September 18, 2017 Sacramento Meeting Notes

Summary

- Attendance: 15 in person, approximately 30 attendees via Webex
- Presentations and notes available online: http://www.cpuc.ca.gov/vgi/
- Facilitator Justin Regnier summarized key takeaways from the previous meeting
- Presentation 1: Sub-Working Group 1.1, Dean Taylor, SCE
    - Outlined the Glossary's organization, sought feedback about controversial terms, noted progress toward describing a single benefits framework, and identified needs:
        - Controversial terms: Are PFE and NSP synonymous?
        - Single benefits framework:
            - Compliance. Utilities oppose creating additional requirements.
            - Who receives, what is done, how is it achieved?
        - See slide 8
            - Missing Definitions
            - Benefits framework
            - Areas of disagreement?
            - Need to ensure consistency
            - Double check References #11-13, 17
            - Is the benefit monetized?
        - What is the use of the Glossary in the future?
- Presentation 2: Sub-Working Group 1.2b, Stephanie Palmer, ARB
    - Reviewed Deliverable1.2b process to establish requirements. Functional Requirements Matrix was sent to the Deliverable 1.3 mapping group
    - Summary and full matrix posted in the Deliverables section of the VGI website.
- Presentation 3: Sub-Working Group 1.3, Justin Regnier, CEC
    - Goal is to have consistent answers within the matrixes from each protocol
        - E.g. individual SMEs are discussing to learn how other protocols complete functions.
        - Have completed SEP. Progressing through: OCPP, ADR, 15118, SAE, ChaDeMo, CNMP, telematics.
    - Requires time given nuances, but goal is to complete information gathering by end of September or early October.
    - Joshua McDonald's proposal for an IP solution (see below) requires more detail.
- Presentation 4: Rule 21, Joshua MacDonald, SCE
    - Rule 21 intended to avoid repeating the EU's grid problems, by updating the Tariff and California Smart Inverter Profile Handbook with the use of SEP2 as a default utility→DER protocol.
        - Described 3 phases: identifying autonomous functions, 3-options in the use of SEP2, and ongoing working group discussing Advanced Capabilities.
- Presentation 5: Deliverable 2 Exercise, Noel Crisostomo, CEC
    - Described Deliverable 2 spreadsheet and via group exercise (example SEP2) and sought feedback
        - Stakeholder suggestions:
            - Baseline – evaluate implementations of architectures/ end-to-end solutions instead of instead of individual protocols.
                - Validate linkages between D1.3 (as completed) into D2

    - Do not want to debate perfect counterfactual charging system.
- Costs – cannot provide actual proprietary cost , concern about anti-trust/collusion. Suggests market maturity analysis.
- Benefits – more clearly define benefits to ensure consistency in analysis, be able to validate performance/deliverability. Define the metrics for deliverability of grid services.
- Question 2 – clarify process for determining net benefits.
- Preference to work in teams around preferred architecture.

Action Items & Next Steps

- Glossary sub-working group must provide feedback and review for consistency. Email Dean.Taylor@sce.com to participate. Most of the unfinished work is detailed in Dean's presentation, posted on the VGI website.
- To participate in the Mapping sub-working group email Justin.regnier@energy.ca.gov
    - SCE will send proposal to agencies on IP solution and detail the concerns around "bridging" in their opposition to terminating communications in the "middle."
- Deliverable 2: Noel to refine assignment and process on Deliverable 2.
    - Incorporating feedback to spreadsheet.
    - Will send a request for groups to coalesce around architectural solutions.
- Agencies are updating Work Plan schedule according to extra time needed for analyses and recommendation.
- The next full Working Group meeting is a Webex on Monday, October 16.

