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Cruise ship order book: Another booming year for the industry 10

Platform concept: Common technical foundation for ship designs 16

Survey: Cyber security arrangements need improvement 48

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Cruising with KVM

IT INFRASTRUCTURE Cruise ships are becoming larger and more complex than ever before. Keyboard, video, mouse (KVM) switching and extension technology provides a solution to the need for reliable and accurate connection to vital computer services on board, writes Dr Enno Littmann, managing director of IHSE, a German developer and manufacturer of advanced KVM devices.



IT infrastructure on modern cruise ships like the *Symphony of the Seas* is similar to that of large office complexes

The technology used on board cruise ships is evolving. There are many more computer-based systems than ever before, ranging from navigation and ship control to passenger entertainment, information systems and retail terminals.

The massive size and complexity of these vessels highlights the problems of making available accurate and up-to-date information to crew and passengers.

The IT infrastructure on modern cruise liners is designed along similar lines to that of large office complexes. There is a justifiable tendency to locate computers in highly secure, atmospherically controlled environments where they can be managed more effectively. On ships, the sensitive electronic gear is usually located in lower decks – those not accessed by passengers and well away from areas that might be exposed to the elements.

Shipboard computing equipment requires greater levels of care and manage-

ment than its land-based counterparts. Replacing a faulty component at sea is fraught with problems and delays. Therefore, ships systems must not be allowed to fail, or at least there should be sufficient back-up equipment to enable continued operation of a vital service, should an individual item drop out of service.

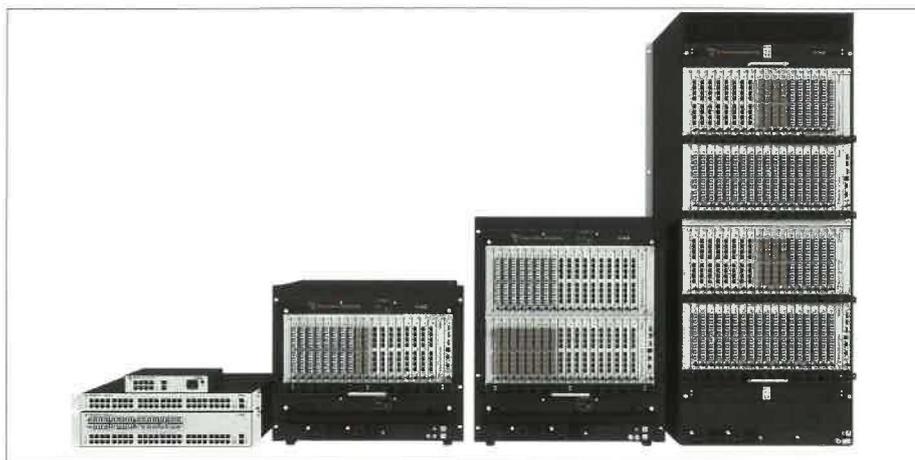
Locating electronic devices in centralised areas allows them to be managed centrally and nurtured in an air-conditioned environment that prolongs lifetime and maximises reliability. However, it is not always possible to place everything in a distant location. Some essential equipment needs to be close to its users, so any solution must take that additional requirement into account.

As an example of these systems, Royal Caribbean Cruise Line's *Harmony of the Seas* and *Symphony of the Seas*, the latest in the fleet of Oasis-class vessels, operate essential propulsion, fire and stability systems

from the safety command centre and engine control room on deck 12 with crew accessing computers on deck 2. An operator may need to access any of several control computers during his shift. For convenience and to limit the potential for confusion and distraction, the system allows an operator to access different computers from his or her personal workstation, without needing to change location.

KVM switching and extension systems provide the solution

In order to achieve the flexibility, functionality and reliability needed to manage these cruise ships from remote locations, all the computers are connected to operators through keyboard, video and mouse (KVM) switches and extenders. These devices make direct electrical connections between the desk-mounted terminals used by operators to the computer-base units located tens, if not hundreds, of metres away. >



IHSE's range of matrix switches

Computer selection is managed by the operators themselves, allowing them to select the application they need at any given time and switch at will; instantly and cleanly.

