1st Meeting of S-130PT Schema Sub-Group

Meeting Slides

Approval of Agenda

4 – 5 July 2022 / Monaco (Hybrid)

IHO MEETING AGENDA

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Day1 (UTC+2)	Title	Lead	Remarks
1. Opening and Administrative Arrangements			
0830 - 0900	Registration		
0900 - 0905	Opening / Welcome	Leader	
2. Approval of Agenda			
0905 - 0910	Agenda	Leader	
3. PS Description and Reference Application Schema			
0910 - 0940	Review S-100 Part 1,3, 5, and S-97	Leader	
0940 - 1030	Review Application Schema of S-1XX PSs a. S-121 Maritime Limits and Boundaries b. S-122 Marine Protected Areas c. Other S-1XX Product Specifications	Leader	
1030 - 1050	Coffee Break		
1050 - 1230	Review Application Schema of S-1XX PSs (Cont.)		
1230 - 1400	Lunch		
4. Requirements for sketching S-130 Application Schema			
1400 - 1430	Review the Initial Description of S-130 PS	PT Chair	
1430 - 1540	Discussion of Proposed Requirements	All	
1540 - 1600	Coffee Break		
1600 - 1620	Discussion of Proposed Requirements (Cont.)	All	
1620 - 1700	Define Data Types, Relationships and Constraints - Feature and Information types - Simple and Complex attribute types - Relationships between the classes - Constraints applicable to the classes, attributes and relationships	Leader	
1700	End of Day 1	PT Chair	
18:00 - 20:00	Team Work Dinner (Non-host)	All	

Day2 (UTC+2)	Title	Lead	Remarks
5. S-130 Application Schema			
0830 - 0900	Registration		
0900 - 1030	Draft Application Schema • Draft Application Schema based on discussion • Review the Draft S-130 Application Schema • Discuss a way forward	Leader All All	
1030 - 1050	Coffee Break		
1050 - 1230	Draft Application Schema (Cont.)	All	
1230 - 1400	Lunch		
6. GI Registry			
1400 - 1430	Identifying newly introduced Feature data	Leader	
1430 - 1450	Process to be registered proposed new feature data in the GI registry (who and when)	Leader	
1450 - 1500	Any issues for the Registry Activities	All	
7. Relationship between Application Schema and others			
1500 - 1530	S-130 Feature Catalogue	PT chair	
	S-130 Portrayal Catalogue		
	S-130 GML Schema		
	S-130 DCEG (Data Classification and Encoding Guide)		
	Metadata part		
	Any considerations for S-100 Ed. 5.0.0		
1530 - 1550	Coffee Break		
8. Any Other Business			
1550 - 1600	Next Meeting	Leader	
Close			

1st Meeting of S-130PT Schema Sub-Group

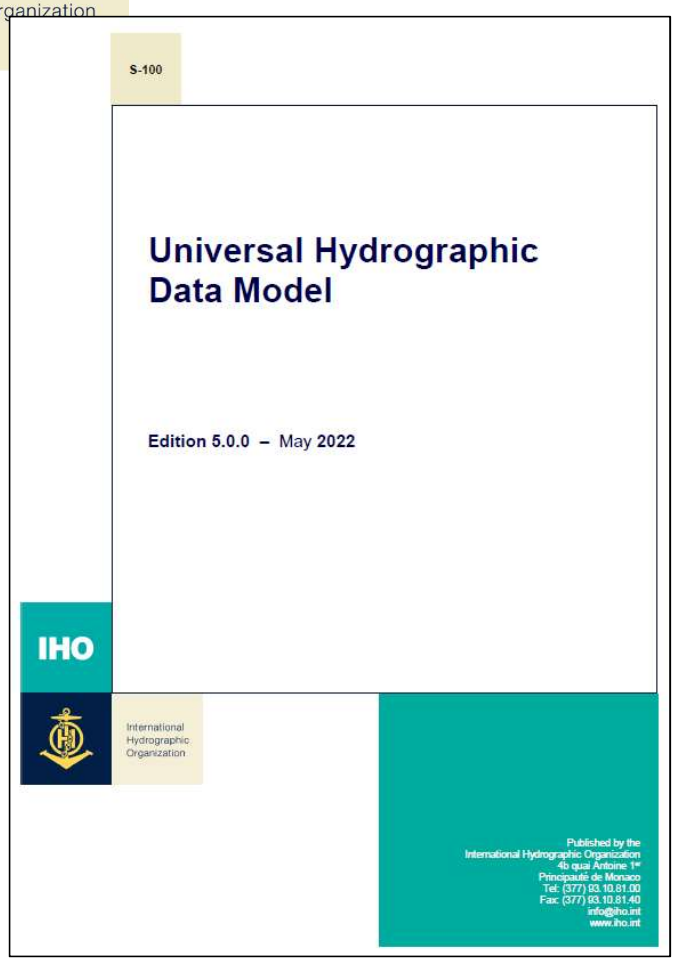
Meeting Slides

PS Description and Reference Application Schema

4 – 5 July 2022 / Monaco (Hybrid)

REVIEW S-100 PARTS AND S-97

- S-100 Ed.5.0.0



- **Part 1 – Conceptual Schema Language**
- Part 2 – Management of IHO Geospatial Information Registers
- Part 2a – Concept and Data Dictionary Registers, Part 2b – Portrayal Register
- **Part 3 – General Feature Model and Rules for Application Schema**
- Part 4 – Metadata
- **Part 5 – Feature Catalogue**
- Part 6 – Coordinate Reference Systems
- Part 7 – Spatial Schema
- Part 8 – Imagery and Gridded Data
- Part 9 – Portrayal, Part 9a – Portrayal (Lua)
- Part 10 – Encoding Formats
- Part 10a – ISO/IEC 8211 Encoding Schema, Part 10b – GML Encoding
- Part 10c – HDF5 Data Model and File Format
- Part 11 – Product Specifications, Part 12 – Maintenance
- Part 13 – Scripting
- Part 14 – Online Communication Exchange
- Part 15 – Encryption and Data Protection,
- Part 16 – Interoperability Catalogue Model
- Part 16a – Harmonized Portrayal of S-100 Products
- Part 17 – Discovery Metadata for Information Exchange Catalogues
- Part 18 – Language Packs

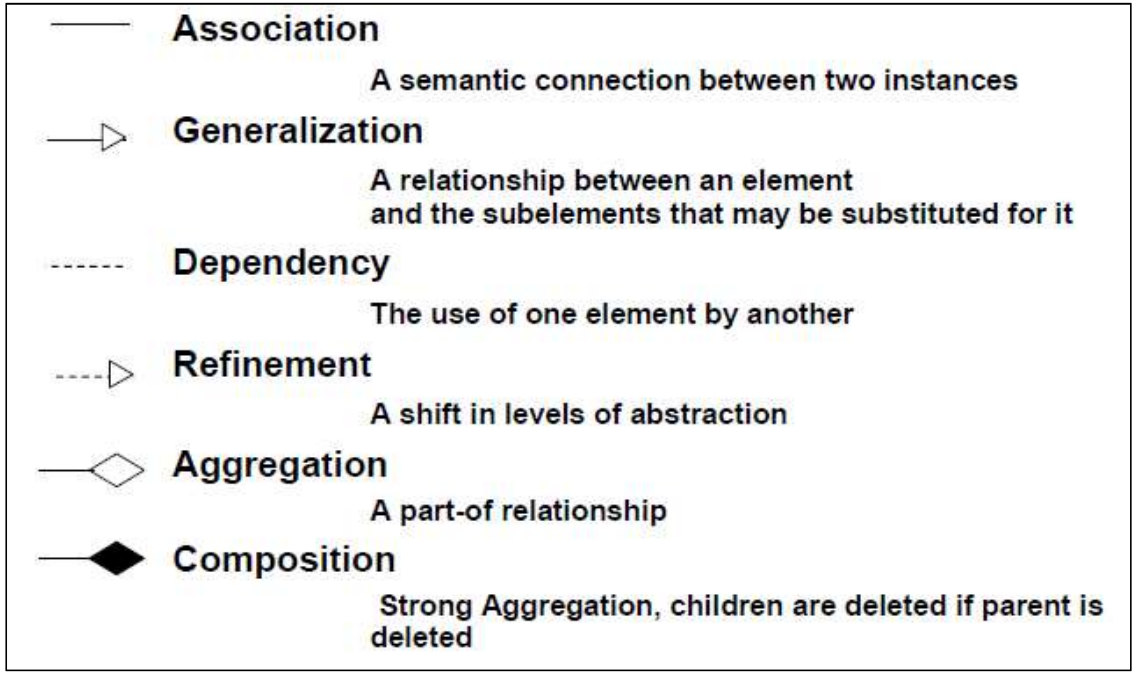
REVIEW S-100 PARTS AND S-97

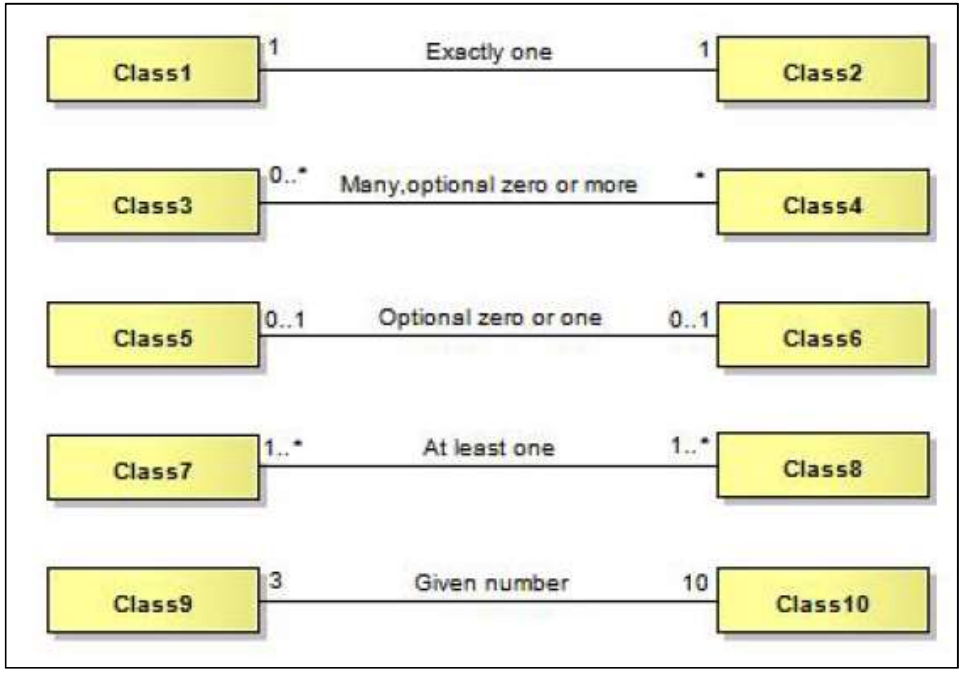
- Part 1 - Conceptual Schema Language
  - Conceptual Schema language and basic data types for use within the IHO community
  - Combination of the Unified Modelling Language (UML) static structure diagram, and a set of basic data type definitions as the Conceptual Schema language for specification of geographic information
  - Guidelines on how UML should be used to create standardized geographic information and service models that are a basis for achieving the goal of interoperability

  - Classes, Attributes, Basic data types, Predefined derived types, Enumerated types, Codelist types, Relationships and associations, Stereotypes, Optional, conditional and mandatory – attributes and associations, Naming and name spaces, Documentation of models in S-100

REVIEW S-100 PARTS AND S-97

- Part 1 - Conceptual Schema Language
  - Class is a description of a set of objects that share the same attributes, operations, methods, relationships, behaviour and constraints
  - Data types : Primitive types, Complex types
  - Relationships and associations





