



# Alexa, how do I build voice-enabled products?

**EBOOK**

Alexa Voice Service (AVS) Integration for AWS IoT

# Table of contents

Alexa, turn up the smart home market .....	3
Alexa, run my device too .....	4
Alexa, give me the highlights on AVS .....	5
Alexa, tell me about Libre's turnkey solution for AVS and AWS IoT Core .....	6
Universal voice remote for Hogar Controls .....	7
Alexa, get this party started .....	8



# