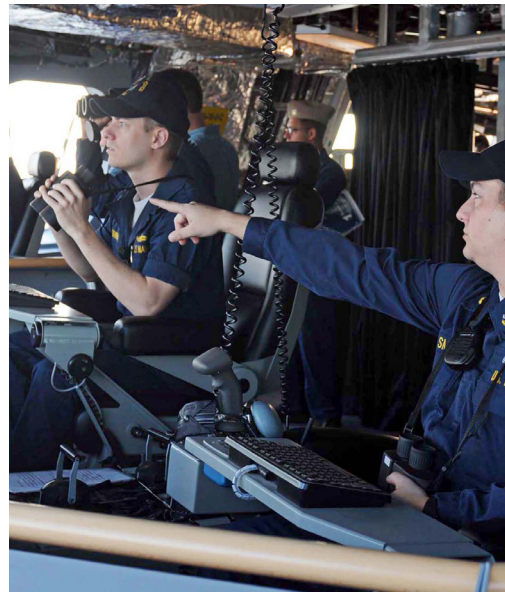# NEXT-GENERATION
INFORMATION SYSTEMS FOR NAVAL SHIPS

ENHANCING MISSION READINESS WITH IMPROVED INFORMATION ACCESS

The proliferation of multi-domain intelligence, surveillance, and reconnaissance (ISR) information has changed the landscape of naval strategic thinking. Real-time analysis of ISR information has influenced the form and function of naval system design, transforming modern navy ships into flexible collaboration platforms better able to support dynamic mission requirements.

WHAT IS THE CHALLENGE?

The video and data distribution infrastructure technology used in ship's Combat Information Centers (CIC) and Integrated Weapon System (IWS) rooms has not kept up with the expanding, information-driven mission. The configuration of traditional CIC and IWS operator stations -- each hard-wired for specific functions -- limits collaborative workflows and dynamic data analysis. These "siloed" legacy stations are inflexible and require significant staffing requirements to support the various dedicated operations.

There is also an increased need for getting access to multiple classified systems from the bridge, and ideally incorporate the bridge information into the CIC and IWS systems. If access to networks at multiple classifications is specified, legacy operator stations often cannot support this capability. If they do, the resulting makeshift system typically violates standard Information Assurance (IA) best practices for data protection and security by requiring the use of vulnerable VDI clients and/or clumsy manual desktop KVM (keyboard, video, mouse) switches to move between classifications at the station.

THE THINKLOGICAL SOLUTION

Next-generation, fiber-optic naval CIC and IWS systems based on Thinklogical video and signal distribution technology results in multi-function consoles that can easily and seamlessly connect to the combat management system, the IWS, and all other computer systems on board, including that of the bridge. Since the Thinklogical solution is certified to handle all types of data and classifications through a single switch, information can be easily distributed to and displayed on individual consoles as needed, or all at the same time, regardless of classification, with just a simple keystroke command. This multi-purpose system allows for greater situational awareness and flexible station reconfiguration for any role a ship has during an operation.

*think***logical**
A **BELDEN** BRAND

WHAT WERE THE RESULTS?

The next-generation system design from Thinklogical creates stateless, video-driven operator consoles, and delivers unparalleled flexibility in how commanders can staff, configure, and interact with the CIC and other ship systems. With the open, "any-to-any" switching architecture and "all glass," video-driven console infrastructure enabled by Thinklogical, commanders can quickly re-assign any task to any console, providing a rapid response to the changing tactical needs of the ship. In addition, critical information can be accessed and analyzed more quickly, turning information in to knowledge and leading to faster and better-informed decisions.

INFORMATION ASSURANCE WHEN IN PORT

To ensure data protection, multi-classification systems on naval ship's bridge, CIC and IWS must be secured when in foreign or civilian ports. To accomplish this with legacy systems, the high-class hardware such as VDI clients and desktop KVM switches are typically physically removed and locked in storage.

IA-accredited signal extension and restricted matrix switching products from Thinklogical helps minimize the requirement to remove hardware for data security when in port, as the actual computing and data sources are now locked away in a secure IT room. Thinklogical extenders are designed with no hard drives or solid-state memory to interact with the signal. No data or other information is stored within the extender; it essentially becomes a stateless terminal when it is disabled. In addition, Thinklogical extenders are not considered a Controlled Cryptographic Item (CCI) and therefore do not need to be removed from bridge or CIC and secured when in civilian port.

> "Everything is in one space, which allows for a lot of flexibility, and a greater expanse of situational awareness. With the open architecture we are able to re-assign any task to basically any console that we have up here on the bridge.* We're still just scratching the surface in terms of how flexible we can actually be."
>
> *- Commander, US Navy Littoral Combat Ship (Independence-variant)*

*LCS has bridge and CIC combined in one area.

This, combined with the capabilities of Thinklogical's secure matrix switches to restrict where information is switched to, based on predetermined parameters, provides for instant resetting of operator stations from classified to unclassified (or blank) with a single keystroke by administrator, eliminating the requirement to remove hardware from the bridge or public areas for security reasons.

SAVE RACK SPACE AND REDUCE SYSTEM COMPLEXITY

Thinklogical's patented, "any-to-any" switching technology is signal/format/protocol agnostic and supports all common AV and IT interface types. Additional data security, space savings and improved workspace ergonomics can be obtained using Thinklogical's unique Integrated Client Transmitter. The ICT combines a full-featured Intel PC processor with a high-performance KVM extender, all in a compact ¼ RU module form factor.

With it, computing resources and accompanying cabling can now be removed from the operator station and chassis mounted and racked in secure IT server room. Computer I/O is extended to operators via Thinklogical matrix switches and KVM receivers over fiber optic cabling with no loss of video resolution or peripheral performance, and with the ability to switch data to any operator station required.

KEY FEATURES

- Multiple identical "stateless" operator stations
- NATO approved for switching of all classifications up to NATO secret
- "All glass," video-driven data presentation
- Fiber cabling: lightweight, secure, high bandwidth
- Compute resources removed and back racked for security and easier maintenance
- Secure "any-to-any" switching of all signal types
- No compression of data; up to full 4K@60hz 30-bits-per-pixel (4:4:4) color video, uncompressed
- Low latency provides smooth and accurate trackball, joystick, and mouse control

BENEFITS

- More productive ergonomics
- Adaptable, flexible, scalable
- Full redundancy and resiliency
- Pooling of resources possible, reducing the computing resource per classification needed
- Access to all networks, classifications on any position
- Instant situational awareness
- Improved collaboration
- Fewer staff required to operate stations

REPRESENTATIVE INSTALLATIONS

- U.S. Navy Littoral Combat Ships (Independence-variant)
- Royal New Zealand Navy ANZAC Frigates
- Royal Norwegian Navy Frigates

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