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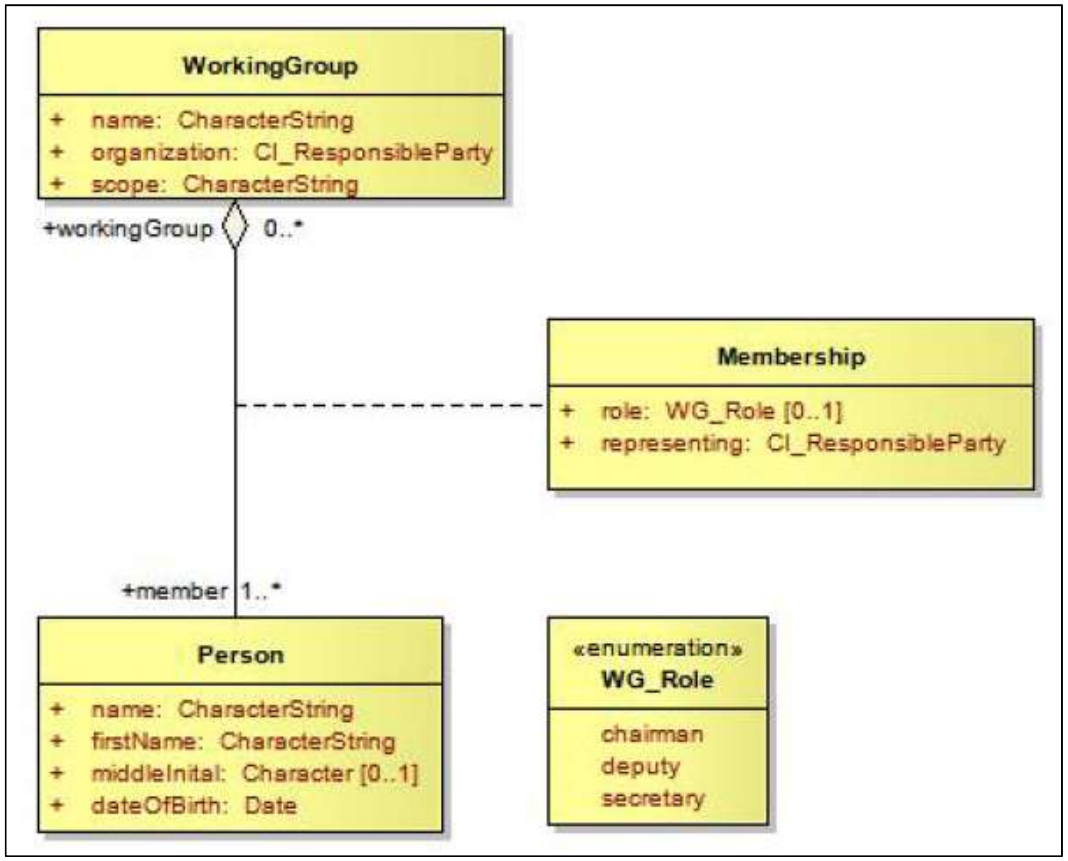
- Part 1 - Conceptual Schema Language
  - Documentation of models in S-100



Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	WorkingGroup	A group of experts doing some useful work	-	-	
Attribute	name	The name of the working group	1	CharacterString	
Attribute	organization	The organization responsible for the working group	1	CI_ResponsibleParty	
Attribute	scope	The reason why so many people travel around the world	1	CharacterString	
Association	member	A person that is designated to contribute to the group	1..*	Person	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	Person	A human being	-	-	
Attribute	name	The name of the person	1	CharacterString	
Attribute	firstName	The first name of the person	1	CharacterString	
Attribute	middleInitial	The middle initial of the person	0..1	Character	
Attribute	dateOfBirth	The date when the person was born	1	Date	
Association	workingGroup	A working group the person contributes to	0..*	WorkingGroup	

Role Name	Name	Description	Multiplicity	Data Type	Remarks
Class	Membership	A class describing the membership of a person in a working group	-	-	
Attribute	role	The role that the person has in the working group	0..1	WG_Role	Ordinary member have no role
Attribute	representing	The organization which is represented by the person in the working group	1	CI_ResponsibleParty	

Role Name	Name	Description	Remarks
Enumeration	WG_Role	The roles people can have in a working group	
Literal	chairman	The gov'nor	
Literal	deputy	His best friend	
Literal	secretary	Poor man (or woman) has to have his (or her) fingers always on the keyboard	

REVIEW S-100 PARTS AND S-97

- Part 3 - General Feature Model and Rules for Application Schema
  - General Feature Model (GFM) which is a conceptual model of features, their characteristics and associations
  - Rules for developing an Application Schema which is a basic part of any S-100 based Product Specification

  - GFM provides a conceptual model for these objects
  - Definitions for object types are held in a Feature Catalogue
  - GFM also acts as a conceptual model for the Feature Catalogue

  - Principles for defining features and information types

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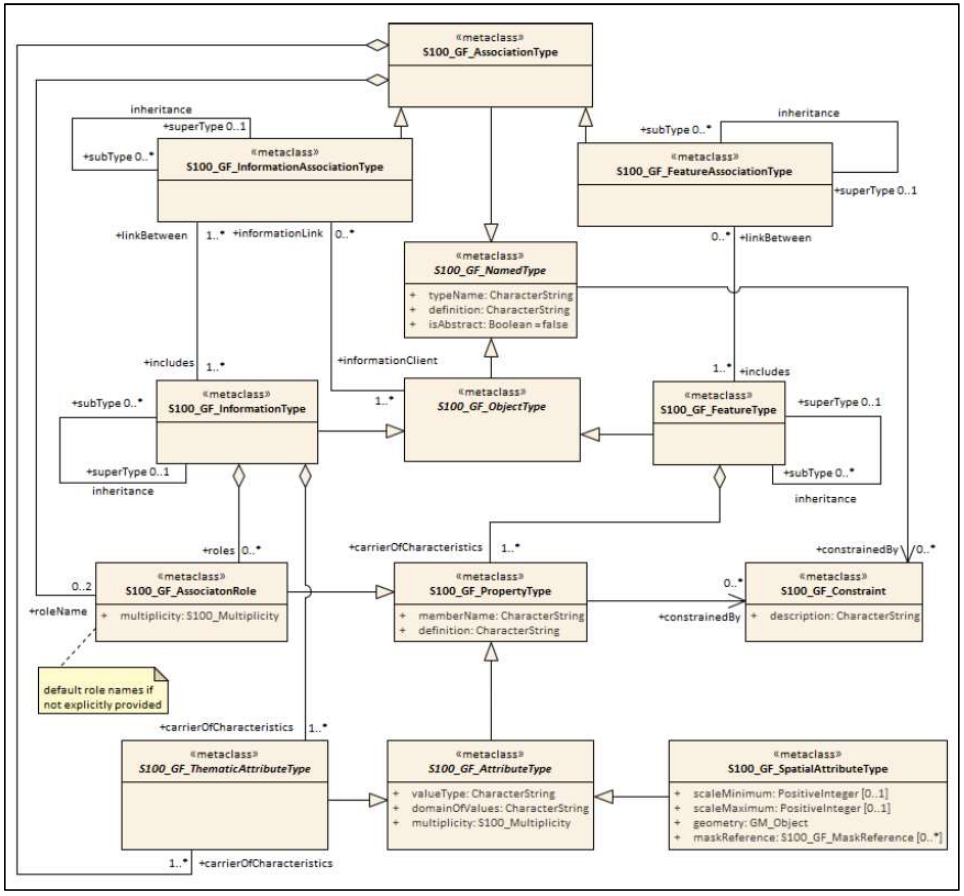
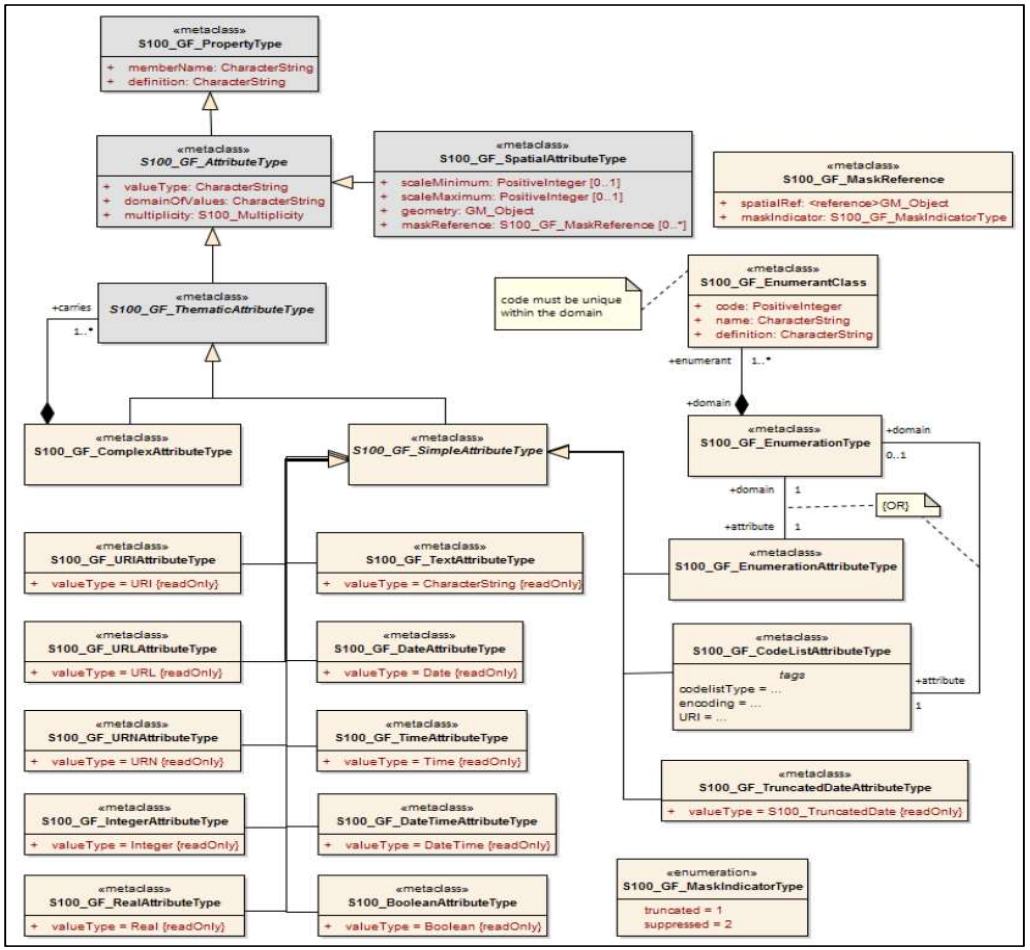
- Part 3 - General Feature Model and Rules for Application Schema
  - General Feature Model





REVIEW S-100 PARTS AND S-97

- Part 5 - Feature Catalogue
  - Standard framework for organizing and reporting the classification of real world phenomena in a set of geographic data
  - defines the methodology for classification of the feature types and specifies how they are organized in a Feature Catalogue and presented to the users of a set of geographic data
  - Feature Catalogue shall be defined for each Product Specification

  - Basic level of classification in the Feature Catalogue is the feature type
  - Feature Catalogue shall be available in electronic form (for example XML) for any set of geographic data that contains features

