



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

PMW 160 Tactical Networks Overview

**28 April 2011
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***Information Dominance
Anytime, Anywhere...***





Agenda



- PMW160 Tactical Networks Overview
- PEO C4I/PMW160 S&T Process
- Examples of S&T gaps
 - *“Tactical Networks Interests”*
- Teaming with the Office of Naval Research
- Opportunities for addressing gaps



PMW 160 Overview



Vision: Secure, reliable information networks to enable information dominance anytime, anywhere

Mission: Deliver and support innovative, agile and secure networks and IT services to enable warfighter mission success

- Automated Digital Networking System (ADNS) – Wide Area Network (WAN)
- Consolidated Afloat Networks Enterprise Services (CANES) – Local Area Network (LAN)

The Navy's LAN and WAN Program Office



CANES Overview

SCI Networks

CENTRIXS-M

ISNS

VIXS

SubLAN

CANES

ADNS

Why CANES?

- **CANES is an IT execution strategy:**
 - Existing Legacy networks are unaffordable and operationally ineffective
 - Align multiple similar programs, capabilities, resources and requirements into a single program
 - Consolidates and focuses overall acquisition, engineering, logistics and security efforts
 - Reduces installations and sustainment costs across networks
 - Adds efficiency value to manpower challenges
 - Reduces overarching network maintenance
- **CANES directly addresses critical IA / CND requirement - provides more secure and reliable afloat network infrastructure**

Capabilities

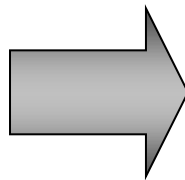
- **Systems Management**
 - Performance, Availability, & Service Level Mgmt
 - Fault, Problem, Incident, & Service Desk Mgmt
 - Configuration, Change, & Release Mgmt
 - Security Mgmt, IA, CND
 - Capacity Mgmt
- **Data Services**
 - Network Support
 - Information Management
 - Core Infrastructure Services
 - Network Access (IPv4 / IPv6 Capable)
 - Information Delivery
- **Voice Services**
 - IP Telephony
 - Mobile and Stationary
 - Secure and Un-Secure
- **Video Services**
 - Video Teleconferencing
 - Video / Graphics Distribution



Enterprise Early Adopters (ISNS CCE)



Current C4I



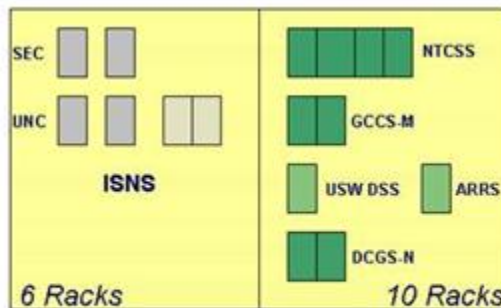
Future C4I Apps



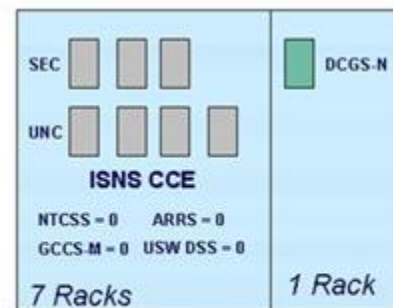
+ CANES



CCE / Hosting risk mitigation on USS ABRAHAM LINCOLN (\$7.1M reduction in total installation costs)



ISNS Without CCE = 16 Racks



ISNS With CCE & Virtualization = 8 Racks

CCE / Hosting enabled 6 rack reduction reducing SWAP



AI Common Entry Point (CEP)

Application Integration (AI) Common Entry Point (CEP)

Application Integration (AI) Common Entry Point (CEP) | How to Use AI CEP | Service Request Status Board | Management | My SRF Workspace | Reports | Site Actions

PEO C4I

How to use AI CEP | Service Request Status Board | Application Integration Management | Quarterly Application Integration Working Group | Submit Service Request Form

Initial Step - Submit Service Request Form

View Service Catalog

Link to AI CEP

Welcome to Application Integration (AI) Common Entry Point (CEP)

The Application Integration CEP's goal is to facilitate the Application Integration Assessment process within the naval community. The AI CEP site is designed to take an application user through a six step process which will assess application integration onto PEO C4I Afloat Tactical Networks.

