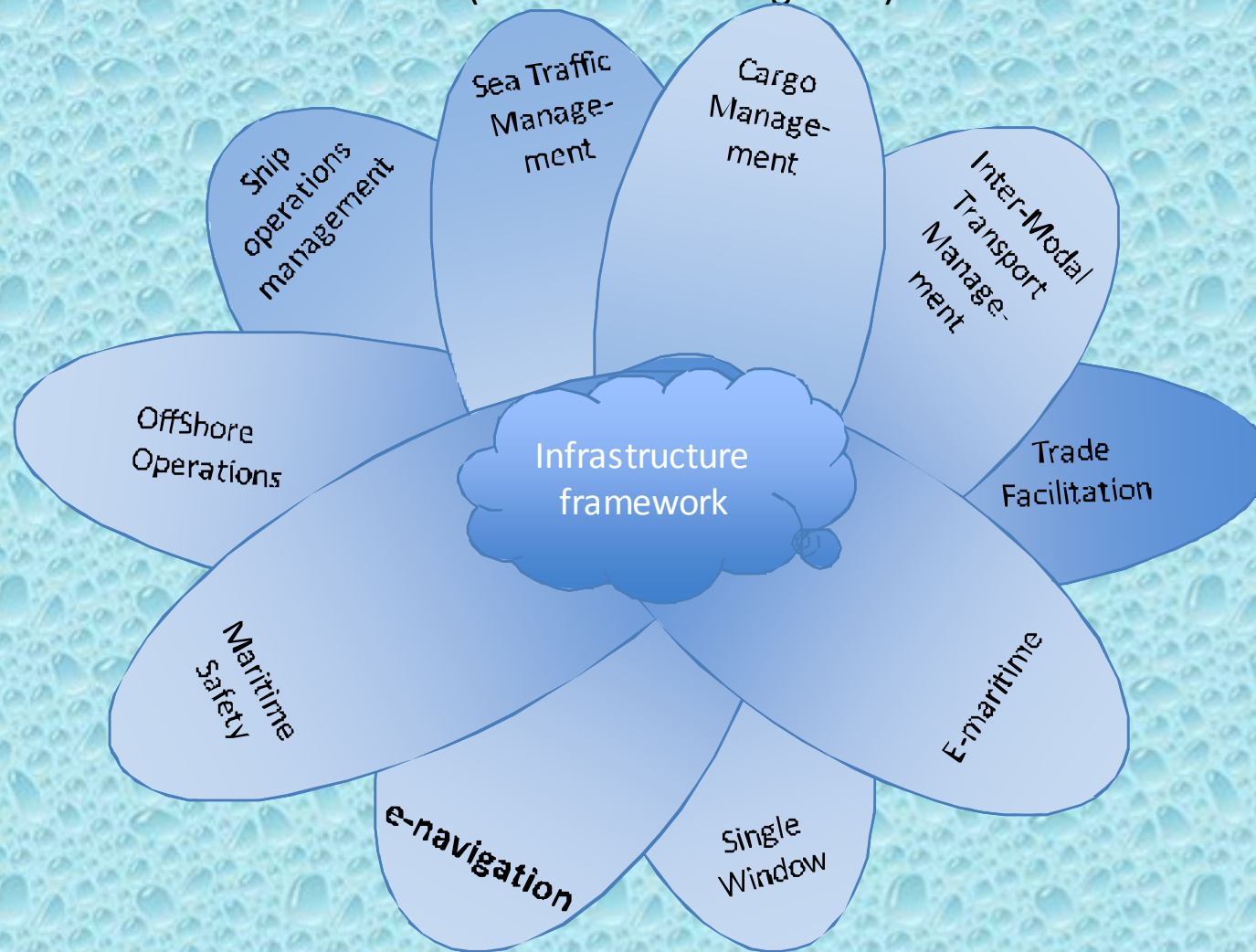


A Maritime Infrastructure Framework

(... also for e-navigation)



Jens K. Jensen
Danish Maritime Authority



Mikael Lind
Viktoria Swedish ICT AB



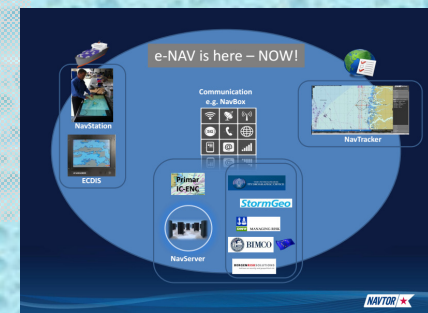
Kwangil LEE
ETRI, Republic of Korea



An infrastructure for e-navigation

(MSC 85/26/Add.1, Annex 20 + 21)

“A communication infrastructure providing authorized seamless information transfer on board ships, between ships, between ship and shore and between shore authorities and other parties with many related benefits.”



SeaSWIM enabling System Wide Information Management for maritime operations



ENAV16-9-23

How the Maritime Cloud supports e-navigation

Means for standardized and automated reporting

Service discovery Service description language Authentication of vetted identities

Improved reliability, resilience and integrity of bridge equipment and navigation information

Seamless roaming – resilient selection of communication link

Validation of Authenticity and integrity of information

Integration and presentation of available information in graphical displays received via communication equipment

Seamless roaming – resilient selection of communication link

Improved communication of VTS service portfolio

Automatic Service discovery + Service Variants => facilitate transition

Functions of Maritime Cloud

ENAV16-9-23 : MC from e-nav perspective

- **Seamless roaming**

- **Global unique identification** with location independence
- Independence on **types** and **available physical communication link**
- Support various **communication service**, i.e geocasting

- **Dynamic service discovery**

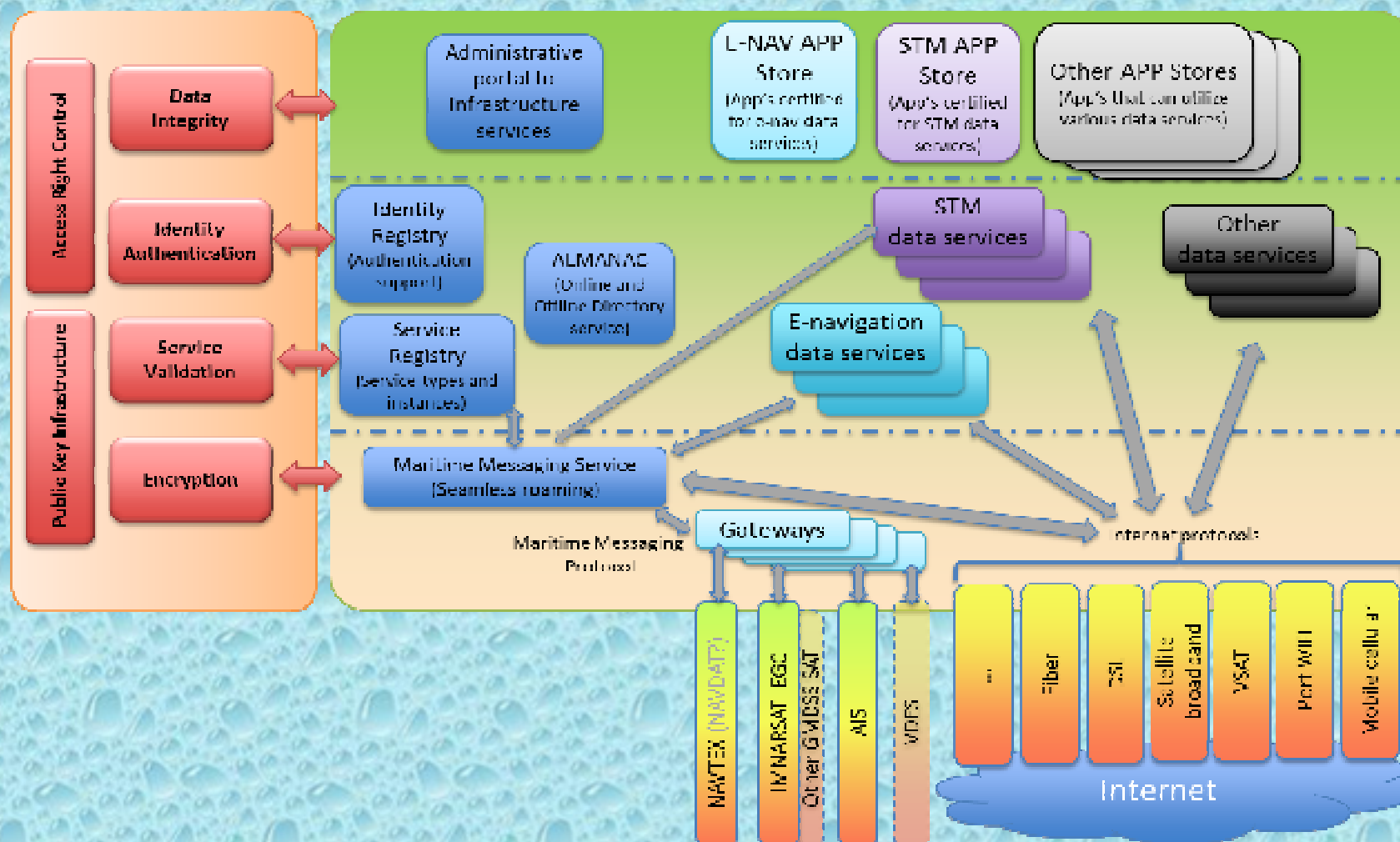
- Open standard for service specification and its interface
- Enabling dynamic service discovery for existing and future services
- **ALMANAC** : dynamically, downloadable, digital publication for available services

