Developments in the Interconnectivity of Tide and Weather Data

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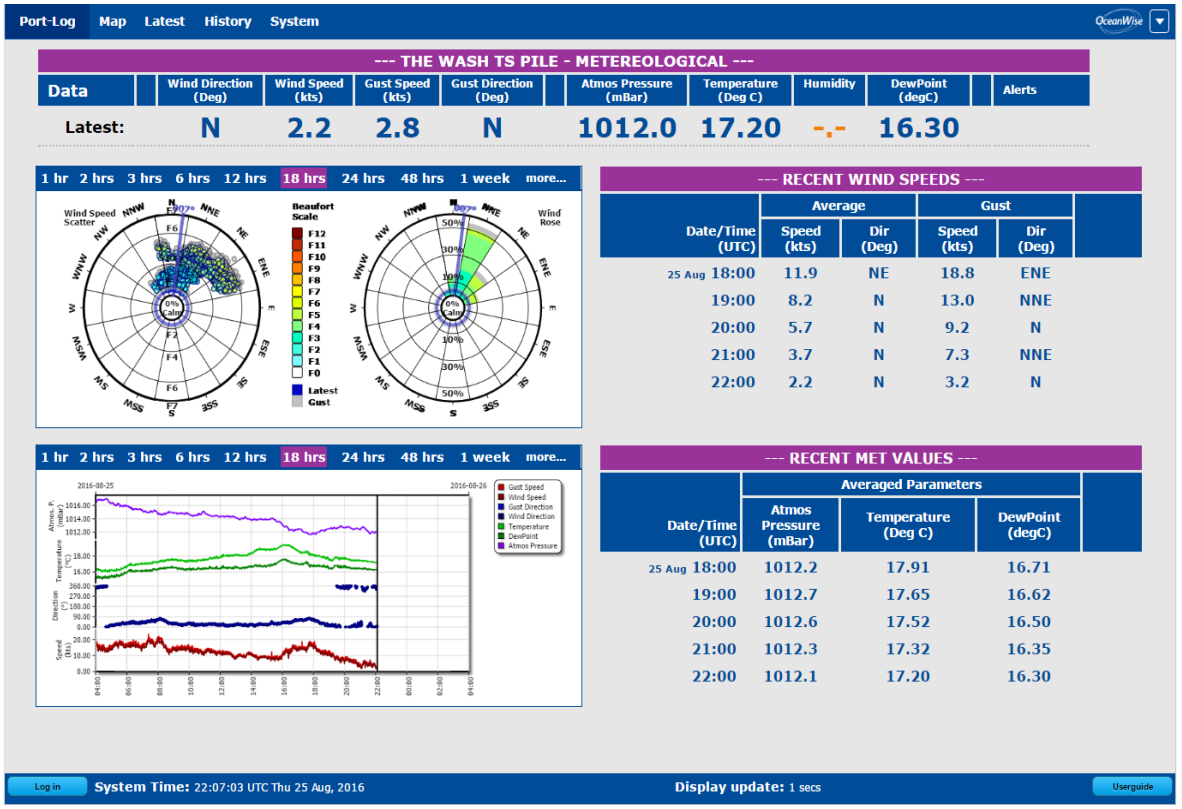
What We Do

- Marine Data Management and Decision Support:
  - Marine and Coastal Mapping Data
  - Enterprise GIS and Maritime Productivity Tools
  - Training, Mentoring and Capacity Building
  - Data Policy, Strategy and Management Systems
  - Environmental Data Sharing and Publishing

