

Welcome

Matter Technology and Market Update Q & A with the Connectivity Standard Alliance

Victor Lee - Sr. Field Application Engineer, Silicon Labs

tech talks



MATTER

Silicon Labs: Simplifying Matter Development, Testing and Manufacturing



Guided end-to-end [Matter Developer Journey](#)

- Steps developers through learning to deployment including guidance for popular Ecosystems



High-performance Low-power [Wireless SoCs](#)

- Wi-Fi and Thread solution with Bluetooth Low Energy for commissioning



Wireless Matter solution for Silicon Labs [GitHub](#) and [Simplicity Studio](#)

- Proven and pre-certified stacks for Matter over Wi-Fi and Matter over Thread



Comprehensive [Development Tools](#)

- Development kits, tools, and sample applications for Matter use cases



Robust [Matter-compliant Security](#)

- The most advanced IoT security solution with full Matter-compliance



Connectivity Lab

- Developed for testing your products from the user's perspective



Silicon Labs [Custom Manufacturing Services](#)

- Secure Programming of your Matter certificates, security parameters, application, and bootloader

Agenda

- 1** Matter Introduction
- 2** A Year in Review
- 3** What's Next
- 4** Q&A

Matter Introduction

tech **talks**



MATTER

Building the Foundation & Future of the IoT



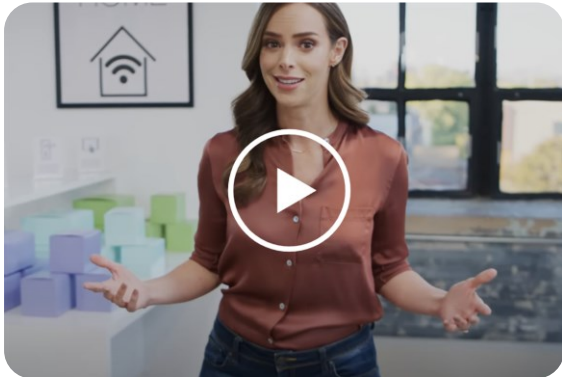
700+ Engaged Companies, with over 6,000 member individuals participating from 49 countries



What is Matter?

An open, universal standard for the smart home, developed by industry-leading companies.

Click play to view
Matter launch explainer



Simple

Easy to purchase, takes out the guesswork.

Makes it easy to setup and control your smart devices with multiple ecosystems.

Interoperable

Devices and ecosystems with the Matter mark are compatible by design.

Customers can choose which devices and ecosystems to connect.

Reliable

Consistent and responsive local connectivity that still works if your Internet connection is down.

Secure

Authenticated before joining the network, using encryption to transfer data.

How does Matter connect devices?

Matter-enabled smart home devices will run on Wi-Fi, Thread and/or Ethernet networks



Universal **wireless** networking technology connecting many devices in the home today.

High Bandwidth & Real-Time: Wi-Fi supports applications such as streaming video and audio, in addition to traditional smart home categories like light bulbs and thermostats.



An energy-efficient **wireless mesh network** that enables smart home devices such as door locks, lighting, and sensors to securely, reliably, and simply integrate into the smart home.

- Reliable: Thread is dependable.
- Instant Control: Thread is fast.
- Extended Range: Thread is well connected.
- Years of Battery Life: Thread is efficient.



Ubiquitous **wired** networking technology connecting many devices in the home today.

High Bandwidth & Real-Time: Ethernet supports applications such as streaming video and audio

Addressable market

No chicken-and-egg adoption cycle.

Most new standards take time for device makers to produce — and users to buy — all new hardware. Often with uncertainty if it will succeed.



Software updates to devices in **millions of homes**, let people **use Matter with many devices they already have**. **Hundreds of devices have been certified!**

Other devices won't get left behind — Matter supports bridging to technologies like Zigbee and Z-Wave, and major ecosystems will support existing integrations.

That means Matter is on shelves and in homes, right now.



