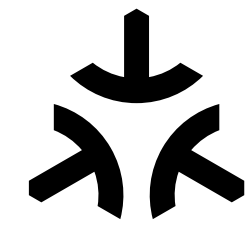


Smart Cooking with Matter

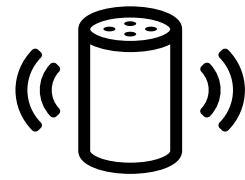
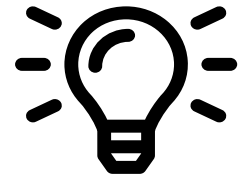
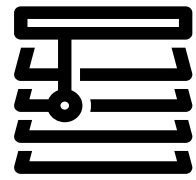
The NXP guide to making fresh, tasty product designs





The **Culinary** **Approach** to Product Design

Is there anything
tastier than a fresh
idea, expertly prepared?



Deliver Fresh, Tasty **Designs**

Great chefs elevate cooking to an art form. They start with the best ingredients, add a bit of the unexpected, execute flawlessly and never fail to amaze.

At NXP, we believe the best product developers have a lot in common with award-winning chefs. After all, engineering teams start with the best specs and components, add a dash of ingenuity, a pinch of originality, and voilà – a new design that’s sure to wow.

We developed this cookbook as a way to help you deliver fresh, tasty designs for Smart Home. It centers on Matter, the foundation for truly autonomous homes. We begin with how Matter saves on prep time, highlight the importance of a great sous chef, and introduce the innovative ingredients in the NXP pantry.



What Makes Matter so Delicious



Think of Matter as a fusion cuisine, bringing together the best traditions while giving developers the freedom to be more creative with their recipes.

Developed by the Connectivity Standards Alliance (CSA), with significant support from NXP, Matter is one of the hottest trends in Smart Home today – covering more than 1,200 certified devices less than a year after Version 1.0 was announced.

Why such rapid adoption?
Simplicity and security.

Matter offers a common language, based on Internet Protocol (IP), so previously incompatible wireless protocols can work together, seamlessly across major Smart Home platforms. And, because Matter makes security an integral part of operation, it delivers the kind of high-level protection needed to ensure safe operation.

That's a menu we can all agree on.

A Palate Pleaser

Matter hits all the right flavor notes, in exactly the right combination. That's because it builds on the right ingredients: IP-based connectivity, built-in security, a single application layer and a unified certification process.



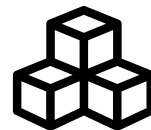
IP-based connectivity

Using IP as the basis for communication eliminates the need for translation, and makes cloud and device data models more consistent. Standardizing on IP also makes it easier to address important issues, like data security and how to safely provision devices onto the network.



Built-in security

Matter includes standardized cryptographic protocols and security mechanisms for things like onboarding and network communication. It also defines an update mechanism so devices already deployed in the field can keep current with the latest security threats.