- **Authentication Infrastructure**

- **Authentication** : enabling **trust chain** through methods for handling Identity including Public Key Infrastructure(PKI)
- **Encryption** : guarantee secure information exchange and integrity
- **Access Right Control** : limits access of information and available service

Structures of Maritime Cloud

ENAV16-9-23 : MC from e-nav perspective

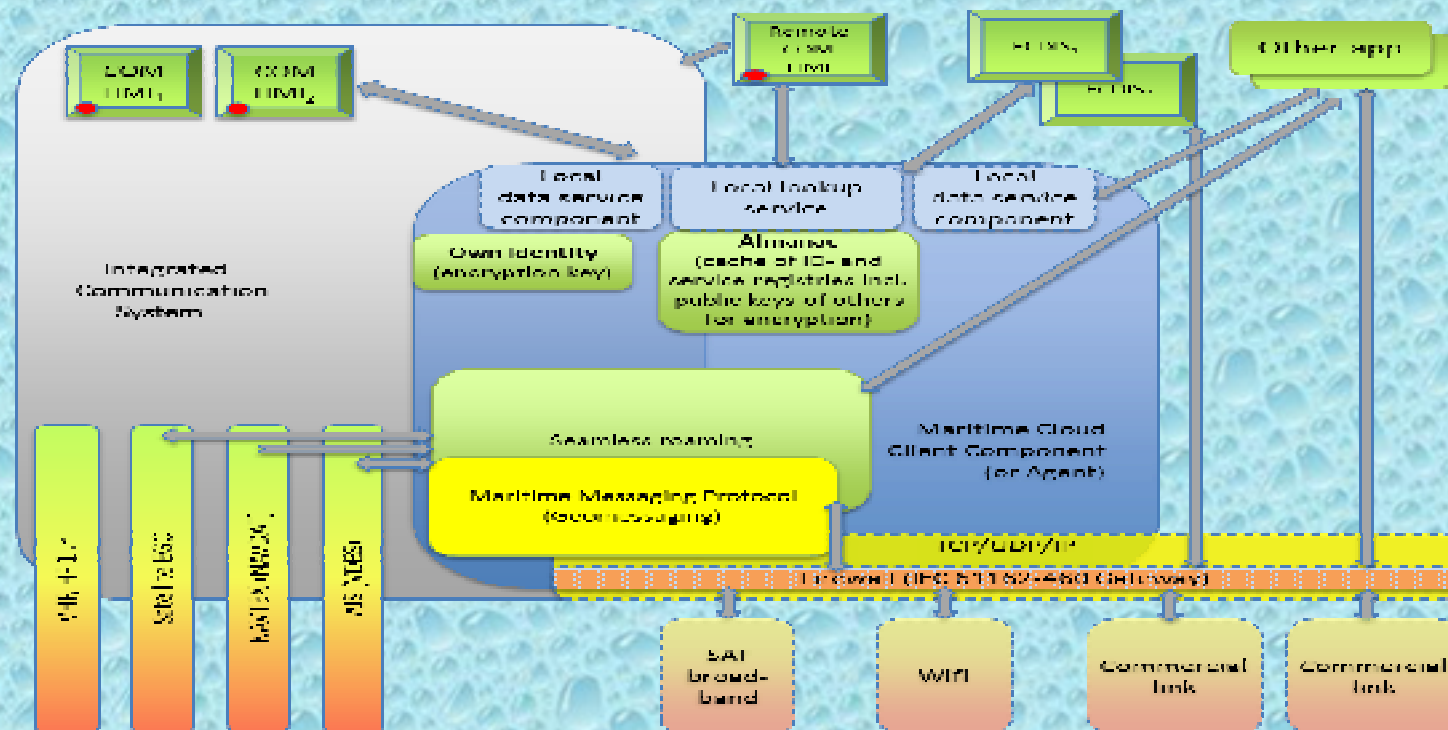


Maritime Cloud Client

ENAV16-9-23 : MC from e-nav perspective

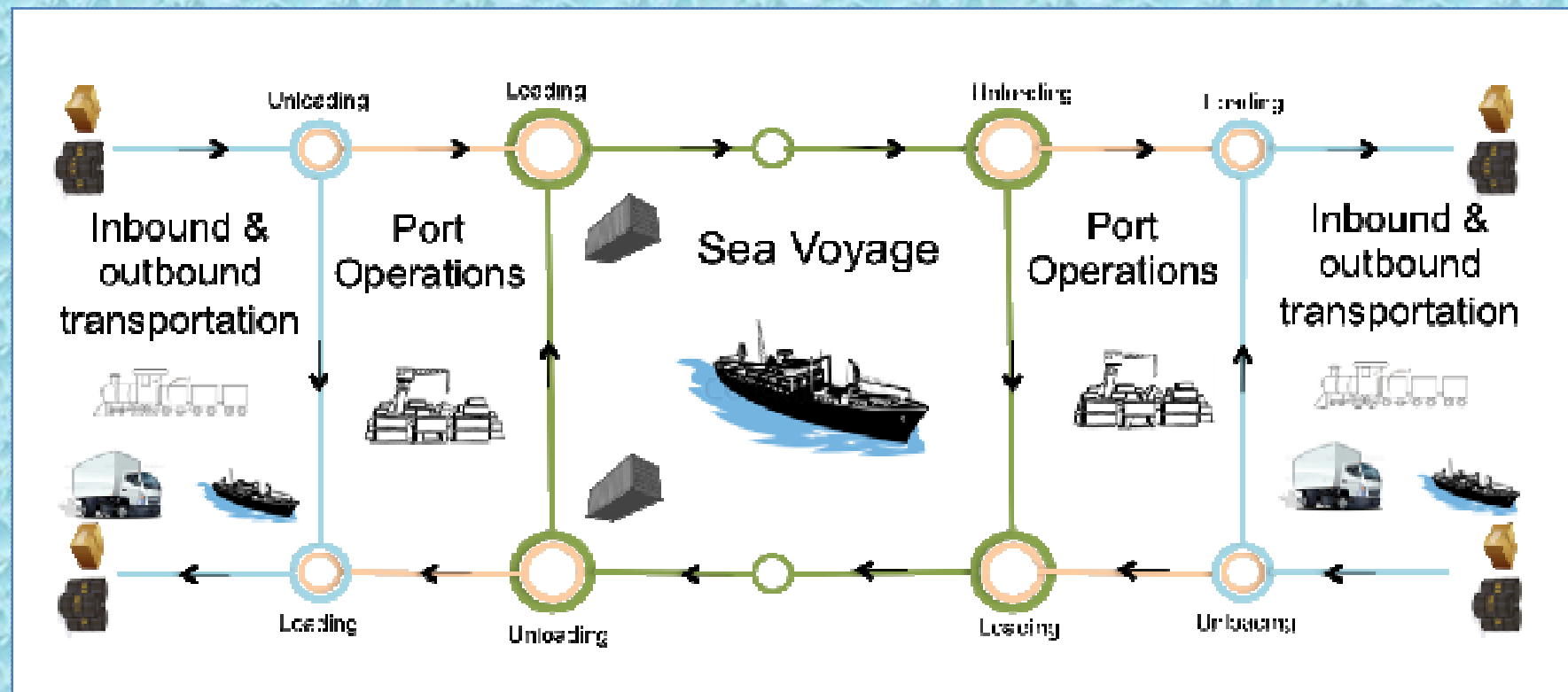
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- **Global unique identification** with location independence
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- Support various **communication service**, i.e geocasting

