



WHEN TRUST MATTERS

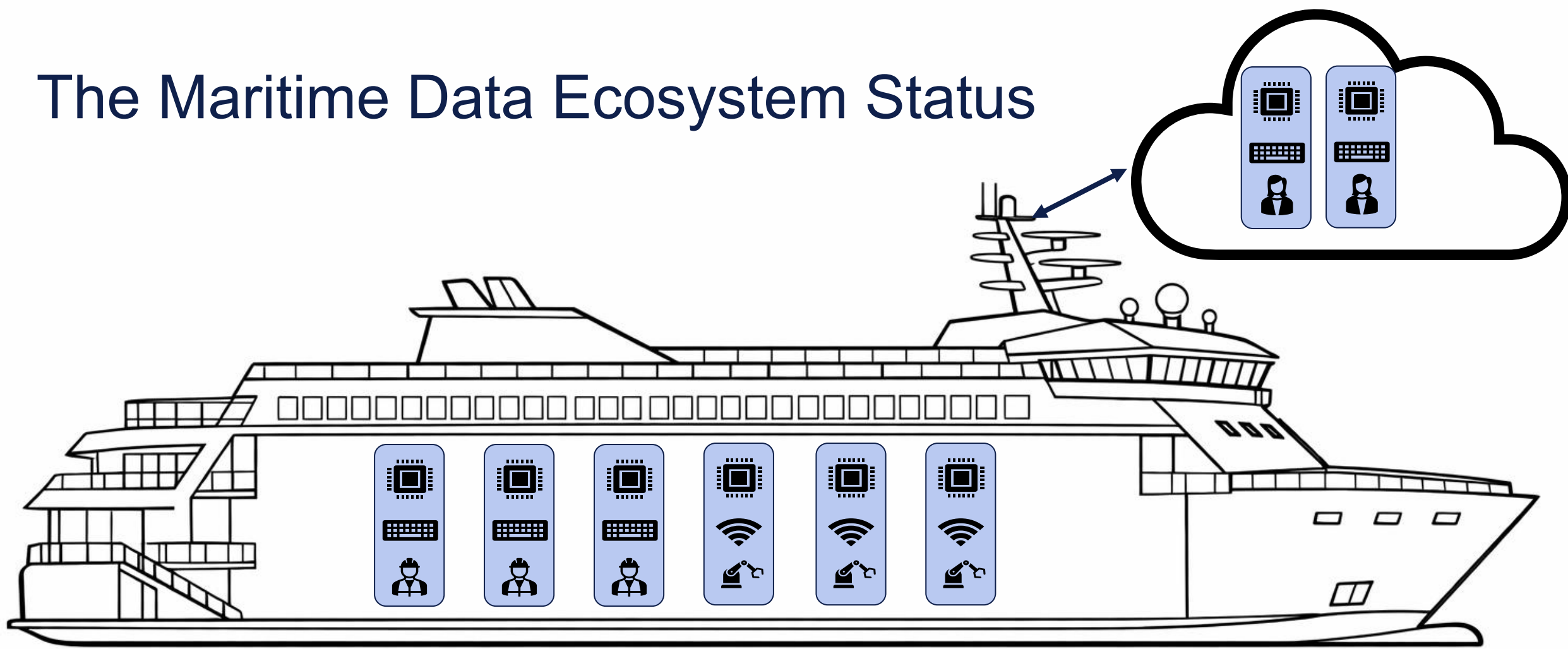
ITxMaritime

Semantic Data Contracts for Maritime Interoperability

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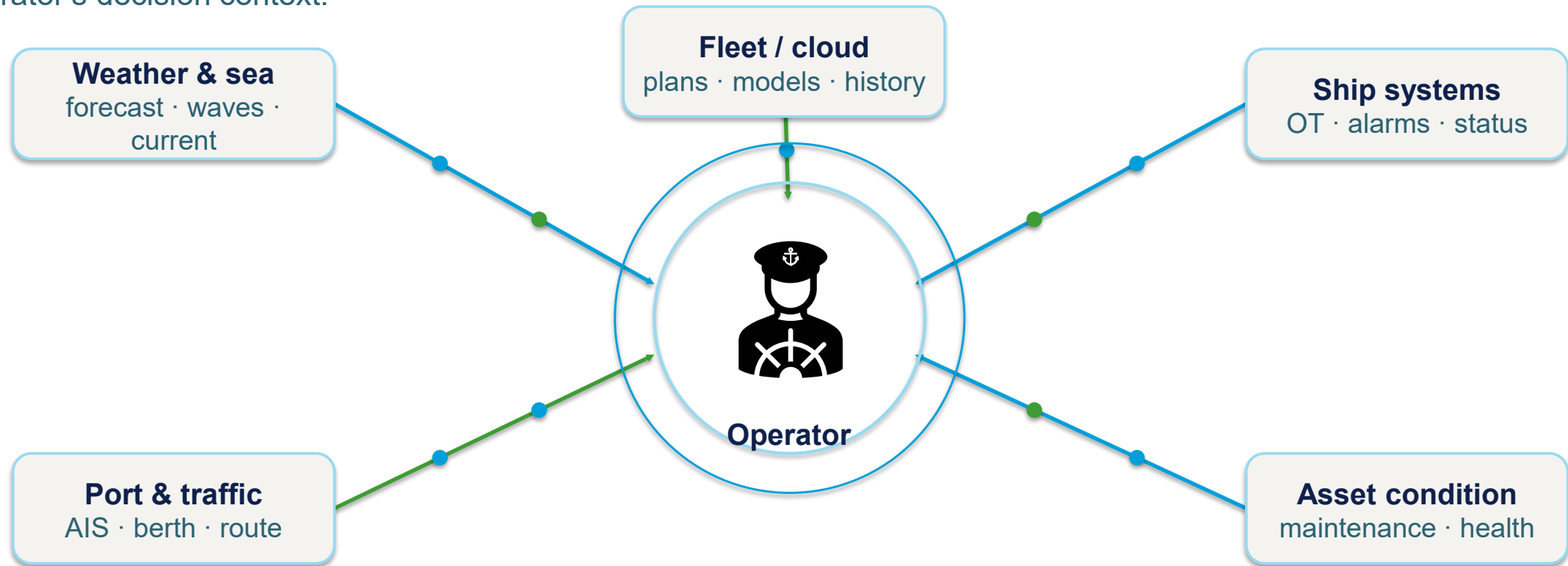
The Maritime Data Ecosystem Status



- Multiple hardware and software systems exist on and off the ships
- Interoperability is based on dedicated system integration on operational technologies (OT)
- Very limited interoperability on the information layer (IT)

Interoperability Use Case: Decision Support

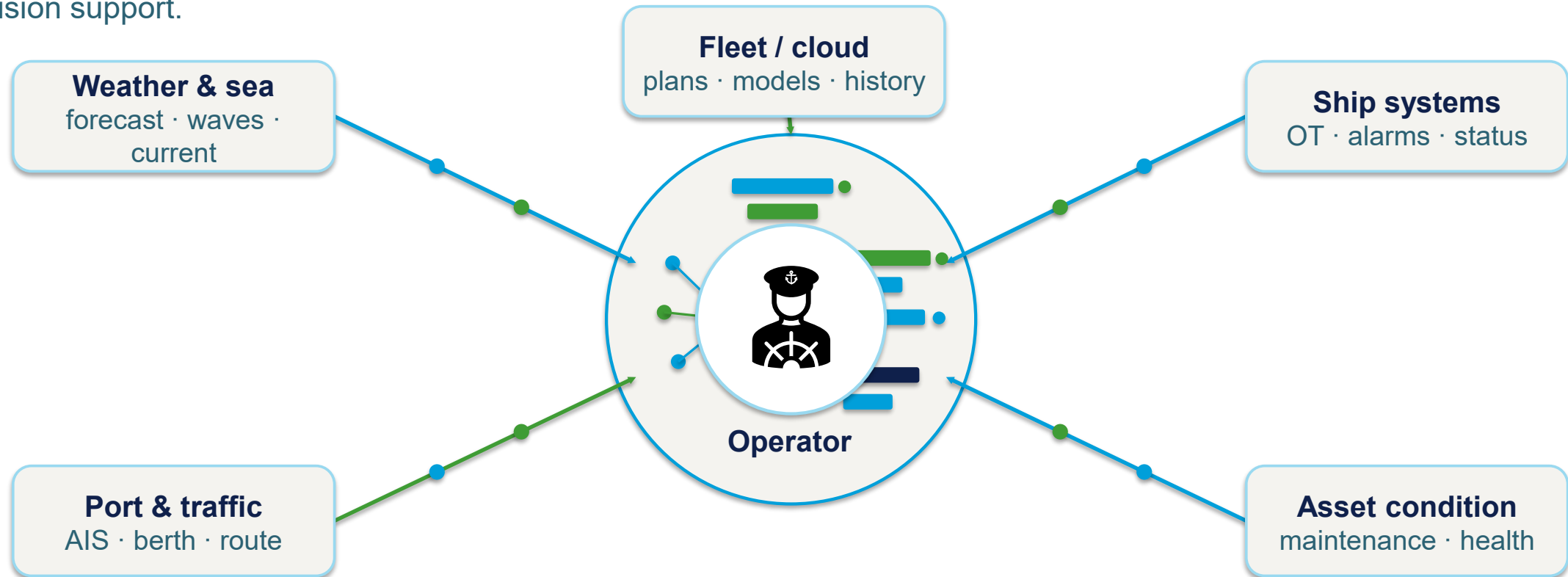
Operational, environmental and ecosystem data streams converge into the operator's decision context.



- Which data is needed to make the 'best' decision?
- When do the data need to be available to support the best decision?

Decision Support

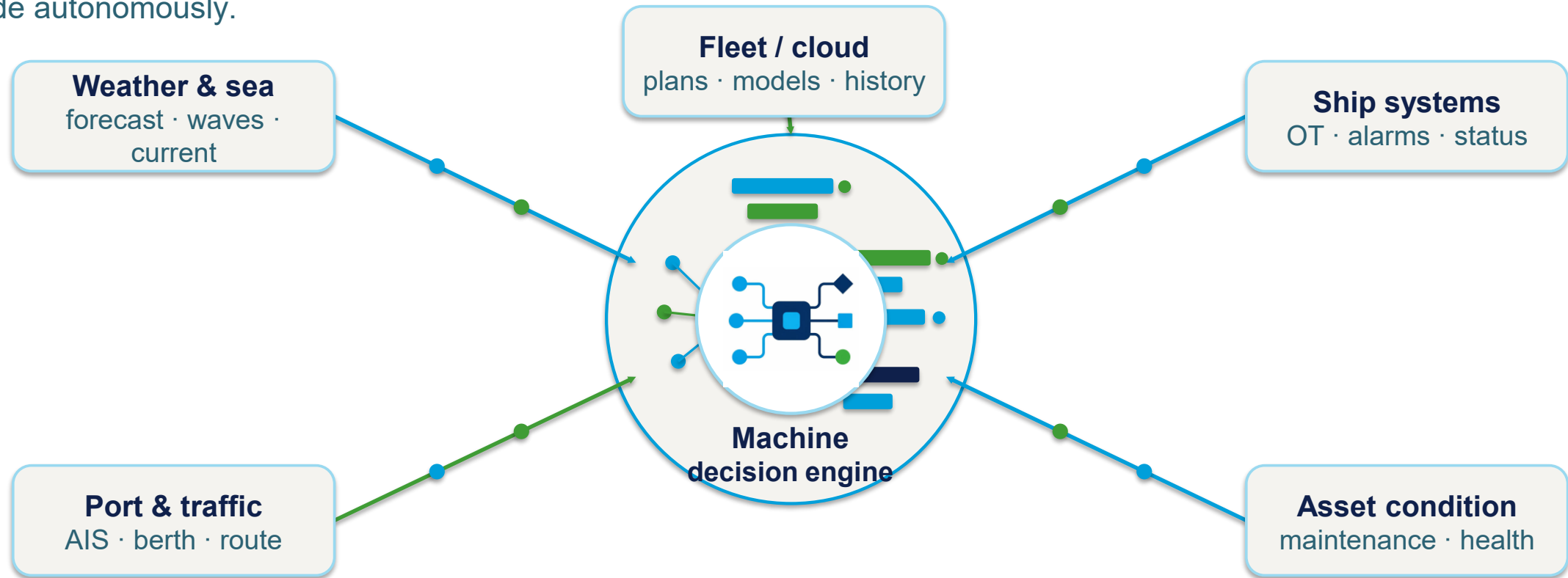
Data streams are contextualized around the operator so the information becomes decision support.