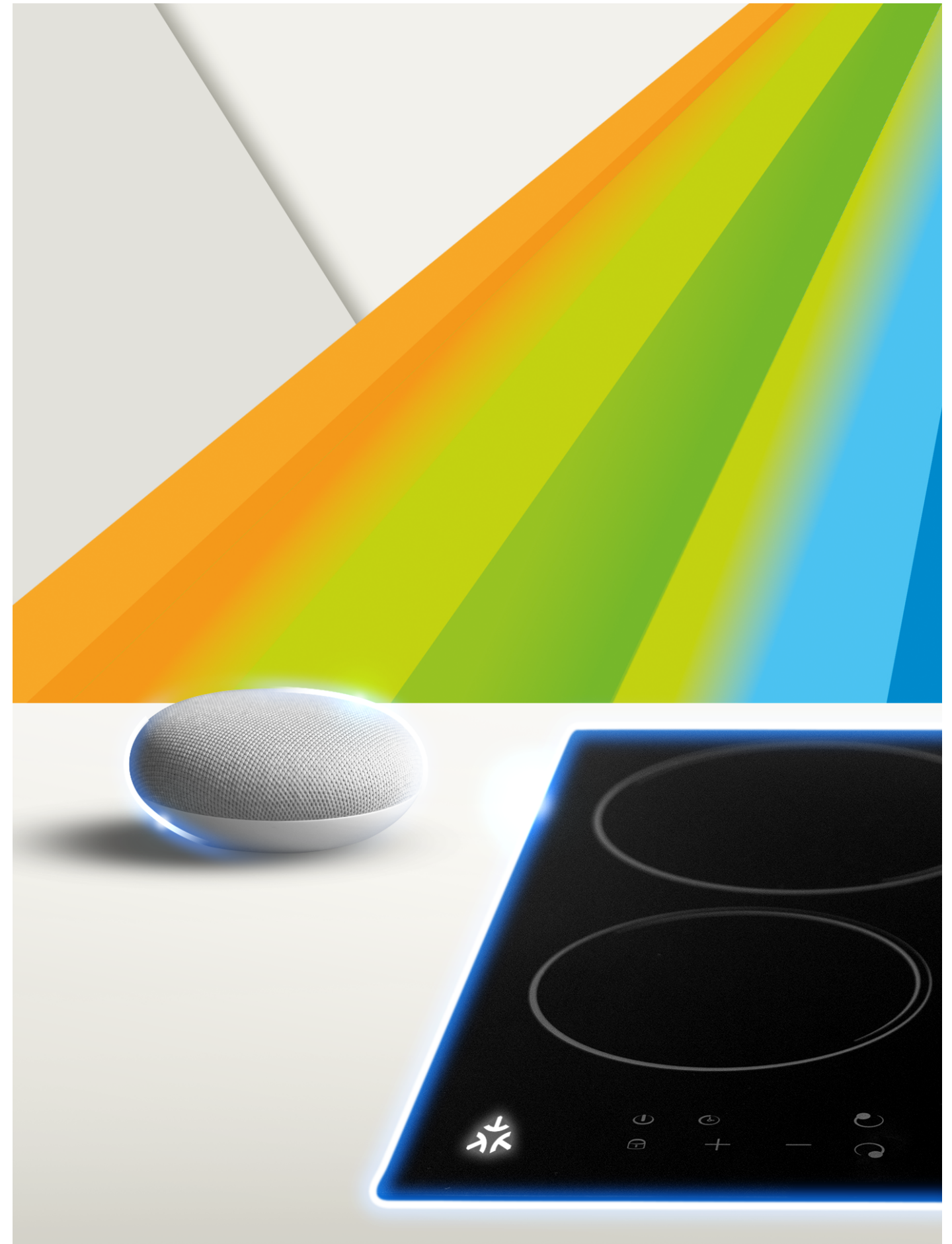
Single, unified application layer

Working with just one application layer, and standards for managing the complete device life-cycle, means device manufacturers can focus on innovation. Matter was also built using proven and mature data models, simplifying integration and providing immediate device interoperability with home automation platforms already in the home.



Reliable certification process

Matter defines a common framework for connectivity, with support for network testing and certification, along with a set of test plans to be used with all major ecosystems. Clear guidelines accelerate the certification process, so developers can finish faster.



Get Ready To COOK



In professional kitchens, much of the day is spent on **“mise en place,”** a French phrase for **“putting in position.”** It’s when the second-in-command, the **“sous chef,”** makes sure all the ingredients are prepped, all the tools and equipment are set out and all the workstations are organized and ready to go, so when it’s crunch time, and the orders are flying in, there’s no wasted time or duplicated effort. When it comes to design, NXP is your partner. NXP is your sous chef.

**It’s the culinary equivalent
of reducing time to market.**

A Fully Stocked Pantry

Whatever the recipe – a tiny, battery-powered sensor or an AI-powered appliance with an interactive user interface – NXP's fully stocked pantry includes everything you need.