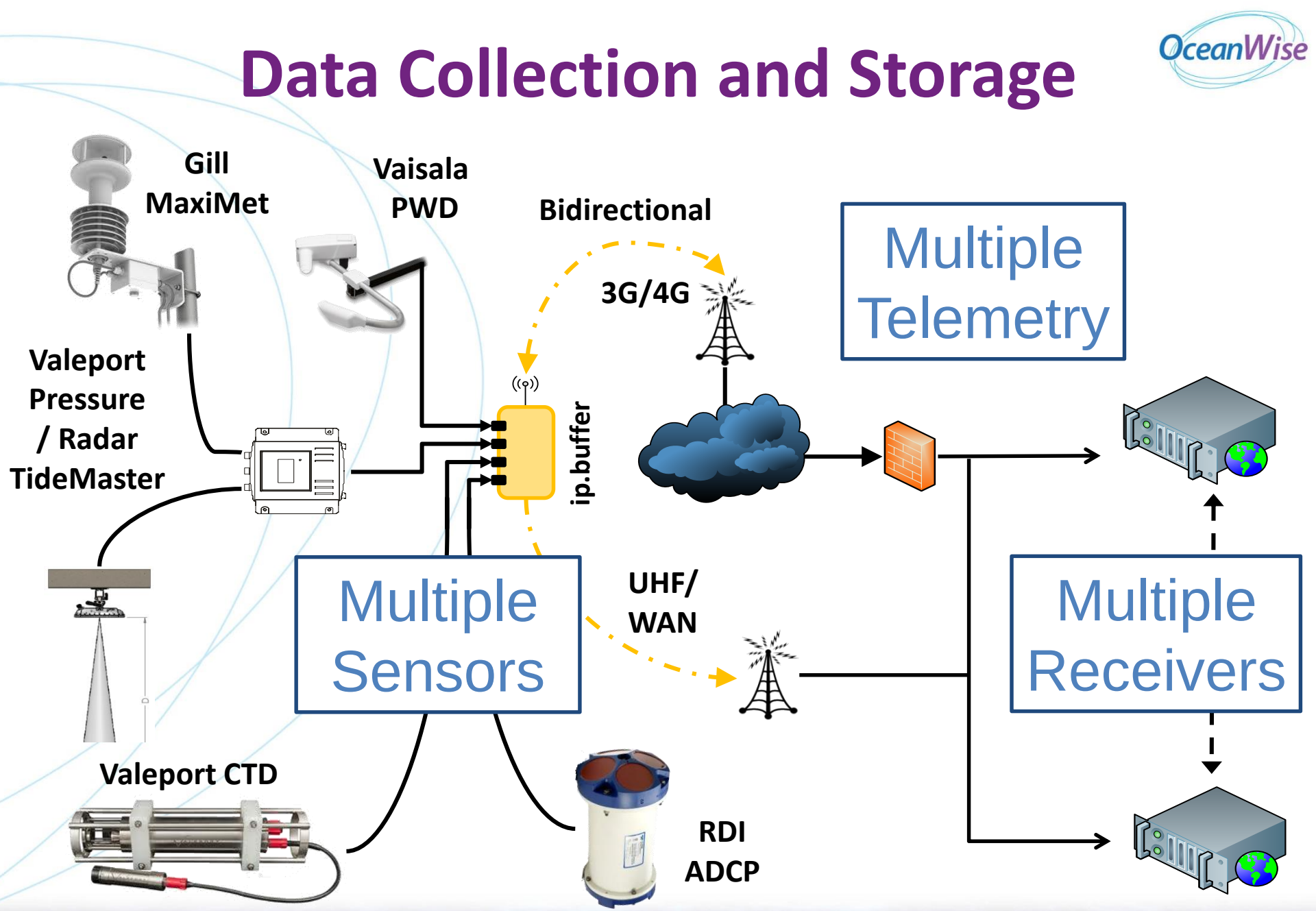
- **System Integration and Interconnectivity**

Port-Log Core Capability

- Multiple sensors and data types
- Real time and historic datasets
- Data Management and Display System
- Designed and proven in VTS
- Standard and custom web pages

