NAVELINK

Developer forum
23-02-2023
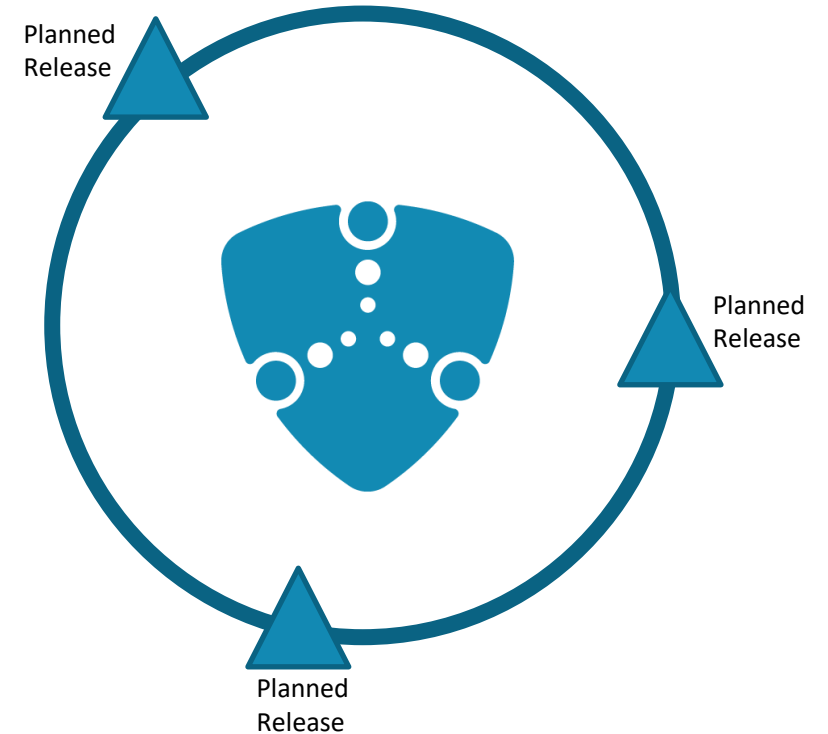
Navelink.org

Agenda

1) Navelink Platform status & update

2) Navelink Roadmap   (Head of concept Navelink)

3) Service development discussions & information
   a) Forum service developers   (Each developer)
   b) Forum security and interoperability   (Each developer)
   c) Ongoing work within the STM-community (Trello)   (Each developer)

4) Overview of Navelink usage

5) Q&A
   a) New questions   (All)

6) Discussion: Navelink + REST + MMS + VDES

7) Presentation & Demo

8) Closing remarks

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1) Navelink Platform status & update

- Since the last meeting:

  – Navelink monitoring has detected sporadic service disturbances. The systems are operational but there may be issues with availability because of external factors. Please report any disturbances you experience with Navelink for further investigation.

