



Adopting the Matter standard for IoT device makers

AWS Prescriptive Guidance



AWS Prescriptive Guidance: Adopting the Matter standard for IoT device makers

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Adopting the Matter standard for IoT device makers

Tushar Patel, Vijay Ujjain, and David Walters, Amazon Web Services

According to [Statista](#), the number of smart home users worldwide are expected to exceed 1.9 billion by 2029. This rapid growth brings challenges in terms of operations and management. From a consumer's point of view, each device vendor has a different method of on-boarding the smart-home device onto a home network through an app that is specific to that device vendor. This makes it challenging to manage a growing array of diverse types of devices from various vendors. Similarly, from a device maker's point of view, certifying their smart-home products with various ecosystems adds to the cost and complexity of their business processes. For example, this might require different SKUs for the same device model. It is an additional overhead to maintain a compelling user experience app and provide periodic updates, taking resources away from the focus on building and delivering a better product. Both consumers and device makers would benefit from a common smart-home interoperability standard. This standard allows devices from multiple vendors to interoperate with each other in a seamless, secure, and reliable manner. Both consumers and device makers have benefited significantly from the adoption of a common smart-home interoperability standard that enables devices from multiple vendors to interoperate seamlessly, securely, and reliably.

The [Matter](#) standard evolved from an exciting opportunity for Internet of Things (IoT) device manufacturers in the smart-home space to actually deliver on the promise of a single protocol to connect smart-home systems. This standard aims to improve compatibility and interoperability between devices from different manufacturers. Matter is an open, smart-home connectivity protocol that enables communication between IoT devices, mobile apps, and cloud services.

Objectives

When integrating the Matter standard into their products, IoT device manufacturers must address several challenges before beginning development. Matter offers many advantages over proprietary IoT protocols, including interoperability, security, simplicity, reliability, and future-proofing of devices. However, integrating Matter into both new and existing IoT deployments requires careful planning and strategy. Manufacturers want guidance on the Matter compliance process in order to leverage the benefits while avoiding pitfalls. This guide provides IoT device makers with comprehensive guidance about Matter adoption. It includes a clear roadmap, from strategy to implementation. This guide eases the transition to Matter, helping you build secure, interoperable, and future-ready products that thrive in the smart-home ecosystem. With the right strategic

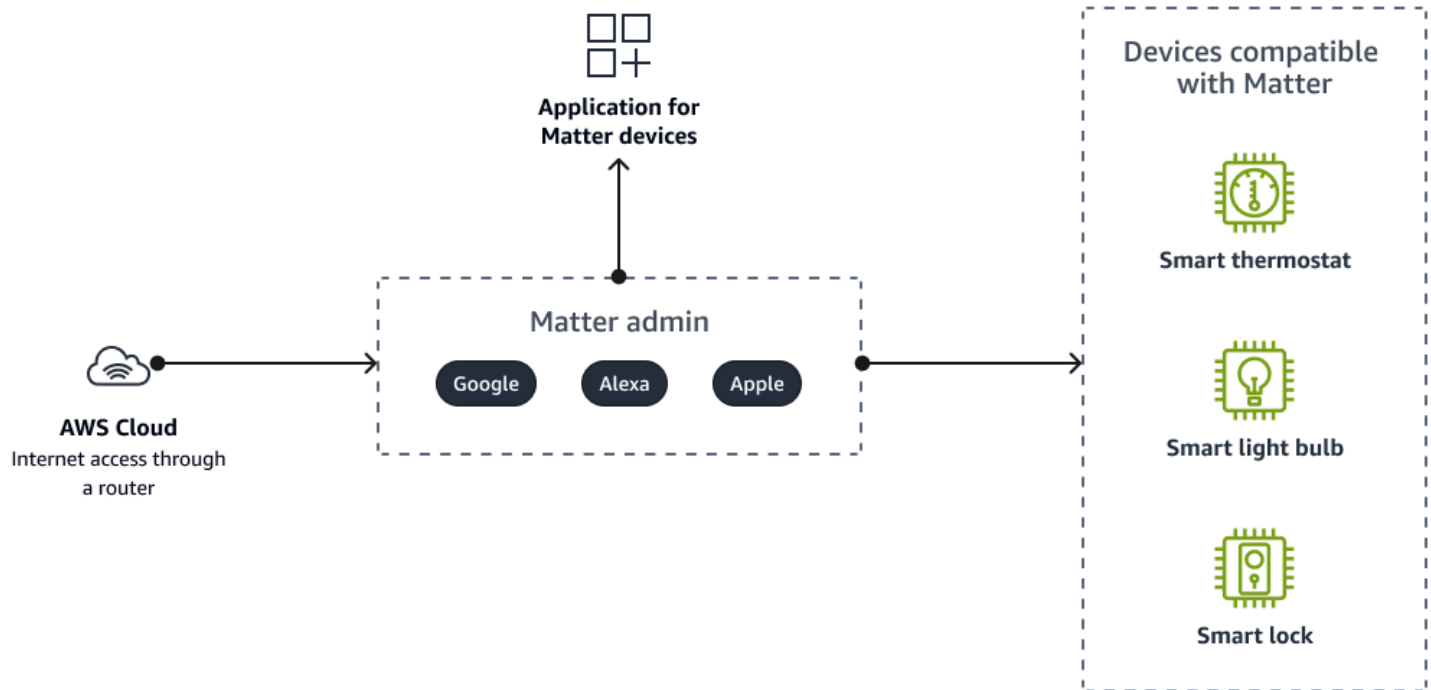
approach, organizations can overcome the hurdles of Matter adoption and develop innovative IoT devices that embrace open standards.

