



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

## **PMW 160**

# ***Tactical Afloat Networks***

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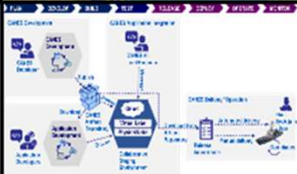




***Deliver threat-based C4I and space capabilities to enable  
the Fleet to compete, deter and win — tonight***



# PMW 160 Tactical Networks

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

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



# PMW 160 Enterprise Initiatives



- **DevSecOps:**
  - Delivering Development Security Operations (DevSecOps) pipeline including cloud-based CANES development & integration environment and to enable rapid fielding of stable, cyber-secure software-based warfighting capability
- **Increasing System Resiliency & Agility:**
  - Implementing increased agility in system upgrades to provide more frequent, incremental delivery of network capability; goal to rapidly address cyber vulnerabilities, maintain operational availability and pace warfighting threats
  - Fielding first Cyber Threat Upgrades in FY23
- **Enhancing Sailor Self-Sufficiency:**
  - Improving Sailor's ability to fight and defend their network through game-changing training delivery (CANES Training Virtual Environment) and augmented troubleshooting through Remote Access / Remote Monitoring distance support capabilities



**Delivering processes and technology to increase network warfighting resiliency, supportability, and installation efficiencies - imperative to "Fight Hurt"**





