

Service Description (SD) – SoSD Wind Farm

Abstract

This document defines the template for the Service Description of Arrowhead compliant Services.

A Service Description provides an abstract description of what is needed for systems/devices/units/software to provide and/or consume a specific service. SD's for Application Services are created (specified) by the Pilots WP's and by the common Arrowhead framework. The SD shall make it possible for an engineer with technical programming knowledge to achieve an Arrowhead compliant realization of a provider and/or consumer of description of how the service is implemented/realized by using the Communication Profile and the chosen technologies.

A Service Description (SD) is the Service in a specific technology. All systems/devices/units/software implementing an Interface Design Description which complies with this SD will be able to exchange information with each other.

All Arrowhead Service Description should be specified using this template and stored on a common repository (available on the SVN server), in order to document and formalize the pilot demonstrators and the common Arrowhead framework.

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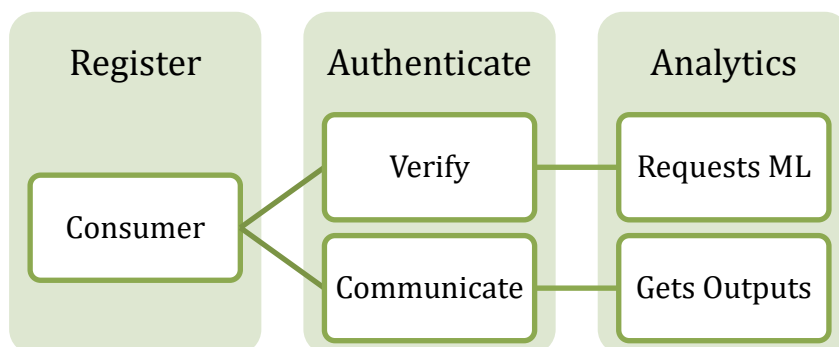
1. Service Description Overview

The service contains following services as GET & POST methods of REST apis:

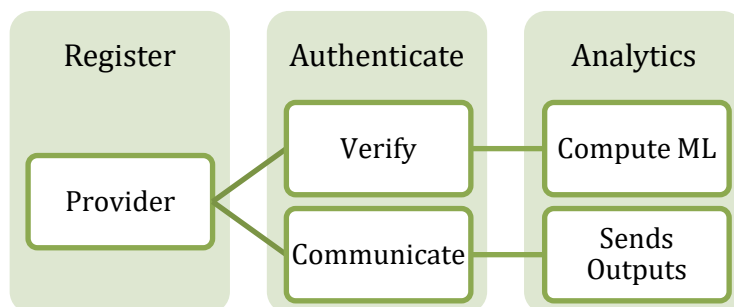
```
serviceRegistryURL = "http://localhost:8443/"
authorizationURL = "http://localhost:8445/"
orchestratorURL = "http://localhost:8441/"
```

1.1. Register:

<http://localhost:5000/register>



```
@app.route('/register', methods=['GET'])
```



1.2. Authorize

```
http://localhost:8445/authorization/echo
```

```
resp = requests.get('http://localhost:8445/authorization/echo')
print(resp.content, resp.status_code)
if resp.status_code != 200: # Testing Authorization
    resp = requests.get('http://localhost:8445/authorization/echo')
    print(resp.content, resp.status_code)
    if resp.status_code != 200:
        # This means something went wrong.
        raise ApiError('GET /tasks/ {}'.format(resp.status_code))
    else:
        print('Authorization: Successful Ping')

        # This means something went wrong.
        raise ApiError('GET /tasks/ {}'.format(resp.status_code))
    else:
        print('Authorization: Successful Ping')
```

1.3. Analytics-ML

Initially sensors data is loaded into the the application. Given data is in .xlsx files that are loaded into sheet books of python.

```
book = xlrd.open_workbook("Sensors_Data1.xlsx")
sheet = book.sheet_by_index(0)
header_dict = {}
```

Then the ML component prepares its dictionaries based on the given data and training data given as **“T1_traineddict.mat”**.

```
@app.route('/analytics/ml', methods=['GET'])
def api_ml():
```

Each execution takes number of set segments for training of dictionaries.

```
Command Prompt

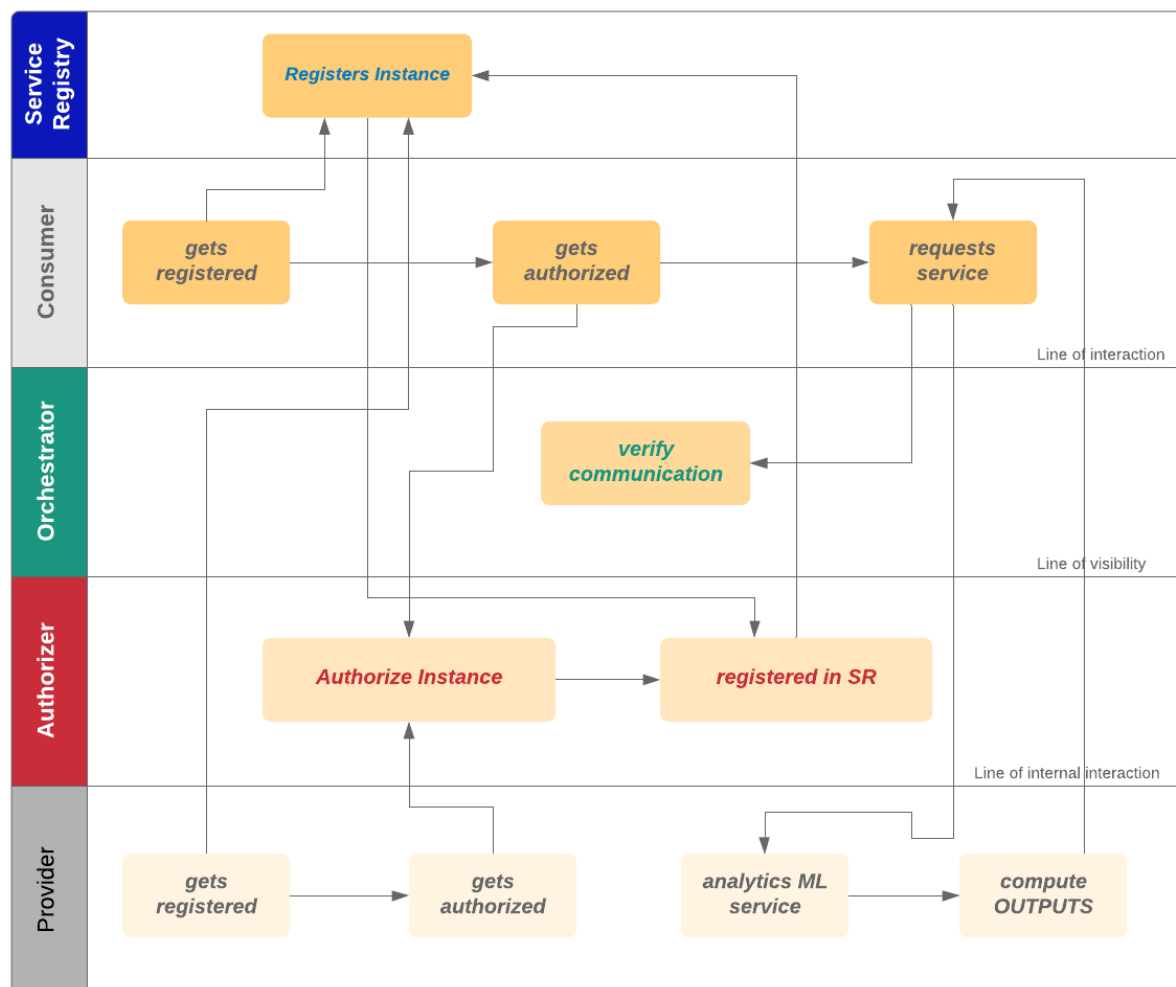
C:\Users\sajlav\windMilla\Arrowhead-task>python Arrowhead_task.py
C:\Users\sajlav\windMilla\Arrowhead-task\Arrowhead_SCDL.py:150: ComplexWarning: Casting complex values to real discards the imaginary part
  w_ind[i] = np.amax(cc)
Segment 4 of 10 is DONE in 317.0496618747711 seconds.
Segment 5 of 10 is DONE in 368.96839356422424 seconds.
Segment 7 of 10 is DONE in 340.54143381118774 seconds.
Segment 8 of 10 is DONE in 340.441707611084 seconds.
Segment 10 of 10 is DONE in 348.3649022579193 seconds.
Calculating dictionary distances, please wait a few minutes...

C:\Users\sajlav\windMilla\Arrowhead-task>
```

2. Abstract Interfaces

Basic WMA Service Blueprint

saleha javed



3. Abstract Information Model

The output of the service is a:

Table 1: Program Output

	Speed	Vibration Signal 1	Vibration Signal 2	Vibration Signal 3
Average Value	999,6608	3,340119	3,584697	3,197944
Maximum Value	998.9766	6.6805434320122	7.17000295536127	6.39649842842482
Minimum Value	1000.345	- 0.000304769317153841	- 0.000609538634307683	- 0.000609538634307683
Initial Segment Value	750.9325	-0.25631099572638	0.182556820975151	0.237720067379996
End Segment Value	794.0413	0.546146616339684	0.468735209782608	0.45776351436507

Table 2: Data type description for all parameters

Field	Description
Average Value	States the average of its 12 hour sensors readings
Maximum Value	States the maximum of its 12 hour sensors readings
Initial Segment Value	States the initial value of its 12 hour time block
End Segment Value	States the end value of its 12 hour time block

4. Non-functional Requirements

The service has none non-functional requirements.

5. Revision history

5.1.1. Amendments

No.	Date	Version	Subject of Amendments	Author
1	2020-02	0.4	Final draft	Saleha Javed