Processing

Our broad, scalable processing platforms enable compelling features like graphics, video streaming, network management and more. From tiny microcontrollers to powerful processing units, we make it easy to deliver compelling edge operation.



Connectivity

We support widely used connectivity protocols, including Wi-Fi, Thread, Bluetooth LE and NFC. We make wireless simple, with optimized, highly integrated solutions that let you add wireless without having to become an RF expert.



Security

As a leading supplier of silicon-based security solutions for highly sensitive use cases, we deliver high-level protection for Smart Home interactions. From secure elements and secure enclaves to secure network management and remote provisioning services using NXP EdgeLock IP, we're known for our comprehensive, multi-layered security solutions.



Software & Services

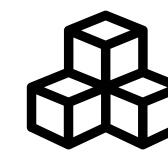
We complement our hardware portfolio with a full range of software and services, so you can deliver faster. In addition to our production-quality connectivity stacks and complete embedded software solutions, we offer professional engineering services that speed designs along, with EdgeLock 2Go provisioning, and device life-cycle management services that deploy and maintain security.



IP-based connectivity



Built-in security



Single application layer



Certification process

Your Source for the Freshest, Most Flavorful Ingredients

Great chefs know how to bring out the best of every element in a recipe, but they also know that it helps to start with great ingredients. They've learned that using the freshest, most flavorful ingredients gives you an edge when making a standout dish – whether it's the simplest of sandwiches or the most complicated of curries – and they rely on their suppliers to provide them with the very best.

Translate that to product design, and you've just described NXP's relationship with the design community. We supply the best ingredients, so it's easier for developers to work their magic.

To get the most flavor out of our Matter recipes, we've assembled a complete suite of Matter-certified Development Platforms. They deliver garden-fresh flavors and mouthwatering features, so you can hit the ground running. Built with automation and interoperability in mind, our continuously evolving portfolio of Matter Development Platforms provide a system-level approach to developing Matter products so you can focus on the creative elements that will set your product apart.



Tastes Better Together: Our Favourite Recipes

Now that your pantry's stocked and you've got your ingredients prepped, you're ready to start cooking.

Here are a few creative, easy-to-follow recipes that are sure to make your menu shine.

Course: Advanced Matter Development

The i.MX Linux/Android BSP supports Matter, Wi-Fi and/or Thread with integrated Border Router via a Yocto cross-compile recipe that is compatible with all devices (i.MX 9, i.MX 8 and i.MX 6) supported in the latest Linux/Android BSP. Testing has been done on the devices shown.

Recipe

MPU (Linux, Android) Hosted

Ingredients

i.MX 8M Mini + IW612 Tri-Radio SoC



Course: Edge Node Matter Development

Recipes

MCU (RTOS) Hosted

Ingredients

Option 1: i.MX RT1170 + IW612 Tri-Radio SoC



Option 2: i.MX RT1060 + K32W148 WMCU



Course: End Node Matter Development Platforms

Recipes

Standalone

Ingredients

Option 1: RW612 Tri-Radio WMCU



Option 2: K32W148 WMCU



Chef's Tips



Fun Fact: Millions of devices, including most smart speakers, now support Matter. And a growing number support Thread, along with Wi-Fi, too.

Tip #1 Be Secure!

Matter protects against cyberattacks by requiring that every product have a Device Attestation Certificate (DAC), which authenticates the device and attests that it is Matter certified. NXP's Matter Development Platforms implement integrated or discrete security accelerators, so it's easier to get a DAC. Plus, all our Matter solutions work with the NXP EdgeLock 2GO cloud service, which generates and distributes Matter DACs directly to the manufacturing facility.

Tip #2 Get Certified!

The CSA's Matter Certification Program is a critical aspect of delivering interoperability, because it ensures compatibility across devices, brands and platforms. With NXP's Matter-certified and Matter-ready Development Platforms, you can be confident that you've streamlined the certification process and can deliver quickly.

