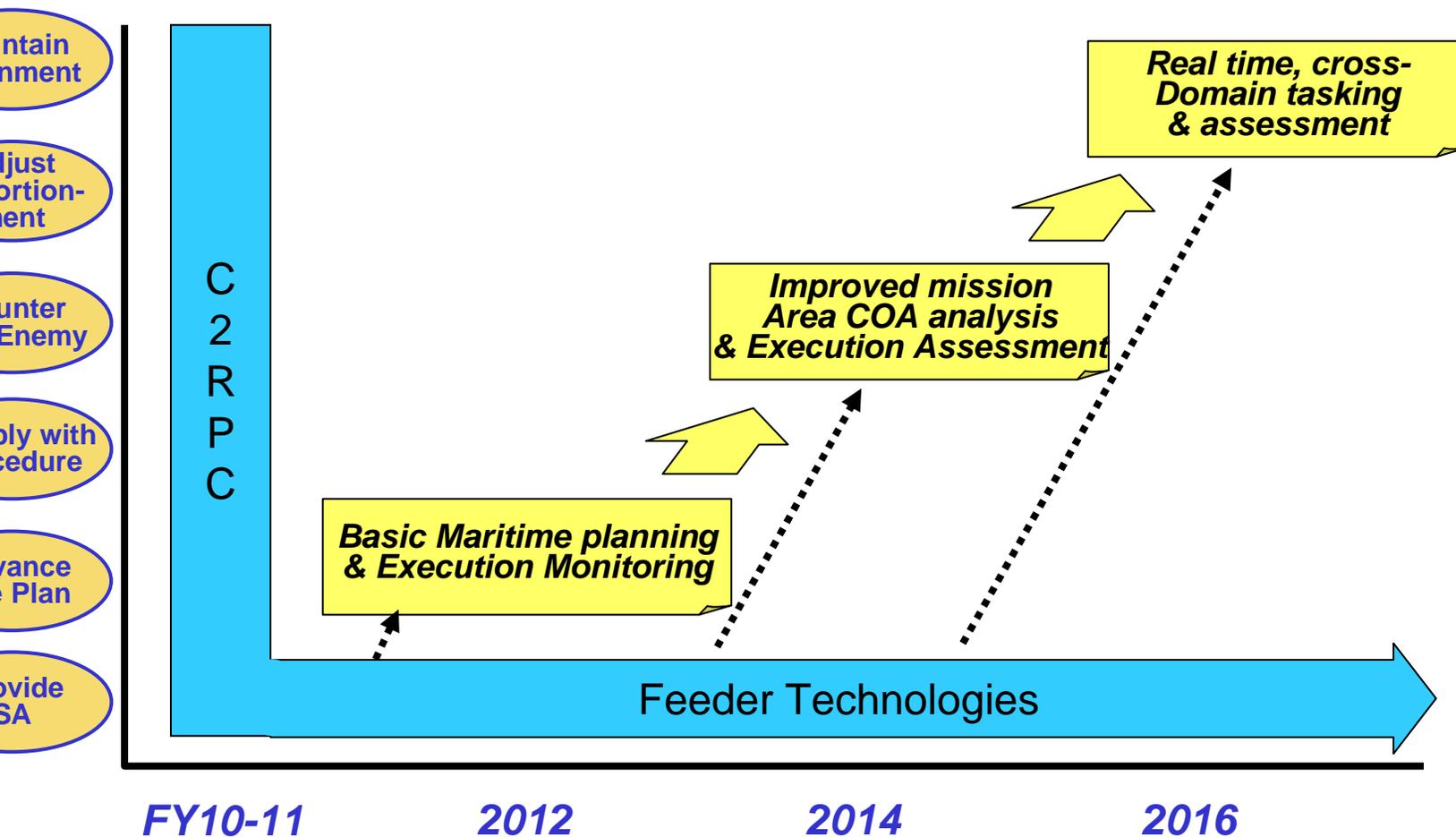


Coalition of PEO C4I, Office of Naval Research, and COMPACFLT

- Accelerate development of Operational Level of Warfare (OLW) C2/ISR mission applications
 - COMPACFLT: “Use COMPACFLT as a “Petri Dish”
 - Advance the state of the art of C2 (and CS)
 - Reduce uncertainty and increase OPTEMPO
 - Ensure systems meet fleet prioritized requirements
- Develop a MOC prototype that feeds back into enduring, supported programs of record

