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MAT-202

Develop Future-Ready Gateways with Matter

Mikko Saarnivala | August 2023

Agenda

01 Why gateways

02 Matter intro

03 Matter architecture

04 General challenges with gateway development

05 Migration into Matter

06 Unify Framework

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Why Gateways?

Introduction and Context

- Gateways are a requirement for the IoT
- More protocols = increased complexity
- Complexity is a barrier to adoption
- Matter is a change in prevailing trend
- How can one adopt Matter?

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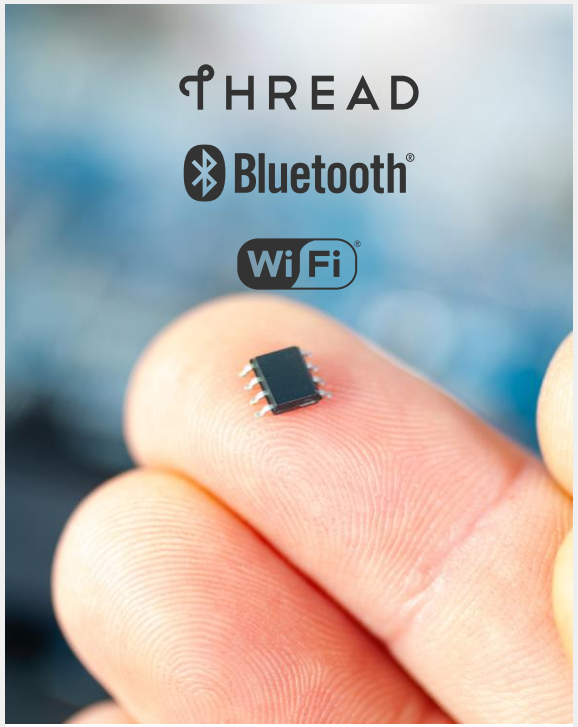
Matter Intro

Paths to Matter End Products

CSA Matter GitHub	Build Sample Apps						
Silicon Labs Matter GitHub	Build Sample Apps	Tested on Hardware Platforms	Verified Compliance	Pre-built Raspberry Pi Matter Image	Partial Tools Integration		
Studio, Tools, and GSDK	Build Sample Apps	Tested on Hardware Platforms	Verified Compliance	Pre-built Matter Library	Full Tools Integrations	Greater Ease of Use	Performance Testing

- With CSA's Matter GitHub there are numerous gaps to getting to production.
- Our Silicon Labs Matter GitHub will provide better stability and an easier path, but there will still be gaps.
- Ultimately the Studio, Tools & GSDK path will provide the best possible path for mass market adoption making use of Simplicity Studio and other Developer tools (example: VS Code).