Resources

- Email the state agencies (CPUC, CEC, ARB, CAISO, GO-Biz) with any questions or comments: vgiworkinggroup@cpuc.ca.gov
- Access the Definitions Sub-Working Group documents on Google drive: https://drive.google.com/open?id=0B4_ZRQzLAsLNdV9Fc0doVHZPZEU

Detailed Comments

- Glossary
    - Power Flow entity (controls) vs Network Service Provider (billing, maintenance)
        - Jeremy: PFE and NSP can be implemented as a single agent or different agents
        - Stephanie: should have a note stating that PFE is only used for the purposes of the requirements group, not an industry standard term
- Rule 21
    - Phase 1: 7 autonomous functions mandated for all new systems by 9/8
        - Hardware can be communicated with and updated.
    - Phase 2:
        - All DER systems should be able to be capable of communications.
        - Default from utility's interface to EITHER 1 of 3 options: DER gateway, Aggregator gateway, Plant's gateway: IEEE 2030.5
            - Barry: Can the DER use anything beyond the 3 Gateways? i.e. can the utility signal be terminated before the inverter?

        - Josh: Yes, could have standards beyond SEP2.
    - IOUs could also communicate: DNP3, IEC 61850
    - Attempted to align with IEEE 1547
    - Interconnection tariff: CPUC has purview over inverter itself. Ongoing question includes: Does it have jurisdiction to mandate aggregator interfaces? Currently no.
  - Phase 3: Advanced Capabilities
    - DR, limit charging rates, monitoring, etc
    - Dean: how does this connect to EV?
        - Could be similar, wherein an off-board inverter is charging with DC.
    - J3072 (EV DER controls for onboard utility interactive inverter)
    - Decision Process:
        - Expectations, Requirements, Vet Standards and Protocols, Interconnection Requirements, Regulatory Decision.
    - California Smart Inverter Profile (CSIP)
        - Object model intent is to group inverters in targets, based on grid level, to intervene on resource using specific programs.
        - Process: Registration, interface, prioritization, security, etc.
  - Barry: How do you find an inverter within the topology, as in 2 inverters next to each other?
    - Since all of the inverters are agglomerated as one "blob" entity, it wouldn't make a difference if there are multiple.
    - Barry: If a customer has 2 inverters, would it need to aggregate them via a BMS or could they be controlled under multiple programs?
        - JM: No, would not need to create 2 programs for 2 inverters, but the utility could create different programs for a BMS or an inverter
        - Hank: This specific implementation would require program design.
        - JM: SCE prefers aggregations of resources (abstractions).
  - Dean: What would be applicable for EV? Does this get added into the glossary?
  - Oleg: How does this work in the context of a microgrid? Does it enable further orchestration downstream? Could sub-resources be exposed as a single entity? What is technical scalability?
    - JM: Tested in microgrid demonstrations. Envisions the interface to be one "blob."
    - JM: IOUs could be deploying devices and the rule helps determine what IOU is procuring.
  - Jen: Does Rule 21 govern NEM interconnections?
    - JM: Rule 21 did not affect compensation -- any rate changes were out of scope.
    - Jeffrey Kwan/Mary Claire Evans (CPUC R21 analysts): NEM is subject to Rule 21 interconnection.
  - Lisa: Does this affect RTP?
    - JM: NEM doesn't have RTP, and there is no expectation to publish pricing to inverters.
- Mapping protocols to Requirements
  - Dean Taylor/Josh McDonald (SCE):
    - Mapping group should consider an "IP suite" solution (OCI layers 2 & 3) to allow for customer choice and flexibility.
    - Applications should be bridged and routed, using the EVSE as a "direct bridge through the EVSE to the EV" for an "end-to-end" solution. Concerned about:
        - Cost