The Matter standard, now in version 1.5, has matured into a proven solution for Internet of Things (IoT) device manufacturers in the smart-home space. This open standard has demonstrated substantial improvements in compatibility and interoperability between devices from different manufacturers. Matter is an open, smart-home connectivity protocol that enables communication between IoT devices, mobile apps, and cloud services across major ecosystems including Amazon Alexa, Google Home, Apple HomeKit, and Samsung SmartThings.

Matter 1.5 introduces expanded device support beyond the initial release, now including enhanced energy management devices, robotic vacuums, air quality sensors, air purifiers, and improved support for cameras and security systems. The standard has also added advanced features such as multi-admin capabilities, improved commissioning flows, and enhanced security protocols. With thousands of certified Matter devices now available in the market, the ecosystem has reached critical mass, making Matter adoption essential rather than optional for device manufacturers seeking market competitiveness.

This guide provides device makers a comprehensive overview of Matter and the steps required to become Matter-compliant. It outlines pros and cons for planning a Matter adoption strategy. The guide also suggests best practices for leveraging Matter while continuing to support existing wireless protocols, in a phased manner. For IoT device manufacturers exploring smart-home solutions, this guide can inform your connectivity strategy.

Understanding the Matter standard



Matter protocol

Matter is an open, smart-home connectivity protocol that enables communication between devices, mobile apps, and cloud services. Developed by the Connectivity Standards Alliance (CSA), Matter simplifies connectivity and interoperability for consumers and manufacturers. Matter supports a wide range of smart-home categories. For consumers, Matter provides onboarding, unified management, and control across ecosystems. For manufacturers, Matter reduces development and support costs through a single certification and through app development. Many large companies, such as Amazon, Apple, and Google, are promoting Matter adoption. CSA offers four [membership levels](#) depending on the organization involvement - Promoters, Participants, Adopters, and Associates. With strong industry support, Matter aims to provide seamless connectivity across brands for consumers and streamline development for manufacturers.

Matter smart home standard has matured significantly with the introduction of version 1.5 on November 20, 2025. The standard expanded support for camera streaming, energy management systems including solar, batteries, and heat pumps. Advances on protocol level include stability advances for Thread and better TV-device integration.

Overview of how Matter works

Matter is an IP-based, application-level protocol for smart-home devices across vendor ecosystems. It works on devices that use IPv6. Conceptually, Matter is organized as a collection of network *nodes*, which are Matter endpoints. The following is a brief summary of the Matter terminology:

- *Matter devices* are smart-home products, such as light bulbs, switches, thermostats, or locks.
- A *Matter fabric* is the virtual network on which all of the devices are connected. All of the devices share the same trusted root. The fabric forms a star network topology.
- A *Matter administrator* creates, maintains, and manages security and privileges for all devices on the fabric. An administrator can be a hub or an application. Matter has a Multi-Admin feature, where a Matter device can be part of multiple fabrics simultaneously. For example, a single Matter device can be managed both by an Amazon Alexa device and a Google Home device, both of which could be Matter administrators on the same physical network.
- A *Matter commissioner* is a device that commissions (or *onboards*) a new Matter device into the fabric. This could be an app on a phone, a smart-home gateway, or a Matter administrator.
- A *Matter bridge* connects non-IP protocol devices to a Matter fabric.

For information about the different roles that hardware and software can assume in Matter, see [Peeking Under the Hood of Your Matter Smart Home](#) (CSA blog post). Matter version 1.4 introduced Enhanced multi-admin with improved credential sharing using Home Router Access Protocol (HRAP). Matter version 1.5 introduced camera streaming. Matter versions are released approximately twice a year.

Advantages of certifying with Matter

Matter has delivered significant advantages for both smart-home consumers and the manufacturers who serve them. By establishing a common language for smart devices, Matter has successfully addressed previously fragmented market through simplified setup, unified management across platforms, and expanded choice and flexibility in voice control.

For consumers, this unified experience has made building and expanding their smart home significantly less complex and daunting. With thousands of certified Matter devices now available across major ecosystems including Amazon Alexa, Google Home, Apple HomeKit, and Samsung SmartThings, the promise of interoperability has become reality. Device makers have also realized meaningful benefits through streamlined certification, reduced development costs, and simplified customer support.

Since its launch in 2022, Matter has evolved through multiple versions. Matter version 1.5 now supports over 50 device types, including the highly anticipated camera streaming capability. The standard has reached critical mass in the market, making Matter certification essential rather than optional for device manufacturers seeking competitiveness. Both consumers and manufacturers benefit as Matter continues to drive greater interoperability and lower barriers to smart-home adoption. Overall, certification to the Matter standard has accelerated growth of the smart-home market by solving problems that previously held it back.

Benefits of Matter certification for smart-home consumers

Matter delivers significant benefits for consumers. Matter provides a common language for smart-home devices to seamlessly work together across major platforms. By certifying devices with Matter, consumers now experience simpler setup and management of their smart home as well as greater flexibility and choice in how they control their devices.

