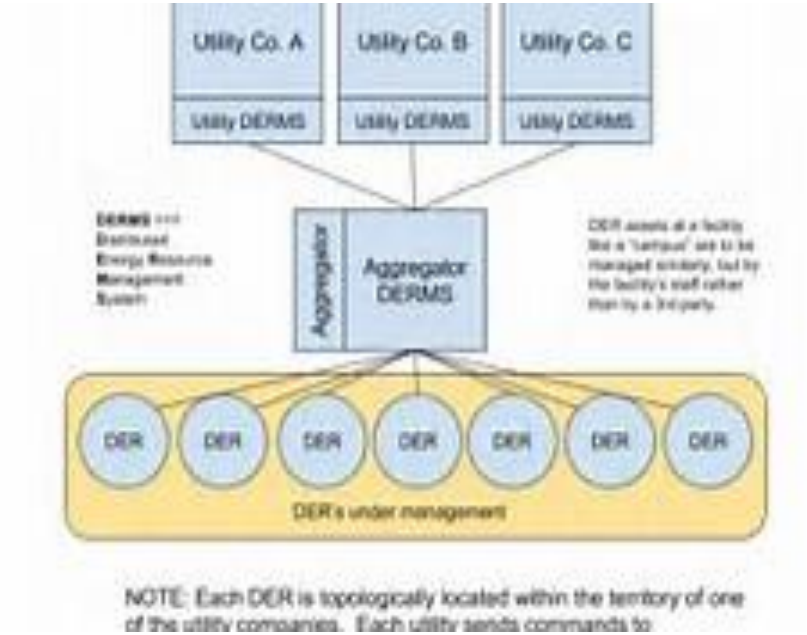
IEEE 2030.5 (SEP 2)



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IEEE 2030.5 History

- ZigBee Smart Energy 1.x
  - A widely deployed standard for the Smart Grid HAN
  - IEEE2030.5 has all of the base functionality of SEP1.x but has the addition of DER and Electric Vehicle support
  - Robust testing and certification program
  - 60+ million meters currently deployed or under contract
    - 12 M in CA; 12 M in TX
  - ~550 Certified Products
- However, limited to a single technology using ZigBee PRO technology (802.15.4 at 2.4 GHz running the ZigBee PRO stack)

IEEE 2030.5 History

- ZigBee Smart Energy Profile 2 initiated in 2008 as successor to SEP 1.0
  - Requirements defined by utilities
- Adopted as IEEE 2030.5 in 2013 (IEEE 2030.5-2013)
- Consortium for SEP 2 Interoperability (CSEP) formed in 2012
  - Founded by HomePlug, Wi-Fi and Zigbee
- Completed V1.0 PICS and Test Spec in December 2013
  - First Test Harness approved in February 2015

IEEE 2030.5

- Modelled on OpenHAN requirements for Residential and Commercial buildings without BMS
- Integrates energy devices into the smart grid based upon
  - Price, DR and DER management
- Transport Layer Agnostic
  - TCP/IP based
    - E.g. Wifi, BlueTooth, Zigbee IP, WiSUN, HomePlug +
- Subscription or Polling method determined by end device
- Data compression optional for end devices
- Zero end device configuration
- 6 years test specification and certification tool development

Why IEEE 2030.5 for DER?

- DER Functionality:
  - Ability to update the CA Rule 21 SIWG Phase 1 functions
  - Full Metering data
  - Monitoring/alarms for situational awareness and M&V
  - Controls provide support for advanced functionality - Autonomous and Curves
  - Ability to group and target groups or individual devices based upon the utility network design
- Architecture:
  - RESTful HTTP & use of IP enables interactions with existing technologies & communications (IOT devices, internet/aggregators, routers, etc.)
  - Security: Strong security profile (TLS 1.2, Certificates for authentication, Access control) meets NIST requirements
  - Open standard: –No proprietary advantage- IEEE 2030.5 an open standard
  - DER information model based on 61850 and SunSpec
  - 2030.5 systems can support many types of programs and classes of customers (Residential, C&I, EV, Storage, Aggregators, Tariffs, DR, M&V, Monitoring, etc.)

IEEE 2030.5 Status

- IEEE2030.5 Standard under revision to accommodate CA Rule 21 advanced functionality
  - Includes additional advanced inverter controls for changing power setting; changing target output Watts and connect/disconnect; and increasing range of “primacy”
  - Expected to go to ballot early 2017 with approval mid-2017
- CA IOU’s Advice Letter for implementing new Rule 21 Communications requirements approved by CPUC 5 April 2017
- The Wi-SUN Alliance has obtained rights to the CSEP IPR and can license it to third parties to operate certification programs.
  - Wi-SUN Alliance does not plan to certify products but will establish an Industry Advisory Group to work out program details
  - The SunSpec Alliance will be the first 2030.5 certification organization
  - QualityLogic/UL will be a test house

Assessment of IEEE 2030.5

Requirements Area	Level of effort to meet all Requirements
Registration	None required.
Identification/Group Management	None required.
Device SW Update	None required.
Transactive Energy	New function set and standard update
Autonomous Deployment Communications	Some advanced functionality defined by SIWG missing which will to be balloted in IEEE in early 2017
Directed (Dispatch) Communications	Some advanced functionality defined by SIWG missing which will to be balloted in IEEE in early 2017
Advisory (Optional) Communications	None required.
EV-to-Grid Services Communications Reporting	None required
DER Information, Status and Telemetry Reporting	None required
DER Configuration Reporting	None required
DER Performance Reporting	None required
DER Notifications and Alarms	None required

Summary

- IEEE2030.5 is the best fit based upon the requirements, if you consider device management
  - Rule 21
  - Extensive device Function sets for Price, DR, EV's etc.
  - Zero end device configuration
  - Support for battery powered devices
- A major gap in DER management is missing DER communications functionality for the Buildings?

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