- How to combine and present the data to allow the operator to make the best decision
- Making the data available at multiple locations allowing for remote operations

Automated/autonomous decisions

Data streams are contextualized by the machine so decisions can be automated or made autonomously.



- All required data must be made available (interoperability)
- Data must be contextualized allowing for machine interpretability and reasoning

OPEN DATA STANDARDS FOR MARITIME

ITxMaritime is a new international, non-profit association dedicated to enabling true interoperability across the maritime sector.

Discover the ITxMaritime membership

This is ITxMaritime

Our purpose is simple



Foster a member led community

Create a collaborative space where members contribute and benefit together.



Create the best standard for interoperability

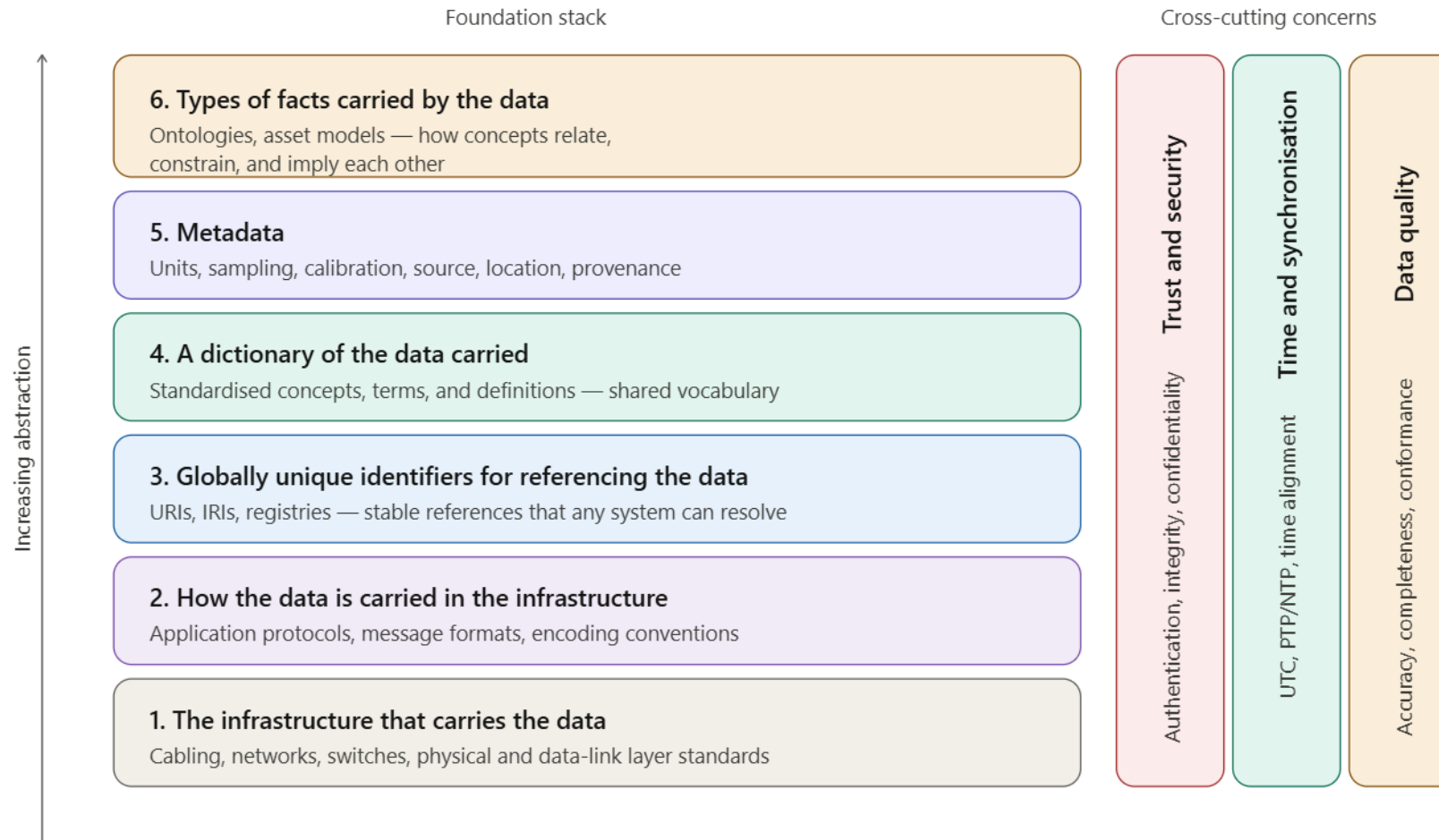
Help the industry adopt existing standards and develop new specifications



Facilitate innovation and collaboration

Support compatibility, innovation, and efficiency in an increasingly digital maritime world

