WSN OpenAPI XML Introduction

This document describes the basic WSN OpenAPI XML messages required to connect and receive real-time data from a WSN OpenAPI Gateway.

1 Establishing Connection

A client connects to the WSN OpenAPI Gateway via TCP/IP connections. The gateway listens for the connections by default in port 10994. Unlimited number of WSN OpenAPI XML messages may be send and received within a connection. Note that the inclusion of XML declaration (`<?xml version="1.0" encoding="UTF-8" ?>`) to the XML message is optional. The connection will be timed out and closed in about 5 minutes if idle.

2 Authentication to a Service

WSN OpenAPI Gateway requires that a client authenticates with a *AuthenticationRequest*. The authentication is valid for the duration of the established TCP/IP session. In the following example, username and password are set to *user* and *pass*, respectively.

Listing 1: *Authentication request*

```xml
<AuthenticationRequest version="1" xmlns="urn:wsn-openapi:acf" method="password">
  <Parameter name="username" value="user"/>
  <Parameter name="password" value="pass"/>
</AuthenticationRequest>
```

WSN OpenAPI Gateway responds to the request with a *AuthenticationResponse*. If the authentication was successful, the response returns value 200 as shown in the following example.

Listing 2: *Authentication response*

```xml
<AuthenticationResponse version="1" xmlns="urn:wsn-openapi:acf" responseCode="200"/>
```

3 Acting as a Data Source

A client acts as a data source by sending sensor data to WSN OpenAPI Gateway. The message is structured hierarchically: *Network* consists of one or more *Node*s that have one or more sensors. A *Sensor* has made one or more measurements, and a *Measurement* comprises of one or more *Component*s.

By default, WSN OpenAPI Gateway does not mandate any specific naming for nodes, sensors, measurements, or components, and can be thus selected by the data

source. However, the network identifier is always used for access control, and the client may not write to the network without sufficient rights.

Listing 3: *Simple measurement message*

```xml
<SIDF version="1.3" xmlns="urn:wsn-openapi:sidf">
 <Network id="1">
  <Node id="2">
   <Sensor id="3" >
    <Measurement quantity="Temperature" unit="C" time="2009-07-03T11:24:46+00:00">
     <Component>23.0</Component>
    </Measurement>
   </Sensor>
  </Node>
 </Network>
</SIDF>
```

Listing 4: *Several measurements in a message*

```xml
<SIDF version="1.3" xmlns="urn:wsn-openapi:sidf">
 <Network id="1">
  <Node id="2">
   <Sensor id="3" >
    <Measurement quantity="Temperature" unit="C" time="2009-07-03T11:24:46+00:00">
     <Component>23.0</Component>
    </Measurement>
    <Measurement quantity="Acceleration" unit="mg" time="2009-07-25T14:24:47+00:00" >
     <Component id="x">142.0</Component>
     <Component id="y">46.0</Component>
     <Component id="z">895.0</Component>
     <Component id="roll" unit="degree">8.0</Component>
     <Component id="pitch" unit="degree">2.0</Component>
     <Component id="total">907.36156</Component>
    </Measurement>
   </Sensor>
   <Sensor id="5" >
    <Measurement quantity="Temperature" unit="C" time="2009-07-25T14:24:46+00:00" >
     <Component>25.0</Component>
    </Measurement>
   </Sensor>
  </Node>
 </Network>
</SIDF>
```

4   Acting as a Data Consumer

A client can receive data from a certain network with a *SubscribeRequest*. Note that a new request will replace existing subscriptions. The request can be filtered by defining networks or nodes of interest (see specification for more details).

Listing 5: *Subscribing data from a network*

```xml
<SubscribeRequest version="1.4" xmlns="urn:wsn-openapi:sidf">
</SubscribeRequest>
```

WSN OpenAPI Gateway replies with a subscribe *SubscribeResponse*. After a successful subscription (indicated by the responseCode 200), the gateway forwards all matching real-time data to the client.

Listing 6: *Response to a subscribe request*

```xml
<SubscribeResponse version="1.4" responseCode="200"/>
```

The client may end its subscription with an *UnsubscribeRequest* message:

Listing 7: *Message to end data subscription*

```xml
<UnsubscribeRequest version="1.4" xmlns="urn:wsn-openapi:sidf"/>
```