PEO-C4I Approach

(Three 2-year spirals of incremental Planning, Execution, & Assessment Capabilities)



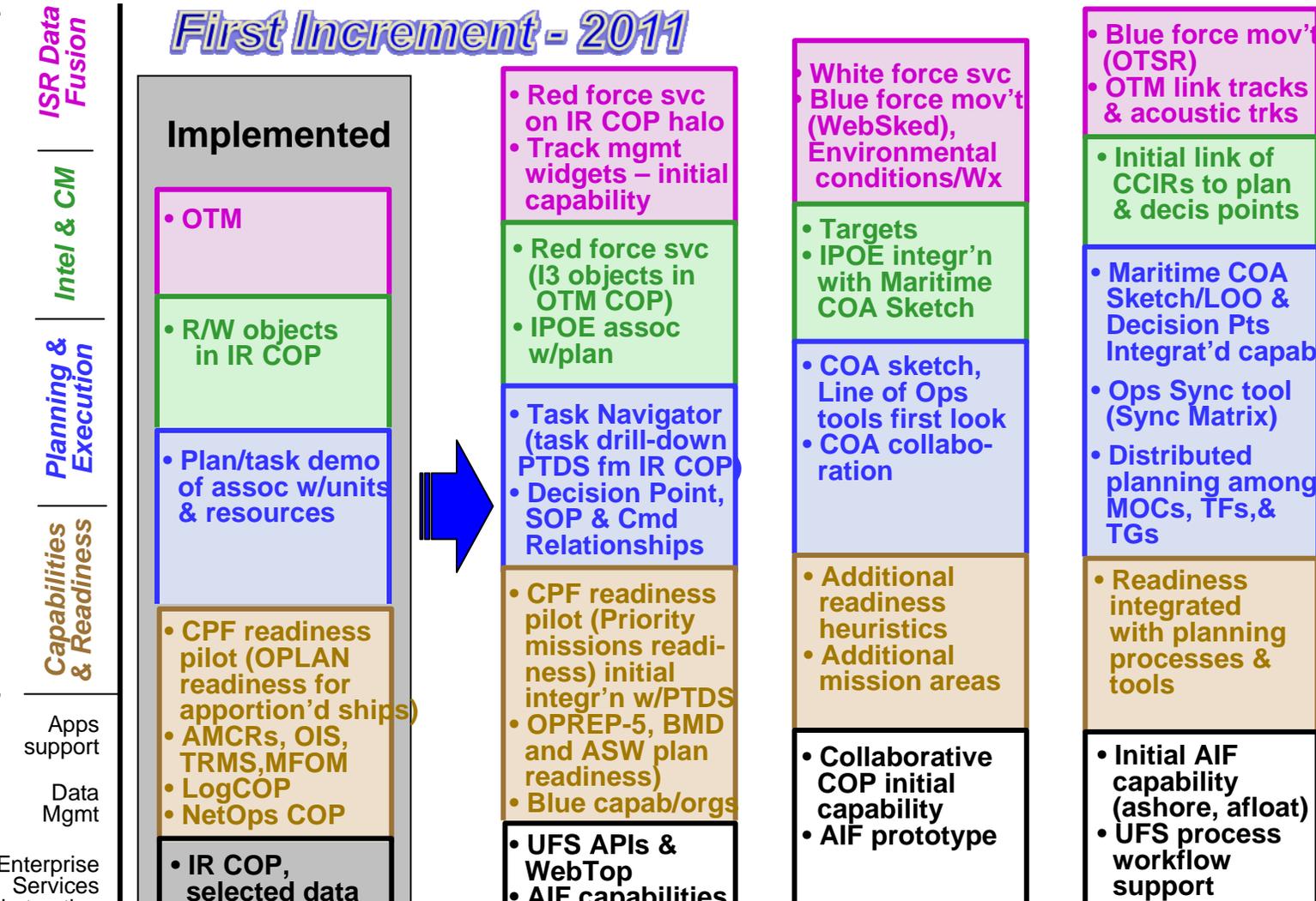
C2RPC New Capabilities



All C2RPC Increments

ISR Data Fusion				
Intel & CM				
Planning & Execution				
Capabilities & Readiness				
Apps support				
Data Mgmt				
Enterprise Services				
	<ul style="list-style-type: none"> OTM R/W/B Data Services R/W objects in COP IPOE assoc w/plan Plan/task assoc w/units & resources Shore MOCs COA & decision support tools CPF readiness pilot hardened (plan heuristics & data feeds) 	<ul style="list-style-type: none"> ISR mgt to plan rqts CM/CCIRs link to decision points Targeting CCIR tracking vs decisions IMA MOC & below (TG) distributed planning/exec'n (DIL environmt) Core plan tool Addnl' mission area heuristics & threat sit'ns Org (GFM) C&M linked to planning (& data fill) 	<ul style="list-style-type: none"> CS track/plans /readiness/I&W/ status