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

PMW 160
Tactical Networks

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*Deliver threat-based C4I and space capabilities to enable
the fleet to compete, deter and win — tonight*
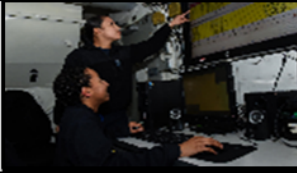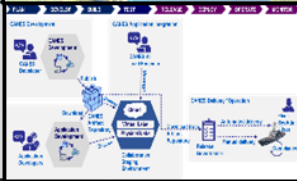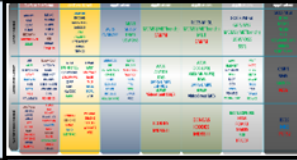
- *Delivering the Tactical Edge*

- *Enabling the Kill Chain through Information Warfare*

- *Operating <u>continuously</u> from Competition to Conflict*

(Source(s): CNSSI 4009-2015)
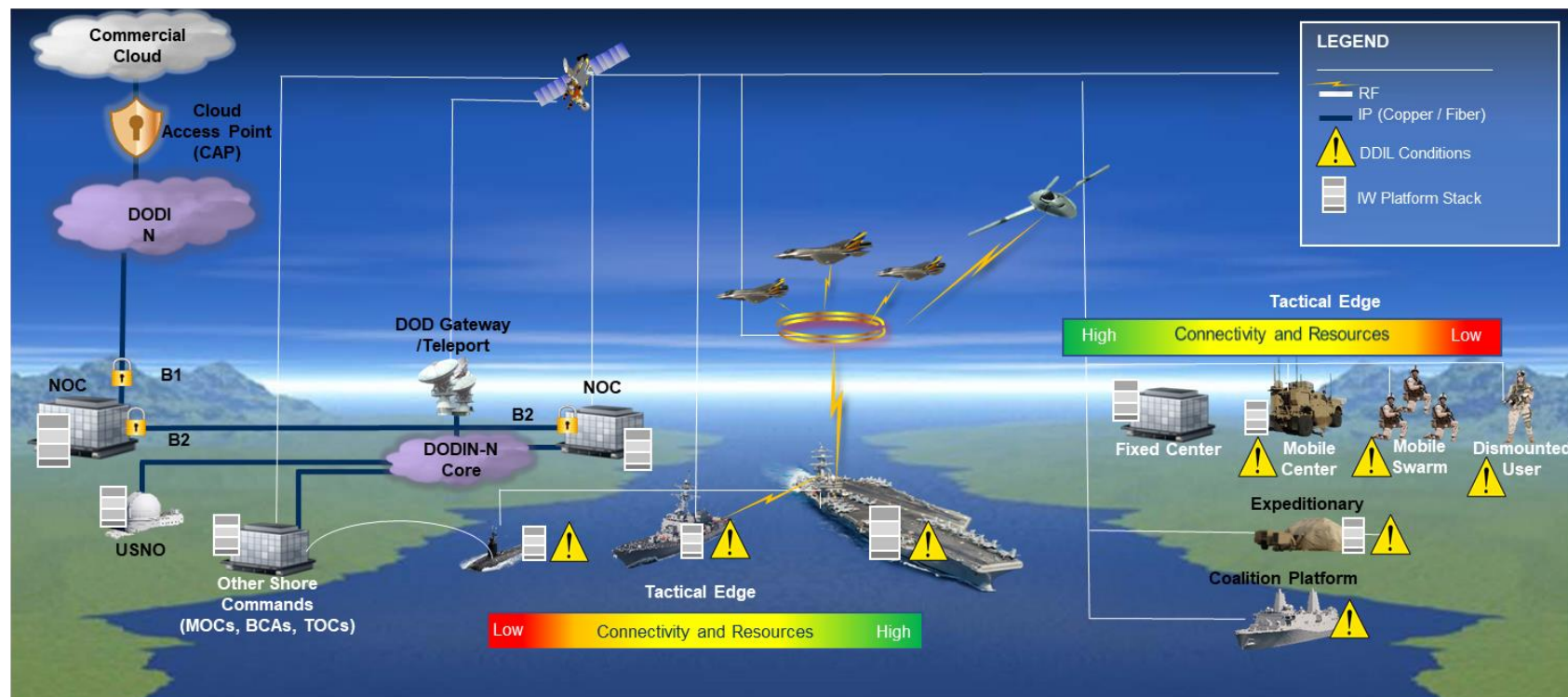
PMW 160's Portfolio- Operating at the Tactical Edge