Tip #3 Connect Your Device!

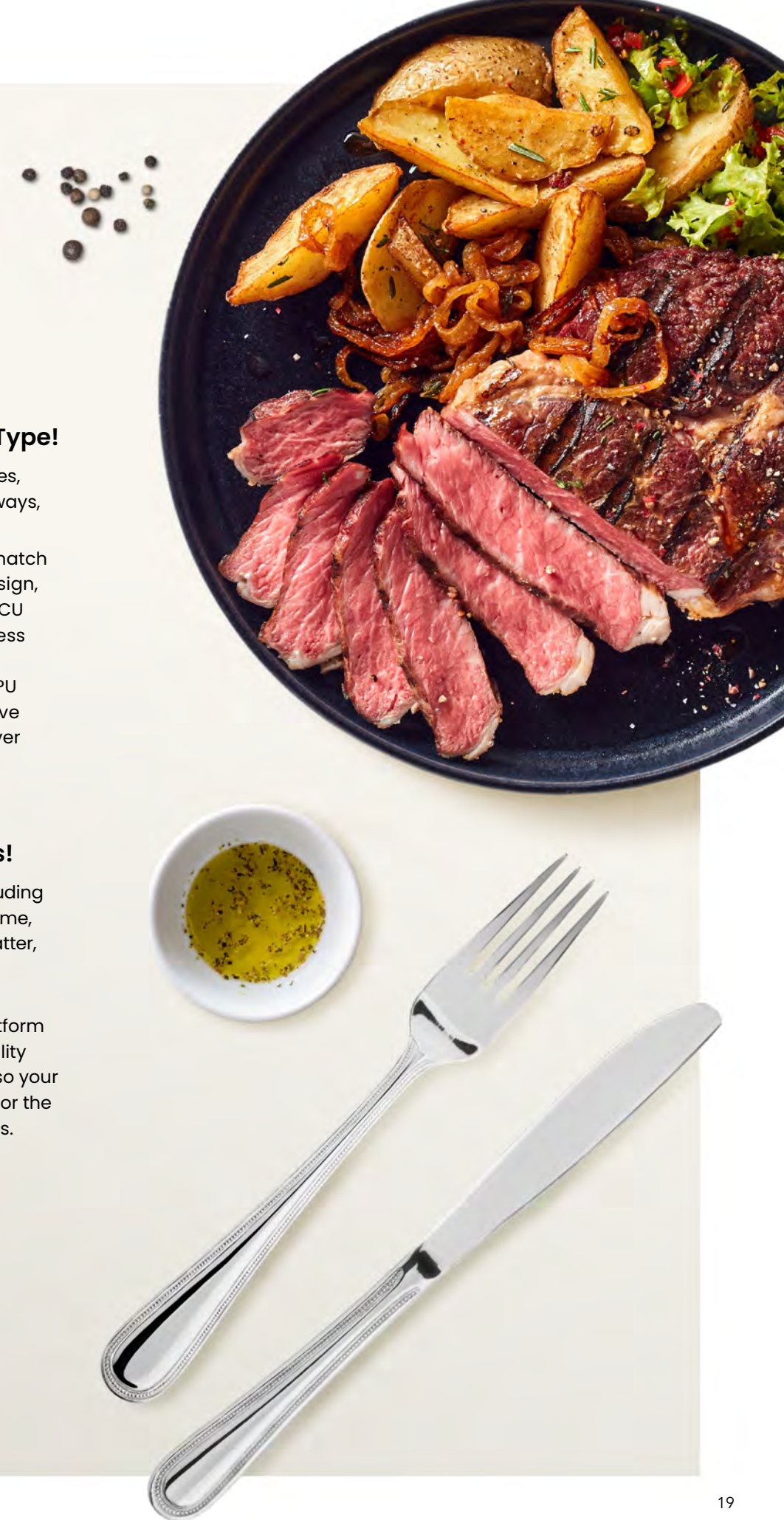
Matter seamlessly supports IP-based networking with Wi-Fi, Thread and Ethernet, so you can choose the best protocol(s) for your use case. NXP's Thread solutions deliver low-power, reliable connections and fast response times, and our Wi-Fi solutions provide higher throughput with ubiquitous connectivity. What's more, our integrated, multi-protocol wireless MCUs and SoCs make it easy to deliver connectivity, with support for Thread and Bluetooth or Wi-Fi, Thread and Bluetooth.