Flexibility to move location

It is essential for crew members to be able to access information quickly and easily, no matter where they are. Physically moving to a dedicated location somewhere else in the ship to use a specific computer system takes time and reduces the efficiency of the crew – impacting on their ability to provide the best possible level of service and safety to customers. A KVM system adopted on these ships facilitates this requirement: operators can use any convenient workstation anywhere on the ship, at any time.

Back up and redundancy capabilities

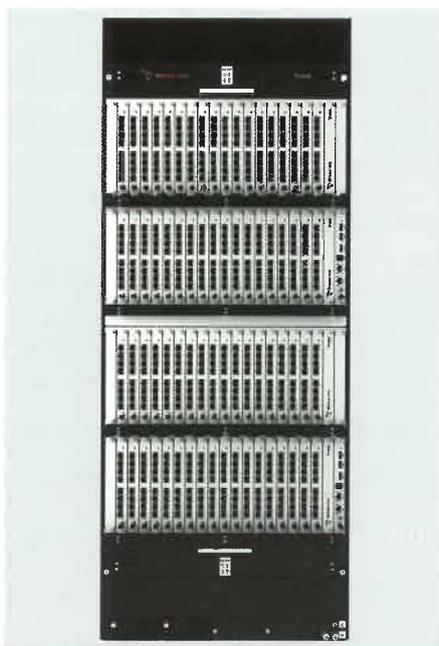
Loss of information is unacceptable in any circumstance. The KVM system is configured to incorporate substantial redundancy to ensure that should any component fail, the data will automatically switch to another route to reach the user. It also accommodates backup computers and user terminals. In the event of a failure of any primary device, a secondary backup computer or workstation can be instantly selected to keep the crew informed. It is even possible to control ships' services from other areas, given the right permissions and procedures.

Seaborne application beyond cruise ships

KVM extenders and switches are ideal for cruise ships. In addition, these systems are well-suited to other types of vessel. Their reputation and performance are proven in several different shipping activities.

On research and geophysical survey vessels, for example, KVM systems provide the essential links for scientists on upper decks to access remote computers located on decks far below. Seismic and other images and data are presented to them with no visible artefacts or corruption which means that they can thoroughly investigate the seabed or marine environment without the noise and clutter of electronic equipment in cramped spaces.

KVM systems are also used within integrated bridges on super-yachts, tugs and other craft. Undistracted focus on the bridge is extremely important and KVM extenders help by removing the noisy and distracting computing equipment whilst maintaining clear and accurate information to officers on the bridge.



A Draco tera matrix switch

Vital on land

The systems are used on land, too, for example in maritime control applications. Hong Kong Harbour's Vessel Tracking Centre is the most advanced in the world and responsible for ensuring safe passage of over 200,000 vessels moving through Victoria Harbour.

Operators and supervisors at the top of the control tower need accurate and timely information from the computers located several floors beneath them. Connection between the equipment on these decks is provided by KVM extenders and switches. These devices ensure that information is displayed exactly as produced by the computers so that operators do not miss vital information that could endanger vessels and lives at sea.

Reliability, flexibility and quality of data

Modern shipping spans a vast range of types and classes of vessel and applications. Every application is unique in scope, layout and type of source and destination device. IHSE KVM systems have been designed using a modular format so that it is possible to select just the components that satisfy a particular installation, without the need to install superfluous equipment. This saves cost, space and weight; particularly important characteristics of sea-going installations.

Prepare for the future

Modularity brings about additional benefits: systems can be extended as requirements change and new technologies evolve. One of the latest trends is the move toward IP connectivity and cloud distribution of data. This is already appearing in many video distribution and communication systems across a broad range of applications, including maritime.

However, it is essential that system integrators and shipowners pay heed to the security aspects of the systems they use. Any network that has external connection to the wider world is susceptible to cyber attack. Precautions must be taken to prevent these. IHSE systems generally operate in closed environments. However, the latest developments include the ability to connect to computers and workstations via IP connections – which enable even more remote connection functionality. An additional security layer, SecureCore, prevents unauthorised access to the KVM switches from IP-connected endpoints and ensures total security on board.