data exch TBD w/PMW120 Mission & asset status/avail Integrated mission mgmt w/distributed legacy systems Tactical assets readiness in decision making TG planning tools 	<ul style="list-style-type: none"> TBD TBD w/PMW120 Joint planning/APEX (complete legacy migration) Ship level tactical plan execution monitoring & feedback Task direction via IP TADIL Continuous readiness assessment for real time decisions
	<ul style="list-style-type: none"> Study & Initial shore capability (AIF study) IR COP, UFS, selected data 	<ul style="list-style-type: none"> Initial shore/ship capability (TBD by study) Collaborative 	<ul style="list-style-type: none"> Fully functional Distrib data svc CS-interface to enable mission mgmt 	<ul style="list-style-type: none"> Full-up AIF (apps support & ES abstract'n) ROW C2 v2

C2RPC 2011 Capabilities





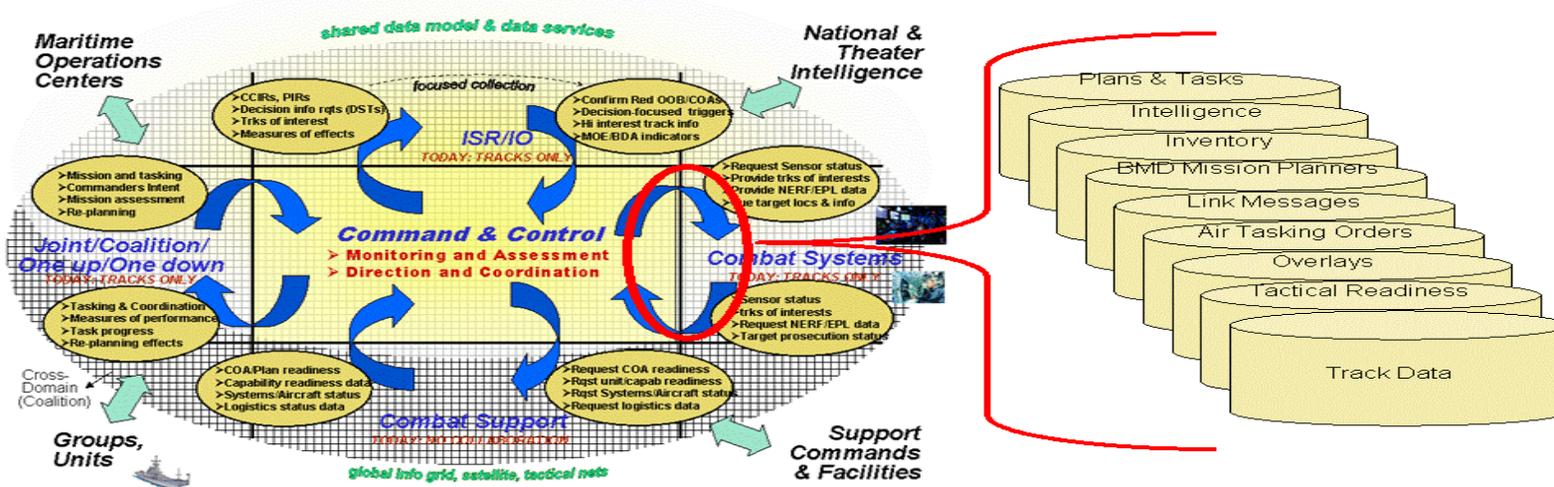
Joint Combat Systems (CS)/C2 Limited Technology Experiment (LTE)