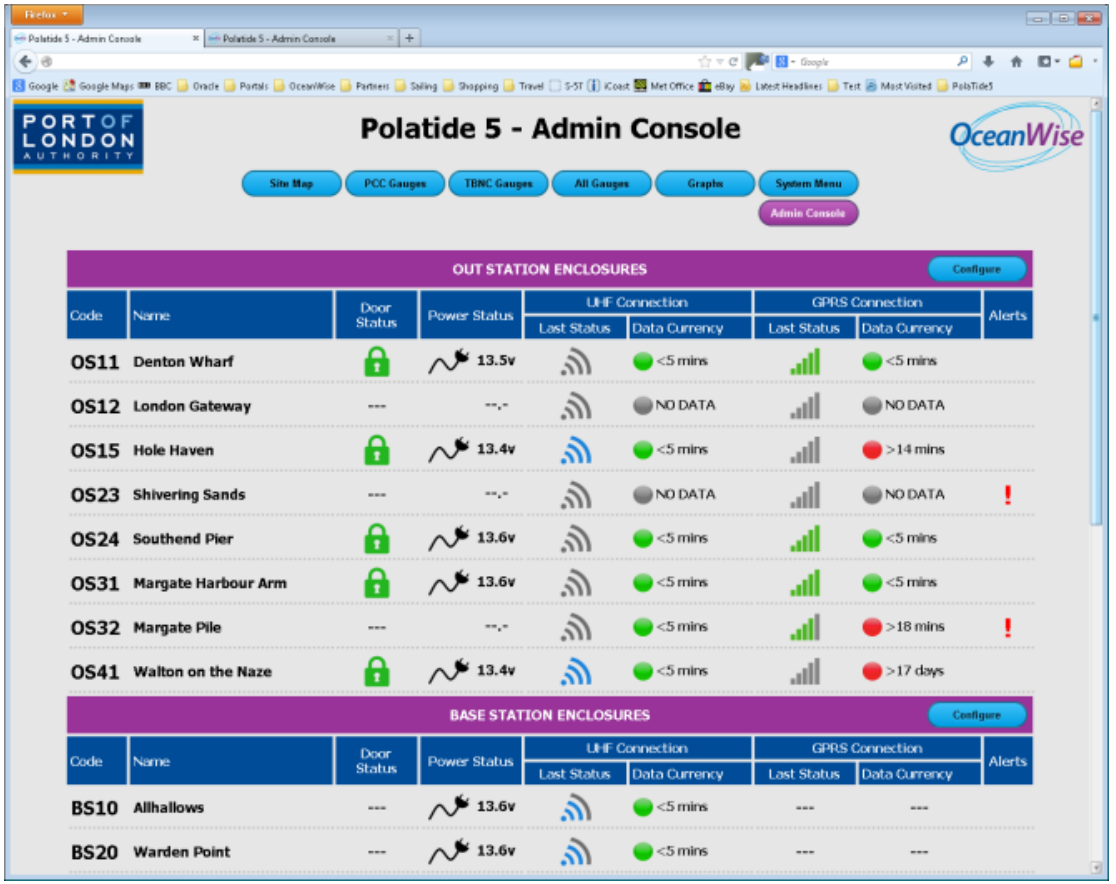


Data Collection and Storage



System Console

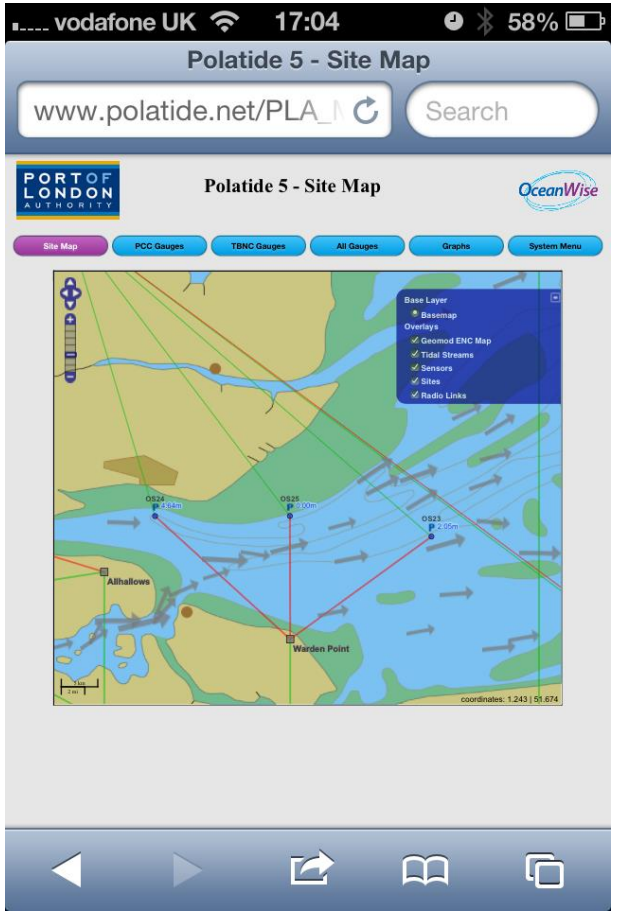
- Calibration data and history
- QC/QA methods and parameters
- System status and monitoring
- Alerts and triggers
- User management
- Metadata