Hierarchy of standards for data interoperability



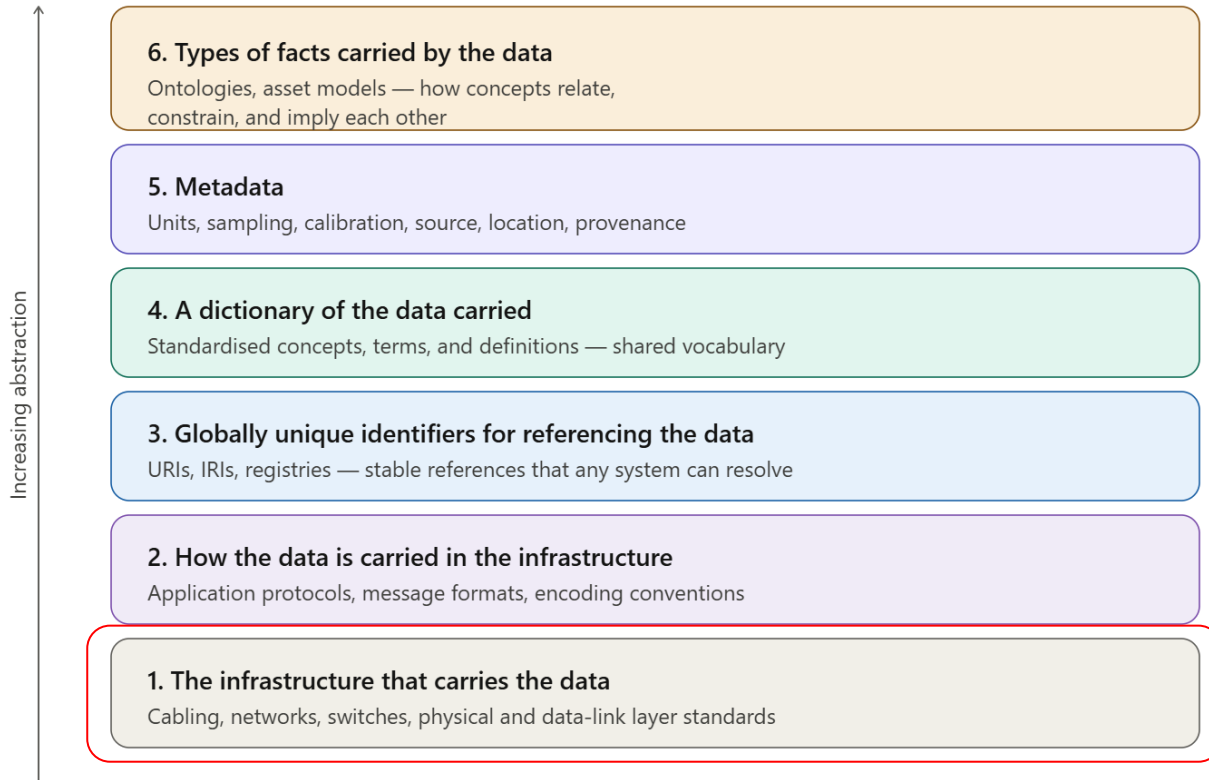
Higher foundation layers depend on those beneath them

Cross-cutting concerns apply at every layer of the stack

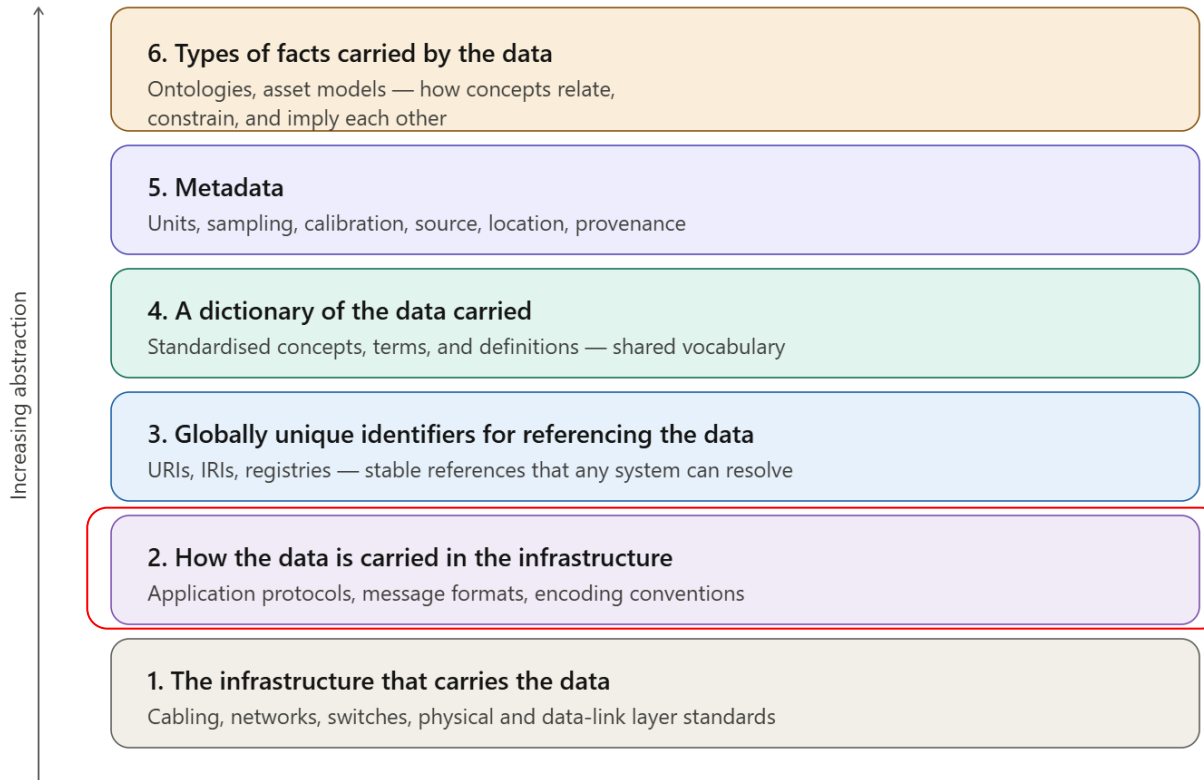
Weak standardisation at any layer or cross-cutting concern limits what can be achieved

