

Paper for Consideration by TSMAD26/DIPWG5

Proposal for TSMAD to make provision for a scheme for persistent unique identifiers (and supporting business rules) in S-100

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Executive Summary:	This paper proposes that, as the e-navigational community develop S-100 compliant databases, there will be a requirement for inter-database or web service transactions at a feature or object instance level. The paper proposes that S-100 should include a scheme for persistent unique identifiers and business rules for their implementation.
Related Documents:	TSMAD26_DIPWG5-11.7E
Related Projects:	IMO e-Navigation and SNPWG

Introduction / Background

The S-100 standard provides a common framework that enables information communities such as IHO, IALA, WMO and others, to model features within their real world domains and develop common specifications for their data products and services. The IHO Registry allows communities to define, describe, register, manage and publish the types of real world features that belong to their particular domains. These are important building blocks required to support the development of an e-navigation infrastructure, however there is an important item that is still required to facilitate seamless data interoperability between these communities (and their customers).

Analysis/Discussion

As information communities develop multi-product databases, there will be a need to exchange data directly between databases and to provide direct product / service updates. To achieve this safely and unambiguously, it is proposed that globally unique and persistent feature identifier will be required for every feature (and or object) instance within a database.

This concept is not unique. The UK Ordnance Survey (OS) for example have assigned unique reference identifier (Topographic Identifier - TOID) to identify every feature in Great Britain. Around 440 million man-made and natural features have been assigned TOID references and can be uniquely identified. Every object in the OS Master Map products (including polygons, lines, points, symbols, text and addresses) has its own TOID. If a feature instance is edited, for example to reflect a real-world change in the source database then the change can easily be cascaded to all dependent databases or products and services. Unless a feature has undergone drastic change, it will always keep its original TOID and all changes made to the feature can be recorded over the course of its lifetime.

The ISO 19118 Geographic information (Encoding) standard makes provision for Universally Unique Identifiers (UUID) and Domain Unique Identifiers (DUID) where unique identifiers target objects located within the same transfer unit and domain identifiers targets objects located within the context of an application domain.

INSPIRE document D2.7: "Guidelines for the encoding of spatial data, Version 3.2", also provides guidance on the implementation of persistent unique identifiers. The documents proposes that identifiers of resources should be Uniform Resource Identifier's (URI) in the "http" scheme, and recommends that every EU Member State should develop, document and maintain a URI scheme for their resources.

There are many types of persistent unique identification schemes currently in use. These range from strict top-down systems that enforce predefined ranges of identifiers, to more flexible schemes that often include a concatenation of one or more identifiers. The OS TOID identifier for example consists of two parts, a prefix describing the responsible organization (e.g. osgb) and a unique identifier that is 13-16 digits long. Some schemes make provision for varying levels of granularity allowing identifiers to be including on spatial objects such as polygons, lines, points etc, in addition to defining complex entities in terms of multiple identifiers (i.e. a "super id" that unites components into one entity).

Conclusions

As many hydrographic and stakeholder organization move from file based production systems to database systems, there will be a need for persistent feature / object identifiers in order to exchange information/data efficiently and unambiguously. S-100 currently does not provide any guidance on the use of a scheme for persistent unique identifiers and it is proposed that this should be added (together with appropriate business rules) to the next edition of the standard.

Recommendations

TSMAD are invited to discuss the paper taking into account papers TSMAD26_DIPWG5-11.7E.

Justification and Impacts

- The inclusion of a suitable feature based persistent unique identification schemes (and appropriate business rules) within S-100 would facilitate the unambiguous exchange of data between e-navigation stakeholder, hydrographic organization and other relevant communities.

Action Required of SNPWG

The TSMAD WG is invited to:

- a. discuss the proposal.