

Agenda

Is Matter the right technology for my products?

What Matter network transport is right for me?

What are the challenges of Matter enabled products?

How can Silicon Labs help me along my journey?

Is Matter the right technology for my products?



Is Matter Right for Me?

Questions you should ask:

- Do my products need to work multiple Ecosystems?
- Do Matter Ecosystems exist in my target markets?
- Do I need an open Ecosystem to allow other devices to join, or do I want a closed Ecosystem?
- Do my devices need to have direct support of IP (Internet Protocol), or can I use a gateway?
- Do I need sub-GHz for range or propagation?
- Can I use Wi-Fi and/or Thread for my products?
- What are my battery life requirements?
- Does Matter support my device types?
- Do I have existing devices in the market that I need to interoperate with?

Advantages of Matter Technology



SIMPLICITY

Matter aims to provide a consistent setup experience across all devices, making it easier for consumers to add and manage new devices in their smart home ecosystem.



INTEROPERABILITY

Devices from different brands and platforms can work together seamlessly, controlled by voice or app, thanks to Matter's universal protocol.



RELIABILITY

Matter uses established IP technologies like Wi-Fi and Thread to build a unified connectivity ecosystem, ensuring reliable communication between devices.



SECURITY

Matter emphasizes strong security protocols to protect smart home devices and user data



Bluetooth LE **Bluetooth Mesh** Wi-Fi Zigbee **Z-Wave Amazon Sidewalk** Matter Market Focus (Home) **Frequency Bands Mesh Networking** Range Throughput **Low Power** Native IPv6 Connectivity **Cloud Connectivity Application Layer Existing Infrastructure Ecosystems Support Additional Notes**



	Bluetooth LE	Bluetooth Mesh	Wi-Fi	Zigbee	Z-Wave	Amazon Sidewalk	Matter
Market Focus (Home)	Wearables, Locks, Trackers	Lighting	Lighting, Locks, T-Stats Appliances, Cameras	Sensors, Lighting, Locks	Sensors, Locks, Security Systems	Outdoor controllers, Access Control	Lighting, Sensors, Locks, Cameras, Appliances, Access Control
Frequency Bands							
Mesh Networking							
Range							
Throughput							
Low Power							
Native IPv6 Connectivity							
Cloud Connectivity							
Application Layer							
Existing Infrastructure							
Ecosystems Support							
Additional Notes							



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Frequency Bands	2.4 GHz	2.4GHz	2.4 & 5 GHz	2.4GHz	Sub-GHz	2.4 GHz (Bluetooth) Sub- GHz (FSK & CSS)	2.4 GHz (Thread) 2.4 & 5 GHz (Wi-Fi)
Mesh Networking	NA	Yes	Yes (Infrastructure)	Yes	Yes	NA	Yes
Range	In Home	In Home	Beyond Front Door (Wi- Fi Mesh)	Beyond Front Door	Beyond Fence	Beyond Fence	Beyond Front Door
Throughput							

Low Power

Native IPv6 Connectivity

Cloud Connectivity

Application Layer

Existing Infrastructure

Ecosystems Support



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Native IPv6 Connectivity

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Cloud Connectivity	Gateway, Phone	Gateway, Phones	Router	Gateway	Gateway	Amazon	Border Router
Application Layer							

Ecosystems Support

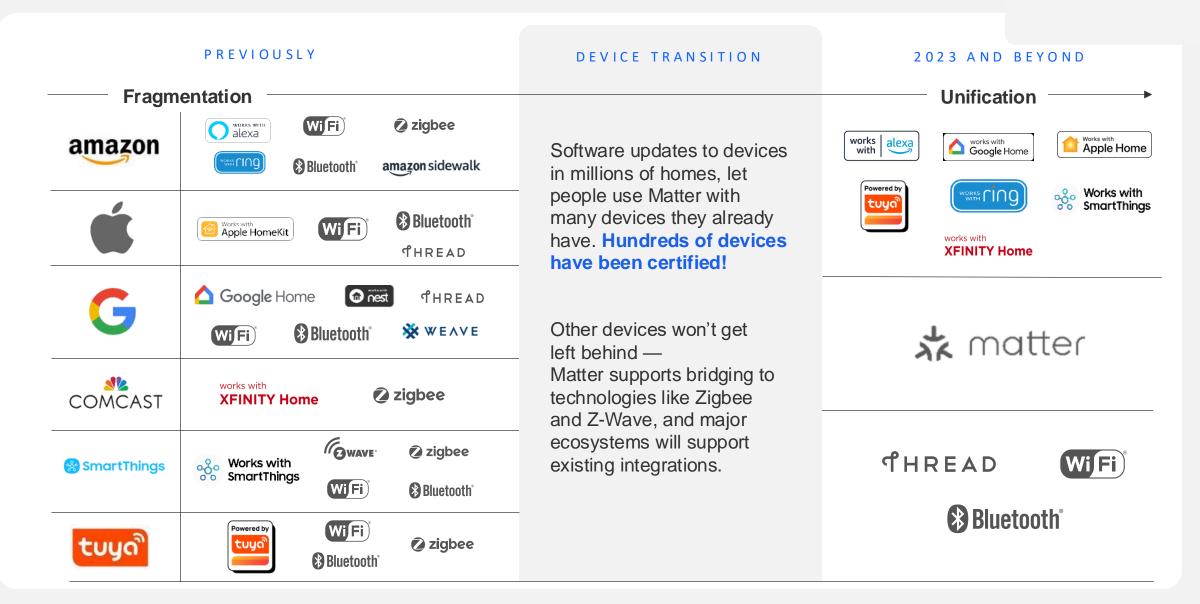
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Existing Infrastructure	Large	Small	Everywhere	Medium-Large	Medium	Very Small	Medium
Ecosystems Support	Amazon, Apple, Google, Signify	Amazon, Leedarson, Alibaba, Xiaomi	All	Amazon, IKEA, Signify, Somfy, Legrand, Tuya, Samsung	Alarm.com, Ring, ADT, Leedarson, Assa Abloy, Samsung	Amazon (Ring)	Amazon, Apple, Google, Comcast, SmartThings, IKEA, Tuya

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Additional Notes	Location services, Direct phone connectivity	Direct phone connectivity	Ubiquitous connectivity	Mature technology, 4000+ certified devices, Battery-less ZGP	Mature technology, 4000+ certified devices, new Long Range	Multiple PHY support and long range	Self-healing (Thread), State of art security, Large ecosystems interest

Matter & The Ecosystems – Past, Present, and Future



Ecosystem Supported Devices



- Apple HomePod (2nd gen)
- Apple HomePod Mini
- Apple TV 4K
- Apple HomePod (1st gen)



- Nest Hub (2nd gen)
- Nest Hub Max
- Google Nest Wi-Fi Pro
- Google Nest Wi-Fi Router
- Nest Audio
- Nest Mini
- Nest Hub (1st gen)
- Google Home
- Home Mini



- Echo Hub
- Echo (4th gen)
- Eero Pro 6
- Echo Show (3rd gen)
- Eero Max 7
- Echo smart speakers
- Echo Pop
- Echo Dot

Red Indicates no Thread border router support

- Echo Studio
- Echo Show 5, 6 (2nd gen)
- Echo Show 10 (3rd gen)



- Aeotec Smart Home Hub
- SmartThings Station
- SmartThings Hub Dongle
- SmartThings Hub v3
- Smart TVs (select models)
- Smart Monitors (select models)
- Smart Soundbar (select models)
- SmartThings Hub v2
- Family Hub fridge
- Smart Monitors (2022)
- Smart TVs (2022)