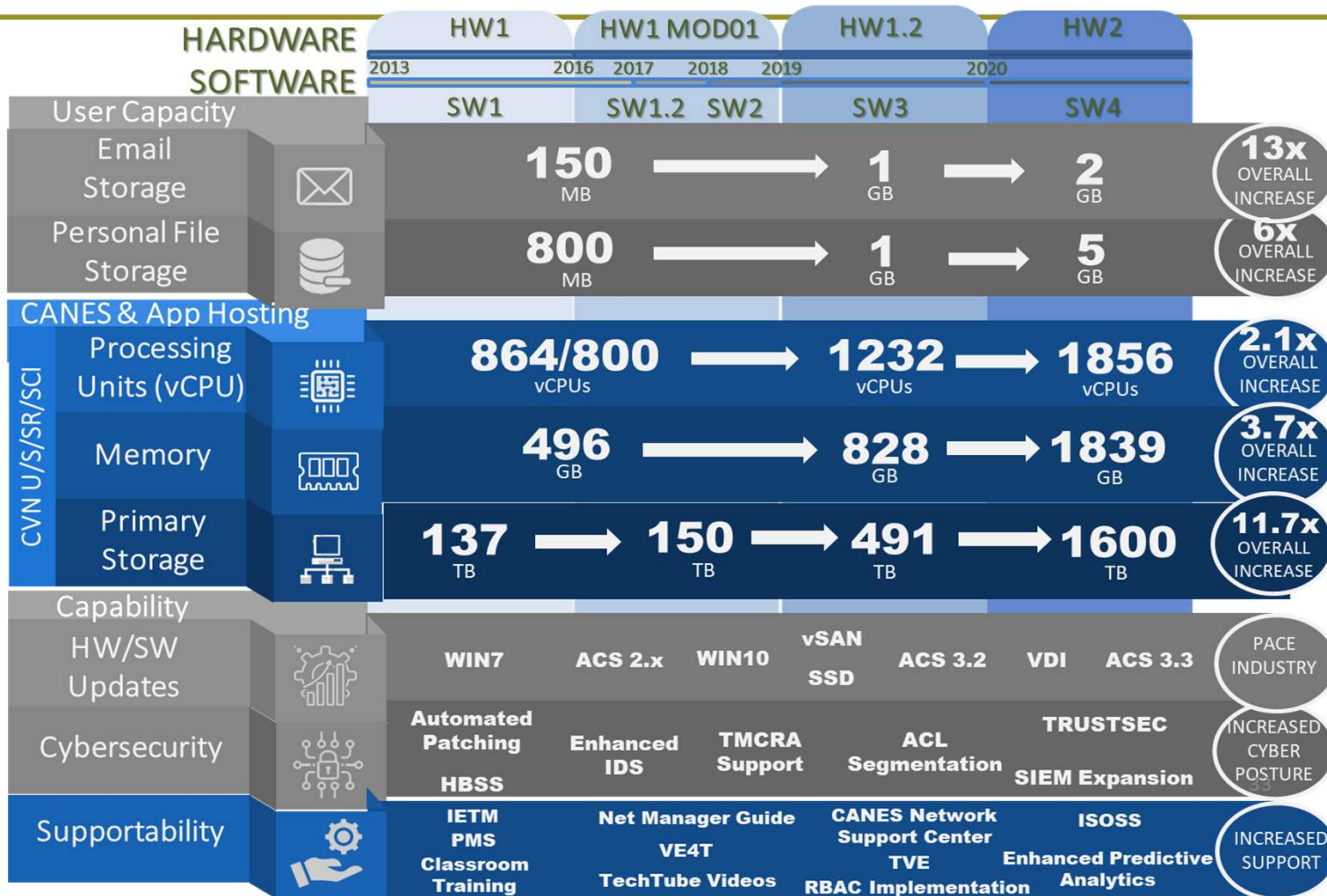
# CANES Status

- **Consolidated Afloat Network Enterprise Services (CANES) is the core of the Information Warfare Platform**
  - Delivering the Navy's secure, reliable afloat tactical network
  - Continuously evolving the baseline to pace the threat, pace technology
  - Leveraging COTS HW/SW coupled with industry best practices to provide POR network solution
- **FY21 delivered 31 systems to the Fleet (26 Surface, 5 Submarine)!**
  - Overall 111 initial installations completed (58% TIO); 36 tech refresh installations complete
  - 5 of 82 SCN installations completed
  - 39 installations in progress, 36 systems in Production at Network Integration Engineering Facilities (NIEF), 33 systems in CANES Vendor Facilities
- **Commenced procurement of initial HW2 / SW4 installations in 2021; first completed installations planned for FY22**
  - Modernizes infrastructure to satisfy application hosting requirements
  - Implements DevSecOps approach to support speed to capability
  - Increased processing / network performance / cybersecurity

