

Input paper for the following Committee(s):

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7.1.7 MCP platform specification

Author(s)/Submitter(s)

Fintraffic, Finland
GLA, UK & Ireland
SAAB (Navelink/Combitech), Sweden
DLR, Germany
AIVeNautics, Korea

USE CASES FOR MCP SERVICE REGISTRY

1. SUMMARY

At the recent IALA council meeting, a guideline for provisioning of MCP identities (G1183) was formally adopted. Following this work - the plan is to work on a specification for the MCP service registry (MSR). Although a prototype of an MCP MSR has been part of the MCP consortium (MCC) public demonstrator of the MCP for several years - this has never formally been specified. The topic has been discussed in the general working group of the MCC, and the group has started from scratch with defining use-cases for the MCP MSR.

The present input paper described initial use-cases for the MSR - to be discussed further in the TG 7.1.7 'MCP platform specification' of DTEC WG1.

Note - the format is currently not following the IALA style-guide, since the use-cases are described in the markdown format. It is the intention to keep working with this format - until we have a final version.

2. ACTION REQUESTED OF THE COMMITTEE

To progress the description of MSR use-cases.

¹ Input document number, to be assigned by the Committee Secretary

² Leave open if uncertain

Introduction

This is a common location for the definition of the main use cases for the MCP Service Registry.

The scope of these use cases is not confined to the strict limits of the Service Registry, but also includes external MCP operations such as the global discoverability and the MCP trust system.

Terminology

- MCP Service Registry or MSR: a standardized system for the discovery and documentation of services used within the maritime domain, at its conceptual level
- MSR Service: an MSR instance
- MSR Service Provider: an MSR instance operator within a MCP domain
- MCP domain: a designated group within the Maritime Connectivity Platform (MCP) encompassing related assets identified and managed by an MCP Identity Provider
- MSR search domain: a predefined scope of search, could be identical with one MCP domain or public services across multiple MCP domains depending on type of search

Use Cases

This section presents some of the most significant use cases identified so far.

In this context the **MCP domain** is defined as all the components, services and information included in a single MCP instance.

The communication between MCP domains is assumed to exist in a technology agnostic manner, so that it does not bind the established use cases to a single technology, such as the blockchain-based implementation of the MCP ledger. To define this technology agnostic inter-operation between the different MCP instances, we will be referring to the **Global MCP Search Platform**.

The **end-user** reference describes all human and non-human (machine) maritime actors that can operate as clients and request information from the Service Registry. Therefore in some of the following use-case definitions, the client might be not be referred to as an end-user, but with another more specific title, e.g. the planning office etc.

User Perspective Requirements

- Ship (User) expects to make ONE search and find services in MCP, across all MCP providers (MSRs)

- Ship (User) wants to be able to make geographical search (search for services providing service in certain area(s))
- User wants to find services of different (compliant) technologies in same search (e.g. SECOM, MMS, VDES, Web pages)
- User wants to be able to filter the result at least based on ServiceType, ServiceDesign, ServiceCoverageArea, ServiceStatus
- User wants to keep number of service calls and amount of data exchanged as low as possible
- User expects to understand service authorization and payment requirements from the returned response from the search

Use Case List

- Use Case 1: Local Search
- Use Case 2: Global Search
- Use Case 3: On-Broad Search

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Use Case 1: Local Search

- **Who:** An end-user registered with a legitimate MCP instance
- **Wants to:** perform a search for a service located in the same MCP domain
- **So that:** they can plan a route towards their nearby destination.

Description

An end-user is a registered user of a legitimate MCP instance. They intent to make a trip towards a nearby destination and will need maritime information (such as Navigational Warnings, AtoN information) regarding their pre-selected route. To find the appropriate services that can provide that information, the end-user performs a search query to their respective MSR submitting as query parameters their route path, and the service design, MRN which is compatible with their onboard equipment.

Actors

- End-user (ECDIS, Route-Planning System or human mariner)
- MSR Service of the end-user's MCP domain
- Maritime Information Service (such as for Navigational Warnings, AtoN information)

Frequency of Use Typically triggered when the end-user is planning for a trip in proximity to their base of operations.

Pre-Conditions

- The end-user is registered with a legitimate MCP instance.
- The end-user's MCP instance already includes in its domain at least one service that meets the end-user's requirements.
- The end-user maintains connectivity throughout the whole operation.
- All actors support the SECOM *searchService* interface.