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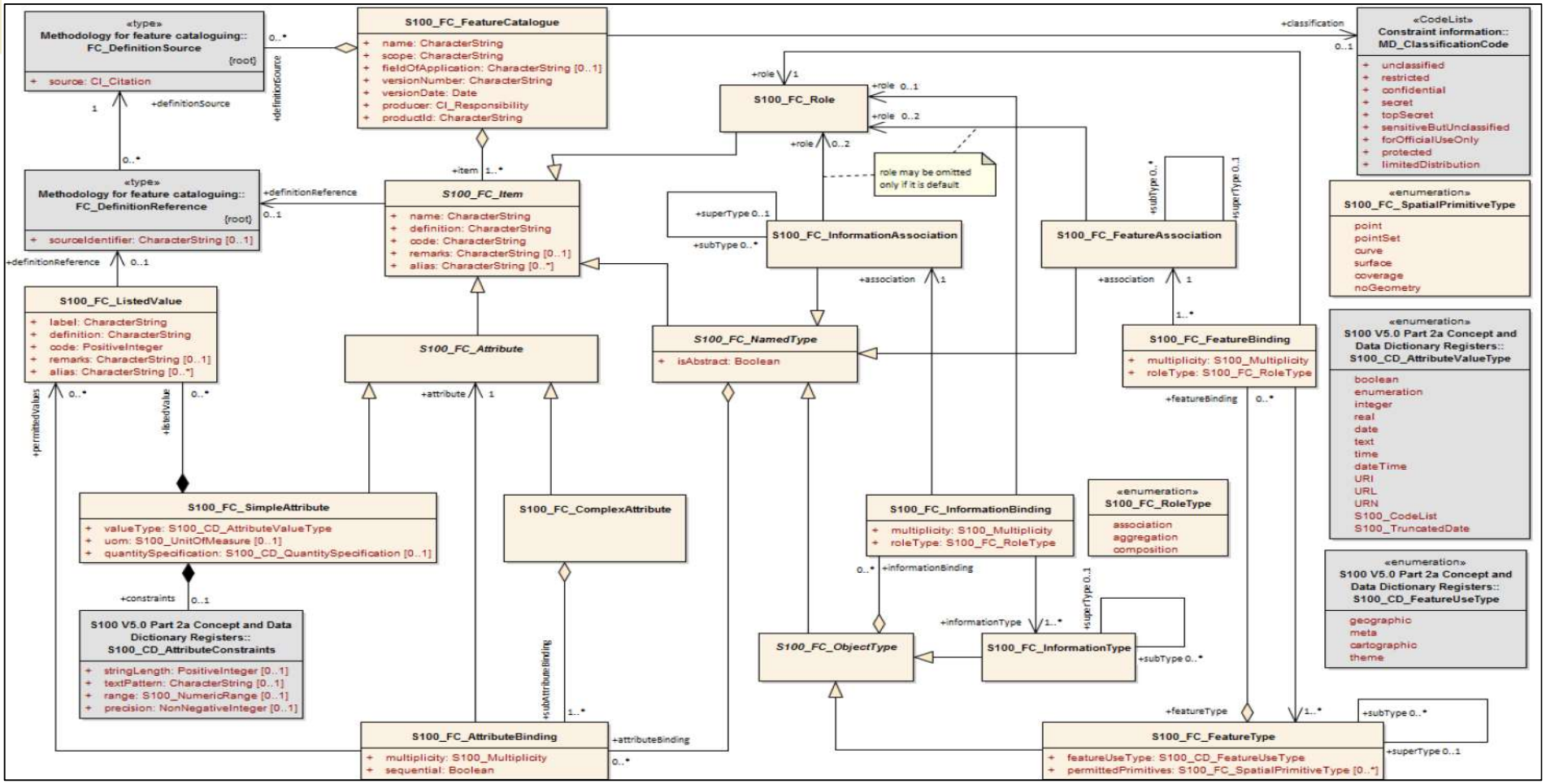
- Part 5 - Feature Catalogue



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- Part 11 – Product Specifications

11-7.4 Object identifiers

The specification of persistent global identifiers for feature and information objects is strongly recommended. Identifiers need not be defined where the physical realities dictate otherwise or it is known that a reference to the object will not be needed, even from an as-yet-unknown external dataset conforming to another product specification. For example, identifiers need not be defined for cartographic objects.

Identifiers of instances should utilize the Maritime Resource Name (MRN) concept and namespace. The MRN namespace is administered by International Association of Lighthouse Authorities (IALA) through the website http://mrnregistry.org, which also contains references to the full set of rules that apply to the MRN concept. The topmost namespace urn:mrn remains fixed, with subsequent name spaces separated by colons, and available through the application process explained on the website. Any organization wishing to issue MRN conformant identifiers should apply for a name space from IALA, or from an organization that already has a namespace registered.

It is not required to encode all feature instances with the whole MRN string, provided the whole string can be recreated, for example by utilizing metadata. Significant data volume savings can be obtained by utilizing such mechanisms. Furthermore, technical issues such as restrictions in GML encoding with the use of ":", may be surmounted by this approach.

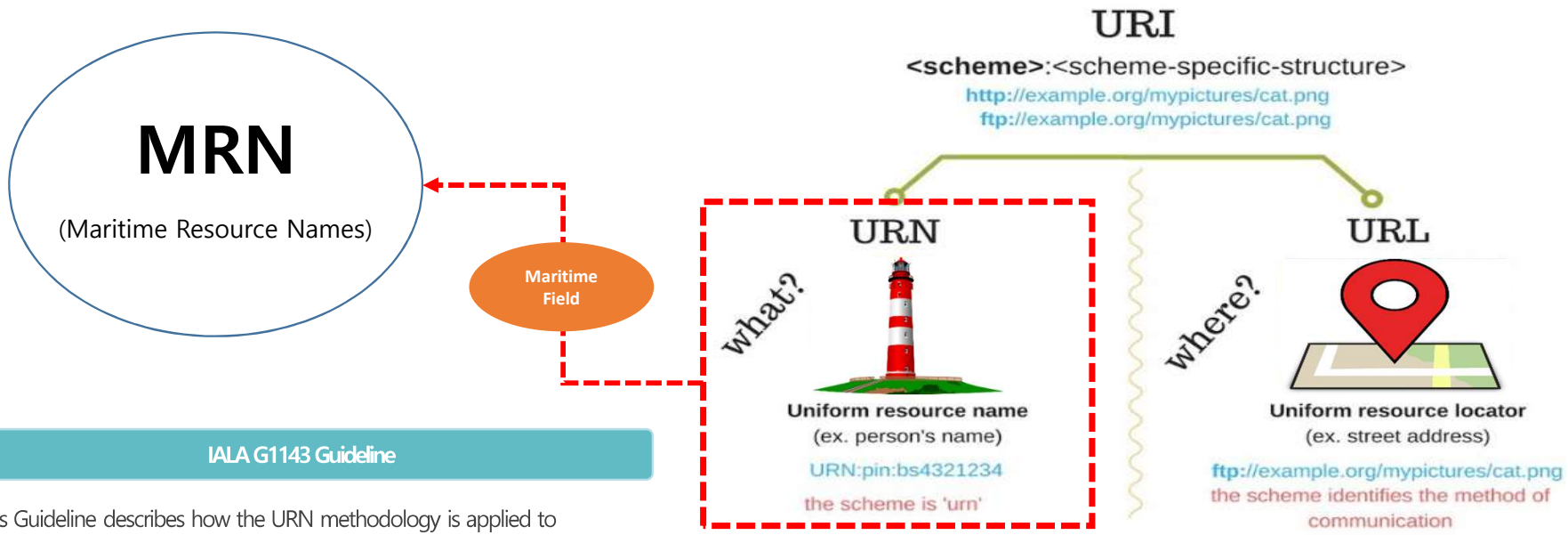
If there are technical reasons why the MRN concept cannot be utilized, other means for persistent global identifiers should be established. One way to implement persistent global identifiers is by defining a namespace and a persistent unique local identifier for individual feature or information types. The persistent global identifier can be constructed by combining the namespace with the local identifier. Local identifiers must be unique within the namespace for the lifetime of the feature or information object.

REVIEW S-100 PARTS AND S-97

- Part 11 – Product Specifications
  - Appendix 11-E. Guidance on Unique Identifiers
  - Important to preserve original identifiers in data products to assist in identifying data objects which describe the same real-world entity between different datasets
  - Persistent unique Identifiers would reduce the workload and likely issues with translation tables which have to be developed and maintained if various stakeholders use different Identifiers for the same feature
  - Recommended that the Maritime Resource Name (MRN) concept

REVIEW S-100 PARTS AND S-97

- Part 11 – Product Specifications
  - Maritime Resource Name (MRN) concept



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- Part 11 – Product Specifications
  - Maritime Resource Name (MRN) concept

- [G1143] - UNIQUE IDENTIFIERS FOR MARITIME RESOURCES
- **Syntax**

urn : mrn : <**N**ame**S**pace**S**tring>

128 byte

<NSS> = <Governing Organization> : <Type> : <Country Code> : <Identifier>

IALA	urn:mrn:iala:aton:us:1234-5
IHO	urn:mrn:iho:pub:spec:s57:3:1:supplement3
	urn:mrn:iho:prod:s64tds:3:0:1:unencrypted:powerup

REVIEW S-100 PARTS AND S-97

*** Source : IHO Guidelines for Creating S-100 Product Specifications**

1) Initiation	Identify the need for a new data product; define its scope; and decide the boundaries between the new product and existing data Product Specifications. Obtain sample source material. Describe typical application use cases
2) Data Model / Application Schema	Define the classes and attributes that describe the domain and which are relevant to the data product. Define the relationships between the classes and specify applicable constraints. Prepare one or more UML diagrams describing the Domain Model
3) Registration of feature elements	Propose amendments to existing classes and attributes and propose new classes and attributes for addition to the Concept and Data Dictionary Registers in the IHO GI Registry using the Registry interface.
4) Develop the Feature Catalogue	Prepare the XML Feature Catalogue from the feature and information classes, attributes and relationships as approved in the IHO GI Registry, utilizing the Feature Catalogue Builder.
5) Transfer modes and packaging	Determine whether data products are to be delivered as data files contained in transfer (exchange) sets, by web services (and if so, identify or outline a service protocol), e-mail, etc.

REVIEW S-100 PARTS AND S-97

6) Define metadata	Survey the metadata elements listed in S-100 for their appropriateness to the data product and its allowed packaging and delivery methods. Define appropriate values and restrictions for the metadata elements listed in S-100
7) Define the data format	Select an appropriate data format. S-100 provides for 3 standard delivery formats (ISO 8211, GML, and HDF5). Prepare format-specific artefacts if necessary
8) Data Classification and Encoding Guide (DCEG)	A DCEG should contain enough overview and general material about basic concepts such as data types, features, information types, associations, etc, to give its intended audience a basic grounding in the concepts they will need to apply
9) Portrayal symbols and rules	Determine the symbols to be used for portrayal and the rules for generating displays from the data product.
10) Registration of portrayal elements	Propose any new portrayal components (for example symbols, colour tokens, line styles, area fills, etc) to the Portrayal Register in the IHO GI Registry using the Registry interface

REVIEW S-100 PARTS AND S-97

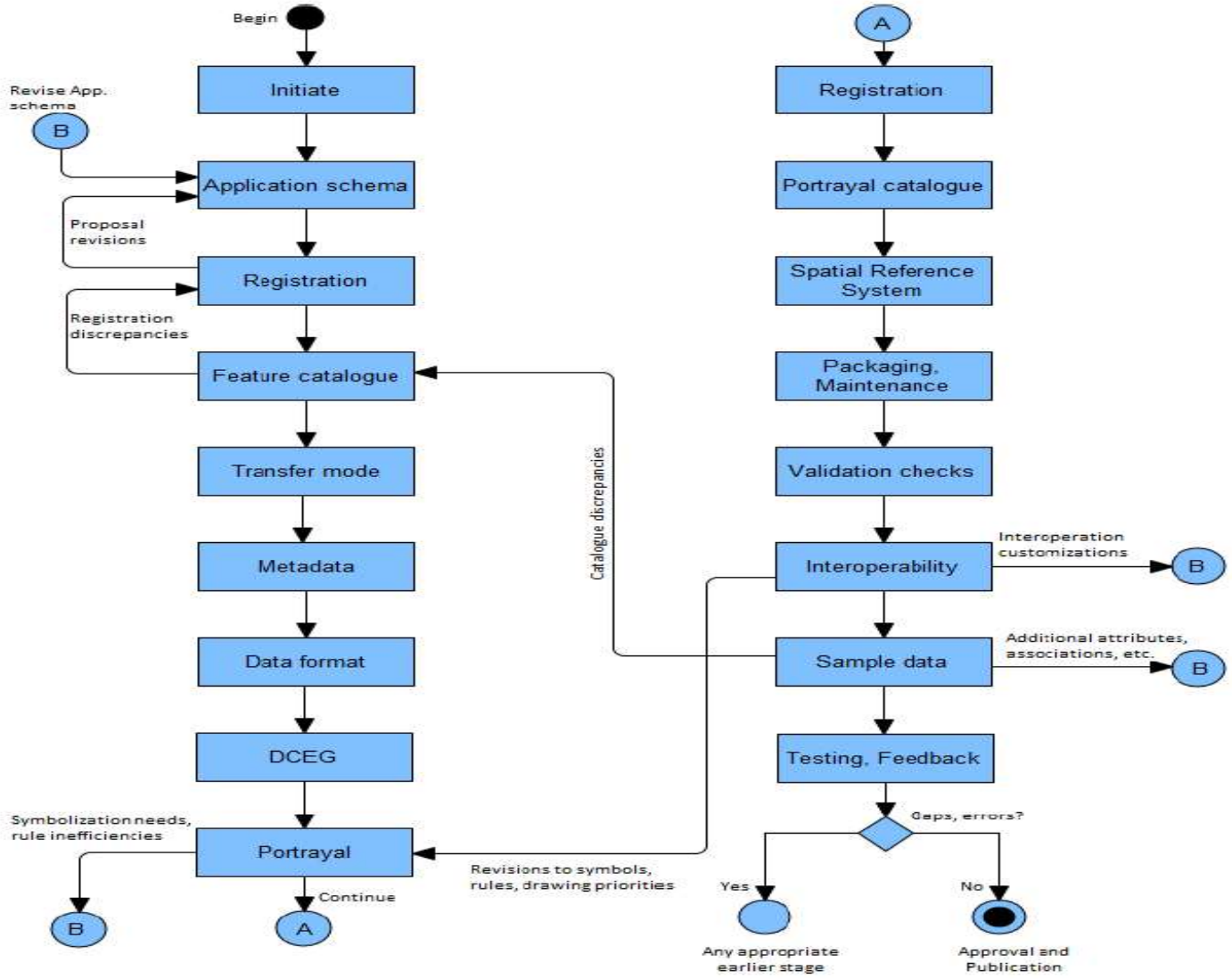
11) Portrayal Catalogues	Prepare a Portrayal Catalogue (or Catalogues) for the features and information types which are intended to be displayed in the intended application domain(s) and usage scenario(s)
12) Define the Spatial reference system	Identify the recommended coordinate reference system and vertical datum(s)
13) Data product packaging and maintenance	Define the content and structure of delivery packages, updating of data, and any auxiliary content delivered either with or as an adjunct to data
14) Validation checks and quality measures	Define tests for the spatial, structural, and conceptual integrity of datasets. Define format-specific implementations of validation checks
15) Determine interoperability	Determine which if any product groups in Interoperability Catalogues are supplemented or enhanced by the data product; and how the IHO Interoperability Catalogue will be affected by the new product

