Application Note

CONNECTING MARITIME VESSELS TO THE CLOUD

New digital technologies have the potential to transform the commercial maritime market by paving the way for cost savings, process improvements, and enhanced crew safety.
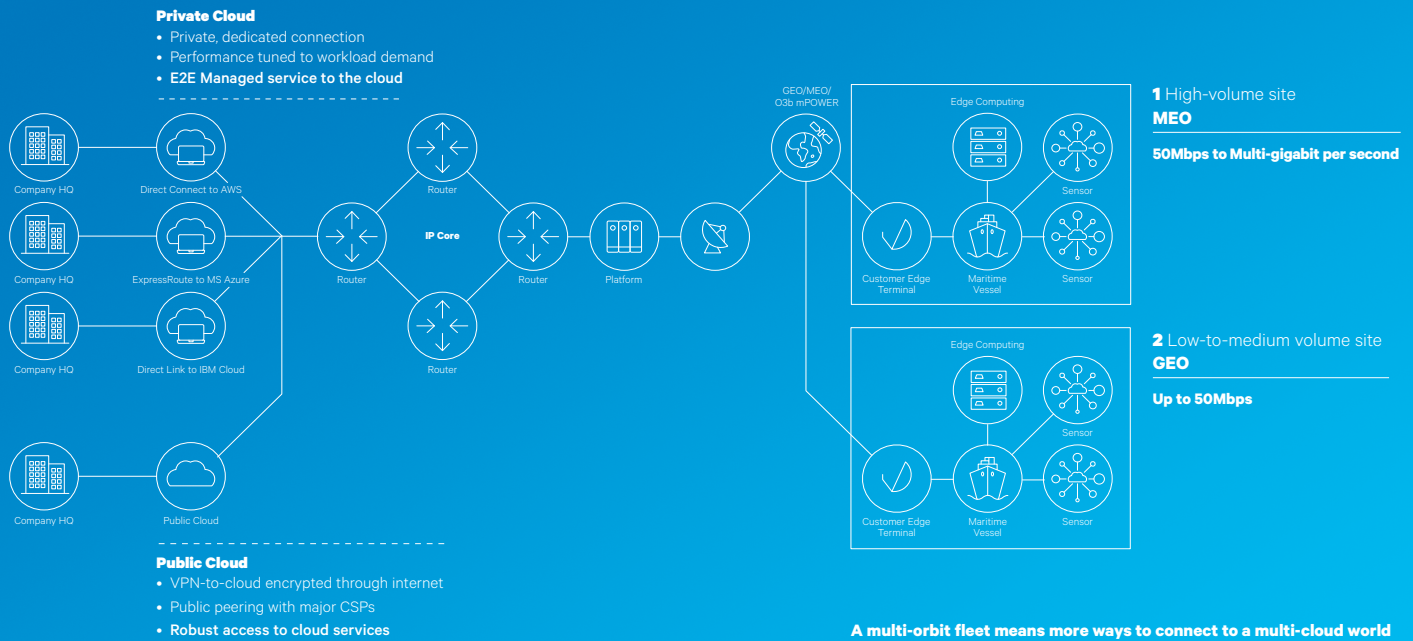
Next-generation solutions such as predictive maintenance, artificial intelligence, electronic logbooks, and blockchain are top of mind for ship owners and operators, with two-thirds of respondents in a recent survey launching their digital transformation initiatives. The ongoing repercussions of the COVID-19 pandemic will further accelerate adoption of digital solutions, as the industry adjusts to disrupted supply chains and new concerns around seafarers' health and wellbeing.

This represents a major shift for the commercial maritime industry, which has long been dominated by manual systems and processes. However, market and regulatory pressures have begun to drive adoption of digital solutions and capabilities:

- New requirements around electronic data sharing between ships and ports are driving momentum for cloud-based platforms that can facilitate the exchange of information on cargo, crew, and passengers – reducing errors, improving tracking and traceability, and minimising freight waiting and stopover times.
- Real-time sensor data gathered from onboard equipment and systems can be leveraged to create virtual models of vessels, allowing onshore engineers to do scenario planning, schedule maintenance more efficiently, and identify potential safety concerns.
- Fuel optimisation systems combine data about engine performance with external information such as weather, draft and trim, and hull fouling to ensure the most efficient use of fuel.
- Blockchain technology has the potential to minimise the need for manual intervention or processing, saving time and transaction costs.
- Cloud-based videoconferencing systems can support learning and telehealth services developed to keep crew safe and healthy while at sea.

