AISM Association Internationale de Signalisation Maritime

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities

IALA Recommendation
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On

the Inter-VTS Exchange Format (IVEF) Service

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Document Revisions

Revisions to the IALA Document are to be noted in the table prior to the issue of a revised document.

Date	Page / Section Revised	Requirement for Revision
10 May 2010	New document	First draft for review

IALA Recommendation on the Inter-VTS Exchange Format (IVEF) Service

(Recommendation ####)

THE COUNCIL:

RECALLING that one of the aims of the Association is to foster safe, economic and efficient movement of vessels and the protection of the marine environment through the improvement and harmonisation of aids to navigation, vessel traffic services and other means world-wide;

NOTING

- IALA Recommendation eNAV 140 on "The e-Navigation Architecture – the Initial Shore-based Perspective" [1],
- IMO's strategic plan regarding e-Navigation [2],
- that IMO expressed an interest in the contribution of IALA to the work on e-Navigation [3];

RECOGNISING that the e-Navigation architecture will assist in the development and maintenance of application interactions between ship and shore and shore to shore, in the following fields

- shore-based technical e-Navigation services,
- technical means for communication,
- data modelling and referential data,
- Human-Machine Interface presentations;

RECOGNISING ALSO the responsibilities of IALA National Members regarding national and international e-Navigation applications

- that the shore-based e-Navigation systems of National Members are embedded into local, regional, national, supra-national and global topologies of systems,
- that there are data/information flow chains within the local, regional, national, supra-national and global topologies of systems which support local, regional, national, supra-national and global e-Navigation applications,
- that requirements regarding quality parameters, such as accuracy, reliability, continuity, confidentiality, and others, will need to be taken into account when designing elements of the common shore-based e-Navigation system architecture;

RECOGNISING FURTHER that the **I**nter-**V**TS **E**xchange **F**ormat (IVEF) service, as laid out in this Recommendation, will assist in the efficient deployment of services to the mariner and to the maritime community by

- allowing shore-based systems of National Member and other appropriate Authorities and Entities to participate in harmonised data exchange;
- easing the integration of components;

- improving the efficiency in organisational terms by exploiting commonalities;
- harmonising data exchange to systems of other shore-based stakeholders (local, regional, national and global);
- taking into account the value, timeliness and sensitivity of data.

RECOMMENDS that National Members and other appropriate Authorities and Entities, introducing an IVEF Service into their shore infrastructure, take into account the principles as set out in the annex to this recommendation.

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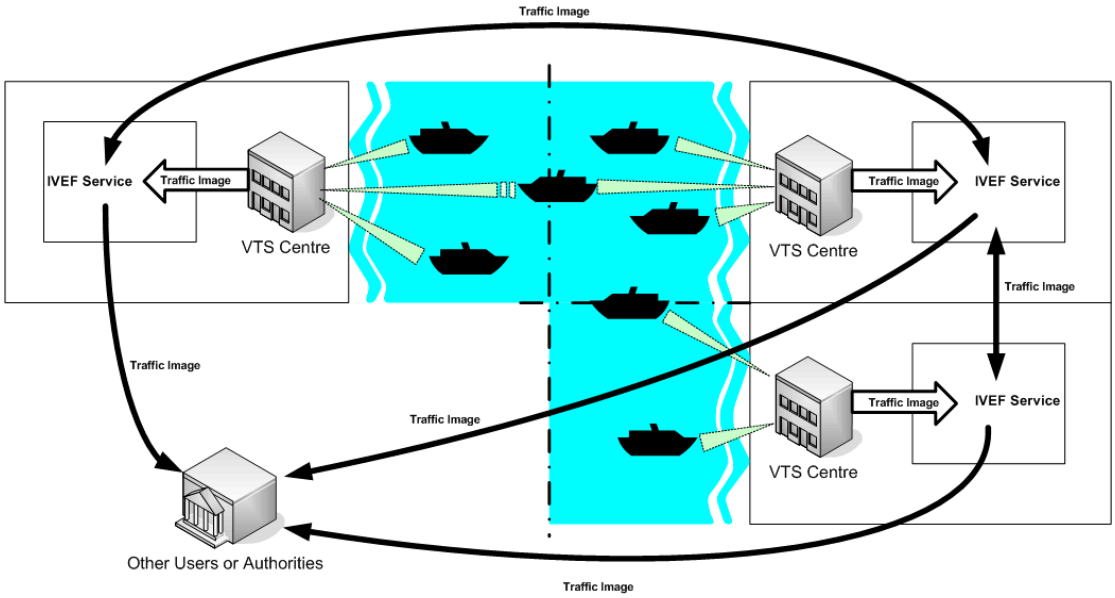
Annex – the Inter-VTS Exchange Format (IVEF) Service

1 Introduction

The IVEF Service is intended to provide a common framework for the exchange of vessel traffic image information between shore-based e-Navigation systems, such as VTS systems, e-Navigation stakeholders and relevant external parties.
Figure 1 shows such a situation, where VTS centres share information about the common operational area and also to relevant other users and authorities.

Figure 1 The IVEF Service in Operation



The IVEF Service is client/server-based. Clients make a connection to a server, running the IVEF Service and receive traffic image data according to their specific preferences and authorisations (figure 2). Different clients may specify different data requirements, such as the area of interest, the update frequency and the particular traffic objects that are relevant to them. Based on the client credentials, the IVEF Service will enforce restrictions on the data that is being served to the client. These restrictions can be specified by the data provider.

Figure 2 The IVEF Service Client/Server Model

2 The IVEF Service as described by other IALA Recommendations

The IVEF Service is a gateway service, as contained in the general description of the common shore-based system architecture in the "*IALA Recommendation on Shore-based e-Navigation System Architecture"* [see reference 1]. Such a gateway service is specialised in data exchange shore-to-shore. It interfaces to other e-Navigation systems and to external systems of "third parties". These systems may request the IVEF service to forward relevant data to them. A IVEF service can interface shore-based systems locally, nationally, regionally, and globally.

3 Service Model of the IVEF Service

3.1 Overview

The IVEF Service specification is organised according to the (draft) *"IALA Recommendation on Generic e-Navigation Service Engineering Model Template"* [reference 1] as depicted in figure 3.

Figure 3 The IVEF Service Model

The specification contains exactly those elements that are relevant for a full description of the service. The following is a brief description of these elements:

Basic IVEF Services: capabilities of the IVEF Service and its functional interface statements.

Data Model: the abstract descriptions of the data provided by the IVEF Service at its Basic IVEF Services to shore-based e-Navigation systems and external systems. It defines the data types and data objects of the IVEF Service.

Interaction Model: the dynamics of the interaction of individual components of the IVEF Service (data flow and protocol).

Interfacing Model: the data encoding and interface protocols between the provider of the IVEF Service and the clients, requesting data from the service.

Security Model: control of access to the IVEF Service (filtering and access rights).

Quality Parameters: performance and reliability considerations of the IVEF Service.

Test Model: test and validation of the IVEF service.

Administration Model: the technical administration and maintenance aspects of the IVEF Service.

A full description of all these aspects follows in the remainder of this document.

3.2 Capabilities of the IVEF Service for the Shore-based e-Navigation System

3.2.1 Introduction

The IVEF Service is an optional part of a shore-based e-Navigation system. Its basic purpose is to provide a vessel traffic image to related vessel traffic service systems,

to e-Navigation stakeholders and to relevant external parties. Any IVEF Service provides, at least, the so-called *Basic IVEF Services (BIS)*. A particular characteristic of the IVEF Service is that these services are only rendered on request of another e-Navigation system or of an external system, i.e. the IVEF Service follows the client/server model as already described in the introduction of this specification (figure 3).

3.2.2 Basic IVEF Services (BIS)

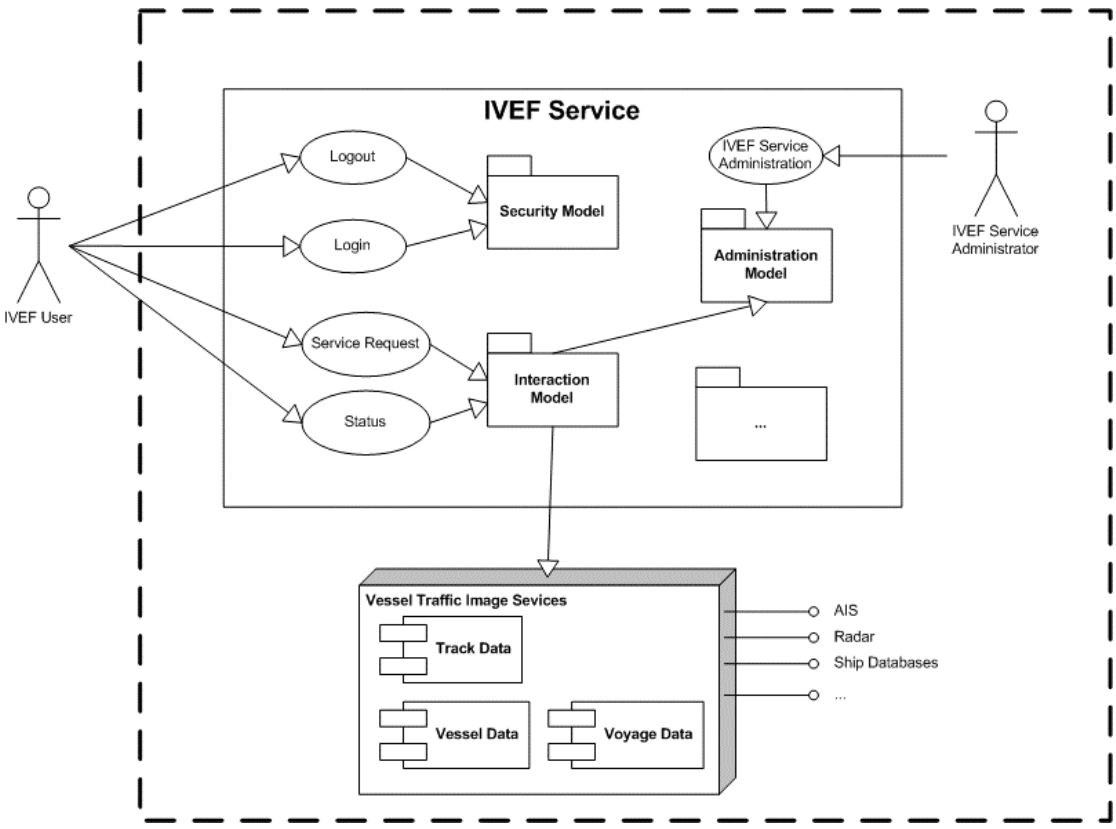
There is only one basic IVEF service, which is

> *Vessel Traffic Image Data Exchange Service* – deliver vessel traffic situation data, according to a specific service profile. Such a service profile determines e.g. the data items delivered, the area of interest and the update rate.

The IVEF Service is part of the e-Navigation Client/Server-based architecture. A general way of describing communication architectures is via the ISO/OSI reference model [reference 3], which describes communication between applications through a layered model. Each higher-level layer in this model increases the level of abstraction. The communication between client and server is described here at the so-called “application layer” in the reference model. The implementation of the lower layers is not discussed here. It is only suggested to use a secured and reliable link between the client and server.

3.2.3 General Use Cases

Figure 4 IVEF Service Primary Use Case



3.3 Data Model of the IVEF Service

3.3.1 Introduction

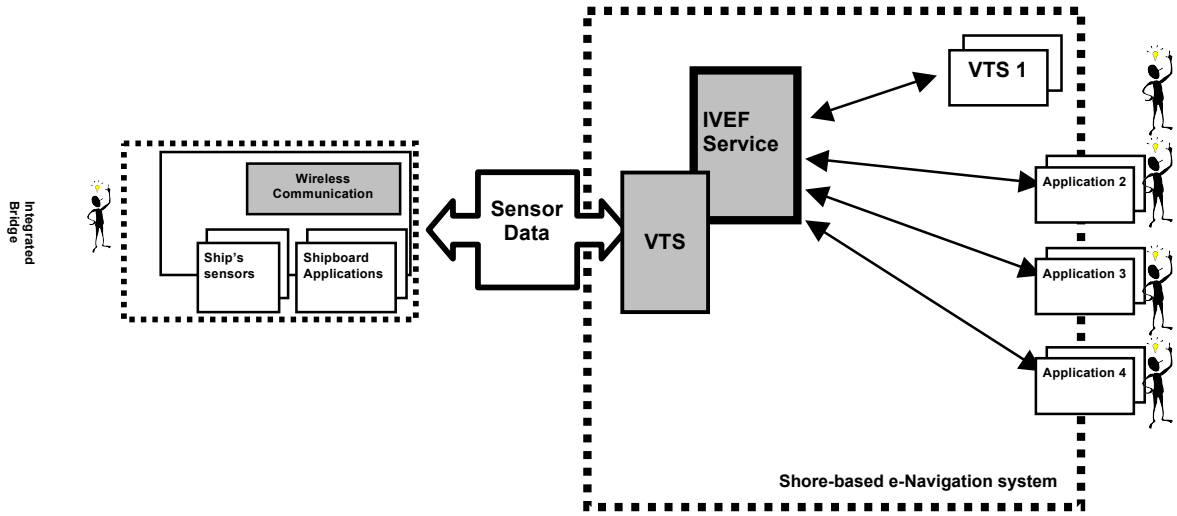
The Data Model of the IVEF Service is intended to be part of the Universal Maritime Data Model (UMDM), as described in [reference 1]. It provides the well-structured and abstract (functional) description of the data that is exchanged through the IVEF Service.

The Data Model itself does not contain data encoding information which is required to create an actual implementation of the service. Separating the data encoding from the Data Model of the IVEF Service provides flexibility in selecting an encoding technique as deemed appropriate by the competent authority. A portfolio of suitable encoding techniques for data objects of the IVEF Service is given in section 3.6 on the Interfacing Model.

3.3.2 The Place of the IVEF Service in the e-Navigation Architecture

Figure 5 illustrates the place of the IVEF Service in the e-Navigation architecture as described by *IALA Recommendation on the e-Navigation Architecture – the Shore Perspective* [reference 1]. It clearly identifies the co-operative nature of the shore-based IVEF Service. Note that the IVEF Service shares the dependencies of the e-Navigation architecture.

Figure 5 The Place of the IVEF Service within the e-Navigation architecture



There may be many client-server-relationships, since the "gateway services" of the shore-based e-Navigation system may be requested by other e-Navigation services within that system, there can be identified. These client-server-relationships can be combined into a hierarchy within the shore-based e-Navigation system (see figure 6).

Figure 6 Client-server relationships of the IVEF Service with other shore-based e-Navigation services

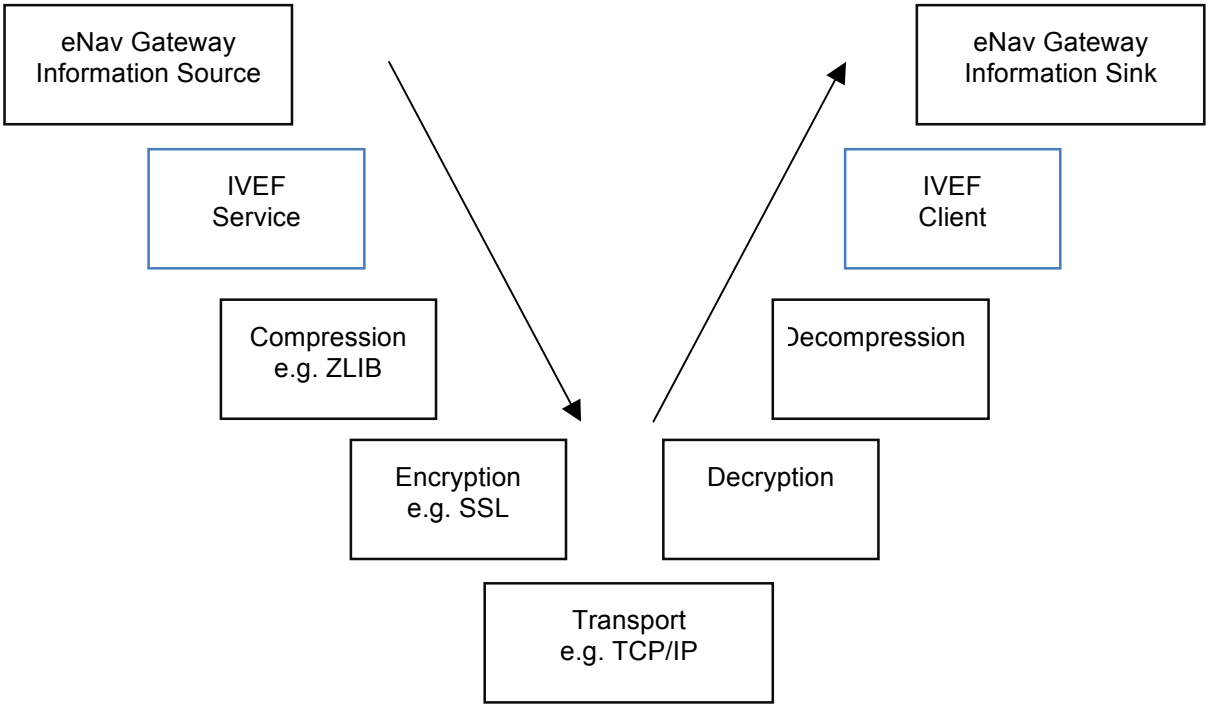
3.4 Interaction Model of the IVEF Service

3.4.1 Context

IVEF Service Interfaces are point-to-point connections between e-Navigation Gateways. One Gateway acts as an information source whereas the other Gateway acts as an information sink. The IVEF Service

Note that the IVEF Service by itself has no provisions for data compression and encryption. IVEF describes the data exchange format between eNAV applications; it relies on transport layers underneath to convert between physical, electrical and network interfaces. Additional transport layers may add data compression and encryption, depending on the system requirements (see figure 7).

Figure 7 The Communications Stack



The justification for this approach is the fact that these transport layers are already well-defined and standardised. Furthermore, standard compression and encryption algorithms are readily available.

Recommended layers (at this time) are TCP/IP for transport, SSL for encryption and ZLIB (RFC-1950) for compression.

3.4.2 Service Negotiation

The IVEF interface is a service based protocol. This means that the data exchange between the parties is not pre-defined, but rather the result of a negotiation between the information provider and the information consumer.

3.4.2.1 Introduction

When a client (an eNav Gateway acting as an information sink) wants to connect to server (an eNav Gateway acting as an information source), it has to initiate the service by authenticating. To do this, the client sends a Login message to the server, the server validates the login requests and if correct, it sends a LoginResponse message. The server initiates the default service for that particular user. An example of a service is:

> "*using an interval of 10 seconds, output all position information and voyage information about all vessels that are within in the following area (x,y) – (x1,y1) – (x2, y2) – (x3,y3)*[1]"[1]

After the client is logged on, the server starts outputting the traffic image that matches the specification in the service.