Office of Naval Research effort, with PEO C4I and PEO S cooperation to exchange of real-time and near-real-time tracks and other data to and from CS and C2 systems

Initial experimentation phase will focus on CS publishing ASW tracks, tactical readiness and video – September '10

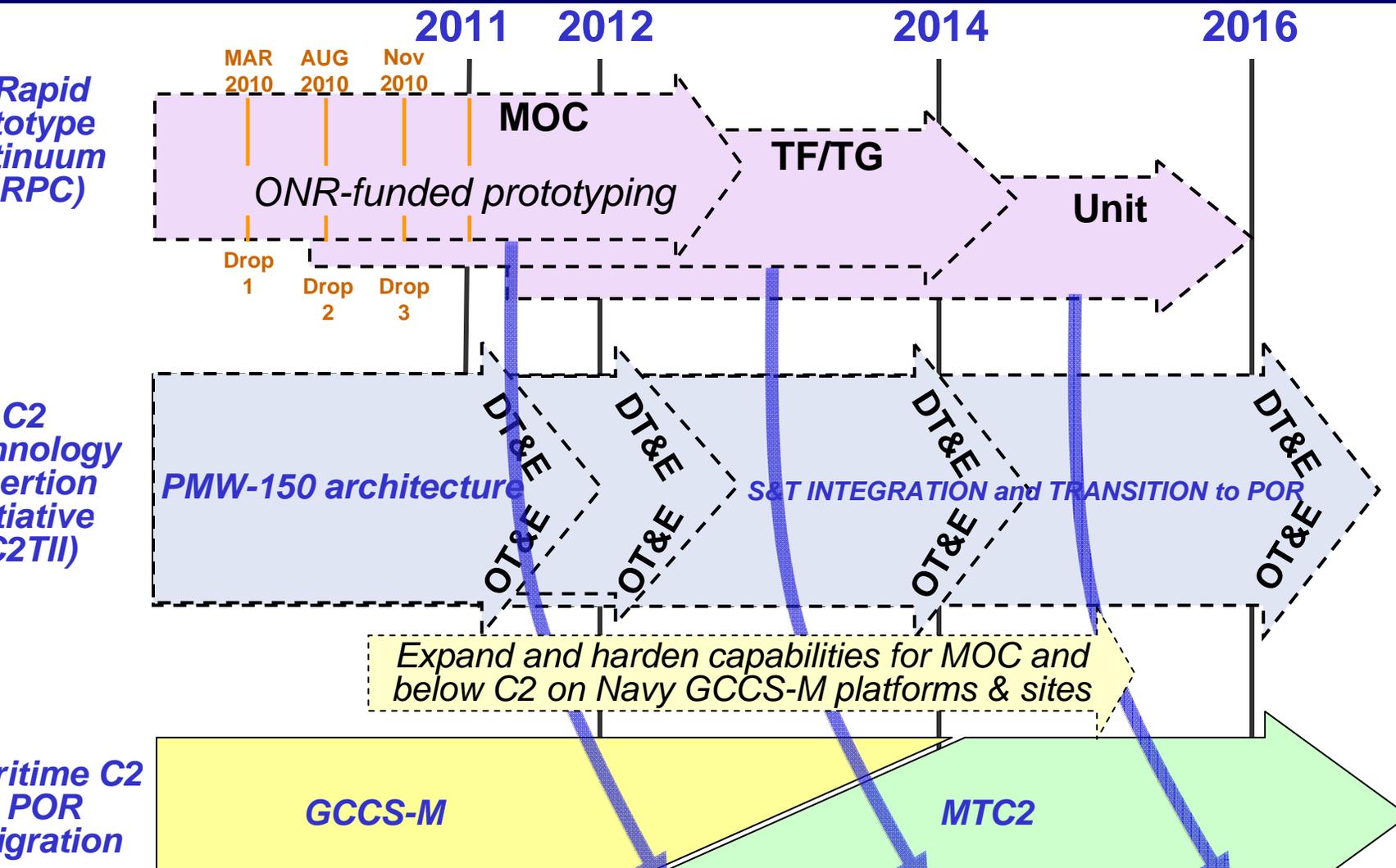
Next experimentation event scheduled for June '11