The concept for the new application integration approach is to integrate applications and systems into a common IT infrastructure offered through a Computing Environment (CCE) and Service Oriented Architecture (SOA) services utilizing Afloat Core Services (ACS). Applications and systems can now be hosted and redundant hardware/software eliminated. PEO C4I provides the CCE and ACS as well as other operational and professional services. This conceptual change allows application Program Offices to concentrate on core competencies while allowing the Navy Enterprise to realize reductions in total C4I costs and an improved overall security posture.

Site Tool List
[Service Request Form](#)
[Service Catalog](#)
[Application Integration Schedule and Calendar](#)

Site Resources
 AI 101 Brief
 CANES Initial Implementation Msg
 Transition to COMPOSE 4.0 (Windows 7 and Server 2008) Environment Initiatives
 Application Integration CONOPS
 How to use AI CEP
 Application Integration Process Flows

Application Integration Process Flow

```

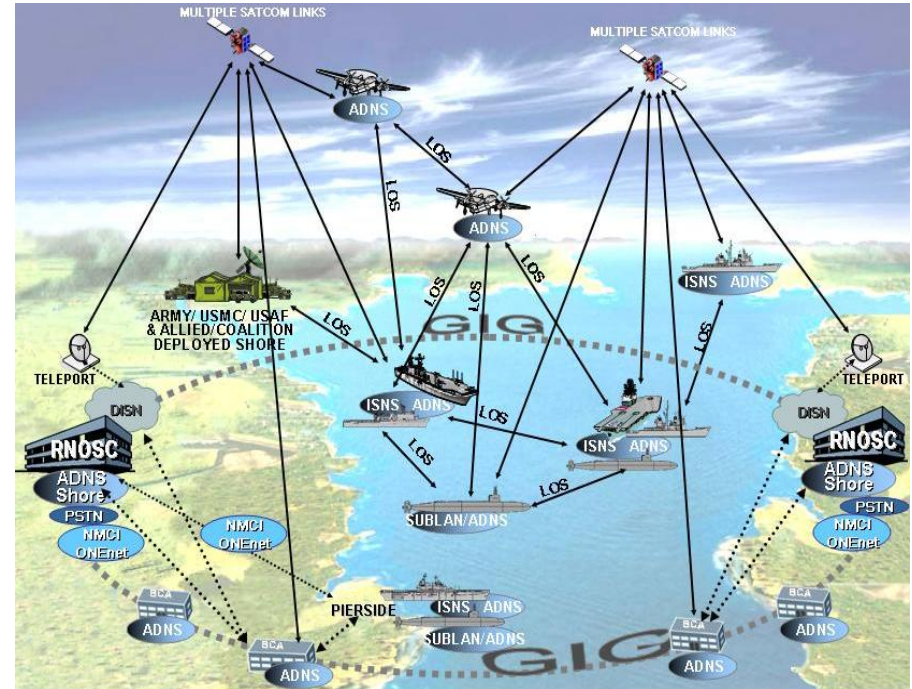
  graph LR
    A[Application Review] --> B[Application Validation]
    B --> C[Solution Determination]
  
```

<https://nserc.navy.mil/spawar/hq/chengws/AICEP/default.aspx>

Automated Digital Network Systems (ADNS)

DESCRIPTION

- ADNS is the Wide Area Network (WAN) for the fleet
- ADNS supports multiple security enclaves in a common architecture
- ADNS utilizes multiple simultaneous radio (RF) links
 - Provides for both reach back and reach forward
 - LOS links interconnect tactical users while SATCOM reaches back to the GIG
- All elements of Wide Area connectivity are provided by ADNS
 - Coordination is essential with other programs
 - radio
 - terrestrial links
 - LAN
 - physical platforms



NEXT STEP

With a wider range of operational threats against our networks, it will require an agile and responsive multi-tiered architecture.