Simplified setup and unified management

One of the biggest frustrations that consumers face is the complex setup and onboarding processes that are required to operate different smart-home devices and get them to work together. Each device might require its own proprietary app and separate account. To address this issue, Matter enabled plug-and-play functionality for certified devices. Onboarding Matter-certified devices is as simple as connecting the device to the local home network and then using the Matter admin, such as the Alexa app, to read the QR code on the device. Matter 1.4.1 introduced Enhanced

Setup Flow with Multi-Device QR Codes and NFC onboarding, making the process even more streamlined.

This unified setup experience through a single app means consumers no longer need to juggle multiple, separate apps to manage different brands of devices. They can view and control all of their Matter-certified lights, locks, sensors, thermostats, cameras, appliances, energy management devices, and more from a single interface. Apple HomeKit, Amazon Alexa, Google Assistant, and Samsung SmartThings users all benefit from being able to discover and control Matter devices without having to download separate manufacturer apps. The simplified management of smart-home devices through a unified system reduces complexity for consumers and makes building out and expanding their setup much less daunting.

Improved choice and flexibility in voice control

Voice control has become a popular way for consumers to interact with their smart-home devices. However, today the choice of voice assistant often dictates what brands of devices you can control with your voice. Matter changes this by enabling voice control across ecosystems.

Consumers gain the flexibility to choose which voice assistant ecosystem best suits their needs, without having to worry about device compatibility. A user comfortable with the Google Assistant can control their Matter-certified devices with their voice, even if the devices were originally manufactured for the Alexa or HomeKit markets.

This cross-compatibility of voice control creates a more open environment that gives users greater choice. They can pick devices based on features and pricing instead of compatibility with a single ecosystem. If a user wants to change voice assistants in the future, their existing smart-home setup can easily move with them because all devices speak the common Matter language.

The Enhanced Multi-Admin feature added in Matter version 1.4 allows a single device to be controlled by multiple voice assistants simultaneously. This means family members can use their preferred voice assistant (Alexa, Google Assistant, or Siri) to control the same devices without conflicts or additional setup.

Benefits of Matter certification for device makers

In addition to helping consumers, Matter certification also provides meaningful benefits to smart device manufacturers. By adopting the Matter standard, organizations can gain advantages that reduce costs and expand their customer reach. Since Matter's launch in 2022 and evolution through

version 1.5 (November 2025), these benefits have been realized by manufacturers across the smart-home industry

Single certification across ecosystems

To ensure compatibility across ecosystems such as Alexa, HomeKit, Google Home, and Samsung SmartThings, manufacturers need to go through multiple lengthy and expensive certification processes with each organization. Matter changes this by establishing a single common certification.

Device makers only need to certify their products once to the Matter standard in order to be compatible with all major smart-home ecosystems and voice assistants. This streamlines development and reduces certification costs significantly compared to the status quo. Resources no longer need to be spent on maintaining separate certifications as products are updated. A single Matter certification also future-proofs products and ensures compatibility even as new ecosystems emerge.

The CSA has also improved the certification process with better tools including the Certification Tool, PICS Tool, and ZUTH, along with expanded testing provider networks and an Interoperability Testing Facility.

Reduced development costs

Matter also helps lower development costs for manufacturers. By adopting a common connectivity and security standard, organizations benefit from shared infrastructure components that contribute to the overall Matter project.

For example, manufacturers no longer need to include their own proprietary Thread border routers in products, offloading this responsibility to hub manufacturers. Shared, open source drivers and libraries further reduce redundant engineering work. Common service discovery and device-setup mechanisms mean less bespoke app development is needed. These reductions in infrastructure and app development costs can be passed on to consumers in the form of more affordable smart-home devices.

The Matter SDK has matured significantly since the initial release, with comprehensive development tools, libraries, and documentation now available. Matter version 1.4.2 (June 2025) introduced major improvements for transport reliability, BLE commissioning, and PSA-based crypto, and testing infrastructure. These enhancements have reduced integration complexity compared to early adoption phases, accelerating time-to-market for new products.

Matter now supports over 50 device types across versions 1.0 through 1.5, including lighting, locks, thermostats, appliances (refrigerators, dishwashers, ovens, microwaves), robotic vacuums, energy management devices (solar panels, batteries, heat pumps), electric vehicle chargers, water management devices, air quality sensors, and cameras with streaming support.

Simplified customer support

The current fragmentation in the smart-home market leads to high customer support burdens for manufacturers. Consumers frequently encounter issues with connectivity, setup, and compatibility that require troubleshooting. Matter aims to reduce these problems by standardizing core functions.

When issues do occur, the common underlying Matter protocols mean companies can more easily diagnose and resolve connectivity problems without having to consider multiple ecosystems. This streamlines the support process. With a single app and common voice compatibility, customers also have an easier time learning to use devices, reducing the need for support in many cases. The simplified customer experience and troubleshooting enabled by Matter helps reduce long-term support costs for manufacturers.

Considerations for certification strategy

Matter enables interoperability between different smart-home devices and platforms. However, certifying with Matter may not always be the best choice for device manufacturers. The costs of implementation and certification may not make practical or financial sense, depending on the device type and use cases. This section explores some of the key reasons why a manufacturer might choose to not certify certain devices with Matter.