Silicon Labs Matter Solution

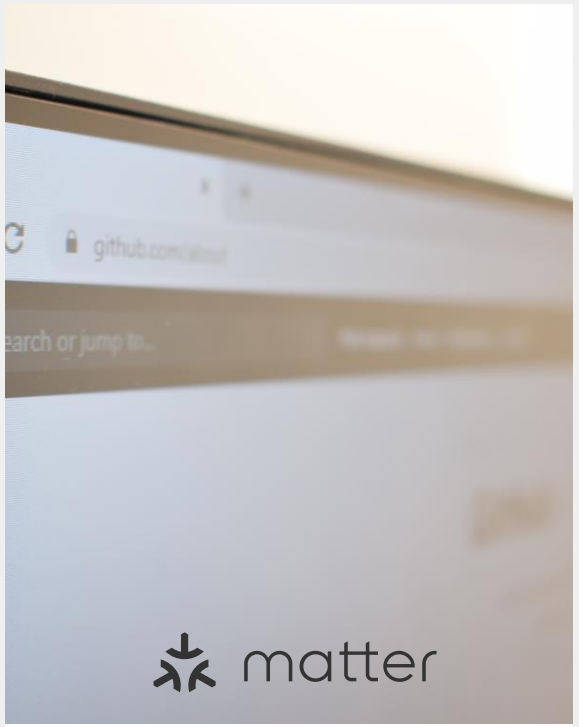


HARDWARE

Field Proven SoCs and Modules

Thread, Bluetooth and Wi-Fi

Certified Thread PHYs



SOFTWARE

One-stop-shop for all software

Full featured Matter solution

Built on top of IP stacks

TOOLS

Reference Applications

Command Line Interface support

LCD to display QR code

Studio support targeted Q4 2022

CERTIFICATION

+50,000 Wi-Fi and 802.15.4 end products deployed

Support for end-product certification

Matter certification Fall of 2022

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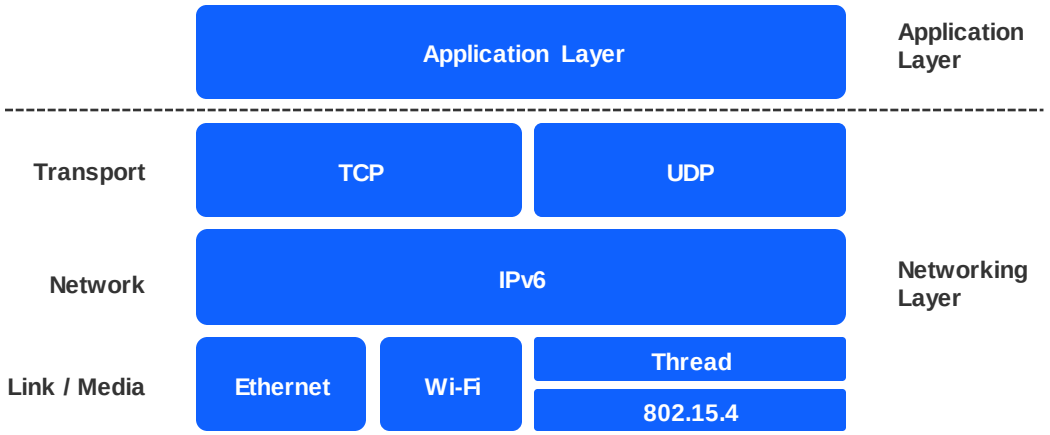
Matter Architecture

Matter Protocol Stack

- **Goal**

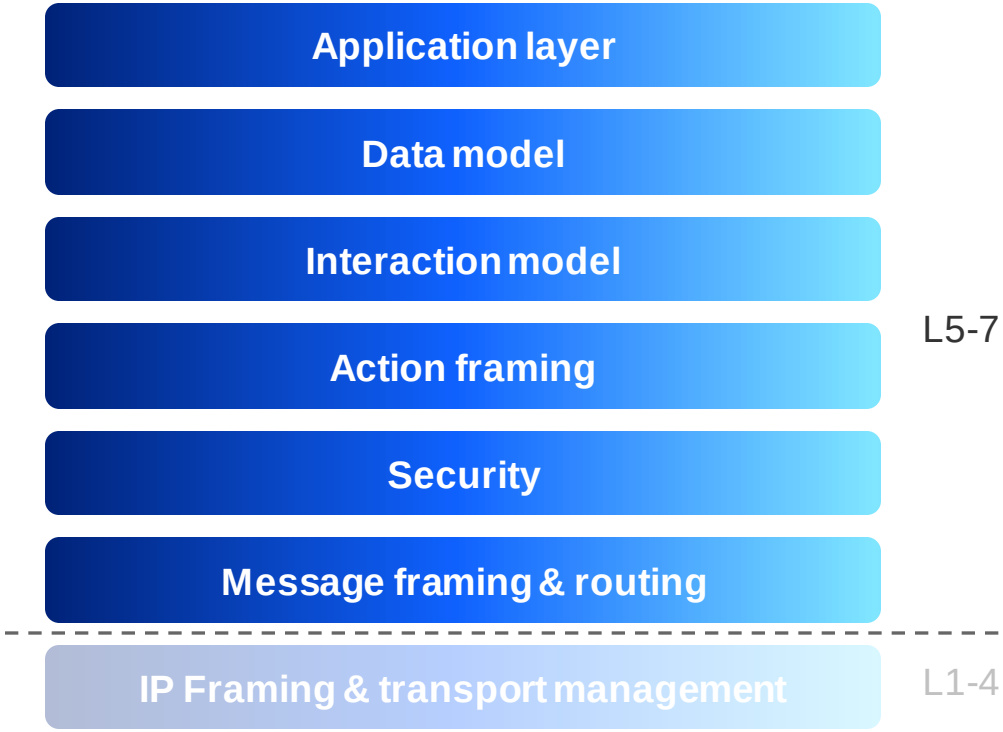
"Matter aims to build a universal IPv6-based communication protocol for smart home devices. The protocol defines the application layer that will be deployed on devices as well as the different link layers to help maintain interoperability."