***Delivering the Tactical Afloat Network across Surface and Submarine Combatants***



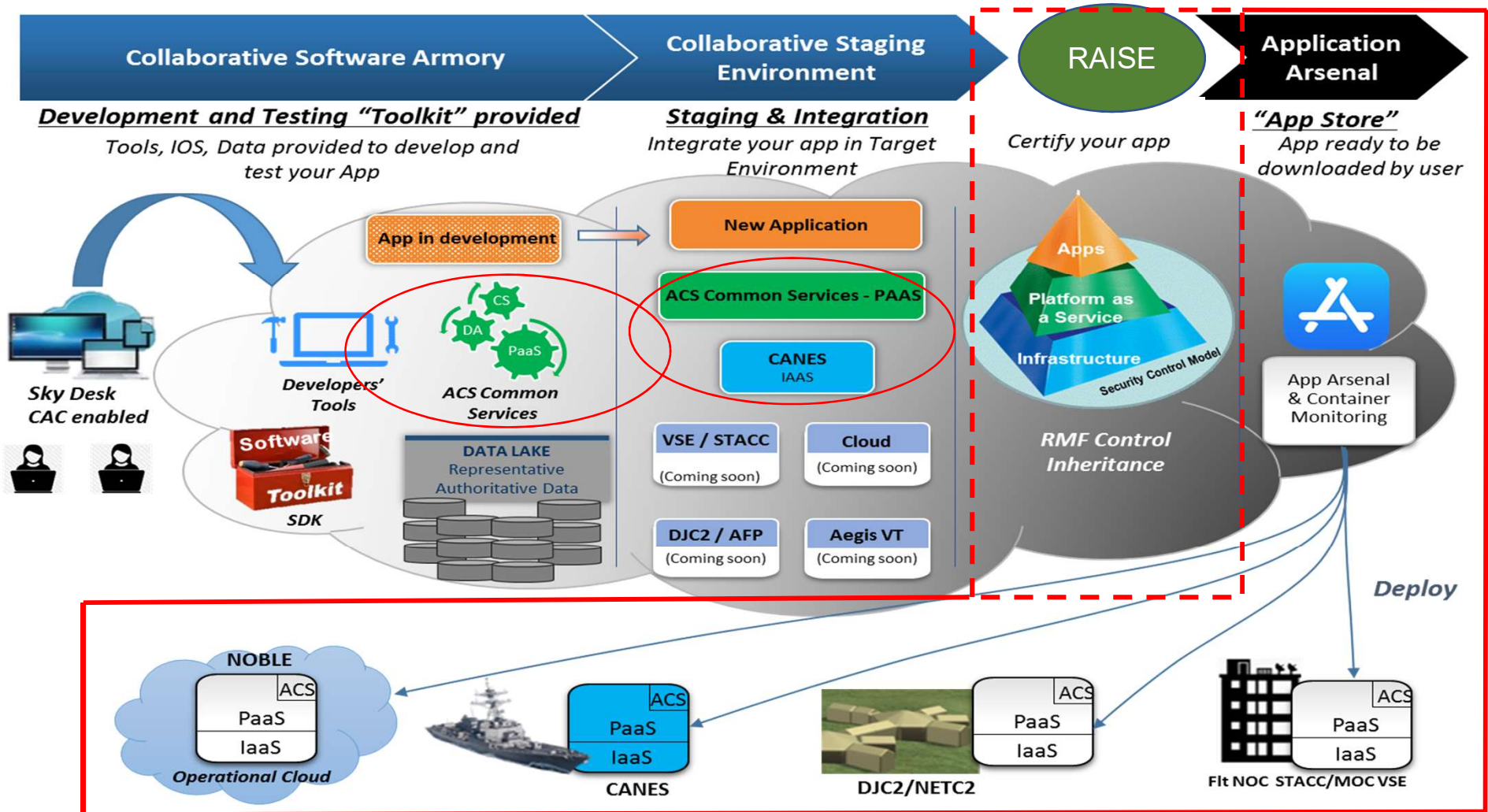
# CANES Baseline Evolution



**5<sup>th</sup> Generation CANES (HW2/SW4) in deployment;  
6<sup>th</sup> Generation (HW3/SW5) under development**



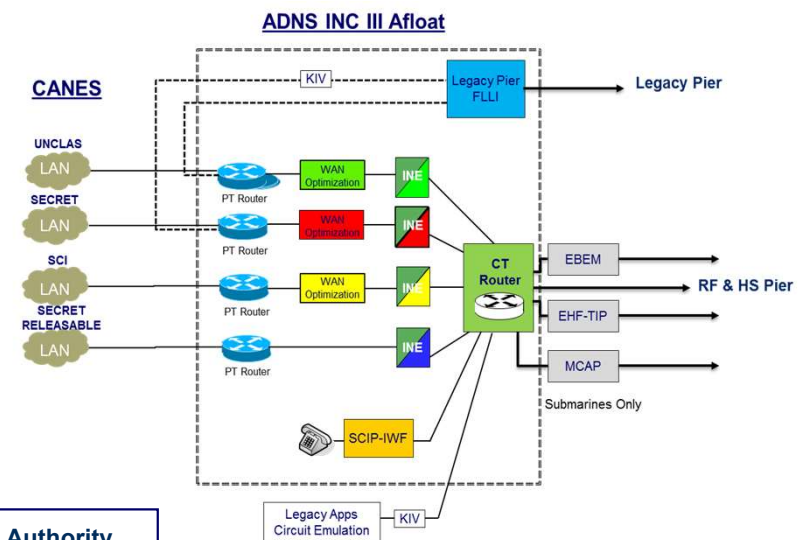
# DevSecOps- Overmatch Software Armory (OSA) Ecosystem