[1] Please note that *x, x1, x2* and *x3* shall be specified in Longitude coordinates and that *y, y1, y2* and *y3* shall be specified as Latitude coordinates.

The client can also sent a ServiceRequest to terminate or change the active service. Services can be defined with different transmission characteristics, which allows of a server push or client pull of the information, or a combination.

3.4.2.2 Service parameters

A service is defined by a number of parameters:

1. Object Selection, which objects should be sent?
    1. Area based
    2. Filter based on the object properties (e.g. length > 50 m)
2. Item Selection, which information elements should be sent?
    3. Track Information
    4. Vessel Information
    5. Voyage Information
3. Transmission Selection, when should it be sent?
    6. Single Occurrence (Pull)
    7. Periodic, with specified update rate (Push)
    8. A-Periodic, synchronous with update (Push)

3.4.2.3 Information flow dynamics

The interface supports the following messages; the contents and meaning of the messages mentioned below are covered in chapter.

Table 1: Interface Messages

Message	**From**	**To**	**Description**
Control Information Messages			
Login	Client	Server	This message is used to identify the client
Login Response	Server	Client	Login accepted or refused, if refused a reason will be supplied
Logout	Client	Server	This message is used to terminate the IVEF Service
Ping	Both	Both	Heartbeat message
Pong	Both	Both	Response to a Heartbeat message
Service Request	Client	Server	This message contains the definition of the service requested by the client. It will replace the current service.
Service Request Response	Server	Client	Request accepted or refused, if refused a reason will be supplied
Service Status	Server	Client	This message will be sent by the server to indicate the status of the service[2].
Real Time Messages			
Object Data	Server	User	The track, vessel- and voyage related data of objects in the traffic image.

[2] e.g. in an overload situation the server may drop messages, in this situation the Service Status message is sent to the client to make him aware of lost information.

3.4.2.4 Timing and priorities

Control Information Messages have a higher priority than Real-Time Messages. This means that in an overload situation, Object Data Messages may be dropped in favour of Control Information Messages.

The service must start with a login message. The server will terminate the connection on transport layer when any other message is received, in order to prevent a possible Denial-of-Service (DoS) by mis-configured or malicious clients. If a service is interrupted at transport level, both server- and client sides will terminate the session and the client must login again to regain access to the service.

Messages, sent as a response to another message (LoginResponse, ServiceRequestReponse and Pong), must be responded to within agreed-upon period (e.g. 4 seconds). If the response message is not received within a specified timeout period, the sender may retry sending the message before terminating the service.

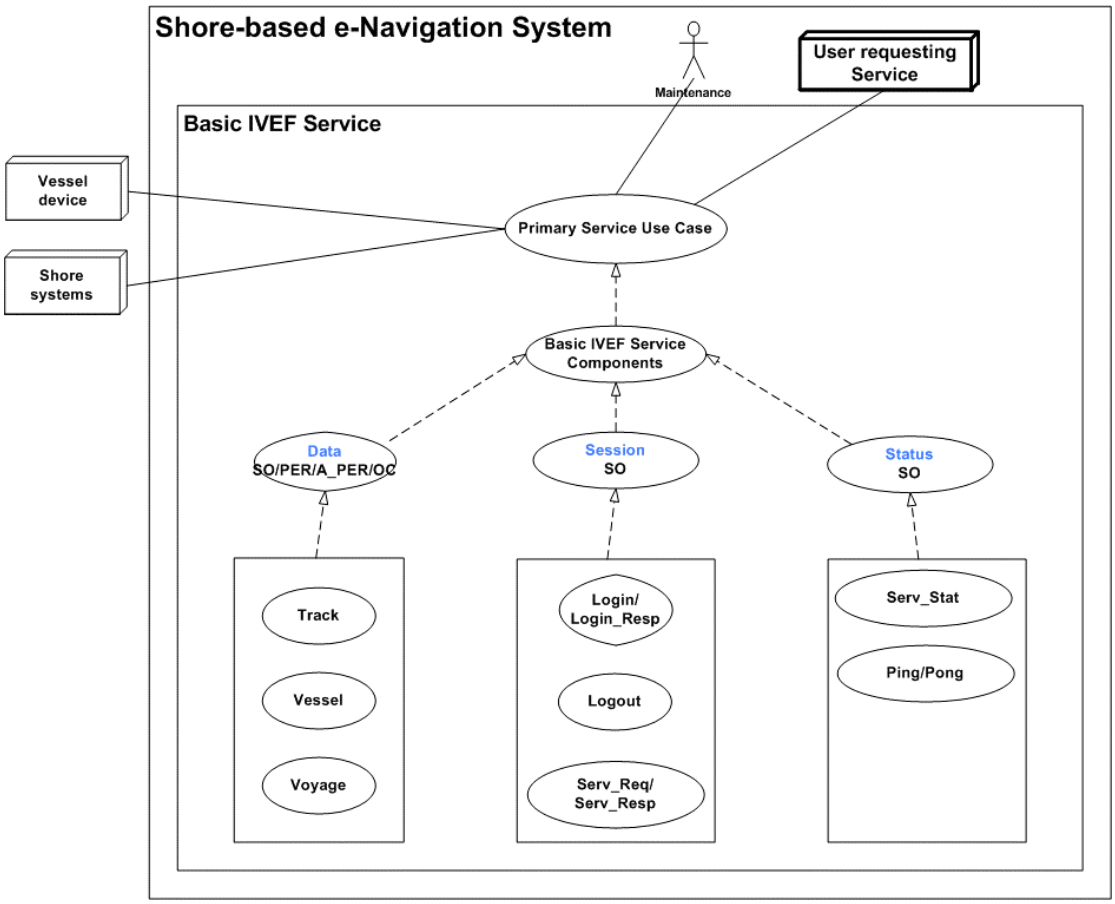
Ping messages must be sent when the sender has no other means[3] to detect whether the receiver is still connected. The Ping message must be sent after an agreed-upon period of inactivity.

3.4.3 Part I: Primary service use cases of the BIS

The primary service use cases all have in common, that they are justified by at least one interaction with a “requesting service” within the common eNAV system architecture: The “requesting service” is any other service of the common shore-based e-Navigation system architecture making a request (*logon*) to the BIS in the previous chapter.

[3] Depending on the transport layer (e.g. SCTP), and receiver activity, the sender may detect the connection state of the receiver automatically. In this case the Ping message is not required.

Figure 8 Overview of the primary service use cases of the IVEF Service



Note: The dotted lines indicate inheritance relationship.

The complete list of external BIS Components and their categories is given below:

BIS Components:

STATUS:	Service Status
DATA:	Object Data
SESSION:	Session Management

BIS Transmission Category

SO:	Single occurrence (non-realtime)
PER:	Periodic, with a specified update rate (real-time)
A-PER:	A-periodic, synchronous with the received track update (real-time)
OC:	On change, updates are sent as data elements change

BIS Basic Service Data Elements:

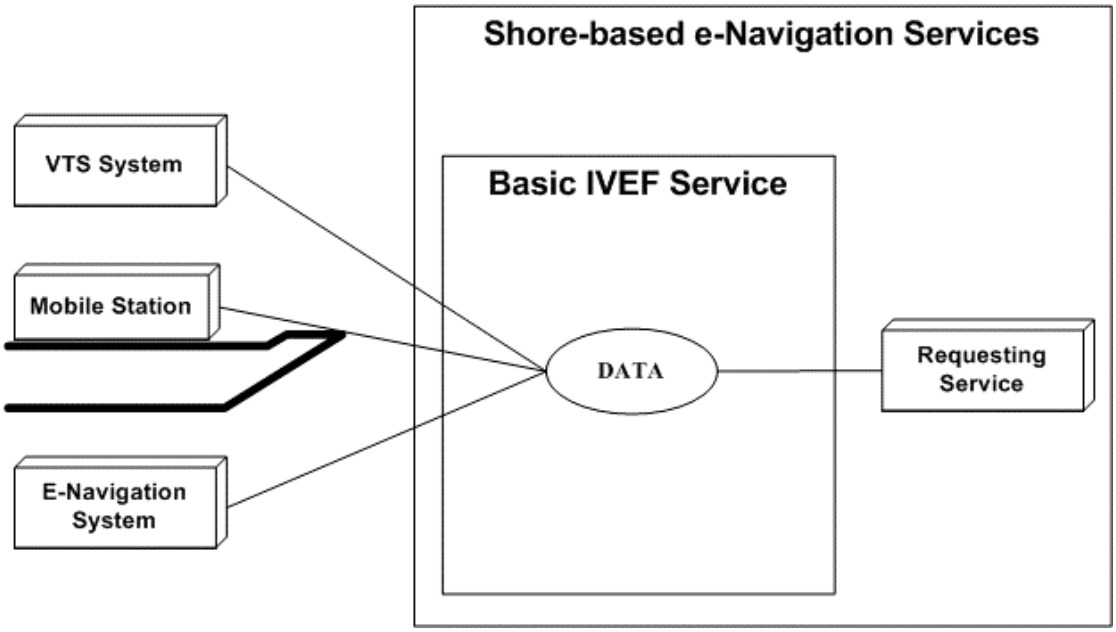
LOGIN:	Authentication request
LOGIN_RESP:	Authentication response
LOGOUT:	Service termination notification
SERV_REQ:	Service request (category, area)
SERV_RESP:	Service response

SERV_STAT: Service Status
PING: Alive request
PONG: Alive response
TRACK: Track data
VESSEL: Vessel data
VOYAGE: Voyage data

3.4.3.1 Service Component DATA

3.4.3.1.1 Service Model

Figure 9 The DATA Service Component



3.4.3.1.2 Description

The DATA service component provides the following information:

1. Object track information; generally dynamic information about an object such as present position and speed
2. Optionally Object vessel data; more or less pertinent information about an object such as call sign, IMO number and object dimensions
3. Optionally Voyage data; such as Destination, ETA,....

Service Data Structure

See section 7

3.4.3.1.3 VESSEL: Vessel Data

Use:

1. The vessel information is used to identify and classify ships.

Risks:

1. The vessel information is obtained from several sources including manual entry onboard a ship or in a VTS system or from database systems. It is possible that this data may be incorrect.

Service Data Structure

See section 7

Operating Characteristics

1. The BIS shall start automatically upon logon confirmation
2. The data will be sent depending on transmission category

3.4.3.1.4 TRACK: Track Data

Use:

1. The track data combined with the data derived from VESSEL and, optionally, VOYAGE represents the actual traffic image.

Risks:

1. The track data that is exchanged is the result multi-sensor fusion of various sensors. Sensor data is inherently noisy and subject to all kinds of disturbances, therefore the track represents the best effort representation of the true situation, but not necessary the true situation itself.

Service Data Structure

See section 7

Operational Characteristics

1. The BIS shall start automatically upon logon confirmation
2. The data will be sent depending on transmission category

3.4.3.1.5 VOYAGE: Voyage-related Data

Use:

1. The voyage-related ship information is used to classify ships with regard to cargo, draught, destination and the route.

Risks:

1. The voyage information is entered onboard a ship or in a VTS system and it is possible that this data may be incorrect;

2. Information on the type of cargo provides only the classification of dangerous goods (Carrying DG, HS, or MP, IMO hazard or pollutant category A, B, C, D). This may not be sufficient in case of SAR/Pollution prevention.

Service Data Structure

See section 7

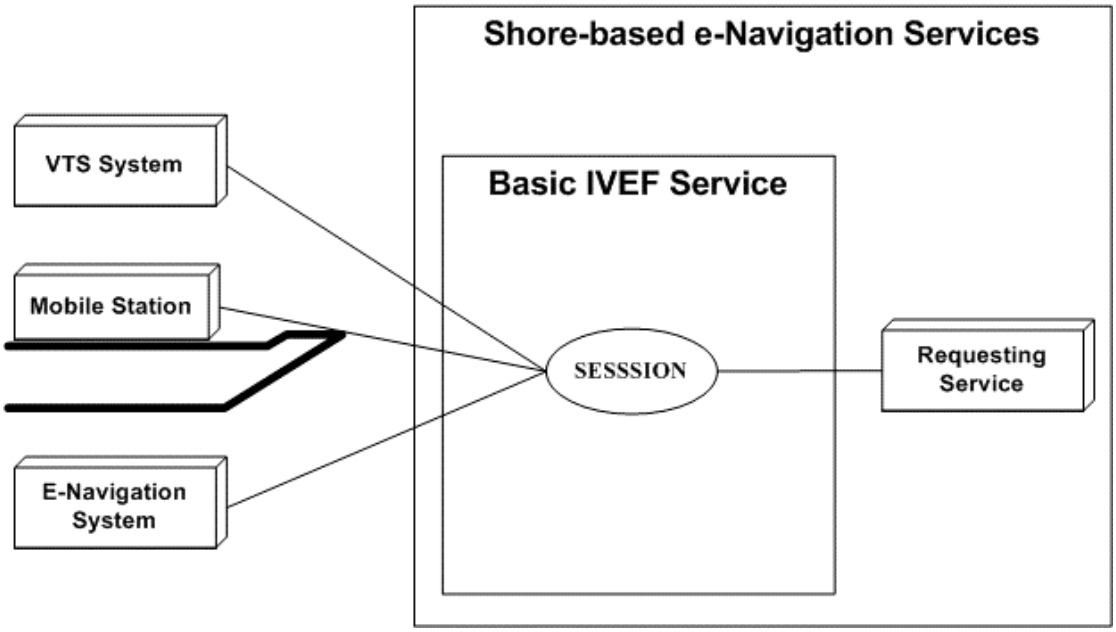
Operational Characteristics

1. The BIS shall start automatically upon logon confirmation
2. The data will be sent depending on transmission category

3.4.3.2 Service Component SESSION

3.4.3.2.1 Service Model

Figure 10 The Session Service Component



3.4.3.2.2 Description

The SESSION service component is responsible for set-up, termination and terms-of-service negotiation.

3.4.3.2.3 LOGIN/LOGIN_RESP/LOGOUT

Use:

1. A session is started by issuing a login request with the appropriate account details
2. The account details are verified and the service responds with a login response granting or denying access to the service

A session can be terminated by issuing a logout request

Risks

1. Secured communication should be considered on the transport layer. IVEF provides only authentication support. Encryption and non repudiation must be established on transport layer using suitable technologies (VPN, https, ssl, direct lines…)

Service Data Structure

See section 7

3.4.3.2.4 SERVICE_REQ/ SERVICE _RESP

Use:

1. A service request is used to negotiate the terms-of-service, i.e. data content, area of interest and frequency of delivery;
2. A service request is acknowledged by a service response. Once acknowledge it will replace the previous service request.

Risks

1. A service request could lead to a data link overload. The client is responsible for issuing the service request that matches the available resources.
2. The server could be overloaded by to many user requests. Proper mechanism should be applied.

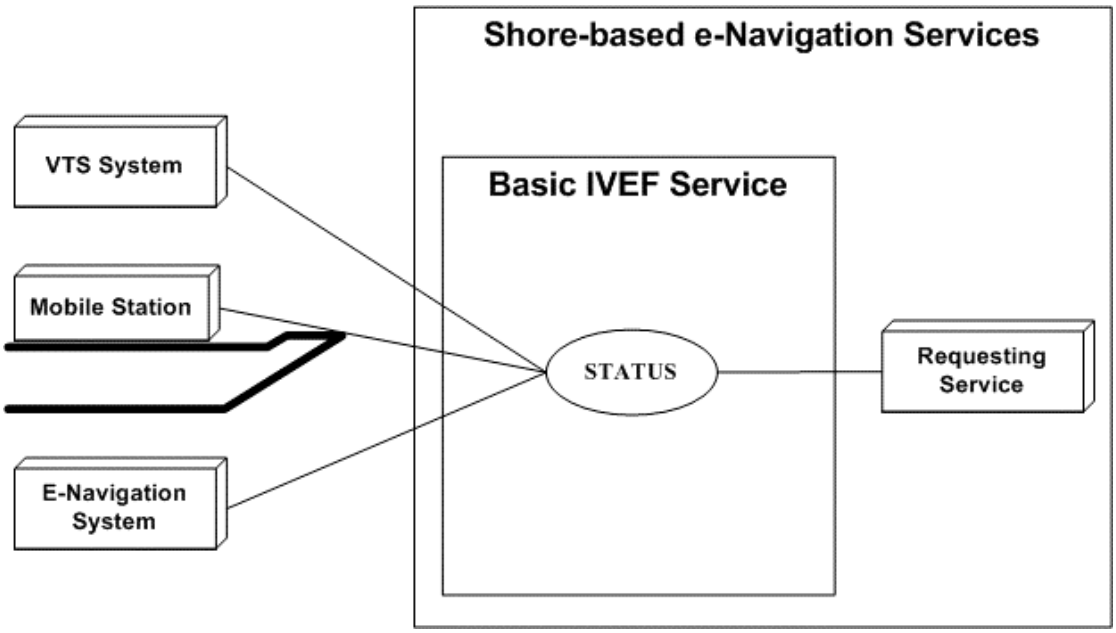
Service Data Structure

See section 7

3.4.3.3 Service Component STATUS

3.4.3.3.1 Service Model

Figure 11 The Status Service Component



3.4.3.3.2 Description

The STATUS service component provides service-related status information and maintains alive status

3.4.3.3.3 PING/PONG/SERV_STAT

Use:

1. PING / PONG are messages exchanged at regular time intervals to verify alive status of the data link.
2. SERV_STAT indicates the status of the server to the client (ok/not ok) with an optional description.

Risks

3. No risks

Service Data Structure

See section 7

3.4.4 Part II: Secondary service use cases of the BIS

3.4.4.1 LOCAL ADAPTATION

Use:

1. The TAGGED_ITEM message can be used for non-standard, additional data exchange.

Risks

1. Requires additional agreement between client side and server side.

Service Data Structure

See section 7

3.5 Security Model of the IVEF Service

The security model concerns the following aspects of the service

- Authentication – this concerns both clients of the service and providers of the service,
- Authorisation – this concerns the clients of the service,
- Data protection – this concerns the data that is being exchanged,
- Physical security – this concerns access to the server- and client systems and the interconnecting network.

The security model of the Basic IVEF Service adresses only the first two items, i.e. authentication and authorisation. The latter two items are outside the scope of this document. For data protection, suitable encryption methods can be defined at communication link-level (see section 3.4) or by providing a, so-called, Virtual Private Network (VPN) for clients.

The IVEF service is usually strictly contained within a shore-based e-Navigation system. Hence, it is assumed that appropriate measures for safeguarding the physical security of the service have been taken at the system level.

The model that is chosen for authentication and authorisation is a simple one, based on a shared secret between client and server (such a shared secret is commonly refererred to as “password”). There is no specific authentication of the server (although this can arranged, e.g. by using SSL certificates) and knowledge of the

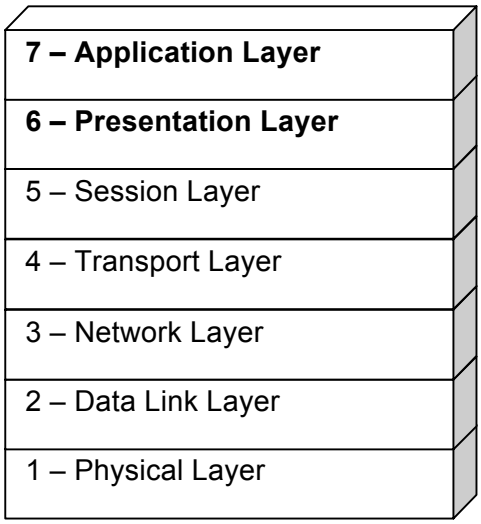
shared secret is assumed to identify the client. Once the client has authenticated itself, a set of client-specific rules is enforced by the server to guarantee that only those data are sent to the client for which the client is authorised (see also section 3.9).

Note that the security model of the IVEF service is, in fact, independent of the traffic image exchange service and can easily be replaced by a more elaborate security model (e.g. based on certificates) if required.

3.6 Interfacing Model of the IVEF Service

The IVEF Service refers to the Presentation and Application layers as defined by the Open Systems Interconnection (OSI) Reference Model [reference 3].

Figure 12 The ISO/OSI Reference Model



The definition of the lower-level telecommunication support layers is beyond the scope of the IVEF Service definition. Transmission of an IVEF-coded vessel traffic image can make use of any available communication medium, for instance a packet-switched Wide Area Network (WAN) or a Local Area Network (LAN).

The specific lower-level telecommunication protocol layers should be agreed upon by all partners of the data exchange, taking into account requirements such as data rates, reliability, security and latency.

In order to ease the exchange of data between different systems (e.g. potential network interconnection) it is advisable to apply standard telecommunication protocols (e.g. TCP/IP).

The IVEF Service uses XML [reference 3] as a Presentation Layer protocol and defines the structure of the data to be exchanged over the communication medium.

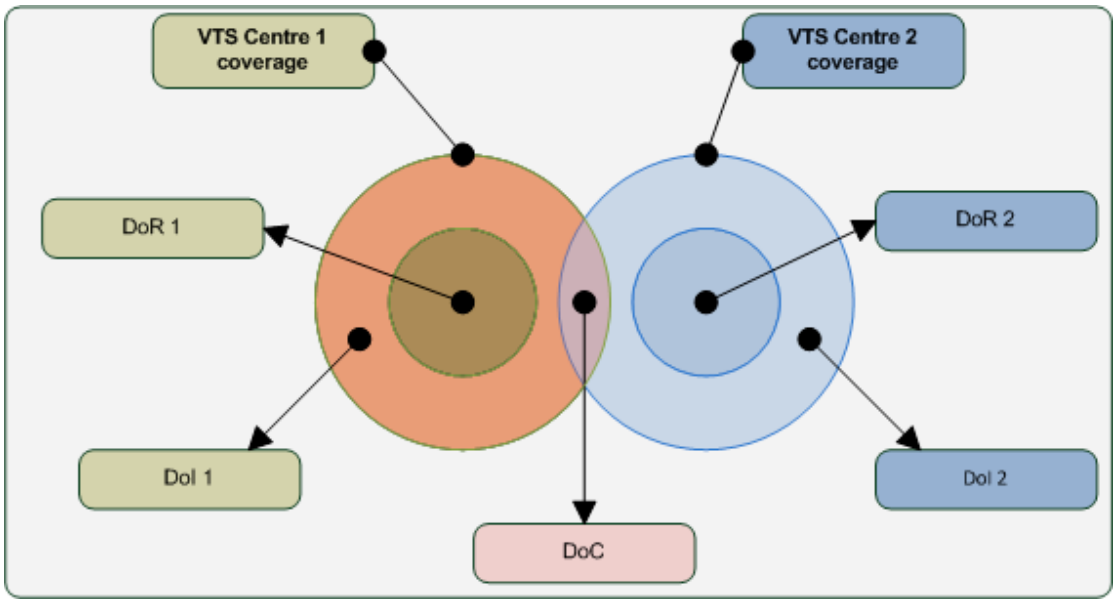
3.7 Quality Parameters of the IVEF Service

The quality parameters of the IVEF Service depend on the intended use of the service: is it a real-time service, suitable for Vessel Traffic Services, or a near-realtime or non-realtime monitoring service that is regularly updated?

An important assumption of the service is that the server and client systems operate with a common time reference. Therefore it is recommended to use a time service that provides UTC time, e.g. based on GNSS or internet time servers (NTP), at both the server and client.

A possible application of the IVEF Service is the provision of monitoring data to a stakeholder, for example a ship owner that wants to have information on his fleet. In such a case, only the relevant data will be delivered; everything else will be filtered out. Also the update rate will be fairly low, say in the order of a few messages per hour. Furthermore, neither availability of the service nor message delays are critical issues.

Figure 13 Domains of Interest, Responsibility and Cooperation



Although the IVEF Service is a one-way service (from server to client), a common operational scenario, where VTSs are involved, is a mutual service, where each VTS provides data to the other (figure 1).
In such a scenario, three areas are considered

Domain of Interest (DoI) – the geographical area which is of interest to a particular VTS centre. In general, this is the total sensor coverage area

Domain of Responsibility (DoR) – the area for which the VTS centre is mandated to provide their VTS service, i.e. a Information Service, Traffic Organisation Service or Navigational Assistance Service.

Domain of Cooperation (DoC) – a subarea within the cross-section of the DoIs of the two VTSs where special processing is done to guarantee continuity of position, speed and course of objects.

In order to use the concept of the DoC, additional functionality is required in both VTSs.
This additional functionality consists of

- the capability of associating multiple tracks to a single object, i.e. in the DoC, both systems will have a track and these tracks must be correlated to the same physical object, for instance via matching position and speed, or some other method.
- the capability of smoothing out differences between the correlated tracks for the same object. The recommended processing to guarantee continuity

across the Domain of Cooperation is to use a weighted average of the track states (see figure 13).

In such a scenario, there should be a mutual agreement between the VTSs involved about the quality of service. This agreement should address

- availability and timeliness of the IVEF Service,
- emergency/breakdown procedures, if applicable,
- integrity of the VTS data delivered. This also concerns possible filtering of the data, for instance for commercial reasons.

A more complicated use case is where there are multiple providers of an IVEF Service to a common authority. The common authority is responsible for further distribution of the data to recognised data users. This means that the common authority is also responsible for validation of these users. In this case, there will be agreements between the common authority and the IVEF Service providers, but also between the common authority and the recognised data users. Obviously, the quality aspects in these agreements may be quite different, depending on the intended use of the data.

3.8 Test model of the IVEF Service

3.8.1 Well formed messages

Each IVEF Service Message must comply with the W3C XML specification [reference 3]. This specification defines an XML document as a text, which is well-formed, i.e., it satisfies a list of syntax rules provided in the specification. The list of rules is fairly lengthy; the most important rules are:

- A message contains only properly-encoded legal Unicode characters.
- None of the special syntax characters such as "<" and "&" appear except when performing their markup-delineation roles.
- The begin, end, and empty-element tags, which delimit the elements, are correctly nested, with none missing and none overlapping.
- The element tags are case-sensitive; the beginning and end tags must match exactly.
- There is a single "root" element, which contains all the other elements.

3.8.2 Valid messages

In addition to being well-formed, an IVEF Service Message must also be valid. This means that data elements and attributes must comply with the definition as specified in section 7. In addition, the values must adhere to minimum value, maximum value, length, precision etc., as specified in section 7.

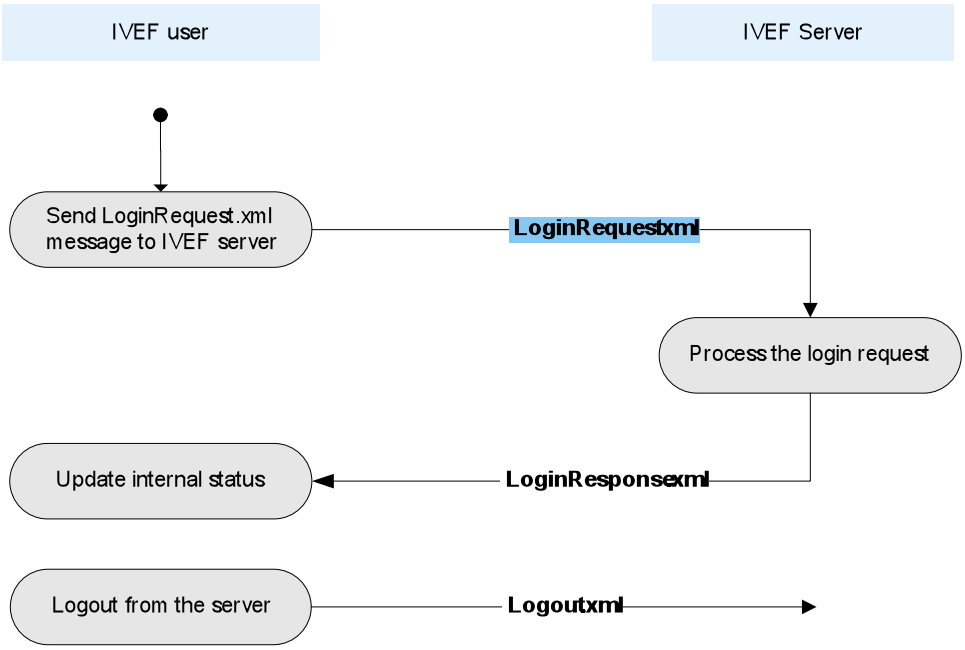
3.8.3 Valid data

All track numbers, at any given time instant, should be unique.

3.8.4 Interaction behaviour

A login should be answered by a login response as indicated in figure 14. The same holds, modus modendi, for ping/pong and service req/service resp.

Figure 14 Login/Logout activity graph



3.9 *Administration Model of the IVEF Service*

The Administration Model describes the aspects of the service that can be configured by service provider. For the IVEF Service, this concerns the maintenance of the user database. The user database contains the shared secret for each user and the user authorisations, i.e. the restrictions, that are enforced by the server, on the data that is provided to a particular user. Additionally, the user database may contain default services for each user. These default services may be adapted by the respective user or be left to the discreteness of the service provider.
Considering the complexity of the user database, it is strongly recommended to provide a graphical Human-Machine Interface (HMI) for this purpose.

4 References

1. IALA Recommendation on the e-Navigation Architecture – the Shore Perspective, IALA Recommendation eNAV-101
2. Generic e-Navigation Service Engineering Model Template, (draft) IALA Recommendation eNAV-210, 2009
3. Open Systems Interconnection (OSI) Reference Model, International Standards Organization (ISO) Standard 7498-1, 1994
4. Extensible Markup Language (XML) 1.0 (Fifth Edition), W3C Recommendation 26 November 2008, http://www.w3.org/TR/2008/REC-xml-20081126/

5 Definitions

Object – a vessel, an Aid-to-Navigation or a helicopter (SAR)
Gateway Service – a generic type of service, as defined in [reference 1]

6 Abbreviations

BIS – Basic IVEF Services
DoC – Domain of Cooperation
DoI – Domain of Interest
DoR – Domain of Responsibility
DoS – Denial of Service
GNSS – Global Navigation Satellite System
HMI – Human-Machine Interface
IVEF – Inter-system Vessel traffic image Exchange Format
ISO – The International Standards Organisation
LAN – Local-Area Network
NTP – Network Time Protocol
OSI – Open Systems Interconnection
SAR – Search and Rescue
SSL – Secure Socket Layer
TCP/IP – Transmission Control Protocol/Internet Protocol
TIE – Traffic Image Exchange
UMDM – Universal Maritime Data Model
UTC – Universal Time Coordinated
VTS – Vessel Traffic Services
W3C – World-Wide Web Consortium
WAN – Wide-Area Network
XML – eXtensible Markup Language

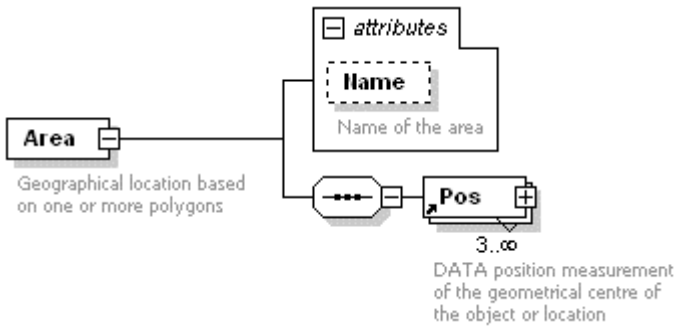
7 Appendix: Data Definition

attribute form default:
element form default: **qualified**
targetNamespace: **http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3**

Elements
Area
Header
LoginRequest
LoginResponse
Logout
MSG_IVEF
ObjectData
OtherId
OtherName
Ping
Pong
Pos
ServerStatus
ServiceRequest
ServiceRequestResponse
TaggedItem
TrackData
VesselData
VoyageData

element **Area**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
content complex

children **Pos**

used by
element **ServiceRequest**

attributes

Name	Type	Use	Default	Fixed	Annotation
Name	**derived by: xs:string**	optional			documentation Name of the area

annotation
documentation
Geographical location based on one or more polygons

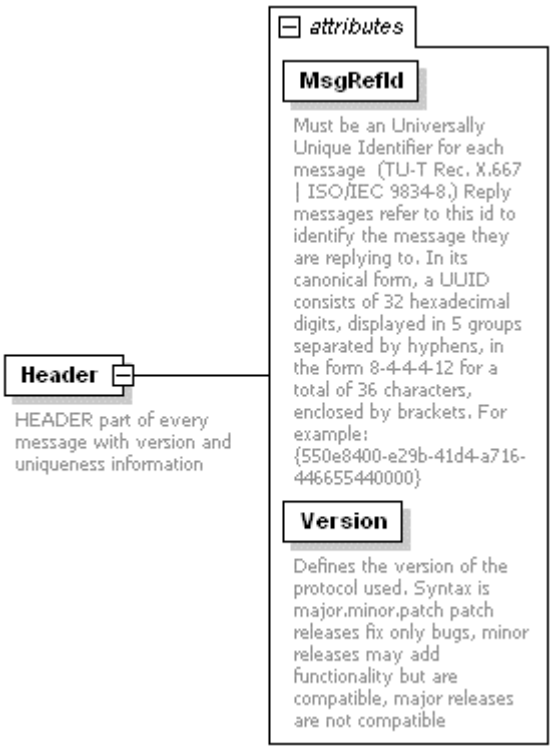
source

```
<xs:element name="Area">
 <xs:annotation>
  <xs:documentation>Geographical location based on one or more polygons</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="Pos" minOccurs="3" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Name" use="optional">
   <xs:annotation>
```

```
      <xs:documentation>Name of the area</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
        <xs:maxLength value="42"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **Header**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF**

attributes

Name	Type	Use	Default	Fixed	Annotation
MsgRefId	**derived by: xs:string**	required			documentation Must be an Universally Unique Identifier for each message (TU-T Rec. X.667 | ISO/IEC 9834-8.) Reply messages refer to this id to identify the message they are replying to. In its canonical form, a UUID consists of 32 hexadecimal digits, displayed in 5 groups

					separated by hyphens, in the form 8-4-4-4-12 for a total of 36 characters, enclosed by brackets. For example: {550e8400-e29b-41d4-a716-446655440000}
	Version	**xs:string**	required	0.2.3	documentation Defines the version of the protocol used. Syntax is major.minor.patch patch releases fix only bugs, minor releases may add functionality but are compatible, major releases are not compatible

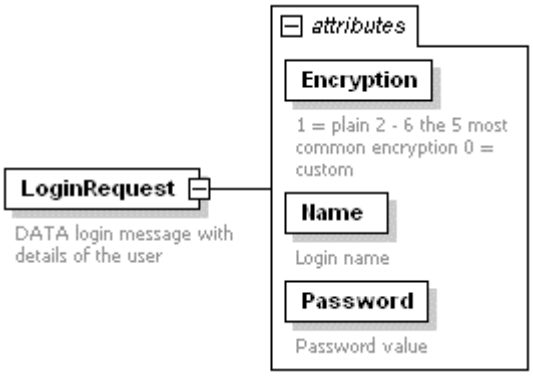
annotation
documentation
HEADER part of every message with version and uniqueness information

source

```
<xs:element name="Header">
 <xs:annotation>
  <xs:documentation>HEADER part of every message with version and uniqueness information</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="MsgRefId" use="required">
   <xs:annotation>
    <xs:documentation>Must be an Universally Unique Identifier for each message  (TU-T Rec. X.667 | ISO/IEC 9834-8.)
Reply messages refer to this id to identify the message they are replying to. In its canonical form, a UUID consists of 32
hexadecimal digits, displayed in 5 groups separated by hyphens, in the form 8-4-4-4-12 for a total of 36 characters, enclose
by brackets. For example:
{550e8400-e29b-41d4-a716-446655440000}</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="36"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Version" type="xs:string" use="required" fixed="0.2.3">
   <xs:annotation>
    <xs:documentation>Defines the version of the protocol used. Syntax is major.minor.patch patch releases fix only bugs,
minor releases may add functionality but are compatible, major releases are not compatible</xs:documentation>
   </xs:annotation>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **LoginRequest**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
Encryption	**derived by: xs:integer**	required			documentation 1 = plain 2 - 6 the 5 most common encryption 0 = custom
Name	**derived by: xs:string**	required			documentation Login name
Password	**derived by: xs:string**	required			documentation Password value

annotation documentation
DATA login message with details of the user

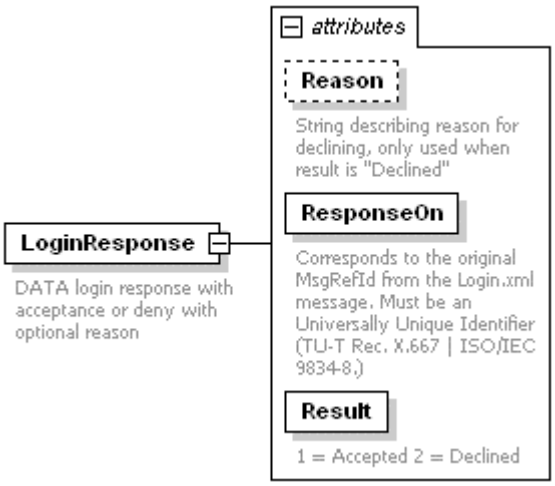
source

```
<xs:element name="LoginRequest">
 <xs:annotation>
  <xs:documentation>DATA login message with details of the user</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Encryption" use="required">
   <xs:annotation>
    <xs:documentation>1 = plain 2 - 6 the 5 most common encryption 0 = custom</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:enumeration value="1"/>
     <xs:enumeration value="2"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Name" use="required">
   <xs:annotation>
    <xs:documentation>Login name</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:maxLength value="256"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Password" use="required">
   <xs:annotation>
    <xs:documentation>Password value</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:maxLength value="256"/>
    </xs:restriction>
   </xs:simpleType>
```

```
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **LoginResponse**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
Reason	**derived by: xs:string**	optional			documentation String describing reason for declining, only used when result is "Declined"
ResponseOn	**derived by: xs:string**	required			documentation Corresponds to the original MsgRefId from the Login.xml message. Must be an Universally Unique Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.)
Result	**derived by: xs:integer**	required			documentation 1 = Accepted 2 = Declined

annotation documentation
DATA login response with acceptance or deny with optional reason

source

