

## ► Vessel Systems Local Area Network - 10 Gigabit Ethernet

The Vessel Systems Local Area Network (VSLAN-10G) is an ultra-high-speed ship-borne data network, that facilitates and manages the transfer of time-critical command and control messages, multimedia streams and background file transfer from many sources to many destinations. The VSLAN architecture supports unicast, broadcast and multicast data transfer types. Optionally it can also provide for network synchronisation and message timestamping as well as sophisticated built-in test and network management.

The VSLAN-10G offers ultra-high-speed high overall data throughput performance and reliability while also flexibility and lower cost by offering both 10G and 1G connectivity to the node connections..

Apart from ship-borne applications, other typical applications are in real-time vetrionics systems as well as tactical command and control systems.

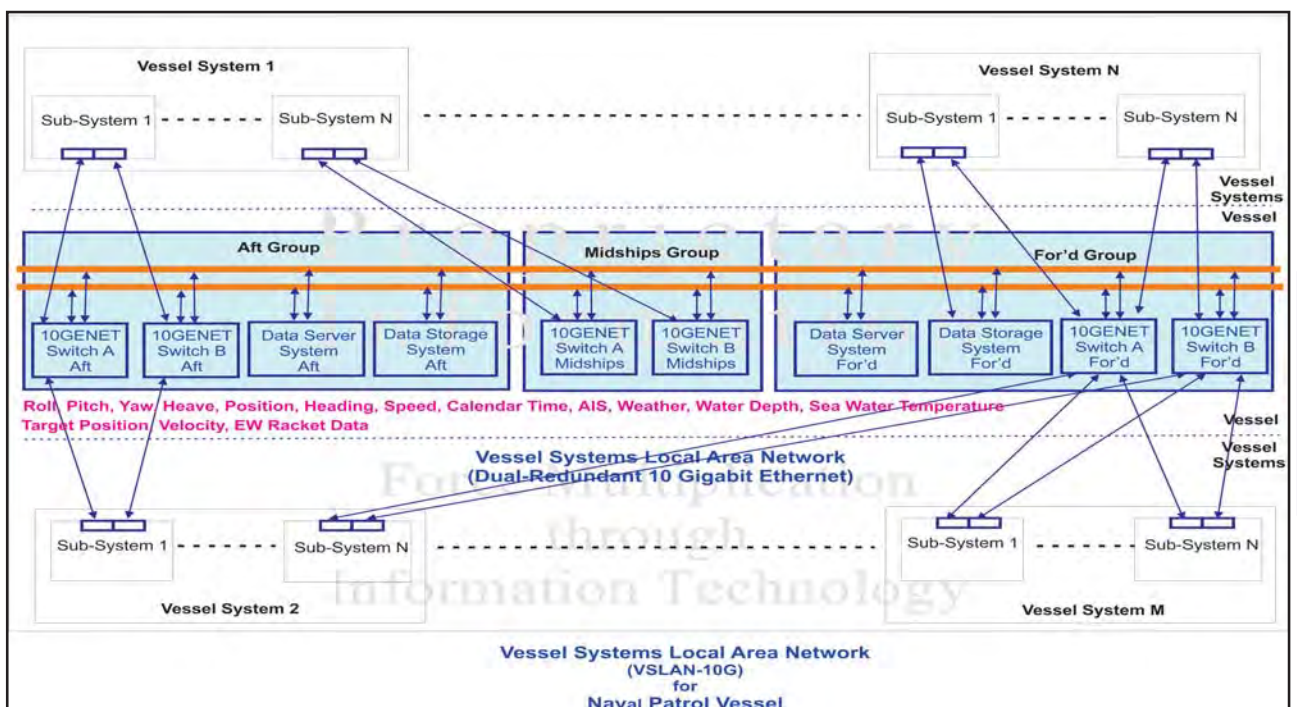
### VSLAN-10G Architecture

The 10 Gigabit Ethernet version of the VSLAN (VSLAN-10G) employs dual high-speed 10 Gigabit Ethernet (GENET) fibre optic channels in a backbone arrangement connected to pairs of 10 GENET Switches (typically Switch A and Switch B) in turn connected to the system nodes in a dual homed topology. The 10 GENET switches have 10G uplinks and downlinks and a numbers of 10G node connections plus a greater number of 1G node connections.

The node-to-switch connections can be using either 10G or 1G fibre or 1G copper media and can be dual connected (dual homed) or single connected. Each node employs a Dual Channel 10 Gigabit Ethernet or 1 Gigabit Adapter which is physically part of the node, but functionally part of the VSLAN.

The 10 GENET Adapter is an intelligent network interface card which offloads processing load from its host processor by performing protocol processing (such as checksumming) in software.

The VSLAN supports the TCP/IP and UDP/IP protocols as standard as well as real-time protocols such as the Real-Time Transport Protocol (RTP) and the Precision Transport Protocol (PTP) as optional.



### VSLAN-10G

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### Functions

#### Application Interface (optional)

- Application Interface Services (APIS) - Real-Time Message-Oriented Middleware (MOM)

#### Transfer Control Data

- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- Real-Time Transport Protocol (RTP) (optional)
- Internet Protocol (IP)

#### Transfer Bulk Data (optional)

- File Transfer Services (FTP)

#### Network Time Services (optional)

- Precision Time Protocol (PTP) and Packet Timestamping

#### Network Management Services (optional)

- Built-in Test Services (BITS)
  - LAN Adapters, Cable Plant
- Simple Network Management Protocol (SNMP V2.0)
- Graphical Human-Machine Interface
- Operator-Assisted Trouble-Shooting, Maintenance and Reconfiguration

#### Operating System Support

- VxWorks, Linux, Windows

#### Cable Plant

- 9 µm / 125 µm Singlemode Fibre Cable Plant (standard)
- Dual-Redundant (standard)
- Marinised COTS Switches
- Trunk Coupling Units (optional)

### Features

- Multi-Protocol Support
- Multi-Formfactor Support (XMC, PCI)
- NICs in air-cooled and conduction-cooled versions and commercial, industrial and ruggedised grades
- Ruggedised Fibre I/O Connectors (ST)

### Performance

- 10 000 Mbps raw bandwidth
- > 900 Mbps node-to-node data throughput (> 1 000 byte messages)
- < 950 µs end-to-end latency (< 1 000 byte messages)
- 30 ms to 100 ms link failover time
- < 250 µs node-to-node synchronisation accuracy (2  $\sigma$ )