SunSpec Alliance Public Key Infrastructure

PV Systems Symposium

Albuquerque, NM

May 16, 2019

PKI Primer

- A system for the creation, storage and distribution of digital certificates which are used to verify that a particular public key belongs to a certain entity

- The PKI creates digital certificates which map public keys to entities, securely stores these certificates in a central repository and revokes them if needed

- Used for mutual authentication of DER resources

How Public Key Exchange Works

PKI Trust Chain

Root (offline)

Sub-CA (online/offline)

Secure Element & Device Certificate
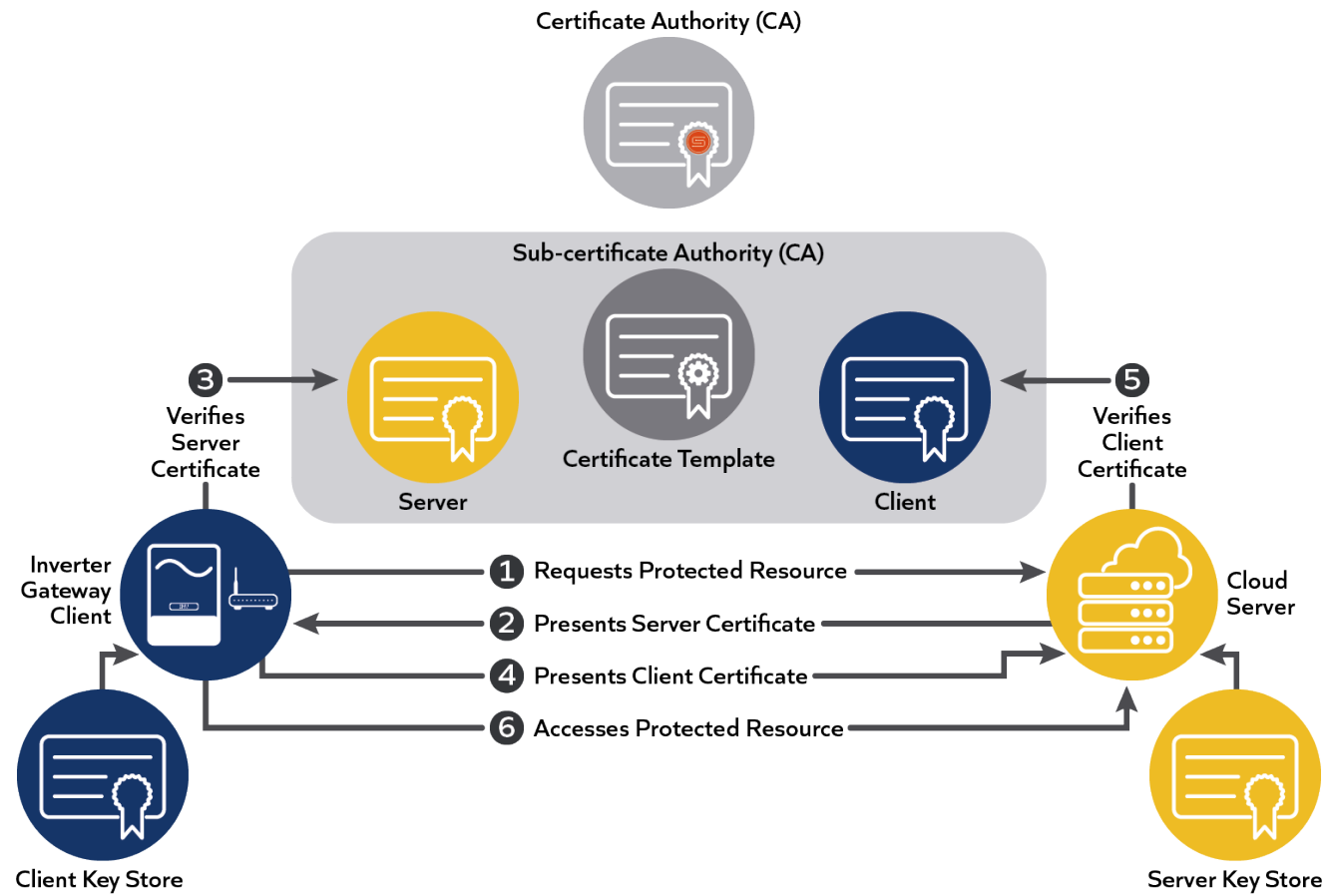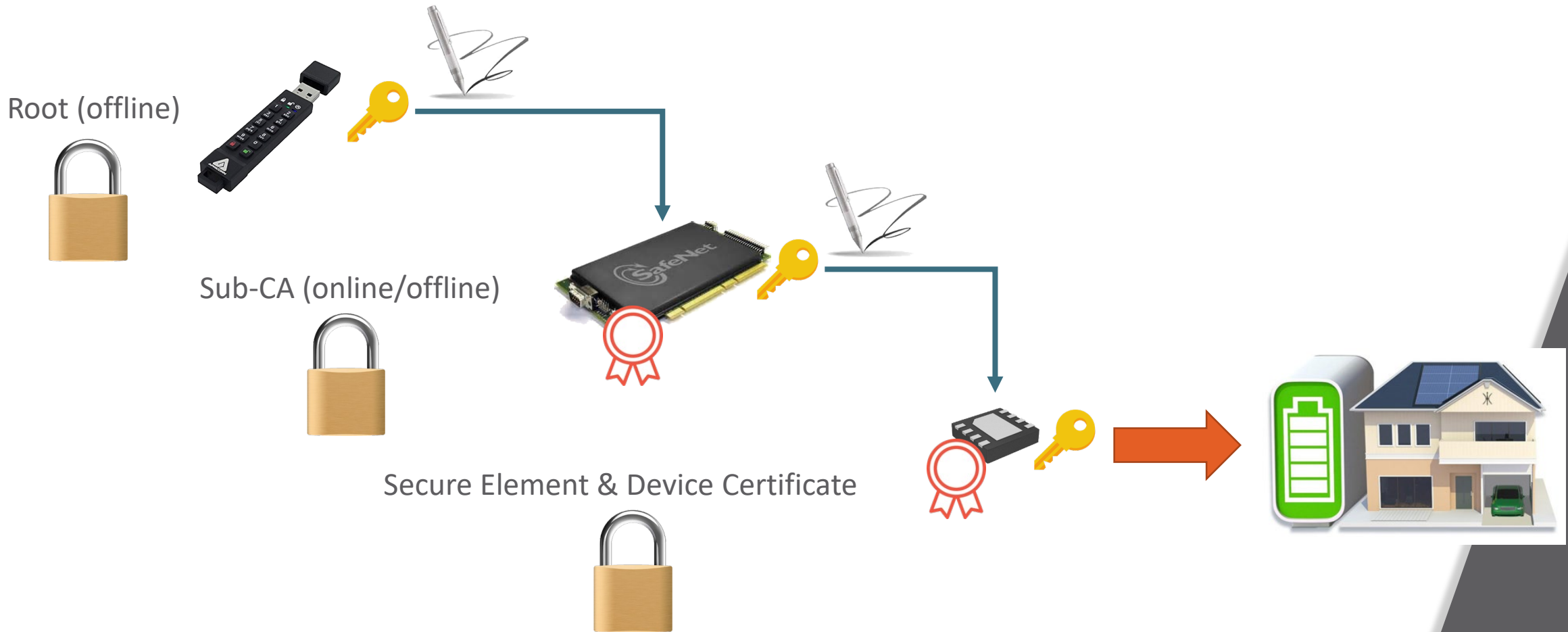
SunSpec PKI Motivation

