NW-NM REST Service Technical Design v0.1

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Document status

Authors

Name	Organisation
Peder O. Pedersen	DMA

Document History

Version	Date	Initials	Description
0.1	02.05.2016	POP	Initial version

Review

Name	Organisation

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Contents

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1 Introduction

1.1 Caveat

This technical design document has been written at an early stage of the EfficienSea 2 project, where the NW-NM model, API and implementation (project *Niord*) is nowhere near completion. The main purpose of the document is to serve as a discussion paper at an upcoming E2 conference.

1.2 Purpose of the document

This document covers a REST-based technical design of the MW-NM service specification [1], according to the guidelines given in the Service Description Guidelines [2].

1.3 Intended readership

This service technical design is intended to be read by service architects, system engineers and developers in charge of designing and developing an instance of the REST-bases NW-NM service.

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

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2 Service Technical Design identification

Name	NW-NM T&P Maritime Cloud REST Service
ID	urn:mrnx:mcl:service:dma:nw-nm:rest
Version	0.1
Description	The NW-NM Maritime Cloud REST service specification defines a combined NW-NM T&P model in JSON, along with the actual REST service API used for accessing NW-NM data, as registered in the Maritime Cloud service catalogue.
Keywords	NW, NM, Navigational Warnings, Notices to Mariners, MSI, Maritime Cloud Service. REST.
Architect(s)	e-Navigation Team Danish Maritime Authority Carl Jacobsens Vej 31 DK-2500 København K Telephone: +45 40 72 61 08 Email: mcb@dma.dk
Status	Identified.

2.1 Service Specification

This technical design describes a REST/JSON based version of the NW-NM Technical Specification [1], referenced below:

Name	NW-NM T&P Maritime Cloud Service
ID	urn:mrnx:mcl:service:dma:nw-nm
Version	0.1

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3 Service overview

This chapter will outline the REST implementation of the services described in the Service Specification [1].

3.1 Service Interfaces

The NW-NM REST service consists of a single public REST endpoint to query the currently published NW-NM messages (Request/Reply Message Exchange Pattern).

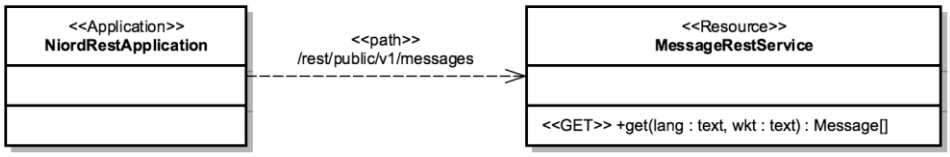

Figure 1: NW-NM Service Definition Diagram

ServiceInterface	Role (from service provider point of view)	ServiceOperation
MessageRestService	Provided	get(lang, wkt)

The returned data model is detailed in chapter 4 and the service operation in chapter 5.

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4 Service Data Model

This chapter details the concrete JSON data model implementation of the data model described in the Service Specification [1].

4.1 Data Model

The JSON data model is detailed in Appendix B as a Swagger Specification (a.k.a. OpenAPI specification) [3].

There is a very direct 1:1 mapping between the UML/XML model detailed in the Service Specification and the JSON data model adopted in this technical design. In fact, both are generated from the same Java class library (niord-model).

Hence, this technical design does not provide an explicit mapping table between the Service Specification model and the Technical Design JSON model.

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5 REST Service interface specifications

This chapter describes the details of the NW-NM REST service interface, which is the REST based implementation of the MessageService specified in the Service Specification [1].

5.1 Service Endpoint /public/v1/messages

The NW-NM service is comprised of a single REST endpoint, /public/v1/messages, which follows the Request/Reply Message Exchange Pattern. Sequence diagram:

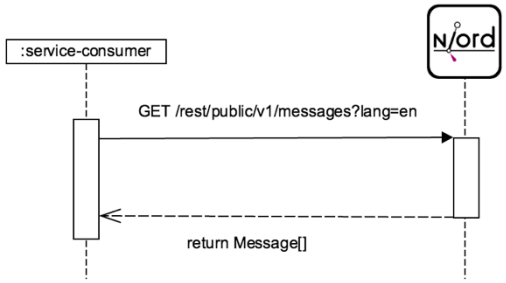

Figure 1: NW-NM Service Sequence Diagram

The formal service interface is detailed in Appendix B as a Swagger Specification (a.k.a. OpenAPI specification) [3].

5.1.1 Operation HTTP GET

The HTTP GET operation returns the list of all published NW and NM messages. The returned result can be controlled using the following parameters:

Parameter	Type	Description
lang	String	An optional ISO-2 language code. If specified, only this language variant is returned for localized entities such as Message, Area and Category. However, if, say, “en” is requested and an entity only has a “da” language description entity, then this is returned instead. A client may want to flag this to the end user.
wkt	String	Optional Well-Known Text representation of a geometry. If specified, only messages intersecting the geometry will be returned.
Header	**values**	**Description**
Accept	application/json, application/xml	Request that the returned data is in the JSON or XML format. Only the JSON format is described in this document.
Return	**Type**	**Description**
	Message[]	The list of published NW and NM messages in the requested format.

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6 References

Nr.	Reference
[1] NW-NM Service Specification	E2 - NW-NM Service Specification version 0.1
[2] Service Description Guidelines	E2_Deliverable D3.4 – Service Specification Template, version 1.0
[3] Swagger (OpenAPI) specification.	Available at https://github.com/OAI/OpenAPI-Specification

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7 Acronyms and Terminology

7.1 Acronyms

Term	Definition
API	Application Programming Interface
DMA	Danish Maritime Authority
MC	Maritime Cloud
MEP	Message Exchange Pattern
MRN	Maritime Resource Name
NM	Notices to Mariners
NW	Navigational Warning
REST	Representational State Transfer
XML	Extendible Mark-up Language
XSD	XML Schema Definition

7.2 Terminology

Term	Definition
Navigational Warnings	Navigational Warnings (NW) are part of the Maritime Safety Information (MSI) system. Currently, NW's are promulgated in text via SafetyNET, NAVTEX, and is in some countries accessible on the WWW or as voice broadcasts via coastal radio stations.
Niord	Anglified name of the Norse God Njord, associated with the sea and seafaring. Also the name of the EfficienSea 2 sub-project implementation of the NW-NM service and authoring system. See http://niord.org
niord-model	A java implementation of the JSON/XML model used by the NW-NM REST service. Available at https://github.com/NiordOrg/niord/tree/master/niord-model
Notices to Mariners	Notices to Mariners (NM) are promulgated weekly in order to keep nautical charts and publications, as far as possible, up to date. Temporary (T) and Preliminary (P) NMs advise mariners of important matters affecting navigational safety, including new hydrographic information (in advance of new editions or chart updates), changes to routing measures and aids to navigation, and other important categories of data. NM T&P's are today promulgated on paper weekly, fortnightly or monthly and are often accessible on the WWW in PDF format. Not all ENCs include T&P information currently.
Swagger API	Swagger provides a framework (and utilities) for specifying a REST API.

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Appendix A Service Technical Design XML

This appendix contains the formal XML definition of the service Technical Design. The actual Swagger API has been included separately in Appendix B

```
<?xml version="1.0" encoding="UTF-8"?>
<ServiceDesignSchema:serviceDesign
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:ServiceDesignSchema="http://efficiensea2.org/maritime-cloud/ServiceDesignSchema.xsd"
      targetNamespace="http://efficiensea2.org/maritime-cloud/ServiceDesignSchema.xsd">
   <id>urn:mrnx:mcl:service:dma:nw-nm:rest</id>
   <version>0.1.0</version>
   <name>NW-NM T&amp;amp;P Maritime Cloud REST Service</name>
   <description>
      A REST-based implementation of the NW-NM Maritime Cloud service specification.
   </description>
   <offersTransport>
      <Transport>
         <name>REST</name>
         <description>This service implementation is available as REST over HTTPS</description>
         <protocol>HTTPS</protocol>
      </Transport>
   </offersTransport>
   <designsServiceSpecifications>
     <ServiceSpecificationReference>
        <id>urn:mrnx:mcl:service:nw-nm</id>
        <version>0.1.0</version>
     </ServiceSpecificationReference>
   </designsServiceSpecifications>
   <designedBy>
     <VendorInfo>
       <id>urn:mrn:mcl:user:dma:mcb</id>
       <name>Mads Bentzen Billesø</name>
       <description>Responsible for the NW-NM service</description>
       <contactInfo>mcb@dma.dk</contactInfo>
       <isCommercial>false</isCommercial>
     </VendorInfo>
   </designedBy>
   <servicePhysicalDataModel>
      <name>NW-NM REST Service Swagger API</name>
      <description>
        Swagger API of the NW-NM REST Service
      </description>
      <modelType>JSON</modelType>
      <model>http://niord.e-navigation.net/rest/swagger.json</model>
   </servicePhysicalDataModel>
</ServiceDesignSchema:serviceDesign>
```


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Appendix B Swagger API sans GeoJSON

This appendix contains the formal Swagger definition of the NW-NM REST service.