Mapping Interface

- User defined base maps
- Application overlays
- Port specific datasets
- Additional functionality
- Scalable screen size

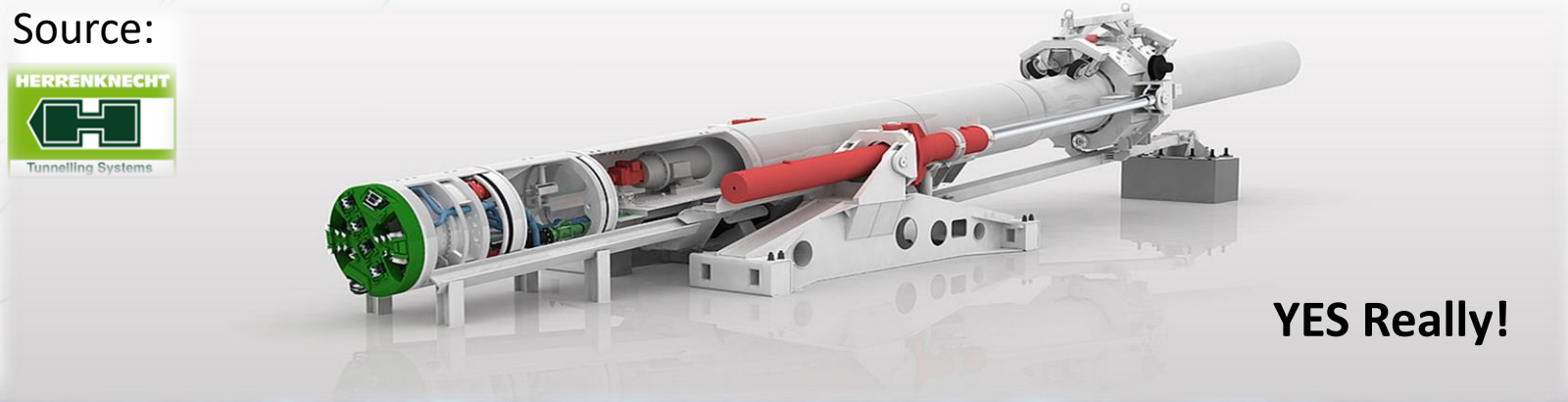
- All good, no Issues
- BUT THEN …



Please can you interface with ....

- Port Authority Website
- Public Service Website
- Gov. Monitoring Network
- AIS Transponder
- AIS Network Controller
- Survey Vessel
- Forecast Provider
- Portable Pilot Units
- Dredgers
- Tunnelling Machine!

Source:



YES Really!

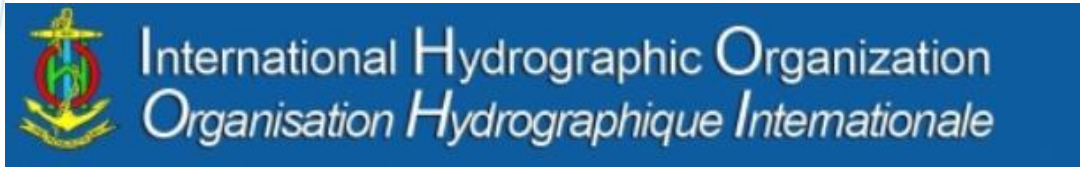
Yes we can!

But how?

Standardisation, of course!

- NMEA Sentences
- AIS ASM
- ISO 19100
- S-112
- OGC Sensor Web

National Marine Electronics Association



What's available

- NMEA standard / proprietary sentences (Serial)
- AIS Application Specific Messaging (VHF)
- XML (Ethernet etc.)
  - SensorML
  - Other?
- JSON (Ethernet etc.)
  - Sensor Stream Format (SSF)
  - JSON Sensor Format (JSF)
  - Other?