Other Platforms

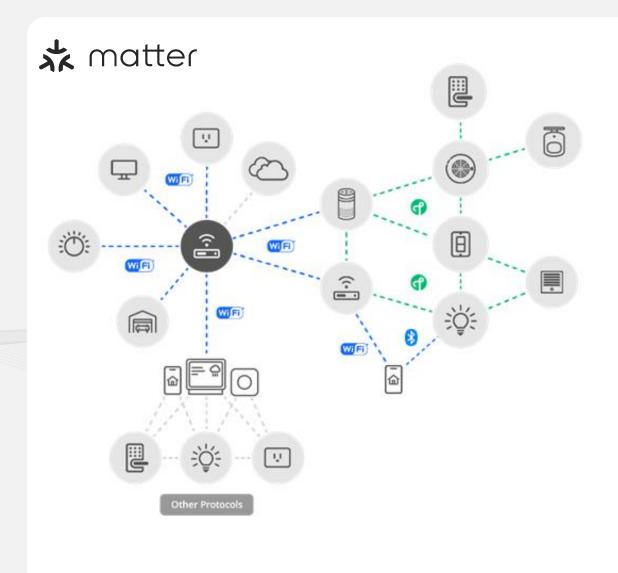
- Agara Hub M3
- Home Assistant Yellow
- Home Assistant Green
- Comcast xFi Gateway
- Habitat Elevation
- Homey Pro hub
- HOOBS Pro
- LG smart TVs (webOS)



What Matter network transport is right for me?



Network Protocol and Topology



Based on Internet Protocol v6

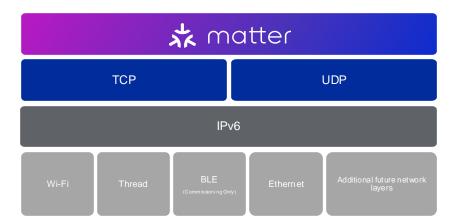
Native support for Wi-Fi and Thread

Thread devices require border routers

Devices use Bluetooth for commissioning

Bridges can link to other protocols

Zigbee, Z-Wave, Proprietary



Wi-Fi and Thread Comparison for Matter Devices



Universal wireless networking technology connecting many devices in the home today including high bandwidth & real-time applications like streaming video and audio, as well as line powered devices like light bulbs and thermostats.

THREAD

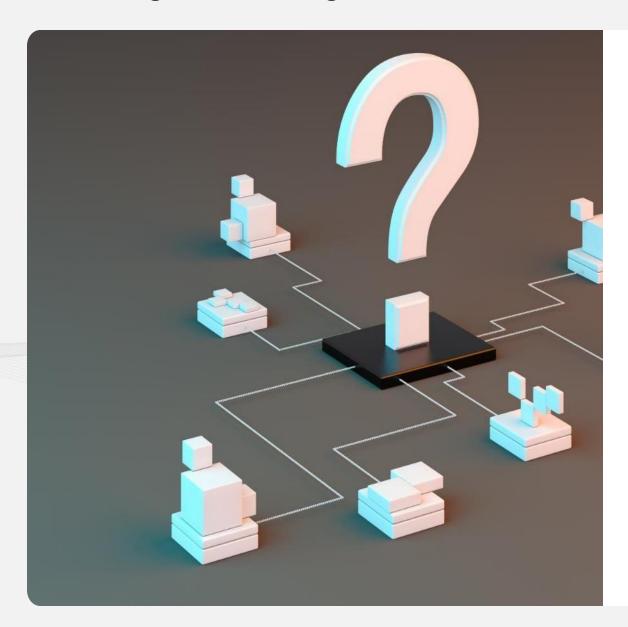
An energy-efficient wireless mesh network that enables smart home devices such as lighting as well as battery operating devices including door locks, sensors and switches.

Category	Sub-Category	Wi Fi	4HREAD
	Existing Infrastructure	Ubiquitous	Growing Adoption
0	Point-to-point	Rarely supported	Mandatory in all routers
Connectivity	Mesh Networking	Requires dedicated devices from same MFG	Mandatory in all routers
	Bandwidth	Very High (600 Mbps+)	Low (250 Kbps)
	Power requirements	55 μA (SiWx917 standby)	2.9 µA (EFR32MG24 sleep)
Power	Battery Type	Rechargeable, Alkaline (i.e. AA)	Alkaline (i.e. AA), Coin cell
	Low Power Infrastructure	Rarely supported by Access points (WMN)	Mandatory in all routers (CSL)
	IP Support	Both IPv4 and IPv6	IPv6 only
Stack	Broadcast Support	Broadcasts are problematic	Optimized for broadcasts
	Internet Support	Extremely easy	Difficult

What are the challenges of Matter enabled products?