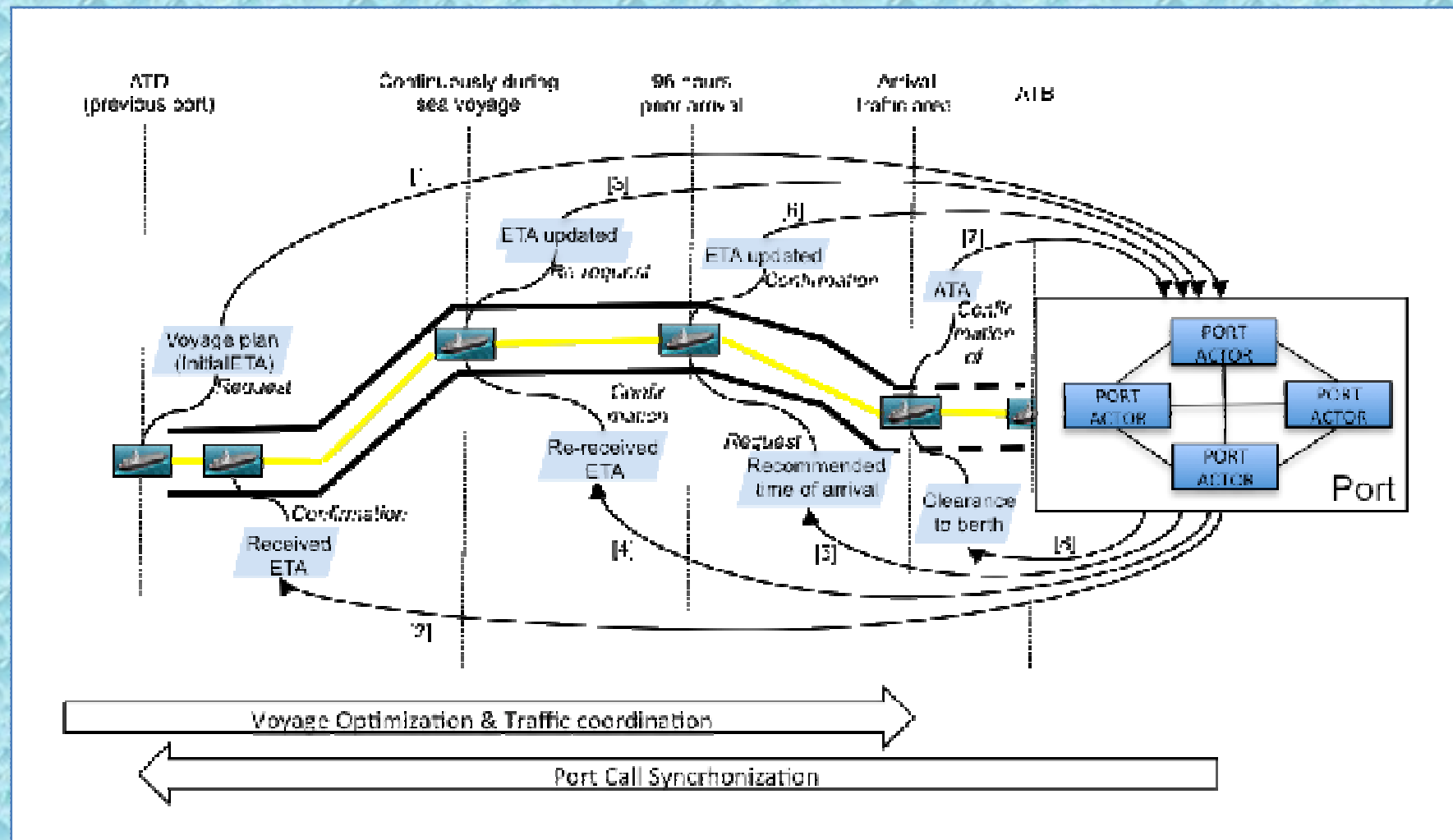


ENAV16-9-22:

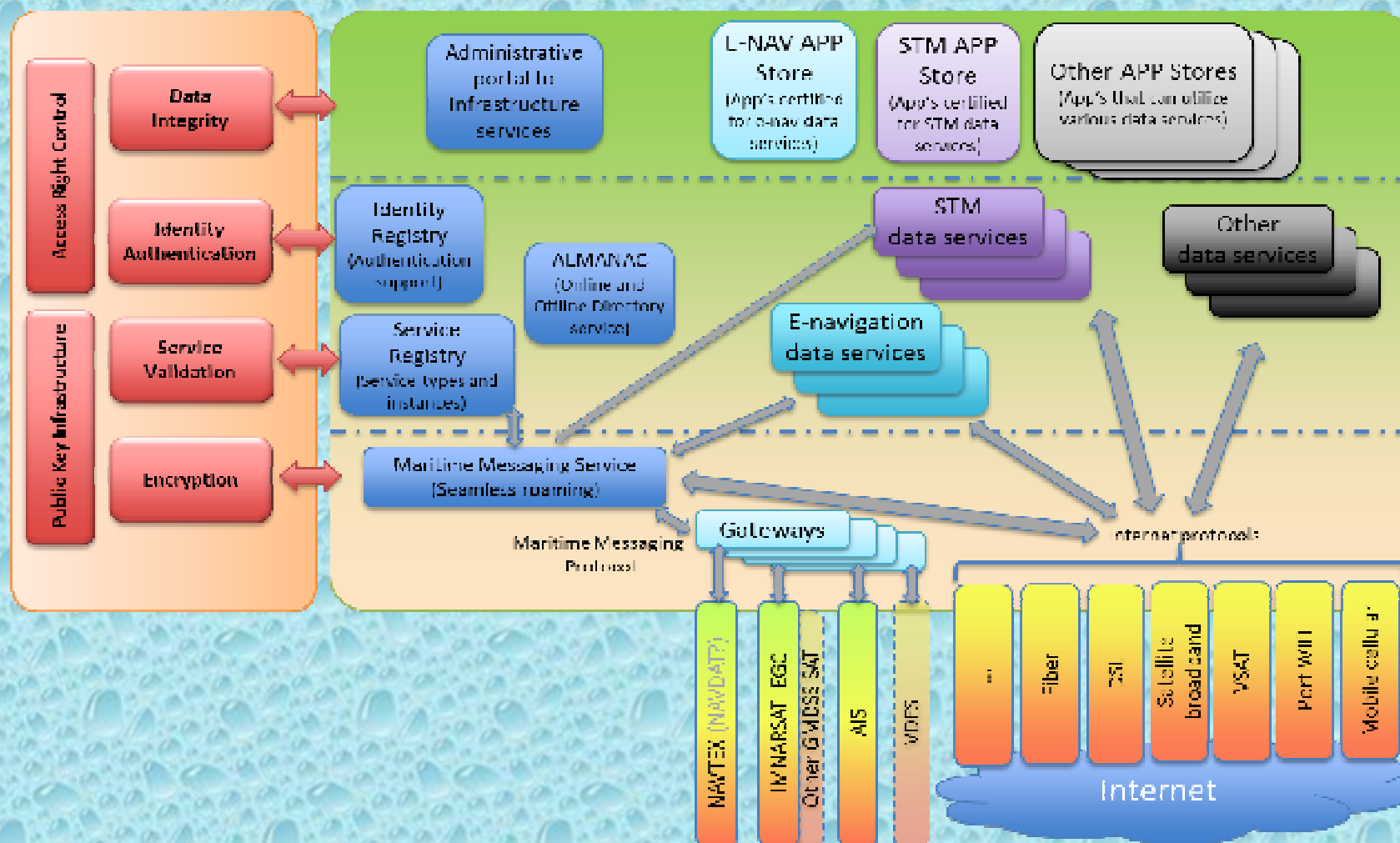
Digital infrastructures for STM - enabling episodic tight coupling