While the Matter standard aims to simplify development and enable universal compatibility, certain types of smart-home devices may face practical barriers to certification that outweigh the benefits. For products with stringent constraints, non-IP protocols, limited audiences, or non-defined device types in Matter, pursuing Matter certification might not be the best strategy initially. These could be the reasons a manufacturer might avoid adopting Matter. However, Matter does allow for IP-enabled gateway devices to proxy for non-IP endpoints. For certain legacy devices, a gateway approach can be a viable path to Matter compatibility, while avoiding a full device redesign.

As of 2026, with Matter now at version 1.5 and thousands of certified devices in the market, the ecosystem has matured significantly. The barriers to certification have been reduced through improved SDKs, better documentation, and expanded testing infrastructure. However, the considerations outlined below remain relevant for manufacturers evaluating their certification strategy.

As the Matter standard evolves and its scope expands to cover more use cases, the case for certification might strengthen over time, even for these product categories. Device manufacturers need to evaluate their specific situations and roadmaps to determine the best approach regarding Matter compliance. In many situations, there might be sound technical or business reasons for opting out of certification, at least temporarily.

Non-IP connectivity protocols

In order to adopt the Matter standard, devices must operate on IP networks, such as Wi-Fi, Ethernet, and Thread. Non-IP wireless protocols, such as Zigbee, Z-Wave, and Bluetooth LE, are commonly used in low-bandwidth devices. These protocols require an additional non-IP to IP-based protocol translator to be compatible with Matter. Upgrading the communication module or introducing a translation gateway typically increases the hardware cost of the device.

Adding IP stack support means allocating more memory and processing power for network handling. This might exceed the capabilities of extremely low-cost and low-power devices. The addition of extra memory or flash to support IP would also increase manufacturing costs and reduce battery life. For use cases where on and off power or sensor data is all that is needed, non-IP protocols can provide an efficient solution.

Matter essentially rules out certifying any devices that rely on proprietary, non-IP wireless standards. This could limit manufacturers who want to use alternative connectivity methods for their low-end products. While IP-based protocols like Wi-Fi and Ethernet are necessary to interface different ecosystems, non-IP standards still have merit for basic connectivity of sensors and switches in some applications.

Matter bridges have become more common and standardized, allowing manufacturers to maintain their existing non-IP device lines while gaining Matter compatibility through certified bridge products. This approach has proven successful for Zigbee and Z-Wave device ecosystems, where a single bridge can expose multiple legacy devices as Matter endpoints.

Hardware limitations

Another challenge is that Matter requires a minimum level of on-device processing power and memory to support the necessary software stack. However, the most basic smart-home devices often have very limited embedded chip capabilities, due to cost and size constraints.

For example, a simple door or window sensor might contain only a microcontroller with less than 100 KB of flash memory and 10 KB of RAM. This does not provide enough storage and processing headroom for a full Matter implementation. Adding more powerful and expensive silicon would drive up the bills of materials significantly.

In cases where cost and size are the top priorities, manufacturers might find Matter requirements do not align with their hardware budgets. Certifying very basic sensors, switches, or controllers with Matter could force unnecessary hardware upgrades that affect affordability.

Matter 1.4.2 (June 2025) introduced improvements to transport reliability and Bluetooth Low Energy (BLE) commissioning that have optimized resource usage. The maturity of the SDK and availability of reference implementations have also reduced the overhead of Matter integration. However, for extremely constrained devices (under 100 KB flash), the gateway proxy approach remains the most practical solution.

Customer ecosystems

Another factor to consider is whether a manufacturer's target customer base uses smart-home platforms that are compatible with Matter. If most consumers in that segment do not use Matter controllers or Matter-enabled hubs and apps, there may be little incentive to certify products.

For example, a company focusing on serving the needs of elderly users might find their customers have simple setups without Matter administrators. Or do-it-yourself (DIY) home automation enthusiasts might prefer custom solutions and don't need Matter's plug-and-play experience across brands.

In scenarios where the target demographic does not engage with Matter infrastructure, certifying adds complexity without clear benefits. Resources might be better spent on optimizing the user experience within the relevant platforms instead of diverting efforts to Matter compliance.

As of 2026, Matter adoption has reached critical mass with major ecosystems (Amazon Alexa, Google Home, Apple HomeKit, Samsung SmartThings) fully supporting the standard. Consumer awareness of Matter has grown significantly, with the Matter logo becoming a recognized mark of interoperability. The target demographic question has shifted from 'Do customers use Matter?' to 'Can we afford not to support Matter?' as it becomes a baseline expectation in many market segments.

Device types not yet defined

While Matter's scope has expanded dramatically from the initial release, covering most common smart-home categories and many appliances, some niche verticals still await standardization.

If a company develops unique device types that are not covered by existing Matter profiles, certification is not possible until new profiles are drafted. This could delay a new product's launch while waiting for Matter to expand its scope.

Rather than hold off on releasing innovations, some manufacturers might prefer bringing niche solutions to market sooner through proprietary means. Certifying later is still an option after the relevant profiles mature. For first-mover advantages, going direct-to-consumer without Matter might be preferable in some cases.

An alternative: Proxying at gateways

In situations where an endpoint device has limitations that prevent direct Matter certification, an alternative approach is to proxy the device's Matter capability at a gateway. The gateway serves as a bridge that translates between the local wireless protocol of the endpoint and the IP-based Matter protocol.

