CONNECTIVITY & MATTER

JANUARY 4, 2022

SECURE CONNECTIONS
FOR A SMARTER WORLD

PRESENTERS

Neal Kondel
Director, Product Marketing for Smart Home
Wireless Connectivity Solutions

Ryan Kelly
Product Management
Wireless Connectivity Solutions

WITH ONE OF THE BROADEST PORTFOLIOS OF WIRELESS TECHNOLOGIES TODAY, NXP IS CONNECTING OUR WORLD

SENSE

Automotive radar and vision

Face and gesture recognition

Voice recognition

Anomaly detection

Motion, speed, pressure

Broadcast reception

THINK

S32 Automotive Platform
Scalable, secure, OTA, ASIL D

i.MX 6, 7, 8, 8M
High-performance, 3D graphics

Layerscape™
High-speed Ethernet, TSN

i.MX RT
Highest performing MCUs

Kinetis™ and LPC
Low cost to high integration

CONNECT

WiFi · UWB · Bluetooth

NFC · zigbee · MIFARE

MiGLO · eSIM

5G · DSRC (V2X) · RAIN RFID

sigfox · THREAD

matter

ACT

Power management

Battery management/ charging

High-speed interface

In-vehicle networks

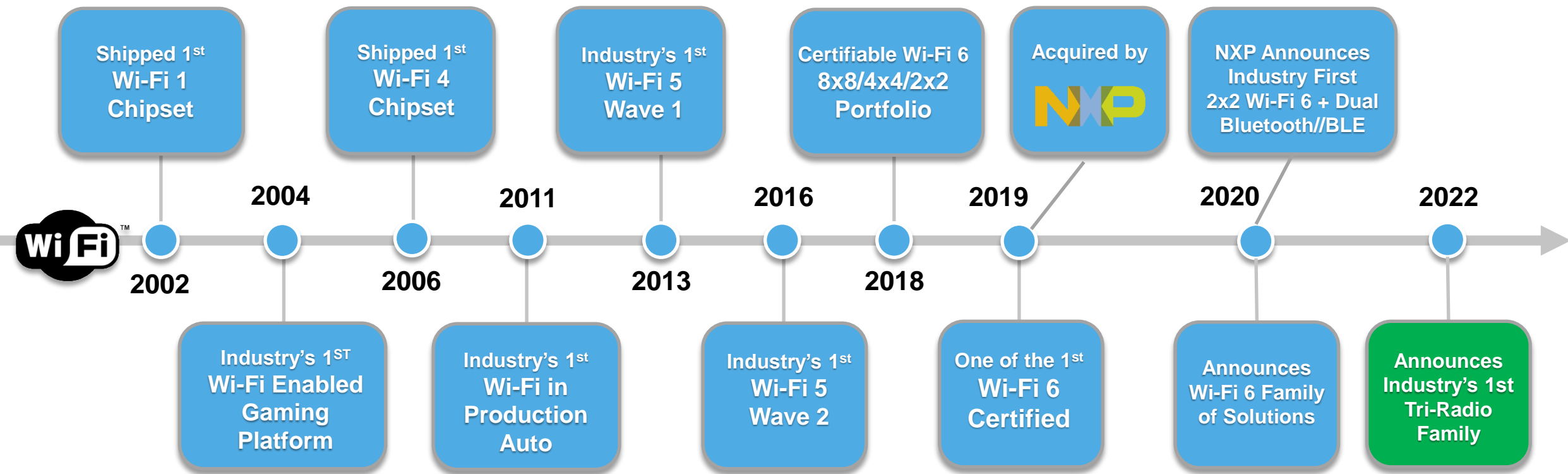High-performance analog

General-purpose analog

IoT secure elements
Embedded security

Secure authenticators
Automotive security

Secure auto networks
Automotive ASIL A to D

TWO DECADES OF Wi-Fi LEADERSHIP

Shipped 1st Wi-Fi 1 Chipset

Shipped 1st Wi-Fi 4 Chipset

Industry's 1st Wi-Fi 5 Wave 1

Certifiable Wi-Fi 6 8x8/4x4/2x2 Portfolio

Acquired by NXP

NXP Announces Industry First 2x2 Wi-Fi 6 + Dual Bluetooth//BLE

2004   **2011**   **2016**   **2019**   **2020**   **2022**

2002   **2006**   **2013**   **2018**

Industry's 1ST Wi-Fi Enabled Gaming Platform

Industry's 1st Wi-Fi in Production Auto

Industry's 1st Wi-Fi 5 Wave 2

One of the 1st Wi-Fi 6 Certified

Announces Wi-Fi 6 Family of Solutions

Announces Industry's 1st Tri-Radio Family

3,000 Wireless Patents

15+ Years Wireless Innovation

2+ Billion Devices Shipped

10 Time Wi-Fi Alliance Winner 'Outstanding Leadership and Contribution'

MATTER

A unified IP-based protocol to securely and robustly connect smart devices with each other, regardless of brand, and across smart home ecosystems

- Bring interoperability in Smart Home Ecosystem
- Simplify development for "things"
- Increase compatibility for consumers
- Ensure security and privacy
- Create a truly smarter home