CANES	Consolidated Afloat Networks and Enterprise Services (CANES) delivers common afloat networks to drive cyber resilience, improve operational availability and reduce total ownership costs	
ADNS	Automated Digital Network System (ADNS) provides assured tactical wide area networking between ships, submarine and shore to support full spectrum battlespace connectivity	
ACS	Agile Core Services (ACS) provides a set of commercial IT services to accelerate delivery of software, streamline integration, and improve enterprise sharing	
AI	Application Integration provides the platform governance and certification to ensure the cyber posture and interoperability of afloat networks and applications	
Piers	Pier IP communications, transitioned to PEO C4I in FY19, delivers connectivity to ships and submarines when connected to the terrestrial network	

CANES Overview

Consolidated Afloat Networks and Enterprise Services (CANES) is the next-generation information warfare platform providing secure, reliable, and resilient networks & services

- Provides afloat tactical data center & local area network infrastructure
- Supports diverse warfare and planning mission areas' hosting 200+ Intelligence, Command and Control (C2), and Logistics applications
- COTS HW / SW capability scaled to meet platform, warfighter and application requirements

The Navy's Tactical Afloat Network Program of Record (POR), consolidating and modernizing legacy shipboard and submarine networks

- 131 initial installations completed (70%), plus 60 tech refreshes completed
- 5th Gen design in fielding (HW2 / SW4); 6th Gen in development (HW3 / SW5)
- Agile procurement contract delivering best value to the Government ($4.1B, 10-Year MAC)

**Enables Over-The-Air (OTA) Mission Software Delivery to Afloat Platforms**

- Delivering containerized applications and application updates OTA
- Platform as a Service (PaaS) through Agile Core Services (ACS) enabling DevSecOps pipeline afloat

CANES delivers the Navy's Decision Advantage at the Tactical Edge

Agile Core Services (ACS)