        - Cybersecurity (packet encrypt/decrypt), MIM attacks
        - Suggests preventing point to point communications.
        - If messages terminate at EVSE, the standard would need to be updated.
- Justin: Would want to avoid destroying value, but need more detail to vet validity of concern
- Jeremy:
    - What if there was a different or additional message from EVSE?
    - The EVSE could still maintain encryption, even though it is a "man in the middle"
    - Maybe the grid signal is not "end to end" and instead manifests itself into something, and doesn't go all the way to the car.
    - Key question is who needs to know and what does it need to know?
- Oleg: Shares Jeremy's concern.
    - EVSE networks routinely manage whitelists (to allow for charging while the network is down).
    - E.g. in industrial IOT, more processing is required at the edge to meet needs. Centralized control is insufficient to enabling the decentralized intelligence of a microgrid.
    - The presence of multiple actors in communications paths is not a threat, if the identities are managed. (Contrary to MIM claim) additional managed identities enhances cybersecurity and resilience. Disagrees that the termination in the middle is a bad thing.
        - Blockchains create a stronger infrastructure because the network can know "who is who."
- Mike: Disagrees because this use case and the EVSE actor was not identified—the BMS had been identified.
    - E.g. a public EVSE is same as a public Wi-Fi (an intermediate device), which would not be trusted if it opened a packet. However, could add cost to keep it secure.
    - Oleg: What is the cost of security?
        - MB: Metering used by utility can be sold for $600, but the Bill of Material costs just 20$. Additional cost comes from sealing and certification.
        - OL: Cost could be an order of magnitude lower, because it is adding silicon (e.g. Intel is deploying sim cards to authenticate and costs decrease with economies of scale).
        - MB: Would need to document and certify device for security.
        - Oleg: Agree with need for UL, FCC, etc certification. Disagrees with comparison of an EVSE to a router, particularly when managing PWM. The router conveys information to a phone. EVSEs can connect to multiple routers. The EVSE is more like an ATM.
- Justin: Despite disagreement on security analogy, the key question is: What does it take to provide a recommendation for bulk purchasing?
    - Oleg:
        - Agrees with requiring at least a IP communications stack in the architecture.
        - Ensure payload encryption.

        - In a 'dumb' EVSE, we still need to translate states indicated by PWM into signals communicated via IP, that is not very different from the protocol translation between IP and IP/ PLC.
    - Hank McGlynn:
        - In AC, EVSE and EV can be considered separate entity
        - EVSE can manage control pilot based on information it received.
        - Bridge doesn't make sense for DCFC
    - Lisa McGhee:
        - Should consider network failures that would prevent the EVSE from running, which would not sustain the vehicle. Set expectations on minimum response/fix time, to get back on the road
        - Concerned about proprietary limits with OBD information.
        - Ensure maintainability to enable operators to share support capability.
    - Oleg Logvinov
        - EVSE is not a piece of hardware, it's a service.
        - By designing with ISO 15118 and OCPP, in the event of a network failure, would be able to access the network via a whitelist. (e.g. set a rule allowing charging while down, permit network diagnostics, etc.)
        - Extract good practices/learnings from implementation for requirements.

Attendees

In Person: Dennis Miller, Barry Sole, Chad Bass, Mark Fruechtnicht , Jeremy Whaling, Jamie Hall, Keerthi Ravikkumar, Hannah Goldsmith, Abigail Tinker, Lisa McGhee, Mike Bourton, Lance Atkins, Oleg Logvinov, Dean Taylor, Josh McDonald

WebEx: Adam Langton, Alec Brooks, Bill Boyce, Ted Bohn, Brian Chen, David McCreadie, Geoge Bellino, Gordon Lum, Hank McGlynn, James Tarchinski, JC Martin, John Mengwasser, Kavya Balaraman, Lonneke Driessen, Mahdi Chamkhari, Scott Turik, Stephan Voit, Steven Yip, Tim Lipman, Francesca Wahl, Jeffrey Kwan, Kelsey Johnson, Robert Uyeki, Rich Scholer, several unidentified.

Agencies: Amy Mesrobian, Carrie Sisto, Jennifer Kalafut, Stephanie Palmer, Justin Regnier, Peter Klauer, Noel Crisostomo, Elise Keddie