```
<xs:element name="LoginResponse">
 <xs:annotation>
  <xs:documentation>DATA login response with acceptance or deny with optional reason</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Reason" use="optional">
   <xs:annotation>
    <xs:documentation>String describing reason for declining, only used when result is "Declined"</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:maxLength value="256"/>
    </xs:restriction>
   </xs:simpleType>
```

```
    </xs:attribute>
    <xs:attribute name="ResponseOn" use="required">
      <xs:annotation>
        <xs:documentation>Corresponds to the original MsgRefId from the Login.xml message. Must be an Universally Unique
Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="36"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Result" use="required">
      <xs:annotation>
        <xs:documentation>1 = Accepted 2 = Declined</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

element **Logout**

diagram

namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

used by element **MSG_IVEF/Body**

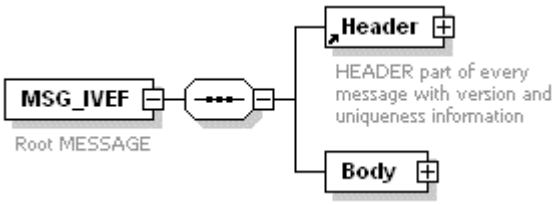
annotation documentation
DATA logout message, the server will drop the connection if logout is successfull

source

```
<xs:element name="Logout">
  <xs:annotation>
    <xs:documentation>DATA logout message, the server will drop the connection if logout is successfull</xs:documentation
  </xs:annotation>
</xs:element>
```

element **MSG_IVEF**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

children **Header Body**

annotation documentation
Root MESSAGE

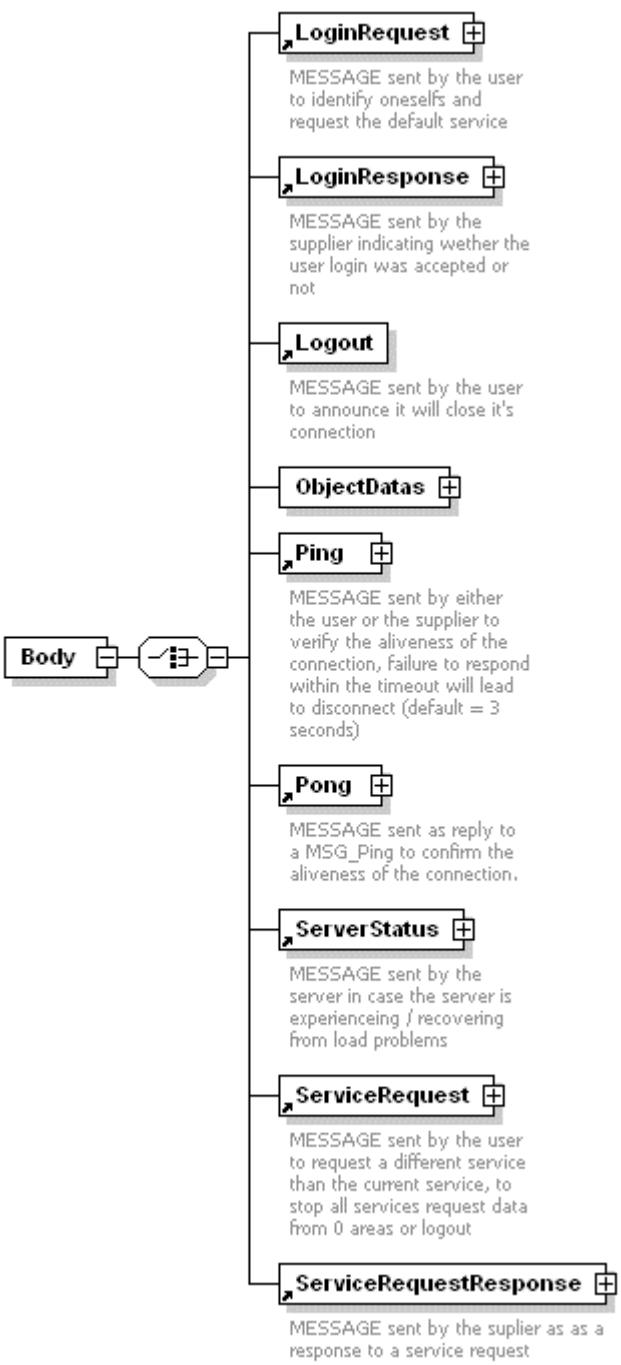
source

```
<xs:element name="MSG_IVEF">
  <xs:annotation>
    <xs:documentation>Root MESSAGE</xs:documentation>
  </xs:annotation>
  <xs:complexType>
```

```
    <xs:sequence>
      <xs:element ref="Header"/>
      <xs:element name="Body">
        <xs:complexType>
          <xs:choice>
            <xs:element ref="LoginRequest">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the user to identify oneselfs and request the default
service</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="LoginResponse">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the supplier indicating wether the user login was accepted or
not</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="Logout">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the user to announce it will close it's connection</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element name="ObjectDatas">
              <xs:complexType>
                <xs:sequence>
                  <xs:element ref="ObjectData" maxOccurs="unbounded">
                    <xs:annotation>
                      <xs:documentation>MESSAGE sent by the supplier containing data regarding objects in its
domain</xs:documentation>
                    </xs:annotation>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
            <xs:element ref="Ping">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by either the user or the supplier to verify the aliveness of the connection,
failure to respond within the timeout will lead to disconnect (default = 3 seconds)</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="Pong">
              <xs:annotation>
                <xs:documentation>MESSAGE sent as reply to a MSG_Ping to confirm the aliveness of the
connection.</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="ServerStatus">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the server in case the server is experienceing / recovering from load
problems</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="ServiceRequest">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the user to request a different service than the current service, to stop all
services request data from 0 areas or logout</xs:documentation>
              </xs:annotation>
            </xs:element>
            <xs:element ref="ServiceRequestResponse">
              <xs:annotation>
                <xs:documentation>MESSAGE sent by the suplier as as a response to a service request</xs:documentation>
              </xs:annotation>
            </xs:element>
          </xs:choice>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

element **MSG_IVEF/Body**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
isRef 0
content complex

children **LoginRequest** **LoginResponse** **Logout** **ObjectDatas** **Ping** **Pong** **ServerStatus** **ServiceRequest** **ServiceRequestResponse**

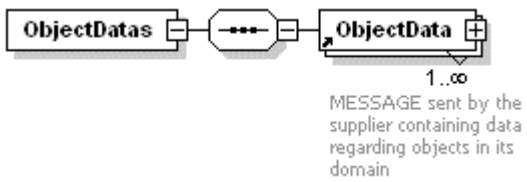
source

```
<xs:element name="Body">
  <xs:complexType>
    <xs:choice>
      <xs:element ref="LoginRequest">
        <xs:annotation>
          <xs:documentation>MESSAGE sent by the user to identify oneselfs and request the default
service</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element ref="LoginResponse">
        <xs:annotation>
          <xs:documentation>MESSAGE sent by the supplier indicating wether the user login was accepted or
```

```
not</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="Logout">
      <xs:annotation>
        <xs:documentation>MESSAGE sent by the user to announce it will close it's connection</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ObjectDatas">
      <xs:complexType>
        <xs:sequence>
          <xs:element ref="ObjectData" maxOccurs="unbounded">
            <xs:annotation>
              <xs:documentation>MESSAGE sent by the supplier containing data regarding objects in its
domain</xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element ref="Ping">
      <xs:annotation>
        <xs:documentation>MESSAGE sent by either the user or the supplier to verify the aliveness of the connection, failure
to respond within the timeout will lead to disconnect (default = 3 seconds)</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="Pong">
      <xs:annotation>
        <xs:documentation>MESSAGE sent as reply to a MSG_Ping to confirm the aliveness of the
connection.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="ServerStatus">
      <xs:annotation>
        <xs:documentation>MESSAGE sent by the server in case the server is experienceing / recovering from load
problems</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="ServiceRequest">
      <xs:annotation>
        <xs:documentation>MESSAGE sent by the user to request a different service than the current service, to stop all
services request data from 0 areas or logout</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="ServiceRequestResponse">
      <xs:annotation>
        <xs:documentation>MESSAGE sent by the suplier as as a response to a service request</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:choice>
 </xs:complexType>
</xs:element>
```

element **MSG_IVEF/Body/ObjectDatas**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
- isRef 0
- content complex

children **ObjectData**

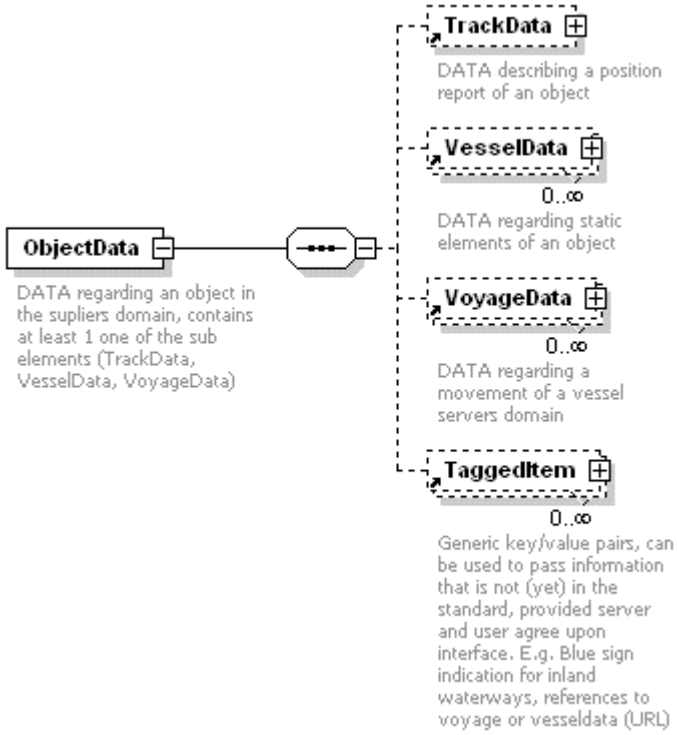
source

```
<xs:element name="ObjectDatas">
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="ObjectData" maxOccurs="unbounded">
    <xs:annotation>
```

```
        <xs:documentation>MESSAGE sent by the supplier containing data regarding objects in its
domain</xs:documentation>
       </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

element **ObjectData**

diagram



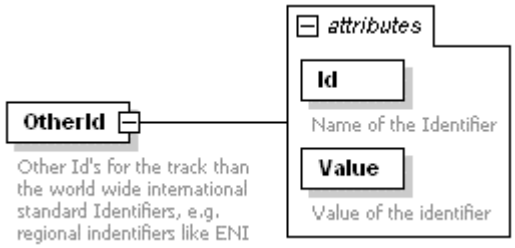
namespace	http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3
properties	content complex
children	**TrackData** **VesselData** **VoyageData** **TaggedItem**
used by	element **MSG_IVEF/Body/ObjectDatas**
annotation	documentation DATA regarding an object in the supliers domain, contains at least 1 one of the sub elements (TrackData, VesselData, VoyageData)

source

```
<xs:element name="ObjectData">
 <xs:annotation>
  <xs:documentation>DATA regarding an object in the supliers domain, contains at least 1 one of the sub elements
(TrackData, VesselData, VoyageData)</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="TrackData" minOccurs="0"/>
   <xs:element ref="VesselData" minOccurs="0" maxOccurs="unbounded"/>
   <xs:element ref="VoyageData" minOccurs="0" maxOccurs="unbounded"/>
   <xs:element ref="TaggedItem" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
```

element **OtherId**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
- content complex

used by
- element **VesselData/Identifier**

attributes

Name	Type	Use	Default	Fixed	Annotation
Id	**derived by: xs:string**	required			documentation: Name of the Identifier
Value	**derived by: xs:string**	required			documentation: Value of the identifier

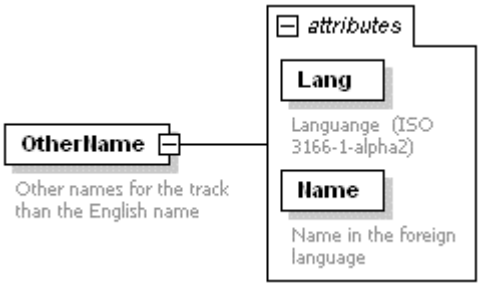
annotation
documentation
Other Id's for the track than the world wide international standard Identifiers, e.g. regional indentifiers like ENI

source

```
<xs:element name="OtherId">
 <xs:annotation>
  <xs:documentation>Other Id's for the track than the world wide international standard Identifiers, e.g. regional indentifiers like ENI</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Id" use="required">
   <xs:annotation>
    <xs:documentation>Name of the Identifier</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Value" use="required">
   <xs:annotation>
    <xs:documentation>Value of the identifier</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **OtherName**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element VesselData/Identifier

attributes

Name	Type	Use	Default	Fixed	Annotation
Lang	**derived by: xs:string**	required			documentation Languange (ISO 3166-1-alpha2)
Name	**derived by: xs:string**	required			documentation Name in the foreign language

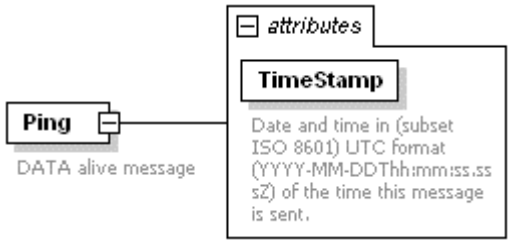
annotation documentation
Other names for the track than the English name

source

```
<xs:element name="OtherName">
 <xs:annotation>
  <xs:documentation>Other names for the track than the English name</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Lang" use="required">
   <xs:annotation>
    <xs:documentation>Languange  (ISO 3166-1-alpha2)</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="2"/>
     <xs:maxLength value="2"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Name" use="required">
   <xs:annotation>
    <xs:documentation>Name in the foreign language</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **Ping**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
TimeStamp	**xs:dateTime**	required			documentation: Date and time in (subset ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the time this message is sent.

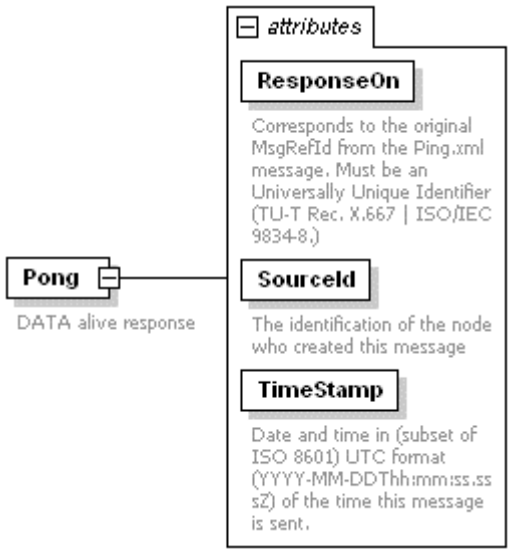
annotation documentation
DATA alive message

source

```
<xs:element name="Ping">
 <xs:annotation>
  <xs:documentation>DATA alive message</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="TimeStamp" type="xs:dateTime" use="required">
   <xs:annotation>
    <xs:documentation>Date and time in (subset ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the time this message is sent.</xs:documentation>
   </xs:annotation>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **Pong**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
- content complex

used by
- element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
ResponseOn	**derived by: xs:string**	required			documentation: Corresponds to the original MsgRefId from the Ping.xml message. Must be an Universally Unique Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.)
SourceId	**xs:integer**	required			documentation: The identification of the node who created this message
TimeStamp	**xs:dateTime**	required			documentation: Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the time this message is sent.

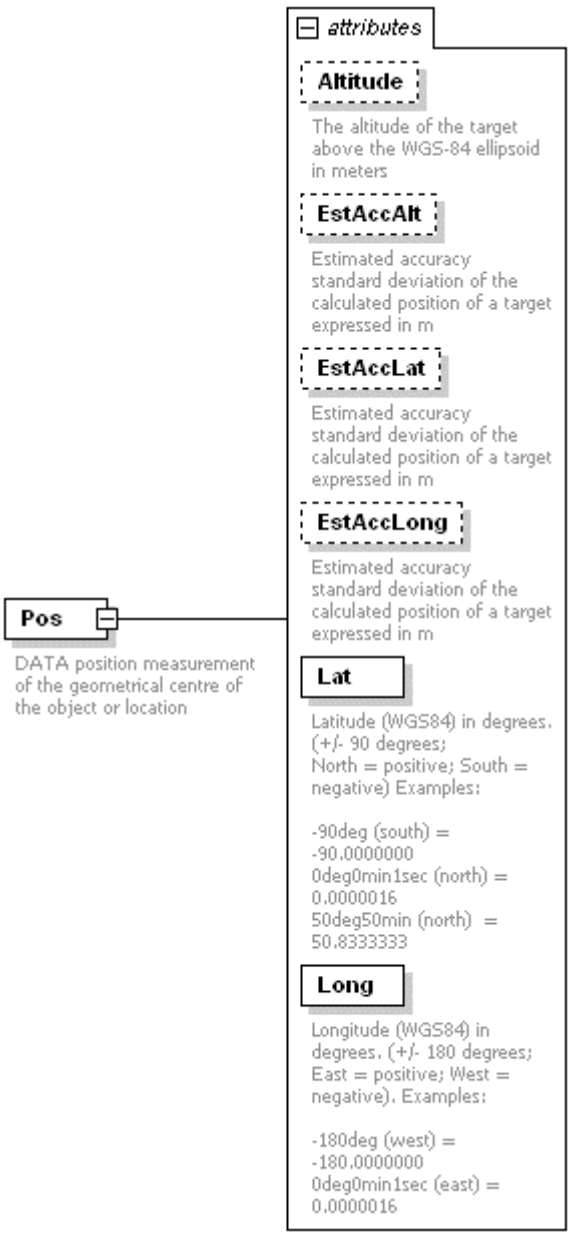
annotation
documentation
DATA alive response

source