Links:

[Build with Matter](#)

[NXP for Matter](#)

Led by global brands

amazon · Apple · ASSA ABLOY · COMCAST · Google · HUAWEI

IKEA · infineon · Kroger · LEEDARSON · legrand · NXP

OPPO · resideo · Schneider Electric · Signify · SILICON LABS · SmartThings

somfy · ST life.augmented · TEXAS INSTRUMENTS · tuya · Wulian

And > 200 other companies!

csa connectivity standards alliance

NXP Leadership for Matter

- **Leadership in developing IoT standards**
  - Networks: Thread Group, Connectivity Standards Alliance (CSA), Wi-Fi Alliance
  - Connectivity: NFC Forum, FiRa, Bluetooth SIG
  - Board-level members of Thread Group, CSA and Wi-Fi Alliance, NFC Forum and FiRa

- **Deep experience in open-source projects**
  - Contributing to Matter and OpenThread repositories

- **Matter contribution areas**
  - Security, platform, certification and marketing
  - Border Router
  - Specification and source code

- **Comprehensive Matter solutions**
  - True one-stop-shop
    - Uses breadth of portfolio for compute, connectivity and security
    - MPU, MCU. Wi-Fi. BT, 802.15.4, NFC, UWB, SE, Sensors
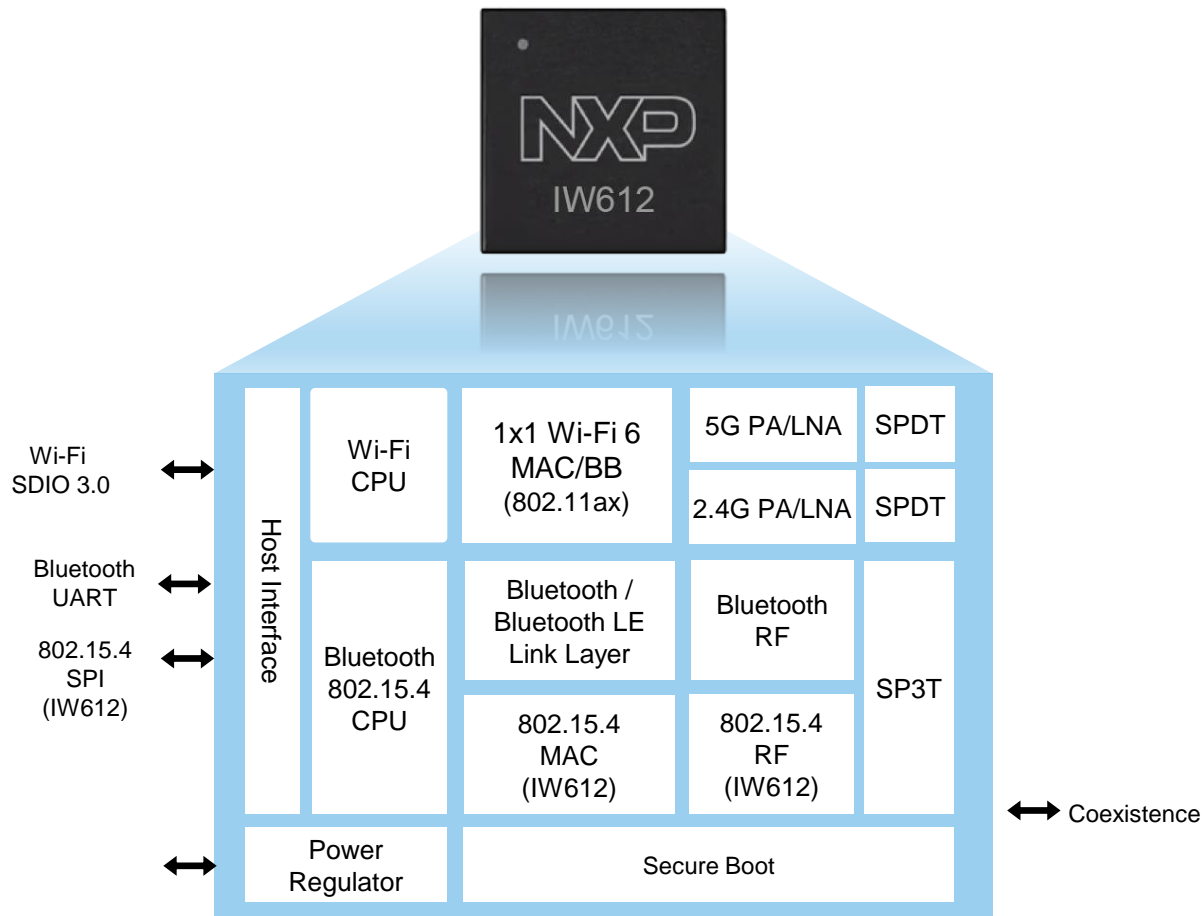 - Flexibility to support all use cases

- **Worldwide team**

INTRODUCING INDUSTRY'S FIRST TRI-RADIO SOC – IW612

Industry's first Secure Tri-Radio monolithic solution
- Latest Wi-Fi 6, BT/Bluetooth LE 5.2 and 802.15.4 standards
- Designed for Smart Home: Border routers (gateways)/bridges/hubs
- Ideal for Matter—standardizing local control and enablement across ecosystems (regardless of cloud connectivity)

Advanced Coexistence
- Flexible internal coexistence for multi-radio operation designed specifically to be market leading across a broad range of key target applications
- Additional support for external radios (UWB, 802.15.4, LTE, etc.)