Tip #4 Build Your Preferred Device Type!

Matter supports a range of device types, from simple sensors to complex gateways, and everything in between. NXP's system-level solutions let you match the development platform to your design, whether you need a single wireless MCU to combine the application and wireless connectivity or a multi-chip hosted architecture combining an MCU or MPU with a wireless SoC. Either way, we have the right integrated solution and deliver all the necessary wireless protocols.

Tip #5 Work with Major Ecosystems!

Leading Smart Home ecosystems, including Amazon Alexa, Apple Home, Google Home, and Samsung SmartThings support Matter, so your Matter-based devices can be controlled across all of them. Using an NXP Matter Development Platform gives you instant, validated compatibility with all these Smart Home platforms, so your products offer seamless connectivity for the most popular Smart Home ecosystems.



RECIPE #1

Standalone Matter over Wi-Fi or Matter over Wi-Fi and Thread Architecture

Building on our proven RW612 Tri-Radio Wireless MCU family for Matter-certified systems, this recipe uses a fully integrated, single-chip solution to create a custom application with wireless software.

Recommended Dishes



Smart appliances



Smart plugs



Smart switches

Ingredients

- RW612 multiprotocol MCU with a 260-MHz Arm Cortex-M33 core, support for 2.4/5-GHz 1x1 Wi-Fi 6, Thread and Bluetooth, and an integrated EdgeLock Security Subsystem.
- EdgeLock 2GO cloud service for certificate generation and delivery, with NXP as a CSA-Certified Product Attestation Authority (PAA).

RW612





RECIPE #2

Standalone Matter over Thread Architecture

Designed around our K32Wx Thread and Bluetooth Low Energy MCU-based Reference Platform for Matter-certified systems, this recipe uses a fully integrated, single-chip solution to create a customer application with wireless software.

Recommended Dishes



Sensors



Actuators



Smart lighting systems



Smart Plugs



Smart window shades



Battery-operated devices

Ingredients

- K32W148 multiprotocol MCU with a 96-MHz Arm Cortex-M4 core, integrated Flash and RAM, support for Thread and Bluetooth Low Energy, and an integrated EdgeLock Secure Enclave.
- EdgeLock 2GO cloud service for certificate generation and delivery, with NXP as a CSA-Certified Product Attestation Authority (PAA).

K32Wx



RECIPE #3

MCU (RTOS) Hosted Architecture for Matter over Wi-Fi, Thread, and/or Ethernet and Bluetooth Low Energy

This recipe places the customer application, Matter and wireless stacks on an i.MX RT1170 high-performance crossover MCU, and uses an IW61x Tri-Radio MCU as a radio coprocessor to run the wireless firmware.