```
<xs:element name="Pong">
 <xs:annotation>
  <xs:documentation>DATA alive response</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="ResponseOn" use="required">
   <xs:annotation>
    <xs:documentation>Corresponds to the original MsgRefId from the Ping.xml message. Must be an Universally Unique
Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.)</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="36"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="SourceId" type="xs:integer" use="required">
   <xs:annotation>
    <xs:documentation>The identification of the node who created this message</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="TimeStamp" type="xs:dateTime" use="required">
   <xs:annotation>
    <xs:documentation>Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the time thi
message is sent.</xs:documentation>
   </xs:annotation>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **Pos**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by elements **Area** **TrackData** **VoyageData/Waypoint**

attributes

Name	Type	Use	Default	Fixed	Annotation
Altitude	**xs:decimal**	optional			documentation The altitude of the target above the WGS-84 ellipsoid in meters
EstAccAlt	**xs:decimal**	optional			documentation Estimated accuracy standard deviation of the calculated position of a

EstAccLat	**xs:decimal**	optional	target expressed in m documentation Estimated accuracy standard deviation of the calculated position of a target expressed in m
EstAccLong	**xs:decimal**	optional	documentation Estimated accuracy standard deviation of the calculated position of a target expressed in m
Lat	**derived by: xs:decimal**	required	documentation Latitude (WGS84) in degrees. (+/- 90 degrees; North = positive; South = negative) Examples: -90deg (south) = -90.00000000 0deg0min1sec (north) = 0.0000016 50deg50min (north) = 50.8333333
Long	**derived by: xs:decimal**	required	documentation Longitude (WGS84) in degrees. (+/- 180 degrees; East = positive; West = negative). Examples: -180deg (west) = -180.00000000 0deg0min1sec (east) = 0.0000016

annotation
documentation
DATA position measurement of the geometrical centre of the object or location

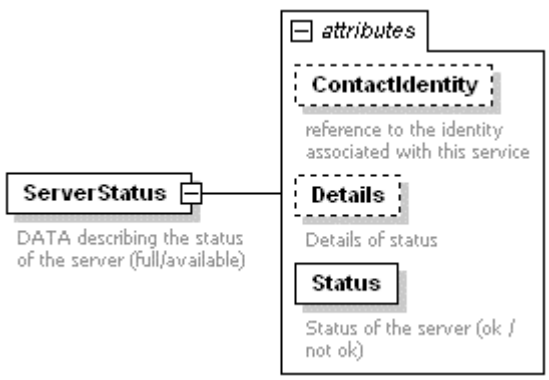
source

```
<xs:element name="Pos">
 <xs:annotation>
  <xs:documentation>DATA position measurement of the geometrical centre of the object or location</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Altitude" type="xs:decimal" use="optional">
   <xs:annotation>
    <xs:documentation>The altitude of the target above the WGS-84 ellipsoid in meters</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="EstAccAlt" type="xs:decimal" use="optional">
   <xs:annotation>
    <xs:documentation>Estimated accuracy
standard deviation of the calculated position of a target
expressed in m</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="EstAccLat" type="xs:decimal" use="optional">
```

```
      <xs:annotation>
        <xs:documentation>Estimated accuracy
standard deviation of the calculated position of a target
expressed in m</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="EstAccLong" type="xs:decimal" use="optional">
      <xs:annotation>
        <xs:documentation>Estimated accuracy
standard deviation of the calculated position of a target
expressed in m</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="Lat" use="required">
      <xs:annotation>
        <xs:documentation>Latitude (WGS84) in degrees. (+/- 90 degrees;
North = positive; South = negative) Examples:

-90deg (south) =   -90.0000000
0deg0min1sec (north) =    0.0000016
50deg50min (north)  = 50.8333333</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="5"/>
          <xs:minInclusive value="-90.00000"/>
          <xs:maxInclusive value="+90.00000"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Long" use="required">
      <xs:annotation>
        <xs:documentation>Longitude (WGS84) in degrees. (+/- 180 degrees; East = positive; West = negative). Examples:

-180deg (west) =   -180.0000000
0deg0min1sec (east) =       0.0000016</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="5"/>
          <xs:maxInclusive value="+180.00000"/>
          <xs:minExclusive value="-180.00000"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

element **ServerStatus**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
ContactIdentity	**derived by:**	optional			documentation

		xs:string		reference to the identity associated with this service documentation Details of status
	Details	**derived by: xs:string**	optional	
	Status	**xs:boolean**	required	documentation Status of the server (ok / not ok)

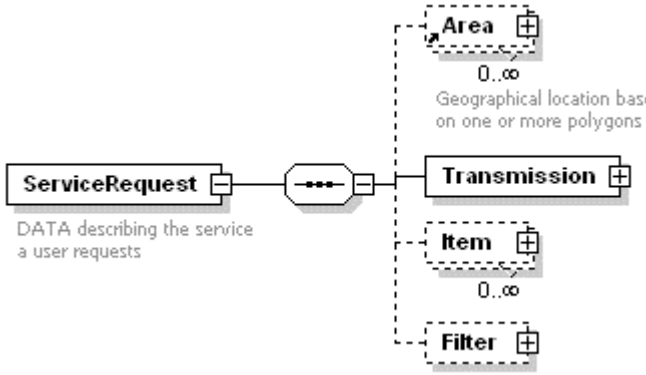
annotation
documentation
DATA describing the status of the server (full/available)

source

```
<xs:element name="ServerStatus">
 <xs:annotation>
  <xs:documentation>DATA describing the status of the server (full/available)</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="ContactIdentity" use="optional">
   <xs:annotation>
    <xs:documentation>reference to the identity associated with this service</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="254"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Details" use="optional">
   <xs:annotation>
    <xs:documentation>Details of status</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:maxLength value="50"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Status" type="xs:boolean" use="required">
   <xs:annotation>
    <xs:documentation>Status of the server (ok /  not ok)</xs:documentation>
   </xs:annotation>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **ServiceRequest**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

children **Area** **Transmission** **Item** **Filter**

used by element **MSG_IVEF/Body**

annotation documentation
DATA describing the service a user requests

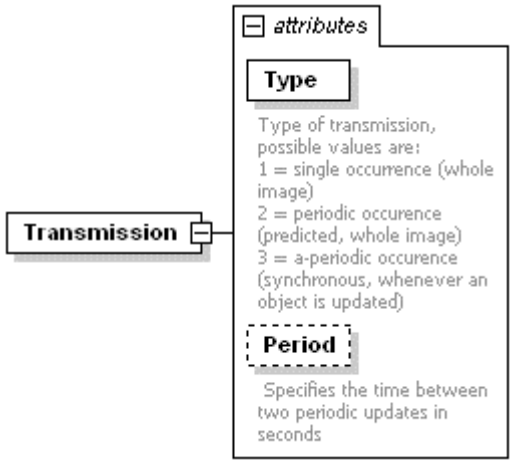
source

```
<xs:element name="ServiceRequest">
 <xs:annotation>
  <xs:documentation>DATA describing the service a user requests</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="Area" minOccurs="0" maxOccurs="unbounded"/>
   <xs:element name="Transmission">
    <xs:complexType>
     <xs:attribute name="Type" use="required">
      <xs:annotation>
       <xs:documentation>Type of transmission, possible values are:
1 = single occurrence (whole image)
2 = periodic occurence (predicted, whole image)
3 = a-periodic occurence (synchronous, whenever an object is updated)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:enumeration value="1"/>
        <xs:enumeration value="2"/>
        <xs:enumeration value="3"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="Period" type="xs:decimal" use="optional">
      <xs:annotation>
       <xs:documentation> Specifies the time between two periodic updates in seconds</xs:documentation>
      </xs:annotation>
     </xs:attribute>
    </xs:complexType>
   </xs:element>
   <xs:element name="Item" minOccurs="0" maxOccurs="unbounded">
    <xs:complexType>
     <xs:attribute name="DataSelector" use="required">
      <xs:annotation>
       <xs:documentation>Describes requested Object data element, possible values:
1 = TrackData
2 = VesselData
3 = VoyageData</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:enumeration value="1"/>
        <xs:enumeration value="2"/>
        <xs:enumeration value="3"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="FieldSelector" use="required">
      <xs:annotation>
       <xs:documentation>Selected field. Can be 'all' or one of the items of object data TrackData, VesselData  or
VoyageData, to be changed into an enumeration of strings once these have been fixed</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
        <xs:maxLength value="42"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
    </xs:complexType>
   </xs:element>
   <xs:element name="Filter" minOccurs="0">
    <xs:complexType>
     <xs:attribute name="Predicate" use="required">
      <xs:annotation>
       <xs:documentation>Filter expression in XPath 1.0 definition (http://www.w3.org/TR/1999/REC-xpath-19991116)
A Filter must start with //ObjectData (Filter always on entire objects) and can not go beyond a single objects parameters
(next/previous/last etc.)

Examples:

All objects: //ObjectData
```

```
All objects faster then 10 m/s: //ObjectData[TrackData[@SOG &gt; 10]]
All objects named "Krieken": //ObjectData[VesselData/Identifier[@Name = "Krieken"]]
All objects heading for Antwerp, HANSADOK 497 with a max keelheigth of 20m: //ObjectData[VoyageData[@DestCode =
BEANR0170100497]]  AND //ObjectData[VesselData/Construction[@MaxKeelHeigth &gt; 20]]
</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="1024"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
 </xs:sequence>
</xs:complexType>
</xs:element>
```

element **ServiceRequest/Transmission**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
isRef 0
content complex

attributes

Name	Type	Use	Default	Fixed	Annotation
Type	**derived by: xs:integer**	required			documentation Type of transmission, possible values are: 1 = single occurrence (whole image) 2 = periodic occurence (predicted, whole image) 3 = a-periodic occurence (synchronous, whenever an object is updated)
Period	**xs:decimal**	optional			documentation Specifies the time between two periodic updates in seconds

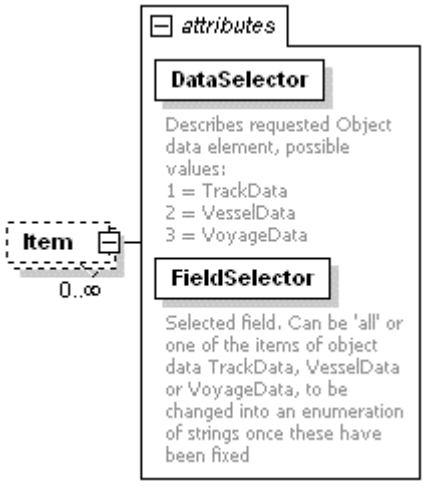
source

```
<xs:element name="Transmission">
 <xs:complexType>
  <xs:attribute name="Type" use="required">
   <xs:annotation>
```

```
      <xs:documentation>Type of transmission, possible values are:
1 = single occurrence (whole image)
2 = periodic occurence (predicted, whole image)
3 = a-periodic occurence (synchronous, whenever an object is updated)</xs:documentation>
     </xs:annotation>
     <xs:simpleType>
      <xs:restriction base="xs:integer">
       <xs:enumeration value="1"/>
       <xs:enumeration value="2"/>
       <xs:enumeration value="3"/>
      </xs:restriction>
     </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Period" type="xs:decimal" use="optional">
     <xs:annotation>
      <xs:documentation> Specifies the time between two periodic updates in seconds</xs:documentation>
     </xs:annotation>
    </xs:attribute>
   </xs:complexType>
</xs:element>
```

element **ServiceRequest/Item**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties

isRef	0
minOcc	0
maxOcc	unbounded
content	complex

attributes

Name	Type	Use	Default	Fixed	Annotation
DataSelector	**derived by: xs:integer**	required			documentation Describes requested Object data element, possible values: 1 = TrackData 2 = VesselData 3 = VoyageData
FieldSelector	**derived by: xs:string**	required			documentation Selected field. Can be 'all' or one of the items of object data TrackData, VesselData or VoyageData, to be changed into an

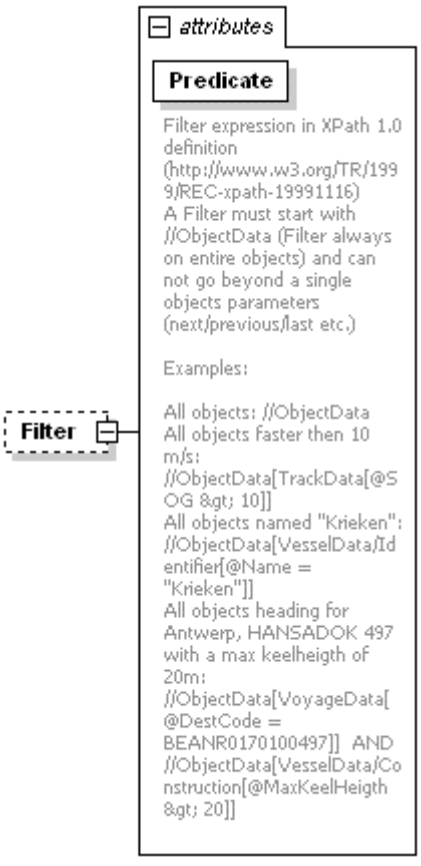
enumeration of strings once these have been fixed

source

```
<xs:element name="Item" minOccurs="0" maxOccurs="unbounded">
 <xs:complexType>
  <xs:attribute name="DataSelector" use="required">
   <xs:annotation>
    <xs:documentation>Describes requested Object data element, possible values:
1 = TrackData
2 = VesselData
3 = VoyageData</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:enumeration value="1"/>
     <xs:enumeration value="2"/>
     <xs:enumeration value="3"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="FieldSelector" use="required">
   <xs:annotation>
    <xs:documentation>Selected field. Can be 'all' or one of the items of object data TrackData, VesselData  or
VoyageData, to be changed into an enumeration of strings once these have been fixed</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **ServiceRequest/Filter**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
- isRef 0
- minOcc 0
- maxOcc 1
- content complex

attributes

Name	Type	Use	Default	Fixed	Annotation
Predicate	**derived by: xs:string**	required			documentation: Filter expression in XPath 1.0 definition (http://www.w3.org/TR/1999/REC-xpath-19991116) A Filter must start with //ObjectData (Filter always on entire objects) and can not go beyond a single objects parameters (next/previous/last etc.) Examples: All objects: //ObjectData All objects faster then 10 m/s: //ObjectData[TrackData[@SOG > 10]] All objects named "Krieken": //ObjectData[VesselData/Identifier[@Name = "Krieken"]] All objects heading for Antwerp, HANSADOK 497 with a max keelheigth of 20m: //ObjectData[VoyageData[@DestCode = BEANR0170100497]] AND //ObjectData[VesselData/Construction[@MaxKeelHeigth > 20]]

source

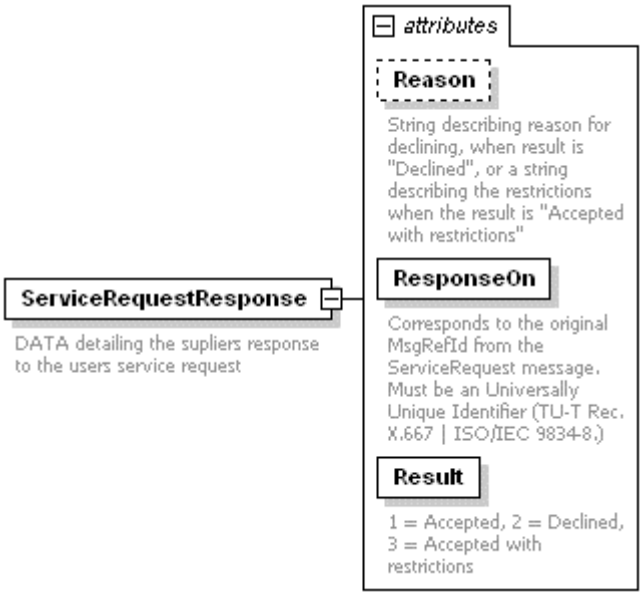
```
<xs:element name="Filter" minOccurs="0">
  <xs:complexType>
    <xs:attribute name="Predicate" use="required">
      <xs:annotation>
        <xs:documentation>Filter expression in XPath 1.0 definition (http://www.w3.org/TR/1999/REC-xpath-19991116)
A Filter must start with //ObjectData (Filter always on entire objects) and can not go beyond a single objects parameters
(next/previous/last etc.)

