Service Specification for [Digital] VTS Anchorage assignment Service

*DRAFT 0.5.0*

*2023-07-27*

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# Introduction

This document was produced as part of the work of IALA joint VTS-ENAV task group on development of technical service specifications for VTS. The document is structured according to the IALA Guideline G1128: THE SPECIFICATION OF e-NAVIGATION TECHNICAL SERVICES. The design of the service interfaces was adapted from the standard for Secure communication between ship and shore IEC 63173-2:2022.

## Purpose of the Document

The purpose of this service specification document is to provide a holistic overview of digital VTS Anchorage assignment Service and its building blocks in a technology-independent way, according to the draft of guideline on VTS digital communication. It describes a well-defined baseline of the service by clearly identifying the service version.

The aim is to document the key aspects of the VTS Anchorage assignment Service at the logical level:

* the operational and business context of the service
  + requirements for the service (e.g., information exchange requirements)
  + involved nodes: which operational components provide/consume the service
  + operational activities supported by the service
  + relation of the service to other services
* the service description
  + service interface definitions
  + service interface operations
  + service payload definition
  + service dynamic behaviour description
* service provision and validation aspects

## Intended Readership

This service specification is intended to be read by service architects, system engineers and developers in charge of designing and developing an instance of the VTS Anchorage assignment Service.

Furthermore, this service specification is intended to be read by enterprise architects, service architects, information architects, system engineers and developers in pursuing architecting, designing and development activities of other related services.

## Inputs from Other Sources

This section provides an overview of activities, which are dealing with similar topics and lists already finished ones that provided inputs to this activity.’

*To be added reference to VTS Voyage Information Service Specifications*

*To be added short references to IEC 63173-1:2021 – S-421, S-211 as well as S-210*

# Service Identification

The purpose of this chapter is to provide a unique identification of the service and describe where the service is in terms of the engineering lifecycle.

|  |  |
| --- | --- |
| Name | VTS Anchorage Assignment Service |
| ID | urn:mrn:iala:techsvc:vts:aas  [not official designation, for example only] |
| Version | 0.5.0 |
| Description | The VTS anchorage assignment service specification describes a standardized service implementing of the VTS assigning anchorage positions in digital format communication between ship and shore |
| Keywords | VTS, MS1, Anchorage Assignment, S-211 |
| Architect(s) |  |
| Status | Provisional |

# Operational Context

According to IMO resolution A. 1158(32) Guidelines for Vessel Traffic Services one of the purposes of a VTS is to monitor and manage ship traffic to ensure the safety and efficiency of ship movements.

IALA Guideline G1089 Provision of a VTS states that the monitoring and management may include, among other things, forward planning and prioritization of ship movements to prevent congestion or dangerous situations and improve overall efficiency, organizing space allocation.

The initial Maritime Service description for MS1 Vessel Traffic Services describes user needs for digital information services for the exchange of VTS information by electronic means between a VTS and vessel. Vessels using MS1 can receive information related to the management of ship traffic in a digital format that can be displayed in the navigational equipment on board. Digital information exchange may apply to elements of vessel traffic management that is not time critical.

NCSR 10/7/1 Proposal for new and updated Maritime Service descriptions for MS1 further describes the example of information exchange on anchorage service, which is assigning anchorage positions.

## Present Day Operational Context

One of the main tasks for VTS is to monitor and manage vessel traffic, including organizing space allocation. Anchorage assignment may be required in situations when a vessel is:

* prior to entering an anchorage

Traditionally VTS communication and interaction with ships is almost exclusively undertaken by VHF voice communications. The move to digital communications will reduce the amount of VHF communication and provide timely information which will improve safe and efficient ship traffic and pave the way to future machine to machine operations.

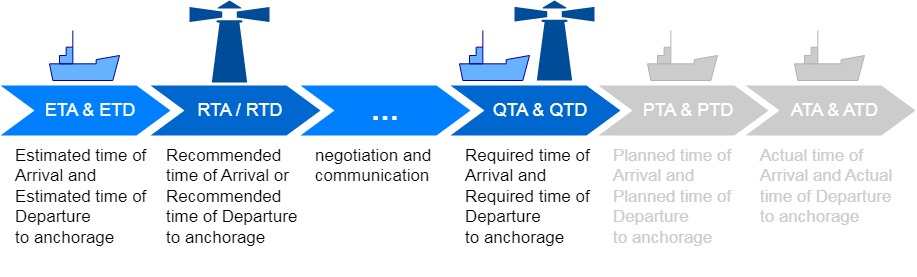
System interfaces for digital exchange of information related to ship traffic management are not standardized. This document starts describing these standardizations with use cases.

## Envisioned Operational Context

A more digitally- envisioned operational anchorage assignment service will provide several valuable benefits to improve communication and with that accuracy, efficiency and traceability.

The ability to achieve standardized data exchange between ships and VTS is a prerequisite for the application of Anchorage Assignment Service.

A typical maritime service for VTS on anchorage can be defined by a general use case: assigning anchorage position.



*Figure 1: Time sequence of anchorage assignment*

Before VTS assigns an anchorage position for a vessel, it should be necessary to know the vessel’s schedule of anchoring and its voyage dynamic information (e.g. ship draft) to arrange appropriate time and space. Assuming a vessel can get its voyage dynamic information by calling Voyage Information Service or other interfaces, it will be more efficient for vessel to send message which be added ETA and ETD to VTS by Anchorage Assignment Service. If not, the vessel must give the minimum information required by Anchorage Assignment Service. It should be ensured that the times in the different systems are aligned.