Received questions

-

2) Navelink Roadmap

1-2 years

2-5 years

Add more Service Specifications and Designs

Increase VDES support

Add MMS support

Increase Traceability

Increase SECOM Compliance

Add SECOM Hotel

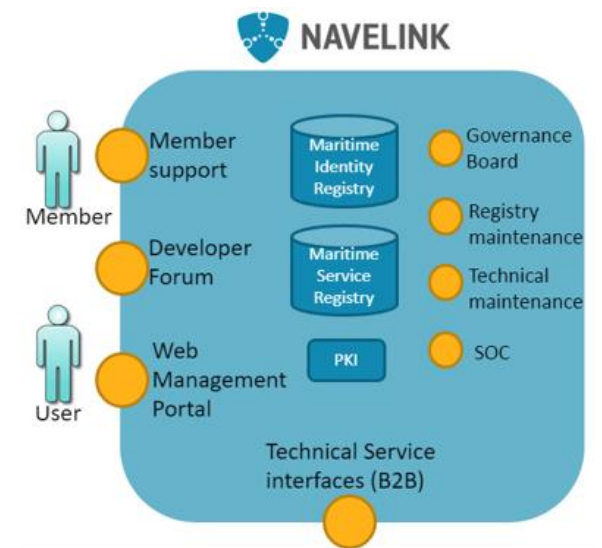Refine Permissions Management

Add Service Ledger support

Enable subscription on Navelink technical notes

Enhance functionality to host payload formats

Add support for Geocasting

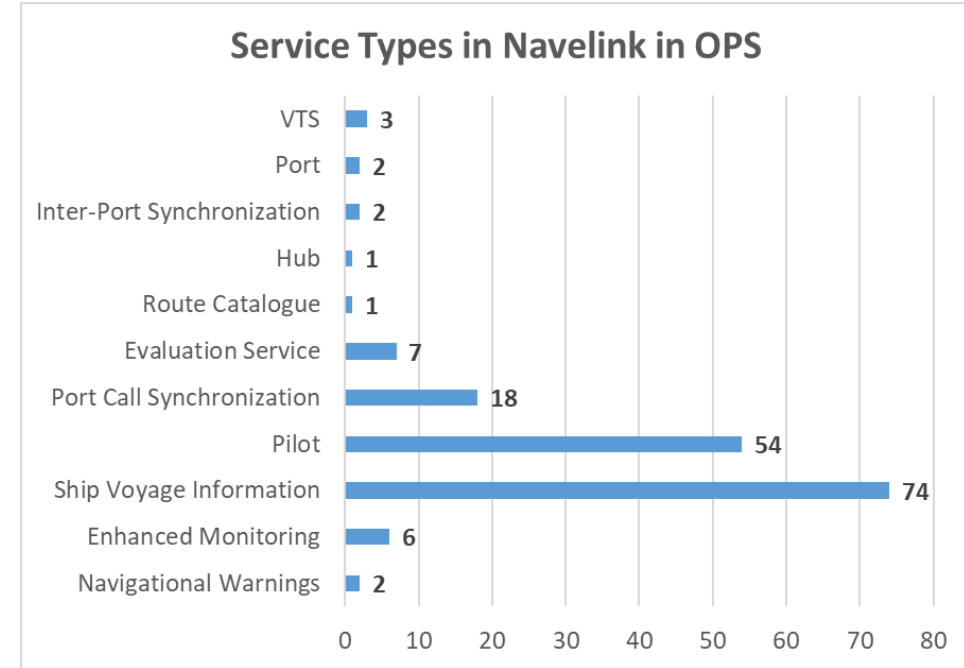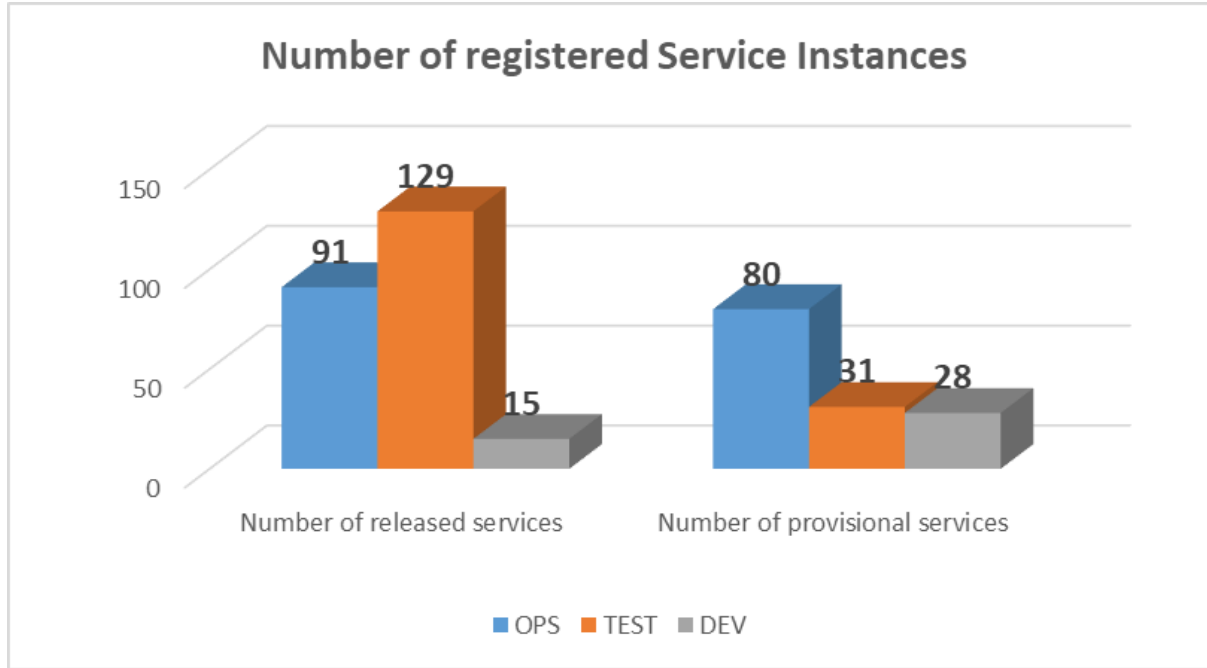Add support for Service Payment

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Member

Member support

Developer Forum

Web Management Portal

User

Maritime Identity Registry

Maritime Service Registry

PKI

Technical Service interfaces (B2B)

Governance Board

Registry maintenance

Technical maintenance

SOC

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3) Service development discussions & information

- Forum service developers

  – Common discussions

- Forum Security and interoperability

  – Common discussions

- Ongoing work within the STM-community (Trello)

  – Trello check

  – Common standardization work: S-124, S-421, SECOM, General STM news

4) Overview on Navelink usage

2023-02-22

Number of registered Service Instances

- Number of released services: OPS 91, TEST 129, DEV 15
- Number of provisional services: OPS 80, TEST 31, DEV 28

Service Types in Navelink in OPS

- VTS: 3
- Port: 2
- Inter-Port Synchronization: 2
- Hub: 1
- Route Catalogue: 1
- Evaluation Service: 7
- Port Call Synchronization: 18
- Pilot: 54
- Ship Voyage Information: 74
- Enhanced Monitoring: 6
- Navigational Warnings: 2

Events since last Dev Forum:

Created in OPS
- Port Synchronization: TZZNZ
- Ship Voyage Information: BOMBESCOOL
- Ship Voyage Information: HENDRIKP

Navelink Operational environment Service Registrations

Service Specifications: 1 (Voyage Information Service v2.2)
Service Technical Design: 1 (Voyage Information Service Design v2.2)
Service Instances: 171

Geographical representation in Europa for services in Navelink

Layer 1

◔ provisional
◔ released

Operational environment

Layer 1

◔ provisional
◔ released
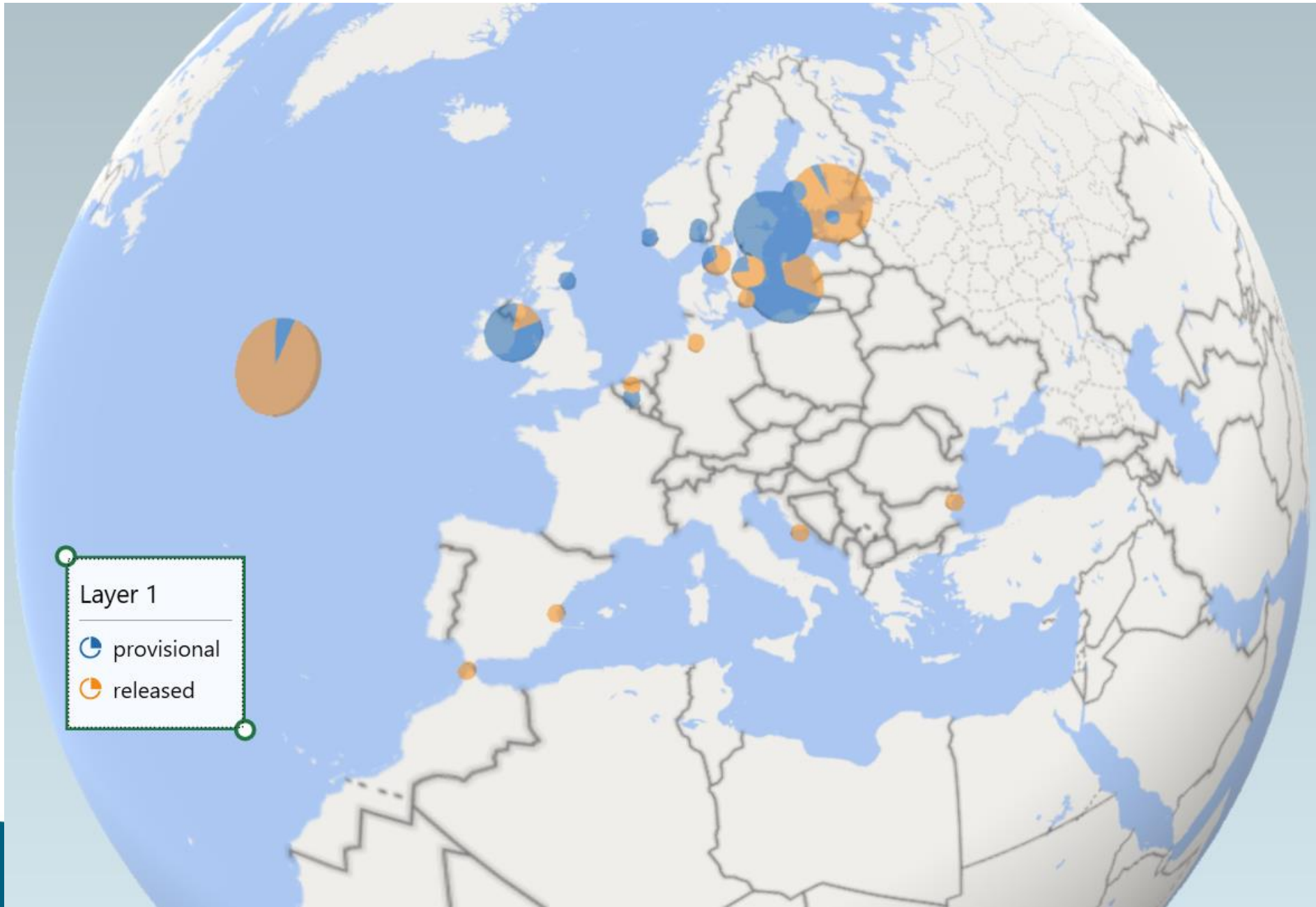
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5) Q&A

- Any Questions? The floor is open.

Question received of public interest:

I'm to start development of Navelink services; Which way [design] should I choose?

- *The STM way*
- *The SECOM way*
- *The MMS way*

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Different service designs

STM way
(+) Simple technology (REST)
(+) Proven concept (in STM)
(+) Existing implementations
(+) No central routing of data
(-) No signing of data
(-) The last link between ship and service for incoming data is not standardised

SECOM way
(+) Simple technology (REST)
(+) Proven concept (in STM)
(+) No central routing of data
(-) The last link between ship and service for incoming data is not standardised

MMS way
(+) Proven concept (in SMART)
(+) The last link between ship and service is standardised
(+) More adaptable to non-ip communication
(-) More complex architecture and new protocols
(-) More central components to maintain
(-) Central routing of data

STM way
The service design chosen in STM Validation project was REST based service with authentication on the communication channel (HTTPS/TLS) where the client authenticates itself with X509 Certificate to the service. No signature on data. For route plan (RTZ) and navigational warning (S-124) exchange the same Voyage Information Service was used both for ship and shore side services, hence one common Service Design for all exchange of RTZ and S-124. Other REST service designs where also in use in STM for Port Call message exchange. This design where REST service was designed also on ship side means that the public REST service is deployed outside of the ship and company specific protocol is used between ship and the public REST service. This worked fine in the STM Validation project to proof the benefits of the STM concept.
All services registered today (170+) in Navelink are based on VIS Technical Design. The forecast is that VIS and RTZ will still be used 2023-2024 (at least).

SECOM way
SECOM is based on STM concept but extended and integrated with IHO S-100 standard. The difference to STM is that SECOM requires signature on the data to enable data authentication independent on transport security (in line with S-100), SECOM contains guidelines for optionally encrypting data and guidelines and API for exchanging the encryption key, SECOM contains API for big data using other files hare in combination with SECOM REST Service and SECOM contains standard SECOM REST Service API "template" independent on payload format, hence the same SECOM REST Service API can be used for any S-product and other well-formatted data formats.

SECOM is IEC 63173-2 standard is approved and work is ongoing to create service specification based on SECOM for AtoN service, S-124 Navigational Warning service and VTS service(s). There is no approved specifications yet, and there is no approved SECOM artifacts registered in Navelink yet.
The forecast is that we should see SECOM artifacts registered in Navelink during 2023 and 2024.