- Enable DER industry to meet state and federal cybersecurity requirements
- California Rule 21
  - IEEE 2030.5-2018
- IEEE 1547-2018
  - IEEE 2030.5-2018
 - IEEE 1815
  - SunSpec Modbus

Current SunSpec PKI Environment

- SunSpec is providing a production PKI for IEEE 2030.5 communications

- IEEE 2030.5 specifies TLS 1.2 as the basis for secure communication

- California Rule 21 specifies IEEE 2030.5 as the default protocol for communicating with utilities

- The Common Smart Inverter Profile (CSIP) specifies the details of IEEE 2030.5 communications in California Rule 21

SunSpec PKI for IEEE 2030.5/CSIP Characteristics

- Only for DER at present

- Manufacturers central to trust chain

- Device expiration policy defined by standard
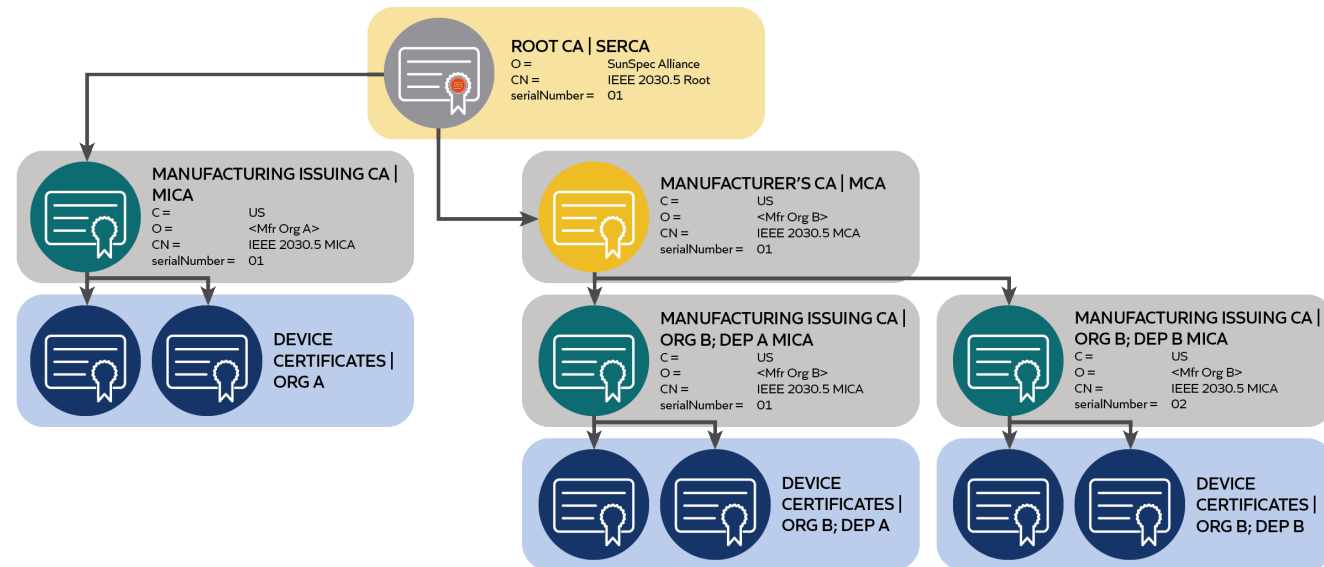
Features

- SunSpec production PKI provides the mechanism for communication security in the production environment

- SunSpec test PKI provides a parallel system that mirrors the production PKI functionality for testing purposes

SunSpec PKI Resources

SunSpec Open Source Reference Test Platform

- Advanced inverter and storage
- SunSpec Modbus
- IEEE 2030.5*

AC POWER
DC POWER
ETHERNET LAN TO CONTROL & MONITOR

DER SYSTEM
ENERGY STORAGE

SMART INVERTER

CONTROL
MONITOR

SunSpec System Validation Platform

PV SIMULATOR
ADJUST: DC INPUT

GRID SIMULATOR
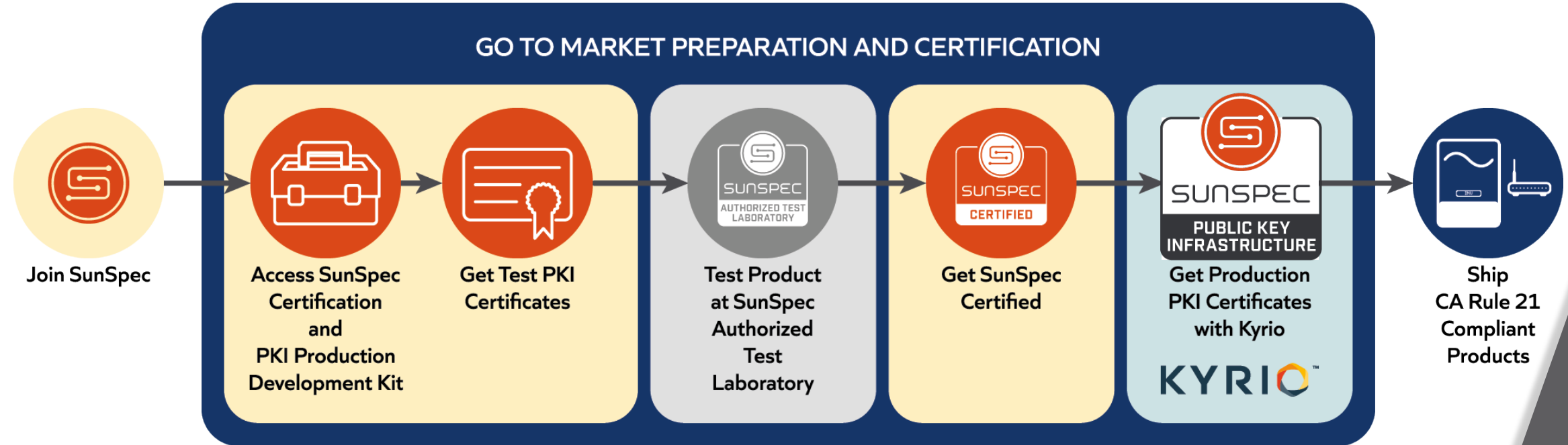ADJUST: VOLTAGE, FREQUENCY LOAD

