Making IoT Just Work in Industry

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CYPRESS IOT Compute & Wireless Business Unit

Essential Ingredients for IoT That Just Works

Robust, Multi-Protocol, IoT – Optimized Solution

Wi-Fi is the backbone of the IoT

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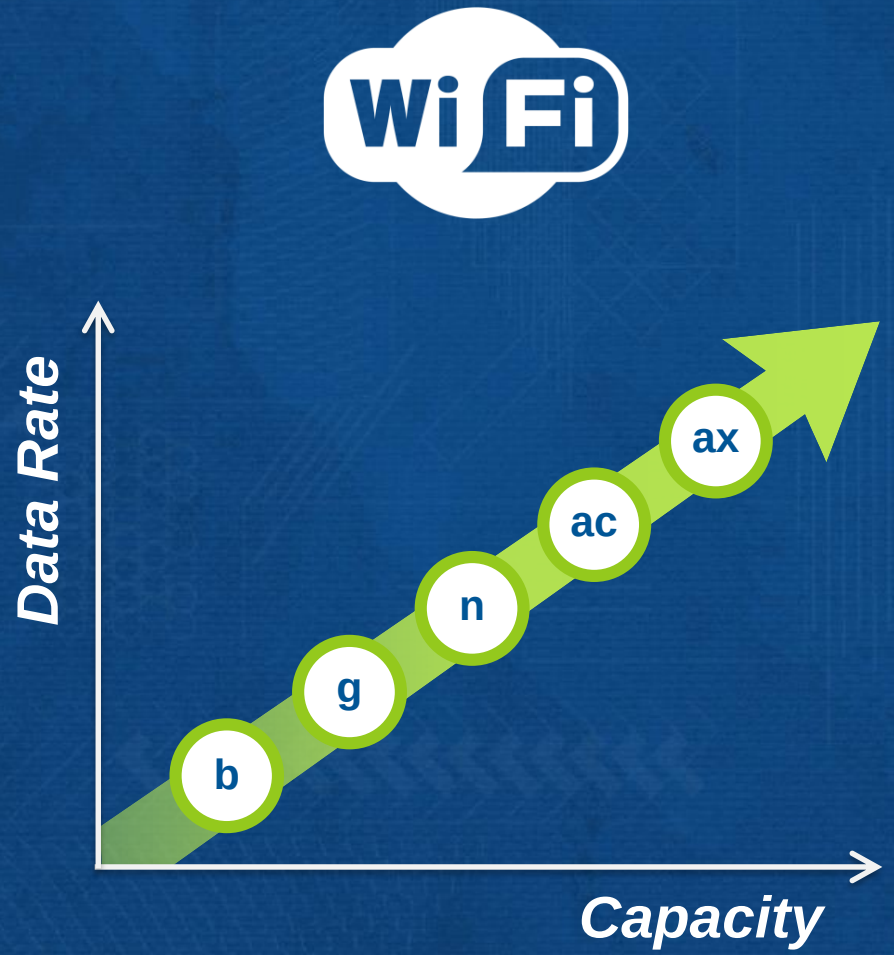

