HARMONIZATION OF IDENTIFIERS USING MARITIME RESOURCE NAMES (MRN)

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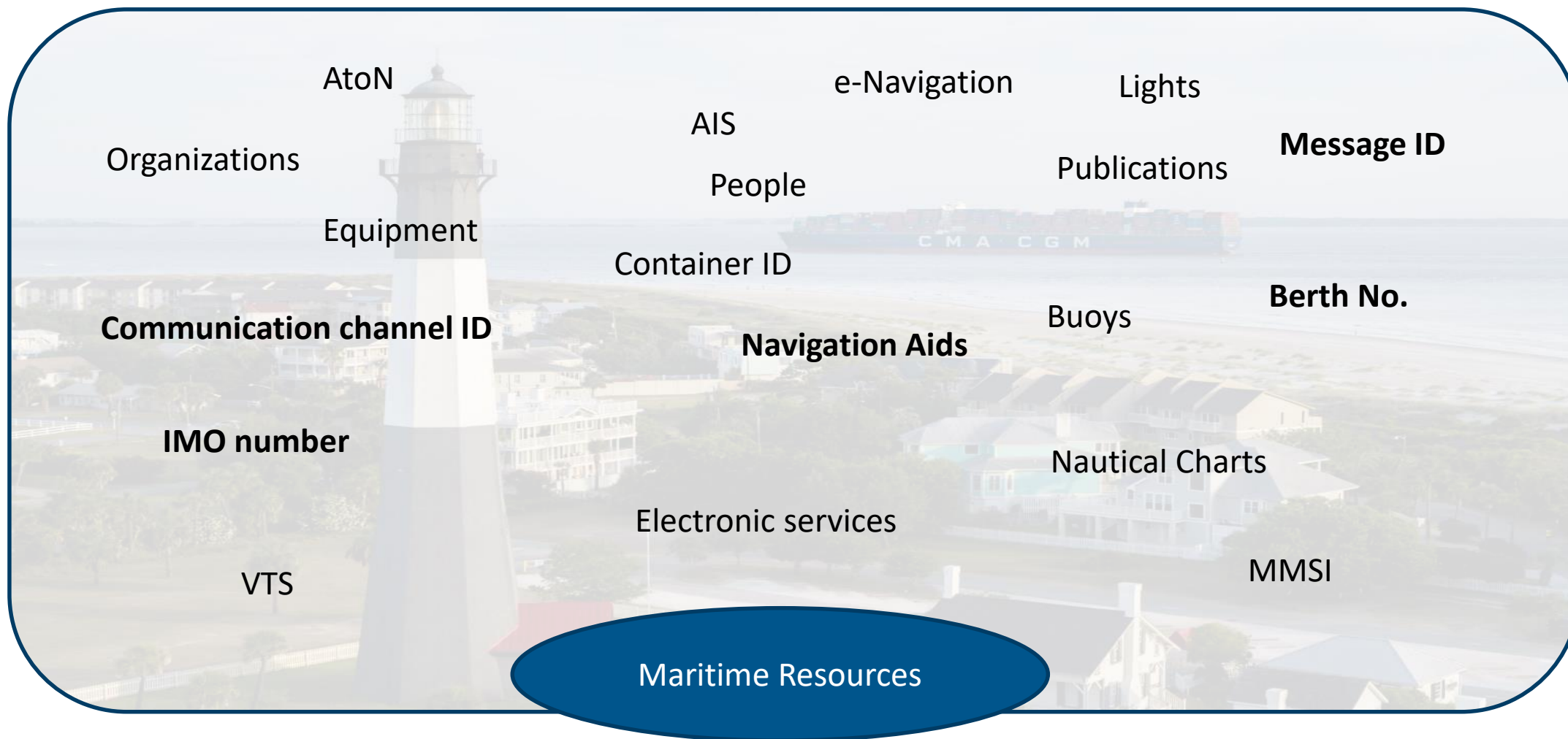
IALA

- Non profit, international technical association established in 1957

- Standards, Recommendations, Guidelines, Manuals, Model Courses

- Two strategic goals aimed at development and harmonisation of global Marine Aids to Navigation system

- Transition from NGO to IGO

S1010 ATON PLANNING AND SERVICE REQUIREMENT

S1020 ATON DESIGN AND DELIVERY

S1030 RADIONAVIGATION SERVICES

S1040 VESSEL TRAFFIC SERVICES

S1050 TRAINING AND CERTIFICATION

S1060 DIGITAL COMMUNICATION TECHNOLOGIES

S1070 INFORMATION SERVICES

MRN - Unique identifier for all types of resources

AtoN

e-Navigation

Lights

AIS

Message ID

Organizations

Publications

People

Communication channel ID

Container ID

Berth No.

