Harnessing cloud to revolutionize training of the Navy's shipboard IT network

The US Navy's Tactical Networks Program Office, PMW 160, is responsible for afloat network infrastructure and basic network information distribution services. One of the critical priorities of the program office is training sailors who operate and manage the Consolidated Afloat Networks and Enterprise Services (CANES) network. To provide advanced CANES training, the Navy utilized physical network racks as training equipment at two training sites. With only two classrooms, the Navy was limited in the number of sailors it could train each year. While critical to the fleet's war-fighting capability, the CANES training environment was expensive to maintain, restricted to a single Hardware-Software (HW-SW) version combination, and configured to the oldest CANES baseline. Sailors were receiving training on legacy CANES systems based upon earlier technologies. The Navy sought a training environment that could keep pace with technology and provide sailors with virtual CANES environments that could be updated and deployed quickly. In the search for a training environment that removed the need for a physical hardware stack in the classroom, the Navy called Deloitte for help.

What happened next:

Using AWS cloud, Deloitte collaborated with the Navy to create a virtually limitless sailor training capability. The Navy's CANES Training Virtual Environment (TVE) provides a scalable, accessible, and adaptable learning environment that supports CANES training and troubleshooting. Leveraging AWS CloudFormation, Amazon Machine Images, Amazon EC2 Bare Metal, VM Import/Export, AWS security tools, and custom configurations, the team re-platformed multiple variations of the CANES shipboard network on AWS GovCloud, saving the Navy costs as training is no longer reliant on physical hardware. The innovative architecture and design have enabled the Navy to provision thousands of servers and multiple concurrent CANES environments with a simple deployment user face.

Students now have individualized access to their specific shipboard CANES environment, curricula, and job sheets anywhere there is a broadband connection. CANES TVE provides fully functional virtual environments of physical CANES configurations that can be created in minutes. Because there is no physical hardware, or risk of compromising a physical network through student actions, the Navy can also increase the number of training scenarios, troubleshooting activities, and conduct real-life situation training. Deloitte's approach enabled the Navy to provide a learning infrastructure accessible at many locations, via multiple users, concurrently, uncovering what's possible for their organization.

The wins:

- Virtualized hardware and infrastructure, removing hardware-based technical training equipment dependencies

- Enabled parallel training meaning that every student gets hands-on training on a CANES network; the impact is more time in the environment troubleshooting

- Enabled easy deployment of entire networks to any virtual desktop

- Improved accessibility and scalability of the training environment

- Maximized operational ease, maintainability, and reusability

- Added functionality not available in physical hardware networks (e.g. real-time upgrades, emulated networking with other Navy networks, backup and restoration)

- Created network-as-a-service cloud offering which can be extended beyond training environments to engineering troubleshooting teams, vendors wanting to test their application in CANES, and war-gaming exercises conducted by the fleet

The numbers:

40+

instance networks created, configured, and deployed in under 40 minutes using Cloud Formation, APIs, and custom code. Fastest CANES installation in the Navy!

4x

as many training sites, expanding training capabilities to training sites around the world

Increase training throughput to 840 sailors a year!

4x

Anticipated

50%

lower cost than building and sustaining physical training equipment over next 5 years

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