- **Two main pillars**
  - Application
  - Networking



Matter application layer

- **Unification of the application layer for smart home**
- **Matter provides interoperability**
  - Security
  - Data model
  - Device interactions
  - Device types
  - Commissioning

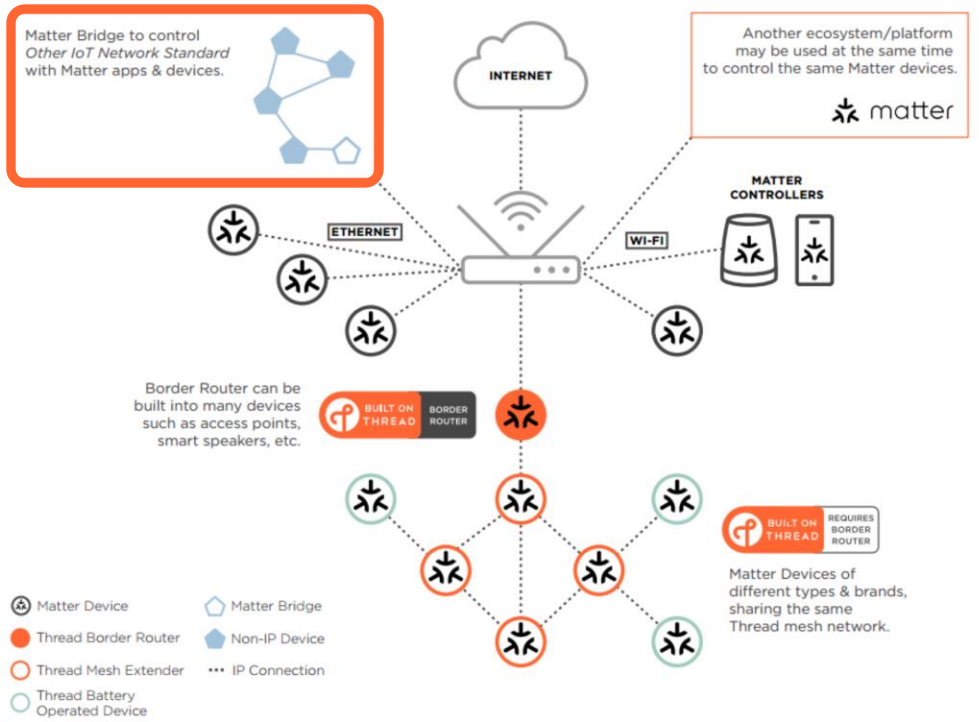


Matter networking

- **Connectivity technology agnostic (almost)**

  "In principle, any IPv6-bearing network is suitable for Matter deployment, subject to supporting a few core IPv6 standards."