ADNS Evolutionary Development



	Increment I 1997-2005	Increment II	Increment IIa/IIb 2004- 2010	Increment III 2009- 2024
RF links	IP over single RF Link	IP over dual RF Links		IP over Several (no limit) RF Links
Throughput	Bandwidth limited to 1.5Mbps	6Mbps Aggregate (2Mbps/channel)	16Mbps Aggregate (8Mbps/channel)	25/50Mbps Aggregate
Converged IP	ADNS feeds into Static TDM (Timeplex) Network		Eliminates need for TDM (Timeplex). Voice, Video, and Data transported through ADNS (Converged IP realized). Increases Dynamic Bandwidth IP Management	
QoS	Baseline Routing, Encryption, & Network Management Based System with Fixed Bandwidth	Application Prioritization, Minimum Bandwidth Guarantees, and Static Traffic Distribution		Enhanced QoS through Optimized Edge Routing (OER), Granular Application Prioritization at Enclave Levels, Minimum Bandwidth Guarantees, and Dynamic Traffic Distribution across multiple RF links
Reliability/Efficiencies	Supports Email, Web Browsing, File Transfer, & Multiple Security Level Enclaves	Automatic Failover and Restoral of RF links	Compression, High Speed Pier (IIa only), LM 5.0 (Linux, IIb only), Automatic Failover and Restoral of RF links	Acceleration, NETOPS (Linux), Compression, High Speed Pier, NOC Fail-Over, IPv4/IPv6 Dual Stack, Automatic Failover and Restoral of RF links
Transport	Secret core			Ciphertext Core





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PEO Tasking Memo – For 2012 Gaps



- **Data call requirements**
 - **S&T Focus Area** (i.e.: usually associated with the approved S&T focus areas – pillars)
 - **Capability** (i.e. synopsis of each capability required within the focus area)
 - **Duration** (i.e. synopsis of each capability required within the focus area)
 - **Timeframe** (i.e. expected transition into POR : Near (2 yrs) – Mid (2-6 yrs)- Far (6-10 yrs))
 - **Estimated LOE** (i.e. If possible estimate of the Level of Effort – descriptive)
 - **Type of effort** (Integration Demonstration, Acquisition Enabler, Transition effort, Leap Ahead, Discover & Invention)
 - **Capability Maturity Level** (i.e. TRL desired for each capability)
 - **PORs** (i.e. PORs that could use capability to mature their POR - TARGETED TRANSITION)
 - **Imperatives** (i.e. stated requirements, warfighter need statements, future strategy, etc..)



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Definition

- **Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction**
 - “The NIST Definition of Cloud Computing”
Peter Mell and Tim Grance
- **Cloud computing is style of computing where scalable and elastic IT-related capabilities are provided “as-a-service” to customers using internet technologies**
 - “The Gartner Definition of Cloud Computing”



Perspective



To End Users:

- **Cloud computing is any capability delivered over the network**
 - If it is not local computing, it is from the cloud
 - To these users, all net-centric computing is cloud computing
 - The network is the computer . . .

To Technologists and Enterprise Architects:

- **Cloud computing requires new ways of providing capability on-demand by the use of virtualized resources**
 - It involves pools of storage, network, processing and other computational resources that can be efficiently allocated on demand
 - It also implies far more agility in support of operational missions (rapid provisioning, elasticity, etc)

Cloud Layers

Software Cloud (SaaS)



- The SaaS cloud provider provides on-line applications
- The SaaS consumer uses the on-line applications using a thin-client device (typically a browser)

Platform Cloud (PaaS)



- The PaaS cloud provider provides on-line application development and hosting platforms
- The PaaS consumer uses the online application platform to host and manage their applications.

Infrastructure Cloud (IaaS)



- The IaaS cloud provider provides on-line computing resources (e.g., processing or storage)
- The IaaS consumer requests and uses IaaS computing resources
- The IaaS consumer provides their own software

Network Cloud



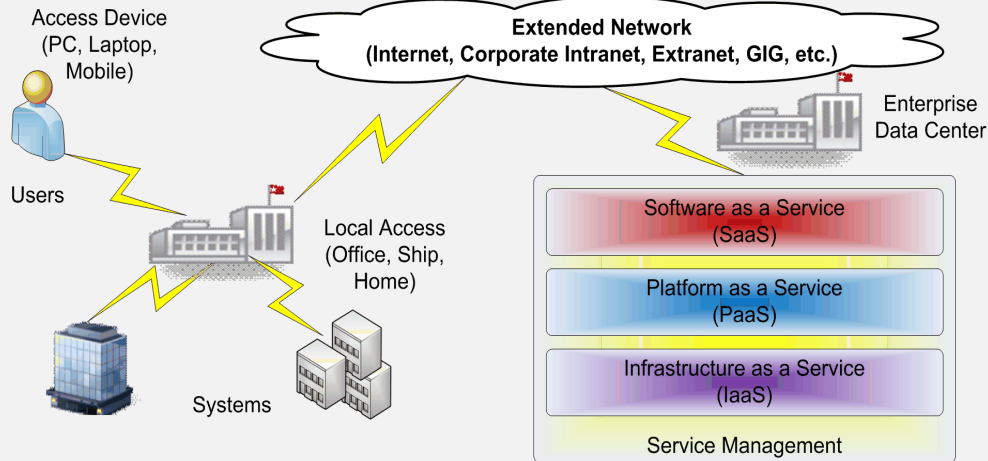
- The network provider provides the routing and address services required to transmit data
- The network consumer uses the network cloud to transmit data across the network