Challenges in Rolling Out Matter Enabled Products



- Device type support
- Membership and certification cost
- Interoperability & integration with existing systems
- Ecosystems and competition
- Low power and battery life
- Security and increased manufacturing complexity
- Consumer education

Matter Device Type (May 2024)

Controllers, Bridges, Routers, AP

Bridges

Media Devices

- Casting Media Players (TV)
- Video Players
- Speaker
- Remote Control

Closures

- Door lock / controller
- Window covering / controller

Energy Management

- Electric Vehicle Supply Equipment
- Electric Vehicle Charger (EVSE)

Robot Devices

Robot vacuum

HVAC Control

- Thermostat
- Fan
- Room air conditioners

White Goods (Appliances)

- Refrigerators / Freezers
- Washing machines
- Dryers
- Dishwashers
- Microwave Ovens
- Ovens
- Cooktops
- Extractor Hoods
- Laundry Dryers

Lighting and Electrical

- LED Bulbs (On/Off, Dimming, Temperature, Color)
- On/Off Plug
- Dimmable Plug
- Pump

Switches

- Light switches (On/Off, Dimming, Color)
- Generic Switch
- Pump Controller

Smoke and CO Detection

Smoke and CO alarms

Sensing

- Light Sensor
- Temperature Sensor
- Pressure Sensor
- Flow Sensor
- Humidity Sensor
- On/Off Sensor

