



NAVELINK

Developer forum

26-01-2023

[Navelink.org](https://navelink.org)

Agenda

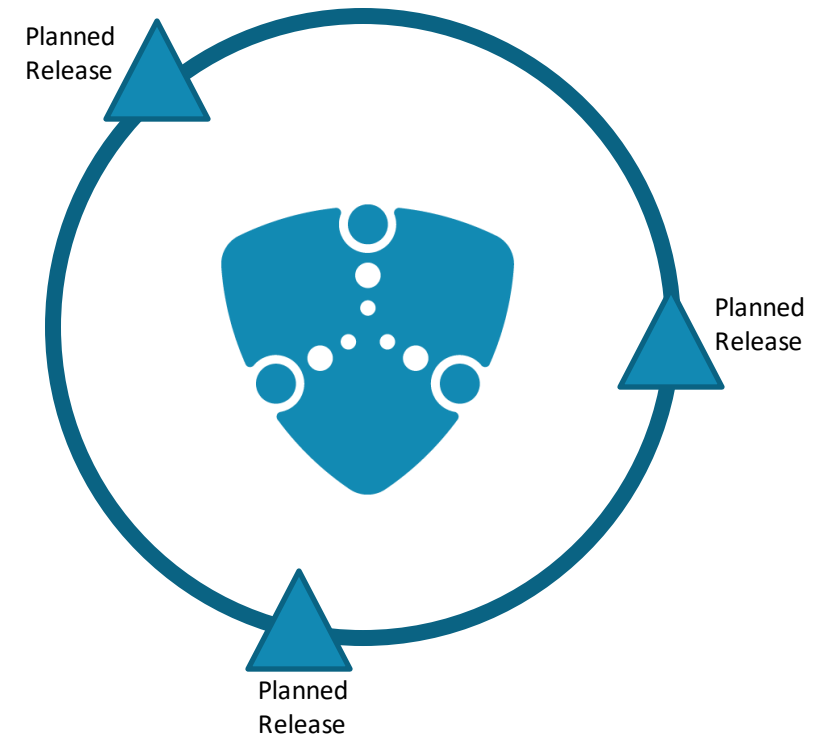
- 1) Navelink Platform status & update
- 2) Navelink Roadmap (Head of concept Navelink)
- 3) Service development discussions & information
 - a) Forum service developers (Each developer)
 - b) Forum security and interoperability (Each developer)
 - c) Ongoing work within the STM-community (Trello) (Each developer)
- 4) Overview of Navelink usage
- 5) Q&A
 - a) New questions (All)
- 6) Discussion: Navelink + REST + MMS + VDES
- 7) Naviport presentation
- 8) Closing remarks

1) Navelink Platform status & update

- Since the last meeting:
 - Implemented G1128 schemas to Operational
 - Created new "About" and "Press Releases" pages on Navelink.org

Received questions

- Bug reported and fixed regarding MSR GetAllInstances
 - Problem: Bugs in the MSR v1.0.1 codebase that resulted in empty result sets being returned from API calls using HTTP GET into the Service Instance APIs:
 - `api/serviceInstance`
 - `api/serviceInstance/{instanceId}/{version}`
 - `api/serviceInstance/{instanceId}`
 - Root cause: New default behavior for handling null valued reference types in .NET 6.0 C# compilers, introduced recently as part of a maintenance update of the MSR codebase.



