Matter Accessory Best Practices for Apple Home

Developer Preview 1.3

Developer

Contents

1. Introduction

1.1. Purpose and Scope

This document details Matter accessory implementation best practices to ensure interoperability and reliability when paired with Apple Home app. This document assumes that developers know how to integrate Matter SDK and OpenThread SDK (if applicable) into their accessories and are familiar with Matter Specifications and the CSA standard.

1.2. Terminology

- Accessory: A Matter device containing one or more Nodes.
- Thread Border Router: A Thread Border Router connects a Thread network to other IP-based networks, such as Wi-Fi or Ethernet. More details.
- mdns: Multicast DNS
- OTA: Over-The-Air
- PR: Git Pull Request
- Sleepy End-Devices: Battery-powered Thread accessories. More details.
- SoC: System on Chip

2. Overview

This guide serves as a resource for accessory manufacturers and SoC providers to ensure their implementations are interoperable and work reliably when paired with Apple Home. It is expected that accessory manufacturers and SoC providers check this guide frequently for updates.

The accessory requirement checklist is divided into the following sections:

1. Open-Source Matter SDK
2. OpenThread SDK (for Thread accessories)
3. Matter OTA
4. Diagnostics
5. CSA Matter Interoperability Testing
6. Testing accessories with iOS/tvOS beta releases
7. Thread Border Router interoperability testing (for Thread Border Router accessories)
8. Feedback to Apple
9. Works With Apple Home badge

3. Accessory Requirements

3.1 Open-Source Matter SDK

- Minimum Requirements:

  Use the latest Matter SDK main branch certified with v1.4 Matter specification from CSA.

- Integrate the following pull requests:
  - Fetching credential index for locks https://github.com/project-chip/connectedhomeip/pull/35868. If applicable to your accessory, implement this pull request.
  - Handling of non-permitted messages as a security fix https://github.com/project-chip/connectedhomeip/pull/33148.

3.2 OpenThread SDK

This section applies to Thread accessories.

- Use the minimum commit version: Link

  git checkout 5c8af41eb2735dec09e7dc5418cdd89d19a1824f

- SRP compression changes https://github.com/abtink/openthread/tree/srp/coder
- Defer SRP update on SLAAC address deprecation https://github.com/openthread/openthread/pull/10505
- SRP client changes to accept delayed older messages https://github.com/openthread/openthread/pull/10353
- Implement these pull requests to avoid packet drops during role transition
  - https://github.com/openthread/openthread/pull/10006
  - https://github.com/openthread/openthread/pull/8307
  - https://github.com/openthread/openthread/pull/9956
  - https://github.com/openthread/openthread/pull/8318
- Conformance to Network Diagnostics (DIAG) test cases in Thread 1.4 certification test plan.
- Manufacturers should properly configure the fields listed below in their OpenThread repository and also provide the same information when queried through network diagnostics.
  - OPENTHREAD_CONFIG_NET_DIAG_VENDOR_NAME
  - OPENTHREAD_CONFIG_NET_DIAG_VENDOR_MODEL
  - OPENTHREAD_CONFIG_NET_DIAG_VENDOR_SW_VERSION

- Certify Thread accessories with v1.3 OpenThread specification.

3.3 Matter OTA

Implement Matter OTA to ensure accessories get timely automatic firmware updates, including the latest interoperability and reliability recommendations.

Please refer to the Apple Matter OTA guide for more details.

In addition, ensure your accessory firmware is tested with the Apple Home before releasing the firmware to end-users.

3.4 Diagnostics

Implement three diagnostic clusters from Matter Core Specification:

- The Diagnostic Logs Cluster will enable users to pull logs from the accessories in the field, which will assist in issue investigation.
- The General Diagnostics Cluster and the Network Diagnostic Cluster will provide insights into reliability and assist in understanding the frequency of reboots and issues with network connectivity.