The GeoJSON package is an implementation of an external data model, as defined at http://geojson.org/geojson-spec.html. The classes have been excluded from the model below for clarity reasons, but the complete Swagger definition can be found at http://niord.e-navigation.net/rest/swagger.json.


```
{
 "swagger": "2.0",
 "info": {
  "version": "1.0.0"
 },
 "basePath": "/rest",
 "tags": [
  {
   "name": "message_list"
  }
 ],
 "paths": {
  "/public/v1/messages": {
   "get": {
    "tags": [
     "message_list"
    ],
    "summary": "Returns the public NW and NM messages",
    "description": "",
    "operationId": "search",
    "produces": [
     "application/json;charset=UTF-8",
     "application/xml;charset=UTF-8"
    ],
    "parameters": [
     {
      "name": "lang",
      "in": "query",
      "description": "Two-letter ISO 639-1 language code",
      "required": false,
      "type": "string",
      "x-example": "en"
     },
     {
      "name": "wkt",
      "in": "query",
      "description": "Well-Known Text for geographical extent",
      "required": false,
      "type": "string",
      "x-example": "POLYGON((7 54, 7 57, 13 56, 13 57, 7 54))"
     }
    ],
    "responses": {
     "200": {
      "description": "successful operation",
      "schema": {
       "type": "array",
       "items": {
        "$ref": "#/definitions/Message"
       }
      }
     }
    }
   }
  }
 },
 "definitions": {
  "MessageSeries": {
   "type": "object",
   "properties": {
    "seriesId": {
     "type": "string"
```


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```
    },
    "mainType": {
      "type": "string",
      "enum": [
        "NW",
        "NM"
      ]
    },
    "mrnFormat": {
      "type": "string"
    },
    "shortFormat": {
      "type": "string"
    }
  },
  "description": "A message series",
  "xml": {
    "name": "messageSeries"
  }
},
"Category": {
  "type": "object",
  "properties": {
    "id": {
      "type": "integer",
      "format": "int32",
      "xml": {
        "attribute": true
      }
    },
    "mrn": {
      "type": "string"
    },
    "parent": {
      "$ref": "#/definitions/Category"
    },
    "children": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/Category"
      }
    },
    "descs": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/CategoryDesc"
      }
    }
  },
  "description": "Hierarchical category model",
  "xml": {
    "name": "category"
  }
},
"CategoryDesc": {
  "type": "object",
  "properties": {
    "lang": {
      "type": "string",
      "xml": {
        "attribute": true
      }
    },
    "name": {
      "type": "string"
    }
  },
  "description": "Translatable fields of the Category model"
},
"Message": {
  "type": "object",
  "properties": {
    "id": {
      "type": "integer",
      "format": "int32",
      "xml": {
        "attribute": true
      }
    },
    "created": {
      "type": "string",
      "format": "date-time",
```


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```
      "xml": {
        "attribute": true
      }
    },
    "updated": {
      "type": "string",
      "format": "date-time",
      "xml": {
        "attribute": true
      }
    },
    "version": {
      "type": "integer",
      "format": "int32",
      "xml": {
        "attribute": true
      }
    },
    "messageSeries": {
      "$ref": "#/definitions/MessageSeries"
    },
    "number": {
      "type": "integer",
      "format": "int32"
    },
    "mrn": {
      "type": "string"
    },
    "shortId": {
      "type": "string"
    },
    "mainType": {
      "type": "string",
      "enum": [
        "NW",
        "NM"
      ]
    },
    "type": {
      "type": "string",
      "enum": [
        "PERMANENT_NOTICE",
        "TEMPORARY_NOTICE",
        "PRELIMINARY_NOTICE",
        "MISCELLANEOUS_NOTICE",
        "COASTAL_WARNING",
        "SUBAREA_WARNING",
        "NAVAREA_WARNING",
        "LOCAL_WARNING"
      ]
    },
    "status": {
      "type": "string",
      "enum": [
        "IMPORTED",
        "DRAFT",
        "VERIFIED",
        "PUBLISHED",
        "EXPIRED",
        "CANCELLED",
        "DELETED"
      ]
    },
    "areas": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/Area"
      }
    },
    "categories": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/Category"
      }
    },
    "charts": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/Chart"
      }
    },
    "horizontalDatum": {
```