Cloud Computing Challenge for Tactical Users



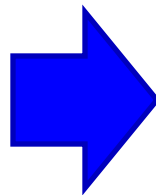
Enterprise Model for Cloud Computing



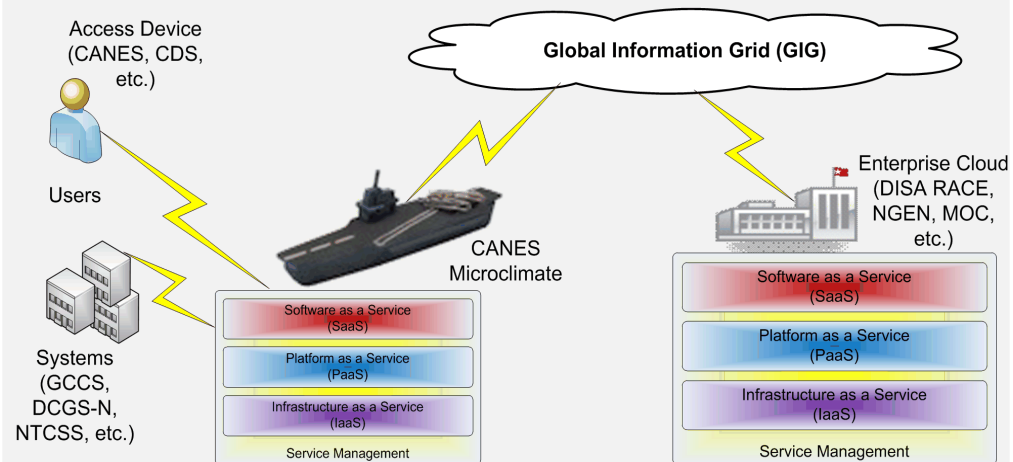
Enterprise Cloud Computing

NOTE: Generally requires significant reliable bandwidth to enterprise assets

Challenge: Enterprise model breaks down in Disadvantaged, Intermittent, Low Bandwidth (DIL) scenarios



CANES Microclimate: A Cloud at the Tactical Edge



Local CANES Cloud Operates Independently during low bandwidth and participates with Enterprise Cloud when available



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ONR Future Naval Capability (FNC) Program



The (FNC) program is structured to align with the pillars of the Chief of Naval Operation's and the Commandant of the Marine Corps' vision for the future—Naval Power 21—and to focus on providing Enabling Capabilities (ECs) to close warfighting gaps.

- Designed to manage designated portions of the Navy's 6.2 and 6.3 funding and provides technology solutions to stated OPNAV requirements by bundling discrete but interrelated S&T products that deliver a distinctly measurable improvement within a five-year time frame.
- Enabling capabilities (ECs) are approved by the Technology Oversight Group (TOG) consisting of three-star Navy and Marine Corps Board of Directors. This approval is based on the EC contribution to closing a warfighting capability gap, rather than on individual products.

The overall goal is to develop and demonstrate technology that will transition to an acquisition program sponsor or directly to the Fleet/Force. This focus on technology transition includes spiral transitions as technology components reach maturity.



Chief of Naval Operations Pillars

- **Sea Shield:** Missile defense, anti-submarine warfare, mine countermeasures and fleet/force protection technologies – global defensive assurance
- **Sea Strike:** Weapons, aircraft, and expeditionary warfare technologies -- precise and persistent offensive power
- **Sea Basing:** Logistics, shipping, and at-sea transfer technologies – operational independence
- **FORCEnet:** C4ISR, networking, navigation, decision support and space technologies -- architectural framework for naval warfare in the information age
- **Naval Expeditionary Maneuver Warfare:** Enhance the capability to fight terrorism with special emphasis on naval ground force capability enhancements
- **Capable Manpower:** Match Sailors and Marines to the right jobs, design intuitive systems, and train for mission essential competencies
- **Force Health Protection:** Protect Sailors and Marines by reducing morbidity and mortality when casualties occur
- **Enterprise and Platform Enablers:** Cross-cutting technologies to lower acquisition, operations, and maintenance costs
- **Power & Energy:** Energy security, efficient power and energy systems, high energy and pulse power