Wi-Fi: A collection of solutions

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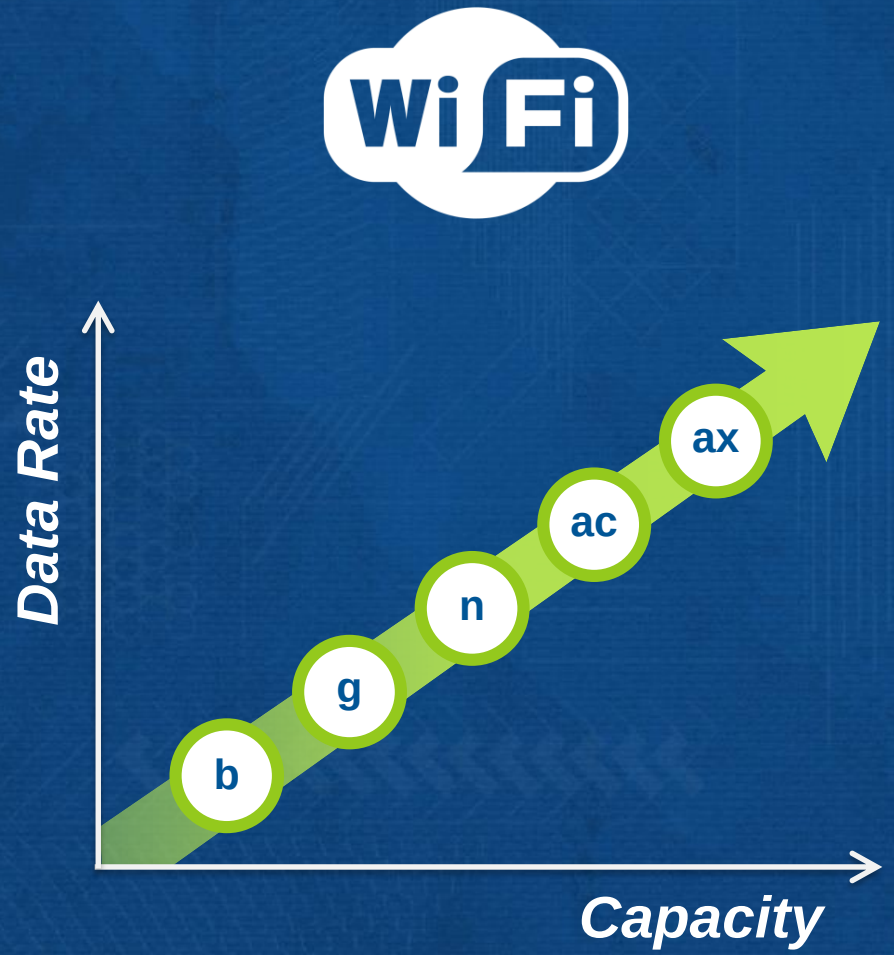

IoT Optimizations:

- Efficiency
- Capacity
- Cooperation

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Robust, Multi-Protocol, IoT – Optimized Solution

BT/BLE

- Discovery
- Provisioning
- Mobile: Ubiquitous UI

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Cypress' Industry-Leading Portfolio of IOT Solutions

Wireless radio standards and combinations

- Wi-Fi (802.11ac, 802.11bgn), Bluetooth (BR, EDR, BLE)
- Advanced coexistence algorithms for multi-radio (Wi-Fi + Bluetooth) platforms

Broad portfolio of Arm®-based MCUs

- PSoC® 4: Arm Cortex® M0 and M0+ devices ideal for HMI, sensor hubs, and other mixed-signal subsystems
- PSoC 6: Most-flexible, lowest-power, dual-core Arm Cortex-M4 and M0+ MCU—purpose-built for the IoT

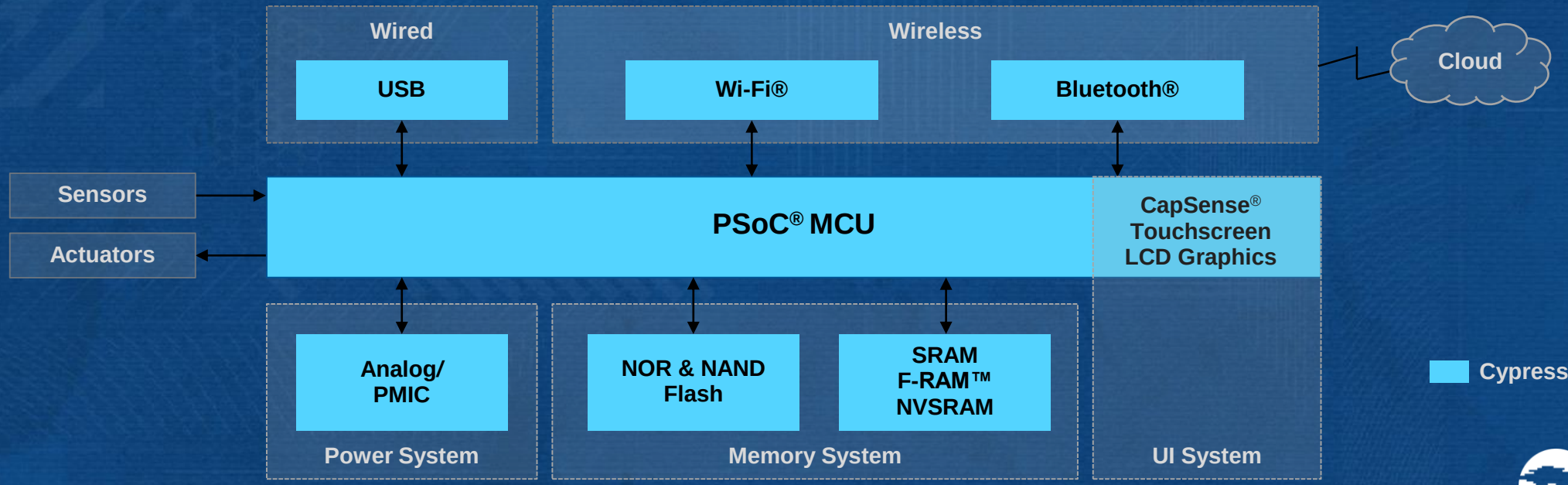
Robust development tools and ecosystem partners