- **ACS provides an application infrastructure platform with diverse services to enable easy and rapid application deployment**
    - Provides common industry standard tools used by modernized Applications
    - Includes Linux-based platform with Platform as a Service, Security, Logging
   - Software Distribution enabled through Application Arsenal
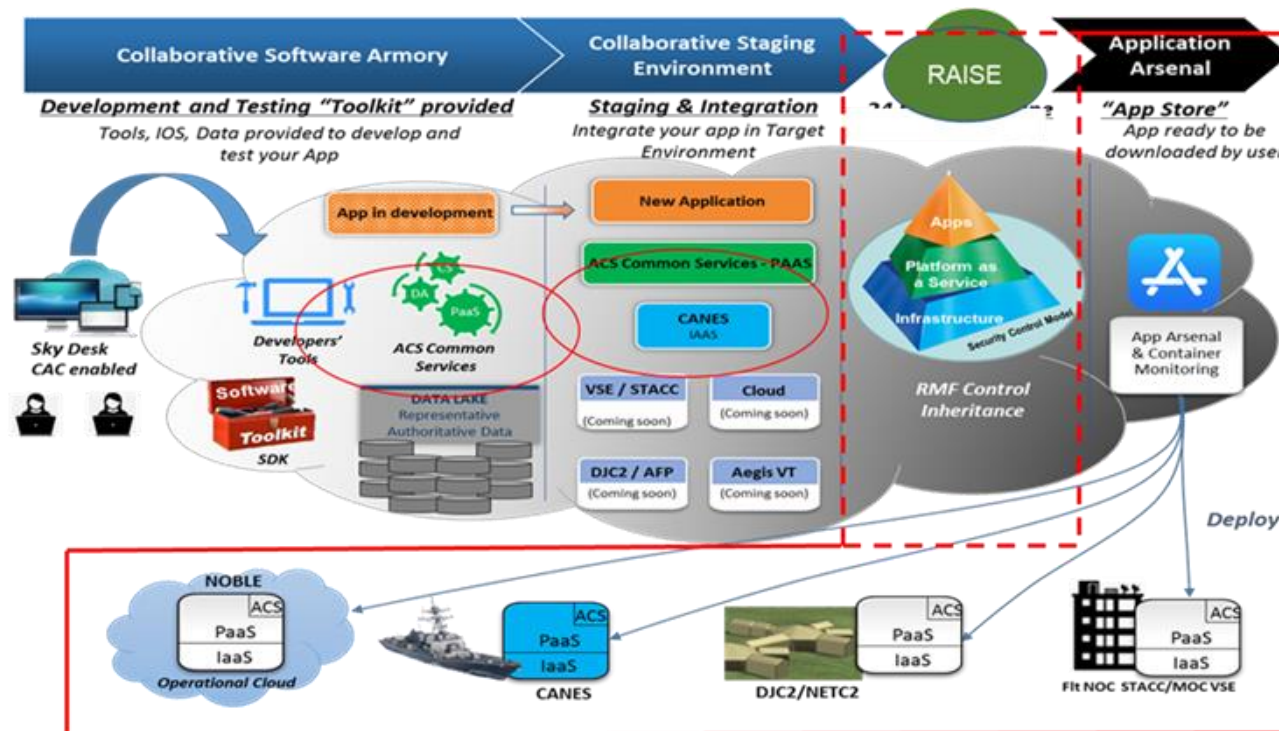
ACS – a key enabler of DevSecOps & the Overmatch Software Armory (OSA)

ADNS & CaaS Overview

None- Publicly releasable

- **Automated Digital Network System (ADNS) is the Navy's Tactical Wide Area Network solution**
  - Entryway into the Department of Defense networks for all Navy Internet Protocol (IP) services and applications
  - Provides Quality and Class of Service (QoS/CoS) routing for Multi-Service Voice, Video, and Data domains
  - Routes IP data between ashore, afloat, & airborne networks over available RF & landline paths

- **Communication as a Service (CaaS) is an integrated software-defined network (SDN) designed to provide provisioned delivery of mission data using available communication links within the mission's requirements**
  - Provides provisioned delivery of mission critical data based on configurable policies
  - Provides ad hoc traffic flows utilizing commander's intent based on prioritization of any available communication path

- **ADNS and CaaS transitioning to a consolidated software-based solution utilizing Software Defined Networking (SDN) and Containerization**
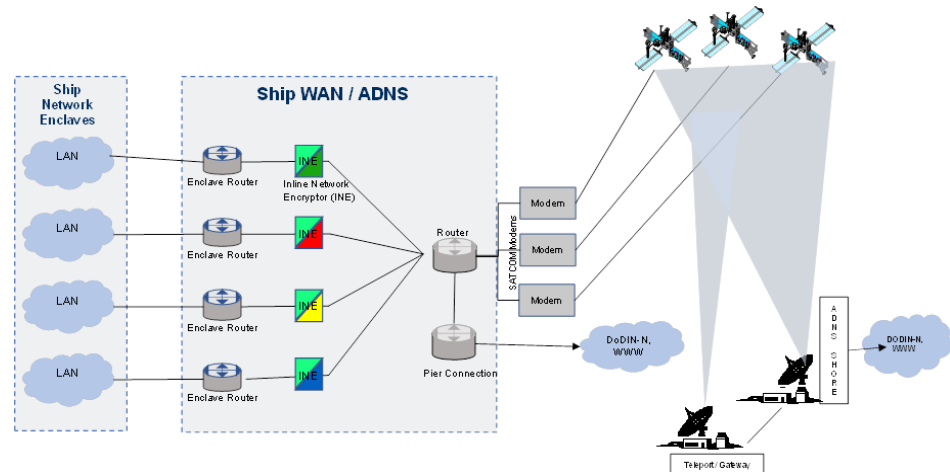
Enterprise Pier Connectivity Architecture (EPCA) Overview

