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Managing of MRNs

# Summary

This document contains a proposal for how to manage *Maritime Resource Names (MRN)*, more specifically the assignment of Organization IDs by IALA, as well as a system for sharing of MRN definitions (organization-specific namespace strings) that have cross-organization interest.

# INTRODUCTION TO MRN

At Enav17 we presented Maritime Resource Names (MRN) as a system for uniquely identifying maritime resources on a global scale using Uniform Resource Identifiers.

To give a short recap, MRNs are defined using the following hierarchical structure (full syntax available in Annex A):

*"urn:mrn:"<NSS>*

where NSS is the Namespace Specific String composed as follows:

*<NSS>::=<Organization ID>":"<Organization-specific namespace ID>":"<Organization-specific namespace string>*

The MRN scheme is highly adaptable. Each organization can choose their own layout for a specific type of identifiers. It is easy to fit existing identifiers into the naming scheme. And it provides good context information about the type of the identifier in comparison to something simple like a random UUID.

Some hypothetical MRN examples we described in our previous paper were:

A vessel with an IMO number of 9743368 could be identified as follows:

*urn:mrn:imo:imo-number:9743368*

An aton located in the USA could be identified as follows:

*urn:mrn:iala:aton:us:1234X5*

A container aboard a ship using the ISO 6346 identifier scheme for container ids.

*urn:mrn:bic:container-id:CSQU3054383*

# Organization IDs

The leftmost part of a MRN string is the *Organization ID* or *OID.* In order to assure that no organization uses the same OID a centralized assignment process is needed. This is similar to how In the Domain Name System, IANA deals with assignments at the higher levels. While subdomains are administered by the organization to which the space has been delegated.

We propose a simple registration on first come first served basis[[1]](#footnote-1). A template with minimum information is submitted via email to the IALA secretary where a representative will evaluate it. If the template is filled out correctly, the Organization ID is available, and the registering organization fits basic requirements set up by IALA. The filled-out template will be added by IALA to a public available source repository hosted on GitHub[[2]](#footnote-2). And the requested organization will be notified of a successful registration.

In the GitHub repository, all templates will be contained in a single directory with the filename <Organization ID>.txt. Making it easily available to everyone using GitHubs Web-based access.

The contents of the template should just contain the minimum information needed. For example, here is a template example of a hypothetical registration of “mcl” for the Maritime Cloud Development Forum:

mcl.txt

Organization ID:

mcl

Date:

2017-06-22

Declared registrant:

Registering organization:

Maritime Cloud Development Forum

http://www.maritimecloud.net

Contact:

Thomas Steen Christensen

THC@dma.dk

Purpose:

The Maritime Cloud Development Forum governs and directs the development of the Maritime Cloud. Which is a communication framework enabling efficient, secure, reliable and seamless electronic information exchange between all authorized maritime stakeholders across available communication systems.

Initially MRNs will be deployed to identify core actors such as organizations, users and vessels.

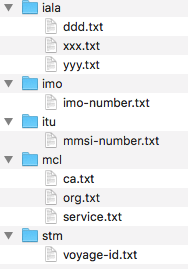
# Organization-specific namespace IDs

The Organization-specific namespace ID is the part following immediately after the Organization ID. It is assigned in a decentralized way by an organization that have obtained an Organization ID. Just like in the Domain Name System (DNS) where whenever an organization have registered a new domain. The organization is free to create new subdomains as they want without involving a central authority, for example, enav.foo.org or xxx.enav.foo.org.

While a total decentralized approach would the easiest from an administrative point of view. We believe that it would make sense to have a central repository where organizations *should*, but does not have to, register MRN definitions they expect will be used across of multiple organizations.

This would make it much easier to discover existing definitions and avoid creating overlapping definitions. Furthermore, it would be easy to find existing definitions that could serve as an inspiration when defining new MRN strings. Finally, there would be no need to send information about MRN definitions back and forth using email or similar methods.

We propose that the same public repository used for Organization IDs could be used for these definitions. The definitions could be stored in a simple hierarchical view such as this:



Each text file would contain a filled-out template similar to the one used for the Organization ID registration process. The exact contents of this template have yet to be defined. However, we believe the following considerations could be used as a starting point:

## Syntax

Since MRNs are expected to be involved in a lot of machine to machine communication or inclusion in documents such as Extensible Markup Language (XML) documents. It is vital that the exact syntax is formalized to avoid any kind of unambiguous representation. To avoid this, a description of the structure of MRNs within the namespace, in conformance with the fundamental MRN syntax is needed. The structure might be described in terms of a formal definition (e.g., using ABNF [RFC5234]), an algorithm for generating conformant URNs, or a regular expression for parsing the string into constituent parts.

## Assignment

The main use case of MRNs is to function as unique identifiers. Therefore, it is important to describe which method is used for ensuring that MRNs within the namespace are unique. This can be done, for example, by assigning URNs sequentially or using a well-defined process by a single authority. Assignment could also be partitioned among delegated authorities that are individually responsible for respecting uniqueness rules. This is, for example, used in the STM project for generating unique vessel IDs.

The mechanisms or authorities for assigning URNs to resources should also be described. For example, it should be clear whether assignment is completely open (e.g., following a particular procedure such as first-come, first-served), completely closed (e.g., for a private organization), or limited in various ways (e.g., delegated to authorities recognized by a particular organization). If limited, it should be described how to become an assigner of names or how to request assignment of names from existing assignment authorities.

## Security and Privacy

This section should describe any potential issues related to security and privacy with regard to assignment or use within the MRN namespace. For example, leakage of private information when names part of the MRN and MRNs are communicated over a public communication channel.

## Interoperability

Interoperability with existing identifier schemes must be evaluated. For example, if an existing non-URN identifier system uses non-ASCII characters these characters must be percent-encoded.

## Additional Information

An optional “Addition Information” section could include information that is useful to those trying to understand this registration or its relationship to other registrations, for example, comparisons to existing MRN namespaces that might seem to overlap.

# ACTION REQUESTED OF THE COMMITTEE

The committee is requested to recommend that IALA takes the responsibility of ownership of the MRN registry and manage it according to the principles described in this document.

1. MRN ANBF Grammar

The basic syntax for a MRN is defined using the Augmented Backus-Naur Form (ABNF) as specified in [RFC5234]:

<MRN> ::= "urn" ":" "mrn" ":" <OID> ":" <OSS>

[ rq-components ]

[ "#" f-component ]

<OID> ::= (alphanum) 0\*32(alphanum / "-") (alphanum) ;

Organization ID

<OSS> ::= <OSNID> ":" <OSNS> ; Organization-specific

string

<OSNID> ::= (alphanum) 0\*32(alphanum / "-") (alphanum)

; Organization-specific namespace ID

<OSNS> ::= pchar \*(pchar / "/") ; Organization-specific

namespace string

Rules not defined here:

* alphanum and pchar as defined in [RFC3986].

* rq-components and f-component as defined in [RFC8141].

The namespace, “mrn”, is case-insensitive in processing but is conventionally written in lower case.

Q-component, F-component and R-component are not generally defined by this specification. Organization specific namespace strings might choose to make use of them where applicable.

1. Obviously, registrations of well-known maritime stakeholders such as IMO or ITU can only be performed by the respective organizations. [↑](#footnote-ref-1)
2. GitHub is cloud based version control repository. Used by programmers, developers, and designers to store projects and keep track of changes to their files. GitHub reports having almost 20 million users and 57 million repositories, making it the largest host of source code in the world.[ [↑](#footnote-ref-2)