- **Trivial interoperability to many technologies**
- **Non-IPv6 devices make things interesting**



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General Challenges

Typical Requirements of an IoT Gateway

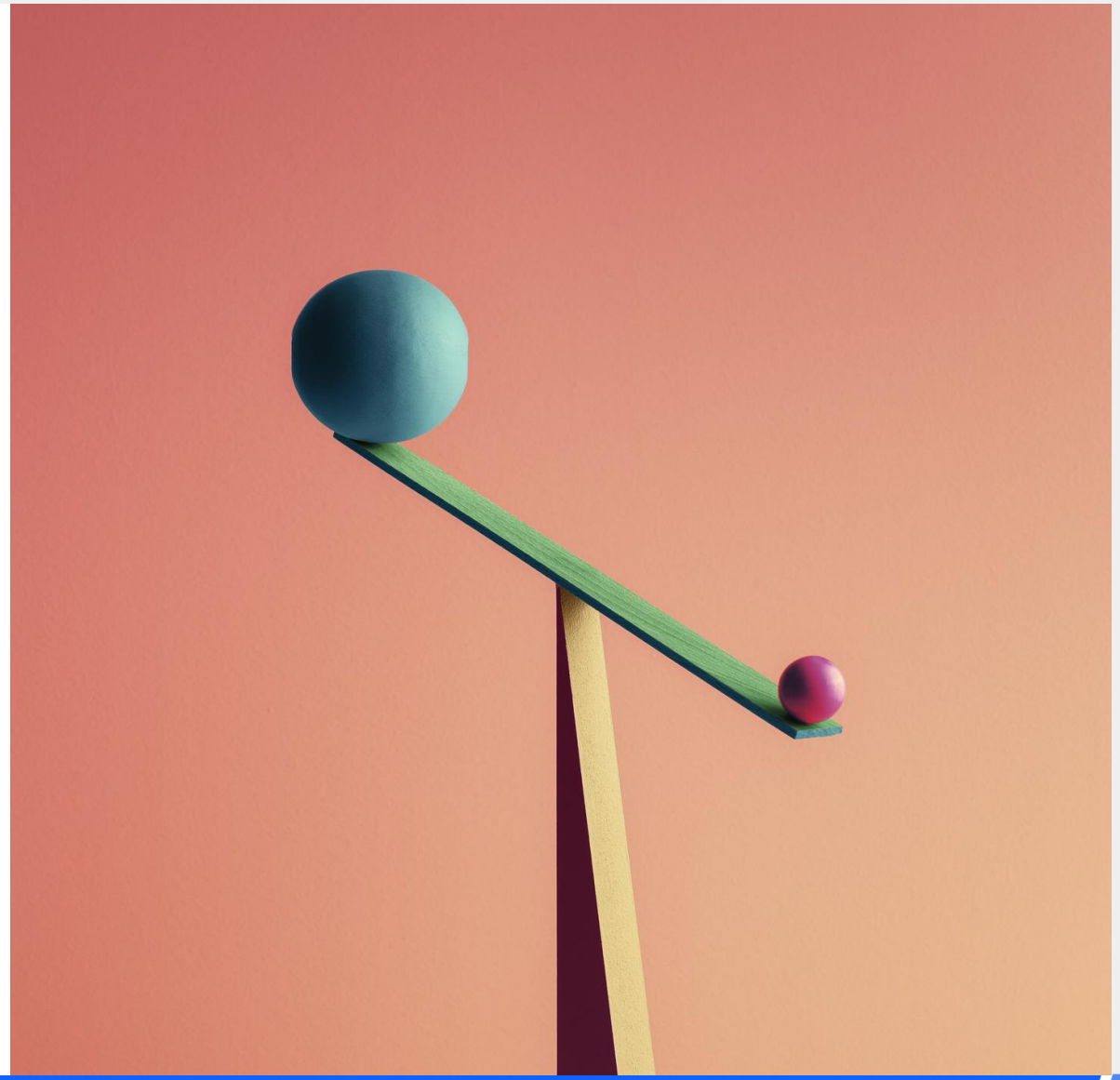
- **Operating system**
  - Networking
  - Standard libraries
  - Development environment
  - BSP
  - Shells
  - Etc.
- **Remote monitoring**
- **Local access control**
- **Security monitoring**
- **Platform (OS) updates**
- **Application management**
  - Updates
  - Monitoring
  - Control (Start/Stop)
- **Connectivity management**
  - Multiple uplinks
  - Security
- **Connectivity monitoring**
- **Intrusion monitoring/alerts**
- **Alert system**
  - Email/SMS/etc.
- **Logging**
  - Syslog often not sufficient
- **Cloud integration**
  - Clients
  - Credential management
  - Key rotation
- **System management**
  - Disk space
  - Configuration

…'But Wait, There's More!'