Water Management Sensors

- Leak detectors
- Frost detectors
- Rain sensors
- Valve Control

Air Quality Control

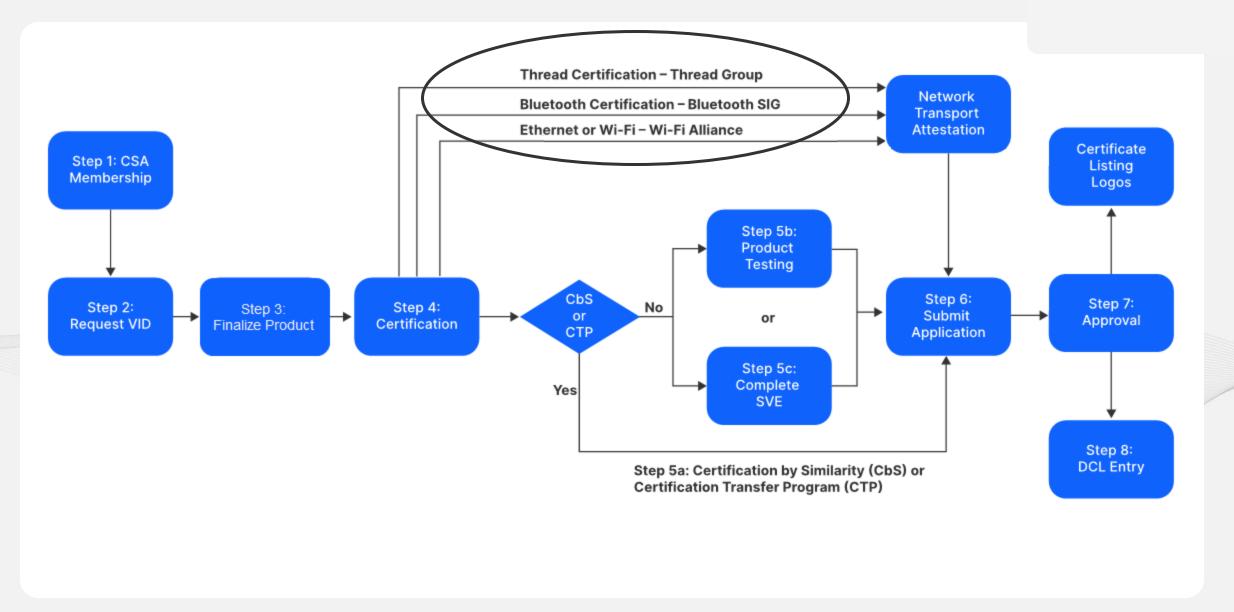
- Air purifiers
- Air quality sensors

Safety and Security

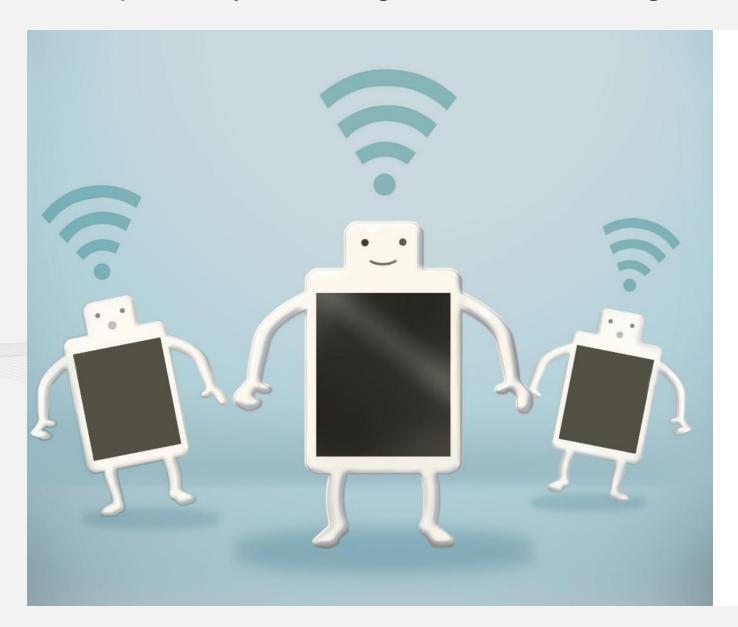
- Contact Sensor
- Occupancy Sensor



Certification Process



Interoperability and Integration with Existing Smart Home Systems



Migration to Matter will not be without issues

- Impacts manufacturers, ecosystems and users
- No new standard is without issues
 - · Ambiguity in spec, bugs in implementation, etc.
- Expect updates in specification
- Existing non-Matter devices may work better short term
 - · Certain devices like Zigbee can be field upgraded to Matter

Developers need to improve testing

- Need to do testing beyond certification
 - Run pilots and internal betas with larger number of devices
- Field updates are a must
 - Product firmware and rollout field updates

Matter Bridging can bridge the gap

- Enables existing technologies onto Matter network
- Can simplify participation in Ecosystems vs Skills

Low Power improvements

Matter 1.2 & 1.3

- Added better support for Sleepy Devices -- Intermittently connected devices (ICD)
 - Controllers can setup subscriptions with these devices to have them periodically check-in, rather than be always on
 - Subscription recovery for when there is de-synchronization between a controller and the ICD
 - Streamlined wake-ups to support reporting to multiple controllers by sending all updates at one wake cycle
- Very beneficial for Door Locks, Shades, and other quick response, actuator sleepy devices (Short Idle Time)

Matter Future

- WG has been iterating on these improvements continuously as part of a phased approach to new updates.
 - Silicon Labs has been the main driver of these efforts...
- Focus on sensors and other long sleep cycle devices (Long Idle Time)

Ecosystems and Competing Standards

Existing Ecosystems

Does Matter Ecosystems exist in your region? Some regions may have key ecosystems providers that don't support Matter or have plans to but have not rolled it out.

Competing Standards

The existence of competing standards is a major challenge for Matter-enabled IoT products. This creates a lack of interoperability, where devices from different manufacturers cannot communicate with each other, causing complexity in IoT ecosystem.

Slow Adoption

Slow adoption of the standard also poses a challenge, as it takes time for the market to adopt new technology. This can hinder the growth of the IoT industry and slow down innovation.

Fragmented Market

The existence of competing standards creates a fragmented market, making it difficult for manufacturers to create devices that are compatible with different networks.



Challenges of Educating Customers

Lack of Awareness

Many consumers are not aware of the benefits of Matter IoT solutions and how they can improve their smart home experience. This lack of awareness can hinder adoption and demand for this technology.

Complex Technology

Matter IoT solutions can be complex and difficult to understand for the average consumer. This complexity can increase the learning curve and hinder adoption and demand for this technology.

Privacy and Security Concerns

Matter IoT solutions can collect a lot of personal data, which can raise concerns about privacy and security. Educating consumers about the safeguards in place and the importance of securing their smart home devices can help alleviate these concerns.