- WICED® IoT platform provides turnkey wireless connectivity
- PSoC Creator™ IDE speeds system configuration and design
- New ModusToolbox™ unifies MCU and wireless development environments

ModusToolbox™

PSoC® Creator™ Integrated Design Environment

WICED™ by CYPRESS



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Industrial (Enterprise) Roaming

- Devices that operate within an Enterprise environment must provide roaming support. Even when a device is sitting still in an Enterprise environment the RSSI levels can change and trigger a roaming event – moving from one AP to another AP.
- Mobile devices require a higher level of roaming performance, supporting AP to AP handoffs can be a big challenge (navigating the Enterprise AP Security variability).
- Wi-Fi Voice-Enterprise adds the complexity of ensuring high quality Wi-Fi VoIP support. Applications can include moving quickly (driving a fork lift) using a BT headset + Wi-Fi VoIP call.

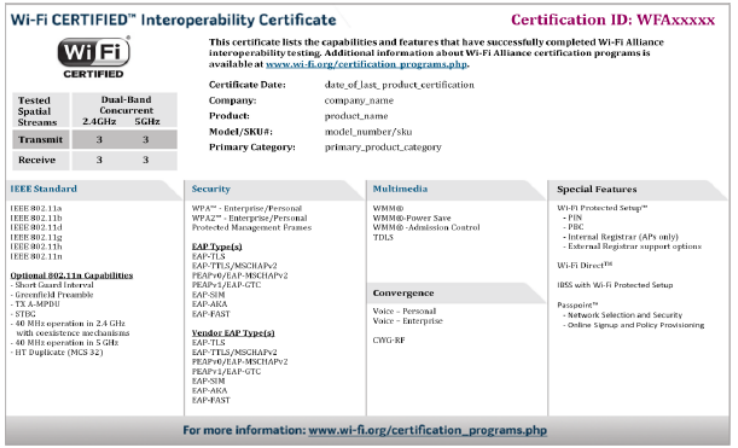

Figure 3. Wi-Fi CERTIFIED Interoperability Certificate

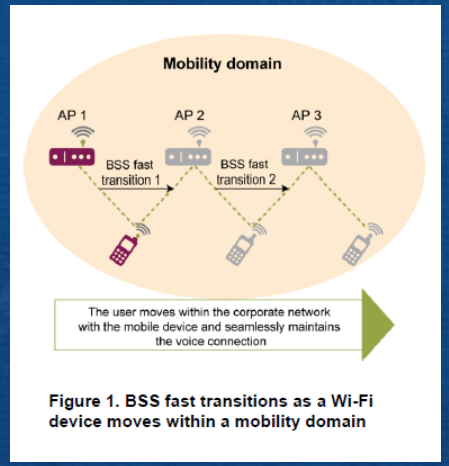

Figure 1. BSS fast transitions as a Wi-Fi device moves within a mobility domain