MMS way
The Maritime Messaging Service alternative have been around awhile and in use in Korea. The STM Validation Project choose to not use the MMS, the REST services was adequate for validating the concept. The main difference is that MMS is built with a central message router where all clients connects, sends and receives the data which is routed by the central MMS router network.
The MMS have now been re-introduced in combination with VDES. Work is ongoing to standardised MMS (by RTCM), and drafts will be used in the coming VDES testbeds during 2023-2025.
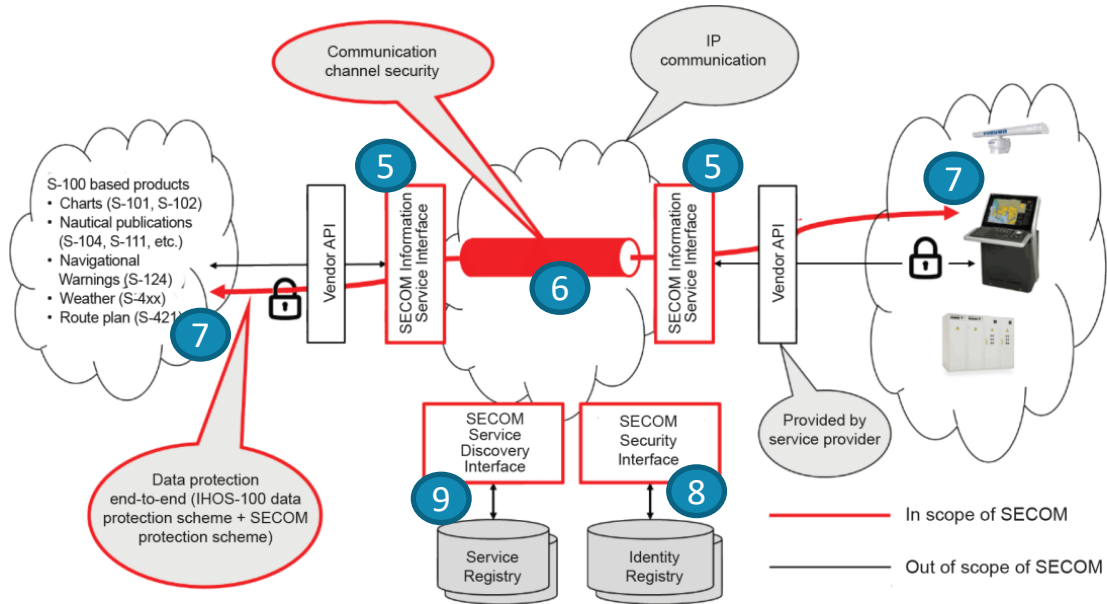
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6) Discussion: Navelink + REST + MMS + VDES
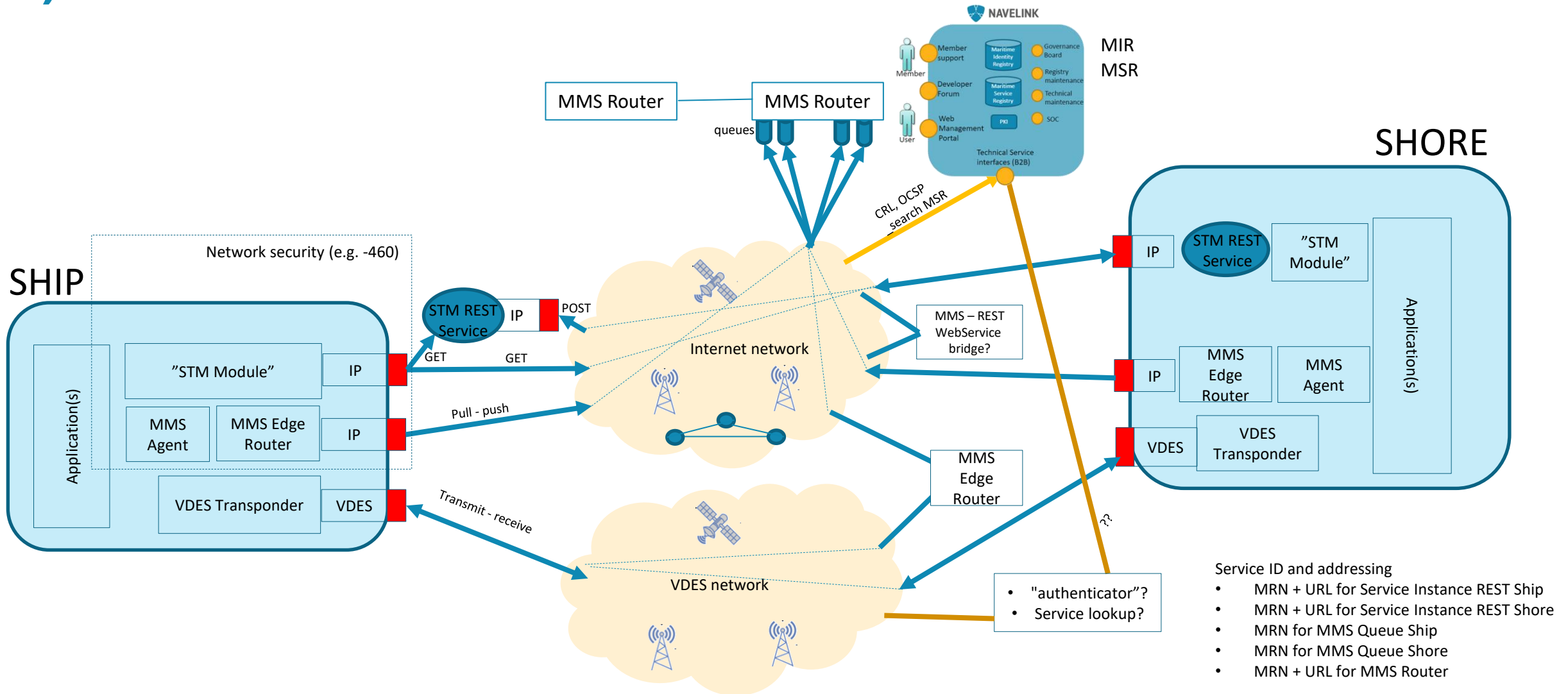
SECOM scope in short

Figure 1 – Overview of SECOM

- Clause 5 SECOM REST Service API
- Clause 6 SECOM REST Service Transport security (TLS)
- Clause 7 SECOM Data Protection (signing and optionally encrypting data)
- Clause 8 SECOM PKI
- Clause 9 SECOM Service Registry lookup

7) Presentation & Demo

- Presentation and demo by Anders Berg, Unikie (See page 18 for the presentation slides)

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8) Closing remarks

- Next Developer Forum at 24/03-2023

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Meeting notes (1/1)

- Information regarding disturbance detected in monitoring of Navelink availability around 26/1 which seems to be related to external network disturbances and activity. No user reports received, but please be aware of high network activity and report any disturbances of Navelink to info@navelink.org.

- Information regarding new service instances; 1 Port Call Synch TZZNZ + 2 Ships

- Presented services on simple map via Excel

- Elaborated on question received regarding design patterns for services; STM way, SECOM way or MMS way. See slides 10-12.

- Anders Berg, Unikie presented their port solution as services

  – Customer driven service oriented web solution

  – Ship requests a port call via web form and receives a queue ticket

  – Launched in Gävle 1 February 2023

  – Short discussion regarding security which may be global in future using Navelink as identity provider

  – Short discussion regarding information sources and how to capture ETA for ship

- Next meeting 2023-03-24

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OPEN ECOSYSTEM-BASED

UNIKIE POLO

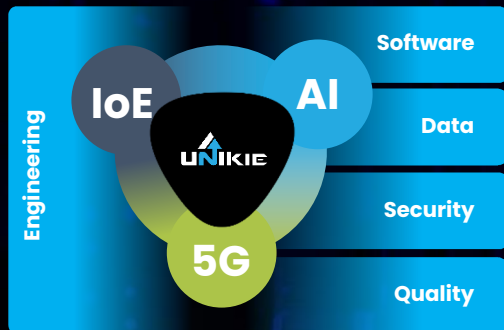## DIGITALIZATION PLATFORM FOR PORTS and LOGISTICS

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UNIKIE

WE ARE UNIKIE

Engineering

IoE **AI** **5G**

Software

Data

Security

Quality

We are a pioneering **engineering** company focused on activating **smart spaces** by bringing intelligence to machines, vehicles, and infrastructure.