Examples:

All objects: //ObjectData
```

All objects faster then 10 m/s: //ObjectData[TrackData[@SOG > 10]]
All objects named "Krieken": //ObjectData[VesselData/Identifier[@Name = "Krieken"]]
All objects heading for Antwerp, HANSADOK 497 with a max keelheigth of 20m: //ObjectData[VoyageData[@DestCode = BEANR0170100497]] AND //ObjectData[VesselData/Construction[@MaxKeelHeigth > 20]]

```
</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
        <xs:maxLength value="1024"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **ServiceRequestResponse**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

used by element **MSG_IVEF/Body**

attributes

Name	Type	Use	Default	Fixed	Annotation
Reason	**derived by: xs:string**	optional			documentation String describing reason for declining, when result is "Declined", or a string describing the restrictions when the result is "Accepted with restrictions"
ResponseOn	**derived by: xs:string**	required			documentation Corresponds to the original MsgRefId from the ServiceRequest message. Must be an Universally Unique

	Result	**derived by: xs:integer**	required	Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.) documentation 1 = Accepted, 2 = Declined, 3 = Accepted with restrictions

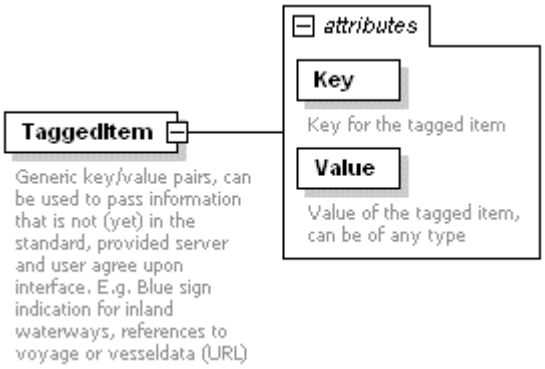
annotation
documentation
DATA detailing the supliers response to the users service request

source

```
<xs:element name="ServiceRequestResponse">
 <xs:annotation>
  <xs:documentation>DATA detailing the supliers response to the users service request</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Reason" use="optional">
   <xs:annotation>
    <xs:documentation>String describing reason for declining, when result is "Declined", or a string describing the restrictions when the result is "Accepted with restrictions"</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:maxLength value="256"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="ResponseOn" use="required">
   <xs:annotation>
    <xs:documentation>Corresponds to the original MsgRefId from the ServiceRequest message. Must be an Universally Unique Identifier (TU-T Rec. X.667 | ISO/IEC 9834-8.)</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="36"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Result" use="required">
   <xs:annotation>
    <xs:documentation>1 = Accepted, 2 = Declined, 3 = Accepted with restrictions</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:enumeration value="1"/>
     <xs:enumeration value="2"/>
     <xs:enumeration value="3"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **TaggedItem**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
- content complex

used by
- element **ObjectData**

attributes

Name	Type	Use	Default	Fixed	Annotation
Key	**derived by: xs:string**	required			documentation: Key for the tagged item
Value		required			documentation: Value of the tagged item, can be of any type

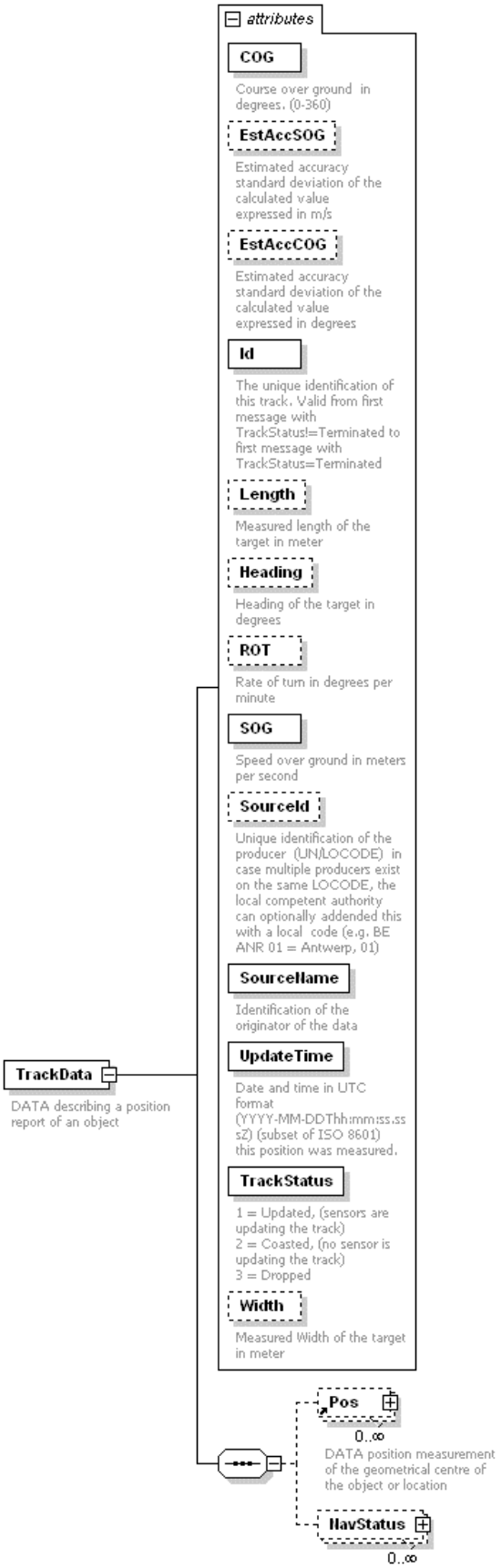
annotation
documentation
Generic key/value pairs, can be used to pass information that is not (yet) in the standard, provided server and user agree upon interface. E.g. Blue sign indication for inland waterways, references to voyage or vesseldata (URL)

source

```
<xs:element name="TaggedItem">
 <xs:annotation>
  <xs:documentation>Generic key/value pairs, can be used to pass information that is not (yet) in the standard, provided server and user agree upon interface. E.g. Blue sign indication for inland waterways, references to voyage or vesseldata (URL)</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="Key" use="required">
   <xs:annotation>
    <xs:documentation>Key for the tagged item</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Value" use="required">
   <xs:annotation>
    <xs:documentation>Value of the tagged item, can be of any type</xs:documentation>
   </xs:annotation>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **TrackData**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

children **Pos** **NavStatus**

used by element **ObjectData**

attributes

Name	Type	Use	Default	Fixed	Annotation
COG	**derived by: xs:decimal**	required			documentation Course over ground in degrees. (0-360)
EstAccSOG	**xs:decimal**	optional			documentation Estimated accuracy standard deviation of the calculated value expressed in m/s
EstAccCOG	**xs:decimal**	optional			documentation Estimated accuracy standard deviation of the calculated value expressed in degrees
Id	**xs:integer**	required			documentation The unique identification of this track. Valid from first message with TrackStatus!= Terminated to first message with TrackStatus=Terminated
Length	**derived by: xs:decimal**	optional			documentation Measured length of the target in meter
Heading	**derived by: xs:decimal**	optional			documentation Heading of the target in degrees
ROT	**derived by: xs:decimal**	optional			documentation Rate of turn in degrees per minute
SOG	**derived by: xs:decimal**	required			documentation Speed over ground in meters per second
SourceId	**derived by: xs:string**	optional			documentation Unique identification of the producer (UN/LOCODE) in case multiple producers exist on the same LOCODE, the local competent authority can optionally addended this

			with a local code (e.g. BE ANR 01 = Antwerp, 01)
SourceName	**derived by: xs:string**	required	documentation Identification of the originator of the data
UpdateTime	**xs:dateTime**	required	documentation Date and time in UTC format (YYYY-MM-DDThh:mm:ss.sssZ) (subset of ISO 8601) this position was measured.
TrackStatus	**derived by: xs:integer**	required	documentation 1 = Updated, (sensors are updating the track) 2 = Coasted, (no sensor is updating the track) 3 = Dropped
Width	**derived by: xs:decimal**	optional	documentation Measured Width of the target in meter

annotation
documentation
DATA describing a position report of an object

source

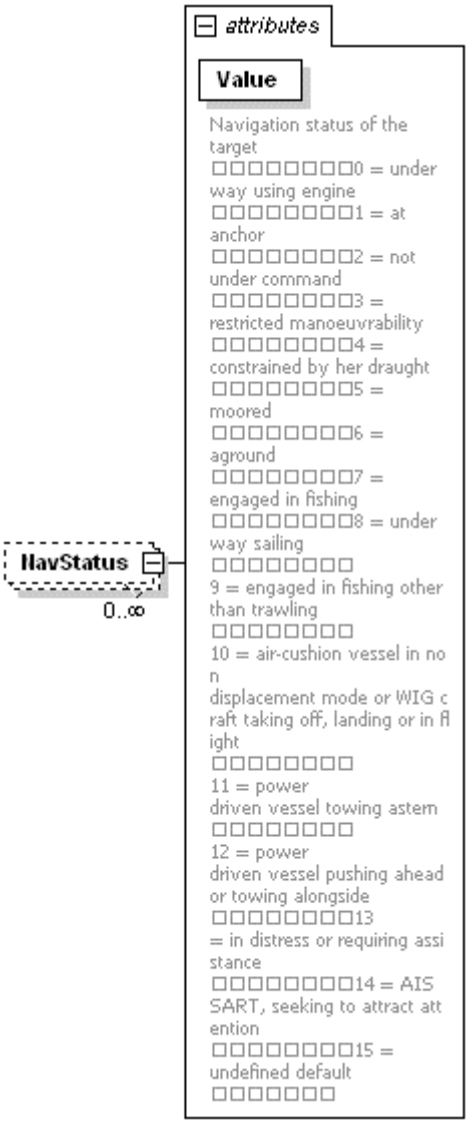
```
<xs:element name="TrackData">
 <xs:annotation>
  <xs:documentation>DATA describing a position report of an object</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="Pos" minOccurs="0" maxOccurs="unbounded"/>
   <xs:element name="NavStatus" minOccurs="0" maxOccurs="unbounded">
    <xs:complexType>
     <xs:attribute name="Value" use="required">
      <xs:annotation>
       <xs:documentation>Navigation status of the target
                                                    0 = under way using engine
                                                    1 = at anchor
                                                    2 = not under command
                                                    3 = restricted manoeuvrability
                                                    4 = constrained by her draught
                                                    5 = moored
                                                    6 = aground
                                                    7 = engaged in fishing
                                                    8 = under way sailing
                                                    9 = engaged in fishing other than trawling
                                                    10 = air-cushion vessel in non
displacement mode or WIG craft taking off, landing or in flight
                                                    11 = power driven vessel towing astern
                                                    12 = power
driven vessel pushing ahead or towing alongside
                                                    13 = in distress or requiring assistance
                                                    14 = AIS SART, seeking to attract attentio
                                                    15 = undefined default
                                                </xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="15"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
    </xs:complexType>
   </xs:element>
  </xs:sequence>
```

```
    <xs:attribute name="COG" use="required">
      <xs:annotation>
        <xs:documentation>Course over ground  in degrees. (0-360) </xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="360"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="EstAccSOG" type="xs:decimal" use="optional">
      <xs:annotation>
        <xs:documentation>Estimated accuracy
standard deviation of the calculated value
expressed in m/s</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="EstAccCOG" type="xs:decimal" use="optional">
      <xs:annotation>
        <xs:documentation>Estimated accuracy
standard deviation of the calculated value
expressed in degrees</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="Id" type="xs:integer" use="required">
      <xs:annotation>
        <xs:documentation>The unique identification of this track. Valid from first message with TrackStatus!=Terminated to
first message with TrackStatus=Terminated</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="Length" use="optional">
      <xs:annotation>
        <xs:documentation>Measured length of the target in meter</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Heading" use="optional">
      <xs:annotation>
        <xs:documentation>Heading of the target in degrees</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minInclusive value="0.0"/>
          <xs:maxInclusive value="360.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="ROT" use="optional">
      <xs:annotation>
        <xs:documentation>Rate of turn in degrees per minute</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minExclusive value="-720"/>
          <xs:maxInclusive value="720"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SOG" use="required">
      <xs:annotation>
        <xs:documentation>Speed over ground in meters per second</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
```

```
    </xs:attribute>
    <xs:attribute name="SourceId" use="optional">
      <xs:annotation>
        <xs:documentation>Unique identification of the producer  (UN/LOCODE)  in case multiple producers exist on the same
LOCODE, the local competent authority can optionally addended this with a local  code (e.g. BE ANR 01 = Antwerp,
01)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceName" use="required">
      <xs:annotation>
        <xs:documentation>Identification of the originator of the data</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="UpdateTime" type="xs:dateTime" use="required">
      <xs:annotation>
        <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mm:ss.sssZ) (subset of ISO 8601)  this position
was measured.</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="TrackStatus" use="required">
      <xs:annotation>
        <xs:documentation>1 = Updated, (sensors are updating the track)
2 = Coasted, (no sensor is updating the track)
3 = Dropped</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
          <xs:enumeration value="3"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Width" use="optional">
      <xs:annotation>
        <xs:documentation>Measured Width of the target in meter</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

element **TrackData/NavStatus**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties

isRef	0
minOcc	0
maxOcc	unbounded
content	complex

attributes

Name	Type	Use	Default	Fixed	Annotation
Value	**derived by: xs:integer**	required			documentation Navigation status of the target

0 = under way using engine

1 =

at anchor

2 = not under command

3 = restricted manoeuvrability

4 = constrained by her draught

5 = moored

6 = aground

7 = engaged in fishing

8 = under way sailing

9 = engaged in fishing other than trawling

10 = air-cushion vessel in non displacement mode or WIG craft taking off, landing or in flight

11 = power driven vessel towing astern

12 = power driven vessel pushing ahead or towing alongside

13 = in distress or requiring assistance

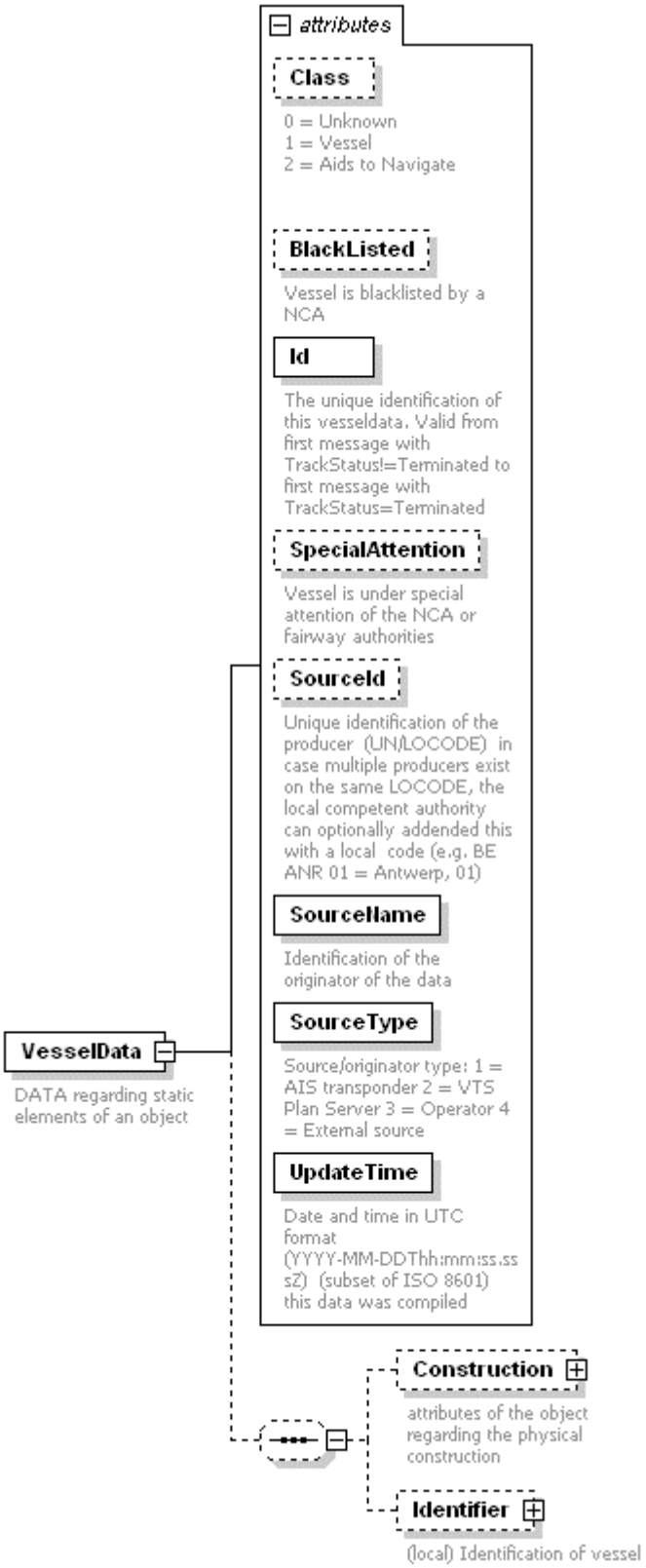
14 = AIS SART, seeking to attract attention

15 =
undefined
default

source
```
<xs:element name="NavStatus" minOccurs="0" maxOccurs="unbounded">
 <xs:complexType>
  <xs:attribute name="Value" use="required">
   <xs:annotation>
    <xs:documentation>Navigation status of the target
                                                    0 = under way using engine
                                                    1 = at anchor
                                                    2 = not under command
                                                    3 = restricted manoeuvrability
                                                    4 = constrained by her draught
                                                    5 = moored
                                                    6 = aground
                                                    7 = engaged in fishing
                                                    8 = under way sailing
                                                    9 = engaged in fishing other than trawling
                                                    10 = air-cushion vessel in non
displacement mode or WIG craft taking off, landing or in flight
                                                    11 = power driven vessel towing astern
                                                    12 = power
driven vessel pushing ahead or towing alongside
                                                    13 = in distress or requiring assistance
                                                    14 = AIS SART, seeking to attract attentio
                                                    15 = undefined default
                                                </xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:minInclusive value="0"/>
     <xs:maxInclusive value="15"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **VesselData**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

children **Construction** **Identifier**

used by element **ObjectData**

attributes

Name	Type	Use	Default	Fixed	Annotation
Class	**derived by: xs:integer**	optional			documentation 0 = Unknown 1 = Vessel 2 = Aids to Navigate
BlackListed	**xs:boolean**	optional			documentation Vessel is blacklisted by a NCA
Id	**xs:integer**	required			documentation The unique identification of this vesseldata. Valid from first message with TrackStatus!= Terminated to first message with TrackStatus=Terminated
SpecialAttention	**derived by: xs:string**	optional			documentation Vessel is under special attention of the NCA or fairway authorities
SourceId	**derived by: xs:string**	optional			documentation Unique identification of the producer (UN/LOCODE) in case multiple producers exist on the same LOCODE, the local competent authority can optionally addended this with a local code (e.g. BE ANR 01 = Antwerp, 01)
SourceName	**derived by: xs:string**	required			documentation Identification of the originator of the data
SourceType	**derived by: xs:integer**	required			documentation Source/originator type: 1 = AIS transponder 2 = VTS Plan Server 3 = Operator 4 = External source
UpdateTime	**xs:dateTime**	required			documentation Date and time in UTC format (YYYY-MM-DDThh:mm:ss.sssZ) (subset of ISO 8601)

this data was compiled

annotation documentation
DATA regarding static elements of an object

source

```
<xs:element name="VesselData">
 <xs:annotation>
  <xs:documentation>DATA regarding static elements of an object</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence minOccurs="0">
   <xs:element name="Construction" minOccurs="0">
    <xs:annotation>
     <xs:documentation>attributes of the object regarding the physical construction</xs:documentation>
    </xs:annotation>
    <xs:complexType>
     <xs:sequence minOccurs="0">
      <xs:element name="UnType" minOccurs="0">
       <xs:annotation>
        <xs:documentation>Object type according to CODES FOR TYPES OF MEANS OF TRANSPORT Revision 2
(UNECE CEFACT Trade Facilitation Recommendation No. 28 edition 2007) Check latest version</xs:documentation>
       </xs:annotation>
       <xs:complexType>
        <xs:attribute name="CodeA" use="required">
         <xs:simpleType>
          <xs:restriction base="xs:integer">
           <xs:minInclusive value="0"/>
           <xs:maxInclusive value="138"/>
          </xs:restriction>
         </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="CodeB" use="required">
         <xs:simpleType>
          <xs:restriction base="xs:integer">
           <xs:minInclusive value="0"/>
           <xs:maxInclusive value="9"/>
          </xs:restriction>
         </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="Mode" use="required">
         <xs:simpleType>
          <xs:restriction base="xs:integer">
           <xs:enumeration value="1"/>
           <xs:enumeration value="2"/>
           <xs:enumeration value="3"/>
           <xs:enumeration value="6"/>
           <xs:enumeration value="7"/>
           <xs:enumeration value="8"/>
          </xs:restriction>
         </xs:simpleType>
        </xs:attribute>
       </xs:complexType>
      </xs:element>
     </xs:sequence>
     <xs:attribute name="HullColor" use="optional">
      <xs:annotation>
       <xs:documentation>Color of Hull (in RGB hex) for SAR operations</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:string">
        <xs:minLength value="6"/>
        <xs:maxLength value="6"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="HullType" use="optional">
      <xs:annotation>
       <xs:documentation>Type of hull (1 = single,  2 = double, 3 =  triple)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:enumeration value="1"/>
        <xs:enumeration value="2"/>
        <xs:enumeration value="3"/>
       </xs:restriction>
      </xs:simpleType>
```

```
        </xs:attribute>
        <xs:attribute name="DeadWeight" use="optional">
          <xs:annotation>
            <xs:documentation>Dead weight in tons</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="GrossWeight" use="optional">
          <xs:annotation>
            <xs:documentation>Gross weight in tons</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="Length" use="optional">
          <xs:annotation>
            <xs:documentation>The overall length of the target in meter as confirmed by NCA</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="LloydsShipType" type="xs:integer" use="optional">
          <xs:annotation>
            <xs:documentation>Number indicating type of vessel </xs:documentation>
          </xs:annotation>
        </xs:attribute>
        <xs:attribute name="YearOfBuild" use="optional">
          <xs:annotation>
            <xs:documentation>The year the vessel was build in 4 digits e.g. 2010</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:integer">
              <xs:totalDigits value="4"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="MaxAirDraught" use="optional">
          <xs:annotation>
            <xs:documentation>Maximum air draught of the object in meters, to be used if voyage data is not
available</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:fractionDigits value="1"/>
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="MaxDraught" use="optional">
          <xs:annotation>
            <xs:documentation>Maximum draught of the object in meters, to be used if voyage data is not
available</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:fractionDigits value="1"/>
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="MaxPersonsOnBoard" use="optional">
          <xs:annotation>
            <xs:documentation>The maximum number of persons on board of the object (crew, support, passengers,
pilots)</xs:documentation>
          </xs:annotation>
```