A Year in Review

tech **t**alks



MATTER

Matter Adoption

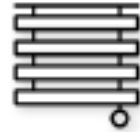


- ✦ **Matter 1.0 Launched on October 4, 2022**
 - Matter 1.1 Released May 2023
 - Matter 1.2 Released October 2023
 - *Matter 1.3 Released May 2024*
 - *Matter 2024 Fall Update*
- ✦ **As of February 29th, 2024, there are 2858 certified devices across 27 device types**
- ✦ **One of the fastest standards adoptions by manufacturers ever**
- ✦ **Major ecosystems have all rolled out device support for both Thread and Wi-Fi**

Device types supported by Matter



HVAC Controls



Window Coverings and Shades



Safety and Security



Lighting and Electrical



Door Locks



Media Devices



Controllers and Bridges



Appliances



Air Quality

What is Next?

tech **talks**



Evolving and Extending our Reach



Ongoing Release Planning

- Biannual Releases – Spring / Fall
- Devices
- Functional Updates
- Continuous Improvement

Active Use Case Teams

- Appliances (White goods)
- Closure Sensors
- Smoke & CO Detectors
- Energy management (EV Charging +)
- Access points, Border Routers
- Ambient motion / presence sensing
- Doorbells & Cameras

Q&A



MATTER

Welcome

The Final Step Matters

Scaling secure products into volume production. Featuring Matter

Victor Lee - Sr. Field Application Engineer, Silicon Labs

tech talks



MATTER

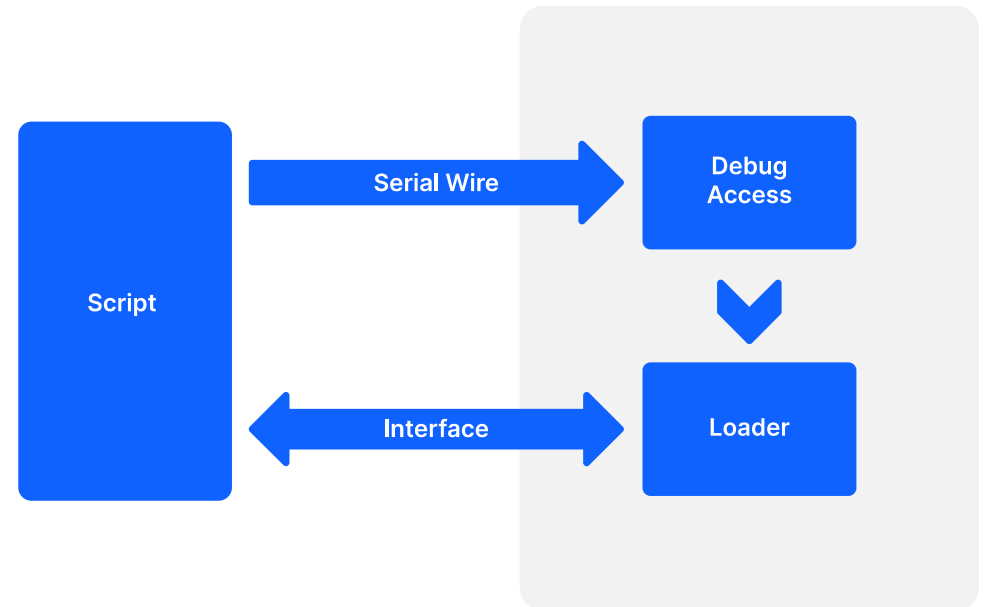
The World, It Is a' Changing



- **Manufacturing used to be simple**
 - All items were identical
 - Maybe they had serial numbers
- **Now, each copy of a product is unique**
- **Example: Matter**
 - Unique keys and certs
 - Unique labels
- **AND products need to keep things secure**