>50 M€
REVENUE (2022)

550+
EMPLOYEES (2022)

180+
GLOBAL CLIENTS

60+
EMPLOYEE NET PROMOTOR SCORE

FOUNDED 2015

ICT COMPANY 2021 (TiVi)

GROWTH DRIVERS

Global Business & Clients

Fast Growing Market

Embedded Meets Enterprise

Competitive Salary Model

Cutting-Edge Technologies

Finland (HQ), USA, Germany, Sweden, Poland, Estonia

WHAT? UNIKIE POLO CONCEPT

LAND LOGISTICS — PORTS — SEA LOGISTICS — PORTS — LAND LOGISTICS

Port Community | **Port Management** | **Supply Chain** | **Sustainability and Emission Control** | **Smart Space**

POLO
Open Ecosystem Platform

VESSELS · VTS · TUG BOAT · PILOTS · PORT · SHIP AGENT · OPERATOR · CARGO · LOGISTIC HUBS · HINTERLAND INDUSTRIES · PUBLIC DATA
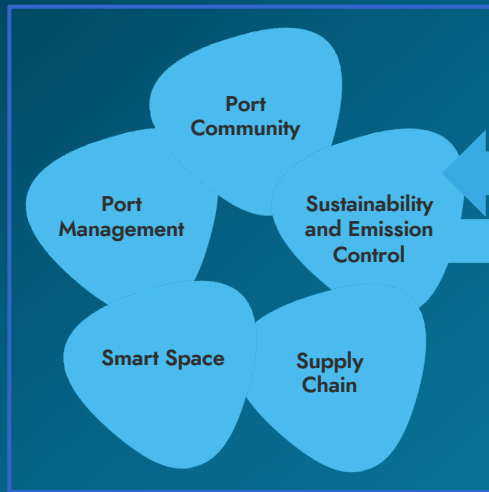
Open Ecosystem based End-to-End digitalization platform for Ports & Logistic

Fintraffic   SWEDISH MARITIME ADMINISTRATION

- Concept originally developed jointly with Nordic maritime authorities
- Started from Integration based Situational awareness and Port Community application
- Ecosystem Partners are expanding the scope, usage, and features to new directions
- Enables even whole new enterprise applications in top the platform

Open Ecosystem based End-to-End digitalization platform for Ports & Logistic
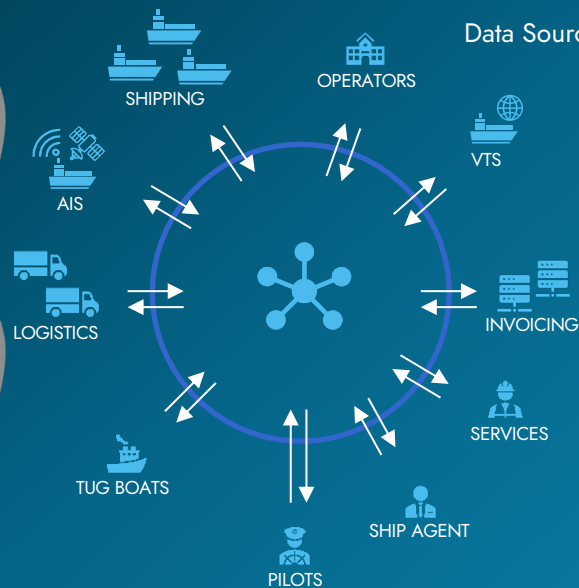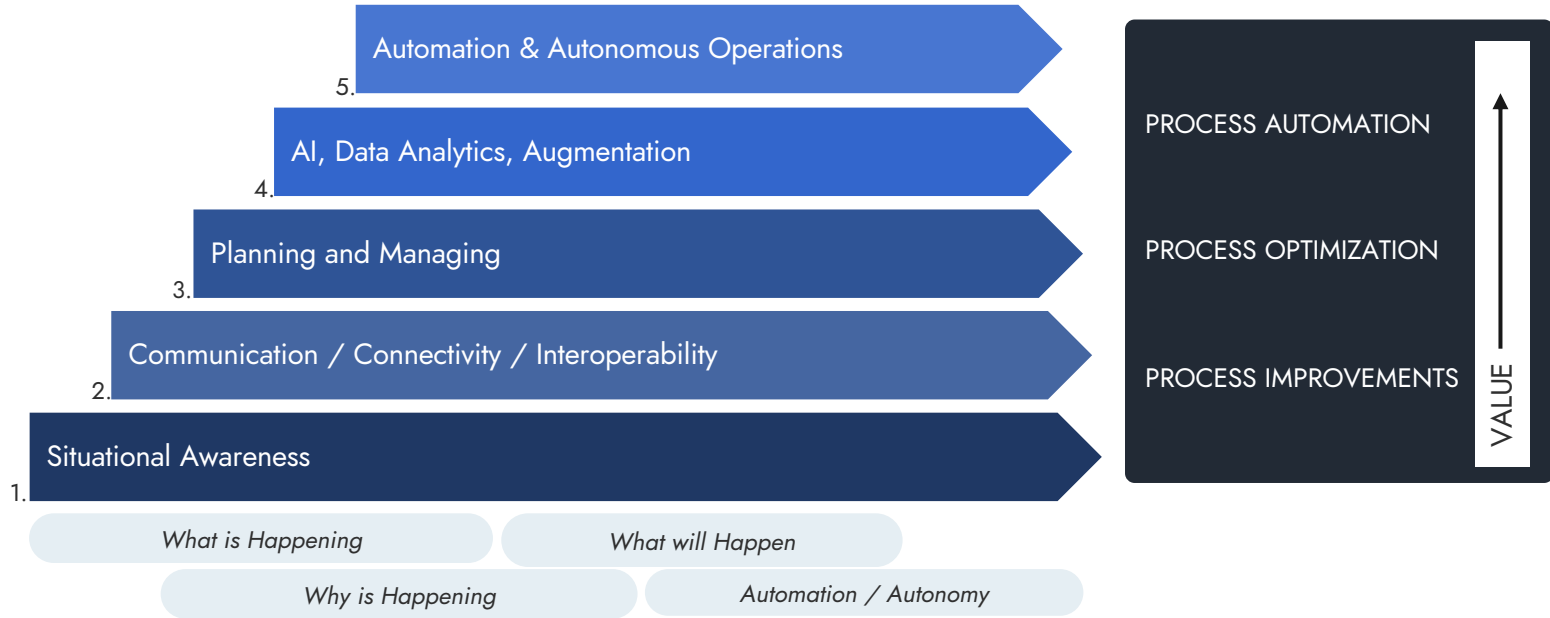

