# SWIM-SERV-019 Protocols and data format

## Requirement

| | |
|---|---|
| **Title** | Service interface protocols and data format |
| **Identifier** | SWIM-SERV-019 |
| **Requirement** | A service description **shall** include the list of service interface protocols (including name and version) and data format to be used. |
| **Rationale** | Makes explicit within the service description what the protocols are. |
| **Verification** | Completeness: Verify that all relevant protocols and versions are listed; verify that the information is provided for each provider side and consumer side interface.<br>Consistency: Verify that the protocols are consistent with the selected interface binding.<br>Correctness: Not Applicable. |
| **Examples /Notes** | Note: The list of supported protocols are the ones corresponding to the selected interface binding. The supported versions of the protocols need to be declared. E.g. version of the Transport Level Security (TLS). |
| **Level of Implementation** | Mandatory |

## Guidance

### Examples

See the Service interface protocols and data format section within the Donlon TOBT Setting Service Description.

## Guidance for JSON service description

**tentative JSON Guidance**

Guidance for JSON service descriptions integrated within the SWIM Service Description Handbook.

**structure of guidance**

This requirement is about two kinds of information. The guidance is structured accordingly

- **part 1** - the list of **service interface protocols** (including name and version)
- **part 2 -** the **data format** to be used

## Schema

The guidance concerns JSON Schema v0.0.3 (see Schema releases).

### part 1 - service interface protocols

```
                "Interface" :
                {
                        "description" : "The means by which the underlying capabilities of a service are accessed. [SWIM-SERV-016]",
                        "type": "object",
                        "additionalProperties": false,
                        "required": ["name", "description", "interfaceProvisionSide", "tiPrimitiveMessageExchangePattern", "endPoint", "serviceInterfaceBinding", "networkInterfaceBinding", "interfaceBindingDescription", "operation", "behaviour"],
                        "properties":
                        {

                                "interfaceBindingDescription":
                                {
                                        "description" : "Complementary description of the protocols and other specifications used by the interface complementing the selected bindings, or any additional requirement specified in a SWIM TI Profile that is supported by the interface. [SWIM-SERV-018], [SWIM-SERV-019]",
                                        "type" : "string",
                                        "minLength":1
                                }

                        }
                }


                "ServiceTechnicalDescription" :
                {
                        "description" : "Description of the technical aspects of the service including data structures, interface and operations behaviour, security mechanisms and technical constraints",
                        "type": "object",
                        "additionalProperties": false,
                        "properties":
                        {

                                "securityMechanism":
                                {
                                        "description" : "A process (or a device incorporating such a process) that is utilized or implemented by the service in order to address a security threat.",
                                        "type" : "array",
                                        "items" : { "$ref":"#/definitions/SecurityMechanism" },
                                        "minItems": 1
                                }

                        }
                },


                "SecurityMechanism" :
                {
                        "description" : "A process (or a device incorporating such a process) that is utilized or implemented by the service in order to address a security threat.",
                        "type": "object",
                        "additionalProperties": false,
                        "required": ["name", "description"],
                        "properties":
                        {
                                "type":
                                {
                                        "description" : "The type of security mechanism.",
                                        "type" : "array",
                                        "items" : { "$ref":"#/definitions/CodeSecurityMechanismType" },
                                        "minItems": 0
                                },
                                "name":
                                {
                                        "description" : "The name of the security mechanism.",
                                        "type" : "string",
                                        "minLength":1
                                },
                                "description":
                                {
                                        "description" : "The description of the security mechanism.",
                                        "type" : "string",
                                        "minLength":1
                                }
                        }
                }


                "CodeSecurityMechanismType" :
                {
                        "description" : "A code listing the types of service mechanisms.",
                        "type": "string",
                        "enum":
                        [
                                "AUDIT",
                                "AUTHENTICATION",
                                "AUTHORIZATION",
                                "CONFIDENTIALITY",
                                "IDENTITY_MANAGEMENT",
                                "INTEGRITY",
                                "MONITORING",
                                "POLICY_ENFORCEMENT"
                        ]
                }
```

## part 2 - data formats

```
                "ServiceInformationDescription" :
                {
                        "description" : "A container for the description of the information exchanged by
the information service.",
                        "type": "object",
                        "additionalProperties": false,
                        "required": ["informationDefinition", "exchangeSchema"],
                        "properties":
                        {

                                "exchangeSchema":
                                {
                                        "description" : "Formal description of the data involved in an
information exchange.",
                                        "type" : "array",
                                        "items" : { "$ref":"#/definitions/ExchangeSchema" },
                                        "minItems": 1
                                }
                        }
                }


                "ExchangeSchema" :
                {
                        "description" : "Formal description of the data involved in an information
exchange.",
                        "type": "object",
                        "additionalProperties": false,
                        "required": ["name", "reference", "schemaLanguage"],
                        "properties":
                        {
                                "name":
                                {
                                        "description" : "The name of the exchange schema. [SWIM-SERV-
019]",
                                        "type" : "string",
                                        "minLength":1
                                },
                                "schemaLanguage":
                                {
                                        "description" : "Description of the language used (e.g. XML,
JSON). [SWIM-SERV-019]",
                                        "type" : "string",
                                        "minLength":1
                                },
                                "reference":
                                {
                                        "description" : "A reference to the exchange schema containing
the specifications of the data structures. [SWIM-SERV-019].",
                                        "type" : "string",
                                        "minLength":1
                                }
                        }
                }
```

Rules expressed for the cases as defined in Registry URD.

| case | rules |
|---|---|
| COMPLIANT | mandatory |
| CANDIDATE | |
| DEFINITION | |

# Guidance

## part 1 - guidance for service interface protocols

**excerpt from requirement**

- Statement: Include the list of service interface protocols (including name and version)
- Rationale: Makes explicit within the service description what the protocols are.
- Note: The list of supported protocols are the ones corresponding to the selected interface binding. The supported versions of the protocols need to be declared. E.g. version of the Transport Level Security (TLS).