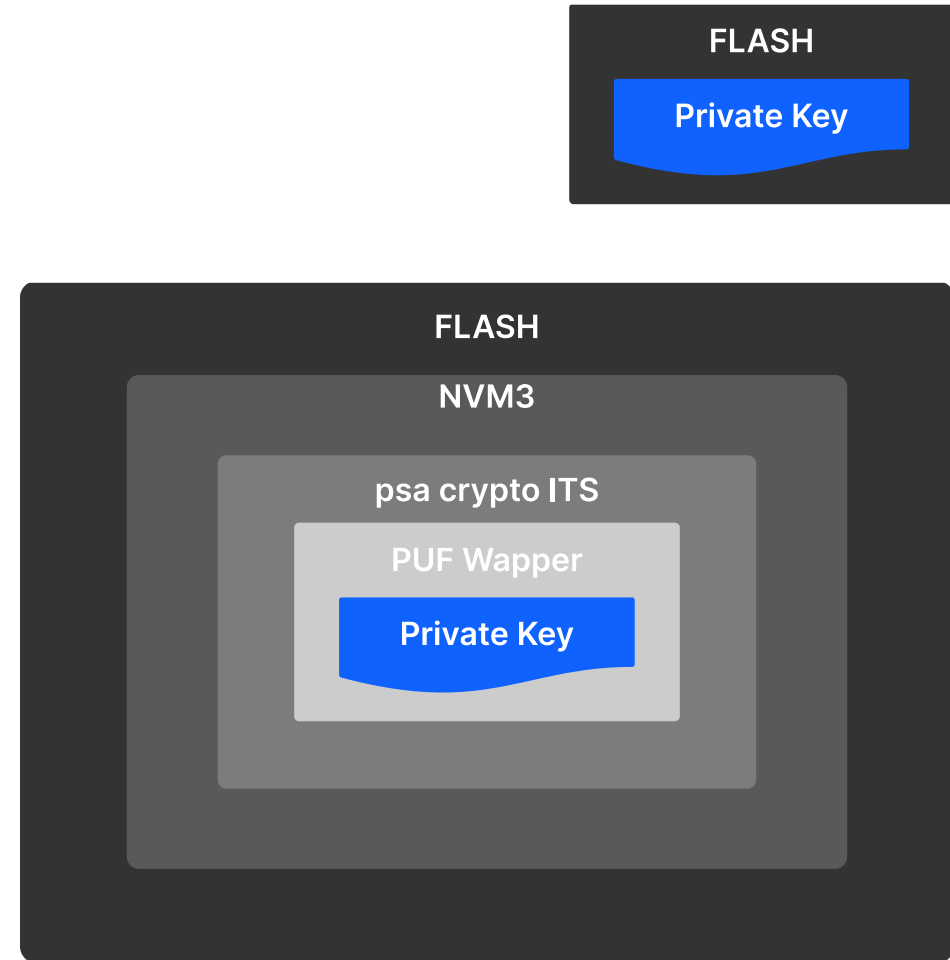
How does Provisioning Actually work?

- **There is a standard method of provisioning.**
 - Program a loader application via Debug
 - Send the Loader information
 - Let the loader program the device