# ADNS INC III Overview

- **ADNS is the Navy's Tactical Wide Area Network solution, serving as the entryway into the Department of Defense Information Networks (DoDIN)**
  - Routes data between ashore, afloat, and airborne networks over available RF and landline paths
  - Secure, rapid, reliable information exchanges for data, voice, and video
  - Evolutionary development and deployment provided increased Throughput, Bandwidth Management, Converged IP, Quality of Service and improved Security
- **Mission: Provide access to the Tactical WAN for Navy IP Networks**
- **Designation: MAC 2 - Mission Essential**
- **Nomenclature: ADNS AN/USQ-144 Series**
- **Footprint:**
  - Surface Ships
  - AEGIS Ashore
  - Shore Sites (NCTAMS & SATCOM Gateway)
  - Submarines
  - Submarine Shore Sites (BCA)
  - Airborne (INC III not a POR)

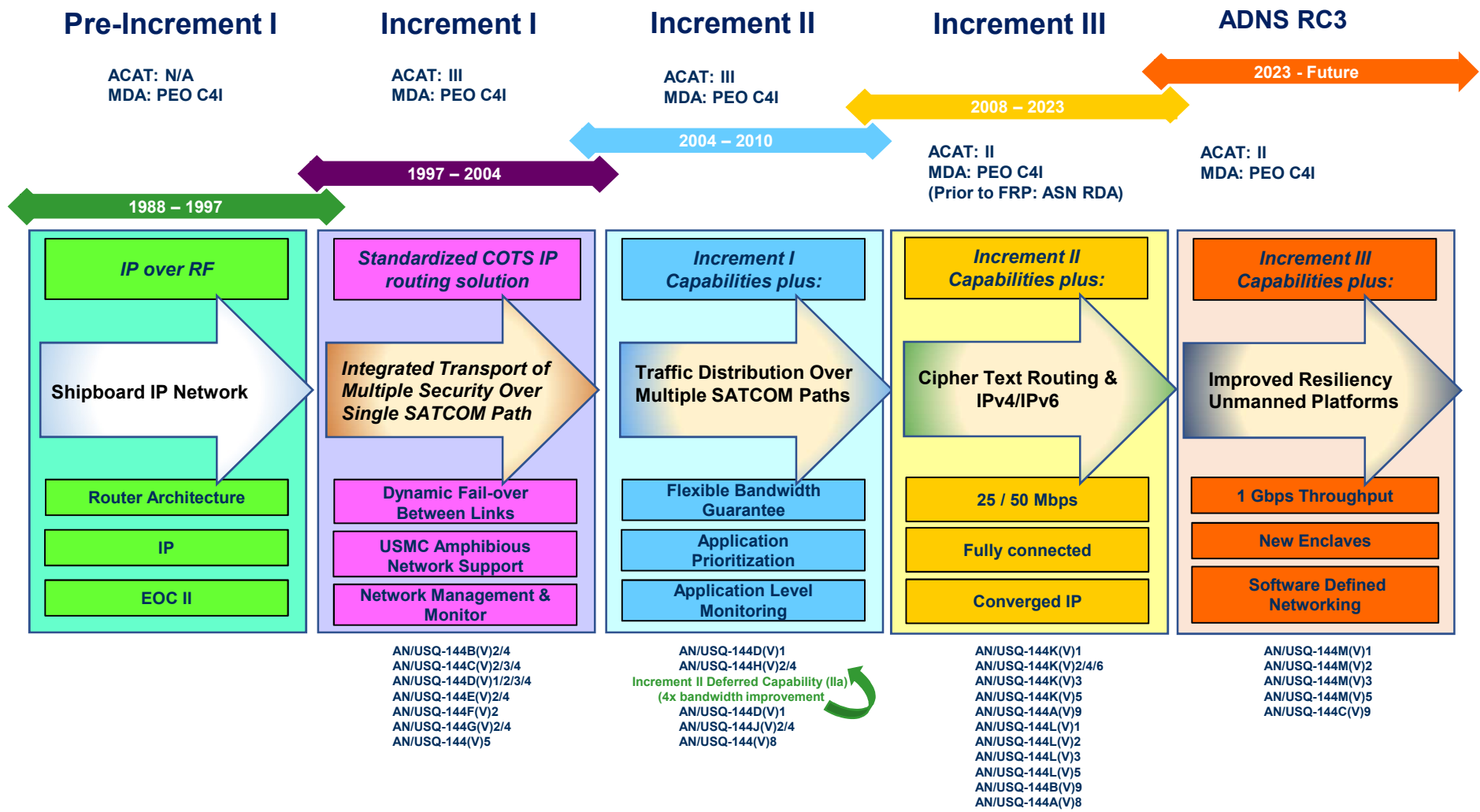


BCA – Broadcast Control Authority  
IP – Internet Protocol  
MAC – Mission Assurance Category  
NOC – Network Operations Center  
SATCOM – Satellite Communications  
WAN – Wide Area Network





# ADNS Baseline Evolution







# ADNS Status

- Continued Feature Set 2 (FS2) fielding. Completed FS3 testing, and began fielding to afloat platforms and shore sites
  - C4I Resiliency improvements
  - Cybersecurity and Quality of Service updates
- Completed multiple Service Pack 4 HW refreshes on submarine and supporting shore sites