NXP Security
- Leverage NXP security IP and industry leadership
- Eases customers concerns devices will be compromised once deployed

NXP Microprocessor and Microcontroller IP and Broad Market Portfolio
- Eliminates need for customers to develop and integrate complex host operating systems and drivers
- Resonating with market and customers
- Single source for major components in design

System Cost Savings
- Reduced bill-of-materials and footprint – Integrated radios, LNA, high-power PAs
- Simplifies complex RF design
- Fewer components to procure

A CLOSER LOOK

1x1 Dual-Band Wi-Fi 6 + Bluetooth 5.2 + 802.15.4 optimized for IoT and Industrial Applications
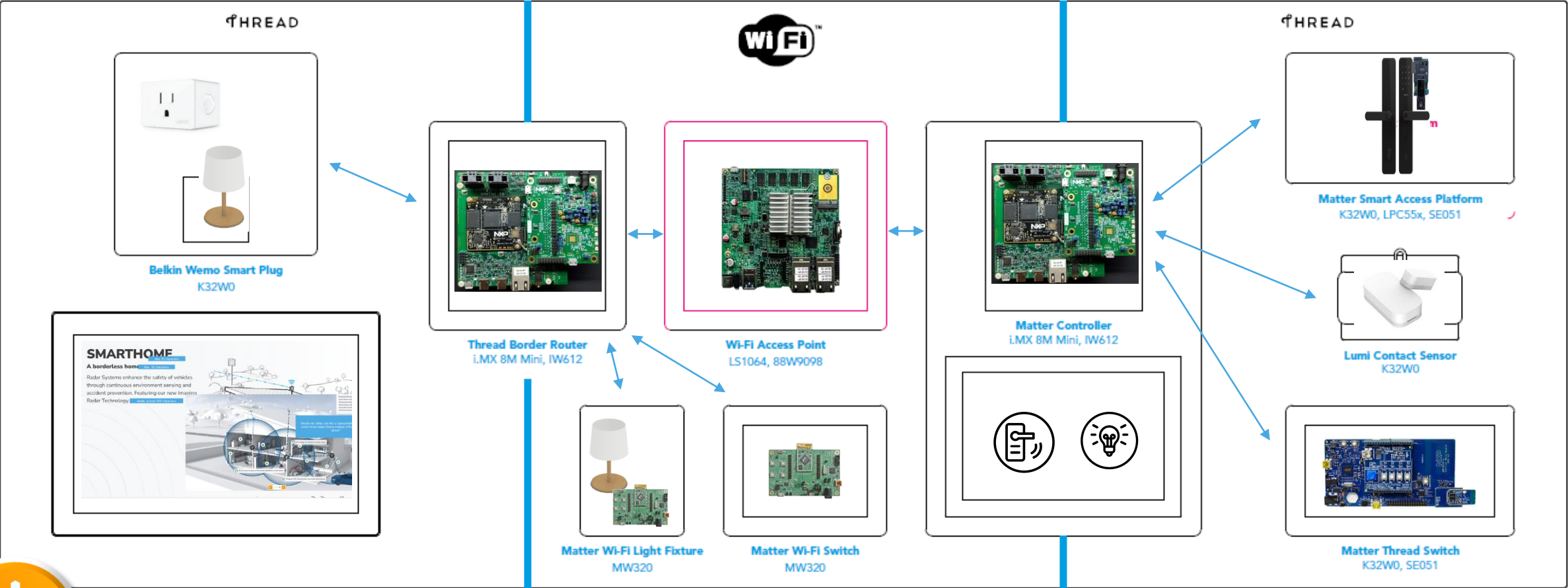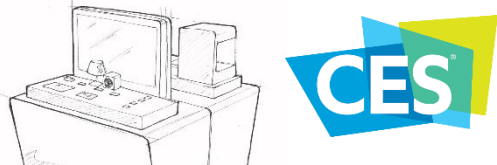

Block diagram labels:
- NXP IW612
- Wi-Fi SDIO 3.0
- Bluetooth UART
- 802.15.4 SPI (IW612)
- Host Interface
- Wi-Fi CPU
- 1x1 Wi-Fi 6 MAC/BB (802.11ax)
- 5G PA/LNA
- SPDT
- 2.4G PA/LNA
- SPDT
- Bluetooth 802.15.4 CPU
- Bluetooth / Bluetooth LE Link Layer
- Bluetooth RF
- 802.15.4 MAC (IW612)
- 802.15.4 RF (IW612)
- SP3T
- Power Regulator
- Secure Boot
- Coexistence