- **EPCA, "Piers," provides secure, transparent, cost-effective, terrestrial IP transport solution to the Fleet while docked at US Navy-controlled piers worldwide (CONUS and OCONUS)**

  - ➤ **Legacy PCA 1.2**
    - Supports legacy vessels for either T-1 (1.544Mbps) or ATM (up to 16Mbps)
    - Legacy vessels include ADNS increments I, IIa and IIb
    - Uses the latest T-1 or ATM equipment, which is EOL/EOS, but is accredited

  - ➤ **Enterprise EPCA 2.0**
    - Can support any ADNS equipped vessel T-1, ATM, or GigE, (up to 1Gbps depending on ADNS)
    - Uses the latest Cisco Routers and Switches and is accredited

  - ➤ **Wireless Piers Connection System (WPCS) 3.0**
    - A Wireless alternative to the Umbilical Cable Assembly (UCA)
    - Based on the Cambium Radio

PMW 160 Focused Initiatives

- ## Drive Continuous Readiness

  Highly automated, intuitive self-healing networks, delivering near continuous Operational Availability (Ao of 100%) and achieving Sailor Self Sufficiency. Ready and Resilient Sailors, trained to maintain, fight and defend their networks, supported by intuitive designs, extensive automation and timely and relevant data to inform their actions.

- ## Enable Agile Capability Delivery

  Modernize, Repair, Anytime, Anywhere. Delivery of tactical network capability where needed, when needed. Delivering hardware and software enabled capability across the spectrum of platform access. Establishment of a superior delivery pipeline of highly modular network capability.

- ## Design for Combat

  Combat Ready, Combat Resilient Tactical Networks. Deliver an architecture and implementation providing the Naval Operational Architecture, enabling secure, timely, assured Information Warfare. Design for the Sailor, the Warfighter across all ranks and rates who must operate, maintain and win the Fight.

Tactical Networks Technical Drivers

Leveraging Cloud & Cloud Native

Image: Princeton.edu

Pacing Cybersecurity & Expanding Zero trust

Image: Caplinked.com

Expanding Automation, AI & ML

Image: warontherocks.com

Enabling Distributed Maritime Operations

Evolving Agile & DevSecOps Driving Speed-to-Capability

Image: automationConsultants.com
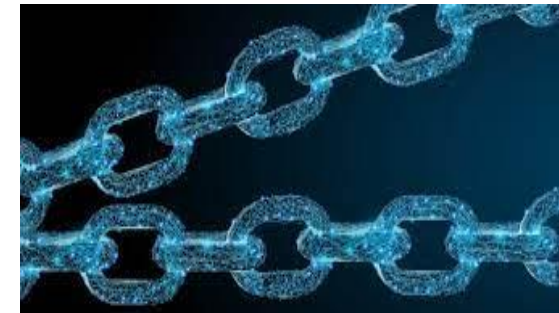
Increasing Network Resiliency

Image: datafoundry.com

Our Ask of Industry

- **Looking for warfighting solutions that will:**

  - ➤ *Operate in an austere, tactical environment*

  - ➤ *Enable Sailor self-sufficiency*

  - ➤ *Reduce complexity, increase automation*

  - ➤ *Increase hardening and resiliency*

  - ➤ *Enable speed to capability*

  - ➤ *Scale affordably*

- **We look forward to teaming to deliver capability to the Warfighter!**

Combat Ready, Combat Resilient - Networks and Sailors