Strategies for Overcoming Challenges

To overcome the challenges of educating consumers, we need to raise awareness, simplify technology, and address privacy and security concerns.



How can Silicon Labs help me along in my journey?



Meeting the Challenges of Matter



- Device type support
- Certification cost
- Interoperability
- Integration with legacy systems
- Low power and battery life
- Security
- Increased manufacturing complexity

Silicon Labs SDK Matter Support

Matter support

- Matter SDK Extension for Simplicity Studio
 - SDK Suite v4.4.4 -- Matter 1.3
- Actively working on future Matter versions with Alpha and Beta releases to support test events

Matter Sample Applications

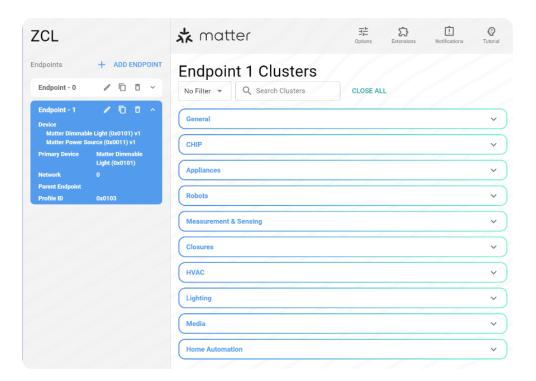
- Dishwasher
- Light Switch
- Lighting
- Lock
- Smart Plug
- Thermostat
- Window Covering
- Others Enabled through ZAP

Cluster Support

All Matter certified clusters

Create any Mattery device with any set of clusters using ZAP

Built into our Simplicity Studio





Matter Certification













Ecosystem Certification

- Interoperability testing & certifications are required with Ecosystems.
- Certification delivers the right to use the official Works With badges.



Stack Certification

- Bluetooth LE Stack is qualified with the Bluetooth SIG and is inheritable.
- Thread Stack is certified and inheritable.
- Wi-Fi Stack is tested & certified with the Wi-Fi Alliance but not inheritable.



Matter Certification

- Matter certification is not inherited
- End devices must be certified despite using pre-certified software components.

- Silicon Labs' Matter software have been tested with Ecosystems.
- Our Matter software, application examples, and SDK are CSA-certified.
- Our Connectivity Lab, docs, guides, and tools speed up your certification processes
- Silicon Labs' wireless stacks are certified with the respective standardization bodies to reduce development time and costs.
- Simplicity Studio streamlines testing and certification for you.



Connectivity Lab – Test Matter & Ecosystems

Why Connectivity Lab?

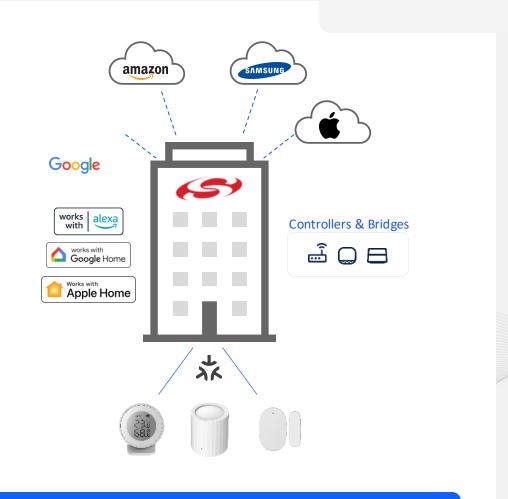
- Many ecosystems support Matter today. However, we are on the verge of exponential market growth
- The increasing popularity of Matter will make interoperability and unification more complex
- Connectivity Lab will provide a practical and simple way to improve many-to-many interoperability to tear down the boundaries between ecosystems

Purpose

- Simulate a real home to address the real issues users might experience when using smart home
- Test real-world multi-fabric use cases in Matter
- Find out solutions to improve interoperability between the ecosystems
- Test the theories to help the smart home industry to advance to a unified, commercially viable, global system