Key Radio Features

- **Wi-Fi 6**
  - 1x1 SISO 2.4 GHz / 5 GHz 802.11 a/b/g/n/ax
  - UL/DL OFDMA, STA UL MU-MIMO Tx and DL MU-MIMO Rx
  - 1024 QAM, 20/40/80 MHz channels, Peak Data Rate: 480 Mbps
  - 2.4 GHz Tx @ 21 dBm; 5 GHz Tx @ 20 dBm
  - 802.11ax extended range (ER), dual carrier modulation (DCM), target wait time (TWT)
  - WPA3 security with hardware encryption engines
  - Integrated PA, LNA and T/R switches
- **Bluetooth & Bluetooth Low Energy 5.2 with up to +20 dBm output power**
  - Class 1 and Class 2
  - High speed, long range, advertising extensions
  - Isochronous channels supporting LE Audio
  - Support for 2 wideband speech (WBS) links
- **802.15.4 supporting Thread with up to +20 dBm output power**
- **Support for Matter over Wi-Fi and Matter over Thread**
- **Advanced internal and external coexistence design for multi-radio operation**
- **Single or dual antenna configurations**
- **Lowest RBOM cost with integrated PAs, LNAs, switches and power mgmt.**
- **Security**
  - Secure boot, debug and firmware update, secure key generation and management, HW crypto, TRNG, PUF, OTP and lifecycle management
- **Android, Linux and FreeRTOS**

General Features

- **9 mm x 9 mm, 0.5p 116-pin HVQFN**
- **4.96 mm x 4.385 mm, 0.3p 140-pin WLCSP**
- **Supply voltages: 3.3V & 1.8V**
- **Operating temperatures**
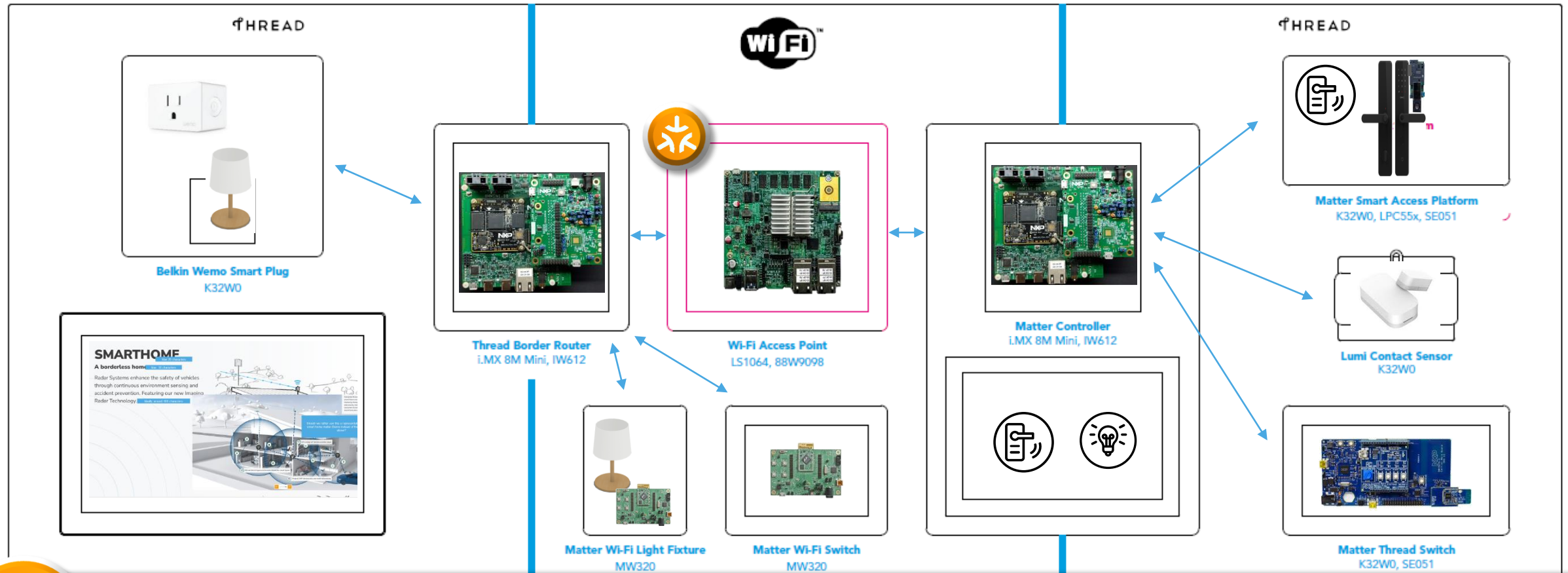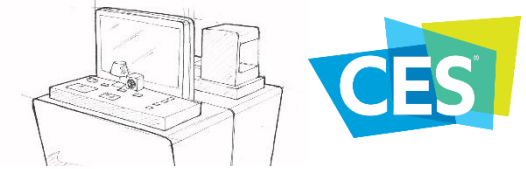 - Commercial: 0 to +70°C
  - Industrial: -40 to +85°C

NXP SMART HOME DEMONSTRATION AT CES 2022
END-TO-END SOLUTIONS FOR SEAMLESS SMART HOME INTEROPERABILITY

THREAD

Wi-Fi™

THREAD

Belkin Wemo Smart Plug
K32W0

SMARTHOME
A borderless home
Radar Systems enhance the safety of vehicles through continuous environment sensing and accident prevention. Featuring our new Imaging Radar Technology.