- Completed ADNS shore based router upgrades in support of airborne platforms. Supporting MQ-25 development engineering, test and integrations
- Developing the ADNS INC III SW Defined Network solution
  - More adept to handle future shore, airborne, unmanned systems requirements
  - Implements Agile and DEVSECOPS for more secure rapid development and deployment

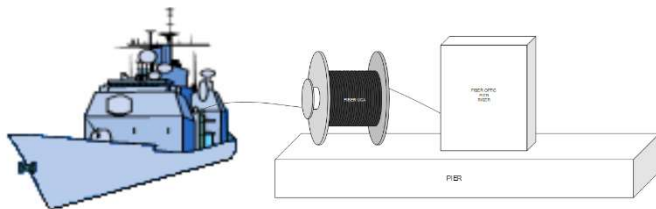


# Piers - EPCA

- Enterprise Piers Connectivity Architecture (EPCA) is the shore transport network for ADNS from pier side ships & submarines to connect to servicing NOCs
- Program delivers multiple products providing high speed pier connectivity. Delivery methods vary and are site appropriate

## Today's Delivery Model

- Government Designed and Integrated
- Operational support migrating to NGEN-R
- Up to 1 Gbps via EPCA 2.0



## Future Technology Adoption:

- WPCS 3.0 roll-out in FY22
- Wireless Connectivity Bridge (WCB) for adjacent sites
- Possible 4G/5G technology incorporation
- Enhancements to ADNS to will increase bandwidth routing



# Piers/EPCA Status

- FY21 - Piers program transitioned to commercial shipyards and added the Wireless Piers Connection System (WPCS) to the portfolio.
  - 5 EPCA 2.0 Naval Stations Installed
  - 7 EPCA 2.0 Sites Pending Installations
  - Will Connect 8 Commercial Shipyards to Naval Stations
- Anticipate averaging 6-10 installations / tech refreshes per year to achieve the Total Inventory Objective (TIO) of 61 sites by FY28