Infrastructure

- Reusing a combination of existing standards

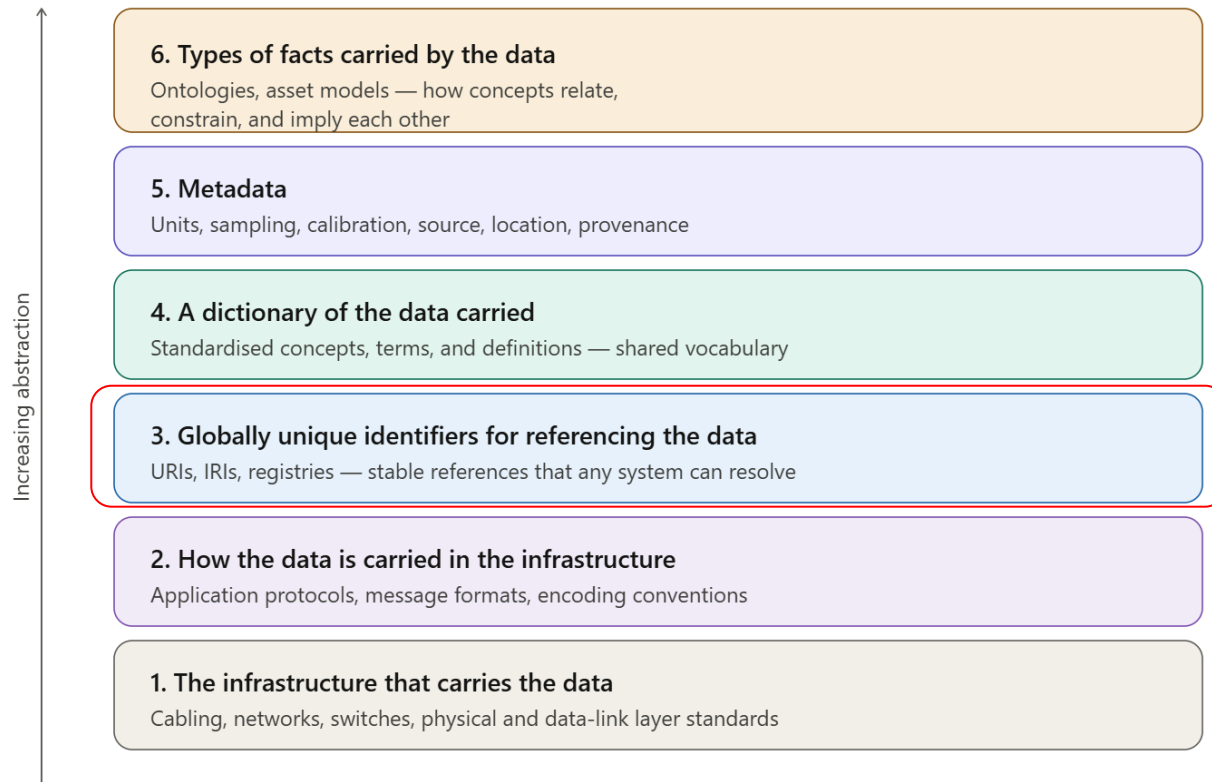


How data is carried



- Web of Things approach:
 - Protocol independence through creating a uniform way of exposing protocols under a single conceptual model. As a result, the producers and consumers do not have to commit to a single protocol ecosystem
 - Provides a uniform abstraction of different ‘things’ regardless of what the thing actually is (sensor, control system, software etc.)
 - Support for semantic annotations through references to external vocabularies and ontologies using JSON-LD
 - Web technologies and standards as a foundation including existing tooling, web security and authentication mechanisms
 - Discovery built in
 - Lifecycle and configuration support