2) Navelink Roadmap



Add more Service Specifications and Designs

Increase VDES support

Add MMS support

Increase Traceability

Increase SECOM Compliance

Add SECOM Hotel

Refine Permissions Management

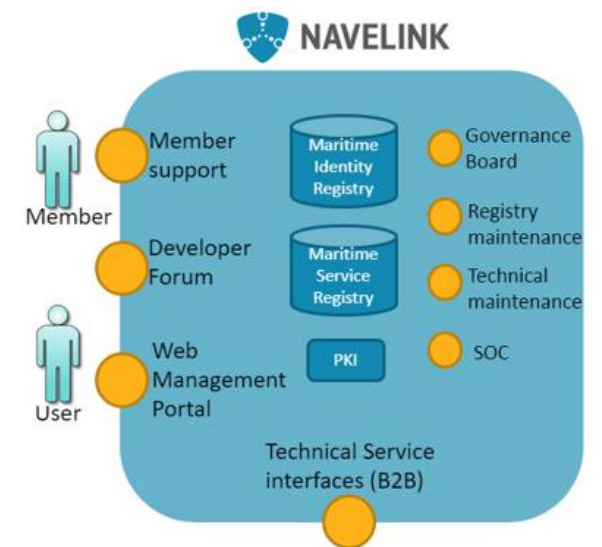
Add Service Ledger support

Enable subscription on Navelink technical notes

Enhance functionality to host payload formats

Add support for Geocasting

Add support for Service Payment



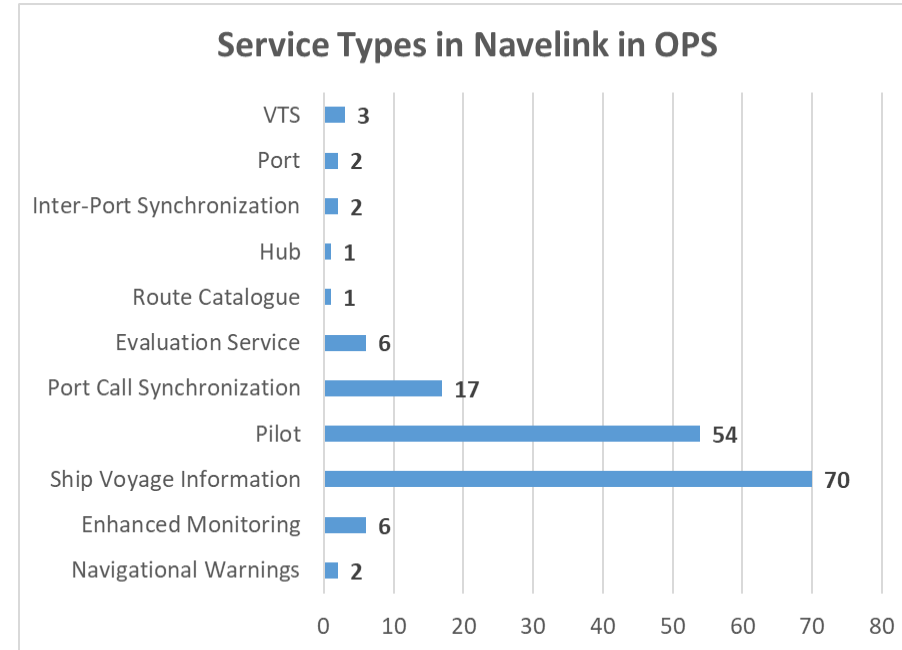
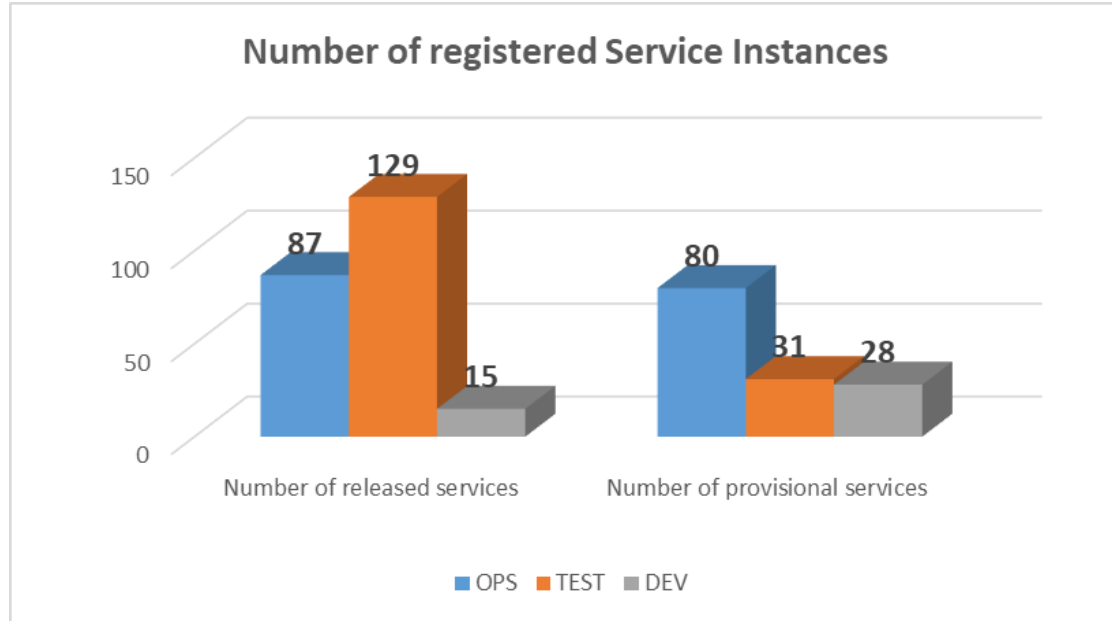
3) Service development discussions & information

- 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

2023-01-24



Events since last Dev Forum:

Created in OPS

- Ship Voyage Information: NEUBURG
- Ship Voyage Information: FAITH

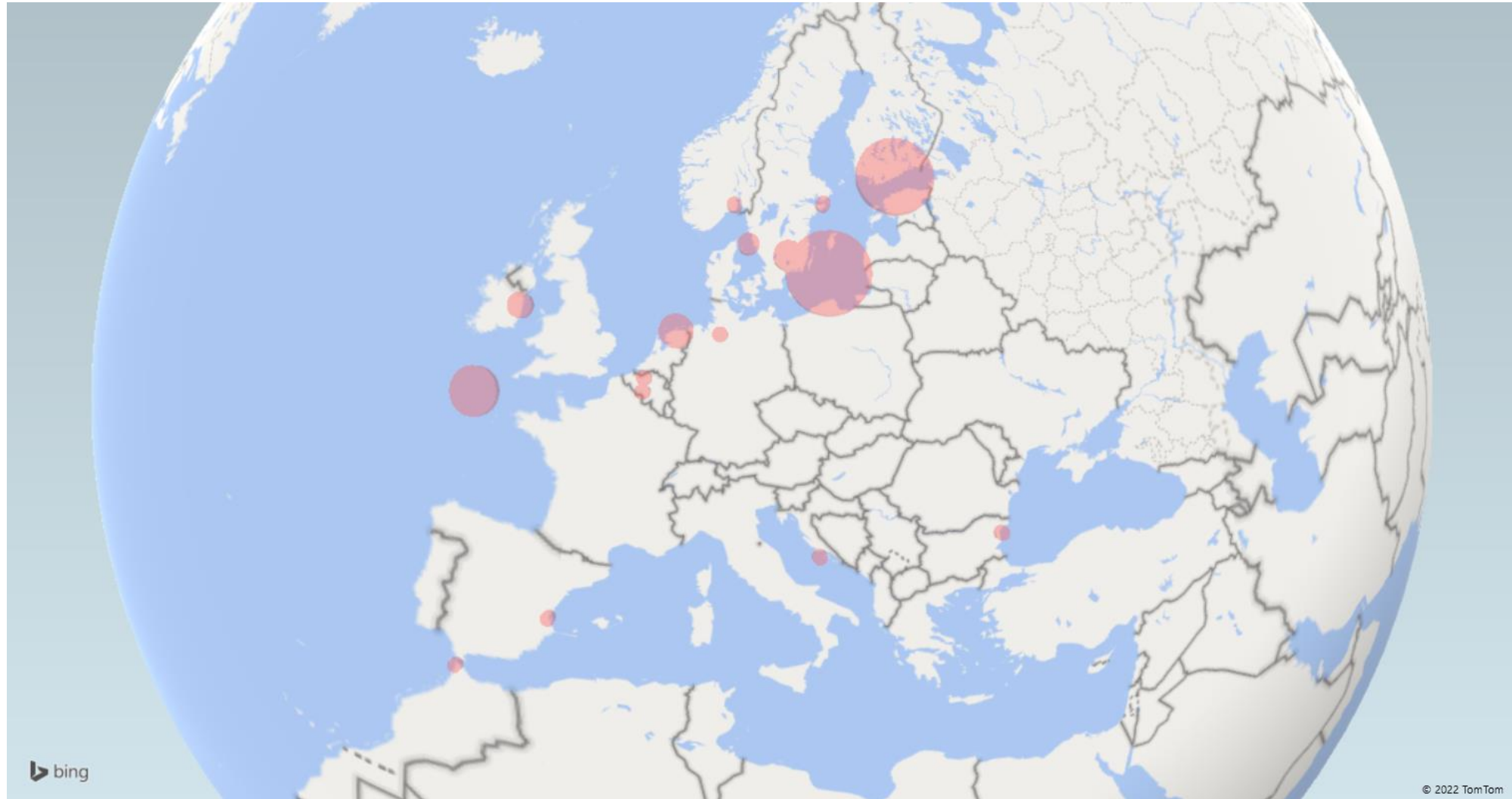
Navelink Operational environment Service Registrations