# PMW 160 Contracts



Contract Description Contract Number	Program(s)	Contract Type Period of Performance	Contractor(s)
CANES BAAS N00039-18-D-0018	CANES	CPFF 8/30/2018 - 8/29/2023	Lockheed Martin
CANES Virtual Training N00039-19-D-0007	CANES	CPFF 12/19/2018 - 12/18/2023	Deloitte Consulting
PMW 160 Engineering and IA Support N00178-04-D-4024 N0003917F3000	Various	CPFF 12/15/2016 - 10/27/2021	BAH
PM/ACQ/Admin Support N00178-14-D-7955 N0003920F3016	Various	CPFF 9/29/2020 - 9/28/2025	AOG
CANES Production N00039-14-D-0121, N00039-14-D-0122, N00039-14-D-0123, N00039-14-D-0124, N00039-14-D-0125, N00039-15-D-0001, N00039-15-D-0002	CANES	IDIQ Eight year Ordering Period ending 7 JAN 2023	British Aerospace Engineering Systems, General Dynamics, Global Technical Systems, Northrop Grumman Systems Corp, SERCO, CGI Federal, DRS Laurel Technologies
ADNS Production N00039-17-D-0006, N00039-17-D-0007, N00039-17-D-0008, N00039-17-D-0009	ADNS	IDIQ 6/21/2017 - 6/21/2025	DRS Laurel Technologies, LEIDOS, SAIC, SERCO
CANES Digital Twin and Automation N00039-21-C-1001	CANES	CPFF 6/15/2021 – 06/14/2025	Innovative Defense Technologies, LLC



# S&T Portfolio Summary

Project Name	Company / S&T Venue	Period of Performance	\$ Value	Transition Target	Description	Type of Deliverable	Project Status
Flow Ordering and Hierarchical Bottleneck Identification for High Speed Data Networks	Reservoir Labs / SBIR Phase II	3QFY20-3QFY21	\$750k	ADNS	Significantly improving network performance by identifying bottleneck and improving routing in dynamic fashion and promotes automation on IT system management	SW /KP	In Execution
Bandwidth Bonding & Virtualization (BB&V)	Cloud Junxcion / SBIR Phase II	Aug 2021 Aug 2022	\$750k	ADNS	Maximize throughput by effectively using all available communications links with aggregation techniques	SW/HW/ KP	In Execution
Configuration Security	DARPA	1QFY19-3QFY22	\$45M	CANES OB2+	Improve cyber resiliency by generate secure configurations with AI/ML algorithms	SW / KP	In Execution
ARCOS	DARPA	2QFY20-2QFY24	TBD	CANES	Improve cyber resiliency by utilizing automation to generate assurance to support software certifications	SW/KP	In Execution
Agile Enclave (AE)	ONR			PMW-160		SW/KP	In Execution



# S&T Portfolio Summary, cont.



Project Name	Company / S&T Venue	Period of Performance	\$ Value (\$M)	Transition Program/Project	Capability Gap being addressed	Type of Deliverable	Project Status
Next-Generation Congestion Alleviation (NXCA)	NIWC PAC / IIR NISE	1QFY21-4QFY22	\$0.193	ADNS	Adopt machine learning to allow the Plain Text (PT) network to dynamically adjust to congestion on the Cipher Text (CT) network using traffic analytics	SW/KP	In Execution
Deep Edge	NIWC PAC / IIR NISE	1QFY20-4QFY21	\$0.406	ADNS	Significantly improve data transfer performance on the distributed system on the edge by reducing bandwidth requirements and increasing data protection	SW / KP	In Execution
Tactical Ubiquitous Flexible Network (TUF-Net)	NIWC PAC / IIR NISE	FY22-FY23	\$0.420	CANES	Capability to maintain or quickly restore critical capability lost due to battle damage or other catastrophic kinetic event.		Proposal
Enhanced Auto-MRC	NIWC PAC / IIR NISE				Utilize test automation framework to perform tedious repetitive maintenance requirement cards typically done by overtasked IT (i.e. health checks, cybersecurity, etc)		
Automated Emergency Shutdown System (AESS)	NIWC PAC / IIR NISE				Perform graceful shutdown of systems during emergencies.		