The following general use case provides an example for the digital information exchange between VTS and vessels using anchorage assignment service:

Use Case –Assigning anchorage position

1 Vessel requests to anchoring

2 Vessel sends request message including its ETA and ETD to/from anchorage or anchoring duration to the service, the service delivers request to VTS

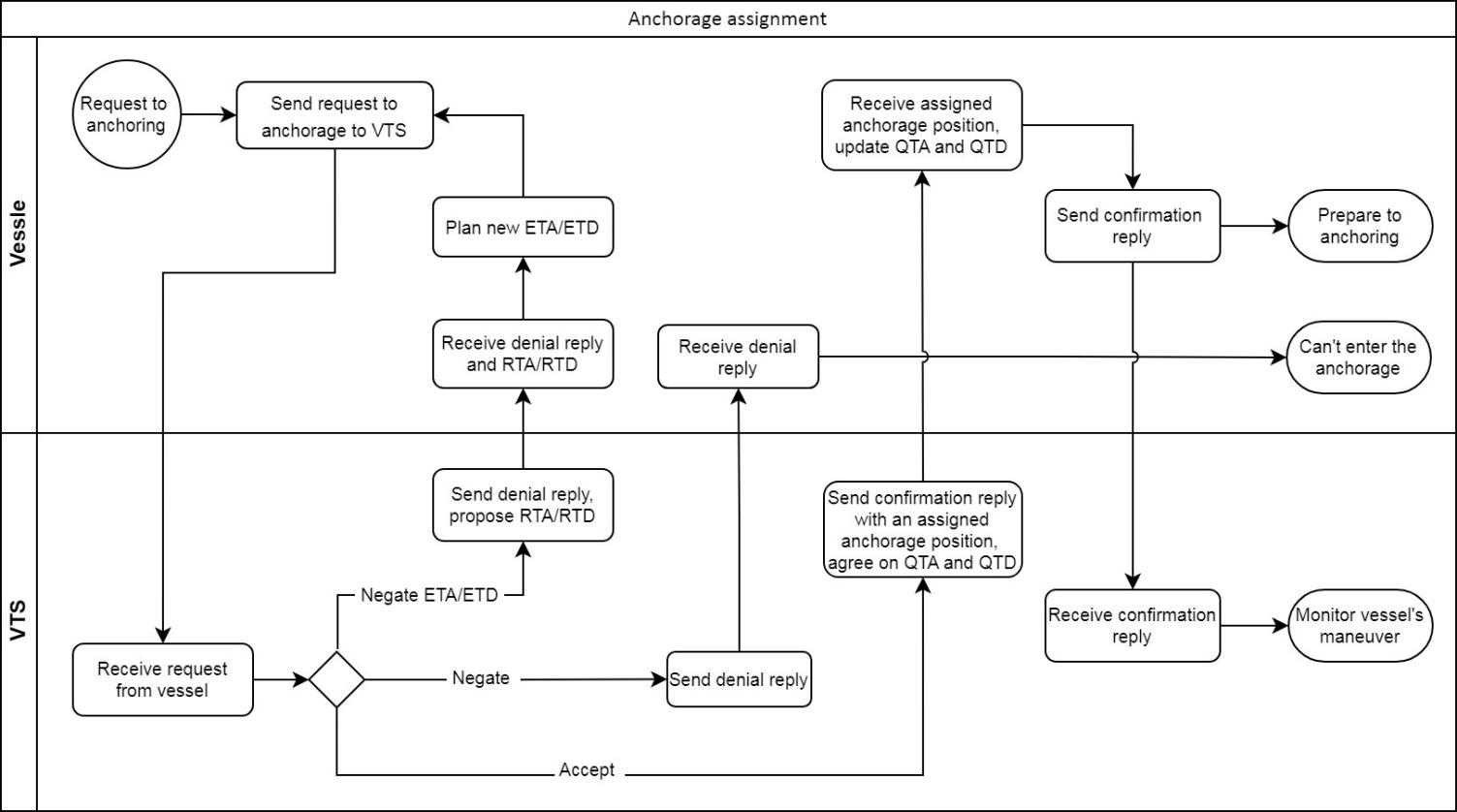
3-1 If the condition is not suitable for vessel to visit anchorage, VTS denies the request

3-2 If vessel's schedule of visiting anchorage is not suitable, VTS denies the request and proposes corresponding RTA or RTD for vessel

3-3 If the condition and vessel's schedule are both suitable, then VTS sends acceptance including an anchorage position as well as agreed QTA and QTD through the service

4 Vessel sends confirmation message of anchorage time and position to the service

5 VTS receives vessel's response



*Figure 2: Anchorage assignment data-flow*

## Functional and Non-functional Requirements

The table below lists applicable existing requirements for the Anchorage Assignment Service.