- **Deployment**
  - Key provisioning
  - Configuration
- **Connectivity**
  - Infrastructure
  - Contracts
- **Backend**
  - Management of the GW devices (all aspects)
  - Build systems for software
  - Monitoring (all aspects)
  - Dashboards
  - Recovery
  - Etc…. (really long list)
- **Key management**

Questions to Answer

- **Bridge vs. Access Point vs. Gateway?**
- **RTOS vs. Full-fledged OS?**
- **Line-powered vs. Battery powered?**
  - Is battery backup required?
- **What wireless technology to use?**
- **Uplink connectivity technology**
- **Off-the-shelf GW platform or custom development?**
- **Service architecture – what needs to be local?**
- **Where to do major development?**
- **What is the most common transaction?**
- **Is all/some/none of communication time-critical?**
- **Who will monitor the system?**



The Recipe for a Perfect Matter Gateway?

It’s an Access Point really…

Actually critical design requirements

Flexible architecture

Extendibility

Maintainability

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Migration into Matter

Barriers for Adoption

- **Matter comes with a large set of promises**
- **Why wouldn't one simply adopt it in new products?**
  - Large installed base of 'legacy' products
  - Lack of interoperability with existing deployments
  - Difficulty of migration
- **Never-ending evolution of technology**

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Unify framework

General

What is it?

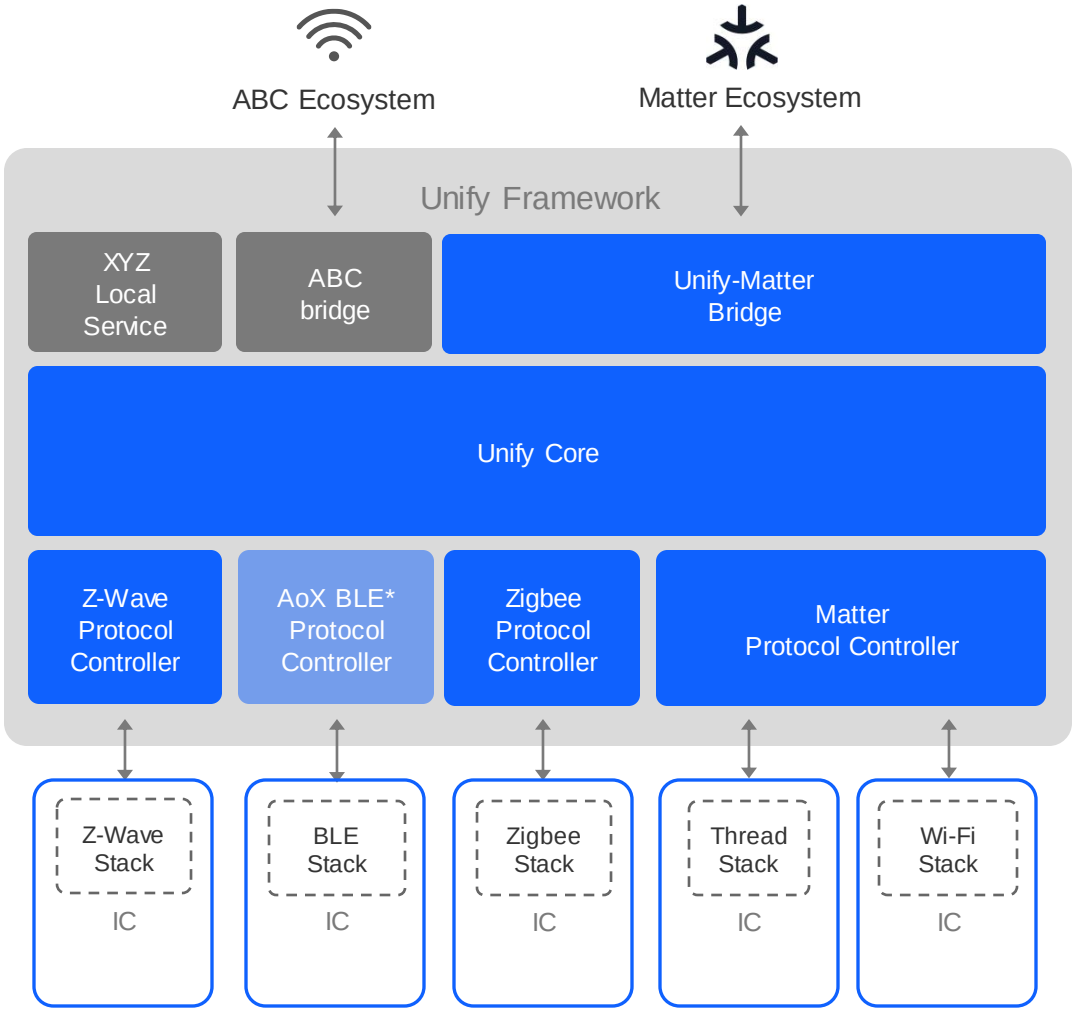
- Network and application data model abstraction framework for system integrators, device vendors, IoT cloud and platform providers etc.