Main Functionalities

- Port Community
- Port Management
- Sustainability and Emission Control
- Smart Space
- Supply Chain

Application
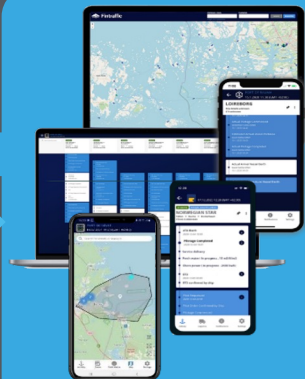
Awareness Platform

Integration Platform

Data Sources

- SHIPPING
- OPERATORS
- VTS
- AIS
- INVOICING
- LOGISTICS
- SERVICES
- TUG BOATS
- SHIP AGENT
- PILOTS

SITUATIONAL AWARENESS AS A KEY IN DIGITALIZATION PROCESS

5. Automation & Autonomous Operations

4. AI, Data Analytics, Augmentation

3. Planning and Managing

2. Communication / Connectivity / Interoperability

1. Situational Awareness

What is Happening

What will Happen

Why is Happening

Automation / Autonomy

PROCESS AUTOMATION

PROCESS OPTIMIZATION

PROCESS IMPROVEMENTS

VALUE

UNIKIE

UNIKIE POLO – DESIGNED TO GROW WITH YOUR NEEDS

Professional, flexible and personalized UI in mobile & desktop

- Designed for professional daily use, both mobile and desktop.
- Features, Functionalities & Data depends on User Rights and Organization
- Platform and application architecture are planned for customized views and functionalities
- Data visualization as maps, dashboards and timelines
- Planning and prediction tools based on real needs
- Basic and optional features
- Private or Co-creation based customization and feature development
- The most cost-efficient platform for customized features

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EXAMPLES OF PORT AND MARITIME ECOSYSTEM PARTNERS AND CUSTOMERS

Ports, Port Authorities, Officials

Shipping companies, Operators

Technology & machinery providers

Time Slot Gävle

Port of Gävle

Time Slot Gävle Web Form

Send ETA to outer port area of Port of Gävle to start Time Slot Gävle request process

Please fill this form and press **Send slot request**. You will receive an e-mail to the address(es) given below.

Verification code (available from port)

Verification code

E-mail(s). Comma to separate addresses.

E-mail address(es) of person(s) in charge

VESSEL INFORMATION

IMO

IMO number

Confirm IMO

IMO number

Vessel name

Vessel name

LOA

LOA

Beam

Beam

Draft

Draft

ETA TO OUTER PORT AREA

Sweden local time, yyyy-MM-dd HH:mm

yyyy-MM-dd HH:mm

Estimated jetty laytime (HH:mm)

HH : mm

Primary berth

Choose one

Secondary berth

Choose one

Send slot request

Vessel or representative of vessel apply for queue slot 36hrs before arrival

POLO generate an RTA based on berth availability

Vessel confirms RTA and the vessel is guaranteed a spot on the berth on arrival

ETA allowed to deviate 2hrs from RTA

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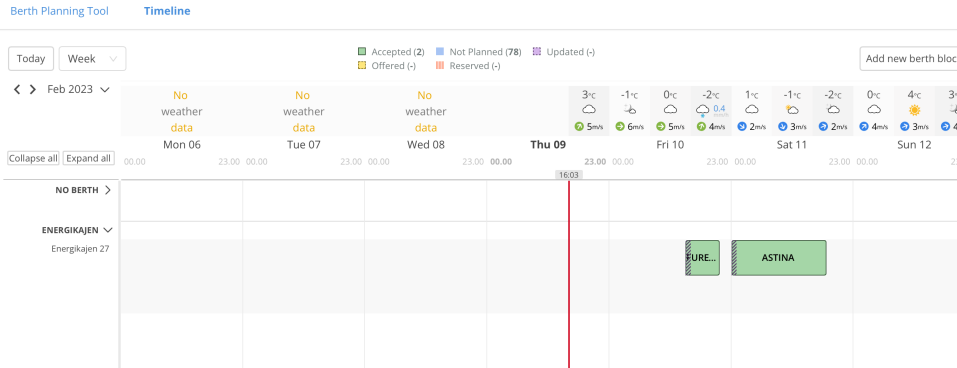
Time Slot Gävle

Vessels can slow-steam or "EcoDrive"

No need to worry that another vessel steal their berth slot time

~~First come first served~~

"On a trip Göteborg - Gävle, we can save up to ten tons of fuel", Lennart Knutsson, commander of the ship Tern Fors
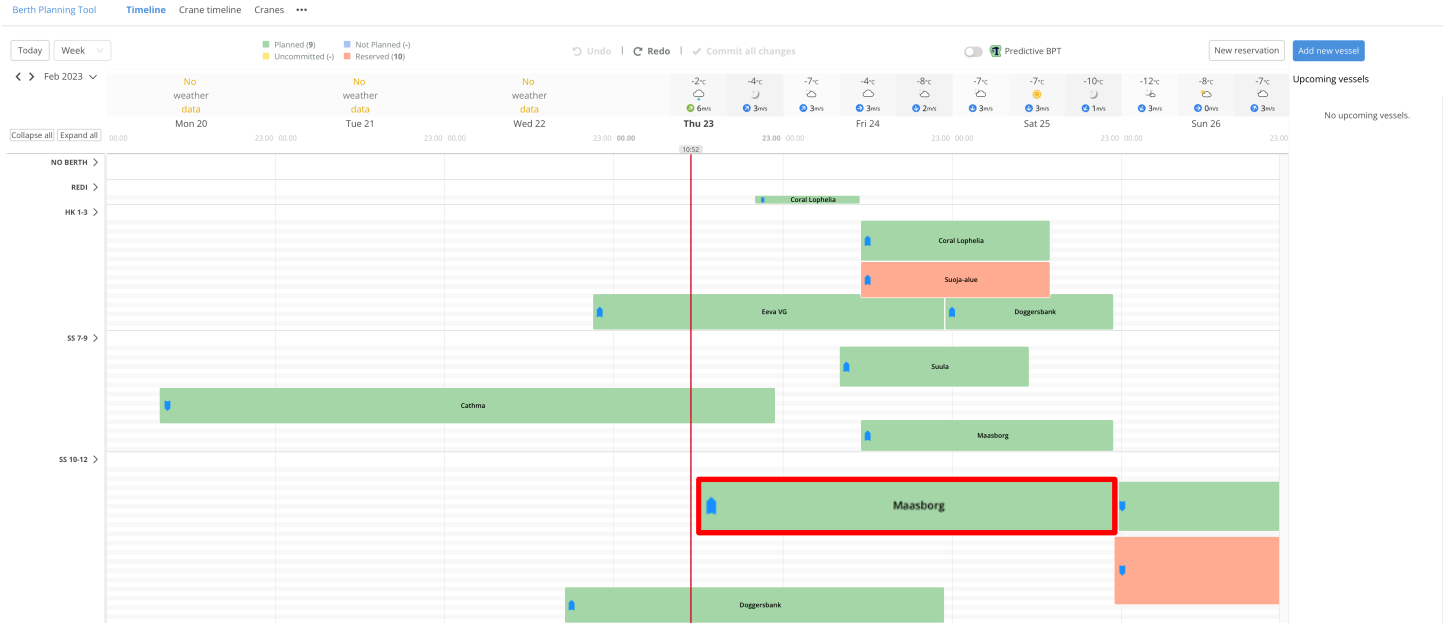
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Time Slot Gävle

