Developer Tools and Resources

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Topics

- Open ADR Requirements Docs
- Testing Tools
- VTN in the Cloud
- Other Tools
- Resource Summary
OpenADR Profiles

- “A” profile is targeted at limited resource devices and simple DR applications
- “B” profile is targeted at robust devices and sophisticated DR applications
## Optional Feature Support

<table>
<thead>
<tr>
<th>Feature</th>
<th>B VTN</th>
<th>B VEN</th>
<th>B VEN Report</th>
<th>A VEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EiEvent - Simple</td>
<td>M</td>
<td>M</td>
<td>NA</td>
<td>M</td>
</tr>
<tr>
<td>EiEvent – Full</td>
<td>M</td>
<td>M</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>EiOpt</td>
<td>M</td>
<td>M</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>EiRegistraton</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NA</td>
</tr>
<tr>
<td>EiReport</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>NA</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSA and ECC Ciphers</td>
<td>M</td>
<td>One(1)</td>
<td>One(1)</td>
<td>One(1)</td>
</tr>
<tr>
<td>XML Signatures</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>NA</td>
</tr>
<tr>
<td>Transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SimpleHTTP Only</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>M</td>
</tr>
<tr>
<td>XMPP and SimpleHTTP</td>
<td>M</td>
<td>One(1)</td>
<td>One(1)</td>
<td>NA</td>
</tr>
<tr>
<td>Exchange Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pull - SimpleHTTP</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Push - SimpleHTTP</td>
<td>M</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Profile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B support for A profile</td>
<td>M</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

(1) Must support at least one, but can support both.  
O=Optional  M=Mandatory
OpenADR Requirements

- OpenADR requirements are defined in the OpenADR Schema and Profile Specification
- The Schema describes the payload structure
- The Profile Specification defines sequence of payload exchanges and the business rules
- "A" and "B" profiles have separate specifications and schemas
PICS and Test Specification

- **PICS**
  - Listing of all testable requirements
  - Manufacturer declares conformance prior to certification

- **Test Specification**
  - A set of tests that validates all of the testable requirements defined in the PICS
  - Positive tests including limited boundary testing
  - Negative tests focused on graceful error handling
  - Security and Transport Tests
## A Profile

### Conformance Rules

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>20</strong></td>
<td>At any time, a VTN can change any element or attribute of a pending or active event as long as it does not pertain to the past</td>
</tr>
<tr>
<td><strong>57</strong></td>
<td>If the VTN sends an oadrEvent with an eventID that the VEN is already aware of, but with a higher modification number, then the VEN should replace the previous event with the new one in its list of known events</td>
</tr>
</tbody>
</table>
## Typical VEN Test Case

<table>
<thead>
<tr>
<th>E0_0040 – Send 24_Prices Event, VEN Push oadrDistributeEvent</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1_0040 – Send 24_Prices Event, VEN Pull oadrDistributeEvent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>- DUT_VEN has no pending or active events</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Scenario</th>
<th>{DUT_VEN: oadrRequestEvent}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TH_VTN: oadrDistributeEvent – 24 Prices Event, “always”</td>
</tr>
<tr>
<td></td>
<td>{DUT_VEN: Transport Acknowledgement}</td>
</tr>
<tr>
<td></td>
<td>DUT_VEN: oadrCreatedEvent</td>
</tr>
<tr>
<td></td>
<td>TH_VTN: oadrResponse, success</td>
</tr>
</tbody>
</table>

**Note:** set the responseRequired element in the oadrDistributeEvent to “always” for this test case. Set signalType to “prices”

<table>
<thead>
<tr>
<th>Expected Results</th>
<th>1)Common Pass/Fail verdicts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2)Received oadrCreatedEvent with optType equal to optIn</td>
</tr>
</tbody>
</table>

| Notes | -A basic 24 hour pricing event transaction |
Test Harness

- Implementation of the test cases defined in the Test Specification
- Used for certification and available Pre-certification test tool
- Each test case validates…
  - Payloads validate against the OpenADR Schema
  - Correct message interaction pattern
  - OpenADR Conformance rules are followed
  - The intent of the test case is achieved
Certification Process

Manufacturer decides on Profile

Manufacturer uses Spec, PICS and test plan/tool to build product

Manufacturer submits to test lab (Intertek)

After passing test – submit documents to Alliance

Manufacturer receives Certificate

ISO 17025 accredited test facility

Submits: Declaration of Conformity, PICS, test report

Phase 1: Certification through the Alliance
Phase 2: ISO Guide 65 accredited certification
OpenADR Cloud Server (EPRI VTN)
The need...

- OpenADR Adoption can be accelerated by...
  - Making it easy for interested parties to “play” with the technology
  - Providing OpenADR developers with readily accessible VENs and VTNs to interoperate with
  - Enabling small scale pilot programs utilizing OpenADR VEN and VTNs
  - Enabling utilities to do “what if” experiments with different OpenADR program characteristics
VTN in the Cloud

- QualityLogic now offers a pre-installed EPRI VTN on the Amazon cloud infrastructure
- Eliminates a somewhat lengthy VTN installation process and gets you going instantly
- QualityLogic’s roadmap for the EPRI VTN includes:
  - Adding more ad hoc testing and diagnostic capabilities
  - Adding “personalities” that model well known DR program behavior
Instance Management

- Users can manage their cloud VTN using the QualityLogic instance management page
  - Generate backups
  - Restore backups
  - Reboot, start and stop the server
  - Disable unsecured access
  - Access a support forum for help
Instance Management Page For test (test@test12.com)

System Message:

Time Check

Status: Instance exists and is running with status check result ok
Unsecured access: VTN URL: http://54.172.125.180:8080 [Disable]
Secured access: VTN URL: https://54.172.125.180:443

Instance Control:
Start  Create Snapshot  Restore Snapshot  ▼  Stop  Reboot

Messages:

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/4/2014 1:11:57 AM</td>
<td>this is a test</td>
</tr>
</tbody>
</table>
Cloud VTN
Availability Details

- Monthly fee of $100
- 10% OpenADR member discount
- Free 2\textsuperscript{nd} months use for completing survey on VTN enhancement preferences
- Easy on-line purchase at www.qualitylogic.com
  - Look for “OpenADR VEN Tester”
Other Tools
XMLSpy

- Used for working with XML
- Edit Schemas
- Generate sample XML document from schema
- Edit XML Documents
- Check for well-formed XML
- Validate XML payloads against schema
- Free XML editors available
Rest Client

- A very simple, easy to use Java Rest Client
- Available for free from code.google.com
TCPMon

- Monitor http traffic when communicating with localhost devices
- Redirects TCP Port
WireShark

- WireShark packet Analyzer
- Use capture filter “tcp port http”
Other Resources

- www.openadr.org
  - Schema and profiles specifications (public)
  - Certification documentation package
  - Join working groups, email reflectors
  - Implementation guides (reporting, certs)
  - DR Program Guide
  - Pre–Certification Test Harness
Other Resources

- www.sourceforge.com
  - EPRI VTN
  - EPRI VEN
  - EPRI VEN C++ Library
- www.github.com
  - EnerNOC "A" Profile VEN and VTN (only useful for XMPP implementation details)
Other Resources

- www.qualitylogic.com
  - OpenADR Developer Workshop
  - OpenADR Developer Support
  - OpenADR VTN in the Cloud
  - Pre-Certification Test Harness
- www.universal-devices.com
  - Off the shelf certified VEN
Questions?