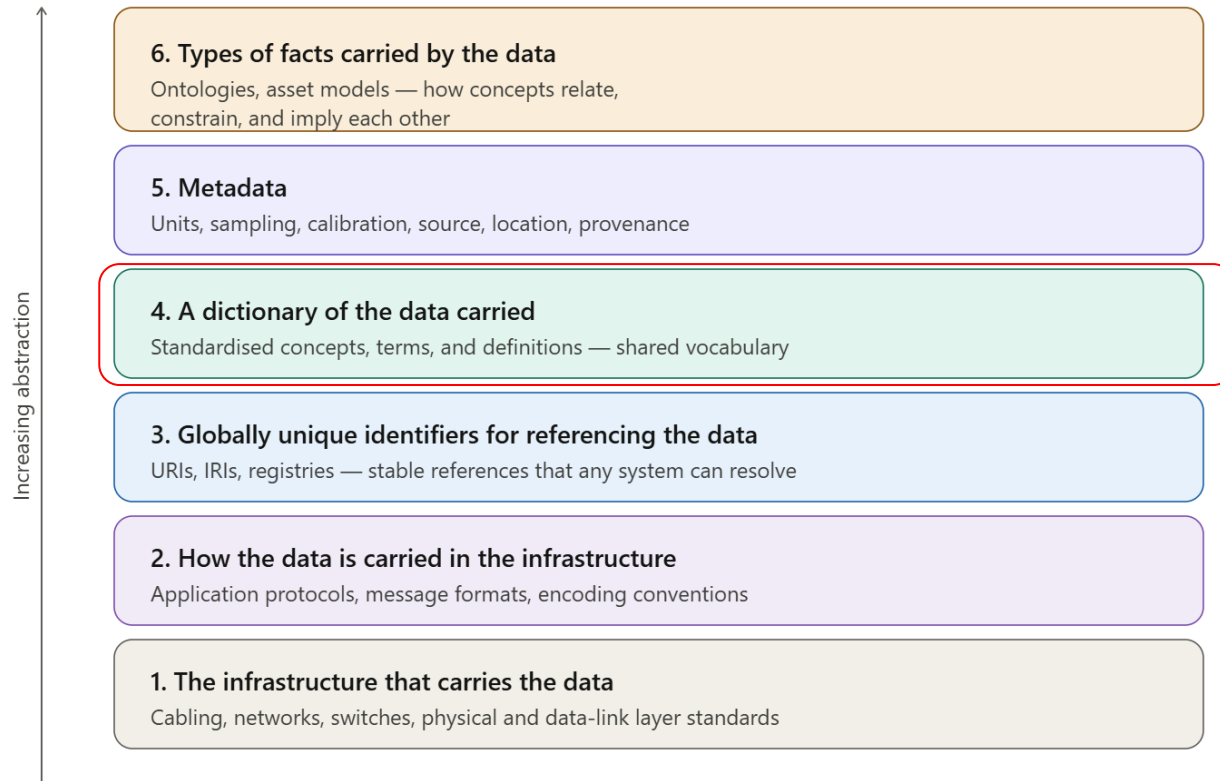
Globally Unique Identifiers



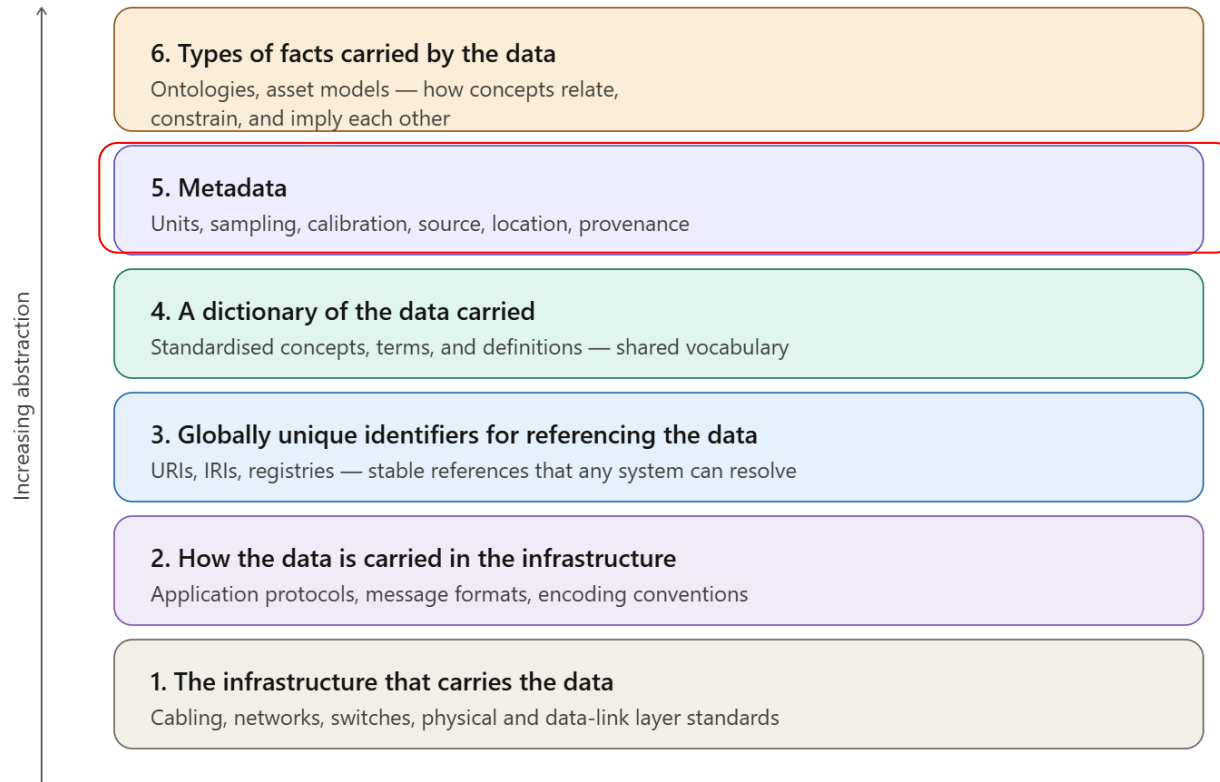
- Reusing existing GUIs where these exist
- Establish and manage domain specific GUIs where these do not exist and are required by use cases

Dictionary of data

- Establish and manage a comprehensive standardized dictionary of maritime data
- Reuse as far as possible what already exists