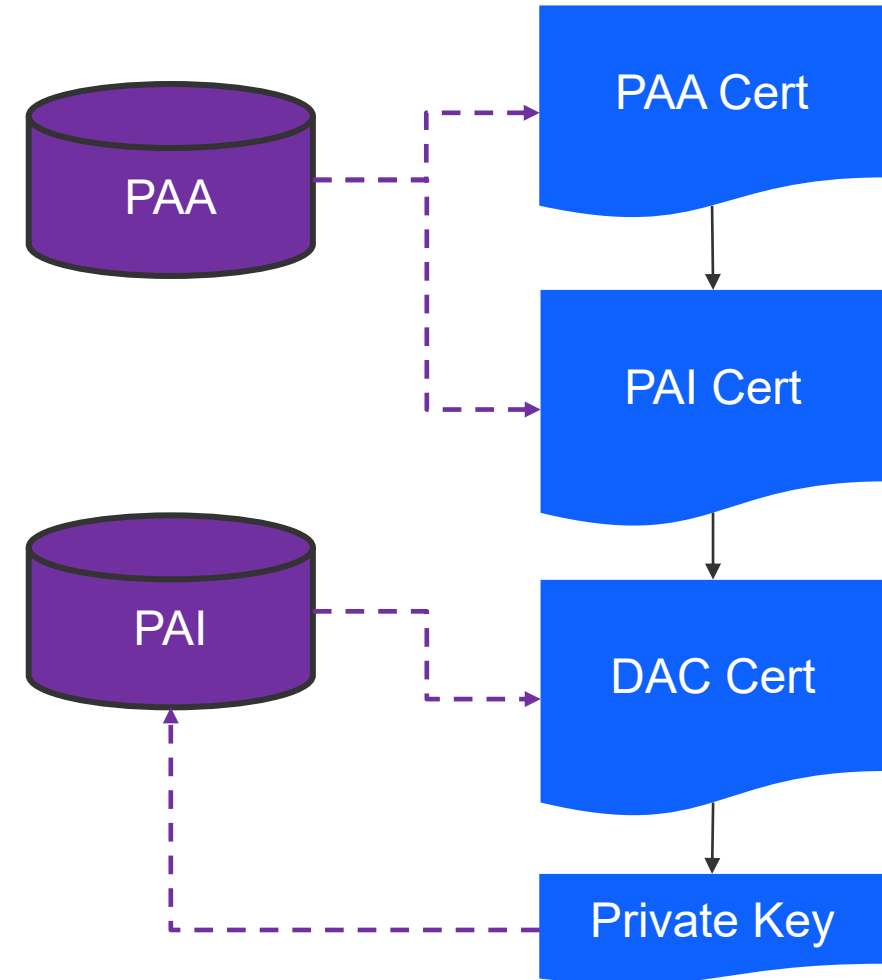
Challenge 1: Storage gets more complex

- **In Matter each device has to store a unique private key**
- **The simple way to do this is to put it in Flash**
 - This is not secure
 - This is not easily updatable
- **Proper storage can be more complex**
 - Key wrapped with PUF for security