Service Specifications: 1 (Voyage Information Service v2.2)

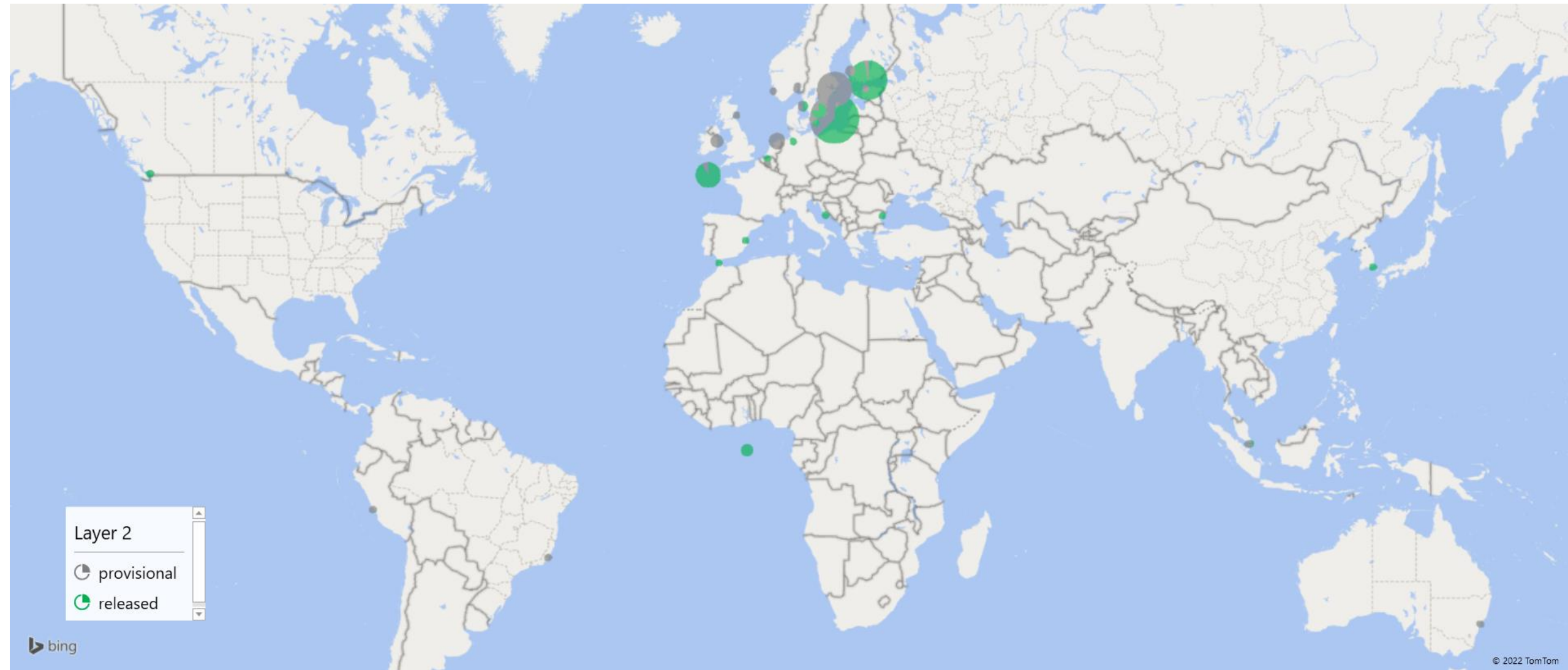
Service Technical Design: 1 (Voyage Information Service Design v2.2)