Buoys

Navigation Aids

Equipment

IMO number

Nautical Charts

Electronic services

VTS

MMSI

Maritime Resources

URI, URL, URN

The global coordination of the DNS Root, IP addressing, and other Internet protocol resources is performed as the Internet Assigned Numbers Authority (IANA) functions. Learn more.

URI (Uniform Resource Identifier)
<Scheme>:<Scheme-specific-structure>
http://iala-aism.org/product/lighthouse

URL(Uniform Resource Locator)
10 rue des Gaudines 78100
Saint Germain en Laye
http://iala-aism.org/

Where

URN (Uniform Resource Names)
Paul Petry
urn:mrn:iala:person:nnnn.n

What

Need for Harmonizing Maritime Identities

Reducing confusion and errors

- Maritime operations usually involve a variety of different resources

  - Need to clearly address individual resources

  - → Always recognizable which resource is being targeted, without misunderstandings

- Nowadays there are different identifiers in various formats to address resources:

  - Vessels: MMSI (e.g. 211321880)/ IMO-Number (e.g. IMO9074729)

  - Ports: UN/LOCODE (e.g. DE HAM)

  - Container: ISO6346 (e.g. CSQZ3054383)

Source: https://www.sailingissues.com/navcourse9.html

Need for Harmonizing Maritime Identities

Reducing confusion and errors

- All these IDs have their relevance - but the use of <u>different not coordinated formats can lead to confusion and errors</u> in maritime operations:
  - Lack of context information
    - What is "211321880"? MMSI, phone number, …?
  - Risk of Duplication
    - IDs are unique in their domain but not across domains
    - "211321880" could be a valid phone number and an MMSI at the same time
  - → Can lead to serious consequences for safety and efficiency

- <u>Harmonization of maritime identities</u> would be beneficial for many use cases
  - "Translating" IDs into a coordinated uniform format
  - Possible through the application of Maritime Resource Names

Maritime Resource Names
Underlying standard and advantages

- MRNs are based on the Uniform Resource Names (URNs) standard (RFC 2141)
  - Well-established standard for the identification of resources
  - URNs are management by the IANA
  - Each domain can register for its own URN-space
    - ISBN, DOI, IETF, …

- URN-space for the maritime Domain → urn:mrn:
  - Maritime URN-space is managed by IALA

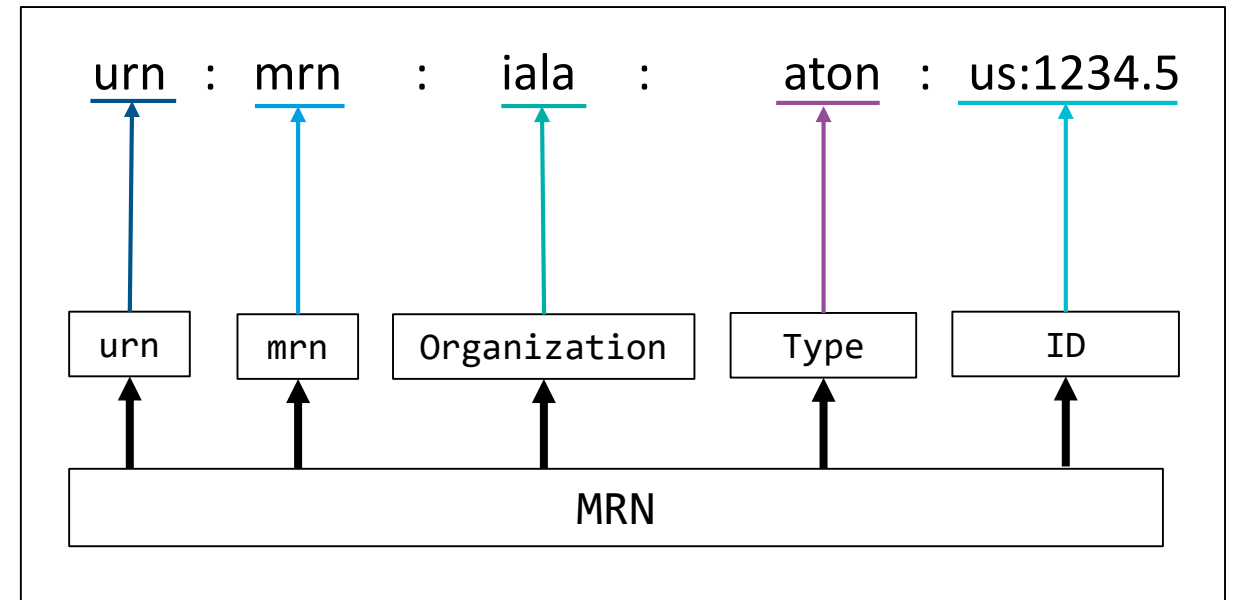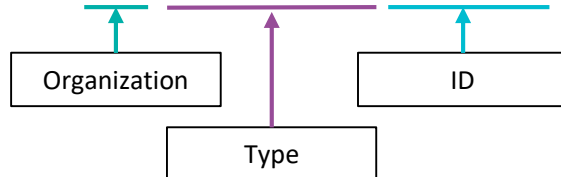| Object	Exemplary URN
Books	urn:isbn:9781472990457
Research Items	urn:doi:10.3390/jmse10122011
IETF Standards	urn:ietf:rfc:2141
Maritime Resources	urn:mrn:itu:vessel:mmsi:211321880