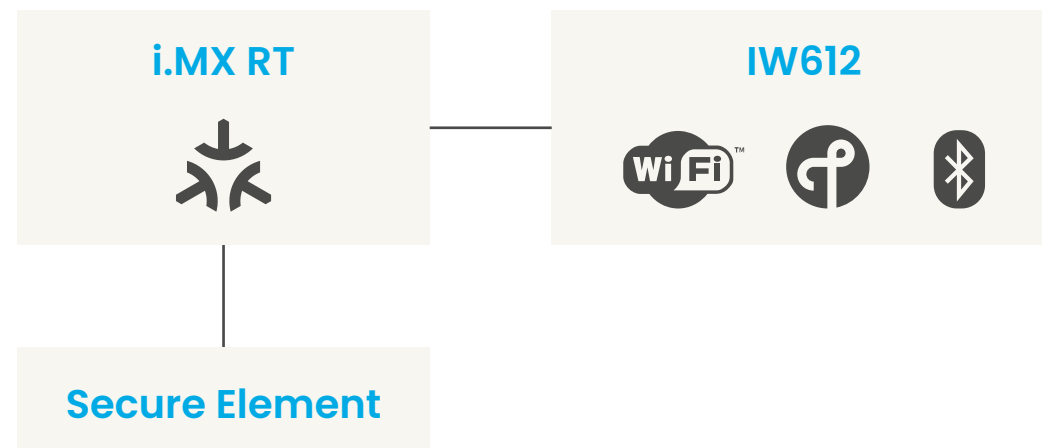
Recommended Dishes

 End nodes with routing capabilities

 Baseline Thread border routers, hubs and bridges

Ingredients

- i.MX RT1170 with a 1-GHz Arm Cortex-M7 core, 2-MB SRAM, 2D GPU, MIPI-DSI and integrated EdgeLock Secure Enclave.
- IW612 multiprotocol SoC with support for 1.4/5-GHz 1x1 Wi-Fi 6, Thread and Bluetooth Low Energy.
- EdgeLock 2GO cloud service for certificate generation and delivery, with NXP as a CSA-Certified Product Attestation Authority (PAA).
- Optional: SE051 Secure Element or A5000 Secure Authenticator for a separate, isolated security implementation that provides security capabilities and certifications beyond what's required by Matter.





RECIPE #4

MCU (RTOS) Hosted Architecture for Matter Thread and/or Ethernet and Bluetooth Low Energy

This recipe runs the customer application and Matter on an i.MX RT1060 high-performance crossover MCU and uses a K32Wx multiprotocol wireless MCU as a network processor, running the wireless firmware for Thread and Bluetooth Low Energy.

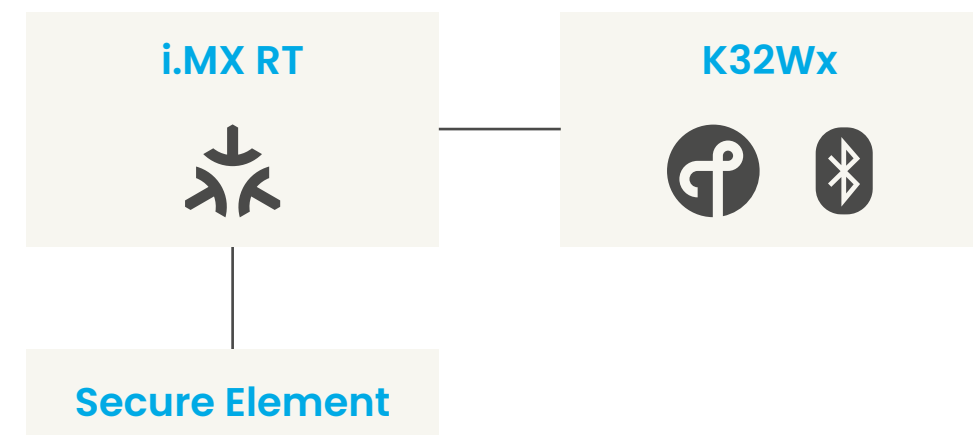
Recommended Dishes

 End nodes with routing capabilities

 Feature-rich, battery-operated end devices

Ingredients

- i.MX RT1060 with a 600-MHz Arm Cortex-M7 core and 1-MB SRAM.
- K32Wx multiprotocol wireless MCU with support for Thread and Bluetooth Low Energy.
- EdgeLock 2GO cloud service for certificate generation and delivery, with NXP as a CSA-Certified Product Attestation Authority (PAA).
- Optional: SE051 Secure Element or A5000 Secure Authenticator for a separate, isolated security implementation that provides security capabilities and certifications beyond what's required by Matter.