# PMW 160 Opportunities



- CANES Full Deployment Production Contract
  - Request For Information (RFI) was released Q4FY20
  - Request for Proposal (RFP) planned Q1FY22 with award targeted in Q4FY22/Q1FY23

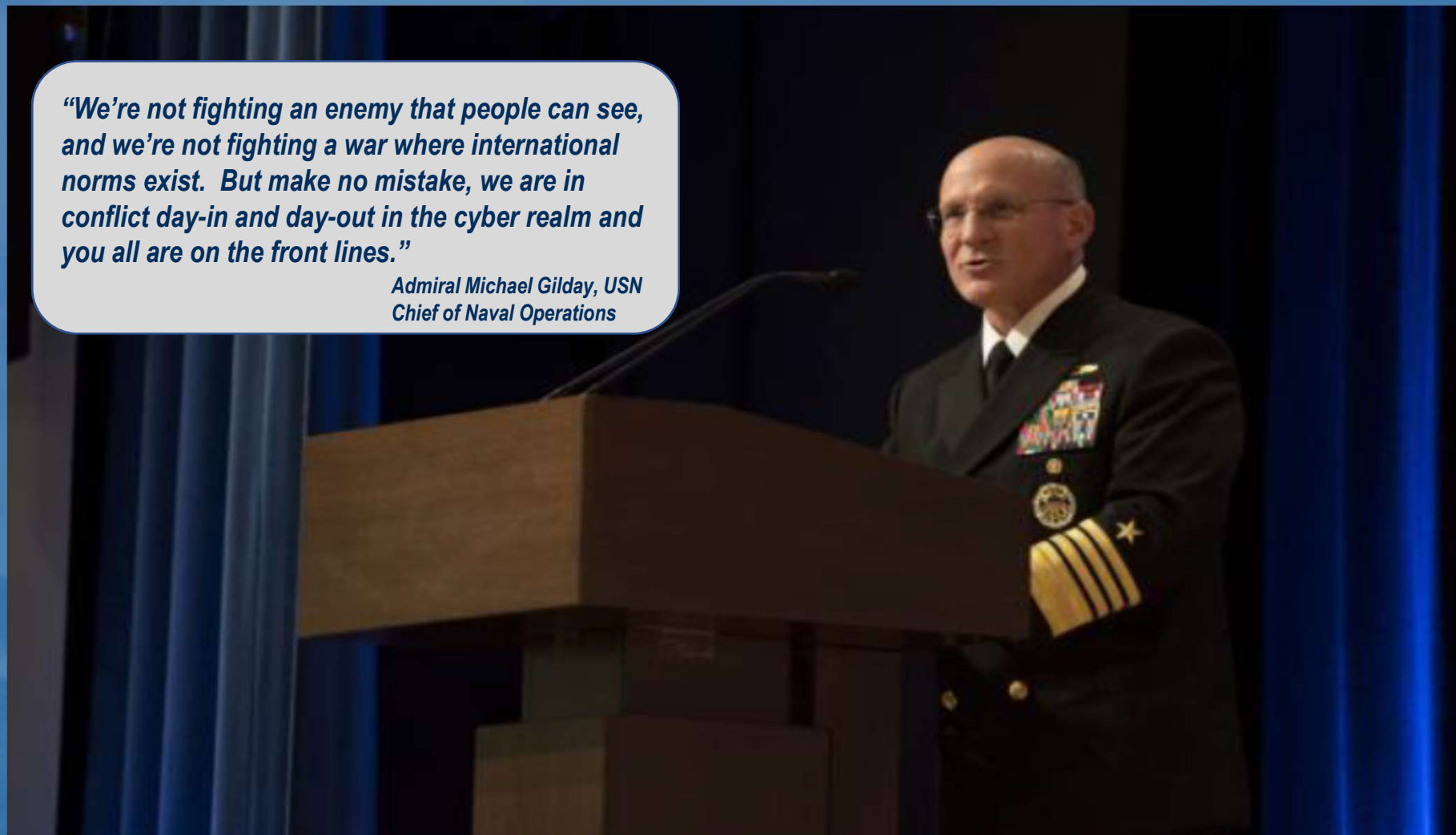


# Our Industry Partners are critical to the fight



*"We're not fighting an enemy that people can see, and we're not fighting a war where international norms exist. But make no mistake, we are in conflict day-in and day-out in the cyber realm and you all are on the front lines."*

*Admiral Michael Gilday, USN  
Chief of Naval Operations*





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**Accelerated delivery of required capability that is  
affordable, integrated and interoperable**