 - Stored in psa_crypto ITS format for consistence and ease of use
 - Stored in an NVM database so it can be efficiently updated
- **Good News! Our loader can handle all this easily for us**
 - But it is now larger and more complex



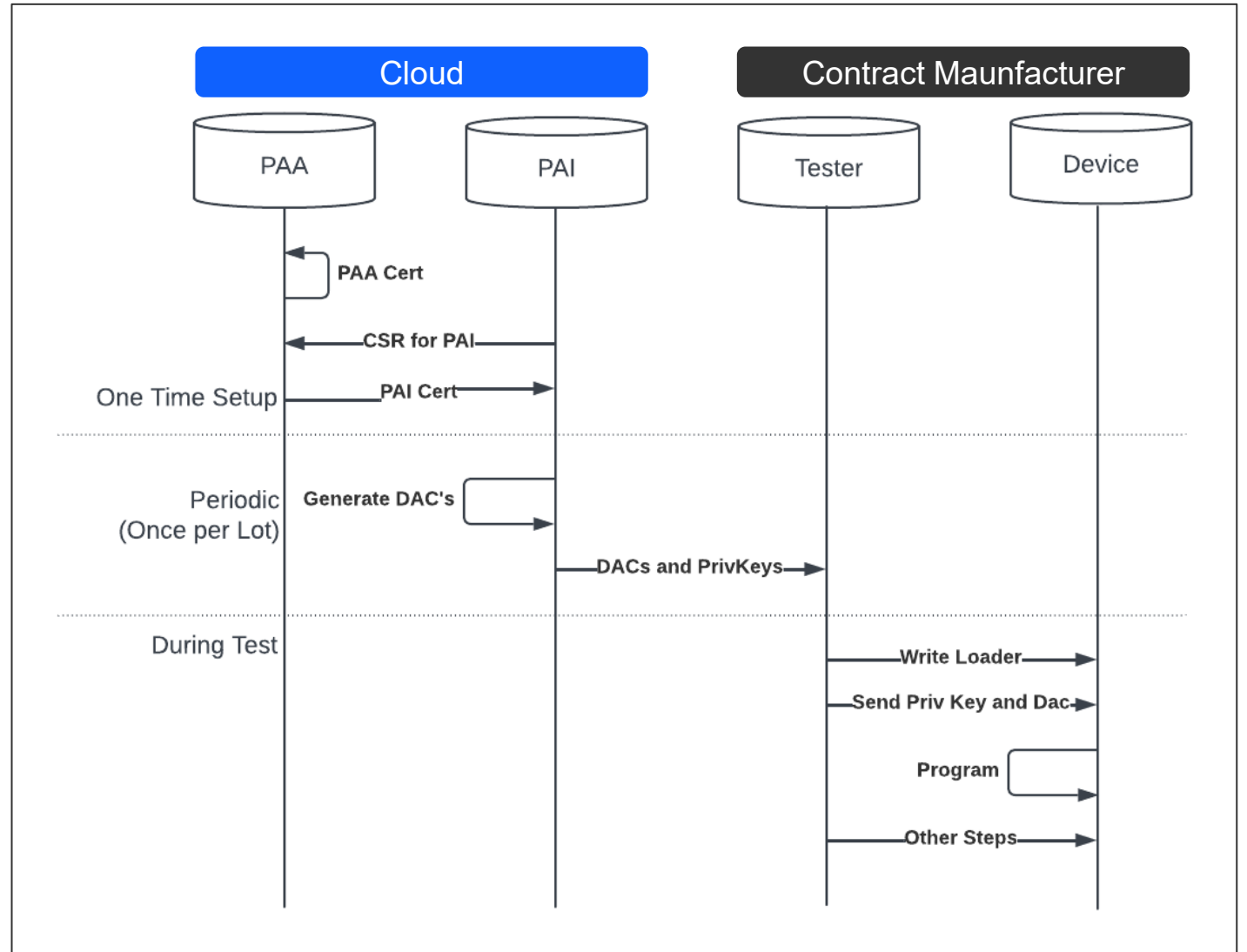
Challenge 2: How do we get our data?