RECIPE #5

MPU (Linux or Android) Hosted Architecture for Matter Wi-Fi, Thread and/or Ethernet and Bluetooth Low Energy

This recipe runs the customer application, Matter, Wi-Fi, Thread, and Bluetooth Low Energy stacks on an i.MX 8M Mini Linux processor, and uses an IW612 multiprotocol wireless SoC as a radio coprocessor to run the wireless firmware.

Recommended Dishes

 End nodes with routing capabilities

 Interfaces Gateways

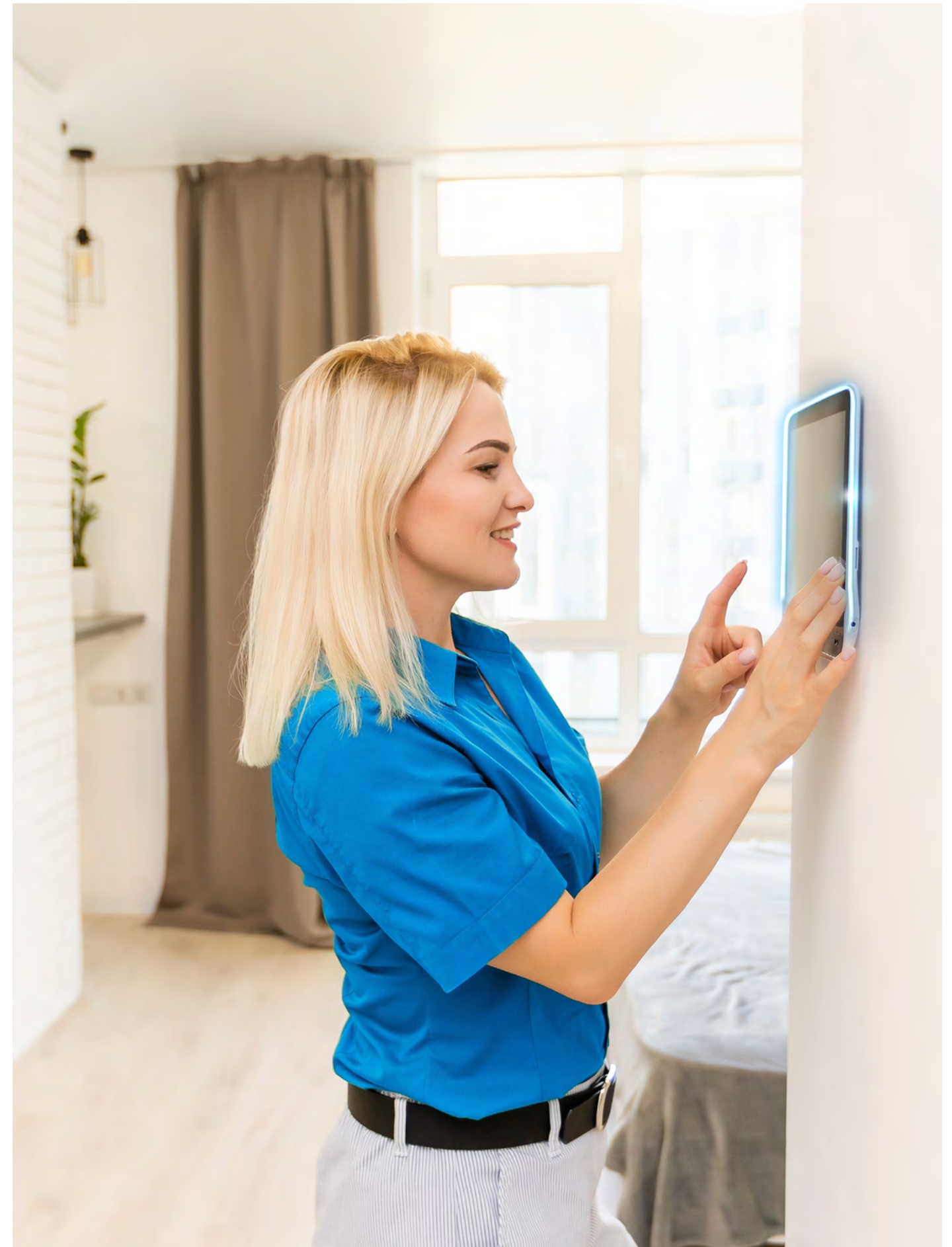
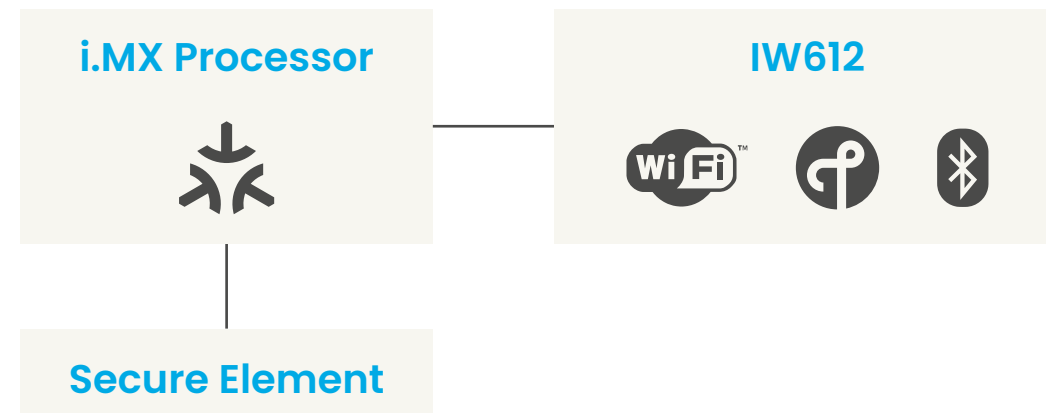
 Thread border routers

