Building a Cyber Safe and Resilient Maritime Ecosystem

Ong Chin Beng

Chief Information Security Officer

Maritime and Port Authority of Singapore

Growing Maritime Risk: Cybersecurity

Global Risks Report 2023
Top 10 Risks

WORLD ECONOMIC FORUM

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

2 years	10 years
1 Cost of living crisis	1 Failure to mitigate climate change
2 Natural disasters and extreme weather events	2 Failure of climate-change adaption
3 Geoeconomic confrontation	3 Natural disasters and extreme weather events
4 Failure to mitigate climate change	4 Biodiversity loss and ecosystem collapse
5 Erosion of social cohesion and societal polarization	5 Large-scale involuntary migration
6 Large-scale environmental damage incidents	6 Natural resource crises
7 Failure of climate-change adaption	7 Erosion of social cohesion and societal polarization
8 Widespread cybercrime and cyber insecurity	8 Widespread cybercrime and cyber insecurity
9 Natural resource crises	9 Geoeconomic confrontation
10 Large-scale involuntary migration	10 Large-scale environmental damage incidents

Risk categories
Economic Environmental Geopolitical Societal Technological

DNV
WHEN TRUST MATTERS

MARITIME CYBER PRIORITY 2023

Staying secure in an era of connectivity

Ransomware attacks continues to expand in maritime sector from new and existing ransomware groups with updated tactics.

On 4 July 2023, cargo operations at the Port of Nagoya were crippled for two days

MPA
SINGAPORE

DIGITAL PORT ECOSYSTEM

digitalPORT@SG™
Port of Singapore's maritime single window that serves as a key node to enable more efficient, seamless and integrated port services, and paves the way for further digitalisation of port and marine services.
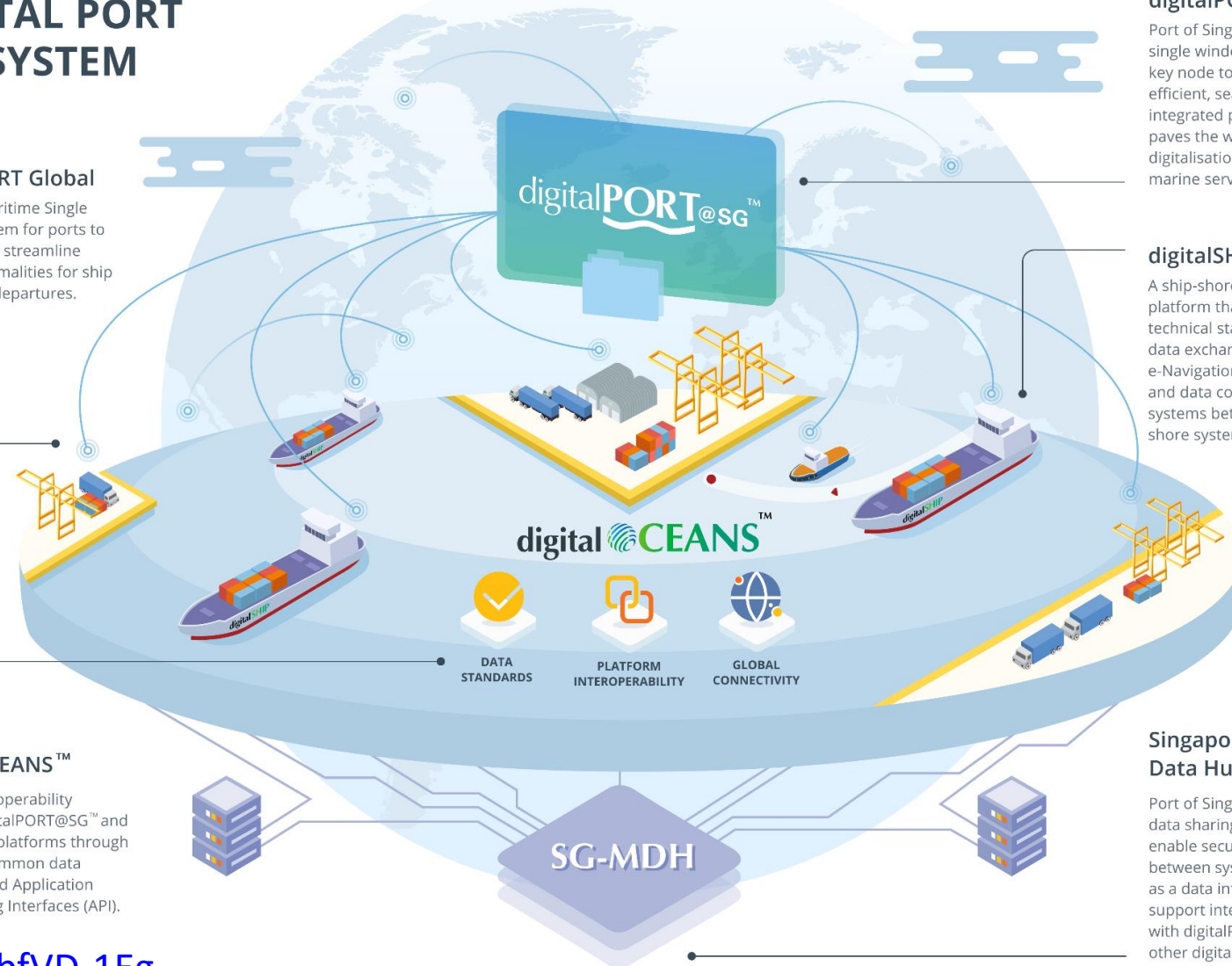
digitalPORT Global
A generic Maritime Single Window System for ports to digitalise and streamline reporting formalities for ship arrivals and departures.