Table 1: Requirements Tracing

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement Id | Requirement Name | Requirement Text | References |
| functional requirements | | | |
| Receive\_Request\_Vessel\_Anchorage | Receive request to anchoring from vessel | The service must have the ability to receive anchoring request from a vessel, including vessel’s ETA and ETD as well as ship draft. |  |
| Send\_Denial\_Vessel\_Anchorage | Send denial of vessel’s request to anchoring | The service must have the ability to send the denial of anchoring from VTS to the vessel. |  |
| Send\_Denial\_ETA/ETD\_Anchorage | Send denial of vessel’s ETA/ETD | The service must have the ability to send the denial of vessel’s ETA/ETD from VTS to the vessel, including proposed RTA/RTD. |  |
| Send\_Confirmation\_Vessel\_Anchorage | Send confirmation of vessel’s request to anchoring | The service must have the ability to send the confirmation of vessel’s anchoring request from VTS to the vessel, including an assigned anchorage position as well as QTA and QTD. |  |
| Receive\_Confirmation\_Vessel\_Anchorage | Receive confirmation of QTA and QTD to/from the assigned anchorage position from vessel | The service must have the ability to receive the confirmation of anchorage assignment from a vessel. |  |
| Integrate\_Service\_System | Service integration with VTS System | The service must integrate with the VTS System. |  |
| Communicate\_Service\_Event | Service must support event-based communication | Service must be compatible with event driven. |  |
| Communicate\_Service\_API | Service must support API based communication | Service should offer APIs for push/pull communication. |  |
| Sign\_Message | Messages should be signed | The service provider and consumer should sign. |  |
| non-functional requirements | | | |
|  | Confidentiality | To ensure that data can only be accessed when authorized, and authorized persons or systems can normally access relevant information or data. |  |
|  | Integrity | It must be clear to both service provider and consumer whether changes have been made to the information after the dataset was created. |  |
|  | Availability | Under specified conditions and at specified times or time intervals, the service has the ability to execute specified functional states. |  |
|  | Authenticity | The recipient of information must be able to verify the authenticity of the received datasets. |  |
|  | Accountability | The activities of the service entity can be uniquely traced back to the sender and receiver of the entity to facilitate verification of data sources and processing. |  |
|  | Performance – timeliness | The service must provide a response to an incoming request instantly. |  |
|  | Reliability | The service must provide a retry mechanism to ensure that messages are delivered to the vessel or VTS System even if the first request fails. |  |

Functional requirements

|  |  |
| --- | --- |
| Requirement Id | Receive\_Request\_Vessel\_Anchorage |
| **Requirement Name** | Receive request to anchoring from vessel |
| **Requirement Text** | The service must have the ability to receive the request to anchoring from a vessel. Request message must include vessel’s ETA and ETD to/from anchorage as well as vessel’s voyage dynamic information (e.g. ship draft). |
| **Rationale** | Capturing the request message from a vessel by the service is a core requirement. In most cases the request message will be the request to anchorage. |
| **Author** | vessel |

|  |  |
| --- | --- |
| Requirement Id | Send\_Denial\_Vessel\_Anchorage |
| **Requirement Name** | Send denial of vessel’s request to anchoring |
| **Requirement Text** | The service must have the ability to send the denial of anchoring from VTS to the vessel. |
| **Rationale** | When there is no vacant space of the anchorage or other situations, it is necessary to refuse the vessel entry. |
| **Author** | VTS |

|  |  |
| --- | --- |
| Requirement Id | Send\_Denial\_ETA/ETD\_Anchorage |
| **Requirement Name** | Send denial of vessel’s ETA/ETD |
| **Requirement Text** | The service must have the ability to send the denial of vessel’s ETA/ETD from VTS to the vessel. This kind of denial message should include proposed RTA/RTD |
| **Rationale** | When vessel’s ETA to anchorage or ETD from anchorage is not suitable, VTS may refuse the vessel entry and propose corresponding RTA/RTD by the service. |
| **Author** | VTS |

|  |  |
| --- | --- |
| Requirement Id | Send\_Confirmation\_Vessel\_Anchorage |
| **Requirement Name** | Send confirmation of vessel’s request to anchoring |
| **Requirement Text** | The service must have the ability to send the confirmation of vessel’s request to anchoring from VTS to the vessel. Confirmation message must include an assigned anchorage position as well as agreed QTA and QTD. |
| **Rationale** | Delivering the confirmation message from VTS to a vessel by the service is a core requirement. The anchorage position could be identified or a geographic information. In general case the vessel’s ETA and ETD to anchorage will be brought in the QTA and QTD. |
| **Author** | VTS |

|  |  |
| --- | --- |
| Requirement Id | Receive\_Confirmation\_Vessel\_Anchorage |
| **Requirement Name** | Receive confirmation of QTA and QTD to/from the assigned anchorage position from vessel |
| **Requirement Text** | The service must have the ability to receive the confirmation of anchorage assignment from a vessel. |
| **Rationale** | The confirmation message will be the confirmation of the assigned anchorage position as well as QTA and QTD. |
| **Author** | vessel |

|  |  |
| --- | --- |
| Requirement Id | Integrate\_Service\_System |
| **Requirement Name** | Service integration with VTS System |
| **Requirement Text** | The service must integrate with the VTS System so that the information received from vessels can be utilized by the VTS System. |
| **Rationale** | The exact details of how this requirement is fulfilled are left to each implement or as they depend on the functionalities of the VTS System itself. In some cases, it may be better for the VTS System to poll the service, in other cases an event may be triggered, or a simple API call on the VTS System may be used. From the perspective of this specification the implementation details of how the service integrates with the VTS System can be left open. |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id | Communicate\_Service\_Event |
| **Requirement Name** | Service must support event-based communication |
| **Requirement Text** | For best possible compatibility with planned platforms service must be compatible with event driven. |
| **Rationale** | The event driven approach mimics the approach of MMS. MMS with its agents and edge routers abstracts much of the complexity of the challenges faced with ship to shore communication. An event driven approach is also architecturally different from a push/pull API-based approach. By supporting both approaches the services are as future proof as can be at the current stage. |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id | Communicate\_Service\_API |
| **Requirement Name** | Service must support API based communication |
| **Requirement Text** | Service should offer APIs for push/pull communication. |
| **Rationale** | Direct API communication enables many ways of interaction with the service. |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id | Sign\_Message |
| **Requirement Name** | Messages should be signed |
| **Requirement Text** | The service provider and consumer should sign all messages to better enable verification of the communicating parties. |
| **Rationale** | While both approaches typically allow both signed and unsigned communication, preferring signed communication enables easier verification and makes it harder to spoof sources of communication. |
| **Author** |  |