Service Instances: 167

Geographical representation in Europa for services in Navelink



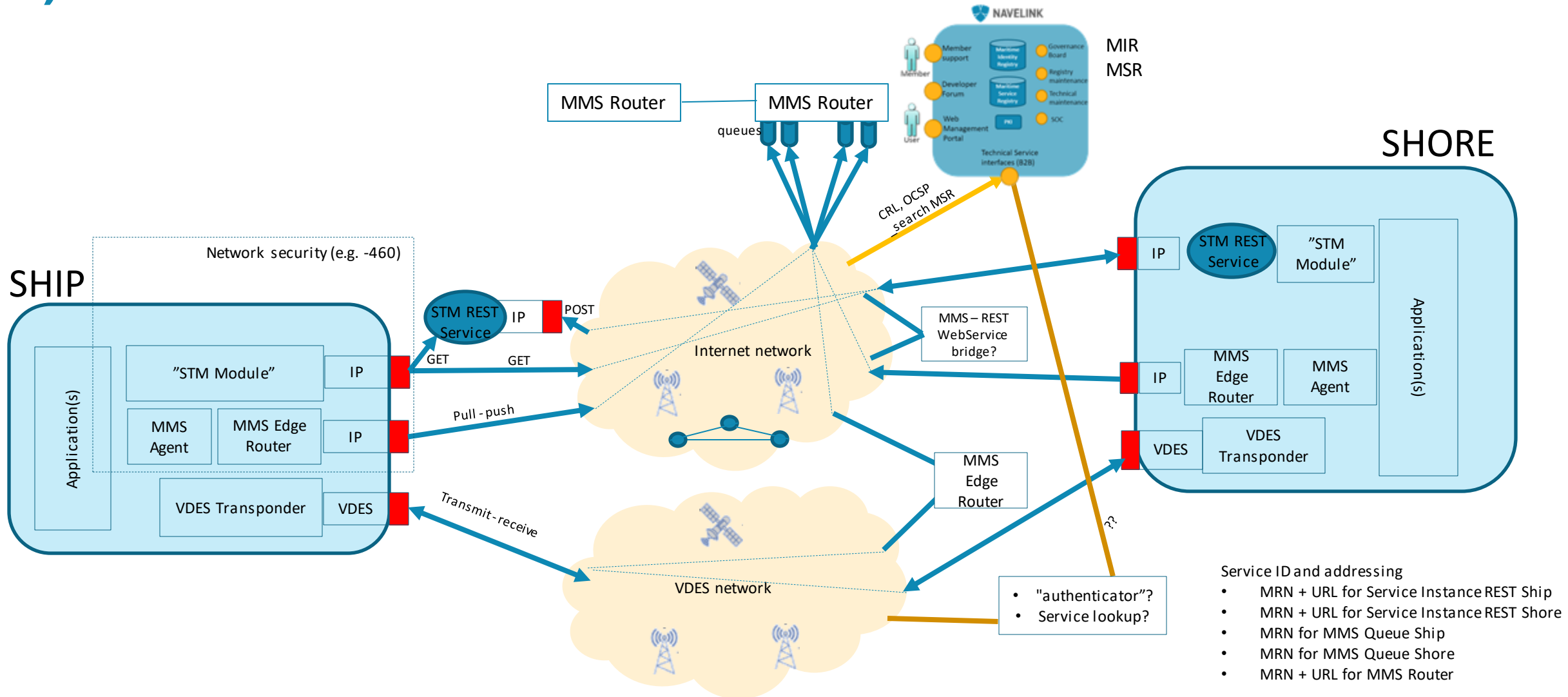
Operational environment



5) Q&A

- Any Questions? The floor is open.

6) Discussion: Navelink + REST + MMS + VDES



- Service ID and addressing
- MRN + URL for Service Instance REST Ship
 - MRN + URL for Service Instance REST Shore
 - MRN for MMS Queue Ship
 - MRN for MMS Queue Shore
 - MRN + URL for MMS Router

Brainstorming around Service Lookup

Using Navelink keys for security

- Signing data
- Authentication between WebServices
- Authentication between MMS Edge router and MMS Router
- Signing VDES "messages"

7) Naviport Presentation

- Presentation of Naviport by Alexey Galka, Wärtsilä

DEVELOPMENT FORUM

Alexey Galka

Product Owner, Port Efficiency

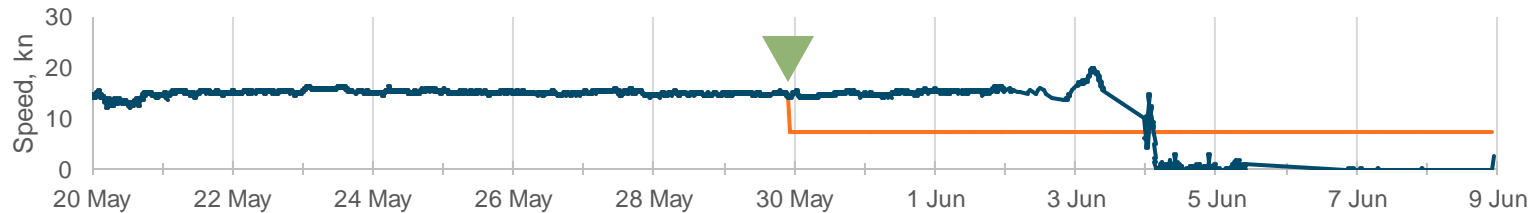
INEFFICIENT OPERATIONS

HOW IT HAPPENS

- Vessel behaviour without a ship-to-shore connectivity solution in place
- Optimal vessel behaviour with JIT solution in place
- ▼ Port informed the vessel about ETA via just-in-time solution

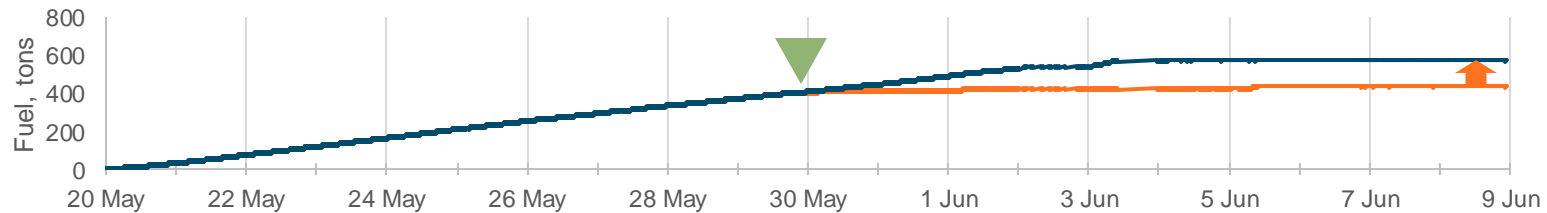
Vessel: Chemical Tanker 23,000 t
 Route: Rotterdam – Santos (5,500 nm)
 Voyage: 20 days (5 days waiting at anchor)

