

Open Automated Demand Response Communications Standards

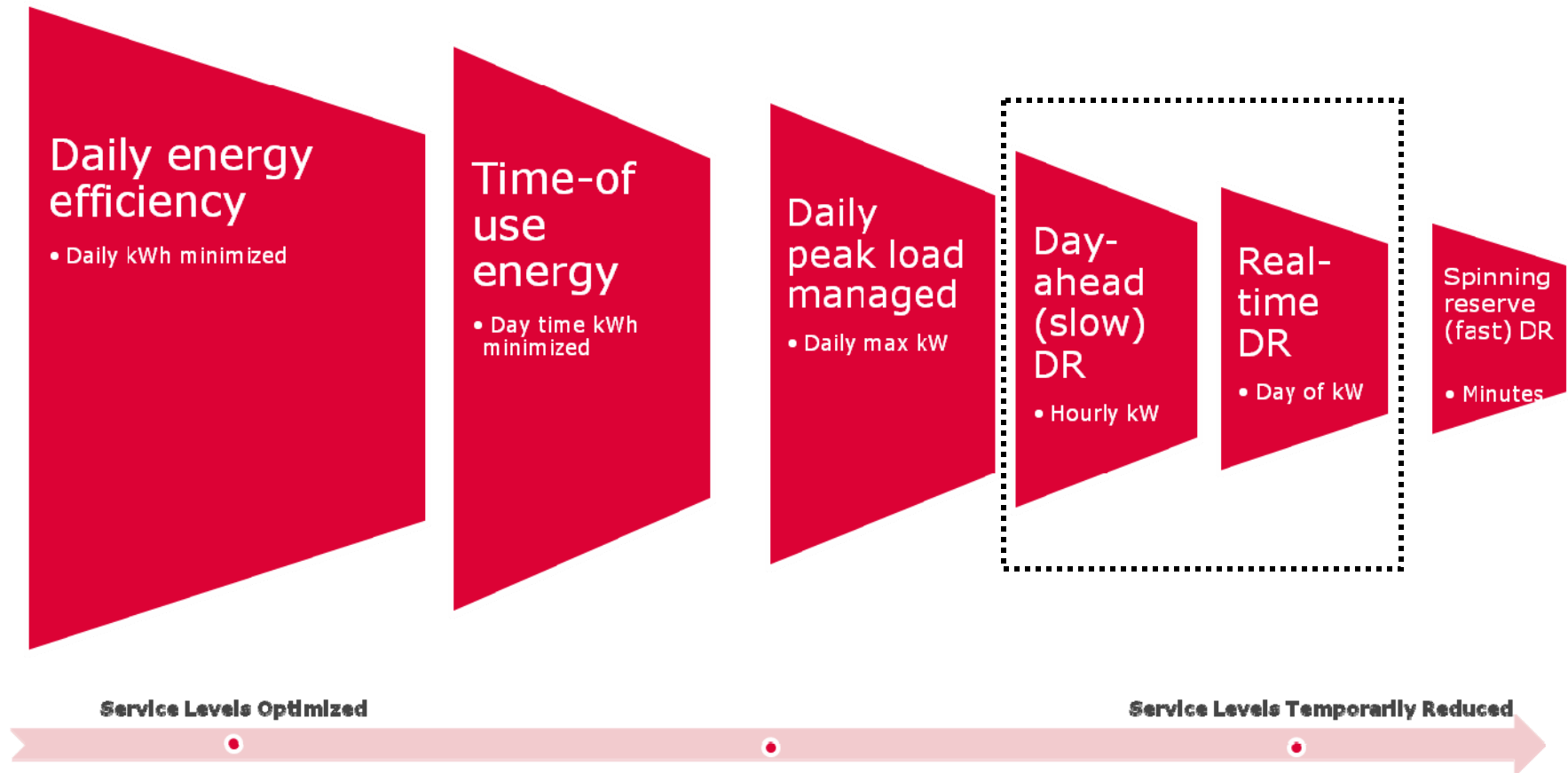
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Agenda

- Definition and History of Open Automated Demand Response (Open-ADR)
- Open-ADR concept and what is being standardized
- Standards effort and status