Non-functional requirements

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Confidentiality |
| **Requirement Text** | To ensure that data can only be accessed when authorized, it is necessary to prevent unauthorized persons or systems from accessing relevant information or data, and to ensure that authorized persons or systems can normally access relevant information or data. |
| **Rationale** |  |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Integrity |
| **Requirement Text** | It must be clear to both service provider and consumer whether changes have been made to the information after the dataset was created. All messages must be signed with the correct certificates so that the contents of a message can be validated. |
| **Rationale** |  |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Availability |
| **Requirement Text** | Under specified conditions and at specified times or time intervals, the service has the ability to execute specified functional states. |
| **Rationale** | The service must be available based on the VTS service hours and service levels. |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Authenticity |
| **Requirement Text** | The recipient of information must be able to verify the authenticity of the received datasets. The IPSec tools and identity registry specified in MCP must be used to facilitate this. |
| **Rationale** |  |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Accountability |
| **Requirement Text** | The activities of the service entity can be uniquely traced back to the sender and receiver of the entity to facilitate verification of data sources and processing. |
| **Rationale** |  |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Performance – timeliness |
| **Requirement Text** | The service must provide a response to an incoming request instantly. This response is by necessity a technical delivery acknowledgement and not a business process response. This applies both to requests coming from vessels and VTS System. |
| **Rationale** | Especially from a vessel’s point of view it is important to get an acknowledgement that the service has received a request so that the vessel’s system does not need to try resending the request. |
| **Author** |  |

|  |  |
| --- | --- |
| Requirement Id |  |
| **Requirement Name** | Reliability |
| **Requirement Text** | The service must provide a retry mechanism to ensure that messages are delivered to the vessel or VTS System even if the first request fails. |
| **Rationale** | As the service is effectively a proxy between the VTS System and vessel’s systems it is vital that message delivery to the real consumer is ensured by retrying sending the message.  This is of increased importance when the vessel is behind an unreliable network connection or the actual data carrier changes during messaging. |
| **Author** |  |

## Other Constraints

### Relevant Industrial Standards

*To be added a table of applicable industrial standards*

### Operational Nodes

The following tables describe the operational nodes of the service.

Table 2: Operational Nodes providing the Anchorage Assignment Service

|  |  |
| --- | --- |
| Operational Node | Remarks |
| **Vessel** | Vessels visiting in a service coverage area. |
| **VTS centres** | VTS centres responsible for a service coverage area. |

# Service Overview

## Service Interfaces

VTS provides Anchorage Assignment Service to a vessel according to the vessel’s request to anchoring, which is a request-response working mechanism. Thus it is recommended to use the Request/Response Message Exchange Pattern (MEP). However, considering that most VTS centres have not yet fully implemented request-response automation and need to provide asynchronous message responses, Request/Response MEP and Publish/Subscribe MEP should be both compatible in the service.