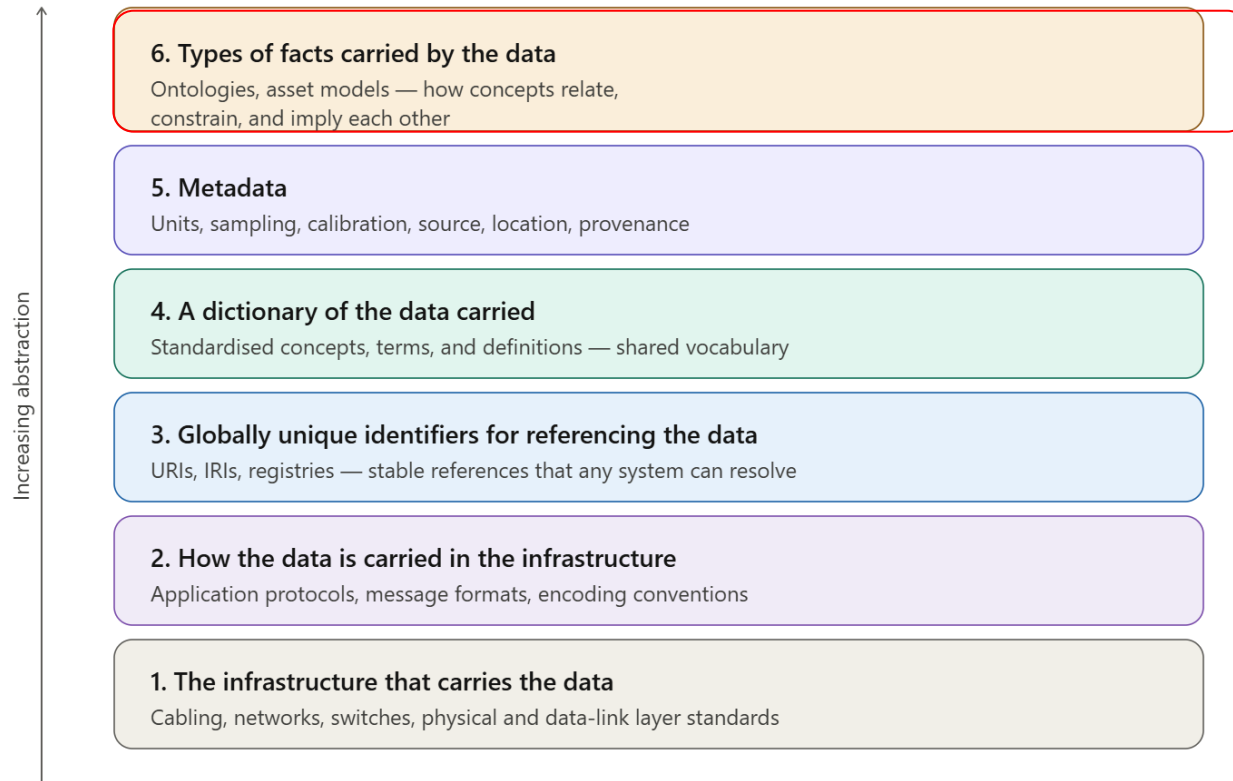
Metadata



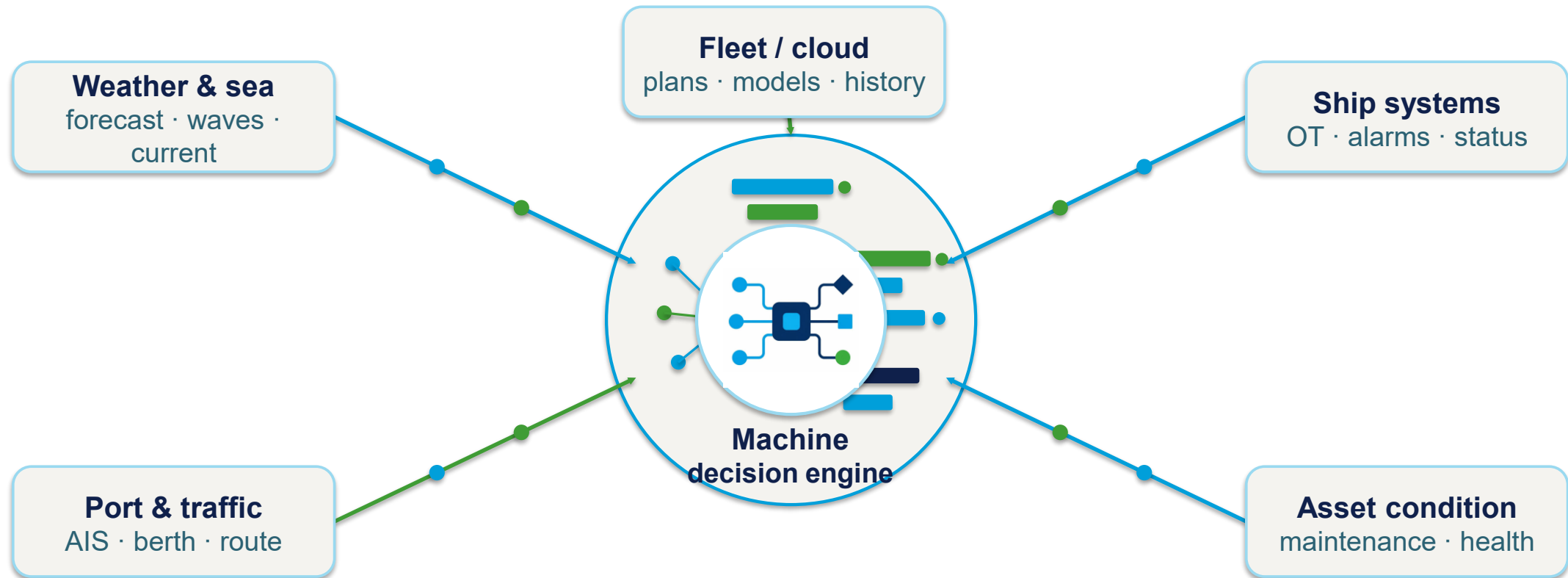
- Reuse cross industry metadata standards
- Establish and manage industry specific metadata standards when required by the use case

Types of fact carried by the data

- Implementation of rich semantic representations based on the principles defined by Industrial Data Ontologies (ISO 23726-3)