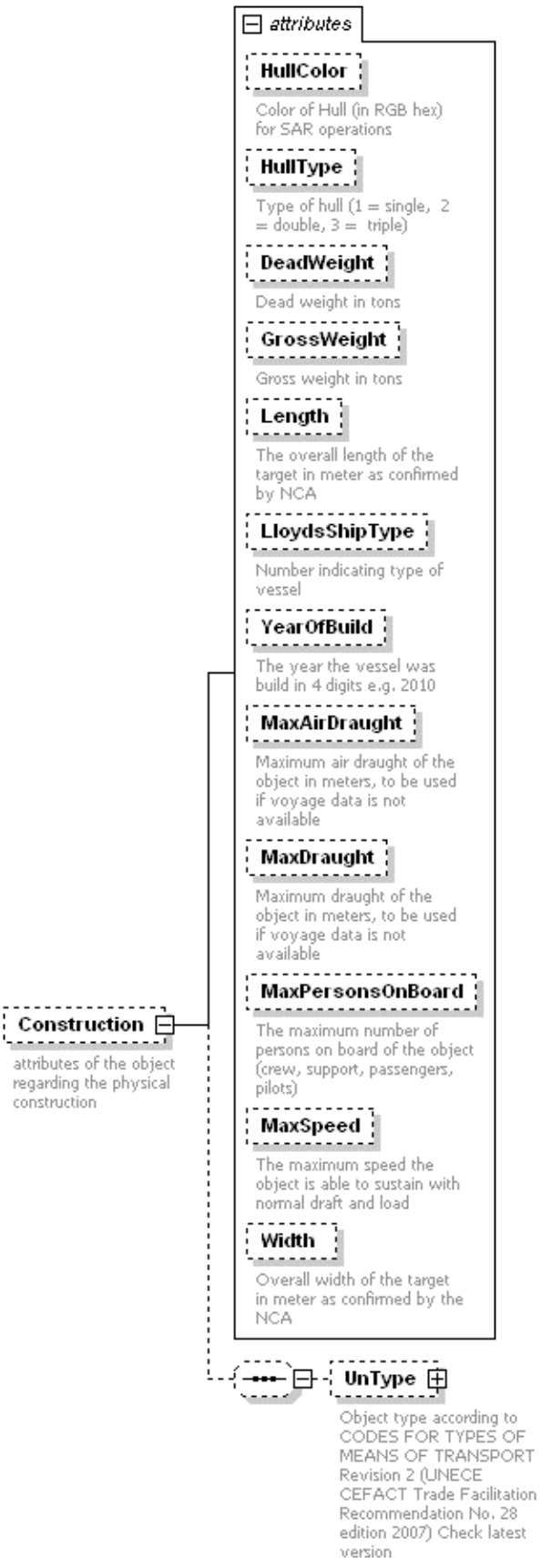
```
          <xs:simpleType>
            <xs:restriction base="xs:integer">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="MaxSpeed" use="optional">
          <xs:annotation>
            <xs:documentation>The maximum speed the object is able to sustain with normal draft and
load</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="Width" use="optional">
          <xs:annotation>
            <xs:documentation>Overall width of the target in meter as confirmed by the NCA</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:decimal">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
      </xs:complexType>
    </xs:element>
    <xs:element name="Identifier" minOccurs="0">
      <xs:annotation>
        <xs:documentation>(local) Identification of vessel</xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:sequence>
          <xs:element ref="OtherId" minOccurs="0" maxOccurs="unbounded"/>
          <xs:element ref="OtherName" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:attribute name="Callsign" use="optional">
          <xs:annotation>
            <xs:documentation>Callsign of the target, in accordance with Article 19, Section III of the ITU Radio Regulations
(RR)</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:minLength value="0"/>
              <xs:maxLength value="9"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="IMO" type="xs:integer" use="optional">
          <xs:annotation>
            <xs:documentation>IMO number of the target</xs:documentation>
          </xs:annotation>
        </xs:attribute>
        <xs:attribute name="Name" use="optional">
          <xs:annotation>
            <xs:documentation>Name of the target</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:minLength value="1"/>
              <xs:maxLength value="42"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:attribute>
        <xs:attribute name="FormerName" use="optional">
          <xs:annotation>
            <xs:documentation>Previous name of the target</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:minLength value="1"/>
              <xs:maxLength value="42"/>
            </xs:restriction>
```

```
        </xs:simpleType>
      </xs:attribute>
      <xs:attribute name="Flag" use="optional">
        <xs:annotation>
          <xs:documentation>The country flag (ISO 3166-1-alpha2)</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="2"/>
            <xs:maxLength value="2"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
      <xs:attribute name="Owner" use="optional">
        <xs:annotation>
          <xs:documentation>Name of owner the target</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="42"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
      <xs:attribute name="MMSI" type="xs:integer" use="optional">
        <xs:annotation>
          <xs:documentation>MMSI number of the target</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="LRIT" use="optional">
        <xs:annotation>
          <xs:documentation>LRIT identification</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="42"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
 </xs:sequence>
 <xs:attribute name="Class" use="optional">
  <xs:annotation>
   <xs:documentation>0 = Unknown
1 = Vessel
2 = Aids to Navigate

</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
   <xs:restriction base="xs:integer">
    <xs:enumeration value="0"/>
    <xs:enumeration value="1"/>
    <xs:enumeration value="2"/>
   </xs:restriction>
  </xs:simpleType>
 </xs:attribute>
 <xs:attribute name="BlackListed" type="xs:boolean" use="optional">
  <xs:annotation>
   <xs:documentation>Vessel is blacklisted by a NCA</xs:documentation>
  </xs:annotation>
 </xs:attribute>
 <xs:attribute name="Id" type="xs:integer" use="required">
  <xs:annotation>
   <xs:documentation>The unique identification of this vesseldata. Valid from first message with TrackStatus!=Terminate
to first message with TrackStatus=Terminated</xs:documentation>
  </xs:annotation>
 </xs:attribute>
 <xs:attribute name="SpecialAttention" use="optional">
  <xs:annotation>
   <xs:documentation>Vessel is under special attention of the NCA or fairway authorities</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
```

```
        <xs:restriction base="xs:string">
          <xs:maxLength value="20"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceId" use="optional">
      <xs:annotation>
        <xs:documentation>Unique identification of the producer (UN/LOCODE) in case multiple producers exist on the same
LOCODE, the local competent authority can optionally addended this with a local code (e.g. BE ANR 01 = Antwerp,
01)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceName" use="required">
      <xs:annotation>
        <xs:documentation>Identification of the originator of the data</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceType" use="required">
      <xs:annotation>
        <xs:documentation>Source/originator type: 1 = AIS transponder 2 = VTS Plan Server 3 = Operator 4 = External
source</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
          <xs:enumeration value="3"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="UpdateTime" type="xs:dateTime" use="required">
      <xs:annotation>
        <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mm:ss.sssZ) (subset of ISO 8601) this data was
compiled</xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

element **VesselData/Construction**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties
isRef 0
minOcc 0

maxOcc 1
content complex

children **UnType**

attributes

Name	Type	Use	Default	Fixed	Annotation
HullColor	**derived by: xs:string**	optional			documentation Color of Hull (in RGB hex) for SAR operations
HullType	**derived by: xs:integer**	optional			documentation Type of hull (1 = single, 2 = double, 3 = triple)
DeadWeight	**derived by: xs:decimal**	optional			documentation Dead weight in tons
GrossWeight	**derived by: xs:decimal**	optional			documentation Gross weight in tons
Length	**derived by: xs:decimal**	optional			documentation The overall length of the target in meter as confirmed by NCA
LloydsShipType	**xs:integer**	optional			documentation Number indicating type of vessel
YearOfBuild	**derived by: xs:integer**	optional			documentation The year the vessel was build in 4 digits e.g. 2010
MaxAirDraught	**derived by: xs:decimal**	optional			documentation Maximum air draught of the object in meters, to be used if voyage data is not available
MaxDraught	**derived by: xs:decimal**	optional			documentation Maximum draught of the object in meters, to be used if voyage data is not available
MaxPersonsOnBoard	**derived by: xs:integer**	optional			documentation The maximum number of persons on board of the object (crew, support, passengers, pilots)
MaxSpeed	**derived by: xs:decimal**	optional			documentation The maximum speed the object is able to sustain with normal draft and load
Width	**derived by: xs:decimal**	optional			documentation Overall width of the target in meter as confirmed by the NCA

annotation documentation
attributes of the object regarding the physical construction

source

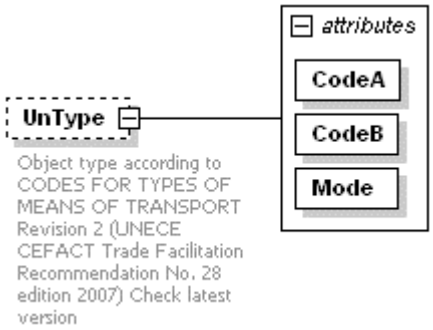
```
<xs:element name="Construction" minOccurs="0">
 <xs:annotation>
  <xs:documentation>attributes of the object regarding the physical construction</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence minOccurs="0">
   <xs:element name="UnType" minOccurs="0">
    <xs:annotation>
     <xs:documentation>Object type according to CODES FOR TYPES OF MEANS OF TRANSPORT Revision 2 (UNECE
CEFACT Trade Facilitation Recommendation No. 28 edition 2007) Check latest version</xs:documentation>
    </xs:annotation>
    <xs:complexType>
     <xs:attribute name="CodeA" use="required">
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="138"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="CodeB" use="required">
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="9"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="Mode" use="required">
      <xs:simpleType>
       <xs:restriction base="xs:integer">
        <xs:enumeration value="1"/>
        <xs:enumeration value="2"/>
        <xs:enumeration value="3"/>
        <xs:enumeration value="6"/>
        <xs:enumeration value="7"/>
        <xs:enumeration value="8"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
    </xs:complexType>
   </xs:element>
  </xs:sequence>
  <xs:attribute name="HullColor" use="optional">
   <xs:annotation>
    <xs:documentation>Color of Hull (in RGB hex) for SAR operations</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="6"/>
     <xs:maxLength value="6"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="HullType" use="optional">
   <xs:annotation>
    <xs:documentation>Type of hull (1 = single,  2 = double, 3 =  triple)</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:enumeration value="1"/>
     <xs:enumeration value="2"/>
     <xs:enumeration value="3"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="DeadWeight" use="optional">
   <xs:annotation>
    <xs:documentation>Dead weight in tons</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:decimal">
     <xs:minExclusive value="0"/>
    </xs:restriction>
   </xs:simpleType>
```

```
    </xs:attribute>
    <xs:attribute name="GrossWeight" use="optional">
      <xs:annotation>
        <xs:documentation>Gross weight in tons</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Length" use="optional">
      <xs:annotation>
        <xs:documentation>The overall length of the target in meter as confirmed by NCA</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="LloydsShipType" type="xs:integer" use="optional">
      <xs:annotation>
        <xs:documentation>Number indicating type of vessel </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="YearOfBuild" use="optional">
      <xs:annotation>
        <xs:documentation>The year the vessel was build in 4 digits e.g. 2010</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:totalDigits value="4"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="MaxAirDraught" use="optional">
      <xs:annotation>
        <xs:documentation>Maximum air draught of the object in meters, to be used if voyage data is not
available</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="MaxDraught" use="optional">
      <xs:annotation>
        <xs:documentation>Maximum draught of the object in meters, to be used if voyage data is not
available</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="MaxPersonsOnBoard" use="optional">
      <xs:annotation>
        <xs:documentation>The maximum number of persons on board of the object (crew, support, passengers,
pilots)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="MaxSpeed" use="optional">
      <xs:annotation>
        <xs:documentation>The maximum speed the object is able to sustain with normal draft and load</xs:documentation>
      </xs:annotation>
```

```
    <xs:simpleType>
      <xs:restriction base="xs:decimal">
        <xs:minExclusive value="0"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Width" use="optional">
    <xs:annotation>
      <xs:documentation>Overall width of the target in meter as confirmed by the NCA</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:decimal">
        <xs:minExclusive value="0"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
 </xs:complexType>
</xs:element>
```

element **VesselData/Construction/UnType**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties

isRef	0
minOcc	0
maxOcc	1
content	complex

attributes

Name	Type	Use	Default	Fixed	Annotation
CodeA	**derived by: xs:integer**	required			
CodeB	**derived by: xs:integer**	required			
Mode	**derived by: xs:integer**	required			

annotation

documentation

Object type according to CODES FOR TYPES OF MEANS OF TRANSPORT Revision 2 (UNECE CEFACT Trade Facilitation Recommendation No. 28 edition 2007) Check latest version

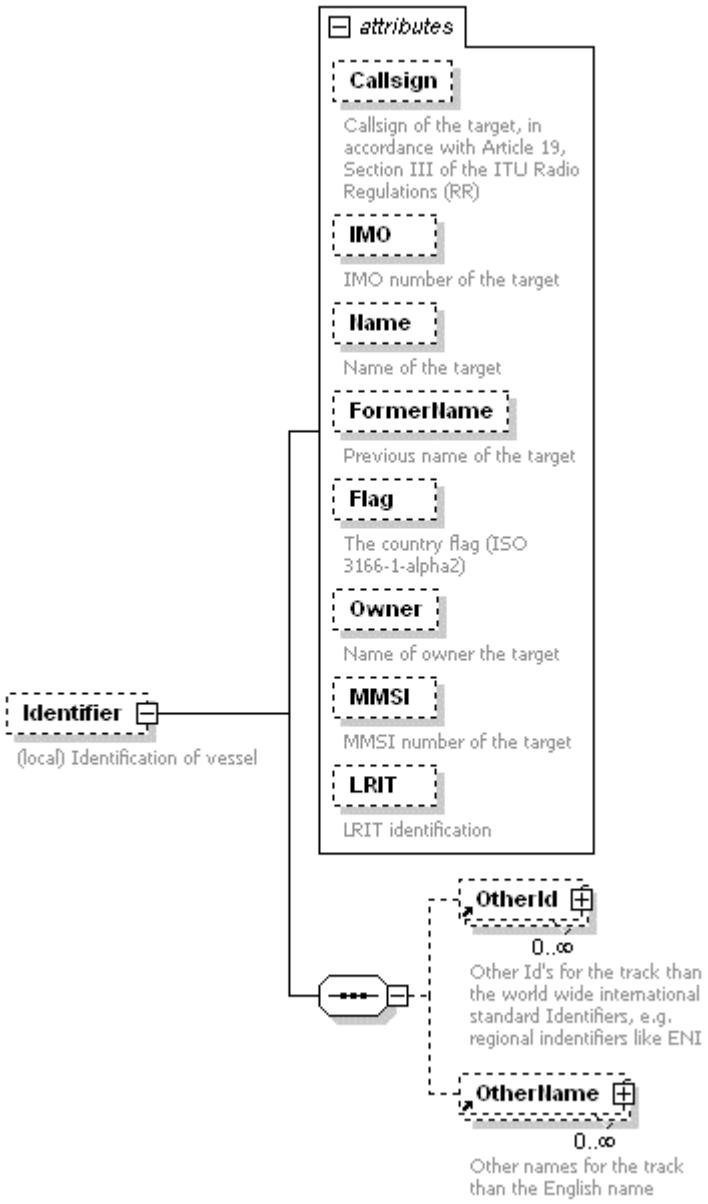
source

```
<xs:element name="UnType" minOccurs="0">
 <xs:annotation>
  <xs:documentation>Object type according to CODES FOR TYPES OF MEANS OF TRANSPORT Revision 2 (UNECE CEFACT Trade Facilitation Recommendation No. 28 edition 2007) Check latest version</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:attribute name="CodeA" use="required">
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:minInclusive value="0"/>
     <xs:maxInclusive value="138"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="CodeB" use="required">
   <xs:simpleType>
    <xs:restriction base="xs:integer">
     <xs:minInclusive value="0"/>
     <xs:maxInclusive value="9"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
```