What can you do with it?

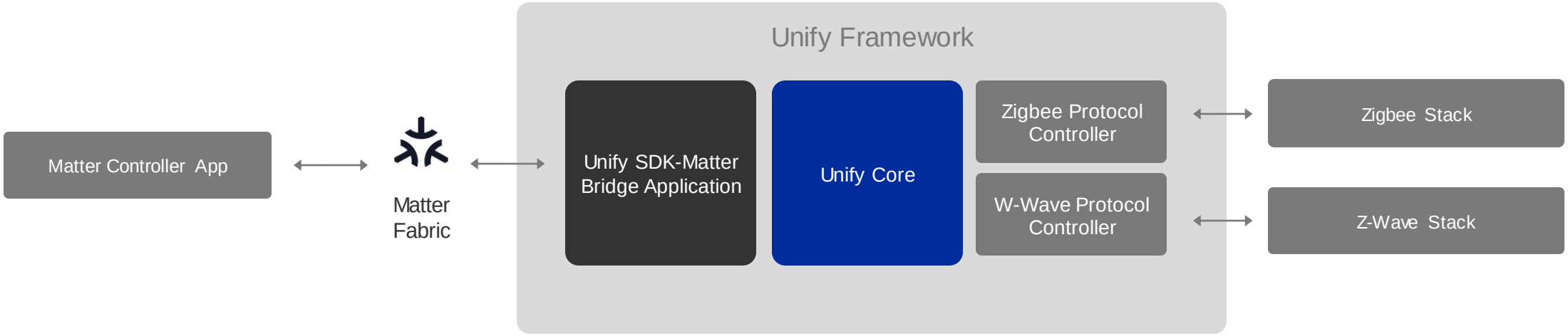
- Develop a single gateway software base
- Let Unify handle the protocol-specific translations
- Maintain just one code base for your business logic, regardless of the devices and wireless protocols
- Seamlessly integrate Matter, Z-Wave and Zigbee devices. More protocols to follow
- Simplify host processor designs

How does it work?

