

DR17.01 SCE OpenADR Test Lab Development: Phase 1

OVERVIEW

Southern California Edison, SCE, conducted a study focused on the development of a multi-use Auto-DR (ADR) test lab that could be a proving ground for new ADR technology.

Three technology protocols used for controlling load management devices were compared in this study to determine which could be used for the initial phase of the ADR test lab development.

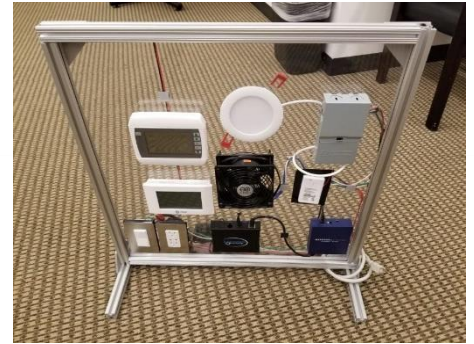


Image: ADR Test Platform

OBJECTIVE

To conduct research on Z-Wave, BACnet, and Wi-Fi communication protocols and load management capabilities to explore the viability of creating a universal lab to test DR load reduction strategies.

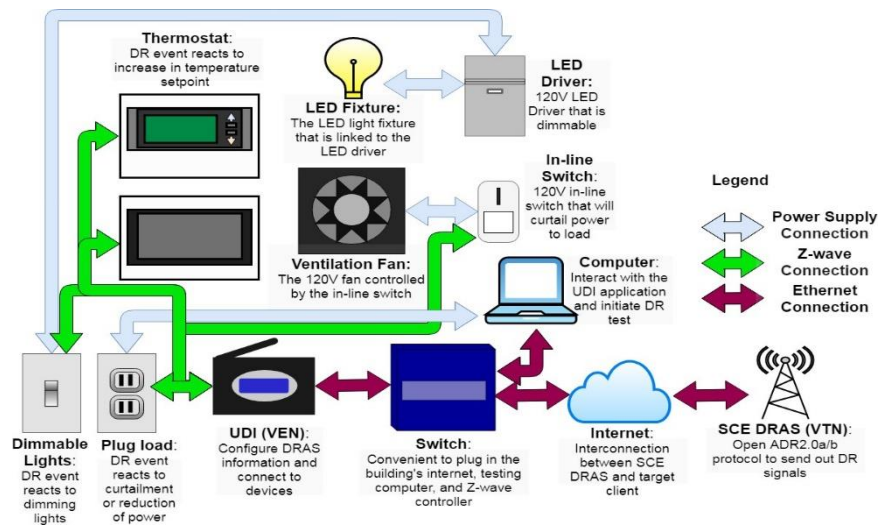


Figure 1. Auto-Dr Z-Wave Network Infrastructure

FINDINGS

What were the major findings from this evaluation?

- **The Z-Wave** protocol has historically been a proven cost-effective solution for implementing OpenADR2.0a/b DR signals. Due to the proven record of Z-Wave load control devices, it was chosen to establish the test lab baseline, and as the first proof-of-concept build.
- **The BACnet** protocol shares the application layer and network layer and is connected by a common Local Area Network (LAN). BACnet devices communicate with each other if they share the same open network protocols; however, if proprietary, they require manufacturer approval to communicate. It was determined to be viable to create a test lab for the BACnet devices using the open network protocol.
- **Wi-Fi protocol** connects to the internet router and wireless-enabled devices using a wireless radio signal. there are numerous Wi-Fi-enabled devices, like appliances, home energy managers, hot water heaters, refrigerators, and thermostats. While all have wireless control capabilities, not all are currently designed to initiate DR.

RECOMMENDATIONS

What were the recommendations from this evaluation?

Below is a summary of technology protocol opportunities, barriers and recommendations:

	Z-Wave	BACnet	Wi-Fi
Opportunities			
Simplicity	X		X
Scalable/Expandable	X	X	X
Convenient/Centrality	X	X	X
Barriers			
Security	X	X	X
Engineering for Interoperability	X	X	X
Proprietary Application Source Code			X
Recommendations:	Chosen to establish the test lab baseline, and the first proof-of-concept build.	Considered viable to create a test lab for the BACnet devices using the open network protocol.	Due to the end-use application being dependent on proprietary programming, a Wi-Fi test lab was determined not to be a current viable universal solution for testing load reduction controls.