Future C2 Program Evolution

Venues of Prototyping, Experimentation, & Hardening



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Maritime C2 Acquisition Issues



Poor Government – Industry Relationship

- Insufficient non-functional Requirements Definition and Product Design
- Inadequate quantitative performance measures
- Poor data rights management

Institutional Knowledge Lock

- Contractor monopoly on 'proprietary source code' level knowledge created 'sole-source contracting environment due to unacceptable program risk associated with vendor change
- Reliance on private-industry for s/w architecture, design, code and integration resulted (over time) in loss of government in-house s/w expertise
- Government left with limited ability to set development cost, schedule, or performance targets or to employ risk mitigation strategies when the contractor does not meet program needs

High Sustainment Cost

- Above issues resulted in release of poor quality software to operational forces



The RITE Vision



Integration and Test Environment (RITE)

Processes S/W Integration issues facilitates development and production of Navy systems:

Integration - software development

Integration - the current

Integration - the final delivery

RITE PILLARS



Contracts

- Govt responsible for non-functional requirements definition
- “Govt Purpose Rights” or “unlimited Rights” for s/w (include source code)
- Drives CDRLs/DIDs/CPARS deliverables
- Aligns Developers and Testers



Processes

- Puts increased effort into early stages of PLC
- Integrates “early” and “frequent” testing into Development stage
- Requires regular engineering drops of software
- Institutionalize source code analysis
- Automates and focuses testing
- Standardizes tools and test cases for Developers and Testers