Implement the following clusters:

ID	Name
0x0032	Diagnostic Logs Cluster
0x0033	General Diagnostics Cluster

Implement the network diagnostic cluster that is applicable to the accessory:

ID	Name
0x0035	Thread Network Diagnostics Cluster
0x0036	Wi-Fi Network Diagnostics Cluster
0x0037	Ethernet Network Diagnostics Cluster

3.4.1 Diagnostic Logs Cluster

The Diagnostic Logs Cluster is certifiable with Matter Specification Version 1.3 and above.

Implement the mandatory attributes of the Diagnostic Logs Cluster. This enables iOS Matter controller to fetch logs from the accessory.

Include log content that is beneficial for debugging process. For example include logs regarding crashes, network failures, read/write events, etc.

3.4.2 General Diagnostics Cluster

Implement the following General Diagnostic Cluster attributes.

3.4.2.1 General Diagnostics Attributes

ID	Name	Notes
0x0000	NetworkInterfaces	
0x0001	RebootCount	
0x0002	UpTime	
0x0003	TotalOperationalHours	
0x0004	BootReason	Avoid use of enum value 0 ‘Unspecified’ as this does not provide actionable insight into the cause of the accessory reboot

3.4.2.2 General Diagnostics Events

ID	Name
0x00	HardwareFaultChange
0x01	RadioFaultChange
0x02	NetworkFaultChange
0x03	BootReason

3.4.3 Thread Network Diagnostics Cluster

Implement the following Thread Network Diagnostic Cluster features, attributes, commands and events.

3.4.3.1 Thread Network Diagnostics Features

Bit	Code	Feature
0	PKTCNT	PacketCounts

3.4.3.2 Thread Network Diagnostics Attributes

ID	Name
0x0000	Channel
0x0001	RoutingRole
0x0002	NetworkName
0x0003	PanId
0x0006	OverrunCount
0x0007	NeighborTable
0x0008	RouteTable
0x00016	TxTotalCount
0x00017	TxUnicastCount
0x00018	TxBroadcastCount
0x00027	RxTotalCount
0x00028	RxUnicastCount
0x00029	RxBroadcastCount

3.4.3.3 Thread Network Diagnostics Commands

ID	Name	Direction
0x00	ResetCounts	Client -> Server

3.4.3.4 Thread Network Diagnostics Events

ID	Name
0x00	ConnectionStatus
0x01	NetworkFaultChange

3.4.4 Wi-Fi Network Diagnostics Cluster

Implement the following WiFi Network Diagnostic Cluster features, attributes, commands and events.

3.4.4.1 Wi-Fi Network Diagnostics Features

Bit	Code	Feature
0	PKTCNT	PacketCounts
1	ERRCNT	ErrorCounts

3.4.4.2 Wi-Fi Network Diagnostics Attributes

ID	Name
0x0003	ChannelNumber
0x0004	RSSI
0x0005	BeaconLostCount
0x0006	BeaconRxCount
0x0007	PacketMulticastRxCount
0x0008	PacketMulticastTxCount
0x0009	PacketUnicastRxCount
0x000A	PacketUnicastTxCount
0x000C	OverrunCount

3.4.4.3 Wi-Fi Network Diagnostics Commands

ID	Name	Direction
0x00	ResetCounts	Client -> Server

3.4.4.4 Wi-Fi Network Diagnostics Events

ID	Name
0x00	Disconnection
0x01	AssociationFailure
0x02	ConnectionStatus

3.4.5 Ethernet Network Diagnostic Cluster

Implement the following Ethernet Network Diagnostic Cluster features, attributes, commands and events.

3.4.5.1 Ethernet Network Diagnostics Attributes

ID	Name
0x0000	PHYRate
0x0001	FullDuplex
0x0002	PacketRxCount
0x0003	PacketTxCount
0x0004	TxErrCount
0x0005	CollisionCount
0x0006	OverrunCount
0x0008	TimeSinceReset

3.4.5.2 Ethernet Network Diagnostics Commands

ID	Name	Direction
0x00	ResetCounts	Client -> Server

3.5 CSA Matter Interoperability Testing

Submit your certified accessories to CSA for Matter interoperability testing here.

3.6 Testing Accessories with iOS/tvOS Beta Releases

Test your accessories with the latest iOS/tvOS beta releases at least twice a year.