Ordinary Sequence

1. User sends a search request to the MSR, including its route path and other criteria.
2. The end-user's MSR searches its internal database and responds directly to the end-user with a list of the currently registered services that meet the provided criteria.
3. The end-user will receive the service information list, which includes the endpoint information.
4. The end-user will make a selection on which of the services it will contact.
5. The end-user will contact the selected maritime information service.
6. The data is rendered and displayed to the user.

Post-Conditions The correct maritime information is received by the end-user.

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Use Case 2: Global Search

- **Who:** An end-user registered with a legitimate MCP instance
- **Wants to:** perform a search for a service located in a different MCP domain
- **So that:** they can plan a route towards their remote destination.

Description

An end-user is a registered user of a legitimate MCP instance. They intent to make a trip towards a remote destination and will need maritime information (such as Navigational Warnings, AtoN information) regarding their pre-selected route. To find the appropriate services that can provide that information, the end-user performs a search query to their respective MSR submitting as query parameters their route path, and the service design MRN, which is compatible with their onboard equipment. Because of the nature of the trip, the end-user is aware of the need to perform a **global** search, .i.e. also search for the appropriate services in compatible Service Registries other than their own.

Actors

- End-user (ECDIS, Route-Planning System or human mariner)
- MSR Service of the end-user's MCP domain

- Global MCP Search Platform
- MSR Service from other MSR Service Provider
- Maritime Information Service (such as for Navigational Warnings, AtoN information) in different MCP domain

Frequency of Use Typically triggered when the end-user is planning for a trip far away from their base of operations.

Pre-Conditions

- The end-user is registered with a legitimate MCP instance.
- The end-user's MCP instance is interconnected with a compatible instance that does include in its domain a service that meets the end-user's requirements.
- The end-user maintains connectivity throughout the whole operation.
- All actors support the SECOM *searchService* interface.

Ordinary Sequence

1. User sends a search request to the MSR, including its route path and other criteria.
2. The end-user's search request includes a indication that the MSR should perform a *global* search.
3. The end-user's MSR searches its internal database but does not find a matching registered entry.
4. The end-user's MSR propagates the search request (along with the geospatial description of the route?) to the Global MCP Search Platform.
5. The Global MCP Search Platform will search for other interconnected MSRs, which might have services that meet the requirements specified in the received request.
6. The Global MCP Search Platform will respond with the identifiers and contact information of the MSRs in other MCP domains that are at least likely to contain information relevant to the end-user's request.
7. The end-user's MSR will propagate the user-user's search request to the MSRs identified by the Global MCP Search Platform.
8. The end-user's MSR will collect all valid responses and compile a single list of search response entries.
9. The end-user will receive the service information list, which includes the endpoint information.
10. The end-user will make a selection on which of the services it will contact.
11. The end-user will contact the selected maritime information service.
12. The data is rendered and displayed to the user.

Post-Conditions The correct maritime information is received by the end-user.

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Use Case 3: On-Broad Search

- **Who:** An end-user on-board a large vessel (e.g. tanker), registered with a legitimate MCP instance
- **Wants to:** perform a search for a service they are interested in
- **So that:** they can receive maritime information, while traveling towards a destination which was identified while on-route

Description

An end-user is a registered user of a legitimate MCP instance. The end-user is travelling towards a destination which is not exactly known until the last part of their journey. Therefore for that last leg of the trip they need to find the appropriate services that can provide that information, while on-board. The end-user performs a search query to their respective MSR submitting as query parameters their route path, and the service design MRN, which is compatible with their onboard equipment.

Actors

- End-user (ECDIS, Route-Planning System or human mariner)
- MSR Service of the end-user's MCP domain
- Maritime Information Service (such as for Navigational Warnings, AtoN information)

Frequency of Use Typically triggered when the end-user is while on-board a large vessel (e.g. tanker), travelling towards a destination which is not previously known.

Pre-Conditions

- The end-user is registered with a legitimate MCP instance.
- The end-user's MCP instance is interconnected with a compatible instance that does include in its domain a service that meets the end-user's requirements.
- The end-user maintains connectivity throughout the whole operation.
- All actors support the SECOM *searchService* interface.

Ordinary Sequence

1. User sends a search request to the MSR, including its route path and other criteria.
2. The end-user's MSR searches its internal database and responds directly to the end-user with a list of the currently registered services that meet the provided criteria.
3. The end-user will receive the service information list, which includes the endpoint information.

4. The end-user will make a selection on which of the services it will contact.
5. The end-user will contact the selected maritime information service.
6. The data is rendered and displayed to the user.

Post-Conditions The correct maritime information is received by the end-user.