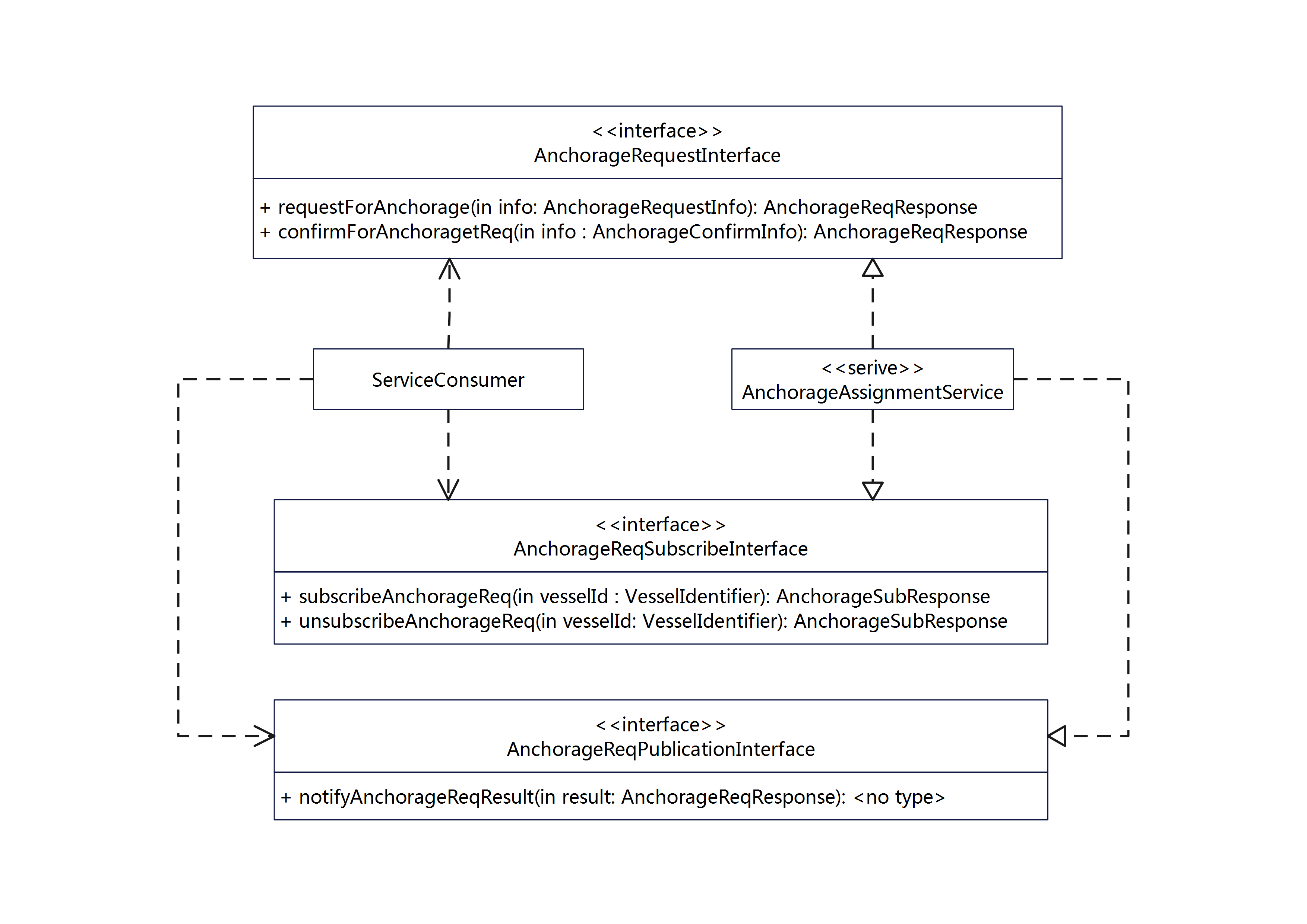
**

Figure 3: Anchorage assignment service interface definition diagram

Table 3: Service Interfaces

|  |  |  |
| --- | --- | --- |
| ServiceInterface | Role (from service provider point of view) | ServiceOperation |
| AnchorageRequestInterface | Provided | requestForAnchorage |
| Provided | confirmForAnchorageReq |
| AnchorageReqSubscirbeInterface | Provided | subscribeAnchorageReq |
| Provided | unsubscribeAnchorageReq |
| AnchorageReqPublicationInterface | Provided | notifyAnchorageReqResult |

# Service Data Model

This section describes the information model, i.e., the logical data structures to be exchanged between providers and consumers of the service.

The data transfer between service provider and consumer MUST always conform to the model displayed below.