- A common, well-defined data model, API, and status definitions for IoT services such as adding, updating, and removing a device
- Protocol controllers translate the common IoT services into protocol-specific formats



Unify Framework – Matter Integration Components



Z-Wave and Zigbee lighting devices are seen as bridged devices on Matter fabric

ZCL commands on the Matter protocol interface translated to Unify Controller Language data model and published to MQTT interface of Unify Core

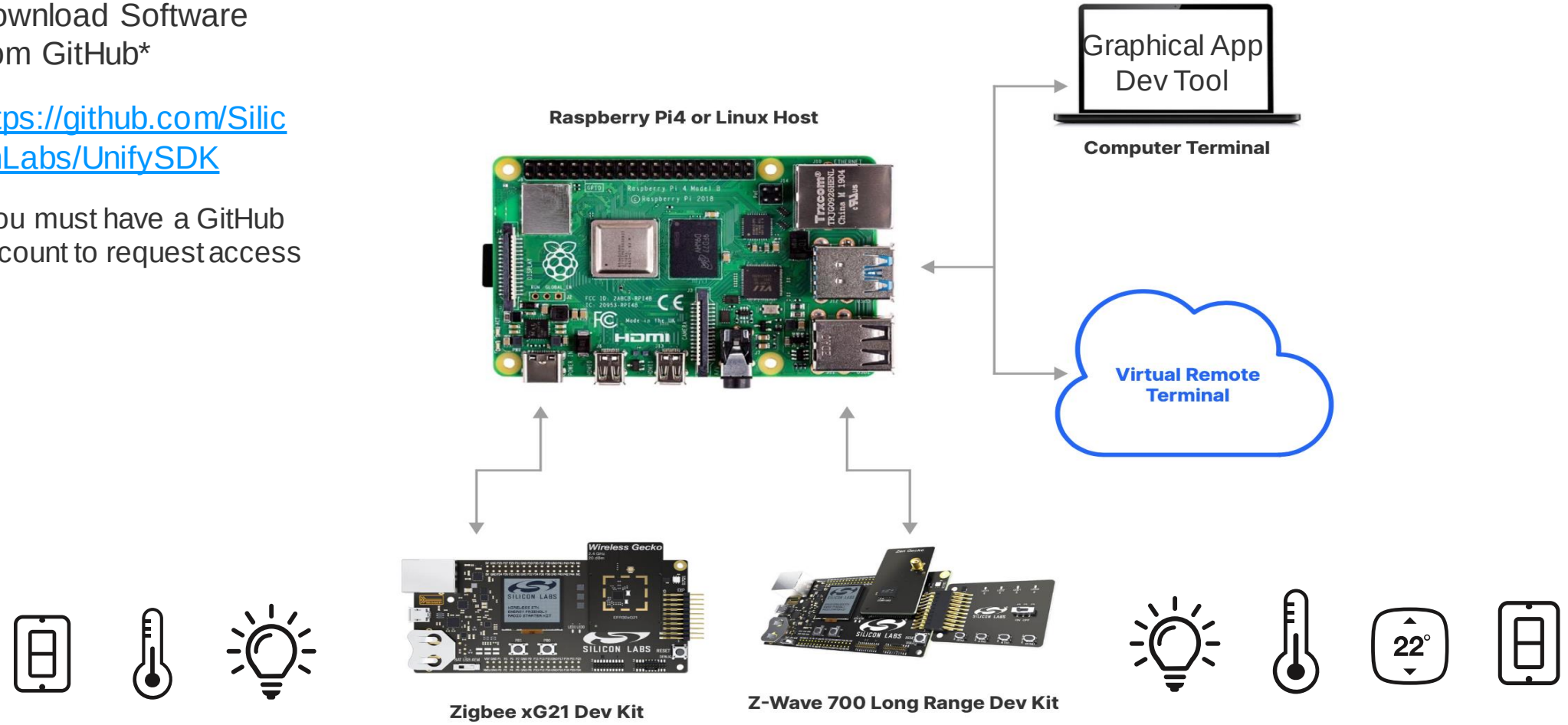
Unify-Matter bridge application based on bridge application software from CSA Alliance

Getting Started with Unify

Download Software from GitHub*

https://github.com/SiliconLabs/UnifySDK

*You must have a GitHub account to request access



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Thank You