Thread Border Router
i.MX 8M Mini, IW612

Wi-Fi Access Point
LS1064, 88W9098

Matter Controller
i.MX 8M Mini, IW612

Matter Smart Access Platform
K32W0, LPC55x, SE051

Lumi Contact Sensor
K32W0

Matter Wi-Fi Light Fixture
MW320

Matter Wi-Fi Switch
MW320

Matter Thread Switch
K32W0, SE051

Access point for remote control/monitoring of smart home and firmware updates via cloud

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Belkin Wemo Smart Plug
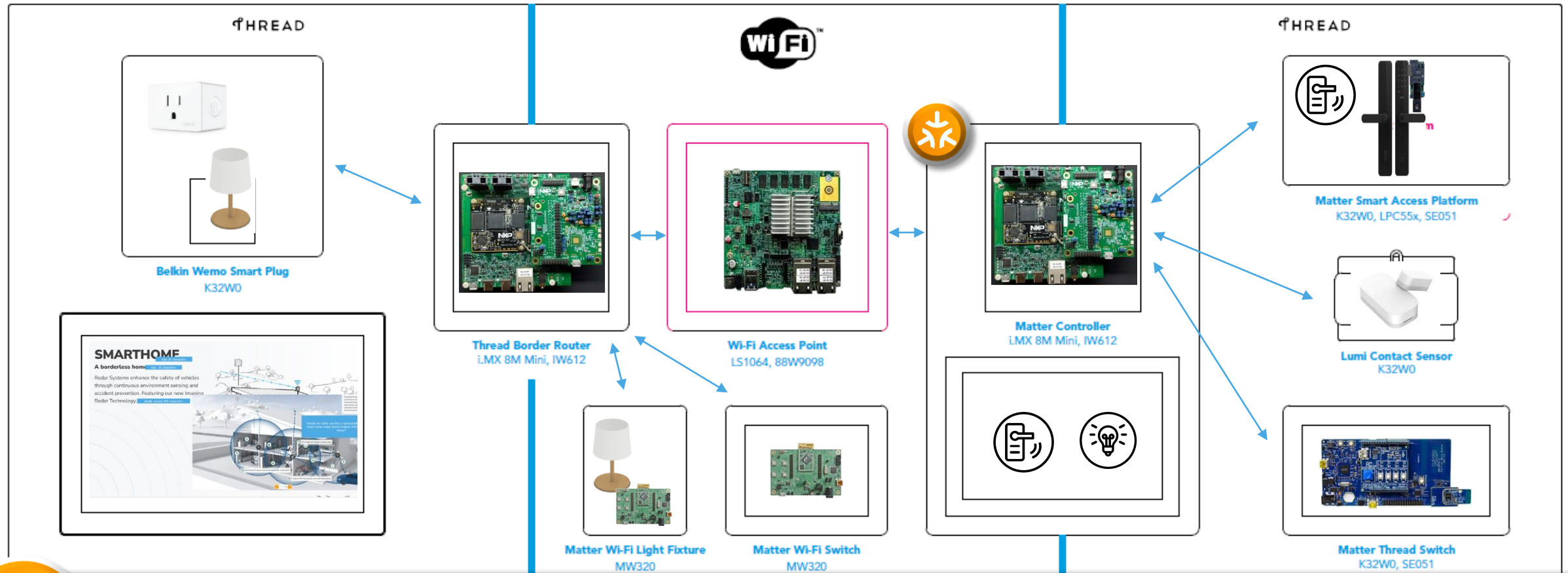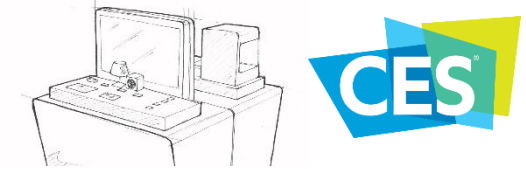K32W0

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Matter Wi-Fi Light Fixture
MW320