Exemplary Identifiers based on URNs

Maritime Resource Names

MRN Strucure

- MRNs have a hierarchical structure with <u>multiple parts separated by colons</u>

- MRNs usually consist of the following components:
  - **urn:mrn** – static part with which each MRN begins
  - **Organization** – ID of the coordinating body of the resource (e.g. IALA, IMO, …)
  - **Type** – Specifies the nature of the resource
  - **ID** – identifier of the (digital / physical) object

- MRNs make it easy to map already existing identities:
  - Exemplary MRN for an IMO number could look like:
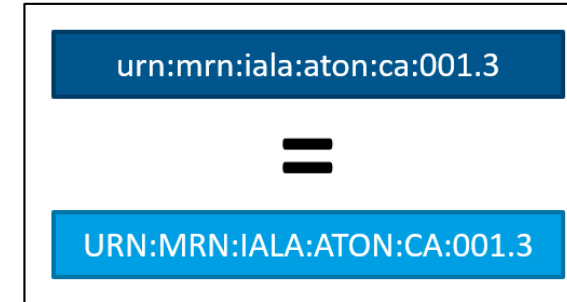   - urn:mrn:imo:imo-number:9743368

Simplified structure of MRNs

Maritime Resource Names
Characteristics of MRNs

- MRNs are case-insensitive
  - But: Various spellings could be interpreted as different
  - In general - MRNs should always be written in lowercase

- Possible to have more than one MRN assigned to a single resource
  - Example: Vessel Josephine has one MRN for the vessel's MMSI number and one MRN for the vessel's IMO number
  - Same ship has two IDs for different domains

- Advantages of Maritime Resource Names
  - Uniqueness: Globally unique persistent identifiers in a standardized format
  - Flexible: Existing IDs can be easily converted into the MRN format
  - Informative: Contains meta-information in contrast to classic identifiers
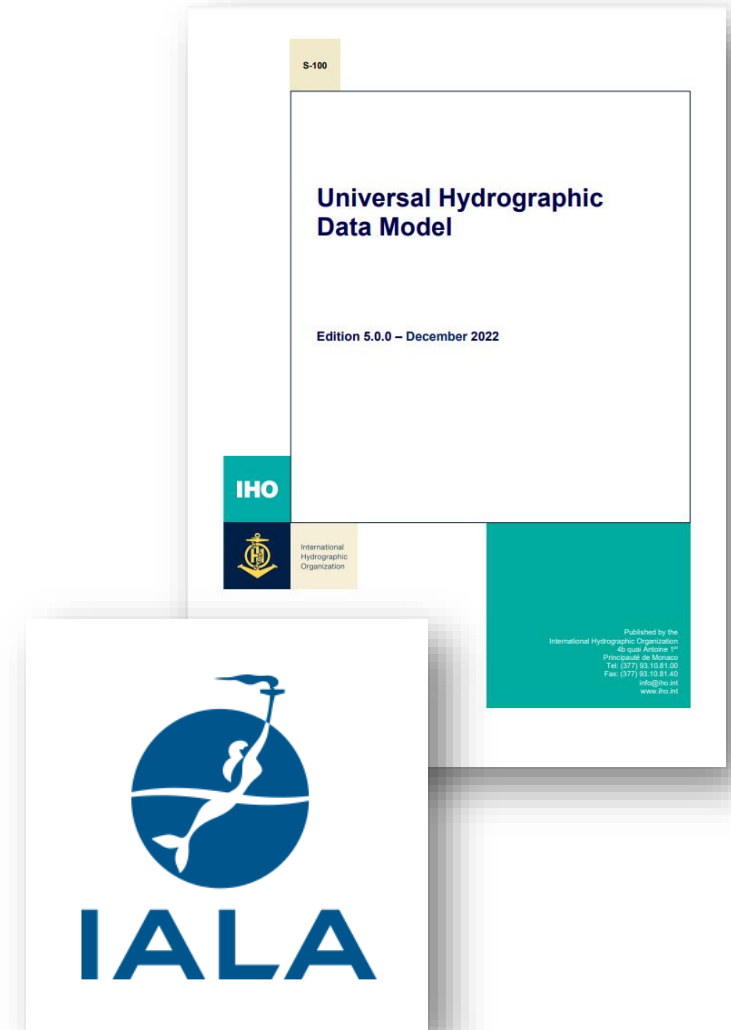   - urn:mrn:itu:vessel:mmsi:211321880 → Vessel with MMSI 211321880