Speed profile
(vs time), kn



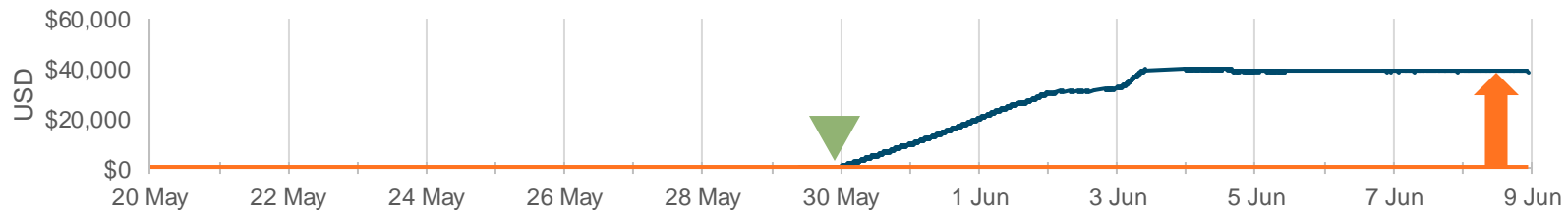
7.6KN
excess speed

Fuel consumed
(vs time), tons



143T
fuel loss

Fuel-associated loss due to late RTA change
(vs time), USD



\$39K
loss

BENEFITS FOR STAKEHOLDERS

PORTS AND TERMINALS

- Get full transparency on the ships going to arrive to the port and related ETA update
- Get a capability to communicate to ships adjusting recommendations on the arrival time
- Know exactly in advance when the ship is coming and ensure all port services are ready to accept the ship therefore optimize needed resources
- Decrease anchor time reduce local CO₂ emission and noise pollution
- Increase safety removing traffic congestions

FLEETS

- Reduce the required speed to a comfortable and necessary level, save fuel and reduce CO₂ emission
- Higher fuel efficiency of cargo transportation therefore lower freight cost
- Priority service in port's operations
- Reduce maintenance operations

HOW IT WORKS

Scenario 3
JITapp only
CyberSecure

Scenario 4
AIS only
CyberSecure

Scenario 2
**Wärtsilä FOS and
3rd-Party ECDIS**
CyberSecure

Scenario 1
**Wärtsilä ECDIS or
Wärtsilä Navi-Planner**
CyberSecure

Onshore
Fleet Operations
CyberSecure

Port
CyberSecure

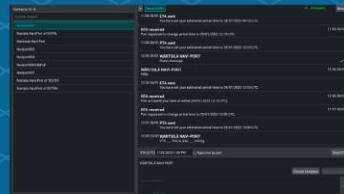
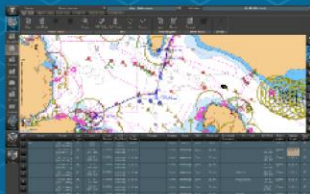
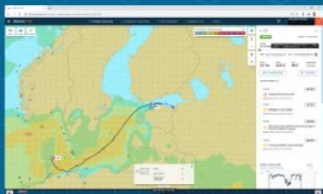
Fleet Operations Solution

Planning Station

Navi-Port

JITapp

Wärtsilä Navi-Port
JIT Solution



WÄRTSILÄ ECDIS / NAVI-PLANNER

The screenshot displays the Wärsilä ECDIS / NAVI-PLANNER interface. The main map shows a route plan in the North Sea region, with various waypoints and route segments. The interface includes a control panel on the right with settings for AIS filter, VECT, and VOT MASTER. Below the map, there is a table of waypoints and route data, and a control panel at the bottom for managing waypoints and route data.

Name	Position	Leg Type	Leg	Total Distance	X PORT	X STBD	Turn Radius
FIRAU Port of Rauma	49° 28.191 N 000° 07.843 E	XX	XXX.X XXX.X	XXX.X	XXX.X	XXX.X	XXX.X
GBMON Montrose Navi-Port	49° 28.303 N 000° 07.673 E	RL	315.3° 0.06 NM	0.06 NM	0.05 NM	0.05 NM	0.70 NM
SEGVX Port of Gävle	49° 29.133 N 000° 05.398 E	RL	299.2° 1.72 NM	1.78 NM	0.03 NM	0.04 NM	0.70 NM
XXTRA Naviport001	49° 31.177 N 000° 04.982 W	RL	286.8° 6.78 NM	8.56 NM	0.08 NM	0.08 NM	0.70 NM

Additional interface elements include a 'Route Data' table on the right showing route details like 'Route 040222', 'To WPT 0', 'BWW', 'XTD', 'BWOL 093.7°', 'DWOL 229.58 NM', 'ETA (UTC)', 'TTG', 'Next WPT 1', 'Next BWW 153.5°', and 'RAD 0.10 NM'. The bottom control panel shows 'LOCODE: FRLEH', 'LOCODE: XXTRA', and 'Type: Waypoint'.

WÄRTSILÄ FOS

Wärtsilä FOS
038 Fostestuser
Web FOS Test 2
99+

Tracking & Awareness
Compliance & Reporting
Hull & Machinery
Voyage & Ports
More

Layers x

Vessels x

Voyages x

rot

VESSELS

All With Active Events

No results.