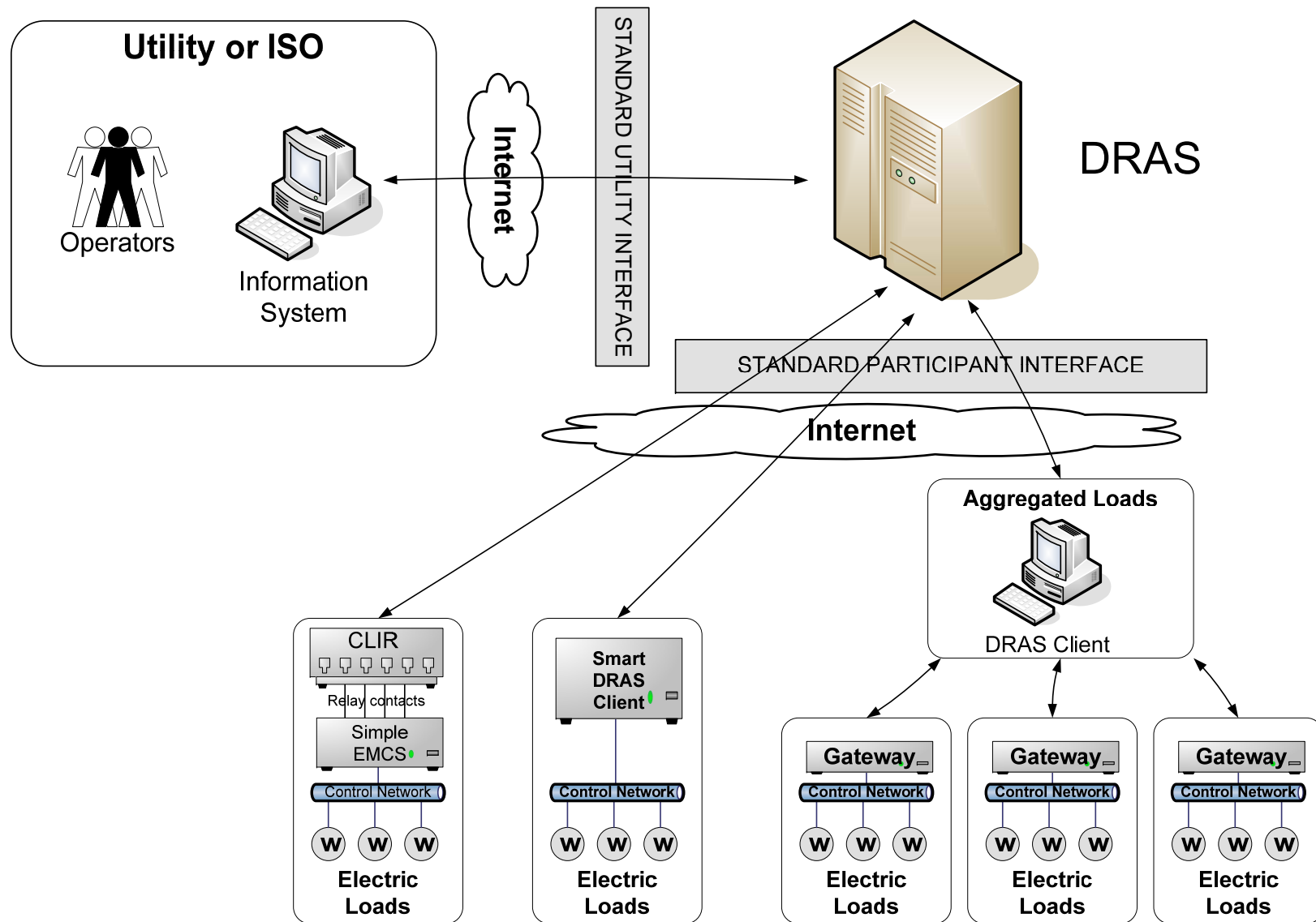
Energy Management/DR Spectrum



History

- 2002 - Research begun at LBNL Demand Response Research Center (DRRC) into automated DR
- 2003 – Initial development at DRRC using XML exchange of information with limited field trials.
- 2004 – Use of internet relays in field trials to support automation with simple EMCS, scaled up field tests.
- 2005 – Development of DRAS concept. Collaboration with PG&E's CPP DR program.
- 2006 – Expanded field trials and use in PG&E's Pilot DR programs. Development of CLIR box for use as Simple DRAS Client.
- 2007 & 2008 – Commercialization and use of DRAS in PG&E, SCE, and SDG&E DR programs.
- **2007 – Standardization effort for Open-ADR begins**

Automation of DR Signals



Open ADR Standardization

- **Impact interoperability**
 - Reduces “vendor lock-in”
 - Increases innovation
 - Lowers technology costs
- **Change a utilities current business practices**
 - Allows DR technology specifications to be interoperable
- **Impact reliability**
 - AutoDR can be used for price or reliability DR
 - Standards are secure and reliable
- **Impact pricing or financial planning for a utility**
 - CORNERSTONE of technology development is to enable DR with dynamic tariffs – facilitate ubiquitous response capabilities

Synergistic Efforts

- **Facility Systems**
 - BACnet Standard Project Committee (SPC) and Analysis Program (<http://www.bacnet.org/>) – NIST
 - LonMark
 - OASIS/Obix
 - Continental Automated Building Association (CABA) (<http://www.caba.org/>)
- **Utility/ISO and Intelligent Grid**
 - IntelliGrid™ (<http://intelligrid.info/>) Living Laboratory Project with Enernex
 - Open Home Automation Network (OpenHAN) and Advanced Metering Infrastructure (AMI) (<http://www.sdge.com/ami/>) – SDG&E
 - AMI (<http://www.pge.com/smartmeter/>) – PG&E
 - AMI (<http://www.sce.com/PowerandEnvironment/ami/>) – SCE
 - OpenAMI (<http://www.openami.org/>)
 - Gridwise™ (<http://www.gridwise.com/>) and Gridwise Architecture Council (GWAC) (<http://www.gridwiseac.org/>)
 - Programmable Communicating Thermostats (PCT) (<http://pct.berkeley.edu/>) – CEC/PIER
 - Standardization of Bidding Messaging Models – CA ISO
 - Southern Company RTP XML Demonstration
 - UCA International Users Group (<http://sharepoint.ucausersgroup.org/default.aspx>)
 - IEEE PES Intelligent Grid Coordination Committee
 - CAISO -MRTU
 - IEC TC-8 (European)
- **Industry Initiatives**
 - New Energy Alliance
 - DRAM
 - Utility Standards Board
 - Retail Energy Alliance

OpenADR Standardization Status

- Recruited participation from major stake holders including:
 - Utilities and ISO's including CAISO, PG&E, SCE, SDG&E, etc.
 - Variety of national standards bodies including NIST, OpenAMI, TC-8, etc.
 - Facility controls vendors and organizations including BACnet, LonMark, Obix, etc.
 - End user organizations including aggregators and Retail Energy Alliance (Big box retailers representing 3B square feet of retail space)
- First draft just released for public review:
 - <http://drcc.lbl.gov/openadr>