Power IT Project Part III 3\textsuperscript{rd} Year Final Report 1\textsuperscript{st}

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voceweb
Contents

1. Overview
2. Interactions
3. Demonstrations
4. Others
1. Overview

2.1 Consumer Portal Configuration

- Isolation between Internal and External Network
- Load Balancing via Application Switch
1. Overview

2.2 Module Diagram

- SANION DC
- KWU SRB
- KESCO HSCP
- LSIS SCP
- Device Portal @KWU
- Device Portal @VOCEWEB
- Consumer Portal @VOCEWEB
- Acogito DG
- Conv
- DG EMUL
- TCP/IP
- RS485/232
- RS-485
- psXML
- SOAP
- KDN BL
- KDT BL

- KWU, Kyungwon Univ.
- SRB, Saerom Building
2. Interactions

2.1 Interactions Overview

- Interaction Baseline between Device/DG/DP/CP
  - Periodic Information Fetch and Store, Sampling Stored Series Data
  - Direct Fetch from CP or DP UI
  - Event from Device

- Periodic Information
  - Each 15 min. (Changeable) DP stored Main Information via DG in DB.
  - DPUI or CP gets updated and history information when it requests

- Direct Fetch
  - DPUI/CP gets Current Extra Information Data from DP or controls the Device.

- Event
  - An Active Event from Device delivers to Receivers through Asynchronous Queue

- Differences between Periodic Information and Direct Fetch
  - Periodic Information stores periodically without exception (Capacity of DP)
  - Direct Fetch only has Control Command/Event Command/Extra Information. (DP does not store)
2. Interactions

2.2 Periodic Information Fetch

- Request Device Information (periodic) psXML/HTTP
- Reply Device Information psXML/HTTP
- Get Information
- Reply getStoredProps psXML/HTTP
- Cache
- Store
- OODB
- getStoredProps psXML/SOAP
- Reply getStoredProps psXML/HTTP
- CP BM
- CP/DPUl
- DP
- DG
- Device
2. Interactions

2.3 Direct Information Fetch / Control

Direct Command
psXML/SOAP

Reply Direct Command
psXML/SOAP

Direct Command
psXML/HTTP

Reply Direct Command
psXML/HTTP

Direct Command
psXML/HTTP

Reply Direct Command
psXML/HTTP

Direct Command
Legacy/RS-485...

Reply Direct Command
Legacy/RS-485...
2. Interactions

2.4 Event

CP BM  CP/DPU  DP  DG  Device

Reply Direct Command
Legacy/RS-485...

Reply Direct Command
psXML/HTTP

Subscribe
Publish

Subscribe
Publish

psXML over STOMP or JMS
2. Interactions

2.5 psXML Example

**DP Request**

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<callMethod>
  <qid>dc.dc</qid>
  <method>GetQuarterDemand</method>
  <params>
    <param name="UserId" type="Short">1</param>
    <param name="QuaterDemandYear" type="Byte">8</param>
    <param name="QuaterDemandMonth" type="Byte">4</param>
    <param name="QuaterDemandDay" type="Byte">28</param>
    <param name="QuaterDemandHour" type="Byte">11</param>
  </params>
</callMethod>
```

**DG Reply**

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<props>
  <prop type="String" name="Command">
    <value>Z</value>
  </prop>
  <prop type="Short" name="UserId">
    <value>1</value>
  </prop>
  <prop type="Byte" name="QuarterDemandReportMonth">
    <value>4</value>
  </prop>
  <prop type="Byte" name="QuarterDemandReportDay">
    <value>28</value>
  </prop>
  <prop type="Byte" name="QuarterDemandReportHour">
    <value>11</value>
  </prop>
  <prop type="List" name="QuarterDemandMeasureByWattMeter">
    <item type="Integer"><value>0</value></item>
    <item type="Integer"><value>0</value></item>
    <item type="Integer"><value>0</value></item>
    <item type="Integer"><value>0</value></item>
  </prop>
  <prop type="Byte" name="NumberOfRCUs">
    <value>0</value>
  </prop>
  <prop type="List" name="QuarterDemandRCU/>
</props>
```

Request: callMethod tag
qid = [device_id].[port_id]
method = Request Name
params: parameter

Every Information goes to "prop" tag
"prop" tag includes "value", "item", "map" tag
Tag type is decided by type of "prop"
## 2. Interactions

### 2.6 psXML value Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte</td>
<td>1byte, value tag follows</td>
</tr>
<tr>
<td>Short</td>
<td>2byte, value follows</td>
</tr>
<tr>
<td>Integer</td>
<td>4byte, value follows</td>
</tr>
<tr>
<td>Long</td>
<td>8byte, value follows</td>
</tr>
<tr>
<td>Float</td>
<td>32-bit IEEE754 real number, value follows</td>
</tr>
<tr>
<td>Double</td>
<td>64-bit IEEE754 real number, value follows</td>
</tr>
<tr>
<td>Boolean</td>
<td>true/false, value follows</td>
</tr>
<tr>
<td>String</td>
<td>string, value follows</td>
</tr>
<tr>
<td>List</td>
<td>Array or List, item tag follows. Based on the type of item, applied recursively</td>
</tr>
<tr>
<td>Map</td>
<td>Object/Map, map tag follows. There are plural “prop” tags next map tag (recursive)</td>
</tr>
</tbody>
</table>
3. Demonstration

3.1 Recognizing WSDL

- Recognizing WSDL
  - File -> New WSDL Project
  - Project Name, put the proper name
  - Initial WSDL is http://210.108.170.142/CPWeb?wsdl
  - OK
3. Demonstration

3.2 Running callMethod

- Running call Method
  - CPWebPortBinding → callMethod →, double click “Request 1”

In “Example.txt” from the attached SOAP, first copy the request section, paste to left side, and then click the green arrow. The result is showed.
3. Demonstration

3.3 Example

- Running GetQuaterDemand
  - Put the input to the left side, request section, click the green arrow, then the XML result is shown to the right side. This result is used after Parsing.

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
               xmlns:ns1="http://www.cs.fsu.edu/~engelen/soap.html">
  <soap:Body>
    <ns1:GetQuaterDemandResponse xmlns:ns1="http://www.cs.fsu.edu/~engelen/soap.html">
      <ns1:QuarterDemandResult>
        <!-- XML result goes here -->
      </ns1:QuarterDemandResult>
    </ns1:GetQuaterDemandResponse>
  </soap:Body>
</soap:Envelope>
```

gSOAP can be useable.
In gSOAP, it is helpful that WSDL makes corresponding code.

http://www.cs.fsu.edu/~engelen/soap.html
4. Others

4.1 Progress & TODO List

- **Progress (3rd Year Qt 3)**
  - Device Gateway Emulator is completed to interact SANION DC
  - Corrected psXML applied (Recursive / Complex architecture) from SANION DC
  - SOAP architecture is changed based on Corrected psXML
  - Interaction is completed via SANION DC (DC/DRC/KDN BL)

- **TODO List (Development)**
  - Add the process related to Event: Message Queue architecture
  - Packaging / Document adding / Fortify Security
  - Fortify Performance & Management