For example, a basic temperature sensor communicating over a proprietary radio standard could still appear as a Matter device to the Matter admin. The gateway receives sensor data on a non-IP interface but exposes virtual Matter entities representing that data over IP to controllers. This allows you to use existing hardware and gain some interoperability benefits through the gateway.

Of course, this adds complexity for developers and requires gateways to support the necessary translation layer. But it might be a viable compromise in cases where direct certification is too challenging for the device itself. Proxies could help low-power or niche solutions participate in Matter ecosystems without a complete hardware overhaul.

The Matter bridge specification has matured, with numerous certified bridge products now available from major manufacturers. This has made the gateway approach more viable and standardized compared to the early days of Matter. Manufacturers can now partner with bridge providers or develop their own certified bridges to bring non-IP devices into the Matter ecosystem without redesigning the endpoint hardware.

Cloud connectivity with Matter

While Matter enables basic local device interoperability, additional cloud connectivity is required to deliver robust over-the-air updates, telemetry data, remote management, and integration with proprietary vendor services. Device makers have options, such as shipping a Matter gateway hub, using a household's Matter-certified hub, or integrating direct cloud connectivity into endpoints. Standards for Matter-to-cloud connectivity are emerging, but manufacturers still need to integrate additional connectivity software stacks into Matter devices. Delivering the full value of smart-home devices in areas like diagnostics and new feature updates requires Matter manufacturers to consider cloud integration, beyond basic local operation.

Enabling advanced device capabilities with cloud connectivity for matter endpoints

The Matter standard promises to unify IoT devices from different vendors through a common protocol. It specifies how smart-home devices discover, communicate, and interoperate with each other on the local network by using IP-based networking technologies, such as Ethernet, Wi-Fi, and Thread. This local interoperability enables Matter-certified devices from different vendors to work together seamlessly for activities like automated scenes and voice control. However, Matter does not define cloud interfaces or require internet connectivity for the device endpoints.

Many smart devices today rely on additional cloud connectivity for key features, such as over-the-air (OTA) updates, remote access, and integrations with manufacturer platforms. Device makers looking to build Matter-compliant products while retaining advanced functionality face some design considerations around supplementing Matter with cloud connectivity. While basic local control and voice assistant integration work for simple Matter devices, additional cloud connectivity is required to enable more advanced capabilities.

Use cases that require cloud connectivity

Although Matter handles local device interoperability, additional cloud connectivity enables several important smart-home device capabilities:

- **Over-the-air (OTA) updates** – Delivering firmware and software updates over the internet allows vendors to easily enhance devices that are already deployed. Without OTA, updates would be

handled manually. While Matter standard describes how the OTA updates are handled and delivered to Matter-certified endpoints, it is dependent on the functionality supported by the Matter hub that the endpoint is connected to. Additionally, there are restrictions regarding which updates are provided to the endpoint. For example, when the endpoint requests an update, only the latest update available is provided. All devices of the same type are provided that single update. There is no option to do a sequential update or even an OTA rollback or deletion of an update. Enabling cloud connectivity on the endpoint can mitigate this lack of fine-grained management of OTA updates. Matter version 1.4.2 (June 2025) introduced improvements to transport reliability and testing infrastructure that have enhanced OTA update mechanisms. However, the fundamental limitations around sequential updates and rollback capabilities remain, making direct cloud connectivity valuable for manufacturers that require fine-grained update control and fleet management capabilities.

- **Camera streaming and media** – Matter version 1.5 (November 2025) introduced camera support using side-channel protocols, such as Real-Time Streaming Protocol (RTSP) over Wi-Fi or Ethernet. While Matter handles device discovery and basic control, the actual video streaming occurs through separate protocols. This often requires cloud infrastructure for remote viewing, recording, and AI-based features, such as person detection.
- **Remote access and control** – Accessing and controlling devices remotely from outside of the home network requires a cloud endpoint. Matter, as currently defined, only supports local access. While a Matter endpoint can be controlled with a user app inside the local network, remote control is only available if it's supported by the Matter hub. Even then, typically, only basic remote controls are available.
- **Telemetry and diagnostics** – Aggregating field data, such as error logs and sensor streams, in the cloud allows vendors to monitor device health and identify issues. While Matter supports radio and protocol-related diagnostics through the general diagnostics cluster, any detailed diagnostics specific to the device requires cloud connectivity so that the manufacturer can retrieve data from the device.
- **Vendor-specific integrations** – Any custom features and data types that are not defined in the Matter specification require connectivity to vendor cloud platforms. This is particularly important for devices with advanced features like cameras (Matter version 1.5), energy management devices (Matter version 1.4), and appliances (Matter versions 1.2-1.3) that may require manufacturer-specific cloud services for full functionality.
- **External integrations** – Linking to third-party services like voice assistants not on Matter ecosystem or third-party payment gateways (as needed per use case) requires internet connectivity beyond the Matter admin.

With these critical capabilities relying on cloud connectivity, Matter endpoints often need additional options for internet access.

Architectures for enabling cloud connectivity

For Matter devices, there are three general approaches to providing the necessary cloud connectivity while meeting the local operation specifications.