urn:mrn:iala:aton:ca:001.3

=

URN:MRN:IALA:ATON:CA:001.3

urn:mrn:itu:mmsi:538070999

urn:mrn:imo:imo-number:9743368

Vessel: Josephine

Maritime Resource Names

Outline

- MRN have the potential to bring all existing identifiers of the different maritime stakeholders into one unified format!

- This would lead to:
  - **Higher interoperability**: MRNs can be used across different systems, applications, and organizations in a uniform way
  - **Enhanced security**: MRNs are unique across all stakeholders and use cases → reduction of errors and confusion

- <u>Existing identifiers are not replaced by MRNs but supplemented!</u>

- MRNs are already an integral part of many existing standards like the S-100 framework

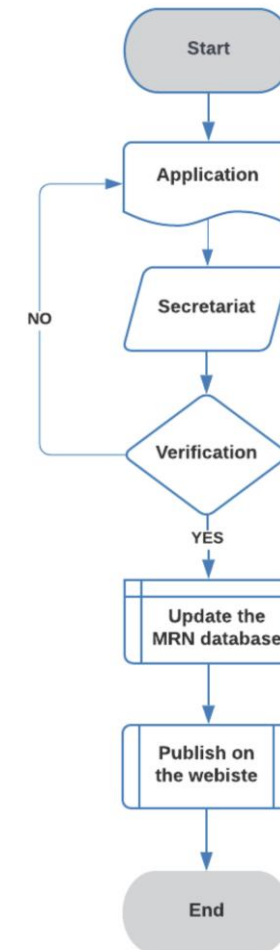- Interested organizations can apply for their own MRNs at IALA

S-100

Universal Hydrographic Data Model

Edition 5.0.0 – December 2022

IHO
International Hydrographic Organization

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IALA

Maritime Resource Names

Application – IALA G1164 Management of MRN Organisation Identifiers

- The assignment of country codes has already been pre-determined.

Organization IDs	Date	Registering organization
urn:mrn:iala:	2017-07-30	International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) http://www.iala-aism.org
urn:mrn:iho:	2018-04-04	International Hydrographic Organization (IHO), http://www.iho.int
urn:mrn:mcl: urn:mrn:mcp:	2017-06-22	Maritime Connectivity Platform Consortium, www.maritimeconnectivity.net
urn:mrn:gs1:	2018-10-30	GS1 Global Office, www.gs1.org
urn:mrn:mission:	2019-2-01	Manage Information Seamlessly in Ports and Hinterlands (MISSION) https://www.lhg.com/index.php?id=239
urn:mrn:ipcdmc:	2019-06-26	International Port Collaborative Decision Making Council (IPCDMC) http://www.ipcdmc.org
urn:mrn:stm:	2019-03-28	Sea Traffic Management (STM), https://www.stmvalidation.eu/
urn:mrn:nlp:	2020-03-20	Navelink Industry Consortium, https://navelink.org
urn:mrn:iehg	2023-03-11	The Inland ENC Harmonization Group (IEHG), https://ienc.openecdis.org/

QUESTIONS ?

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