REVIEW S-100 PARTS AND S-97

16) Prepare sample data	for test-beds. Create sample datasets and exchange sets conforming to the data format, packaging, and Feature Catalogue defined in the Product Specification
17) Testing and feedback	Carry out tests of data production and use of the sample data in selected applications to validate the correctness, completeness, consistency, and utility of the Product Specification, including related artefacts such as the Feature Catalogue and XML schemas
Final Step	Production of S-130 dataset

REVIEW S-100 PARTS AND S-97

- Product Specification development process



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REVIEW S-100 PARTS AND S-97

- **Steps in model development of S-97**
  - **Step 1** - Determine whether the data product is coverage or vector data
  - **Step 2** - Identify the concepts in the application domain
  - **Step 3** - Search for existing concepts using key words (classes, attributes and relationships) in the IHO GI Registry which can be re-used
  - **Step 4** - Develop new concepts only for those that do not yet exist in the IHO GI Registry
  - **Step 5** - Define the classes and attributes that describe the domain and are relevant to the data product

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REVIEW S-100 PARTS AND S-97

- **Steps in model development of S-97**
  - **Step 6** - Define the relationships between the classes
  - **Step 7** - Specify any constraints applicable to the classes, attributes, and relationships
  - **Step 8** - Prepare one or more UML class diagrams describing the domain model
  - **Step 9** - Prepare supporting text explaining the overall structure of the Application Schema

REVIEW S-100 PARTS AND S-97

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- International Hydrographic Organization (IHO) (S-101 to S-199)

- S-101 Electronic Navigational Chart (ENC)
- S-102 Bathymetric Surface
- S-103 Sub-surface Navigation
- S-104 Water Level Information for Surface Navigation
- S-111 Surface Currents
- S-112 Open - (See Decision HSSC9/38)
- S-121 Maritime Limits and Boundaries
- S-122 Marine Protected Areas
- S-123 Marine Radio Services
- S-124 Navigational Warnings
- S-125 Marine Navigational Services
- S-126 Marine Physical Environment
- S-127 Marine Traffic Management
- S-128 Catalogue of Nautical Products
- S-129 Under Keel Clearance Management (UKCM)
- S-130 Polygonal Demarcations of Global Sea Areas
- S-131 Marine Harbour Infrastructure
- S-164 IHO Test Data Sets for S-100 ECDIS

S-121 Maritime Limits and Boundaries
Version 1.0.0, Version date 2019-10-29, S-100 Ed 4.0.0

S-122 Marine Protected Areas
Version 1.0.0, Version date 2019-01-25, S-100 Ed 3.0.0

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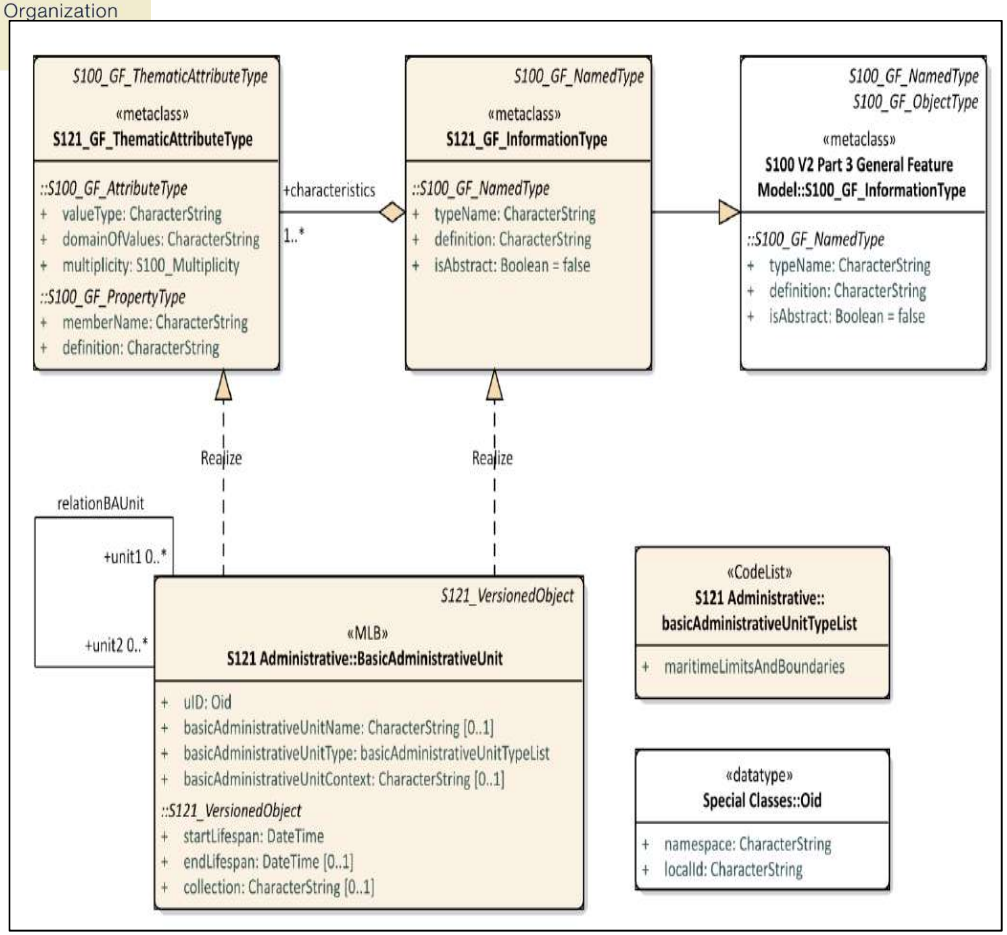
REVIEW APPLICATION SCHEMA OF S-1XX PS

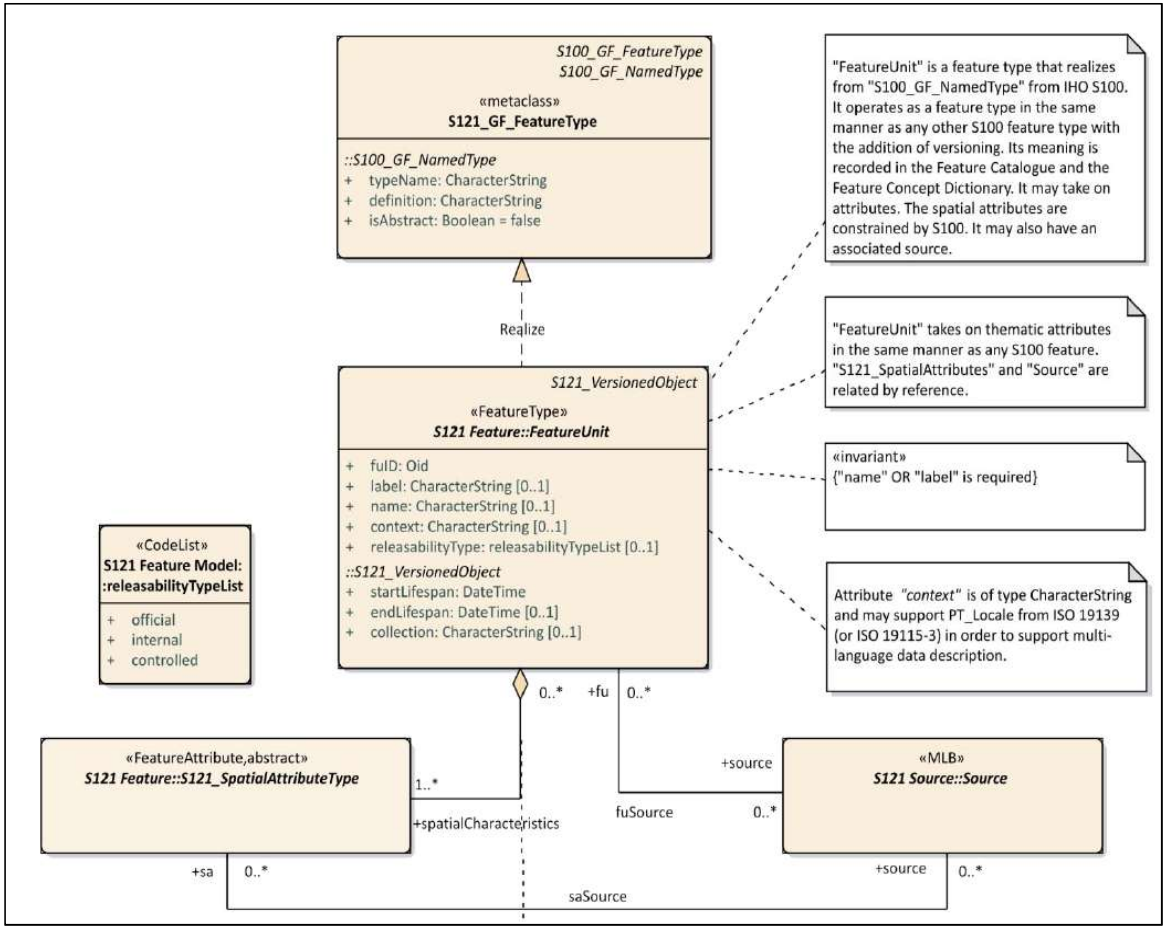
- S-121 Maritime Limits and Boundaries
  - product specification for Maritime Limits and Boundaries for the administration of the maritime domain
  - description of maritime zones, as defined by the UN Convention on the Law of the Sea (UNCLOS)
  - for the administration of Maritime Limits and Boundaries in support of the deposit by States Parties of the geographical coordinates of points identifying their baselines and outer limits of maritime zones in accordance with UNCLOS