AIS Application Specific Messages (ASM)

Title	Msg	DAC	FI	#slots (max)	State	Registrant
Weather Station Message	6	366	1	5	In force	Saint Lawrence Seaway Development Corporation
Environmental	8	1	26	5	In force	IMO Circ. 289
Meteorological and Hydrographic data	8	1	31	2	In force	IMO Circ. 289
Water levels	8	200	24	1	In force	EU

- A good standard
- Multiple specifications
- Which one to use?
- AIS ASM 8-1-31

NMEA 'OneNet'

- Network interface standard built on IEEE 802.3
- Transports standard and proprietary NMEA sentences over TCP/IP networks e.g. Ethernet
- Introduced to address lack of interoperability between different implementations
- Lesson for AIS ASM?

WMO Information System 2.0

- WIS, mainly the GTS, is a niche infrastructure that supports the expert meteorological community
- WIS 2.0 supporting Internet technologies including APIs and Web Services
- Built on commercially available services and industry standards
- WMO strategy for a one stop shop of weather, water and climate information

WMO OMM

Including for e-Navigation?

‘Port-Log Connect’

- Server application accessing data via the new Port-Log API
- Extends existing Port-Log data download facility to a REST web service
- Uses NMEA sentences for data streaming
- Binary encoded to AIS ASM 8-1-31
- Metadata / payload also available as JSON
- Other interchange formats e.g. XML supported

Met Office

Weather Forecast Services

Synthetic AtoN
VTS Software

REST ASM 8-1-31

OceanWise

AIS Network
Controller

Port-Log
ETL

Port-Log
API

3G/4G
LoRA

RF/3G/4G
Iridium

ODB /
Port-Log

Port-Log
Connect

ip.buffer

Port-Log
Connect Client

REST
ASM
8-1-31

ip.buffer

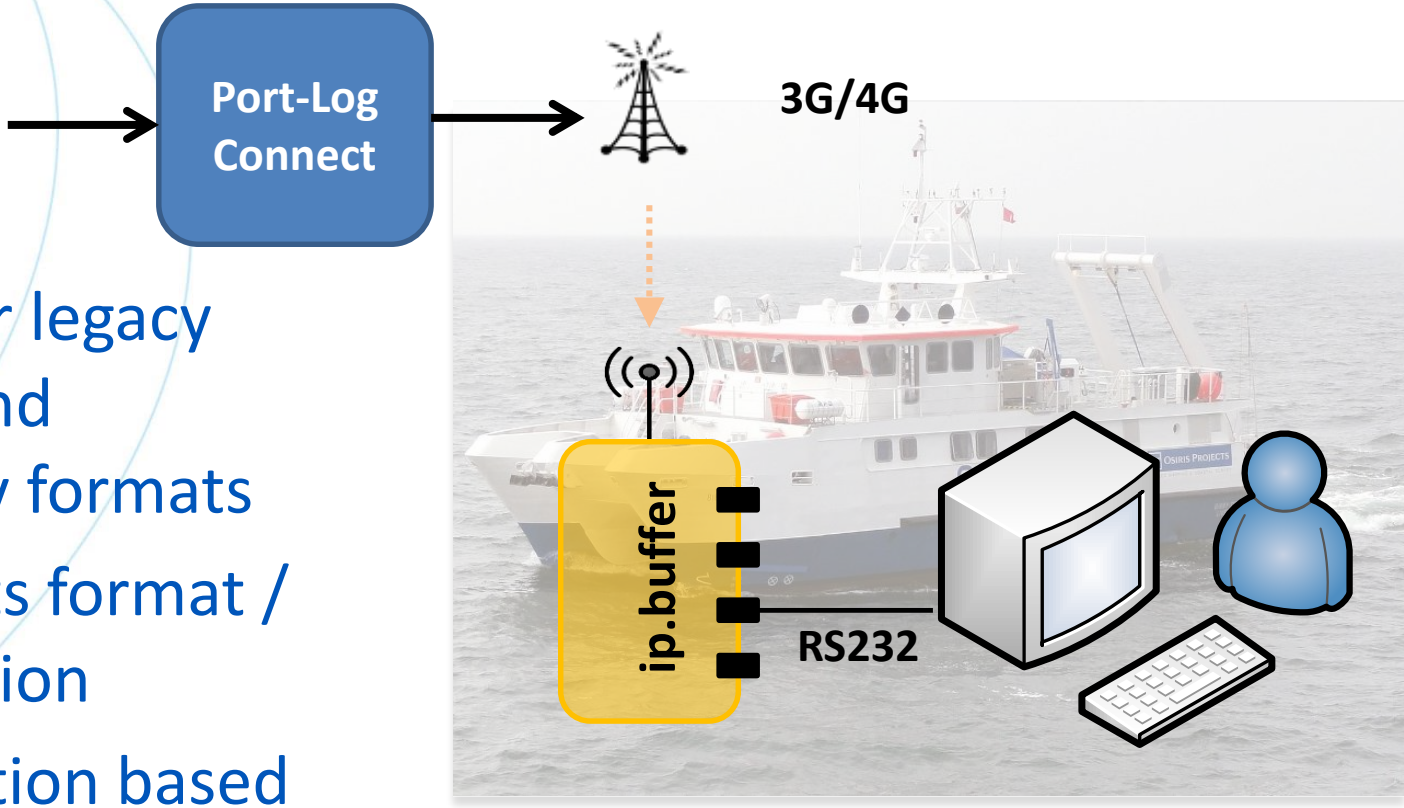
Port-Log Web Displays used
by VTS (for example)