Smart-home hub with built-in gateway

Some device makers might choose to ship a proprietary home hub that incorporates both the Matter administrator and a gateway to their cloud services. This home hub would manage attached Matter endpoints locally per the standard, while also facilitating cloud connections for advanced functions. The hub could support OTA updates, remote access, and telemetry collection for endpoints.

Offload cloud connectivity to an existing Matter hub

Rather than bundle a custom hub, devices could be designed to connect with Matter hubs, such as Amazon Echo, Google Nest Hub, Apple HomePod, or Samsung SmartThings Hub, for internet connectivity. In this case, the existing Matter hub handles local device communication according to the standard, and it also provides a gateway to the cloud for endpoints that require it. This takes advantage of infrastructure consumers might already have. However, this approach depends on the level of support offered by the Matter hub for features that are not specified as normative for Matter hubs in the standard.

Direct cloud connectivity in endpoints

Devices with direct internet connectivity, such as Wi-Fi, could integrate separate connectivity for the Matter local network and for vendor cloud services. This allows the device to act as its own gateway to the cloud. However, solutions are needed for non-Wi-Fi endpoints that rely on protocols such as Thread. This allows devices to connect to the cloud independently, but it might not be feasible for simple, low-cost, battery-powered devices.

Bridging Matter and manufacturer cloud platforms

While Matter simplifies local interoperability, additional effort is required to smoothly connect Matter admin systems and manufacturer cloud platforms. The Connectivity Standards Alliance

(CSA) continues to develop standards for Matter-to-cloud connectivity. As of 2026, while formal cloud interface standards are still evolving, industry best practices have emerged from the deployment of thousands of Matter devices. Widely adopting standards for this cloud connectivity would ease development for device makers.

The optimal path depends on the use cases, price points, and business models of specific products. It is clear that robust access to cloud services is necessary to unlock the full functionality that smart-home consumers expect—even for Matter-compliant devices that are focused on local interoperability. Device makers have an opportunity to use Matter for interoperability while still providing the advanced capabilities through thoughtfully designed cloud connectivity.

Security

Security by design is the practice of incorporating security functions during the device design stage, rather than as an afterthought during the later stages of development. Encrypted communication and over-the-air (OTA) updates are examples of security by design. Matter provides a strong foundation for smart-home devices by implementing security by design, starting in a trusted, secure manufacturing facility. Matter devices can only be manufactured and provisioned by owners of a known, trusted Product Attestation Authority (PAA) certificate authority (CA).

As of Matter version 1.5, the security framework has been continuously strengthened through multiple releases. Matter 1.4.2 (June 2025) introduced PSA-based crypto improvements, enhancing the security foundation. The Connectivity Standards Alliance (CSA), which oversees the Matter standard, maintains a dedicated Vulnerability Reporting Program to manage security disclosures for its protocols.

Device authentication

Matter devices must authenticate themselves to each other and to a controller before they can communicate. Only authorized devices can connect to the Matter fabric. During manufacturing, devices are provisioned with a unique identity and X.509 certificate that is known as the *Device Attestation Certificate (DAC)*. When the device attempts to connect to the Matter fabric for the first time, the commissioner device checks the validity of the DAC and that it is signed by a known and trusted Product Attestation Intermediate (PAI) CA. The commissioner device also checks if the device attempting to connect to the network adheres to Matter's specifications, protocols, and security standards. The device is granted access to the Matter fabric only if all of the checks are successful.

The CSA maintains a list of authorized Product Attestation Authorities (PAAs) and publishes them through the Distributed Compliance Ledger (DCL). The DCL is a blockchain-based system that provides transparent, tamper-proof records of certified devices and trusted certificate authorities. Manufacturers can apply to become PAAs or work with existing authorized PAAs to provision their devices. The DCL also supports Observer Nodes that stakeholders can use to monitor the certification ecosystem.

Encrypted communication

After the device is granted access to the Matter fabric, all data passed between devices is secured by strong encryption. Data integrity is preserved by using a multi-tiered approach. The Matter commissioner performs key exchange and signature verification by using the ECC-256 secp256r1 curve. After keys have been exchanged, the Matter devices encrypt data in transit by using AES-256. For each message, the devices use the SHA-256 algorithm to verify that data was not tampered with during transmission.

Matter version 1.4 introduced Enhanced Multi-Admin capabilities with Home Router Access Protocol (HRAP). This improved security for scenarios where devices are controlled by multiple ecosystems simultaneously. This enhancement ensures that credential sharing and access control remain secure even when a device participates in multiple Matter fabrics. Each fabric maintains its own security context, preventing compromise in one ecosystem from affecting others.

Over-the-air updates

The Matter standard also requires devices to implement a robust security posture for over-the-air (OTA) updates. OTA is a critical part of a smart-home ecosystem so that devices can receive security updates along with new features. Each firmware update for Matter devices must be signed by a manufacturer's private key. The device verifies the payload signature by using the corresponding asymmetrical public key. After the signature of the payload is verified, the device can commit the image to its bootloader and reset. During the boot process, the device must again verify the image to ensure it has not been tampered with, and the device also verifies that it is running the latest known version.

Matter version 1.4.2 (June 2025) introduced significant improvements to the OTA update infrastructure, including better transport reliability and enhanced testing frameworks. These improvements have made OTA updates more robust and reliable in production deployments. However, manufacturers should note that Matter's OTA mechanism has limitations regarding sequential updates and rollback capabilities. For devices that require fine-grained update control, fleet management, or A/B testing of firmware, manufacturers may need to supplement Matter's OTA with direct cloud connectivity to their own update infrastructure.