Leveraging the cloud can help ship owners and operators mitigate the risk and cost of deploying these innovative new digital technologies. Moving key workloads to major cloud platforms means ship owners don't need to acquire and maintain expensive on-premises systems, while also enabling them to capitalise on consumption-based pricing that lets them scale their solutions as needed. By transferring sensor data from the vessel to the cloud for processing and analysis, ship owners can gain valuable insights into the performance of onboard systems, while machine learning algorithms help guide them to decisions that will make every journey as cost-effective and safe as possible.

SES

Private Cloud
- Private, dedicated connection
- Performance tuned to workload demand
- **E2E Managed service to the cloud**

Company HQ

Direct Connect to AWS

Company HQ

ExpressRoute to MS Azure

Company HQ

Direct Link to IBM Cloud

Company HQ

Public Cloud

Router

Router

IP Core

Router

Router

Platform

GEO/MEO/
O3b mPOWER

Edge Computing

Customer Edge
Terminal

Maritime
Vessel

Sensor

Sensor

1 High-volume site
MEO

50Mbps to Multi-gigabit per second

Edge Computing

Customer Edge
Terminal

Maritime
Vessel

Sensor

Sensor

2 Low-to-medium volume site
GEO

Up to 50Mbps

Public Cloud
- VPN-to-cloud encrypted through internet
- Public peering with major CSPs
- **Robust access to cloud services**

A multi-orbit fleet means more ways to connect to a multi-cloud world

EXTENDING THE CLOUD TO SEA

As the only satellite-enabled network services provider with a commercially proven multi-orbit fleet, we ensure that maritime users are able to access the full range of cloud services, even from the middle of the ocean. With the ability to deliver private, dedicated connectivity to the cloud over Medium Earth Orbit (MEO) or Geostationary Earth Orbit (GEO) links — or a combination of the two — we ensure that cloud users can access the technology they need to execute on their digitalisation initiatives. Remote sites everywhere are just one hop from major cloud data centres, providing cloud customers with the high-quality connectivity they need to migrate their operations to the cloud.

Supporting "smart ship" data volumes
Smart vessels have thousands of sensors that generate multiple gigabits of sensor data each day — data that then needs to be transferred to cloud platforms for processing and analysis. Our satellite-enabled network has the capacity required to support smart ship data volumes, with the ability to scale as their digitalisation efforts ramp up.

Application-aware connectivity
Different maritime use cases have specific network performance requirements. Our advanced software capabilities allow us to combine multiple satellite links to create application-aware network services, ensuring that critical cloud workloads receive the right level of connectivity, backed by the appropriate service level agreements (SLAs).

Reliability with global reach
Mission-critical cloud-based maritime applications such as weather routing, engine monitoring, and telehealth rely on solid connectivity wherever the vessel may sail. Our multi-orbit fleet of interlinked high-throughput and widebeam satellites ensures any ship can access seamless, reliable cloud-native connectivity—regardless of its location or size.

Scalability to support digital evolutions
As the commercial maritime industry continues its digitalisation path, vessels will generate exponentially greater volumes of data. We enable a consumption-based model that lets ship owners scale up their bandwidth investments easily and cost-effectively as they expand their use of cloud-connected onboard systems.

A path to the future
As the maritime industry evolves its digital transformation, our network is evolving with it. Our next-generation O3b mPOWER system builds on our market-proven MEO capabilities, delivering the flexibility, performance, and scale essential for cloud services. Dedicated, private connections from remote sites to the nearest cloud data centre ensure the performance and latency ship owners and operators need for their cloud applications.

Learn more about SES's full portfolio of services and solutions.
Website: **ses.com**