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IMPLEMENTING AN IEEE 2030.5 SERVER IN AUSTRALIA

Key Challenges and Lessons Learned

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GridOS DERMS Gateway

Originally designed as an IEEE 2030.5 server, Gateway is GE Vernova's primary component for communicating with and monitoring DERs connected to the network.

GridOS Gateway is currently deployed at 4 DNSPs across Australia, with expansion planned in 2026.

GridOS DERMS has supported the CSIP-AUS extension of IEEE 2030.5 in production since 2024.

Key Challenges and Pain Points

RAPID ADOPTION

Regulatory Requirements

- New regulatory requirements push for rapid adoption of the IEEE 2030.5 protocol and extension

High Volume of Rooftop Solar Installations

- Large volumes of DERs coming online, combined with the complexity of the IEEE 2030.5 protocol has tested the performance limits of Gateway
- In-band registration was introduced to streamline DER onboarding, but comes with its own security challenges around traffic verification and authorization

INCONSISTENT IMPLEMENTATION

Differences in Client-side Behavior

- Inconsistent implementation for mandatory functionality makes server-side support challenging. Examples include MUP and MMR creation and polling for DER information.
- Varying behavior requires servers to introduce protective functionality like rate limiting or request limits to prevent system instability

UNCERTAINTY AROUND SUPPORT

Ambiguity on Supported Features

- Not all IEEE 2030.5 functionality is required for device testing, leading to uncertainty of how widely non-tested features are supported
- Examples include subscription-notification functionality and support for program primacy
- This uncertainty can result in less efficient business processes

Lessons Learned in Implementation

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Interoperability

- Inconsistent implementation of some features of the standard demonstrate more robust support for onboarding is needed
- Common interop testing (or expansion of common test requirements) will improve time to onboard

Scalability

- Aggregators are an essential part of supporting large volumes of DERs connecting to the grid
- Use of more performant features like notifications can help systems support a larger number of DERs

Resiliency

- With a complex protocol and rapid adoption, communication failures are inevitable
- Business processes must account for default controls or mechanisms that protect against these communication failures
- This will require support for local orchestration at the DER level

Suggestions for the Future

Consider the region's primary use cases –

- Grid safety and stability drives requirements for fast remote disconnection, export and import limits, and streamlined onboarding
- Telemetry and monitoring provides utilities with key information used in making informed operational decisions

Create alignment on interoperable testing for all features in the IEEE 2030.5 standard

- Different states have different priorities across the use cases for IEEE 2030.5 CSIP-AUS. This makes interoperability testing and implementation difficult for OEMs.
- More consistent interoperable testing and onboarding practices will help reduce unknown/undesired behavior and streamline the onboarding experience.

OUR AIM IS TO SUPPORT COMMUNICATION WITH EVERY DER CONNECTED TO THE NETWORK


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