PMW-160 Works within the FORCEnet Pillar



Four Elements of S&T Within the FORCEnet Naval Capability Package



- **Rapid, Accurate Decision-Making**
 - Dynamic Command and Control for Tactical forces and Maritime Operations Center to enable dynamic and responsive management and control of net-centric enterprise theater and tactical Anti-Submarine Warfare interactions. (FNT 09-04)
- **Communications and Networks with Increased Throughput (includes Network Security)**
 - Dynamic Tactical Communications Networks for highly mobile, low-echelon Navy and Marine Corps users who need self-organizing, self-administering communication capability. (FNT 09-02)
- **Pervasive and Persistent Sensing**
- **Information Operations**



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Broad Area Announcements (BAA) Office of Naval Research (ONR)



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 - Submit Proposals
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 - Manage Your Grant
 - Office of Small Business
 - Regional Offices

Broad Agency Announcements

Currently Active | Expired

ONR is constantly looking for innovative scientific and technological solutions to address current and future Navy and Marine Corps requirements. We want to do business with educational institutions, nonprofit and for-profit organizations with ground-breaking ideas, pioneering scientific research and novel technology developments. The following list includes currently active broad agency announcements (BAAs) – each announcement provides technical and contracting points of reference.

IMPORTANT NOTICE: All FY-11 BAAs will now incorporate a standardized template for the submission of technical and cost proposals for all awards to be made as contracts.

When completed properly, the new easier to understand format will improve efficiency by eliminating much of the follow-up that now occurs after proposals are submitted. The template, which does not require any additional content beyond what is currently required in ONR BAAs, may help to expedite award times. Guidance and assistance in completing the form and spreadsheet can be obtained from points of contact provided in the BAA, and training will be available to interested offerors. [Download the new forms](#)

2011 Long-Range Broad Agency Announcement for Navy and Marine Corps Science and Technology 11-001

From time to time throughout fiscal year 2011, ONR program offices will issue special opportunity notices to solicit program-specific basic research proposals which expand on one of the topic areas described in the ONR Long-Range Broad Agency Announcement. Interested parties are urged to periodically check the [Special Notices](#) section on the website and the [Federal Business Opportunities](#) and [Grants.gov](#) websites for new special opportunity notices.

[11-001](#) (PDF - 120.89 KB)

[Amendment 0001](#) (PDF - 175.02 KB)

[Amendment 0002](#) (PDF - 120.92 KB) Replacement for original Amendment 0002

[Amendment 0003](#) (PDF - 118.7 KB)

[Amendment 0004](#) (PDF - 180.93 KB)

[Amendment 0005](#) (PDF - 122.22 KB)

Published: September 27, 2010 02:27 PM EST | Full Proposals will be accepted until September 30, 2011 04:00 PM EST

Long-Range Annual Funding Opportunity Announcement for Navy and Marine Corps Science



BAAs posted to FedBizOpps

Federal Business Opportunities

IAE E.GOV USA.gov

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Search more than **1,100*** active federal opportunities.

Posted Date: Last 90 Days Set-Aside Code: Any

Place of Performance: Any State or Territory Type: Any

Keyword / Solicitation #:

Agency:

Additional criteria and multiple selections are available on the [advanced search form](#).
** Notices posted within the last 90 days.*

[Where can I find the U.S. Coast Guard's announcement seeking innovative ideas supporting the Deepwater Horizon Response efforts for the oil spill in the Gulf of Mexico?](#)

Buyers / Engineers
Government users may post, manage, and award opportunities.

Vendors / Citizens
Vendors and citizens may search, monitor, and retrieve opportunities.

RECOVERY
FBO now contains Recovery and Reinvestment Act actions.

FBO RECOVERY REPORTS
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USER GUIDES
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Use [Adobe Acrobat Reader](#) to view files in PDF format.



Summary

- PMW160 provides ***Secure, reliable information networks to enable information dominance anytime, anywhere***
- We have many challenges from having to operate in a Disconnected Intermittent Low BW Environment
- Teaming with the Office of Naval Research and Industry to meet our challenges



We get IT.

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

Visit us at www.peoc4i.navy.mil