3.7 Thread Border Router Interoperability Testing

This section is applicable for Thread Border Routers that implement THClient API.

Ensure that your accessories pass all the test cases outlined in the following documents:

- Thread Test Plan - THClient API Test Plan
- Thread Test Plan - User Experience Border Router

To access these documents, file a Feedback Assistant.

3.8 Feedback to Apple

Report issues/bugs to Apple through Feedback Assistant. This will help in timely triage and feedback.

Include the following information when reporting issues to Apple:

3.8.1. Issue Description and Reproducibility

Please provide the details of the issue and list the steps to reproduce them.

3.8.2. Profiles

The following profiles must be installed on the iOS/tvOS devices. Follow the instructions provided in the respective profile instructions document on how to trigger sysdiagnose logs for iPhone, HomePod, HomePod mini, or Apple TV.

- HomeKit :
  - This profile helps capture HomeKit layer logs for issues related to Matter on iOS/tvOS.

- Thread (for a Thread Accessory):
  - This profile helps capture Thread protocol-related logs for issues related to Thread and IPv6 when interacting with a Thread Border Router (HomePod, HomePod mini, or Apple TV).

- mdns
  - This profile helps capture mdns discovery issues related to pairing and reachability of accessories with iOS/tvOS.

- Home Network Diagnostics
  - This profile helps capture HomeKit, mDNS, Thread, and Network on iOS/tvOS devices. For Matter over Thread accessories, it is recommended this profile be used on Apple devices.

3.8.3. Logging

Ensure you attach logs from the accessory and iOS/tvOS devices and provide an approximate time stamp of the issue. Refer to the section on the profiles that must be installed on iOS and tvOS devices.

If it is a regression, provide us details on the working and non-working versions of iOS/tvOS with passing and failing logs.

It is assumed that the Matter accessory is following the guidelines for Matter diagnostics detailed in this section.

3.8.4. Additional Information

Additional logs and information on the following are recommended depending on the type of issue:

- Please include Wireshark logs.
- Test with different Wi-Fi routers to narrow down the issue. If information about the router is available, please share it on the feedback assistant.

3.9 Works With Apple Home Badge

Submit a request for the Works with Apple Home badge after the accessory receives Matter certification.

Additional information regarding Works with Apple Home badge and usage guidelines are listed here.

6. FAQs

1. I am currently using an older version of Matter SDK. How do I ensure better interoperability with Apple Home?

Integrate the latest Matter SDK main branch and certify your accessory with v1.4 Matter specification on your next immediate firmware release.

Follow the guidelines in this section on the important pull requests to be implemented for your accessory.

Please check this guide frequently for any updates.

2. I am currently using an older OpenThread SDK commit version on my Thread accessory. How do I ensure better interoperability with Apple Home?

Integrate the OpenThread SDK commit version based on this section in the next immediate firmware release.

Please check this guide frequently for any updates.

3. Do I need to go through CSA Matter Interoperability?

Matter certification from CSA is the standard for testing and verifying that the Matter protocol works correctly.

CSA Matter Interoperability checks for interoperability with Apple Home to ensure it works with no issues on accessories or iOS/tvOS.

7. References

[1] Matter Specification Version (https://csa-iot.org/developer-resource/specifications-download-request/)

[2] Matter Core Specification (https://csa-iot.org/developer-resource/specifications-download-request/)

[3] Matter Device Library (https://csa-iot.org/developer-resource/specifications-download-request/)

[4] Matter open-source SDK (https://github.com/project-chip/connectedhomeip)

8. Revision History

Revision History

Version	Date	Notes
1.3	2025-02-19	Developer Preview 1.3 - Added OpenThread pull requests in section 3.2 based on recent Thread quality testing
1.2	2025-02-05	Developer Preview 1.2 - Added Matter open-source SDK pull requests section 3.1 - Added OpenThread SDK pull requests section 3.2
1.1	2024-07-26	Developer Preview 1.1 - Added OpenThread pull requests section 3.2
1	2024-06-06	Developer Preview 1.0

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