- **Some things we can generate on the fly**
 - Serial numbers
- **Secure things need to come from a secure source**
- **Where does the private key come from?**
 - If it's made by the device it's most secure BUT we can't create our DAC ahead of time
 - If it's made by the PAI then we can make it ahead but it's vulnerable in transport



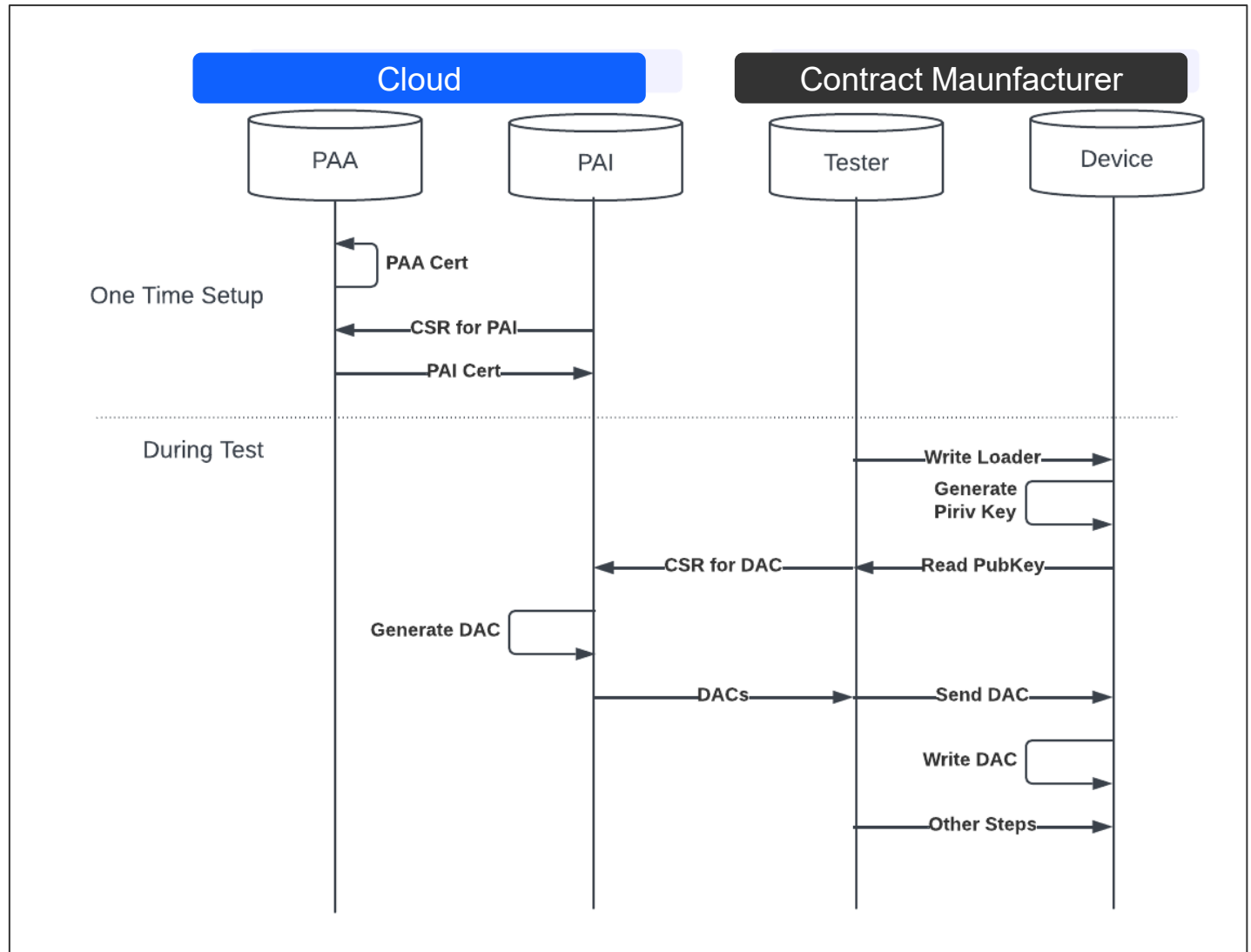
The Simplest Setup

- **This is the simplest setup**
 - Build a database of credentials
 - Send them to the tester
 - Inject the credentials
- **This is good for manufacturing**
 - Low cost
 - Low risk of interruptions
 - Simple
- **This is bad for security**
 - Private keys are transported and stored in multiple places
 - Private keys are ultimately sent to the device which is hard to protect
- **This solution would be a good fit for products that**
 - Don't support secure key storage
 - Prioritize cost over security