Development with Matter

Using Alexa

Amazon offers a comprehensive suite of tools for Matter development. These tools provide an expedited path to build Matter products that are compatible with all major ecosystems and that work seamlessly with Amazon Alexa.

Program: Works with Alexa

This program ensures your Alexa-connected devices provide a great customer experience. The Works with Alexa (WWA) badge increases customer confidence, which helps drive preference for your certified devices. For more information, see [Announcing Matter Launch and Introducing Works with Alexa \(WWA\) for Matter devices](#) (Amazon blog post).

SDK: Develop Matter with Alexa

This SDK lets you add local Matter connectivity to your device while also including managed cloud connectivity, business intelligence, and OTA support. For more information, see [Get the most out of Matter with Alexa](#).

Kit: Alexa Ambient Home Developer Kit

This kit helps you integrate with devices across protocols in order to build an ambient and unified smart home with Alexa. For more information, see [Amazon Alexa](#).

Endpoint: Commissionable Endpoint

For skill-connected Matter devices, the Commissionable Endpoint API creates a local, Matter-based connection to Alexa devices without any steps required by your customer with their permission. For more information, see [Alexa.Commissionable Interface 1.0](#) (Alexa Skills Kit).

AWS Private CA support for Matter

AWS Private Certificate Authority (AWS Private CA) provides guidance on using the Matter standard.

DAC for Matter

Matter requires a device attestation certificate (DAC), which must be issued by a device attestation CA that is compliant with the Matter public key infrastructure (PKI) certificate policy (CP). Device vendors can use AWS Private CA to do the following:

- Host the Product Attestation Authority (PAA) certificate authority (CA)
- Host the Product Attestation Intermediate (PAI) CA
- Issue, sign and maintain each device's DAC

For more information, see [Use AWS Private Certificate Authority to issue device attestation certificates for Matter](#) in the AWS Security Blog.

Node Operational Certificates (NOC)

In addition to device attestation, AWS Private CA supports issuing Node Operational Certificates (NOCs), which are used to secure communication within a Matter fabric. AWS provides Java samples for activating a root CA and subordinate CA for NOCs and creating a NOC.

For more information, see [Using the AWS Private CA API to implement Matter certificates](#) in the AWS Private Certificate Authority documentation.

CRL Revocation Support (Matter version 1.2 and later)

Matter version 1.2 introduced Device Attestation Certificate (DAC) revocation using Certificate Revocation Lists (CRLs). When enabling CRL revocation for CAs that issue Matter certificates, set `OmitExtension` to `true` in the `CrlConfiguration` object within the `CrlDistributionPointExtensionConfiguration` structure. In Matter, the CRL Distribution Point (CDP) URI is not embedded in certificates but is instead fetched from the Matter Distributed Compliance Ledger (DCL). You must upload the CDP URI to the Matter DCL for discovery during DAC validation.

Infrastructure for Matter

AWS provides an example that demonstrates the use of [AWS Cloud Development Kit \(AWS CDK\)](#) to set up PKI infrastructure for Matter. You use AWS Private CA to meet the requirements of the Matter PKI CP. For more information, see [Matter PKI CDK project](#) on GitHub.

Java samples

AWS Private CA provides Java samples for creating Matter-compliant Product Attestation Authority (PAA) certificates, Product Attestation Intermediate (PAI) certificates, and Device Attestation Certificates (DACs). For more information, see [Using the AWS Private CA API to implement the Matter standard \(Java examples\)](#) in the AWS Private Certificate Authority documentation.

Guide for Matter PKI compliance

This [Matter PKI Compliance Guide](#) explains how to implement and demonstrate compliance with the CSA Matter PKI CP requirements. It provides information about how you can use to AWS Private CA to create and operate Matter-compliant Certificate Authorities (CAs).

Managed integrations with AWS IoT Device Management

[AWS IoT Device Management](#) includes the managed integrations feature, which provides a unified interface for onboarding and managing diverse IoT devices regardless of connection type (direct, hub-based, or cloud-to-cloud).

The following are key capabilities relevant to Matter:

- Device SDKs supporting ZigBee, Z-Wave, Matter, and Wi-Fi protocols
- More than 80 device data model templates based on the AWS implementation of the Matter data model standard
- Partner-built cloud-to-cloud (C2C) connectors
- Unified device control across multiple brands and protocols
- Available in Canada (Central), Europe (Ireland), and Middle East (UAE) regions

For more information, see [What is managed integrations for AWS IoT Device Management?](#)

FAQs

What are the membership levels with Matter?

The membership information can be found on the [CSA website](#). The membership level you choose depends on your interest in certifying a product (adopter) or defining the product type within the standard (participant). For more information about the membership levels, see [Impact the Future of the IoT](#) on the CSA website.

How do smart-home consumers benefit from Matter?

Consumers benefit from Matter in the following ways:

- Simplified onboarding of Matter devices at home, including enhanced setup flow, multi-device QR codes, and NFC onboarding (Matter version 1.4.1)
- Unified management of all smart-home devices through a single app across major ecosystems (Amazon Alexa, Google Home, Apple HomeKit, Samsung SmartThings)
- Device control from multiple voice assistants simultaneously through Enhanced Multi-Admin (Matter version 1.4)
- Access to expanded device types including cameras with streaming, appliances, energy management devices, and robotic vacuums

For more information, see [Benefits of Matter certification for smart-home consumers](#) in this guide.