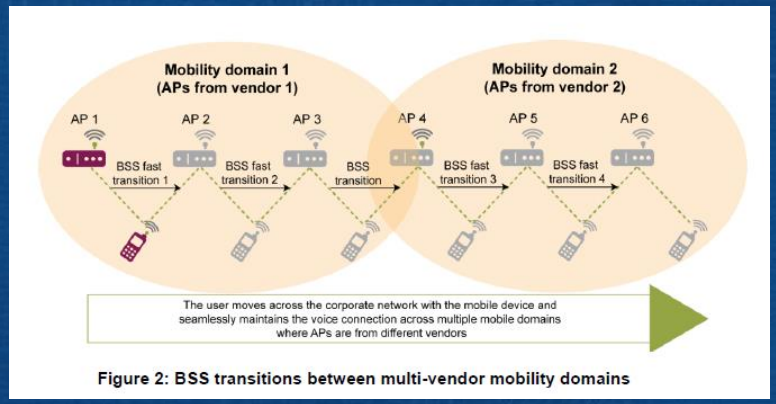

Figure 2: BSS transitions between multi-vendor mobility domains

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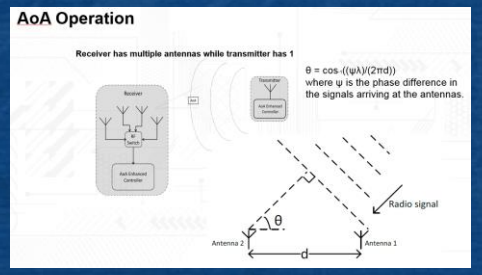
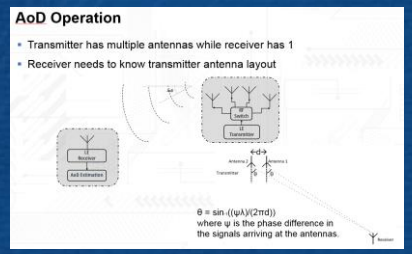
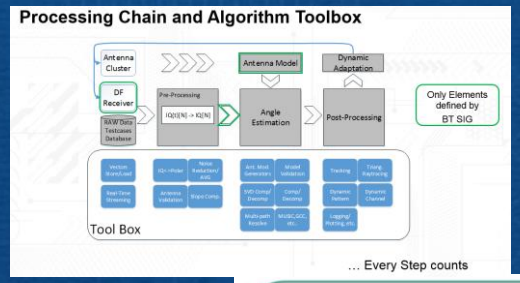
Industrial (Enterprise) – Indoor Location Tracking

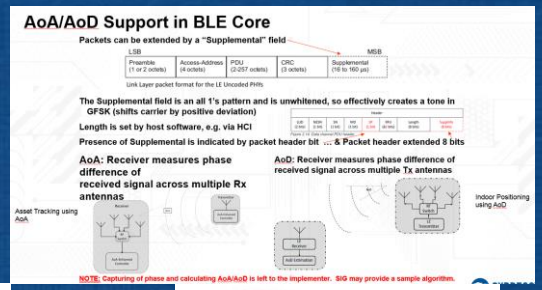
- Customers are asking for enhanced solutions to help with Indoor Location Tracking – moving beyond RSSI triangulation solutions used today.

- Industry standards have been in process for many years, but we are getting closer to having technologies such as AoA/AoD and 802.11mc (RTT/FTM) finalized.









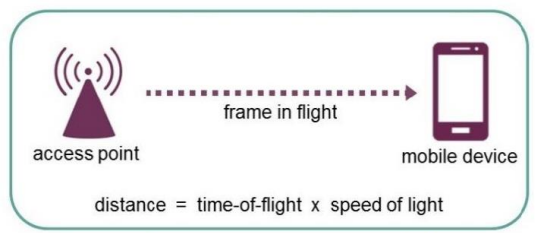


Figure 1. Basic transmission time calculation

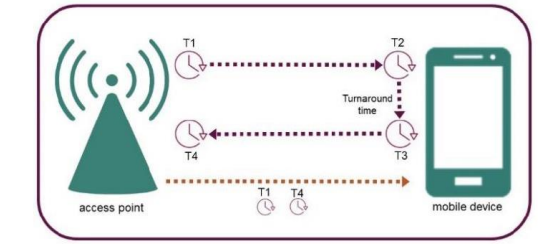


Figure 2. Round-trip timestamps synchronize to same clock

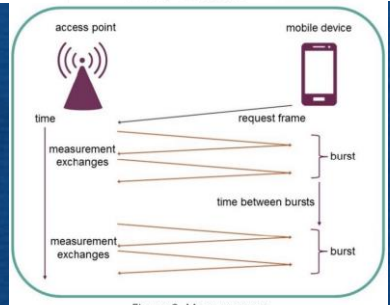


Figure 3. Measurement

Figure 4. Trilateration

Broad Wi-Fi and Wi-Fi + BT Portfolio

The industry's most widely deployed, state-of-the-art Wi-Fi and Wi-Fi + Bluetooth (BT) combo solutions