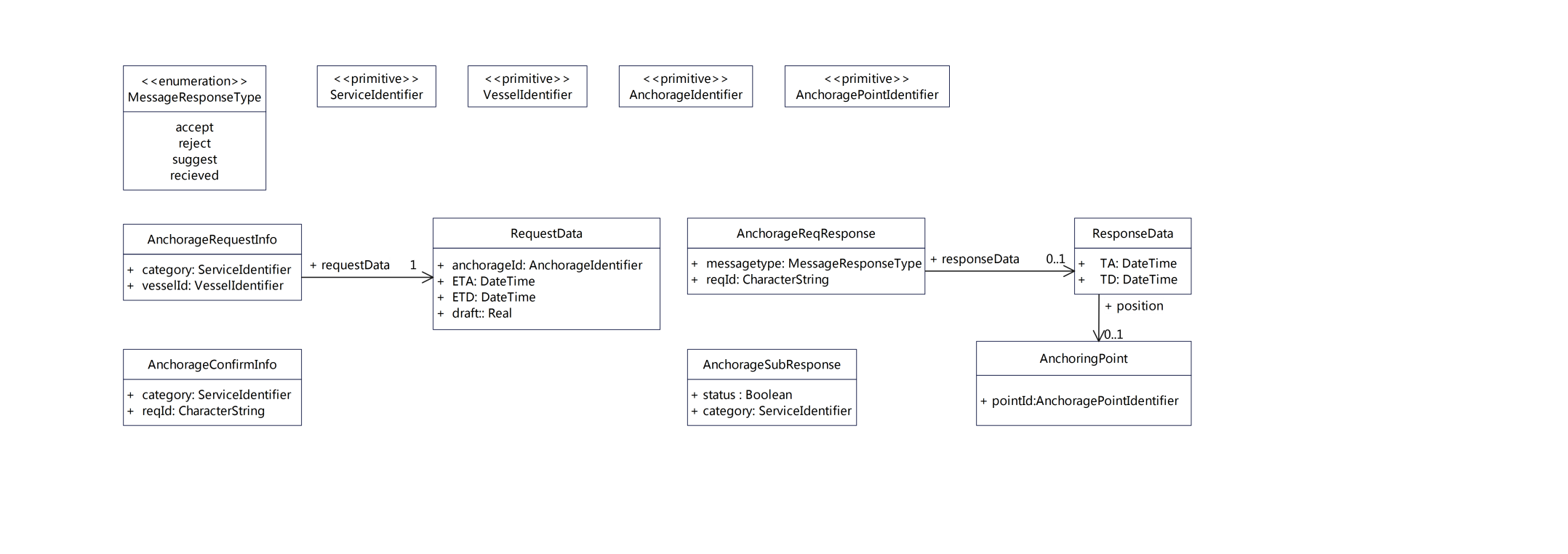


Figure 4: Anchorage Assignment Service Data Model diagram

Table 4: Information elements of Anchorage Assignment Service Specification

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | | Description | |
| AnchorageConfirmInfo | | Information of the vessel’s confirmation to the assigned anchorage position as well as QTA and QTD. | |
|  | Element Name | Type | Description |
|  | category | ServiceIdentifier | Service identifier type to be used for the corresponding service call.  Globally unique identification of the service. Newer versions of the same service specification shall not change the id.  The identifier should conform to a Maritime Resource Name (MRN) identity. |
|  | reqId | CharacterString | After the anchoring request sent by the vessel to the service is successfully received, the unique identifier provided by the service is recommended to use UUID. |
| Type Name | | Description | |
| AnchorageRequestInfo | | Information of the vessel’s anchoring request. | |
|  | Element Name | Type | Description |
|  | category | ServiceIdentifer | Service identifier type to be used for the corresponding service call.  Globally unique identification of the service. Newer versions of the same service specification shall not change the id.  The identifier should conform to a Maritime Resource Name (MRN) identity. |
|  | vesselId | VesselIdentifer | Globally unique identification of the vessel, i.e. IMO number, MMSI number.  The identifier should conform to a Maritime Resource Name (MRN) identity. |
|  | requestData | RequestData | Refers to the vessel’s voyage dynamic information for anchoring request. It is mandatory to provide. |
| Type Name | | Description | |
| RequestData | | Information of the vessel’s voyage dynamic associated with anchoring request. | |
|  | Element Name | Type | Description |
|  | anchorageId | AnchorageIdentifer | Globally unique identification of the anchorage.  The identifier should conform to a Maritime Resource Name (MRN) identity. |
|  | ETA | DateTime | Estimated time of arrival to anchorage. |
|  | ETD | DateTime | Estimated time of departure from anchorage. |
|  | draft | Real | Refers to the vessel’s actual draft for VTS to assign a suitable anchorage position based on water depth. |
| Type Name | | Description | |
| AnchorageSubResponse | | Information of response for subscription. | |
|  | Element Name | Type | Description |
|  | status | Boolean | Flag to indicate whether the subscribe operation or unsubscribe operation shall be ‘successful’. |
|  | category | ServiceIdentifier | Service identifier type to be used for the corresponding service call.  Globally unique identification of the service. Newer versions of the same service specification shall not change the id.  The identifier should conform to a Maritime Resource Name (MRN) identity. |
| Type Name | | Description | |
| AnchorageReqResponse | | Information of replyfor the vessel’s anchoring request. | |
|  | Element Name | Type | Description |
|  | messageType | MessageResponseType  <<enumeration>> | Types of reply for the vessel’s anchoring request. The reply message type field has one of the following values:   * accept   Agree the vessel’s anchoring request, and assign anchorage position.   * reject   Deny the vessel’s anchoring request.   * suggest   Deny the vessel’s anchoring request, while provide recommendation.   * received   Notify that the vessel’s anchoring request has been received. |
|  | reqId | CharacterString | After the anchoring request sent by the vessel to the service is successfully received, the unique identifier provided by the service is recommended to use UUID. |
|  | responseData | ResponseData | Optional reference to the recommended or required (negotiated) information associated with the vessel’s anchoring request. Should be one of:   * If the value of ‘messageType’ is ‘reject’ or ‘received’, then ‘responseData’ does not refer. * If the value of ‘messageType’ is ‘accept’ or ‘suggest’, then ‘responseData’ is mandatory to provide. |
| Type Name | | Description | |
| ResponseData | | Information of recommendation or requirement (negotiation) for the vessel’s anchoring request. | |
|  | Element Name | Type | Description |
|  | TA | DateTime | Refers to time of arrival. Should be one of:   * If the value of ‘messageType’ is ‘accept’, then ‘TA’ is the required time of arrival (QTA). * If the value of ‘messageType’ is ‘suggest’, then ‘TA’ is the recommended time of arrival (RTA). |
|  | TD | DateTime | Refers to time of departure. Should be one of:   * If the value of ‘messageType’ is ‘accept’, then ‘TA’ is the required time of departure (QTD). * If the value of ‘messageType’ is ‘suggest’, then ‘TA’ is the recommended time of departure (RTD). |
|  | position | AnchoringPoint | Optional reference to the informationof the assigned anchorage position. Should be one of:   * If the value of ‘messageType’ is ‘accept’, then ‘AnchoringPoint’ is mandatory to provide. * If the value of ‘messageType’ is others, then ‘AnchoringPoint’ does not refer. |
| Type Name | | Description | |
| AnchoringPoint | | Information of the assigned anchorage position. | |
|  | Element Name | Type | Description |
|  | point | AnchoragePointIdentifer | May be one of:   * If registered in MRN, it refers to globally unique identification of the anchorage position. * If unregistered in MRN, it refers to latitude and longitude of the assigned anchorage position. |