Current queue situation to Port of Gävle

Port of Kokkola implementation

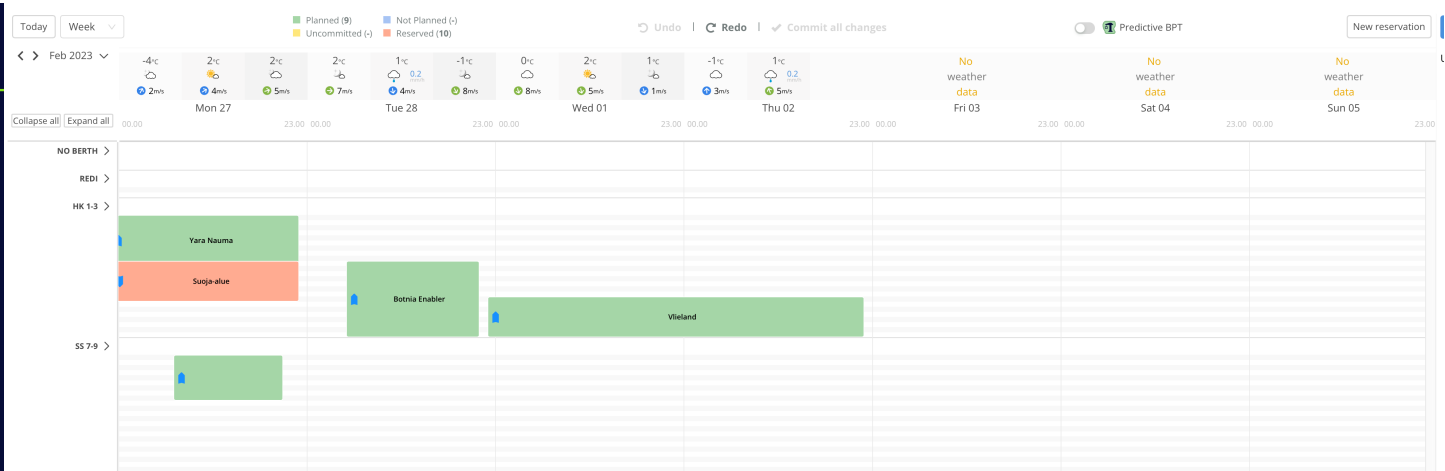Shipping company plan their vessel at their own planning system. By integration this comes to:
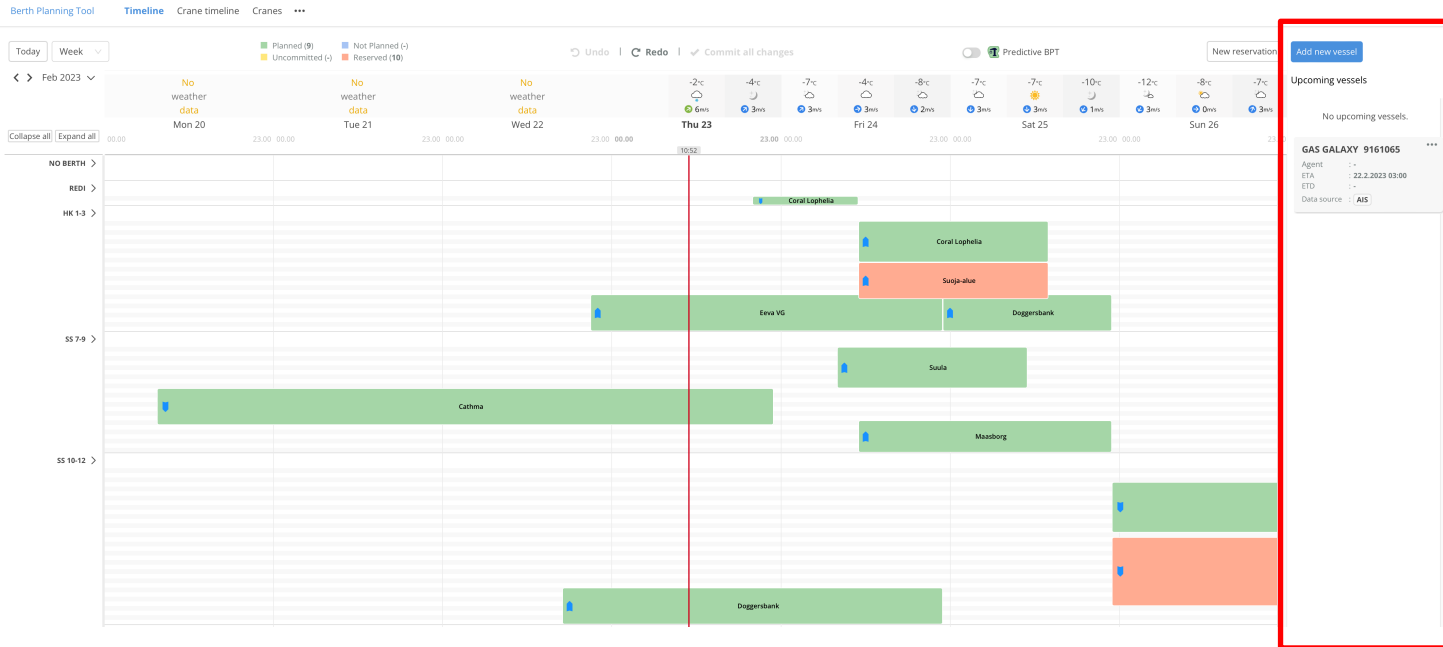
Port of Kokkola implementation