Matter Wi-Fi Switch
MW320

Matter Thread Switch
K32W0, SE051

Enables communication between Matter with Thread and Matter with Wi-Fi devices and to cloud via the access point
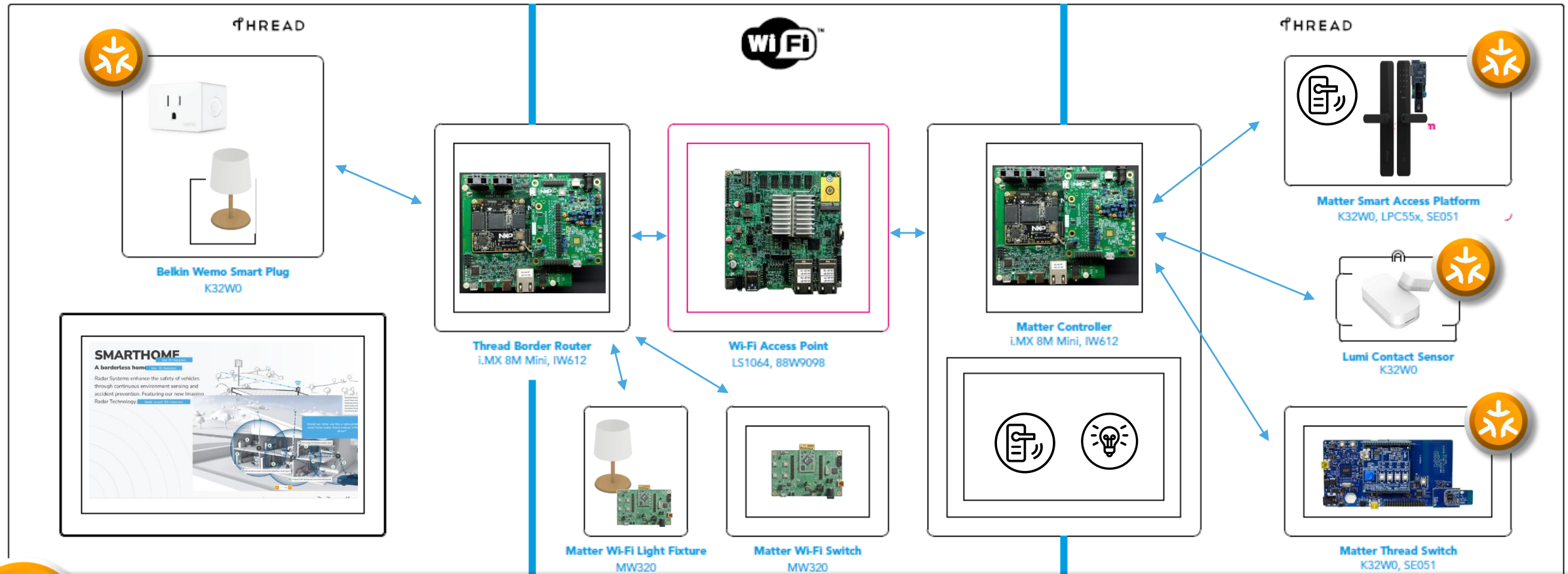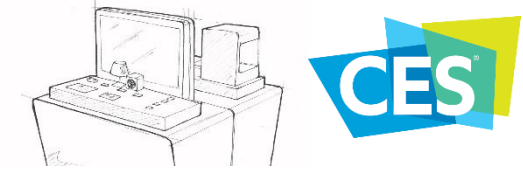
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Provisions new Matter devices onto the local network and can universally communicate with any device within the network

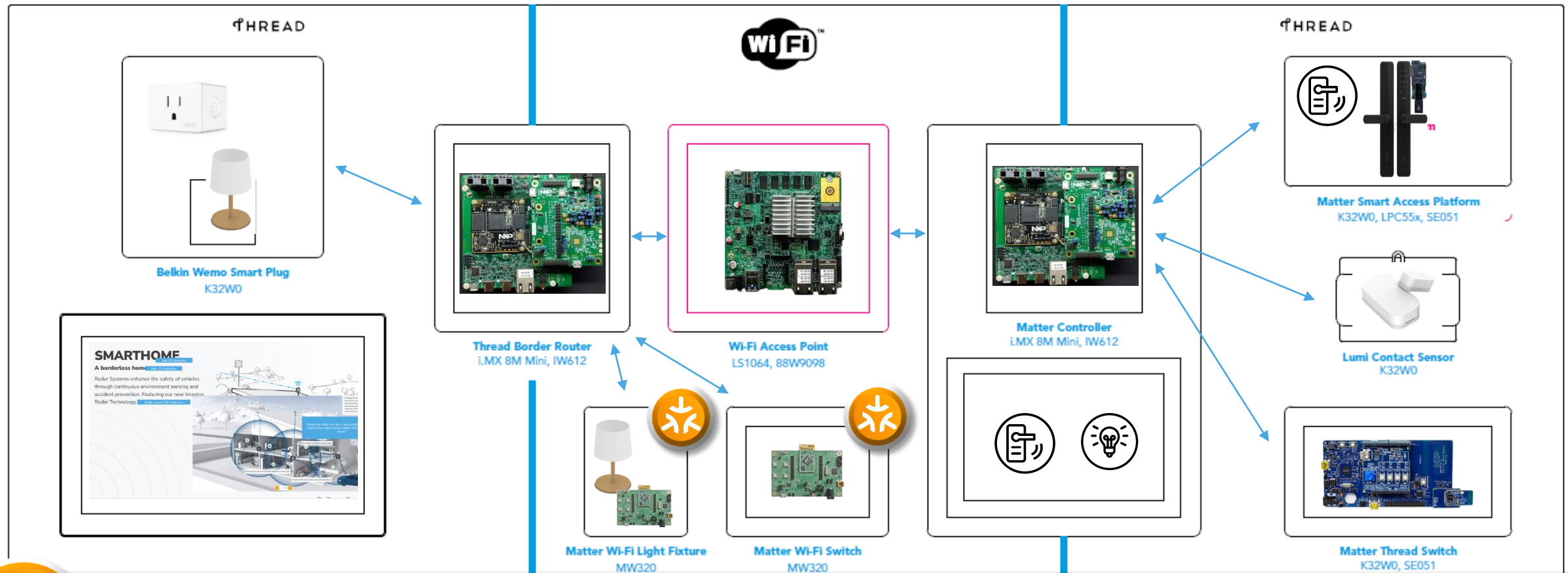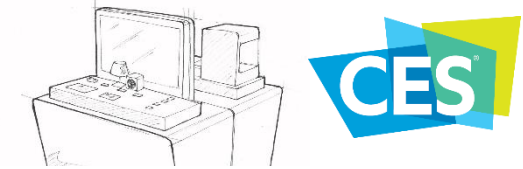# NXP SMART HOME DEMONSTRATION AT CES 2022
END-TO-END SOLUTIONS FOR SEAMLESS SMART HOME INTEROPERABILITY