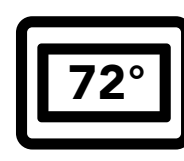
 Matter controllers

 Devices with rich user

Ingredients

- i.MX 8M Mini with quad-core 1.8-GHz Arm Cortex-A53 and 2D/3D graphics.
- IW612 multiprotocol wireless SoC with support for 2.4/5-GHz 1x1 Wi-Fi 6, Thread, and Bluetooth Low Energy.
- EdgeLock 2GO cloud service for certificate generation and delivery, with NXP as a CSA-Certified Product Attestation Authority (PAA).
- Optional: SE051 Secure Element or A5000 Secure Authenticator for a separate, isolated security implementation that provides security capabilities and certifications beyond what's required by Matter.





NXP and Matter: The **Smart Way** to Create Fresh, Tasty Designs

There's a saying, in professional kitchens, that a sharp knife is a chef's best friend, because it's arguably the most important tool in the kitchen and a starting point for many of the most essential kitchen tasks.

That's how we feel about Matter. It's arguably one of the most important tools to come along for Smart Home and a starting point for just about every kind of Smart Home use case.

Our optimized, highly integrated solutions include all the right ingredients, so you can focus on innovation instead of compatibility. Our tailor-made development platforms, designed in accordance with the CSA's requirements for Matter certification, let you build on proven approaches for specific use cases, and simplify delivery by streamlining the certification process.

With NXP and Matter, you have everything you need to start making fresh, tasty designs. And we think that's what really matters.



NXP

WHET YOUR APPETITE

This Matter cookbook is just a small taste of how a partnership with NXP can up your culinary game. To learn more about what Matter means for Smart Home and our end-to-end solutions for seamless Smart Home interoperability, visit www.nxp.com/matter.