REVIEW APPLICATION SCHEMA OF S-1XX PS

International Hydrographic Organization

- S-121 MLB – Application schema





REVIEW APPLICATION SCHEMA OF S-1XX PS

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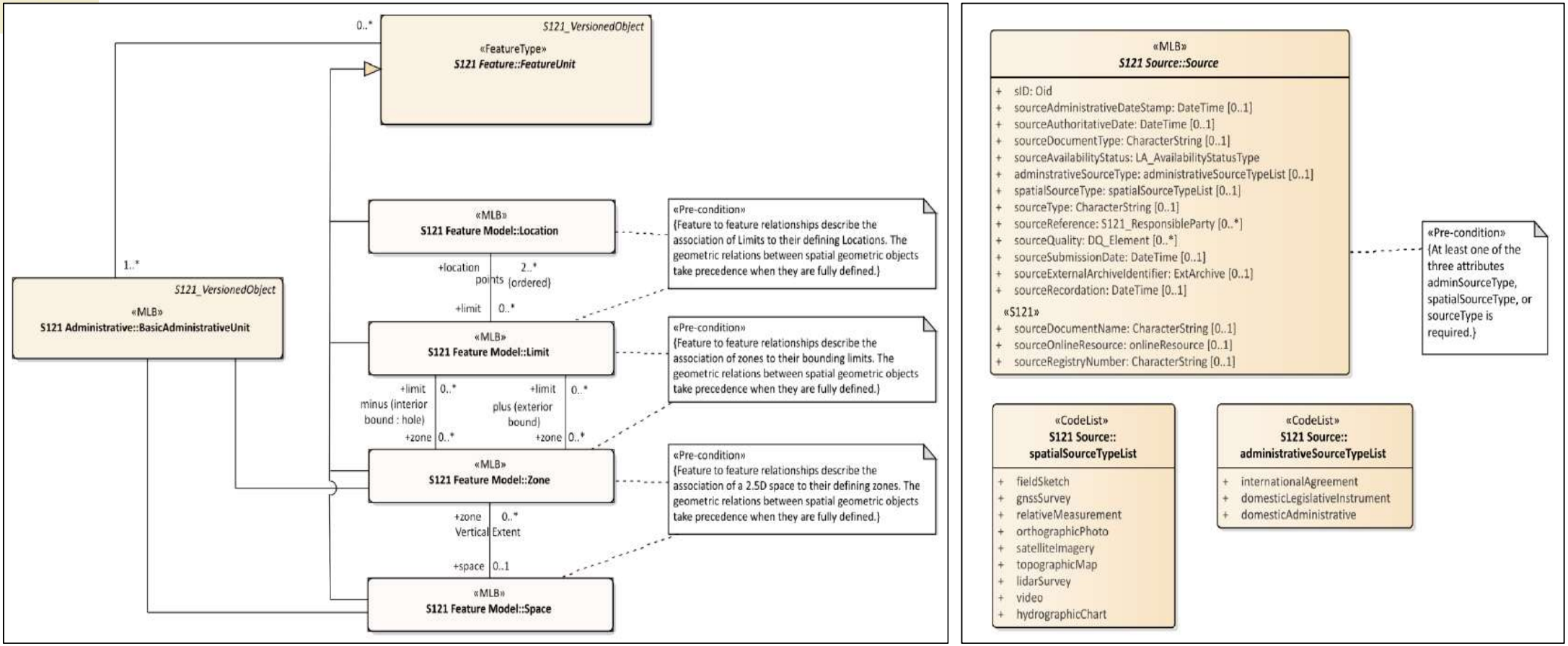
- S-121 MLB – Application schema



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International Hydrographic Organization

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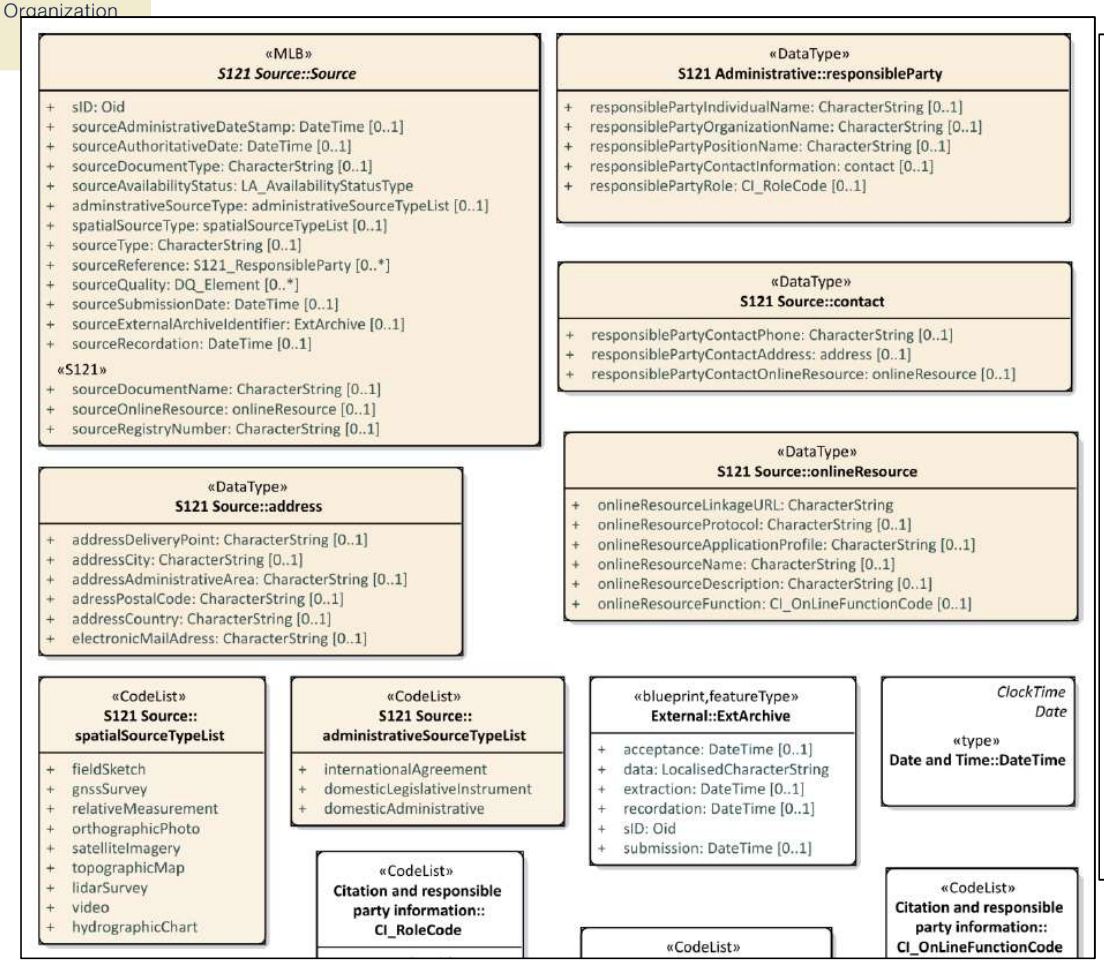

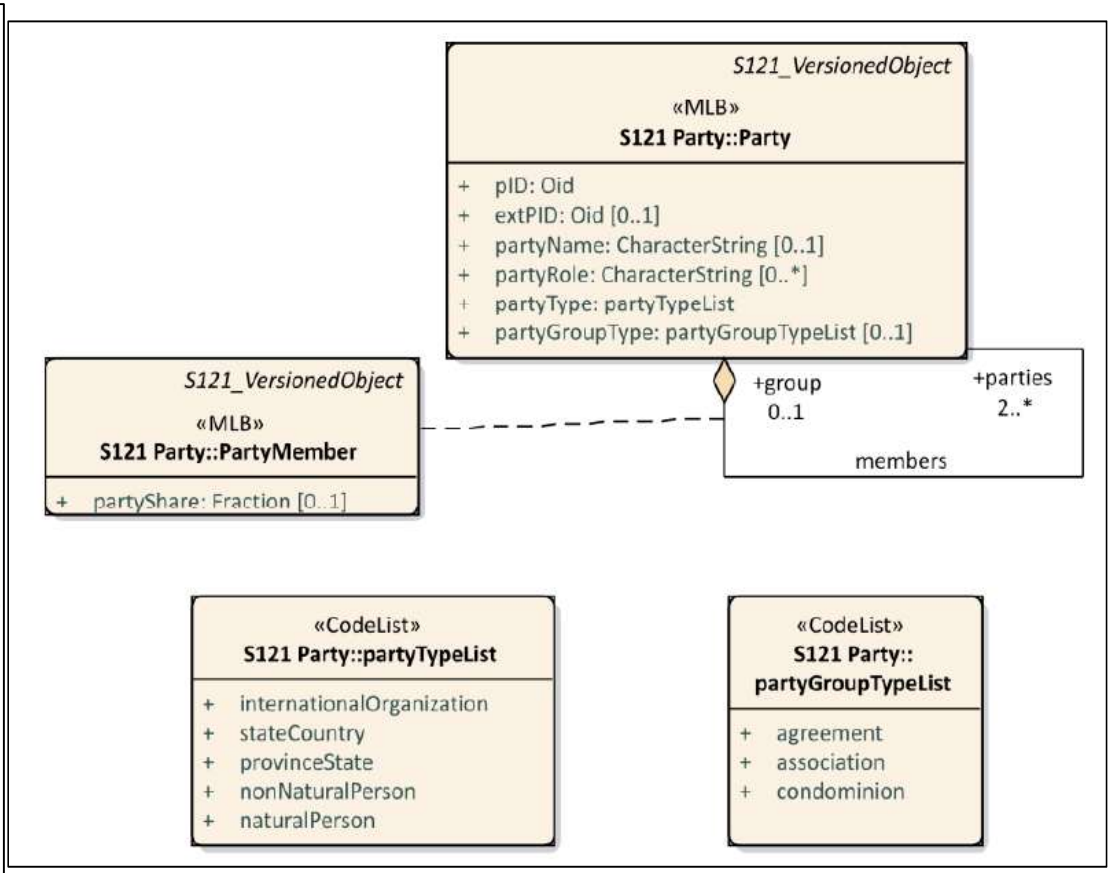

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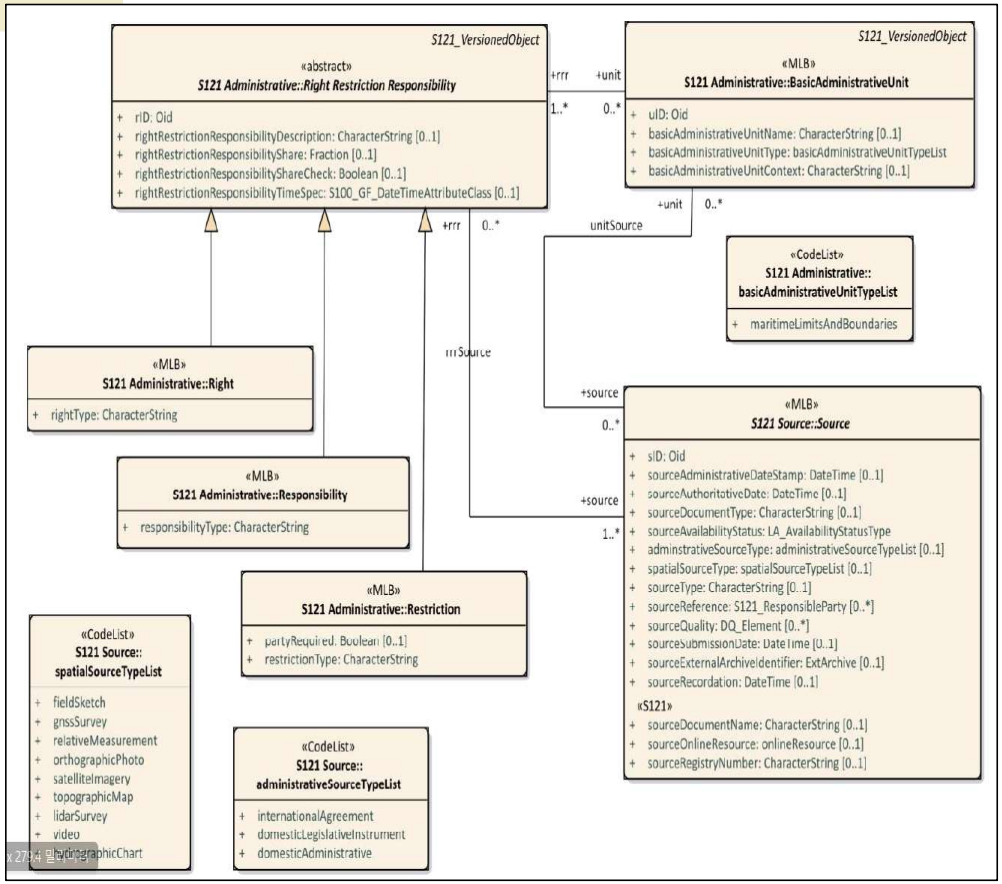
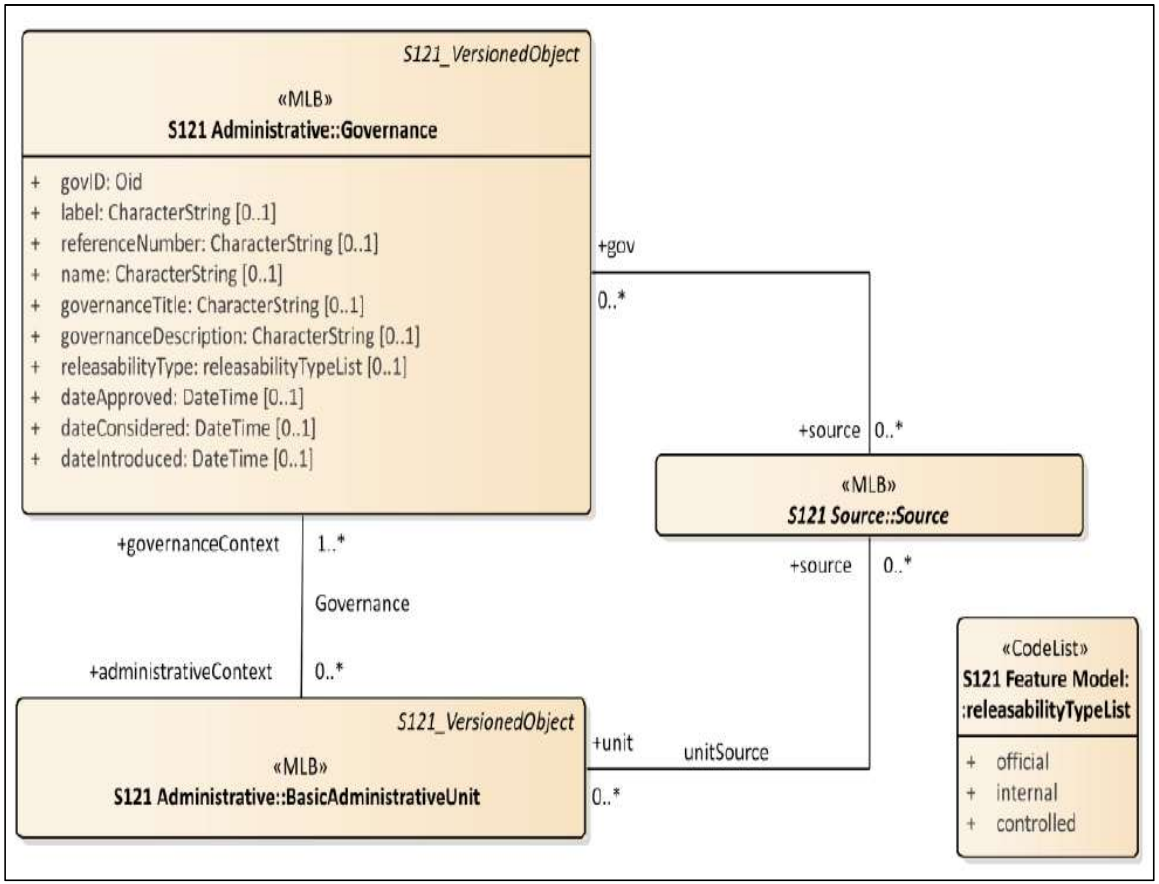
International Hydrographic Organization