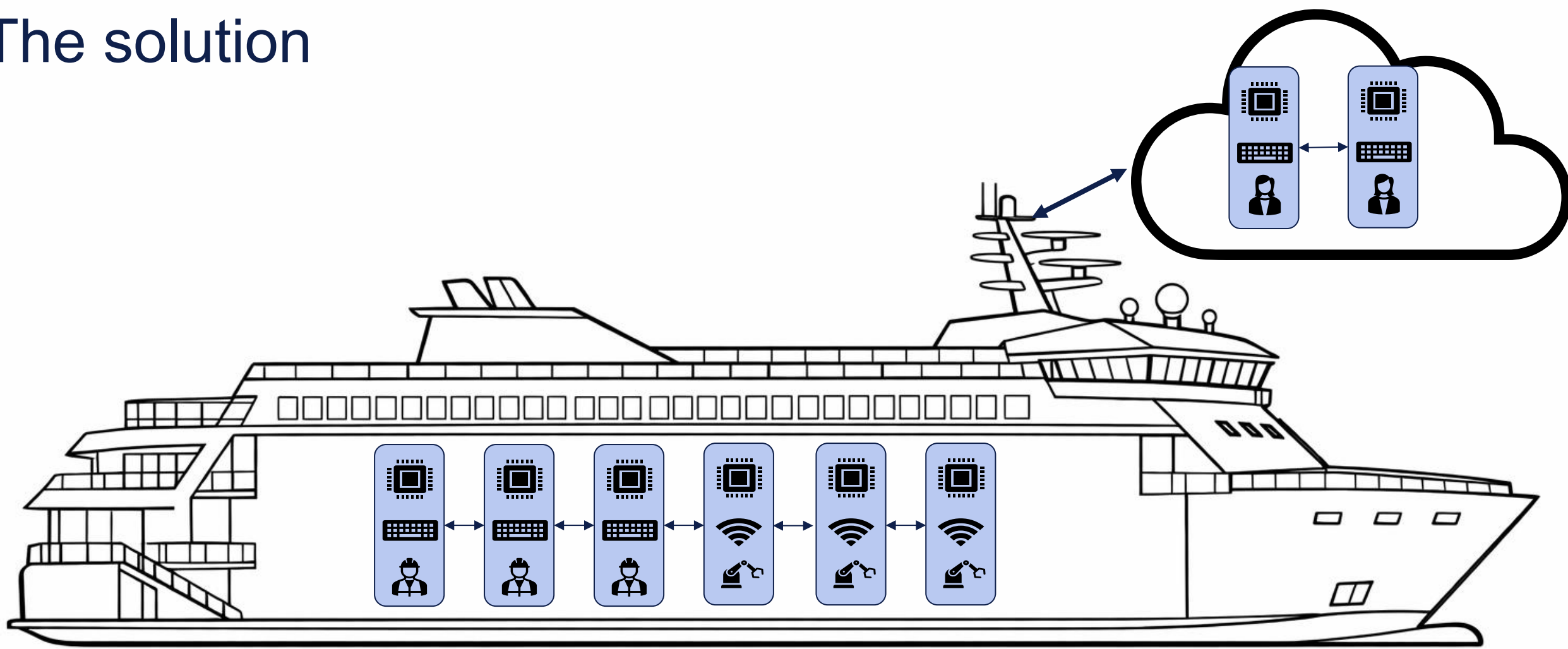


Standards enabling value creation



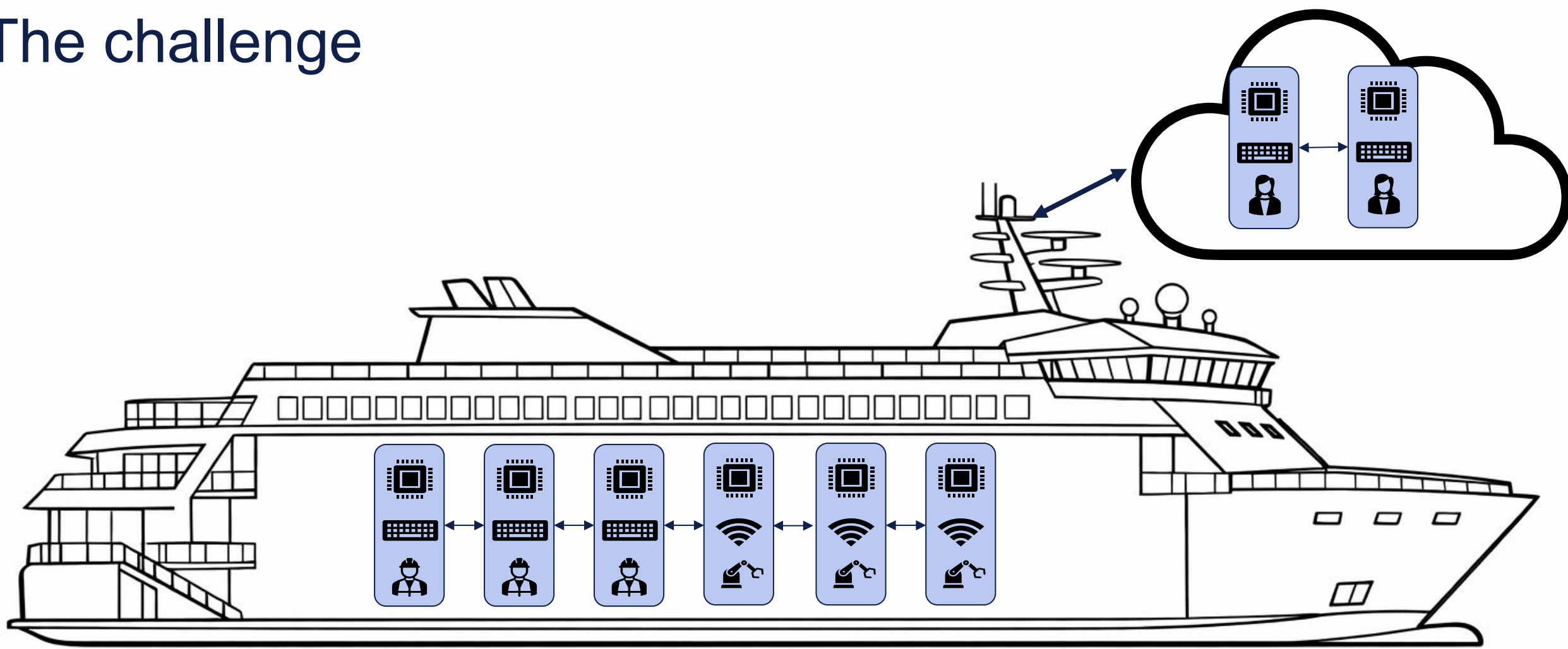
- Deploying the full stack of standards should enable the use case by implementing semantic data contracts

The solution



Enable cost effective data interoperability through standardization
Enable value creation through semantic data contracts

The challenge



- Convince the industry that it is not only important to standardize data contracts, but also how you do it.
- Educate buyers that it is important to implement this in contracts towards their suppliers