digitalSHIP™
A ship-shore interoperability platform that focuses on technical standards for data exchange of e-Navigation services and data communication systems between ship and shore systems.

digitalOCEANS™
Fosters interoperability between digitalPORT@SG™ and other digital platforms through the use of common data standards and Application Programming Interfaces (API).

**Singapore Maritime Data Hub (SG-MDH)**
Port of Singapore's one-stop data sharing platform to enable secure data exchanges between systems and to serve as a data infrastructure to support integration of services with digitalPORT@SG™ and other digital systems.

DATA STANDARDS | PLATFORM INTEROPERABILITY | GLOBAL CONNECTIVITY

https://youtu.be/KvMbfVD-1Eg

NOT FOR GENERAL CIRCULATION

MPA SINGAPORE

Strengthening Cyber Resilience: Maritime Cyber Assurance and Operations Centre (MCAOC)

To enhance cyber resiliency of the Maritime Singapore, MPA will collaborate with industry to strengthen early detection, monitoring and response, analysis and information sharing of cyber threats by expanding existing Maritime Security Operations Centre supporting the cyber risk management of critical information infrastructure to a Maritime Cyber Assurance and Operations Centre (MCAOC) from 2025.
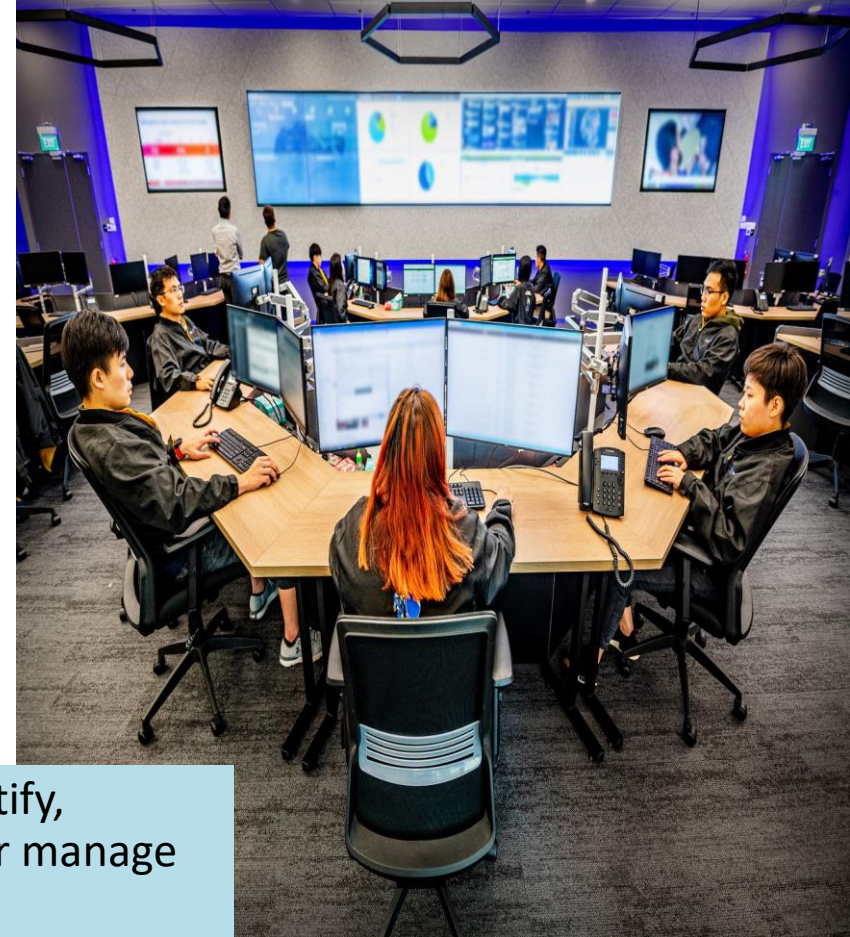
- 24/7 maritime sector wide detection and operational centre, which can help to identify, analyse, assess and provide cybersecurity advisories, and allow participants to better manage cyber risks, and implement active mitigation plans.