DATA ACQUISITION
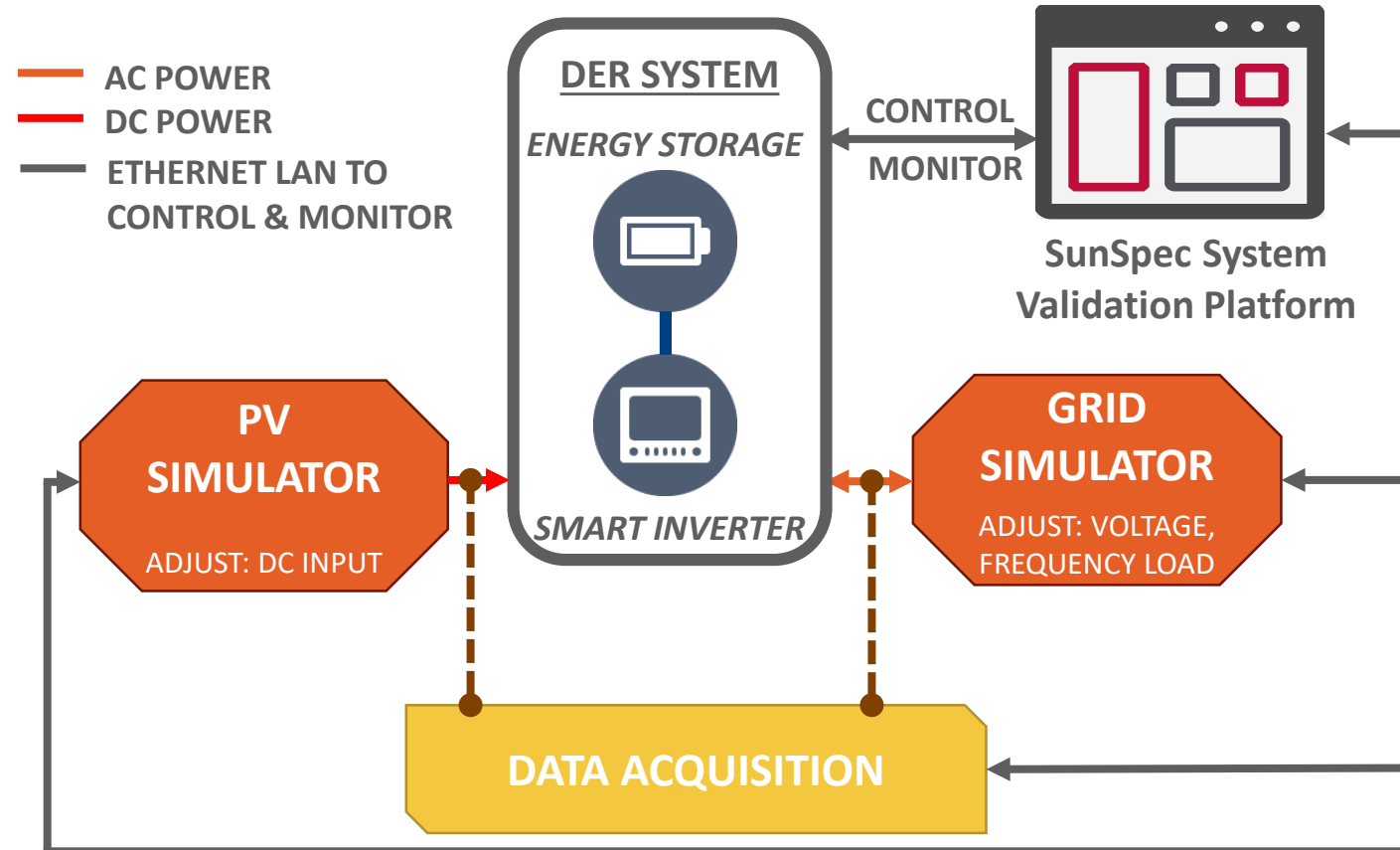
* Available Q3 2019

SunSpec Certified Testing Laboratories

Open to all qualified testing institutions

Going To Market With SunSpec PKI

GO TO MARKET PREPARATION AND CERTIFICATION

Join SunSpec

Access SunSpec Certification and PKI Production Development Kit

Get Test PKI Certificates

Test Product at SunSpec Authorized Test Laboratory

Get SunSpec Certified

Get Production PKI Certificates with Kyrio

Ship CA Rule 21 Compliant Products

Look for the SunSpec Certified™ Mark

Join the SunSpec Test PKI Network

- Free test PKI certificates available

- Enables access to SunSpec certification and interoperability testing

- Allows testing with any equipment or test framework using the SunSpec test PKI