AIS

- ▶ ROTTUM
Cargo (length: 58m)
- ▶ ROTTERDAM
Passenger (length: 296m)
- ▶ ROTTERDAM
Special Craft (length: 185.8m)
- ▶ ROTTERDAM
Special Craft (length: 44.22m)
- ▶ ROTTERDAM
Tug (length: 28.9m)

PORTS

- ⚓ Rotterdam (NL) ONLINE

ROTTERDAM

ONLINE

General Info
Weather Graphs

Position	51° 54.00' N 4° 29.00' E
Country code	NL
Harbour	River Basin
Harbour Size	Large
Shelter Type	Fair
Pilotage	
Available	Yes
Advisable	Yes
Compulsory	Yes
Local Assistance	N/A
Entrance Restrictions	
Main Channel Depth	10.8 – 12.3 m
Cargo Piers Depth	6.2 – 7.8 m
Oil Terminal Depth	12.3 – 13.9 m
Anchorage Depth	10.8 – 12.3 m
Max Vessel Size	Over 500 ft Length
Overhead Limits	Yes
Mean Level Of Tide	0.3 m
Tide Impact	No
Swell Impact	No
Ice Impact	N/A

IOANNA

Summary
Passage
Graphs
Events
Machinery
Radars

OFFLINE

Updated 3 min ago (AIS)

Unable to draw vessel shape: particulars are incomplete. Edit »

No route information available

SOG	COG	HDG	POSITION
11.4 kn	133.0°	132.0°	16° 21.17' N 69° 24.13' E

PTA sent

DESTINATION	WARTSILA NAVI-PORT OF DEVELOPMENT TEAM
PTA PBP	2022-04-18 00:00

DELETE
SET NEW PTA

REAL TIME MONITORING
PIN VESSEL

SPEED OVER GROUND

SPEED THROUGH WATER MEASURED 11.4 kn

LIVE AIS INFO Updated 5 min ago

Destination COCHIN INDIA

WIND SPEED AT 10 M - BEAUFORT SCALE

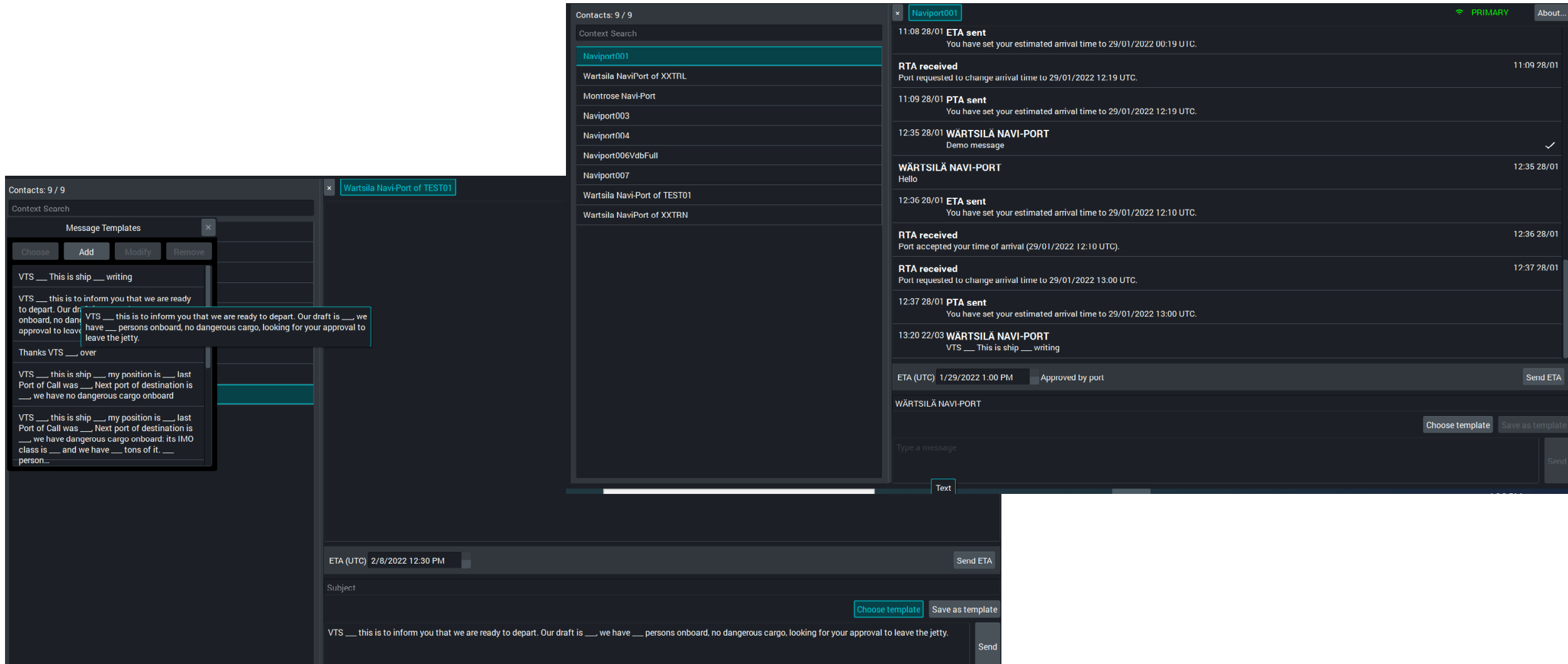
3
4
5
6
7
8
9
10
11
12

Layers x

Vessels x

Voyages x

WÄRTSILÄ JITAPP



The screenshot displays the Wärtsilä JITAPP interface, which is used for managing vessel communications. It features a dark-themed layout with several key components:

- Message Templates:** A panel on the left allows users to select, add, modify, or remove templates. Examples include:
 - VTS __ This is ship __ writing
 - VTS __ this is to inform you that we are ready to depart. Our draft is __, we have __ persons onboard, no dangerous cargo, looking for your approval to leave the jetty.
 - Thanks VTS __ over
 - VTS __ this is ship __, my position is __, last Port of Call was __. Next port of destination is __, we have no dangerous cargo onboard
 - VTS __ this is ship __, my position is __, last Port of Call was __. Next port of destination is __, we have dangerous cargo onboard. its IMO class is __ and we have __ tons of it. __ person...
- Contact Lists:** Two panels show lists of contacts. The top one lists 'Naviport001' through 'Naviport007', and the bottom one lists 'Wartsila Navi-Port of TEST01' and 'Wartsila NaviPort of XXTRN'.
- Message History:** A central pane shows a list of messages for 'Naviport001', including:
 - 11:08 28/01 **ETA sent**: You have set your estimated arrival time to 29/01/2022 00:19 UTC.
 - 11:09 28/01 **RTA received**: Port requested to change arrival time to 29/01/2022 12:19 UTC.
 - 11:09 28/01 **PTA sent**: You have set your estimated arrival time to 29/01/2022 12:19 UTC.
 - 12:35 28/01 **WÄRTSILÄ NAVI-PORT**: Demo message
 - 12:35 28/01 **WÄRTSILÄ NAVI-PORT**: Hello
 - 12:36 28/01 **ETA sent**: You have set your estimated arrival time to 29/01/2022 12:10 UTC.
 - 12:36 28/01 **RTA received**: Port accepted your time of arrival (29/01/2022 12:10 UTC).
 - 12:36 28/01 **RTA received**: Port requested to change arrival time to 29/01/2022 13:00 UTC.
 - 12:37 28/01 **PTA sent**: You have set your estimated arrival time to 29/01/2022 13:00 UTC.
 - 13:20 22/03 **WÄRTSILÄ NAVI-PORT**: VTS __ This is ship __ writing
- Message Composition:** At the bottom, there is a 'Type a message' field with buttons for 'Choose template', 'Save as template', and 'Send'. A 'Text' label is also visible.
- ETA/PTA/RTA Management:** A section shows 'ETA (UTC) 1/29/2022 1:00 PM' with an 'Approved by port' status and a 'Send ETA' button.

INDUSTRY MOVING TOWARDS JIT



IMO-GIA JIT roundtable



Sea Traffic Management



BIMCO clause
on Virtual Arrival



EU Commission's
Directorate-General for
Mobility and Transport
(DG MOVE)



International Taskforce
Port Call Optimization



Digital Container
Shipping Association



JIT Arrival Guide

COMMON QUESTIONS



DEMURRAGE

Adoption of Just-In-Time will not result in lost revenue, as fuel savings can be used to offset any reductions in demurrage.

Virtual arrival clause in Charter Party can reduce effect of demurrage as well.



SCALABILITY

The solution is functional at all stages of port maturity, allowing us to integrate RTA data from some of the remotest ports in the global network.



CYBER

Data is exchanged via the sophisticated security compliant Wärtsilä cloud platform which has AiP for CS from BV and on board system which is approved by DNV iaw IEC 61162-460 standard.



INTEROPERABILITY

The solution based on data formats developed in Sea Traffic Management concept and uses The Maritime Connectivity Platform Navelink allows interoperability between various manufacturers and service providers.

REFERENCES

PIONEERS OF JIT FRONTIER

PORTS AND TERMINALS

- Tanger Med
- Rijeka
- Varna
- Valencia
- Hamburg
- Singapore
- Vancouver
- Antwerp
- Busan

FLEETS

- MSC
- Anglo-Eastern
- Hapag-Lloyd
- CMA CGM
- Vivid Point SIA
- Ektank AB
- Maritech
- Carisbrooke
- AdMare
- BW Epic Kosan

REFERENCES

WORLD FIRST DIGITAL PORT CALL EVER

10 June Discovery of FOS vessel **Kobe Express**: expected to be in **Tanger Med** 24/06 from Cartagena, Columbia. For any previous port call she always been waiting for 8h in average.

+15 days prior arriving

13 June Kobe Express is in Cartagena: updates for SW on a bridge.

17 June Kobe Express is seen in Navi-Port now.

21 June First contact ship-to-shore. Not reliable communication yet, the crew do not reply to the port in timely manner.

+5 days prior arriving

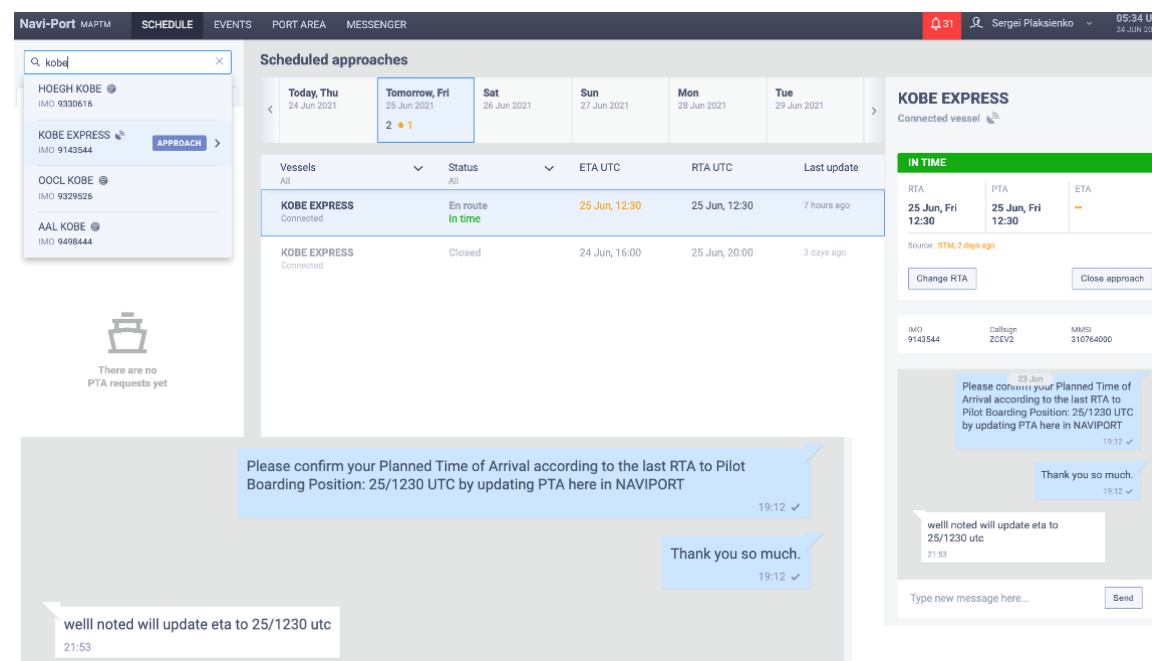
22 June Communication with the Captain established, short training provided.