Port of Kokkola plans the vessel in the Berth Planning Tool and if they change time (ETA and/or ETD): automatically by the integration this information goes back to Shipping companies planning system.
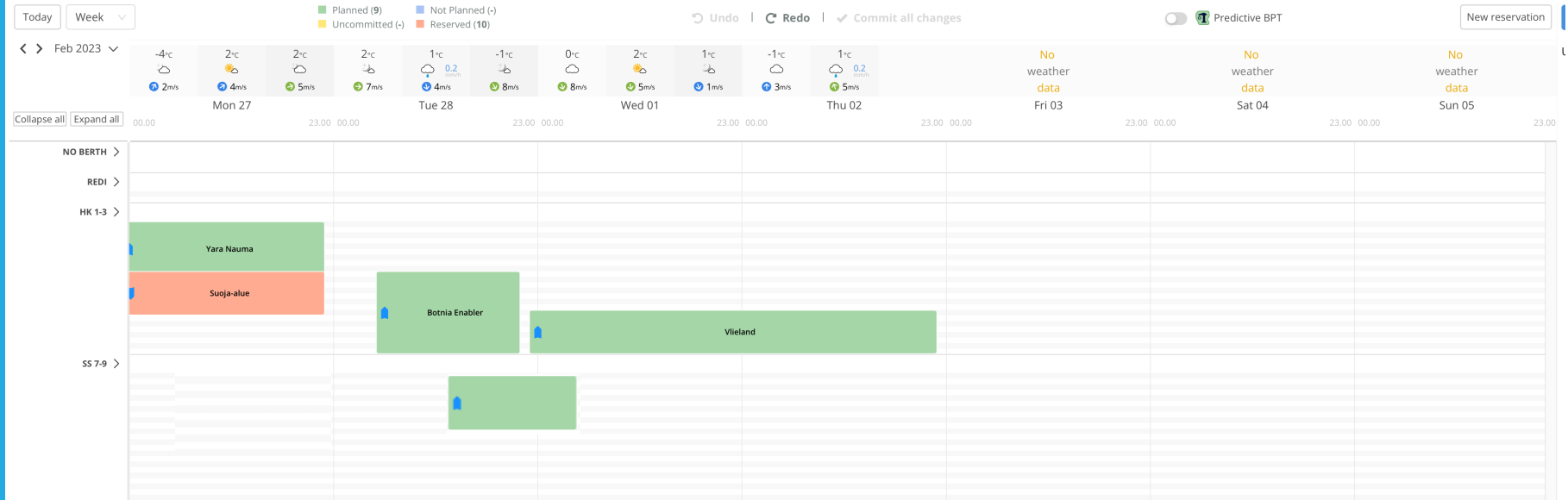
Port of Kokkola implementation

Shipping company planning system has a service that communicate updated information to their vessels by SMS and/or E-mail + information directly how much fuel they can save.
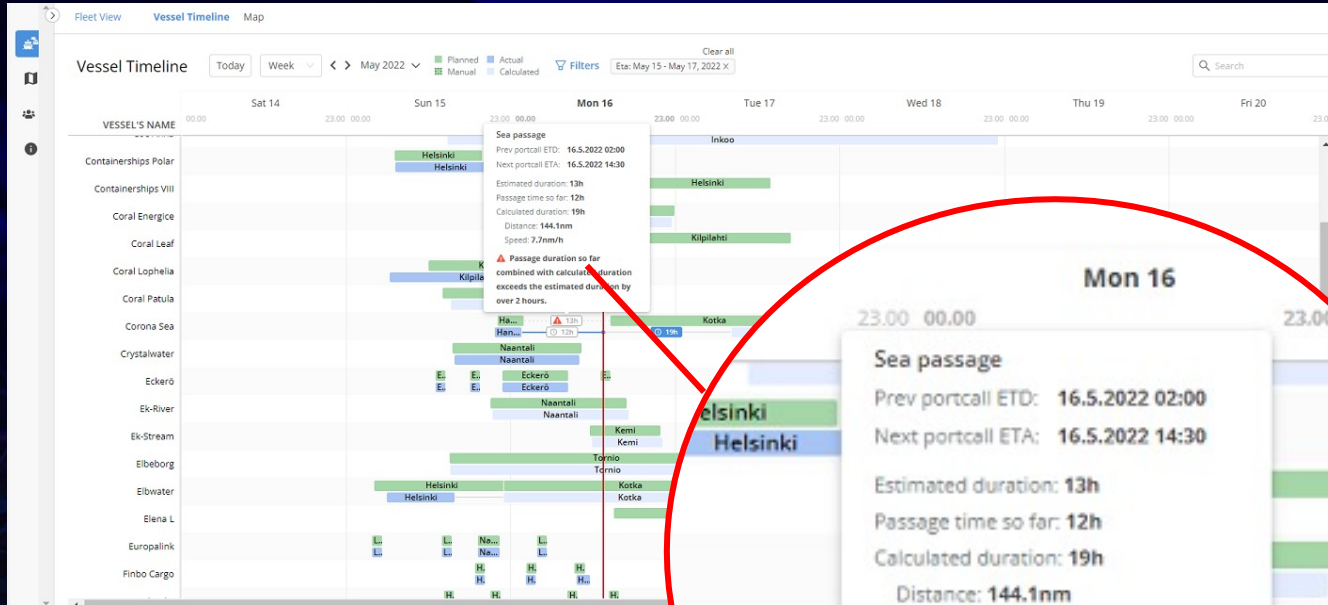
Port of Kokkola implementation

Shipping company planning system has a service that communicate updated information to their vessels by SMS and/or E-mail + information directly how much fuel they can save.

UI EXAMPLE: FLEET VIEW WITH SEA PASSAGE TIME

Fleet view with Sea-Passage time

- Whole fleet or all the vessels of certain port in one view
- Shows previous and up-coming ports
- Estimates travel times and compares to planned times

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