Infrastructure

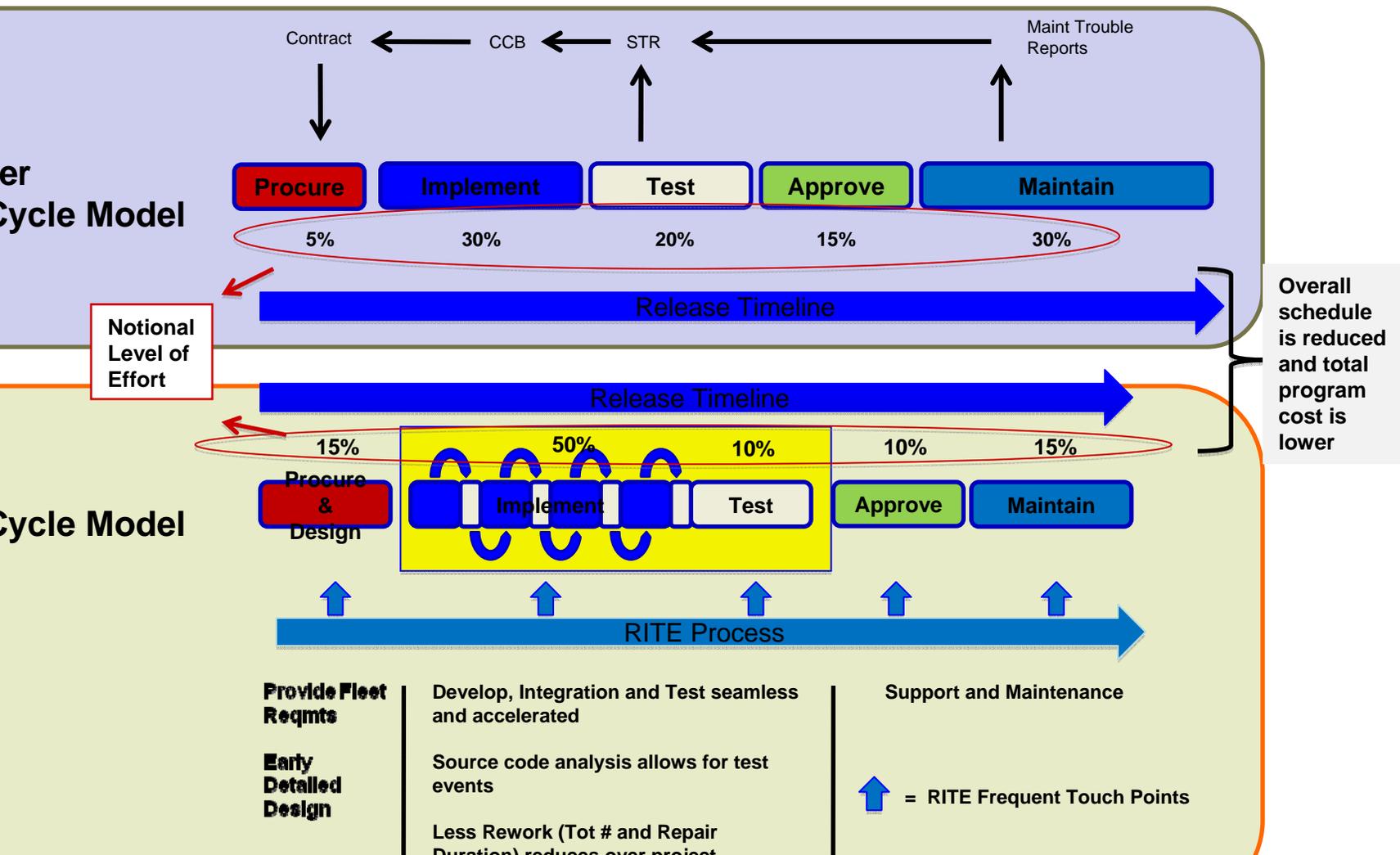
- Centralized Repository—enhances project communication and collaboration
- Create Framework for:
 - Software Distribution/Apps Store
 - Documentation Library
 - Development
 - Software Testing tools and data
- Centralized software Configuration Management



Organization

- Establishes Governance Plan based upon community process
- Rebuilds Govt in-house S/W SME's to LEAD and WORK “as peers” with Private Industry
- Establishes S/W career pipeline (Software focused vs. operationally focused)

Life Cycle Comparison



Provide Fleet Reqmts

Early Detailed Design

Develop, Integration and Test seamless and accelerated

Source code analysis allows for test events

Less Rework (Tot # and Repair Duration) reduces over project

Support and Maintenance

↑ = RITE Frequent Touch Points



In Summary.....



Three Maritime C2 Objectives

- Expand Mission Management Capabilities by providing access to Who, What, Where, When, Why, and How information
- Transition to a Open Source/Net-Centric Architecture (component portfolio approach) using Rapid Prototyping (C2RPC) and S&T insertion (LTE/C2TII) to augment C2 Program of Record (POR) migration
- Create agile software acquisition processes through implementation of RITE initiative

The Achilles' Heel to effective C2 is *data exposure!*

- We don't necessarily own and/or control services and/or data sources (IWS, OPNAV N4) – NOR - do we WANT, or NEED, to
- We need to support Navy and Joint processes and standards to



We get it.

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