- Go to https://sunspec.org/sunspec-public-key-infrastructure-pki-program/ to get the application note and request test certificates
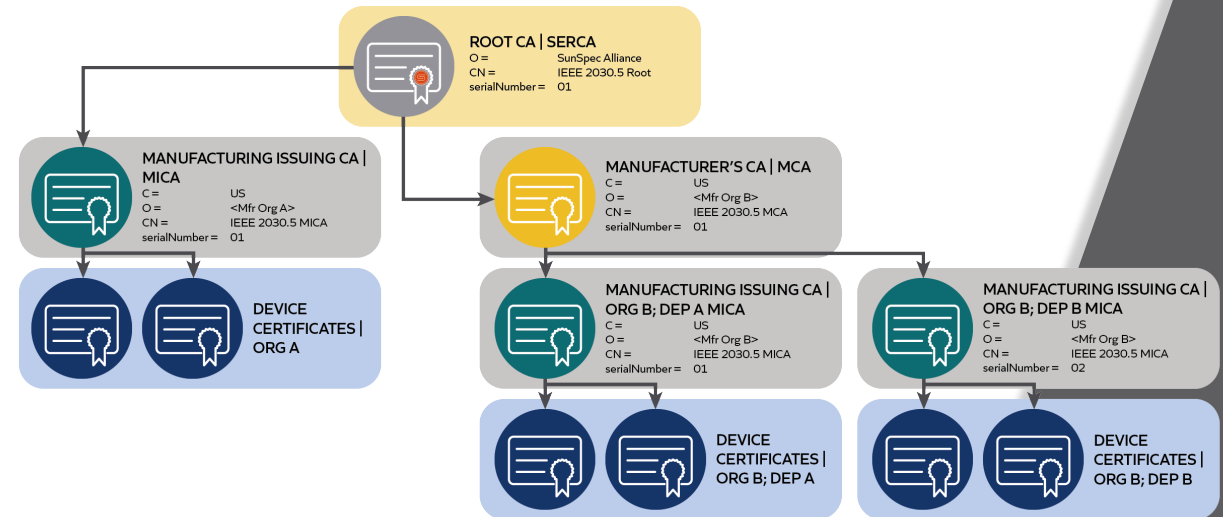
Upcoming Public Cybersecurity Sessions

Register June for 12 2019 Webinar

https://sunspec.org/webinar-three-implement-strong-cybersecurity-pki-distributed-energy-resource-industry/

Opportunities to Learn & Contribute In Cybersecurity

Register Now for July 2 2019 Course

https://extension.ucsd.edu/courses-and-programs/secure-communication-networking-for-distributed-energy-resources

Cybersecurity Work Group

https://sunspec.org/sunspec-cybersecurity-workgroup/

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Social