THREAD

Wi Fi™

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SMARTHOME
A borderless home

Matter Wi-Fi Light Fixture
MW320

Matter Wi-Fi Switch
MW320

Matter Thread Switch
K32W0, SE051

Application devices for controlling and monitoring the smart home via Thread network, such as smart plugs, switches, lights, door locks, security sensors, etc
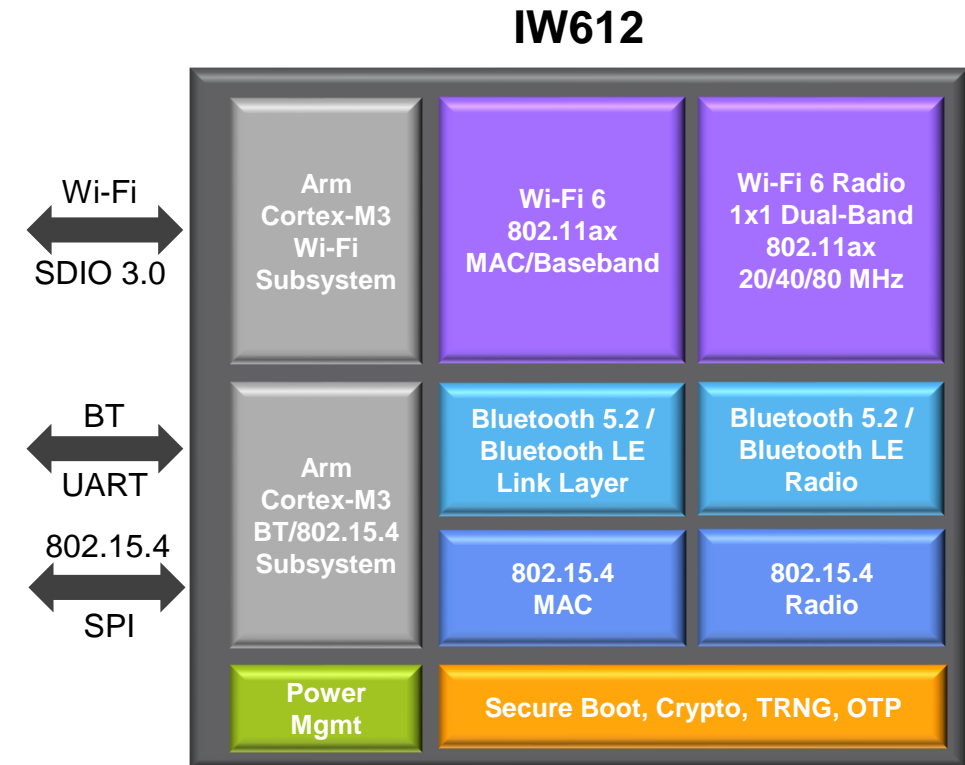
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SMARTHOME
A borderless home

Application devices for controlling and monitoring the smart home via Wi-Fi network, such as switches, lights, cameras, doorbells, smart speakers, etc

IW612 OVERVIEW AND VALUE PROPOSITION

| IW612 1x1 DB Wi-Fi 6 + Bluetooth 5.2 + 802.15.4	Value
Wi-Fi 6: Performance, Efficiency, Power	Spectrum efficient, robust, future-proof
Wi-Fi 6 IoT features supported	Higher throughput, better network efficiency, lower latency, improved range
Bluetooth/Bluetooth Low Energy 5.2	Higher speed, longer range, LE audio, A2DP, HFP
802.15.4	Supports Thread ecosystems
Matter (formerly Project CHIP)	Standardized Thread and Wi-Fi application layer
Simultaneous Wi-Fi + BT + 802.15.4 receive	Reduced latency
Simultaneous or arbitrated Wi-Fi + BT/802.15.4 transmit	Supports single and dual antenna designs
Advanced internal + external radio coexistence	Best-in-class hardware coexistence arbitration
High power +20 dBm PA for Bluetooth and 802.15.4	- Eliminates need of costly external PAs - Reduced board area
Security	- Secure boot, debug and secure firmware update - Secure key generation and management - Hardware cryptography - Lifecycle management
Reduced BOM	Reduced cost and PCB area, simplify design and manufacturing