```
      <xs:attribute name="Mode" use="required">
        <xs:simpleType>
          <xs:restriction base="xs:integer">
            <xs:enumeration value="1"/>
            <xs:enumeration value="2"/>
            <xs:enumeration value="3"/>
            <xs:enumeration value="6"/>
            <xs:enumeration value="7"/>
            <xs:enumeration value="8"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
```

element **VesselData/Identifier**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties

isRef	0
minOcc	0
maxOcc	1
content	complex

children **OtherId** **OtherName**

attributes

Name	Type	Use	Default	Fixed	Annotation
Callsign	**derived by: xs:string**	optional			documentation Callsign of the target, in accordance with Article 19, Section III of the ITU Radio Regulations (RR)
IMO	**xs:integer**	optional			documentation IMO number of the target
Name	**derived by: xs:string**	optional			documentation Name of the target
FormerName	**derived by: xs:string**	optional			documentation Previous name of the target
Flag	**derived by: xs:string**	optional			documentation The country flag (ISO 3166-1-alpha2)
Owner	**derived by: xs:string**	optional			documentation Name of owner the target
MMSI	**xs:integer**	optional			documentation MMSI number of the target
LRIT	**derived by: xs:string**	optional			documentation LRIT identification

annotation documentation
(local) Identification of vessel

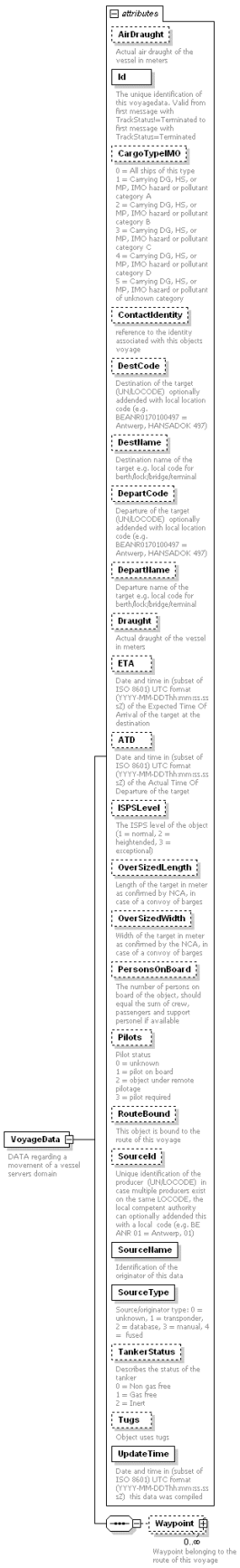
source

```
<xs:element name="Identifier" minOccurs="0">
 <xs:annotation>
  <xs:documentation>(local) Identification of vessel</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="OtherId" minOccurs="0" maxOccurs="unbounded"/>
   <xs:element ref="OtherName" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Callsign" use="optional">
   <xs:annotation>
    <xs:documentation>Callsign of the target, in accordance with Article 19, Section III of the ITU Radio Regulations
(RR)</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="0"/>
     <xs:maxLength value="9"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="IMO" type="xs:integer" use="optional">
   <xs:annotation>
    <xs:documentation>IMO number of the target</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="Name" use="optional">
   <xs:annotation>
    <xs:documentation>Name of the target</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:string">
     <xs:minLength value="1"/>
     <xs:maxLength value="42"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="FormerName" use="optional">
   <xs:annotation>
```

```
      <xs:documentation>Previous name of the target</xs:documentation>
     </xs:annotation>
     <xs:simpleType>
      <xs:restriction base="xs:string">
       <xs:minLength value="1"/>
       <xs:maxLength value="42"/>
      </xs:restriction>
     </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Flag" use="optional">
     <xs:annotation>
      <xs:documentation>The country flag (ISO 3166-1-alpha2)</xs:documentation>
     </xs:annotation>
     <xs:simpleType>
      <xs:restriction base="xs:string">
       <xs:minLength value="2"/>
       <xs:maxLength value="2"/>
      </xs:restriction>
     </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Owner" use="optional">
     <xs:annotation>
      <xs:documentation>Name of owner the target</xs:documentation>
     </xs:annotation>
     <xs:simpleType>
      <xs:restriction base="xs:string">
       <xs:minLength value="1"/>
       <xs:maxLength value="42"/>
      </xs:restriction>
     </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="MMSI" type="xs:integer" use="optional">
     <xs:annotation>
      <xs:documentation>MMSI number of the target</xs:documentation>
     </xs:annotation>
    </xs:attribute>
    <xs:attribute name="LRIT" use="optional">
     <xs:annotation>
      <xs:documentation>LRIT identification</xs:documentation>
     </xs:annotation>
     <xs:simpleType>
      <xs:restriction base="xs:string">
       <xs:minLength value="1"/>
       <xs:maxLength value="42"/>
      </xs:restriction>
     </xs:simpleType>
    </xs:attribute>
   </xs:complexType>
  </xs:element>
```

element **VoyageData**

diagram



namespace http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3

properties content complex

children **Waypoint**

used by element **ObjectData**

attributes

Name	Type	Use	Default	Fixed	Annotation
AirDraught	**derived by: xs:decimal**	optional			documentation: Actual air draught of the vessel in meters
Id	**xs:integer**	required			documentation: The unique identification of this voyagedata. Valid from first message with TrackStatus!= Terminated to first message with TrackStatus=Terminated
CargoTypeIMO	**derived by: xs:integer**	optional			documentation: 0 = All ships of this type 1 = Carrying DG, HS, or MP, IMO hazard or pollutant category A 2 = Carrying DG, HS, or MP, IMO hazard or pollutant category B 3 = Carrying DG, HS, or MP, IMO hazard or pollutant category C 4 = Carrying DG, HS, or MP, IMO hazard or pollutant category D 5 = Carrying DG, HS, or MP, IMO hazard or pollutant of unknown category
ContactIdentity	**derived by: xs:string**	optional			documentation: reference to the identity associated with this objects voyage
DestCode	**derived by: xs:string**	optional			documentation: Destination of the target (UN/LOCODE) optionally addended with local location code (e.g. BEANR0170100497 = Antwerp, HANSADOK497)

DestName	**derived by: xs:string**	optional	documentation Destination name of the target e.g. local code for berth/lock/bridge/terminal
DepartCode	**derived by: xs:string**	optional	documentation Departure of the target (UN/LOCODE) optionally addended with local location code (e.g. BEANR0170100497 = Antwerp, HANSADOK 497)
DepartName	**derived by: xs:string**	optional	documentation Departure name of the target e.g. local code for berth/lock/bridge/terminal
Draught	**derived by: xs:decimal**	optional	documentation Actual draught of the vessel in meters
ETA	**xs:dateTime**	optional	documentation Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the Expected Time Of Arrival of the target at the destination
ATD	**xs:dateTime**	optional	documentation Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the Actual Time Of Departure of the target
ISPSLevel	**derived by: xs:decimal**	optional	documentation The ISPS level of the object (1 = normal, 2 = heightended, 3 = exceptional)
OverSizedLength	**derived by: xs:decimal**	optional	documentation Length of the target in meter as confirmed by NCA, in case of a convoy of barges
OverSizedWidth	**derived by: xs:decimal**	optional	documentation Width of the target in meter as confirmed by the NCA, in case of a convoy of

			barges documentation
PersonsOnBoard	**derived by: xs:integer**	optional	The number of persons on board of the object, should equal the sum of crew, passengers and support personel if available documentation
Pilots	**derived by: xs:decimal**	optional	Pilot status 0 = unknown 1 = pilot on board 2 = object under remote pilotage 3 = pilot required documentation
RouteBound	**xs:boolean**	optional	This object is bound to the route of this voyage documentation
SourceId	**derived by: xs:string**	optional	Unique identification of the producer (UN/LOCODE) in case multiple producers exist on the same LOCODE, the local competent authority can optionally addended this with a local code (e.g. BE ANR 01 = Antwerp, 01) documentation
SourceName	**derived by: xs:string**	required	Identification of the originator of this data documentation
SourceType	**derived by: xs:integer**	required	Source/originator type: 0 = unknown, 1 = transponder, 2 = database, 3 = manual, 4 = fused documentation
TankerStatus	**derived by: xs:integer**	optional	Describes the status of the tanker 0 = Non gas free 1 = Gas free 2 = Inert documentation
Tugs	**xs:boolean**	optional	Object uses tugs documentation
UpdateTime	**xs:dateTime**	required	Date and time in (subset of ISO 8601) UTC format (YYYY-MM-

DDThh:mm:ss.sssZ) this data was compiled

annotation documentation
DATA regarding a movement of a vessel servers domain

source

```
<xs:element name="VoyageData">
 <xs:annotation>
  <xs:documentation>DATA regarding a movement of a vessel servers domain</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element name="Waypoint" minOccurs="0" maxOccurs="unbounded">
    <xs:annotation>
     <xs:documentation>Waypoint belonging to the route of this voyage</xs:documentation>
    </xs:annotation>
    <xs:complexType>
     <xs:sequence>
      <xs:element ref="Pos" minOccurs="0"/>
     </xs:sequence>
     <xs:attribute name="ATA" type="xs:dateTime" use="optional">
      <xs:annotation>
       <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601 ) of the Actual
Time Of Arrival of the target.</xs:documentation>
      </xs:annotation>
     </xs:attribute>
     <xs:attribute name="ETA" type="xs:dateTime" use="optional">
      <xs:annotation>
       <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Expected
Time Of Arrival of the target.</xs:documentation>
      </xs:annotation>
     </xs:attribute>
     <xs:attribute name="RTA" type="xs:dateTime" use="optional">
      <xs:annotation>
       <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Requestec
Time Of Arrival of the target.</xs:documentation>
      </xs:annotation>
     </xs:attribute>
     <xs:attribute name="LoCode" use="optional">
      <xs:annotation>
       <xs:documentation>Waypoint name in UN/LOCODE optionally addended with local location code (e.g.
BEANR0170100497 = Antwerp, HANSADOK 497)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:string">
        <xs:minLength value="5"/>
        <xs:maxLength value="15"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
     <xs:attribute name="Name" use="required">
      <xs:annotation>
       <xs:documentation>Name of the waypoint</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
       <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
        <xs:maxLength value="42"/>
       </xs:restriction>
      </xs:simpleType>
     </xs:attribute>
    </xs:complexType>
   </xs:element>
  </xs:sequence>
  <xs:attribute name="AirDraught" use="optional">
   <xs:annotation>
    <xs:documentation>Actual air draught of the vessel in meters</xs:documentation>
   </xs:annotation>
   <xs:simpleType>
    <xs:restriction base="xs:decimal">
     <xs:fractionDigits value="2"/>
     <xs:minExclusive value="0"/>
    </xs:restriction>
   </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="Id" type="xs:integer" use="required">
```

```
      <xs:annotation>
        <xs:documentation>The unique identification of this voyagedata. Valid from first message with
TrackStatus!=Terminated to first message with TrackStatus=Terminated</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="CargoTypeIMO" use="optional">
      <xs:annotation>
        <xs:documentation>0 = All ships of this type
1 = Carrying DG, HS, or MP, IMO hazard or pollutant category A
2 = Carrying DG, HS, or MP, IMO hazard or pollutant category B
3 = Carrying DG, HS, or MP, IMO hazard or pollutant category C
4 = Carrying DG, HS, or MP, IMO hazard or pollutant category D
5 = Carrying DG, HS, or MP, IMO hazard or pollutant of unknown category</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="0"/>
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
          <xs:enumeration value="3"/>
          <xs:enumeration value="4"/>
          <xs:enumeration value="5"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="ContactIdentity" use="optional">
      <xs:annotation>
        <xs:documentation>reference to the identity associated with this objects voyage</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="254"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="DestCode" use="optional">
      <xs:annotation>
        <xs:documentation>Destination of the target (UN/LOCODE)  optionally addended with local location code (e.g.
BEANR0170100497 = Antwerp, HANSADOK 497)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="DestName" use="optional">
      <xs:annotation>
        <xs:documentation>Destination name of the target e.g. local code for berth/lock/bridge/terminal</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="DepartCode" use="optional">
      <xs:annotation>
        <xs:documentation>Departure of the target (UN/LOCODE)  optionally addended with local location code (e.g.
BEANR0170100497 = Antwerp, HANSADOK 497)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="DepartName" use="optional">
      <xs:annotation>
        <xs:documentation>Departure name of the target e.g. local code for berth/lock/bridge/terminal</xs:documentation>
      </xs:annotation>
```

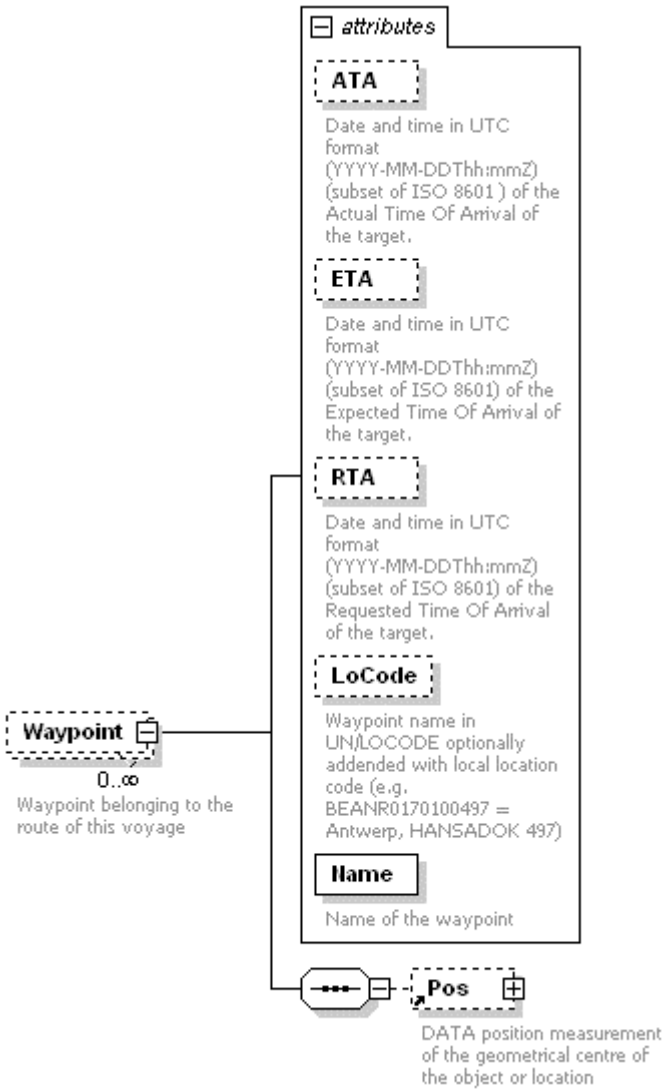
```
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Draught" use="optional">
      <xs:annotation>
        <xs:documentation>Actual draught of the vessel in meters</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="2"/>
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="ETA" type="xs:dateTime" use="optional">
      <xs:annotation>
        <xs:documentation>Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the
Expected Time Of Arrival of the target at the destination</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="ATD" type="xs:dateTime" use="optional">
      <xs:annotation>
        <xs:documentation>Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ) of the Actual
Time Of Departure of the target</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="ISPSLevel" use="optional">
      <xs:annotation>
        <xs:documentation>The ISPS level of the object (1 = normal, 2 = heightended, 3 = exceptional)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
          <xs:enumeration value="3"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="OverSizedLength" use="optional">
      <xs:annotation>
        <xs:documentation>Length of the target in meter as confirmed by NCA, in case of a convoy of
barges</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="OverSizedWidth" use="optional">
      <xs:annotation>
        <xs:documentation>Width of the target in meter as confirmed by the NCA, in case of a convoy of
barges</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:fractionDigits value="1"/>
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="PersonsOnBoard" use="optional">
      <xs:annotation>
        <xs:documentation>The number of persons on board of the object, should equal the sum of crew, passengers and
support personel if available</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:minExclusive value="0"/>
        </xs:restriction>
```

```
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Pilots" use="optional">
      <xs:annotation>
        <xs:documentation>Pilot status
0 = unknown
1 = pilot on board
2 = object under remote pilotage
3 = pilot required</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:decimal">
          <xs:minExclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="RouteBound" type="xs:boolean" use="optional">
      <xs:annotation>
        <xs:documentation>This object is bound to the route of this voyage</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="SourceId" use="optional">
      <xs:annotation>
        <xs:documentation>Unique identification of the producer (UN/LOCODE) in case multiple producers exist on the same
LOCODE, the local competent authority can optionally addended this with a local code (e.g. BE ANR 01 = Antwerp,
01)</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceName" use="required">
      <xs:annotation>
        <xs:documentation>Identification of the originator of this data</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="SourceType" use="required">
      <xs:annotation>
        <xs:documentation>Source/originator type: 0 = unknown, 1 = transponder, 2 = database, 3 = manual, 4 =
fused</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
          <xs:enumeration value="3"/>
          <xs:enumeration value="4"/>
          <xs:enumeration value="5"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="TankerStatus" use="optional">
      <xs:annotation>
        <xs:documentation>Describes the status of the tanker
0 = Non gas free
1 = Gas free
2 = Inert</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:integer">
          <xs:enumeration value="0"/>
          <xs:enumeration value="1"/>
          <xs:enumeration value="2"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
```

```
    <xs:attribute name="Tugs" type="xs:boolean" use="optional">
      <xs:annotation>
        <xs:documentation>Object uses tugs</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="UpdateTime" type="xs:dateTime" use="required">
      <xs:annotation>
        <xs:documentation>Date and time in (subset of ISO 8601) UTC format (YYYY-MM-DDThh:mm:ss.sssZ)  this data was
compiled</xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

element **VoyageData/Waypoint**

diagram



namespace	http://www.iala-to-be-confirmed.org/XMLSchema/IVEF/0.2.3					
properties	isRef	0				
	minOcc	0				
	maxOcc	unbounded				
	content	complex				
children	**Pos**					
attributes	Name	Type	Use	Default	Fixed	Annotation
	ATA	**xs:dateTime**	optional			documentation Date and time in UTC format (YYYY-MM-

				DDThh:mmZ) (subset of ISO 8601) of the Actual Time Of Arrival of the target.
	ETA	**xs:dateTime**	optional	documentation Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Expected Time Of Arrival of the target.
	RTA	**xs:dateTime**	optional	documentation Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Requested Time Of Arrival of the target.
	LoCode	**derived by: xs:string**	optional	documentation Waypoint name in UN/LOCODE optionally addended with local location code (e.g. BEANR0170100497 = Antwerp, HANSADOK 497)
	Name	**derived by: xs:string**	required	documentation Name of the waypoint

annotation
documentation
Waypoint belonging to the route of this voyage

source

```
<xs:element name="Waypoint" minOccurs="0" maxOccurs="unbounded">
 <xs:annotation>
  <xs:documentation>Waypoint belonging to the route of this voyage</xs:documentation>
 </xs:annotation>
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="Pos" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="ATA" type="xs:dateTime" use="optional">
   <xs:annotation>
    <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601 ) of the Actual Time C
Arrival of the target.</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="ETA" type="xs:dateTime" use="optional">
   <xs:annotation>
    <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Expected Time
Of Arrival of the target.</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="RTA" type="xs:dateTime" use="optional">
   <xs:annotation>
    <xs:documentation>Date and time in UTC format (YYYY-MM-DDThh:mmZ) (subset of ISO 8601) of the Requested
Time Of Arrival of the target.</xs:documentation>
   </xs:annotation>
  </xs:attribute>
  <xs:attribute name="LoCode" use="optional">
   <xs:annotation>
    <xs:documentation>Waypoint name in UN/LOCODE optionally addended with local location code (e.g.
BEANR0170100497 = Antwerp, HANSADOK 497)</xs:documentation>
   </xs:annotation>
```

```
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="5"/>
          <xs:maxLength value="15"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="Name" use="required">
      <xs:annotation>
        <xs:documentation>Name of the waypoint</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:minLength value="1"/>
          <xs:maxLength value="42"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```