- S-121 MLB – Application schema





REVIEW APPLICATION SCHEMA OF S-1XX PS

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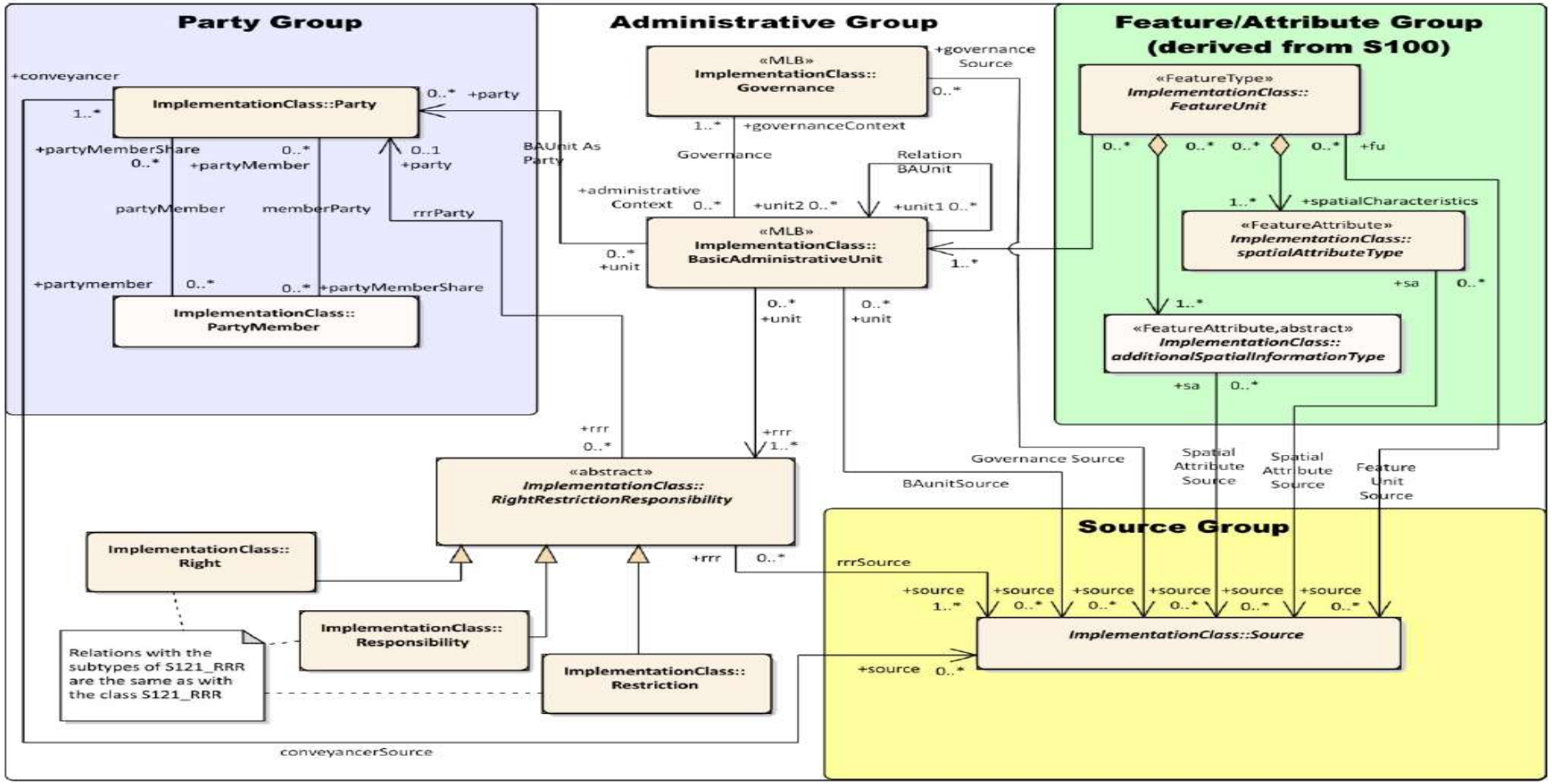
- S-121 MLB – Application schema



REVIEW APPLICATION SCHEMA OF S-1XX PS

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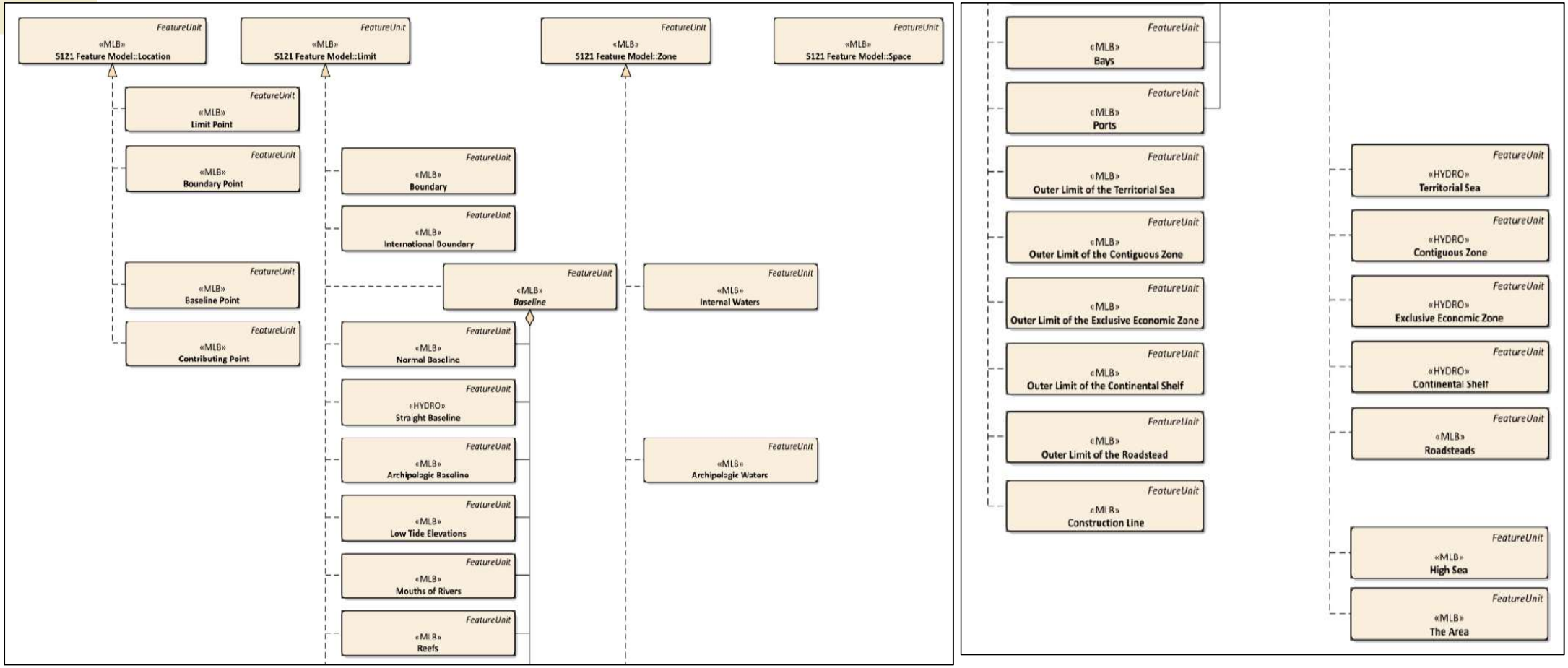
- S-121 MLB – Application schema



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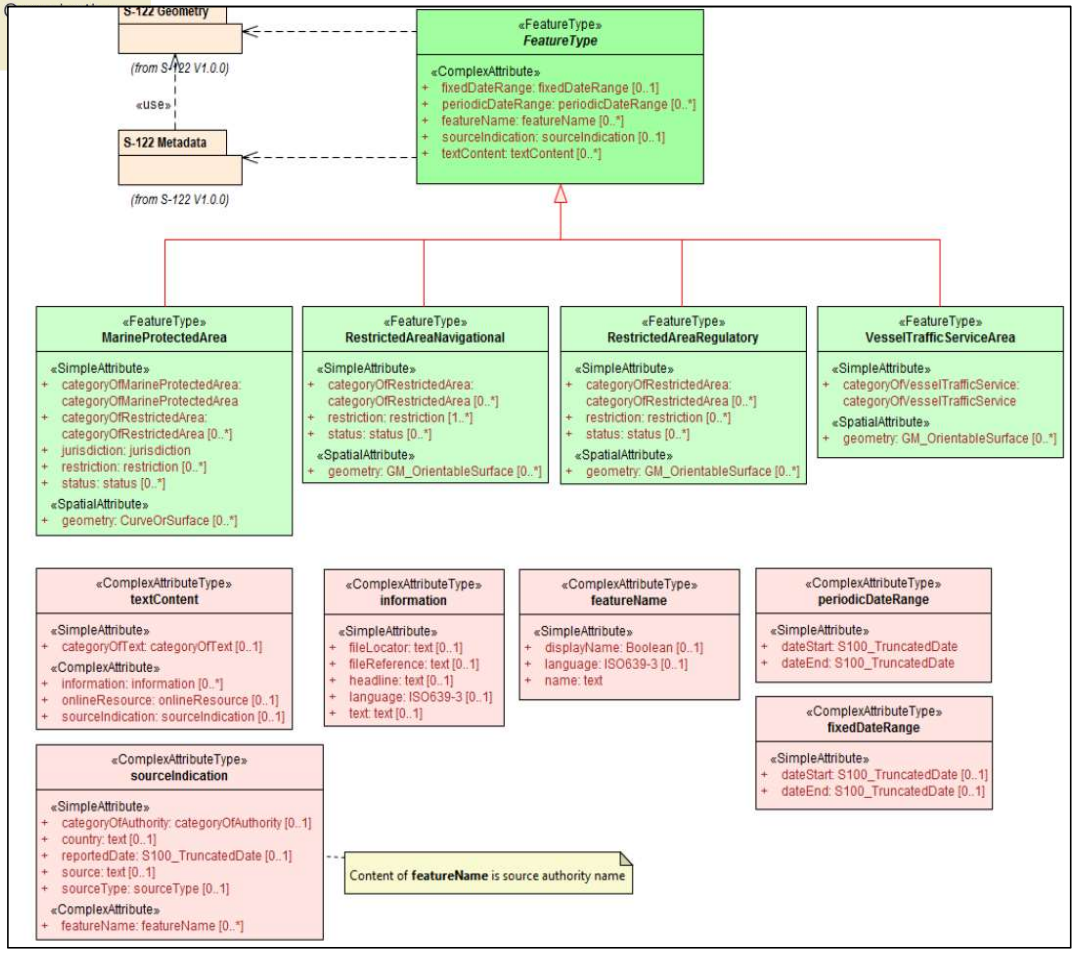
REVIEW APPLICATION SCHEMA OF S-1XX PS