IW612

IW612 & MATTER: SIMPLIFYING HOSTED REFERENCE PLATFORMS

HOSTED: MCU HOST

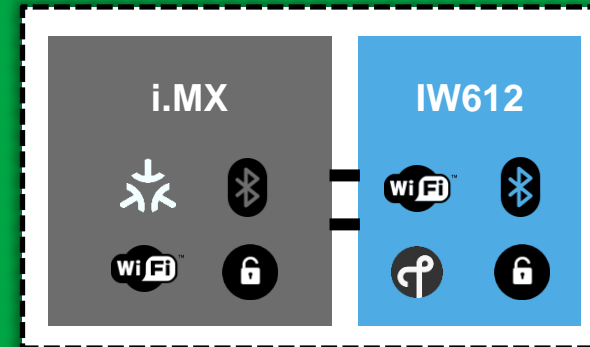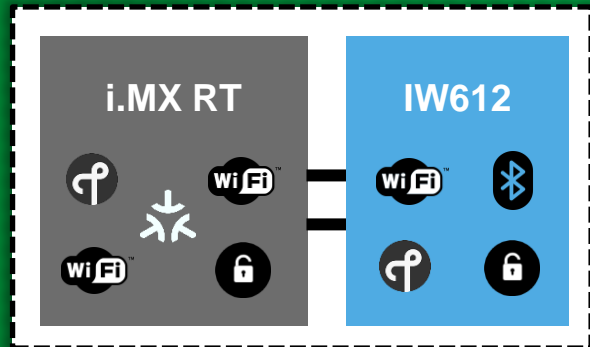## HOSTED: MPU HOST

IW612 Features
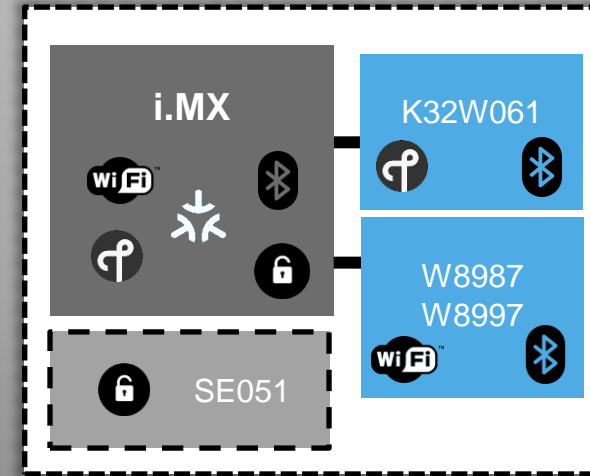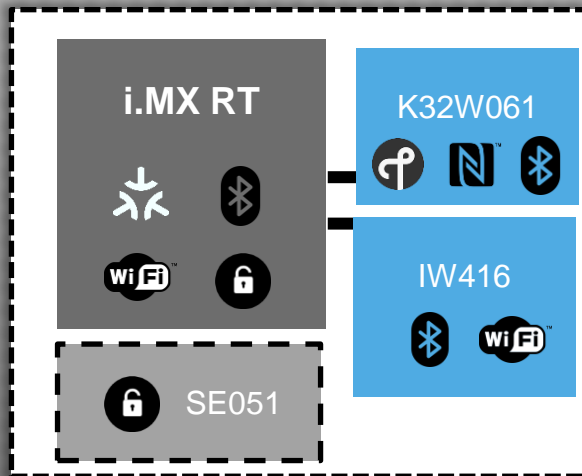
- True single-chip Thread Border Router
- Higher security / Fewer devices equates to lower security risk
- Run Matter over Wi-Fi and Matter over Thread from same device
- On-chip built-in advanced hardware co-existence
- Simplifies design and development
- Smaller form factor, lower cost
- On-chip PAs provide output power up to +20 dBm for all radios (Wi-Fi, BLE, and 802.15.4)
- External PA not needed
- Reduces supply chain issues
- Fewer chips to procure

LEADING WI-FI POSITIONS

Smart Home

- Border Routers
- In-home Display Hubs/Assistants
- Voice Assistants
- Thermostats
- Smart Doorbells
- Garage Door Controller
- Speakers/Soundbars
- Robotic Cleaners

Industrial

- Building & Energy Management
- Location Services
- Condition based Monitoring
- Sensor Networks
- Healthcare

Automotive

- In-Vehicle Infotainment (IVI)
- Read Seat Entertainment
- Motorcycles (IVI/Rider Comms)
- Telematics (TCU)

NXP

SUMMARY

- **Industry's first secure Tri-Radio monolithic solution**

- **Advanced Coexistence**

- **NXP Security**

- **NXP Microprocessor and Microcontroller IP and Broad Market Portfolio**

- **System Cost Savings**