Sensors &
Modem

Real AtoN

Port-Log Connect 'Client'

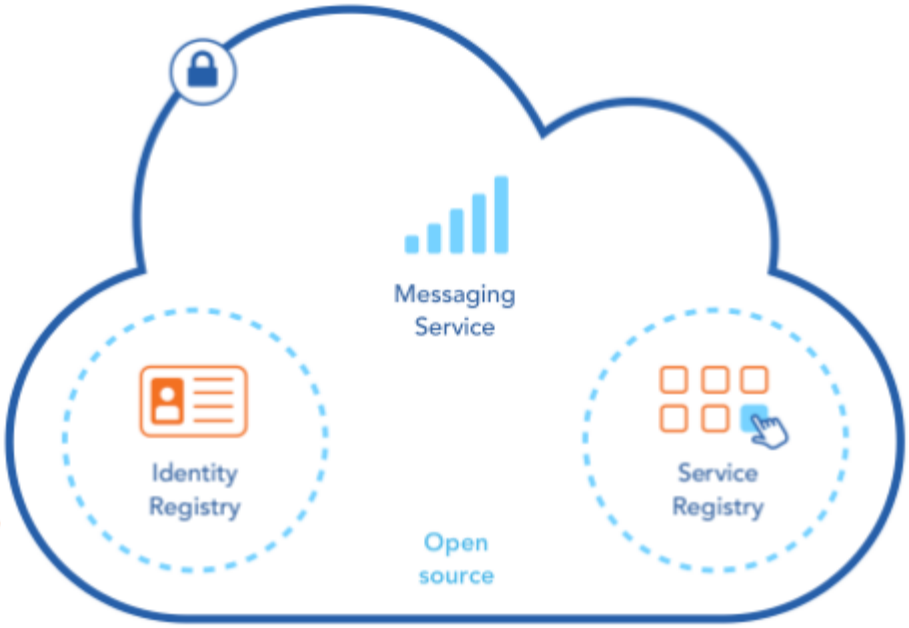
Port-Log API



- Support for legacy systems and proprietary formats
- User selects format / source station
- Auto selection based on vessel position

Connect Client / Survey / Dredger Control Software

Maritime Connectivity Platform

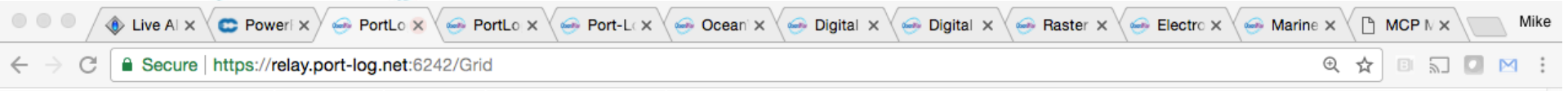


MCP Core Components:

- Identity Registry – Trusted Users Access
- Service Registry – Phone Book of Services
- Maritime Messaging Service – Facilitates Data Exchange
- Core components are Open Source

