

OpenADR Technical Reference Package

This OpenADR technical reference package summarizes OpenADR standards and development activities, including work within Standards Development Organizations (SDOs) and national Smart Grid activities.

In 2007, the Open Automated Demand Response Communications Specification (OpenADR) development project started in continuation of 5 years of research within Lawrence Berkeley National Laboratory's Demand Response Research Center (DRRC). Since then, OpenADR has made significant advances:

1. **OpenADR** is in formal standards process with SDOs – Utilities Communications Architecture (UCA) and Organization for Advancement of Structured Information Standards (OASIS).
 2. **OpenADR** was recently recognized under the national Smart Grid activities pursued by National Institute of Standards and Technology (NIST)
 3. **OpenADR** is commercially implemented in California with the investor-owned utilities and piloted with Seattle City Light sponsored by the Bonneville Power Administration in Pacific North-West.
- 1) **OpenADR Standardization within SDOs:** In June 2009, both UCA and OASIS kicked-off the OpenADR standardization process. UCA activities are more focused on utilities business requirements and OASIS activities focus on technical aspects such as data models, messaging, and semantics. Within UCA OpenADR is being standardized under Open Smart Grid Subcommittee's OpenADR Task Force and in OASIS, OpenADR is being standardized under Energy Interoperation Technical Committee.
 - 2) **NIST National Smart Grid Initiative:** OpenADR along with other standards were recommended by NIST in its early draft. OpenADR was included in the initial list of standards.
 - 3) **OpenADR Commercialization:** OpenADR is commercially deployed by California utility DR programs with over 60 MW of DR capabilities and over 200 customer accounts enrolled. OpenADR has been deployed in 5 buildings for cold winter morning with utilities in Pacific North-West.

For UCAIug OpenADR Task Force questions not addressed here, please contact:

- Albert Chiu (Chair – OpenADR Task Force): AKC6@pge.com
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For OASIS Energy Interoperation Technical Committee questions not addressed here, please contact:

- David Holmberg (Co-Chair): David.Holmberg@nist.gov
- Bill Cox (Co-Chair): WTCox@coxsoftwarearchitects.com

References and Technical Materials

OpenADR Technical Documents for Review

- Version 1.0 specification: <http://drcc.lbl.gov/openadr/pdf/cec-500-2009-063.pdf>
- Press-release: <http://newscenter.lbl.gov/press-releases/2009/04/27/openadr-specification/>
- XML schema source files¹: <http://openadr.lbl.gov/src/>

UCA and International Users Group (UCAIug)

- UCAIug: <http://www.ucaiug.org/>
- Open Smart Grid (OpenSG) Docs: <http://osgug.ucaiug.org/Shared%20Documents/Forms/AllItems.aspx>
- Join UCAIug mailing list: <http://listserv.utilityami.org/archives/>
- Join UCAIug: <http://www.ucaiug.org/Pages/join.aspx/>

¹ All XSD and WSDL files are available for download. The naming convention for folders such as /src/1/ is used to indicate OpenADR Version 1.0 support.

OASIS and Energy Interoperation Technical Committee (EI TC)

- OASIS: <http://www.oasis-open.org/>
- OASIS Energy Interoperation work: <http://www.oasis-open.org/committees/download.php/33115/EnergyInterop%20Minutes%2020090622.doc>
- EI TC Charter: <http://lists.oasis-open.org/archives/smartgrid-discuss/200902/msg00007.html>
- Join OASIS EI TC: <http://www.oasis-open.org/join/>

NIST Smart Grid Activities

- U.S. Department of Energy press release: <http://www.energy.gov/news2009/7408.htm>
- NIST Smart Grid activities: <http://www.nist.gov/smartgrid/>
- Collaboration: <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/WebHome>
- Roadmap: <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGridInterimRoadmap/WebHome>

DRRC OpenADR and Auto-DR Activities

- OpenADR and Open Auto-DR Contact: Auto-DR@lbl.gov
- DRRC: <http://drcc.lbl.gov>
- OpenADR Website: <http://openadr.lbl.gov>
- Development documents: <http://drcc.lbl.gov/openadr/docs.html>
- Akuacom's OpenADR Client development program contact: devprog@akuacom.com

XML Tools and Resources

- The XSD and WSDL can be viewed using any text editors. For editor, rich representations and additional features, any free tools such as Liquid XML Studio® could be used: <http://www.liquid-technologies.com/XmlStudio/XmlStudio.aspx/>
- Other XML Tools:
 - Visit W3C's web site (<http://www.w3.org/>) for a summary of the various XML recommendations/specifications.
 - Another popular tool for XML editing is XMLspy: <http://www.altova.com/>