Real World User Testing Results

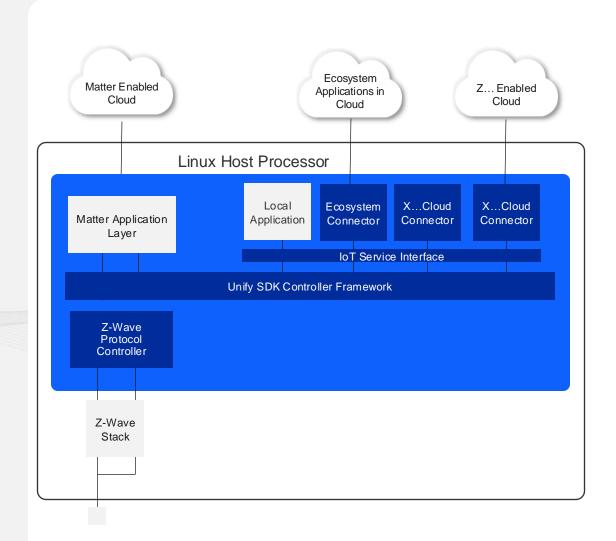
- Article
- Podcast



Connectivity Lab Complements Silicon Labs' **Leadership as a One-stop Matter Solution Provider**



Unify



Unify SDK for Infrastructure:

- MQTT based Unify SDK Framework
- Common IoT Service Interface for Applications
- **Protocol Controllers**
 - Abstracts all protocols in stable common API
 - Flexible architecture that can expand to other protocols
- Bridge for Z-Wave to Matter

Custom Part Manufacturing Service

User customization of Silicon Labs devices

- Ensures secure supply chain and prevents counterfeiting
- Simplifies product manufacturing and test fixture cost
- Helps meet upcoming security regulations
- Self-service web portal
- CPMS Introduction Video

CPMS Options

- Unique Part Numbering
 - Track shipments to avoid overproduction and counterfeiting
- Custom Programming Application and Bootloader
 - Pre-flash your software securely and cost efficiently
- Secure Options
 - Debug Lock Secure debug port to protect IP
 - Secure Boot Ensures only authorized firmware is run
 - Key Injection Safeguard products before production
 - Custom Identity Ensure product authentication
 - Tamper Detection Protect products from attacks
- Custom Marking
 - Hide the technology used in your products
- Matter DAC Injection
 - · Simplify Matter product manufacturing
 - · CPMS for Matter Video

Secure Programming (CPMS)

1.



Secret Keys

- Secure Boot & Debug Public Keys written to **OTP Memory**
- Custom Kevs
- OTA Decrypt Key



Matter Provisioning

Official Product DAC

3.

- Factory Data
- Certificate Declaration
- Onboarding Payload



Security

- Lock Flash Pages
- Enable Secure Boot/Secure Debug (OTP)

2.

Set Default Tamper

4.



Flashing

- Customer Application
- Bootloader



Summary

Is Matter Right for Me?

Matter is a good choice if:

- You need to work multiple Ecosystems
 - Amazon, Google, Apple, Samsung, etc.
- You can use Wi-Fi and/or Thread for your products
 - Full application layer support
- You want an open Ecosystem
 - 3rd party devices can join the network
- You need to have direct support of IP (Internet) Protocol)
 - Matter is based on IP
- Your device types are supported by Matter
 - Device types are required for interoperability

Matter might not be a good choice if:

- You require sub-GHz for range
 - Consider a Matter bridge (i.e Matter to Z-Wave)
- You want a closed ecosystem
 - May be better options with less overhead
- Matter device types are not supported
 - Consider joining CSA to help define new device type



Summary

Matter addresses the challenges faced by consumers, manufacturers, and retailers

- Reduces purchasing confusion and returns
- Improves interoperability and user experience

Matter aims to bring simplicity, interoperability, reliability, and security to smart home devices

Enables devices from multiple brands to work natively together on multiple ecosystems

Silicon Labs' provides lowest power Matter over Thread and Matter over Wi-Fi solutions

Designed to address a broad range of applications

Silicon Labs' end-to-end Matter developer journey

Simplifies Matter development, testing, and manufacturing

Silicon Labs is committed to the success of Matter

- Strong portfolio of both Matter over Wi-Fi and Matter over Thread
- Continued development and support in CSA for new features and device types
- Largest Matter code contributor among Semiconductor companies





Thank You