# Service Interface Specifications

*To be added after discussing and confirming the content above*

# Service Dynamic Behaviour

*To be added after discussing and confirming the content above*

# References

| Nr. | Version | Reference |
| --- | --- | --- |
| 1. IALA Guideline G1128 | ED 1.4 | THE SPECIFICATION OF E-NAVIGATION TECHNICAL SERVICES |
| xx.yy | Deliverable abc |
| 1. IALA Recommendation R1023 | ED 1.0 | MARITIME RESOURCE NAMES |
| 1. IHO Standard S-100 | ED 5.0.0 | IHO Universal Hydro graphic Data Model  <https://iho.int/uploads/user/pubs/standards/s-100/S-100_5.0.0_Final_Clean_Web.pdf> |
| 1. IEC 63173-2 ED1 | 1.0 | Maritime navigation and radio communication equipment and systems –  Data interfaces –  Part 2: Secure communication between ship and shore (SECOM) |
| 1. IALA data model S-211 | 1.0 | IALA Port Call Message Product Specification |

# Acronyms and Terminology

## Acronyms

|  |  |
| --- | --- |
| Term | Definition |
| API | Application Programming Interface |
| MRN | Maritime Resource Name |
| VTS | Vessel Traffic Service |
| XSD | XML Schema Definition |

## Terminology

|  |  |
| --- | --- |
| Term | Definition |

1. Service Specification XML

*To be added after discussing and confirming the content above*

XSD file of Service Specification for digital VTS Anchorage Assignment Service V0.5.0

<?xml version="1.0" encoding="UTF-8" standalone="no"?>

<schema xmlns="http://www.w3.org/2001/XMLSchema"

xmlns:AnchorageAssignmentServiceSchema="http://iala-aism.org/g1128/v1.3/AnchorageAssignmentServiceSchema.xsd"

targetNamespace="http://iala-aism.org/g1128/v1.3/AnchorageAssignmentServiceSchema.xsd"

elementFormDefault="qualified"

version="1.0.0" xml:lang="EN">

<annotation>

<documentation>

Author:

LI WEI WEI

TIAN CHI

SUN SHUO

TANG YAO

ZHANG FENG YUN

WEI GAO JIAN

SHI ZHI GUO

</documentation>

</annotation>

<annotation>

<documentation>

This section describes the information model, i.e.,the logical data structures to be exchanged between providers and consumers of the service.

The data transfer between service provider and consumer MUST always conform to the model displayed below.

</documentation>

</annotation>

<simpleType name="ServiceIdentifier">

<annotation>

<documentation>

Service identifier type to be used for the corresponding service call.

Globally unique identification of the service. Newer versions of the same service specification shall not change the id.

The identifier should conform to a Maritime Resource Name (MRN) identity.

</documentation>

</annotation>

<restriction base="string"/>

</simpleType>

<simpleType name="VesselIdentifer">

<annotation>

<documentation>

Globally unique identification of the vessel, i.e. IMO number, MMSI number.

The identifier should conform to a Maritime Resource Name (MRN) identity.

</documentation>

</annotation>

<restriction base="string"/>

</simpleType>

<simpleType name="AnchorageIdentifier">

<annotation>

<documentation>

Globally unique identification of the anchorage.

The identifier should conform to a Maritime Resource Name (MRN) identity.

</documentation>

</annotation>

<restriction base="string"/>

</simpleType>

<simpleType name="AnchoragePointIdentifier">

<annotation>

<documentation>

May be one of:

If registered in MRN, it refers to globally unique identification of the anchorage position.

If unregistered in MRN, it refers to latitude and longitude of the assigned anchorage position.

</documentation>

</annotation>

<restriction base="string"/>

</simpleType>

<simpleType name="MessageResponseType" final="restriction">

<annotation>

<documentation>

Types of reply for the vessel’s anchoring request. The reply message type field has one of the following values:

• accept

agree the vessel’s anchoring request, and assign anchorage position.

• reject

deny the vessel’s anchoring request.

• suggest

deny the vessel’s anchoring request, while provide recommendation.

• received

notify that the vessel’s anchoring request has been received.

</documentation>

</annotation>

<restriction base="string">

<enumeration value="accept"/>

<enumeration value="reject"/>

<enumeration value="suggest"/>

<enumeration value="recieved"/>

</restriction>

</simpleType>

<complexType name="RequestData">

<annotation>

<documentation>

Information of the vessel’s voyage dynamic associated with anchoring request.

- anchorageId Globally unique identification of the anchorage.

The identifier should conform to a Maritime Resource Name (MRN) identity.

- ETA Estimated time of arrival to anchorage.

- ETD Estimated time of departure from anchorage.

- draft Refers to the vessel’s actual draft for VTS to assign a suitable anchorage position based on water depth.

</documentation>

</annotation>

<sequence>

<element name="anchorageId" type="AnchorageAssignmentServiceSchema:AnchorageIdentifier" minOccurs="1" maxOccurs="1"/>

<element name="ETA" type="dateTime" minOccurs="1" maxOccurs="1"/>

<element name="ETD" type="dateTime" minOccurs="1" maxOccurs="1"/>

<element name="draft" minOccurs="1" maxOccurs="1">

<simpleType>

<annotation>

<documentation>

Keep two valid decimal places after the decimal point ##.##

</documentation>

</annotation>

<restriction base="decimal">

<fractionDigits value="2"/>

<pattern value="[0-9]{0,2}[.][0-9]{2}"/>

</restriction>

</simpleType>

</element>

</sequence>

</complexType>

<complexType name="ResponseData">

<annotation>

<documentation>

Information of recommendation or requirement (negotiation) for the vessel’s anchoring request.

- TA Refers to time of arrival. Should be one of:

If the value of ‘messageType’ is ‘accept’, then ‘TA’ is the required time of arrival (QTA).