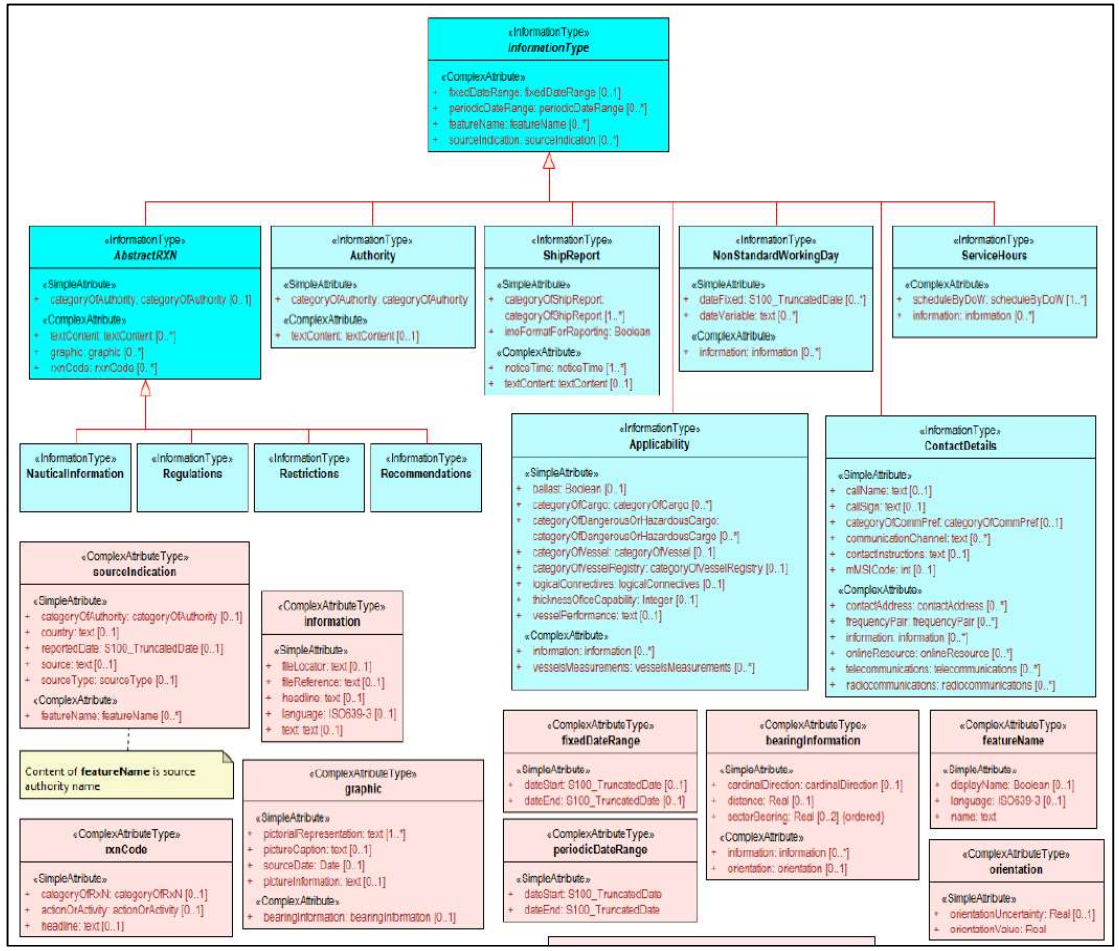
- S-122 Marine Protected Area
  - vector product specification that is primarily intended for encoding the extent and nature of Marine Protected Areas, for navigational purposes
  - Marine Protected Area (MPA) is a protected area whose boundaries include an area of the ocean
  - areas of the intertidal or sub-tidal terrain, together with their overlying water and associated flora, fauna, historical and cultural features
  - which have been reserved by law or other effective means to protect part or all of, the enclosed environment
  - MPAs may be established to protect fish species, rare habitat area, or entire ecosystems

REVIEW APPLICATION SCHEMA OF S-1XX PS

International Hydrographic

- S-122 MPA – Application schema





REVIEW APPLICATION SCHEMA OF S-1XX PS

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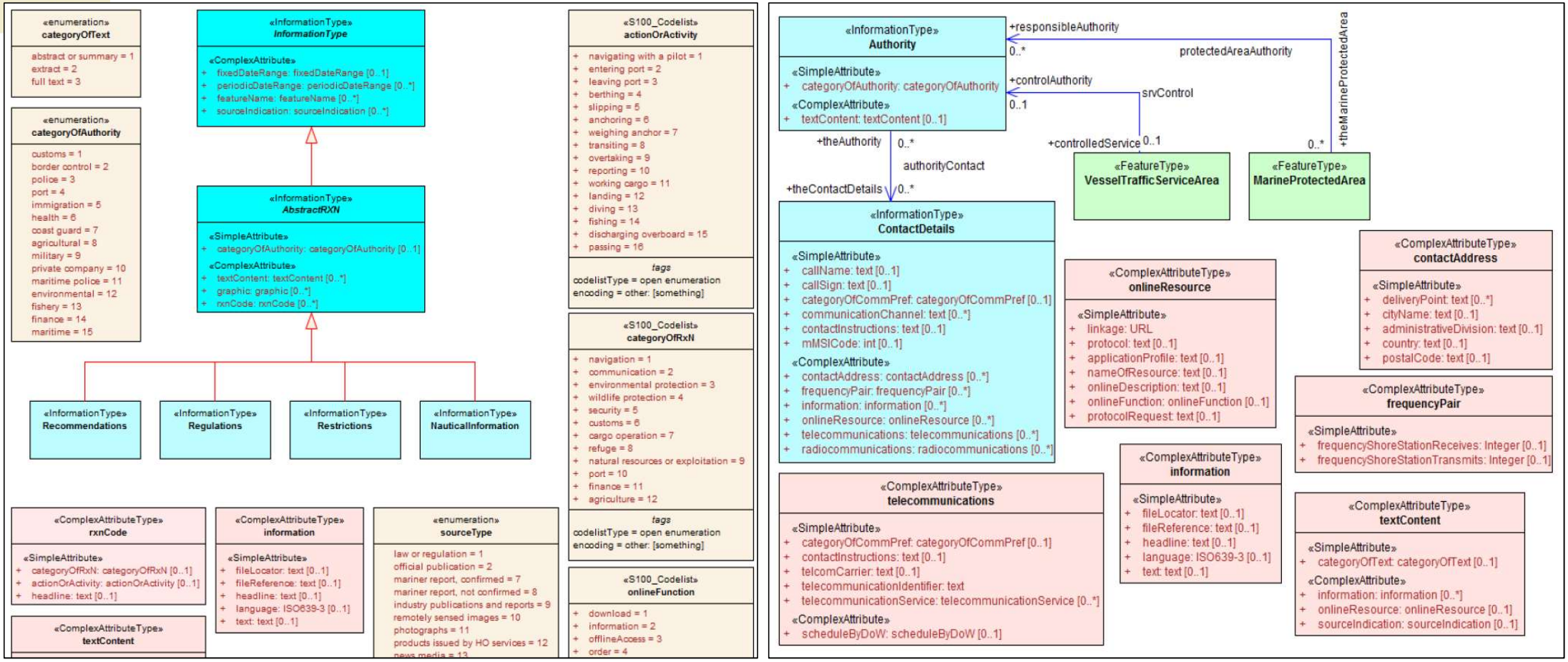
- S-122 MPA – Application schema



REVIEW APPLICATION SCHEMA OF S-1XX PS

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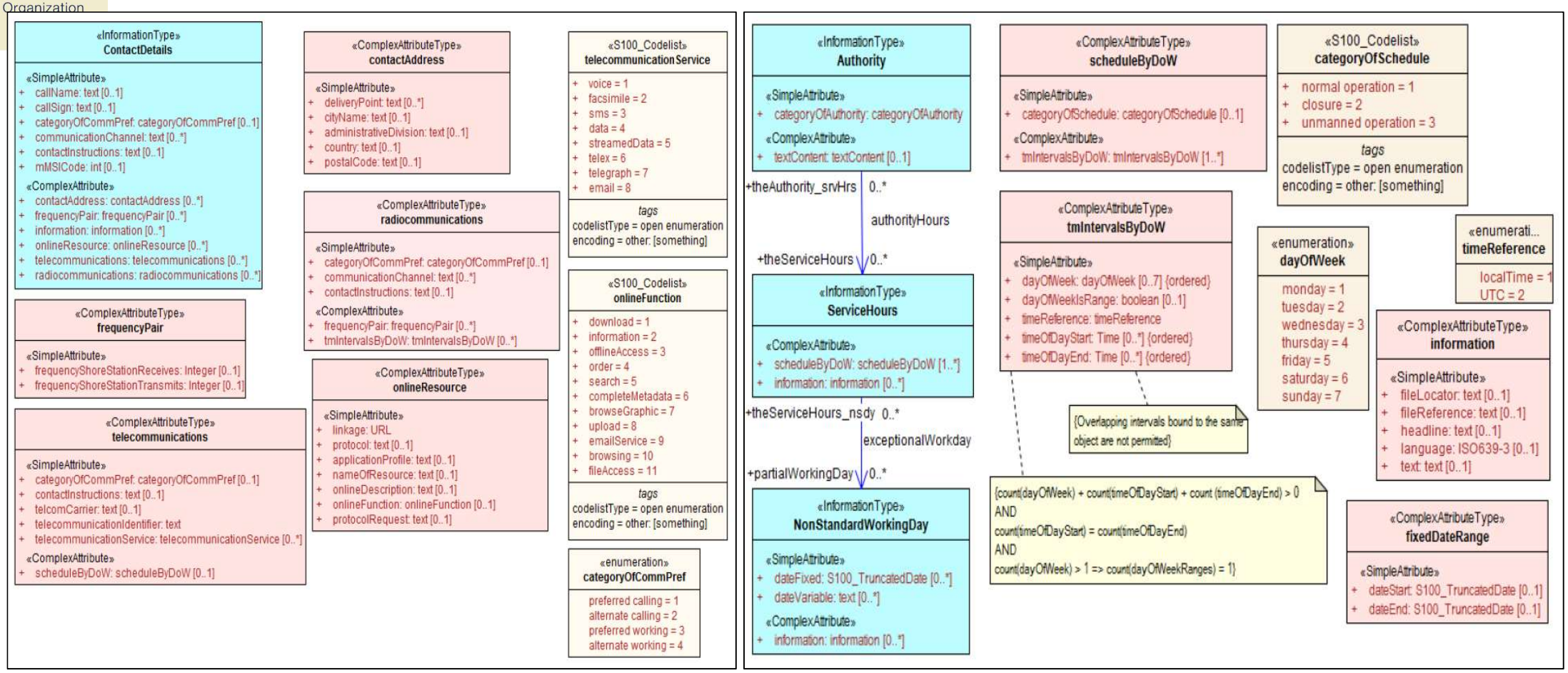
- S-122 MPA – Application schema