- Maritime critical information infrastructure community will operate from the MCAOC, which will also include time-critical services by firms.

- **We welcome industry partners and their cyber teams to operate from MCAOC, which can bring cyber specialists, engineers and architects together, upskill our maritime workforce and conduct exercises with like-minded partners.**

MPA
SINGAPORE

International and Industry Partnerships

Int' Partnership on Maritime Cybersecurity

Port Authorities CIO Cybersecurity Network (PACC-Net) Table-top Exercise

MPA-SSA Cybersecurity Roundtable

Exercise CyberMaritime

Industry Partnership: CyberSafe framework for maritime industry including development of maritime cybersecurity standards to support building up of cyber capabilities

MPA SINGAPORE

Maritime Testbed of Shipboard Operational Technology (MariOT) System

- MPA, in collaboration with Singapore Maritime Institute (SMI) and SUTD, is developing the world's first industrial-grade cyber-physical <u>Mari</u>time testbed of shipboard <u>OT</u> systems (MariOT) to offer a safe and realistic testing environment for cybersecurity technologies without affecting actual vessel operations

Objectives

- **Train** maritime professionals (engineers, operators, crew)

- Safe, realistic, large-scale platform for **cyber exercises & drills**

- **R&D** of ship side cybersecurity technologies

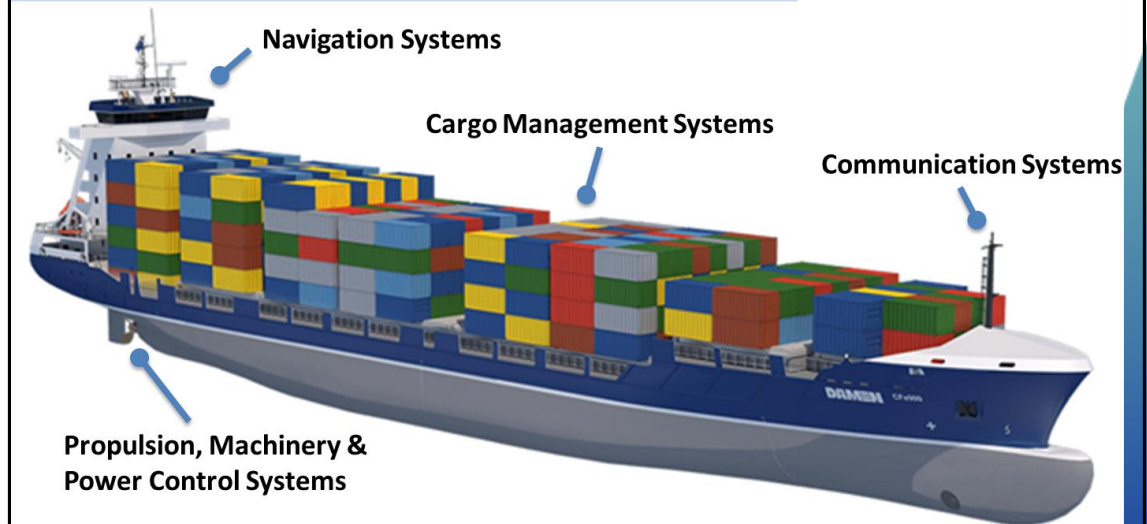- **Technology validation** / testing / certification

Benefits

- Increase **cybersecurity posture** of shipping community

- Complement annual sectoral maritime **table-top exercise** led by MPA

- Spur **growth of R&D** of cybersecurity technologies for maritime sector

Components of MariOT

- Navigation Systems
- Cargo Management Systems
- Communication Systems
- Propulsion, Machinery & Power Control Systems

Towards Tuas

4 Phases
2021 - 2040

1337
ha of land

65
MTEU Capacity

City Terminals
(Up to 2027)