If the value of ‘messageType’ is ‘suggest’, then ‘TA’ is the recommended time of arrival (RTA).

- TD Refers to time of departure. Should be one of:

If the value of ‘messageType’ is ‘accept’, then ‘TA’ is the required time of departure (QTD).

If the value of ‘messageType’ is ‘suggest’, then ‘TA’ is the recommended time of departure (RTD).

- position Optional reference to the informationof the assigned anchorage position. Should be one of:

If the value of ‘messageType’ is ‘accept’, then ‘AnchoringPoint’ is mandatory to provide.

If the value of ‘messageType’ is others, then ‘AnchoringPoint’ is not refer.

</documentation>

</annotation>

<sequence>

<element name="TA" type="dateTime" minOccurs="1" maxOccurs="1"/>

<element name="TD" type="dateTime" minOccurs="1" maxOccurs="1"/>

<element name="position" type="AnchorageAssignmentServiceSchema:AnchoringPoint" minOccurs="0" maxOccurs="1"/>

</sequence>

</complexType>

<complexType name="AnchoringPoint">

<annotation>

<documentation>

Information of the assigned anchorage position.

- point May be one of:

If registered in MRN, it refers to globally unique identification of the anchorage position.

If unregistered in MRN, it refers to latitude and longitude of the assigned anchorage position.

</documentation>

</annotation>

<sequence>

<element name="point" type="AnchorageAssignmentServiceSchema:AnchoragePointIdentifier" minOccurs="1" maxOccurs="1"/>

</sequence>

</complexType>

<complexType name="AnchorageRequestInfo">

<annotation>

<documentation>

Information of the vessel’s anchoring request.

- category Service identifier type to be used for the corresponding service call.

Globally unique identification of the service. Newer versions of the same service specification shall not change the id.

The identifier should conform to a Maritime Resource Name (MRN) identity.

- vesselId Globally unique identification of the vessel, i.e. IMO number, MMSI number.

The identifier should conform to a Maritime Resource Name (MRN) identity.

- requestData Refers to the vessel’s voyage dynamicinformation for anchoring request. It is mandatory to provide.

</documentation>

</annotation>

<sequence>

<element name="category" type="AnchorageAssignmentServiceSchema:ServiceIdentifier" minOccurs="1" maxOccurs="1"/>

<element name="vesselId" type="AnchorageAssignmentServiceSchema:VesselIdentifer" minOccurs="1" maxOccurs="1"/>

<element name="requestData" type="AnchorageAssignmentServiceSchema:RequestData" minOccurs="1" maxOccurs="1"/>

</sequence>

</complexType>

<complexType name="AnchorageReqResponse">

<annotation>

<documentation>

Information of replyfor the vessel’s anchoring request.

- messageType Types of reply for the vessel’s anchoring request. The reply message type field has one of the following values:

• accept

agree the vessel’s anchoring request, and assign anchorage position.

• reject

deny the vessel’s anchoring request.

• suggest

deny the vessel’s anchoring request, while provide recommendation.

• received

notify that the vessel’s anchoring request has been received.

- reqId After the anchoring request sent by the vesselto the service is successfully received, the unique identifier provided by the service is recommended to use UUID.

- responseData Optional reference to the recommended or required (negotiated) information associated withthe vessel’s anchoring request. Should be one of:

If the value of ‘messageType’ is ‘reject’ or ‘received’, then ‘responseData’ does not refer.

If the value of ‘messageType’ is ‘accept’ or ‘suggest’, then ‘responseData’ is mandatory to provide.

</documentation>

</annotation>

<sequence>

<element name="messageType" type="AnchorageAssignmentServiceSchema:MessageResponseType" minOccurs="1" maxOccurs="1"/>

<element name="reqId" type="string" minOccurs="1" maxOccurs="1"/>

<element name="responseData" type="AnchorageAssignmentServiceSchema:ResponseData" minOccurs="0" maxOccurs="1"/>

</sequence>

</complexType>

<complexType name="AnchorConfirmInfo">

<annotation>

<documentation>

Information of the vessel’s confirmation to the assigned anchorage position as well as QTA and QTD.

- category Service identifier type to be used for the corresponding service call.

Globally unique identification of the service. Newer versions of the same service specification shall not change the id.

The identifier should conform to a Maritime Resource Name (MRN) identity.

- reqId After the anchoring request sent by the vesselto the service is successfully received, the unique identifier provided by the service is recommended to use UUID.

</documentation>

</annotation>

<sequence>

<element name="category" type="AnchorageAssignmentServiceSchema:ServiceIdentifier" minOccurs="1" maxOccurs="1"/>

<element name="reqId" type="string" minOccurs="1" maxOccurs="1"/>

</sequence>

</complexType>

<complexType name="AnchorageSubResponse">

<annotation>

<documentation>

Information of response for subscription.

- status Flag to indicate whether the subscribe operation or unsubscribe operation shall be ‘successful’.

- category Service identifier type to be used for the corresponding service call.

Globally unique identification of the service. Newer versions of the same service specification shall not change the id.

The identifier should conform to a Maritime Resource Name (MRN) identity.

</documentation>

</annotation>

<sequence>

<element name="status" type="boolean" minOccurs="1" maxOccurs="1"/>

<element name="category" type="AnchorageAssignmentServiceSchema:ServiceIdentifier" minOccurs="1" maxOccurs="1"/>

</sequence>

</complexType>

</schema>