23 June RTA time from Tanger Med sent. Speed reduced from 17kn in the morning down to 15kn mid-day, 11kn in the evening.

25 June Kobe Express finally arrived at Tanger Med, Terminal 3. Approx. 26 tons saved, 10,000 USD (75 tons of CO₂).

Potential wating time without ETA change: 15h 50m

Estimation made based on FOS data



The screenshot displays the Navi-Port interface with the following components:

- Search Results:** Lists vessels including HOEGH KOBE, KOBE EXPRESS (IMO 9143544), OOCL KOBE, and AAL KOBE.
- Scheduled approaches:** A calendar view for June 2021 showing the vessel's status as 'In time' on Friday, 25th June.
- Vessels Table:**

Vessels	Status	ETA UTC	RTA UTC	Last update
KOBE EXPRESS	En route In time	25 Jun, 12:30	25 Jun, 12:30	7 hours ago
KOBE EXPRESS	Closed	24 Jun, 16:00	25 Jun, 20:00	3 days ago
- IN TIME Section:** Shows RTA (25 Jun, Fri 12:30) and PTA (25 Jun, Fri 12:30).
- Chat Log:**
 - 21:53: "we'll noted will update eta to 25/1230 utc"
 - 19:12: "Please confirm your Planned Time of Arrival according to the last RTA to Pilot Boarding Position: 25/1230 UTC by updating PTA here in NAVI-PORT"
 - 19:12: "Thank you so much."
 - 19:12: "we'll noted will update eta to 25/1230 utc"

Wärtsilä Navi-Port successfully tested in Tanger Med in collaboration with Hapag-Lloyd and Anglo-Eastern Ship Management



LESSONS LEARNED

PORTS AND TERMINALS

- Digital processes in the port must be mature enough
- Need connection of all stakeholders to coordinate the port call
- Involvements of agents is necessary at all steps
- Additional benefits from ports could be a good driver for the shipping

SHIPPING COMPANIES

- Fleet operations must be involved and actively participate in port call coordination; ship to port link is not enough
- Every company has slightly different processes—no universal solution is possible

CREW

- Involvement into the process, understanding the goal is the key
- Proper training of the equipment and process needed
- Push from the shipping company to collaborate helps

WILLINGNESS TO SHARE THE DATA

NEXT STEPS

- Need more vessels and more ports to be involved to gain critical mass
- Expanding scope of data exchange — more timestamps and more processes
- Migration to a brand new software version with option to combine more opportunities for port operators



THANK YOU!

Join the priority list to test out our solutions
wartsila.com/navi-port

8) Closing remarks

- Next Developer Forum at 23/02-2023

Meeting notes (1/2)

- New testbeds are being discussed such as for VDES, Port Calls
- Navelink are looking into increasing traceability and remaining work to become fully SECOM compliant
- A lot of workgroup activities ongoing about product specification and service specifications
 - Active workgroup for Navigational warnings, VTS services, AtoN services, if you want to join, contact Navelink and we can forward you to relevant person.
 - If you know of more work ongoing regarding service specifications and designs, please contact Navelink.
- Discussion on Navelink + REST + MMS + VDES
 - Due to cyber security constraints, ship don't normally accept ingoing service calls, thus when shoreside needs to send a message to a ship, one solution is to deploy a REST service outside ship where shoreside can send message to, and where ship can poll and get the message when they want. This is the architectural design chosen for the services currently registered in Navelink..
 - Navelink provide service identification and service lookup independent on technology used in the service design. Hence the Navelink service registry can be used both for REST web services, SOAP, MMS solution and VDES services (ASM) as a way to announce the service for the consumers.
 - The selection of technologies and designs hav an impact on service providers and consumers.
 - *Should Navelink take active participation in the different designs and technology used by the service producers and consuemrs?*
 - What services/techniques shall we have in the future? - is an issue for Navelink and the guidelines and recommendations to service development around Navelink.
 - *What do you as a user expect from Navelink? Do you expect service design guidelines? Services? Ect.*
 - *Will we "force" consumers to have both REST, MMS, VDES in order to reach all available services?*
 - *Will there be bridges between?*
 - *Will certain type of data products "select" a prefered technology?*
 - Anders Berg comment: If we wait for IALA and IMO it will probably take years, so it is best not to wait but develop further so that we have something later.
 - *We have to agree on the technologies and make them stable.*

Meeting notes (2/2)

- Naviport is a ship to port communication that allows real-time data exchange to facilitate better and more effective planning.
 - The communication processes use Navelink for authentication of clients
 - Expect to have 12 more ships registered to Navelink in the near future
 - Wärtsilä highlights that ports need to be mature, and crews well trained to better accept the new technology
 - Do you see any benefits on using the port call format rather than the route plan exchange format? - The port call are the only format will all relevant timestamps in a port (can be 100+ timestamps)
- Next developer forum at 23/02-2023



NAVELINK

[Navelink.org](https://navelink.org)