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```
      "type": "string"
     },
     "geometry": {
      "$ref": "#/definitions/FeatureCollection"
     },
     "startDate": {
      "type": "string",
      "format": "date-time"
     },
     "endDate": {
      "type": "string",
      "format": "date-time"
     },
     "publishDate": {
      "type": "string",
      "format": "date-time"
     },
     "cancellationDate": {
      "type": "string",
      "format": "date-time"
     },
     "dateIntervals": {
      "type": "array",
      "items": {
       "$ref": "#/definitions/DateInterval"
      }
     },
     "references": {
      "type": "array",
      "uniqueItems": true,
      "items": {
       "$ref": "#/definitions/Reference"
      }
     },
     "atonUids": {
      "type": "array",
      "items": {
       "type": "string"
      }
     },
     "originalInformation": {
      "type": "boolean",
      "default": false
     },
     "descs": {
      "type": "array",
      "items": {
       "$ref": "#/definitions/MessageDesc"
      }
     }
    },
    "description": "Main NW and NM message class",
    "xml": {
     "name": "message"
    }
   },
   "Reference": {
    "type": "object",
    "properties": {
     "messageId": {
      "type": "string"
     },
     "type": {
      "type": "string",
      "enum": [
       "REFERENCE",
       "REPETITION",
       "CANCELLATION",
       "UPDATE"
      ]
     },
     "description": {
      "type": "string"
     }
    },
    "description": "A message reference"
   },
   "DateInterval": {
    "type": "object",
    "properties": {
     "fromDate": {
      "type": "string",
```


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```
      "format": "date-time"
     },
     "toDate": {
      "type": "string",
      "format": "date-time"
     }
    },
    "description": "Date interval"
   },
   "MessageDesc": {
    "type": "object",
    "properties": {
     "lang": {
      "type": "string",
      "xml": {
       "attribute": true
      }
     },
     "title": {
      "type": "string"
     },
     "subject": {
      "type": "string"
     },
     "description": {
      "type": "string"
     },
     "otherCategories": {
      "type": "string"
     },
     "time": {
      "type": "string"
     },
     "vicinity": {
      "type": "string"
     },
     "note": {
      "type": "string"
     },
     "publication": {
      "type": "string"
     },
     "source": {
      "type": "string"
     }
    },
    "description": "Translatable fields of the Message model"
   },
   "Area": {
    "type": "object",
    "properties": {
     "id": {
      "type": "integer",
      "format": "int32",
      "xml": {
       "attribute": true
      }
     },
     "mrn": {
      "type": "string"
     },
     "type": {
      "type": "string",
      "enum": [
       "COUNTRY",
       "FIRING_AREA"
      ]
     },
     "parent": {
      "$ref": "#/definitions/Area"
     },
     "geometry": {
      "$ref": "#/definitions/GeoJson"
     },
     "children": {
      "type": "array",
      "items": {
       "$ref": "#/definitions/Area"
      }
     },
     "siblingSortOrder": {
      "type": "number",
```


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```
      "format": "double",
      "xml": {
       "attribute": true
      }
     },
     "descs": {
      "type": "array",
      "items": {
       "$ref": "#/definitions/AreaDesc"
      }
     }
    },
    "description": "Hierarchical area model",
    "xml": {
     "name": "area"
    }
   },
   "LineString": {
    "allOf": [
     {
      "$ref": "#/definitions/GeoJson"
     },
     {
      "type": "object",
      "properties": {
       "coordinates": {
        "type": "array",
        "items": {
         "type": "array",
         "items": {
          "type": "number",
          "format": "double"
         }
        }
       }
      },
      "description": "GeoJson LineString type",
      "xml": {
       "name": "lineString"
      }
     }
    ]
   },
   "AreaDesc": {
    "type": "object",
    "properties": {
     "lang": {
      "type": "string",
      "xml": {
       "attribute": true
      }
     },
     "name": {
      "type": "string"
     }
    },
    "description": "Translatable fields of the Area model"
   },
   "Chart": {
    "type": "object",
    "properties": {
     "chartNumber": {
      "type": "string"
     },
     "internationalNumber": {
      "type": "integer",
      "format": "int32"
     },
     "geometry": {
      "$ref": "#/definitions/GeoJson"
     },
     "horizontalDatum": {
      "type": "string"
     },
     "scale": {
      "type": "integer",
      "format": "int32"
     },
     "name": {
      "type": "string"
     },
     "fullChartNumber": {
```


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```
      "type": "string"
     }
    },
    "description": "Sea chart model",
    "xml": {
     "name": "chart"
    }
   }
  }
}
```


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