Testbed for Port-Log API in wider world

Port-Log Real-Time Data



Source	Received	Age	Leader	Data
TW03	16:14:36	6 mins	AIBBM --	!AIBBM,1,1,0,3,8,>jHCv@0Gh0GF2P6uAt3@00HFR06EuOwgwl?wnSwe7wvlOwwsAwwnP7mwvh,0*00
TW03	16:14:37	6 mins	AIVDM --	!AIVDM,1,1,,,8>jHCv@0Gh0GF2P6uAt3@00HFR06EuOwgwl?wnSwe7wvlOwwsAwwnP7mwvh,0*3D
UDPS_212_227_92_121_6240	16:21:04	1 secs	AIVDM 01	!AIVDM,1,1,,B,13P>ArP05SOrhjLM2TW8?Fb:061D,0*19
UDPS_212_227_92_121_6240	16:21:05	0 secs	AIVDM 03	!AIVDM,1,1,,B,33P8g5@Oh2OrrwpM4?N5SED<00rA,0*62
UDPS_212_227_92_121_6240	16:21:00	5 secs	AIVDM 04	!AIVDM,1,1,,A,402MN7iv6ohDswrrk0M4Eb?020S:,0*2B
UDPS_212_227_92_121_6240	16:21:03	1 secs	AIVDM 05	!AIVDM,2,1,7,B,53P9i0800000hmDd000hmDdU=@E=@0000000000000000000Ht00000000000,0*03 !AIVDM,2,2,7,B,00000000000,2*20
UDPS_212_227_92_121_6240	16:19:11	113 secs	AIVDM 08-200-10	!AIVDM,1,1,,A,84hnkJ0j2d<<<<<<<0000?`50000,0*57
UDPS_212_227_92_121_6240	16:20:47	17 secs	AIVDM 18	!AIVDM,1,1,,A,B3P;wJ@0?GveugWA
UDPS_212_227_92_121_6240	16:20:24	40 secs	AIVDM 21	!AIVDM,1,1,,B,E>jHC`2W0Q@:7cRa@6400000000OulMR>OhMh:1AACcg@0,4*49
UDPS_212_227_92_121_6240	16:20:49	16 secs	AIVDM 24	!AIVDM,1,1,,B,H3P;wJDU0000000j426p000h5130,0*5C
UDPS_212_227_92_121_6240	16:20:33	31 secs	AIVDM 27	!AIVDM,1,1,,B,K3HhKt1OuKkf;0;@,0*7F
UDPS_77_221_167_70_6908	16:15:53	5 mins	ABVDM --	!ABVDM,2,2,1,A,Bh0000000000000,2*04
UDPS_77_221_167_70_6908	16:21:05	0 secs	ABVDM 01	!ABVDM,1,1,,B,13cpQg001wOtgRRLmN<9sGv:0H31,0*7B
UDPS_77_221_167_70_6908	16:21:04	1 secs	ABVDM 03	!ABVDM,1,1,,B,33P9f0OP0ownrEfM13j=Dgv82>`S,0*53
UDPS_77_221_167_70_6908	16:21:05	--:--	ABVDM 04	!ABVDM,1,1,,A,402:oP1v6ohE4woA:HLKNp700p36,0*49
UDPS_77_221_167_70_6908	16:21:04	1 secs	ABVDM 05	!ABVDM,2,1,2,B,53P9i0800000hmDd000hmDdU=@E=@0000000000000000000Ht0000000,0*0D !ABVDM,2,2,2,B,000000000000000,2*2E
UDPS_77_221_167_70_6908	16:18:27	3 mins	ABVDM 07	!ABVDM,1,1,,A,702:oP3dTnnl,0*72
UDPS_77_221_167_70_6908	16:19:11	113 secs	ABVDM 08-200-10	!ABVDM,1,1,,A,84hnkJ0j2d<<<<<<<0000?`50000,0*5C

Concluding Remarks

- Standardisation – but which standard / specification?
- Multiple users / applications require multiple interfaces
- Port-Log API + Port-Log Connect addresses this issue
- Convergence is happening e.g. on ISO19100
- BUT the specifications are diverging – a problem?
- Test platforms e.g. MCP are major step forward
- More work required by governing bodies to address challenges e.g. MMSI if not 'AtoN' → '900 + PLG Site ID'?
- Way forward is to keep talking – IMO but also WMO etc

Thank You!

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