Wi-Fi + BT combos with 802.11ac for throughput-intensive applications

Wi-Fi + Bluetooth

- **CYW43340**[1,2] — Widely Adopted Combo; 802.11n, Dual Band; SISO, BT 4.0
- **CYW88373**[1,2] — Low-Power Combo; 802.11n; SISO, BT 4.1
- **CYW43455**[1,2] — Next-Gen. Combo; 802.11ac, Dual Band; SISO, BT 4.1
- **CYW88359**[1,2] — High-Performance Combo; 802.11ac, Dual Band; 2x2 MIMO, BT 4.1

Wi-Fi solutions with integrated host MCUs offer a single-chip solution to add Wi-Fi connectivity

Wi-Fi + arm

- **CYW43903**[1,2] — Wi-Fi + Powerful MCU; 802.11n, SISO; 160-MHz CR4, 1MB RAM
- **CYW43907**[1,2] — Dual Band Wi-Fi + Powerful MCU; 802.11n, SISO; 320-MHz CR4, 2MB RAM
- **P6**[1,2] + **CYW43438**[1,2] — Widely Adopted Combo+ + Powerful MCU; 802.11n, Single Band; SISO, BT 4.2

Wi-Fi-only solutions reduce power consumption while maintaining performance and reliability

Wi-Fi

- **CYW43362**[1,2] — Widely Adopted Wi-Fi; 802.11n, SISO
- **CYW43364**[1,2] — Low-Power Wi-Fi; 802.11n, SISO

[1] In production [2] Cypress is changing the BCM prefix for Broadcom IoT parts to CYW

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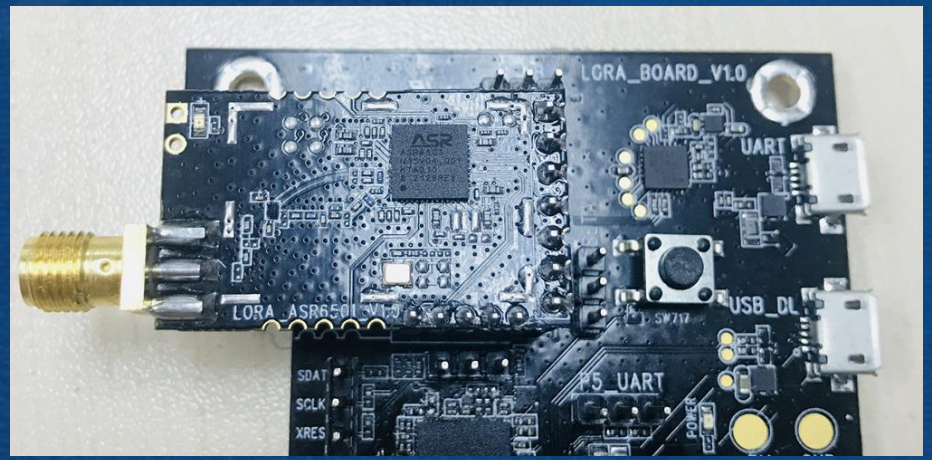
PSoC 4100S Plus MCU Inside LoRaWAN SoC (ASR650x)

- First LoRaWAN SoC combining Cypress PSoC 4 MCU and Semtech SX1262 radio for smart-city, smart-factory and smart-farming applications in China
- Enabling IoT developers with ultra-low Power, ultra-small form-factor, optimized cost LPWAN Solution based on PSoC leading technology and design flexibility
- Strengthen the partnership with Alibaba on IoT ecosystem deep down to the chip level besides all the software cooperation all around



More details about the PSoC 4100S Plus MCU can be found on Cypress website at http://www.cypress.com/psoc4.

More details about the ASR6501 can be found on ASR Microelectronics' website at http://www.asrmicro.com

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