REVIEW APPLICATION SCHEMA OF S-1XX PS

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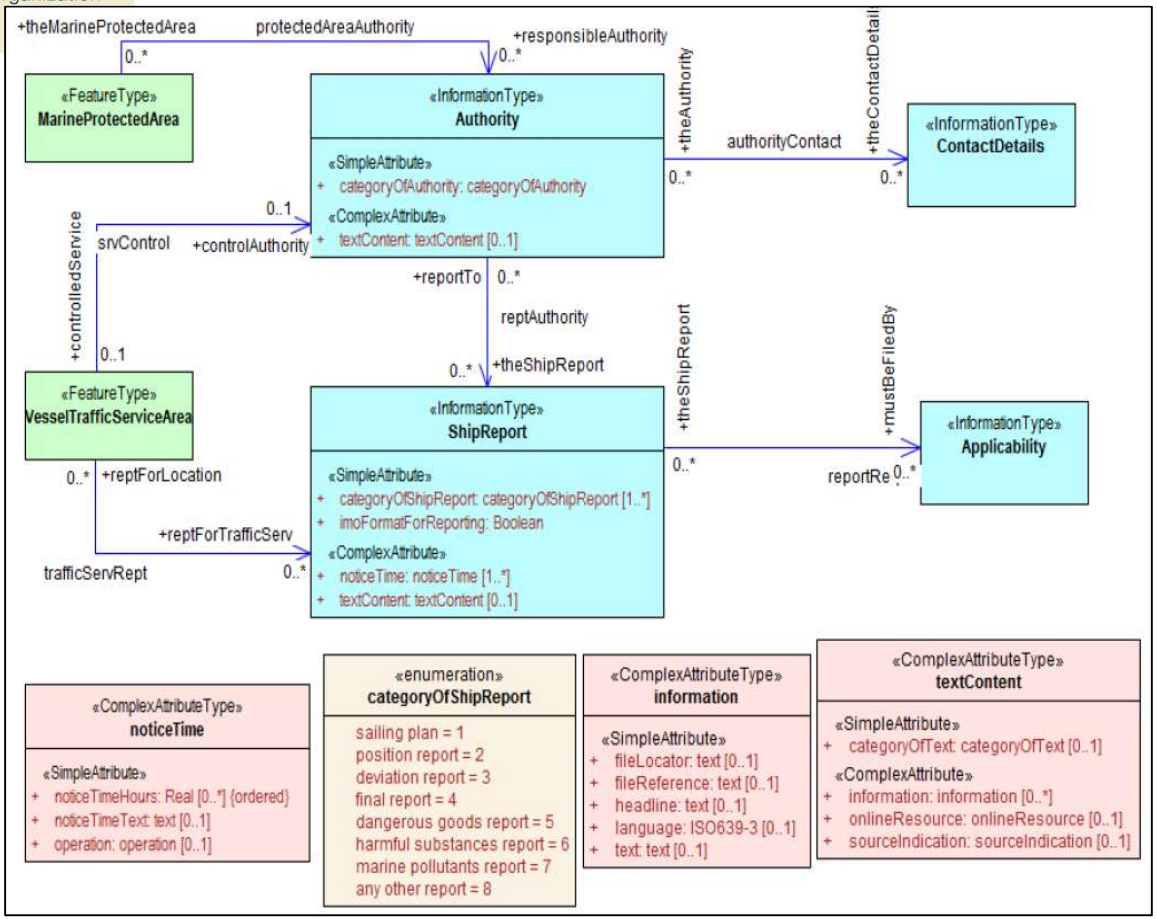
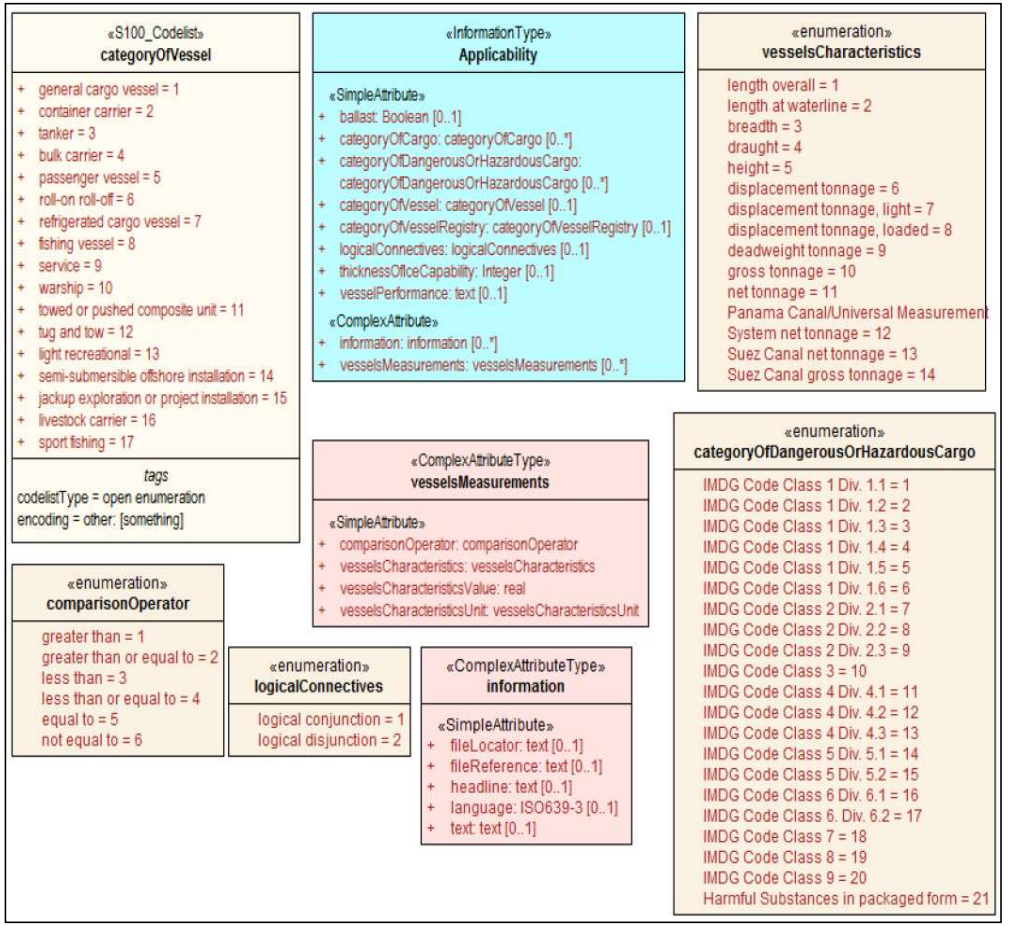
- S-122 MPA – Application schema





1st Meeting of S-130PT Schema Sub-Group

Meeting Slides

Requirements for sketching S-130 Application Schema

4 – 5 July 2022 / Monaco (Hybrid)

REVIEW THE INITIAL DESCRIPTION OF S-130 PS

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- Github – S-130 Initiate

Abstract

This document describes a product specification for the polygonal demarcation of global sea areas (PDGSA). It is a vector product specification that is primarily intended for encoding the extent of global sea areas using a system of unique numerical identifiers only. In this way, an authoritative dataset for limits of oceans and seas can be developed for use in contemporary geographic information and navigation systems. Its use is therefore not limited to navigational purposes only, but should also allow easy geospatial analysis by a broader audience. This product specification complies with the IHO S-100 Universal Hydrographic Data Model.

Comment (Lingzhi WU): Based on the S-130 ToRs and Proposal items 1.9.1-1.9.3 of A-2.

*Comment (Sewoong): I would like to suggest for S-130 not to include the navigational purpose. If the S-130 has the navigational purpose, there will be more considerations like interoperability than if it were not, and it may be difficult to complete the S-130 development on a planned schedule.

*Comment (Sewoong): Need to include descriptive texts introduced by Pro 1.9 at A2.

...

Description: A brief summary of the Product Specification summarizing: 1. the intended use, 2. the primary and secondary user, 3. the expected functionality

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DISCUSSION OF PROPOSED REQUIREMENTS

- Any requirements for drafting the S-130 application schema

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DEFINE DATA TYPES, RELATIONSHIPS AND CONTRAINTS

- Define Feature type
  - Polygonal Demarcations of Global Sea Areas
- Define Information type
  - Contact details
- Define Attribute type
  - Numerical identifiers
  - Spatial attributes
- Constraints
- Multiplicities

1st Meeting of S-130PT Schema Sub-Group

Meeting Slides

S-130 Application Schema

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DRAFT APPLICATION SCHEMA

- Draft Application Schema based on discussion
- Review the Draft S-130 Application Schema
- Discuss a way forward

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S-100 GI Registry

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S-100 GI REGISTRY

- Identifying newly introduced Feature data
- Process to register proposed new feature data in the GI registry (who and when)
- Any issues for the Registry Activities

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Relationship between Application Schema and others

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RELATIONSHIP BETWEEN APPLICATION SCHEMA AND OTHERS

- S-130 Feature Catalogue
- S-130 Portrayal Catalogue
- S-130 GML Schema
- S-130 DCEG (Data Classification and Encoding Guide)
- Metadata part
- Any considerations for S-100 Ed. 5.0.0

RELATIONSHIP BETWEEN APPLICATION SCHEMA AND OTHERS

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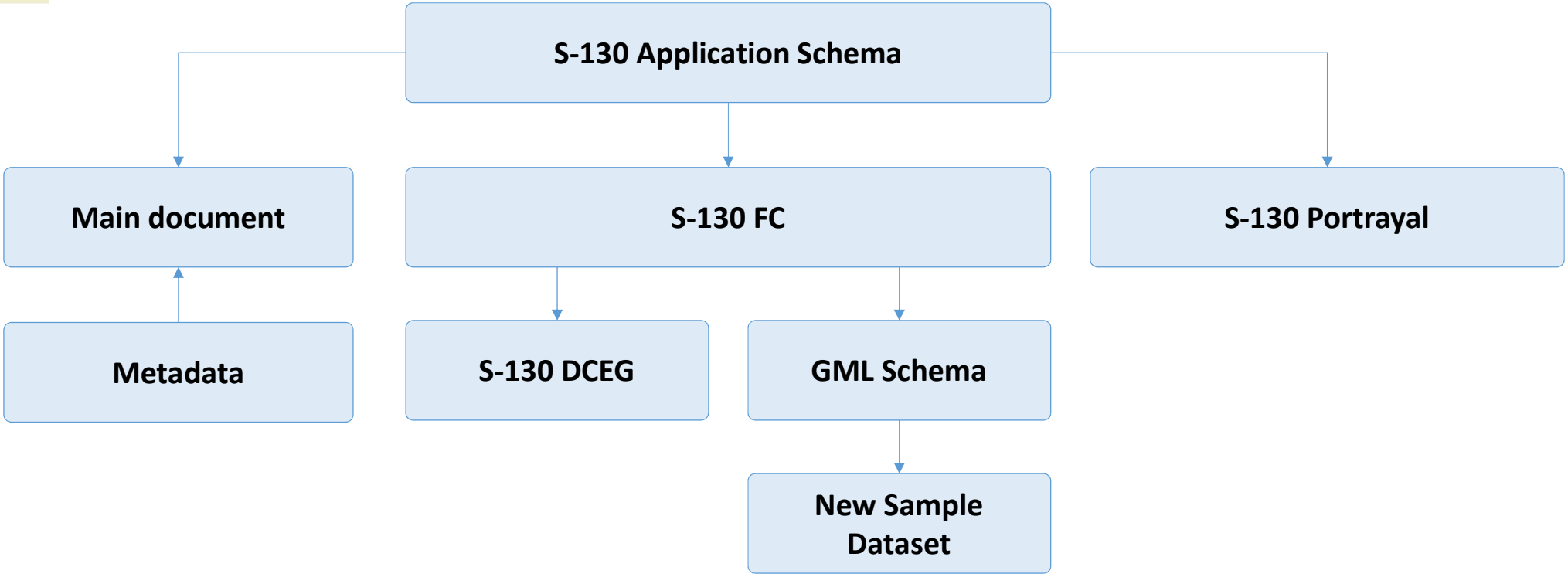
- Process to develop S-130 packages



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Any other Business

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ANY OTHER BUSINESS

- Next meeting