

Interface Design Description (IDD) for DataManager over REST

**Abstract**

This document describes for the Interface Design Description (IDD) of the Arrowhead DataManager service’s interfaces.

An Interface Design Description provides a detailed description of how the service is implemented/realized by using the Communication Profile and the chosen technologies.

This document outlines interfaces, message formats, metadata, and other important information to be able to use the DataManager system’s interfaces.

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## Interface Design Description Overview

This section contains pointers to Service Description (SD) documents.

Table 1 Pointers to SD documents

|  |  |
| --- | --- |
| **Service description** | **Path** |
| Historian service | tbd |
| Proxy service | tbd |

This document describes how to utilize the Orchestrator system’s Orchestration service. Other services, such as the Management service, is not provided over MQTT.

* Protocol: HTTP
* Encoding: JSON
* Compression: none
* Security: Optionally using TLS and X.509 certificates (server and client)

## Service Interfaces

## Interface 1: Echo

Below are the specifics of this interface:

* The data model is plain text.
* The true message semantics is the same as the REST-based Orchestrator, with the extension that the messages are added as a payload field in an REST-Over-MQTT message
* No ontologies are in use.
* No schemas is currently defined.
* No payload encryption is used.

Table 4 Function description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function** | **Service** | **Method** | **Input** | **Output** |
| Echo | Echo | GET | - | String |

## Information Model

The information for Echo is very basic. There is no input, and only plain text output.

## Error handling

There is no error handling for the Echo interface.

## Interaction with consumers

Echo only supports read operations, where the response is always a string “Got it”. This can be used to test if a system is actually running. No authorization is needed.



Figure : Echo interface

## Interface 2: Historian

Below are the specifics of this interface:

* The data model is JSON.
* The true message semantics is the same as the REST-based Orchestrator, with the extension that the messages are added as a payload field in an REST-Over-MQTT message
* No ontologies are in use.
* No schemas are currently defined.
* No payload encryption is used. With MQTT 5.0 it will be possible to use payload encryption between different systems.

Table 4 Function description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function** | **Service** | **Method** | **Input** | **Output** |
| ListSystems | Historian | POST |  | SystemList |
| GetData | Historian | GET | systemName and serviceName | Sensor data |
| StoreData | Historian | PUT | systemName , serviceName, plus Sensor data | Result code |

## Information Model

In order to get a list of endpoints, a GET request must be sent to the corresponding URI. to the /orchestration endpoint. The response upon success is a Orchestration Response.

### Input: ServiceRequestForm message

{

"requesterSystem": {

"systemName": "string",

"address": "string",

"port": 0,

"authenticationInfo": "string"

},

"requestedService": {

"serviceDefinitionRequirement": "string",

"interfaceRequirements": [

"string"

],

"securityRequirements": [

"NOT\_SECURE", "CERTIFICATE", "TOKEN"

],

"metadataRequirements": {

"additionalProp1": "string",

"additionalProp2": "string",

"additionalProp3": "string"

},

"versionRequirement": 0,

"maxVersionRequirement": 0,

"minVersionRequirement": 0

},

"preferredProviders": [

{

"providerCloud": {

"operator": "string",

"name": "string"

},

"providerSystem": {

"systemName": "string",

"address": "string",

"port": 0

}

}

],

"orchestrationFlags": {

"additionalProp1": true,

"additionalProp2": true,

"additionalProp3": true

}

}

### Output: Orchestration Response

{

"serviceQueryData": [

{

"id": 0,

"serviceDefinition": {

"id": 0,

"serviceDefinition": "string",

"createdAt": "string",

"updatedAt": "string"

},

"provider": {

"id": 0,

"systemName": "string",

"address": "string",

"port": 0,

"authenticationInfo": "string",

"createdAt": "string",

"updatedAt": "string"

},

"serviceUri": "string",

"endOfValidity": "string",

"secure": "NOT\_SECURE",

"metadata": {

"additionalProp1": "string",

"additionalProp2": "string",

"additionalProp3": "string"

},

"version": 0,

"interfaces": [

{

"id": 0,

"interfaceName": "string",

"createdAt": "string",

"updatedAt": "string"

}

],

"createdAt": "string",

"updatedAt": "string"

}

],

"unfilteredHits": 0

}

## Parameters

This interface does not take any query path parameters.

## Response codes

|  |  |
| --- | --- |
| Code | **Meaning** |
| 200 | Successful request |
|  |  |

## Error handling

If the request was successful, a Orchestration Response is returned with a response code of 200. If an error occurs, for example due to an incorrectly formatted request, an error message is returned with the reason.

## Interaction with consumers

Figure 2 shows how a client must perform an orchestration operation.



Figure : Historian LiStSystems operation

## Interface 3: Proxy

Below are the specifics of this interface:

* The data model is JSON.
* Supported semantics is SenML
* No ontologies are in use.
* No schemas is currently defined.
* No payload encryption is used.

Table 5 Function description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function** | **Service** | **Method** | **Input** | **Output** |
| Start store Orchestration by ID | Service Discovery | GET | id | Orchestration Response |

## Information Model

In order to start an orchestration with a known id, a client can perform a GET to /orchestrator/orchestration/{id}. The id is sent as a query parameter The response upon success is an updated ServiceRegistryEntry message with all fields filled in.

### Output: Orchestration Response message

{

"response": [

{

"provider": {

"id": 0,

"systemName": "string",

"address": "string",

"port": 0,

"authenticationInfo": "string",

"createdAt": "string",

"updatedAt": "string"

},

"service": {

"id": 0,

"serviceDefinition": "string",

"createdAt": "string",

"updatedAt": "string"

},

"serviceUri": "string",

"secure": "TOKEN",

"metadata": {

"additionalProp1": "string",

"additionalProp2": "string",

"additionalProp3": "string"

},

"interfaces": [

{

"id": 0,

"createdAt": "string",

"interfaceName": "string",

"updatedAt": "string"

}

],

"version": 0,

"authorizationTokens": {

"interfaceName1": "token1",

"interfaceName2": "token2"

},

"warnings": [

"FROM\_OTHER\_CLOUD", "TTL\_UNKNOWN"

]

}

]

}

## Error handling

If the request was successful, an Orchestration Response message is returned inside a REST-over-MQTT encapsulation message, with a response code of 200. If an error occurs, for example due to an incorrectly formatted request, an error message is returned with the reason.

## Security

This service can either run unencrypted over HTTP, or using TLS plus server and client side X509 certificates.

## Certificates

This IDD is using the same certificates as provided by the Java Spring versions.

## Payload protection

Currently, no separate payload protection is supported.

## References

1. …

## Revision history

## Amendments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Date | Version | Subject of Amendments | Author |
| 1 | 2015-02-15 | 1.0 | Revision of text | Michele Albano / Luis Ferreira |
| 2 | 2015-09-30 | 1.1 | Refinement of the structure | Michele Albano / Luis Ferreira |
| 3 | 2020-06-07 | 2.0 | Major update | Jerker Delsing |
| 4 | 2020-06-29 | 2.1 | Added DataManager text | Jens Eliasson |
| 5 | 2020-07-01 | 2.2 | Added text, errors etc | Jens Eliasson |
| 6 |  |  |  |  |

## Quality Assurance

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Date | Version | Approved by |
| 1 |  |  |  |
| 2 |  |  |  |

## Appendixes

Appendix A: REST Communication profile (CP)