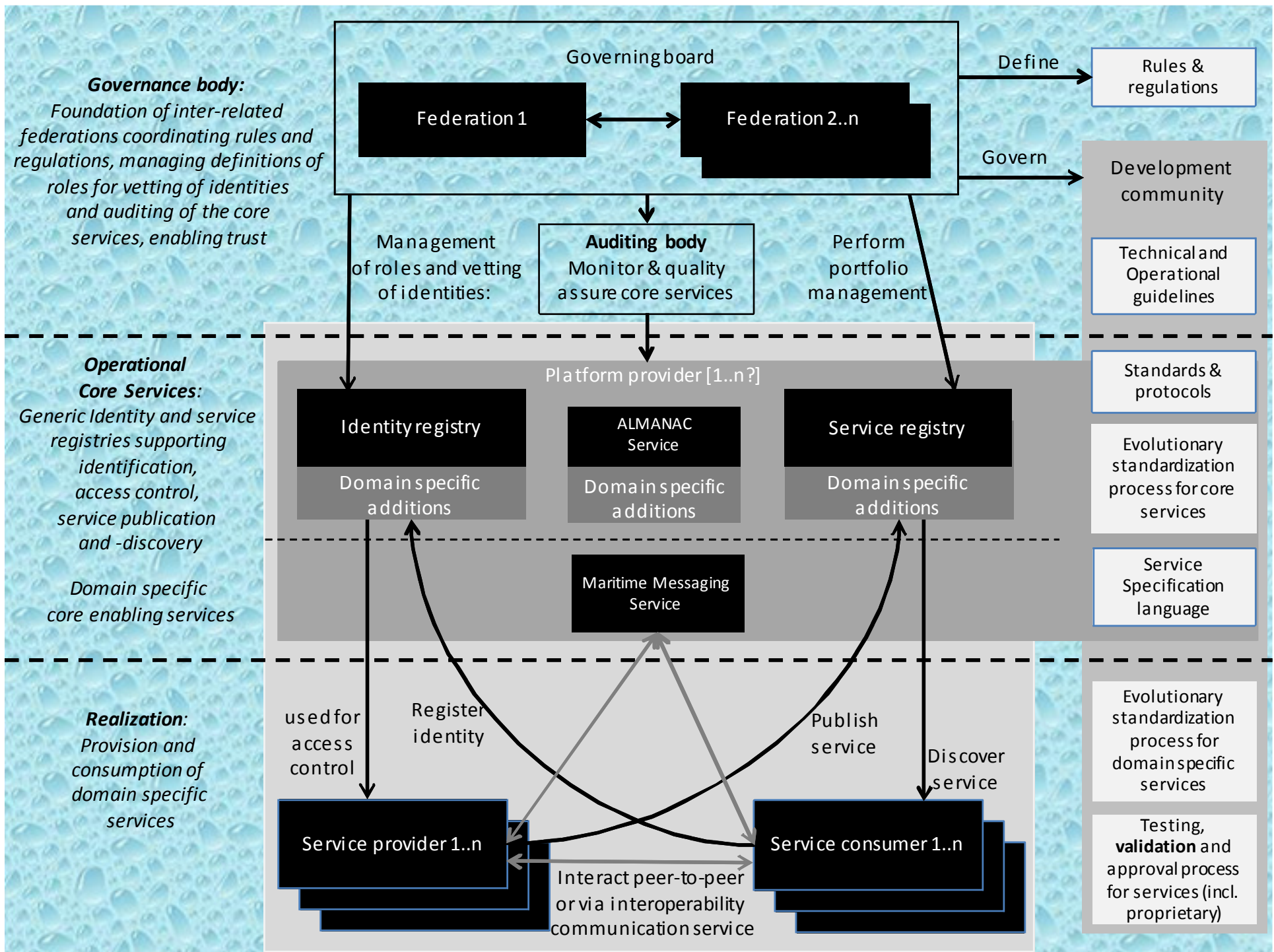


ENAV16-9-22: Information sharing for Sea Traffic Management

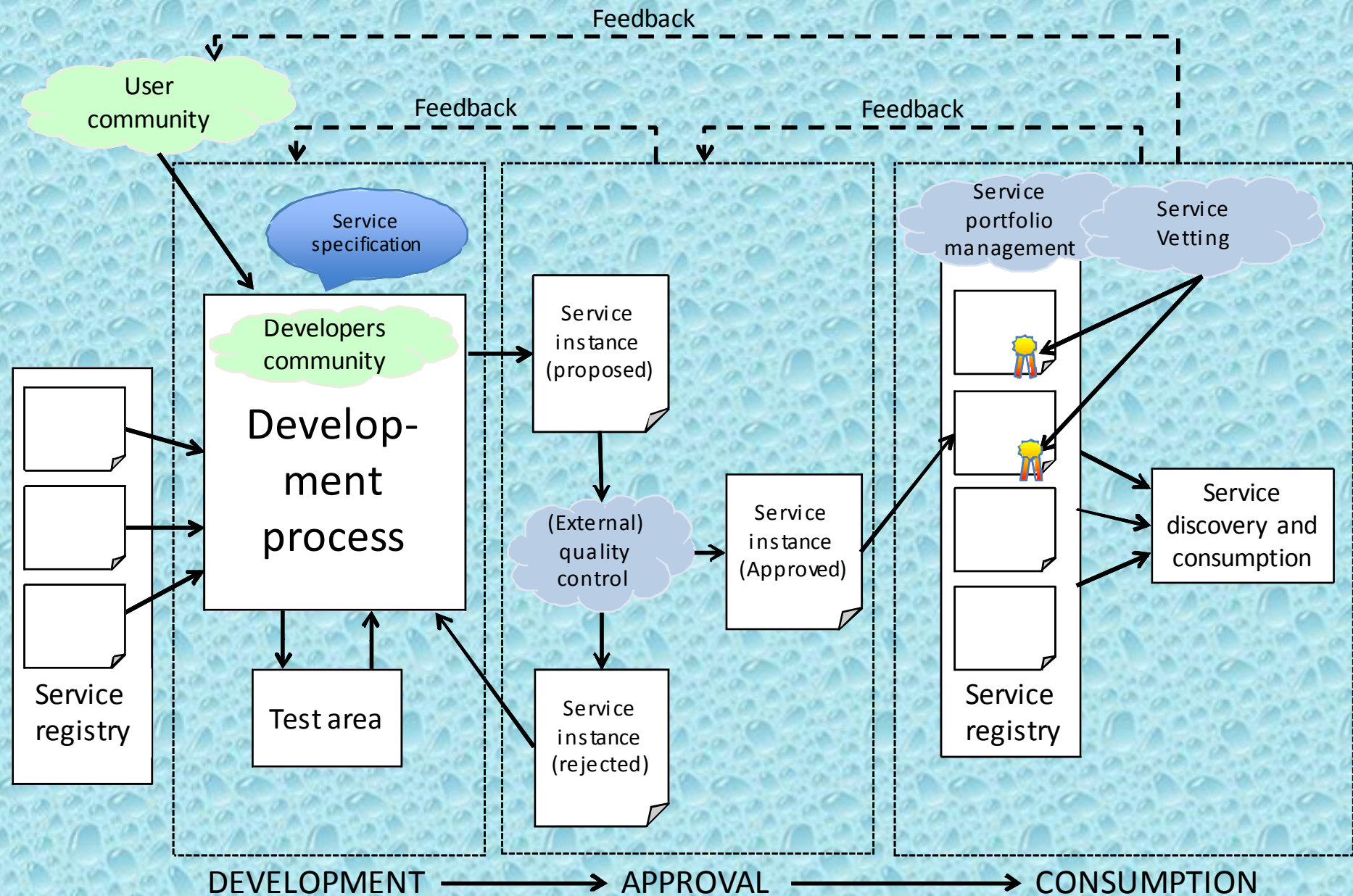


ENAV16-9-24: Layered structure of a Maritime Infrastructure Framework





Development / dissemination process



Roadmap

2015

2016

2017

2018



Innovative solutions for waterborne operations and smarter traffic management, that increase maritime safety – and efficiency too...



Increased efficiency in **Sea Transports** by minimizing the use of energy to steam an maximizing the use of facilities in ports constrained by safety enabled by **digital collaboration**



Preparatory workshop?

Founding conference?

...

Operation...?

Roadmap



EfficienSea
Efficient, Safe and Sustainable Traffic at Sea

2

Innovative solutions for waterborne operations and smarter traffic management, that increase maritime safety – and efficiency too...

STM
SEA TRAFFIC MANAGEMENT

Increased efficiency in **Sea Transports** by minimizing the use of energy to steam an maximizing the use of facilities in ports constrained by safety enabled by **digital collaboration**

Validating concepts at:
- 100 ships
- 10 ports
- 2 service centres



ENAV16-9-22, -23 and -24