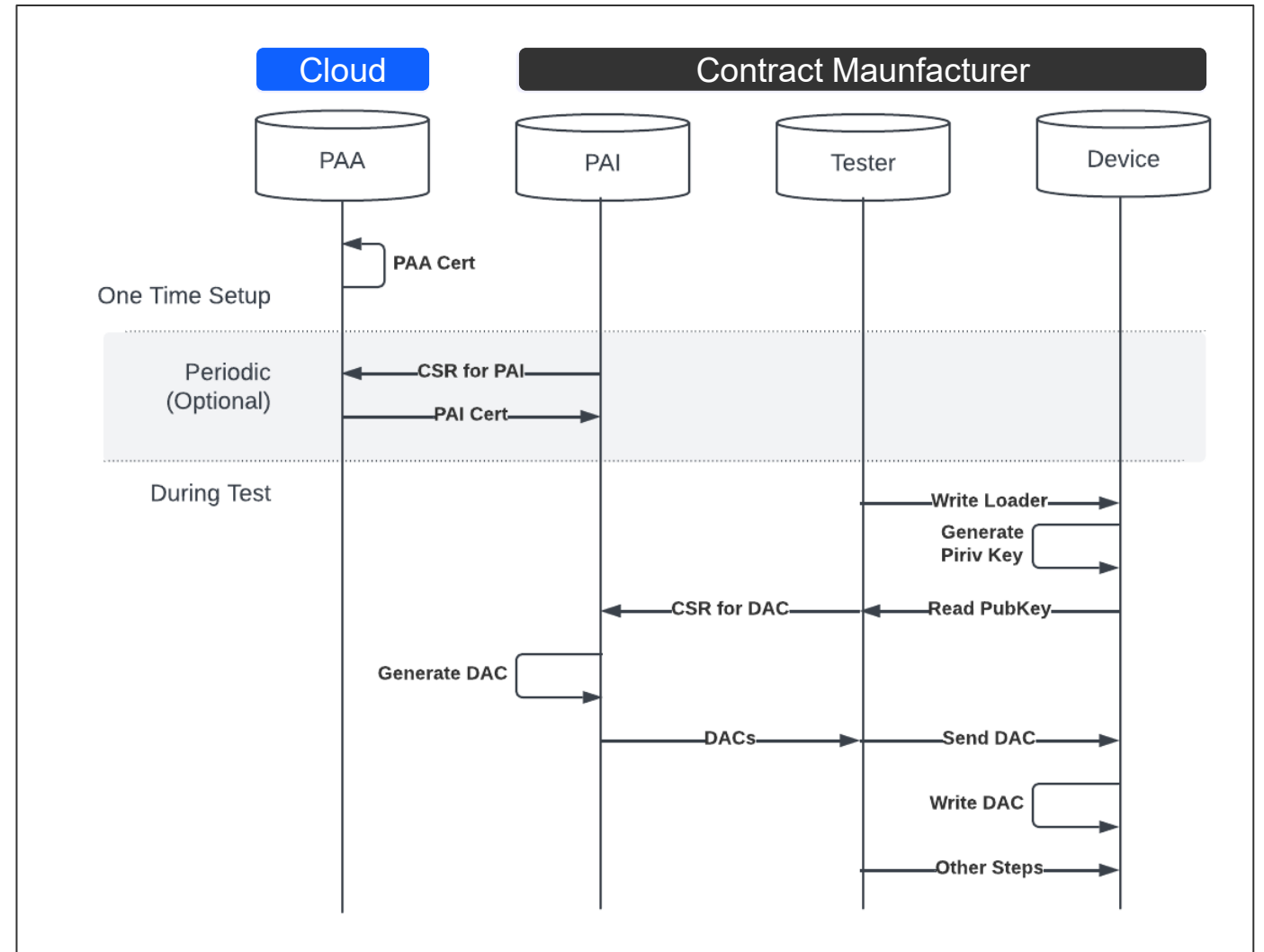
On-Line Manufacturing

- **Device Generates its own Key**
 - Key is never exposed
- **This comes with dangers of its own**
 - How much test time does that communication add?
 - CM may have 100's of systems running
 - What happens if the internet connection fails or degrades?
 - What happens if someone targets the CM with a dDoS?
- **This solution is good for**
 - OEM's who can tolerate production interruptions and value the security increase



The Most Secure Solution

- **On-Site PAI Address the On-Line risks**
- **Rotating PAIs increase security**
 - Keys are now time-bounded
 - Provides good revocation granularity
- **The PAI is on-site**
- **For Matter this is difficult due to the way the requirements are structured**
 - Especially at a site owned by a 3rd party
- **This solution is good for**
 - Products that need high security and can tolerate high cost
 - OEM's who own their own manufacturing sites



We still must be proactive about manufacturing



The Future
NEXT EXIT

- **Develop with the same script and loader that will be used in production**
 - Ensures no surprises when going to production
 - Production is debugged during development
- **Tools can easily support this**
 - Post build steps can run provisioning scripts
 - If structured properly firmware can be updated without changing provisioned data for faster firmware development
- **Silabs Provisioning Support**
 - Support all provisioning needs with scripts and loaders
 - ▶ For development AND for production
 - CPMS available to do custom part provisioning
 - ▶ Pre-program loaders or applications
 - ▶ Pre-provision credentials
 - ▶ Pre-configure device settings
 - Provide consistency between protocols and ecosystems

Conclusion

- **Matter credentials present an interesting challenge to volume manufacturing**
- **But many other problems are addressed by the same pattern**
- **There is no “Best” solution. Each product has its own needs.**
- **It’s important to plan for these new manufacturing needs up front**
 - It’s easy to run into months of delay and potentially need significant changes to a product if manufacturing is not accounted for
 - But if you know it’s coming it doesn’t have to be a problem

Q&A



MATTER

Thank You

tech **talks**



MATTER