How do device makers benefit from Matter?

Device makers benefit from Matter in the following ways:

- Reduced costs for supporting customers who have infrastructure and connectivity issues
- A single certification for a device instead of multiple certifications with each ecosystem
- Development of proprietary apps is no longer necessary for basic device functionality
- Reduced costs of materials due to not having to ship infrastructure elements (such as Thread Border Routers)

- Reduced costs for supporting customers who have infrastructure and connectivity issues
- Access to mature SDKs, development tools, and testing infrastructure (significantly improved since initial release)
- Faster time-to-market with established certification processes and expanded testing provider networks

For more information, see [Benefits of Matter certification for device makers](#) in this guide.

Does Matter replace Wi-Fi, Bluetooth, or Thread?

No, Matter is an application-level protocol that runs on IP networks. Devices that use Wi-Fi, Ethernet, or Thread for connectivity can become Matter certified. The following table summarizes how Matter contrasts with Wi-Fi, Bluetooth, and Thread.

Feature	Matter	Wi-Fi	Bluetooth	Thread
Purpose	Smart-home communication	Internet access and data transfer	Short-range wireless communication	Low-power wireless mesh networking
Range	Varies depending on the underlying protocol	Up to 300 feet	Up to 30 feet	Up to 300 feet
Bandwidth	Varies depending on the underlying protocol	Up to 10 gigabits per second	Up to 2 megabits per second	Up to 250 kilobits per second
Power consumption	Varies depending on the underlying protocol	Relatively high	Relatively low	Very low
Security	Varies depending on	WPA2, WPA3	AES, BLE Secure Connections	AES

	the underlying protocol			
Cost	Varies depending on the device	Relatively inexpensive	Relatively inexpensive	Relatively expensive

What is a vendor ID and product ID?

CSA members can apply for a vendor ID that identifies them as a supplier. Products from the company are henceforth assigned to this ID and can be traced back to their origin. In addition, they receive a unique product ID. The 16-digit numerical code accompanies products like a passport number and renders them as unmistakable as the vendor.

Which devices need to be Matter certified?

Any devices that need to authenticate and be part of the Matter fabric need to be Matter certified. However, those devices that are designed to interact only with the vendor-specified hub over a non-standard (proprietary) protocol would not benefit from the Matter certification process. For example, a smart home security system hub must be certified as Matter compliant, but a door or window sensor that communicates with the hub doesn't need to be certified as Matter compliant. The choice to getting a product certified for Matter is primarily driven by this consideration.

My product type is not currently defined in Matter. What additional tasks should I budget time for to get the products Matter certified?

Matter has significantly expanded device type coverage through versions 1.0 to 1.5. The standard now supports over 50 device types, including:

- **Core devices:** lighting, switches, plugs, door locks, thermostats, window coverings, sensors
- **Appliances:** refrigerators, air conditioners, dishwashers, robotic vacuums, microwaves, ovens
- **Energy management:** solar panels, batteries, heat pumps, water heaters, EV chargers
- **Environmental:** water management devices, air quality sensors, air purifiers
- **Security:** cameras with streaming support

If your device type is still not supported, the first step is to join the CSA as a participant. Matter releases new versions approximately twice per year, continuously expanding device type coverage. As a participant member, you can lead the definition of new device types and have access to draft specifications that enable a faster go-to-market strategy. For more information about the membership levels, see [Impact the Future of the IoT](#) on the CSA website.

Some of my devices connect directly to the home Wi-Fi network. Do these devices need to be Matter certified?

Matter certification can benefit devices that connect directly to the smart-home network because they can connect to the Matter fabric. This enables consumers to control the devices through their virtual assistants on the same Matter fabric. However, consumers must use a device-specific app for any operations that are vendor-specific and not defined in the Matter specification.

What is the current version of Matter and what's new?

As of November 2025, Matter 1.5 is the current version. Key additions across recent versions include:

- Matter 1.5 (November 2025): Camera streaming support via RTSP, stability improvements
- Matter 1.4.2 (June 2025): Improved BLE commissioning, PSA-based crypto, transport reliability
- Matter 1.4.1 (November 2024): Enhanced setup flow, multi-device QR codes, NFC onboarding
- Matter 1.4 (November 2024): Energy management devices, Enhanced Multi-Admin, HRAP
- Matter 1.3 (May 2024): Appliances, EV chargers, enhanced energy reporting
- Matter 1.2 (October 2023): Refrigerators, air conditioners, dishwashers, robotic vacuums

Matter versions are released approximately twice per year by the CSA working group.

Resources

AWS resources

- [Get the most out of Matter with Alexa](#)
- [Announcing Matter Launch and Introducing Works with Alexa \(WWA\) for Matter devices](#) (Amazon Alexa blog)

Connectivity Standards Alliance (CSA) for IoT

- [CSA website](#)
- [CSA certification process overview](#)
- [CSA authorized testing providers](#)
- [Matter specifications](#)

Document history

Change	Description	Date
Matter standard version updates	Updated to include information about the latest Matter standard, version 1.5	March 5, 2026
Initial publication	—	February 5, 2024