The corresponding information in the schema in split between

- security mechanism : list the (security protocols) that are global for the service, if any
- interfaceBindingDescription : list **per interface** the protocols not already mentioned in security mechanism

## securityMechanism - Optional

within field securityMechanism, itself within field techncialDescription, list **zero or more** instances of SecurityMechanism , for security mechanism protocols that are implemented in all interfaces of the service.

## SecurityMechanism - Optional - zero or more

A protocol dealing with security.

<table>
<tr><th>attribute name</th><th>description</th><th>type</th><th>guidance</th><th>rule</th></tr>
<tr><td>name</td><td>The name of the security mechanism.</td><td>string</td><td>Provide the name and version of the security mechanism.<br>Eg X.509v3 Client Certificate</td><td>Mandatory</td></tr>
<tr><td>description</td><td>The description of the security mechanism.</td><td>string</td><td>Describe the mechanism<br>Eg Authentication performed based on X.509 client certificates over a secured connection based on TLS.</td><td>Mandatory</td></tr>
<tr><td>type</td><td>The type of security mechanism.</td><td><i>A code listing the types of service mechanisms.</i>
<table>
<tr><td>AUDIT</td><td></td></tr>
<tr><td>AUTHENTICATION</td><td>A security functionality enabling the verification of the validity of credentials and their correspondence with an identity.</td></tr>
<tr><td>AUTHORIZATION</td><td></td></tr>
<tr><td>INTEGRITY</td><td></td></tr>
<tr><td>IDENTITY_MANAGEMENT</td><td>A security functionality enabling the management of identities (e.g. identity creation, identity validation, federated identity retrieval).</td></tr>
<tr><td>MONITORING</td><td></td></tr>
<tr><td>POLICY_ENFORCEMENT</td><td></td></tr>
<tr><td>CONFIDENTIALITY</td><td></td></tr>
</table></td><td>Select <b>zero or more</b> code values that indicate the type of security mechanism.</td><td>Optional</td></tr>
</table>

## interfaceBindingDescription - Mandatory

Additional attribute to Interface type as described in SWIM-SERV-016 Service interfaces.

Within each Interface, use following attribute.

| attribute name | description | type | guidance | rule |
|---|---|---|---|---|
| interfaceBindingDescription | Complementary description of the protocols and other specifications used by the interface complementing the selected bindings, or any additional requirement specified in a SWIM TI Profile that is supported by the interface. [SWIM-SERV-018], [SWIM-SERV-019] | string | List all service interface protocols (including name and version) applicable for this interface, and that are not mentioned in securityMechanism.<br>This field is used as well by requirement SWIM-SERV-018 TI Profile and bindings to describe additionally supported requirements as specified in the selected SWIM TI Profile, if any. | Mandatory |

## part 2  - guidance for data formats

Within field exchangeSchema, itself within field serviceInformationDescription, list **one or more** occurrences of type ExchangeSchema.

### ExchangeSchema - Mandatory

Enables to understand data format(s).

| attribute name | description | type | guidance | rule |
|---|---|---|---|---|
| name | The name of the exchange schema. | string | Provide the name of the data format that is used to exchange data via the service interface. | Mandatory |
| schemaLanguage | Description of the language used (e.g. XML, JSON). | string | Indicate the language in which the data format is expressed (e.g. XSD, JSON, natural language,..) | Mandatory |
| reference | A reference to the exchange schema containing the specifications of the data structures. | string | Indicate with a reference the location of where the data format is defined (e.g. See service documents) | Optional |

# Example

## part 1 - service interface protocols

```
                        "securityMechanism": [
                                {
                                        "name": "TLS 1.2",
                                        "description": "The service relies on TLS 1.2 to provide integrity
and confidentiality.",
                                        "type": [
                                                "AUTHENTICATION",
                                                "CONFIDENTIALITY",
                                                "INTEGRITY"
                                        ]
                                },
                                {
                                        "name": "Cypher Suites",
                                        "description": "The following cipher suites are allowed in
accordance with ECRYPT-CSA recommendations https://www.ecrypt.eu.org/csa/documents/D5.4-FinalAlgKeySizeProt.
pdf: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 , TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384",
                                        "type": [
                                                "AUTHENTICATION",
                                                "CONFIDENTIALITY",
                                                "INTEGRITY"
                                        ]
                                },
                                {
                                        "name": "X.509v3 Server Certificate",
                                        "description": "The service utilizes X.509v3 public certificate to
authenticate the provider.",
                                        "type": [
                                                "AUTHENTICATION"
                                        ]
                                },
                                {
                                        "name": "X.509v3 Client Certificate",
                                        "description": "The service utilizes X.509v3 public certificate to
authenticate the consumer.",
                                        "type": [
                                                "AUTHENTICATION"
                                        ]
                                }
                        ]


                "serviceInterface": [
                        {

                                "interfaceBindingDescription": "XML requests and replies embedded into SOAP
messages, themselves embedded into HTTP requests and responses. Operation names are associated to SOAP
requests. The interface does not use compression or message transmission optimization mechanism (MTOM).",

                                        }
```

## part 2 - data formats

```
                "serviceInformationDescription": {
                        ...
                        "exchangeSchema": [
                                {
                                        "name": "TOBT Setting Schema",
                                        "schemaLanguage": "XML",
                                        "reference": "This schema defines the data structures used to
exchange data with the service. See service documents"
                                }
                        ]
                        ...
                }
```

A complete JSON example is available in page JSON example - Donlon TOBT Setting service description.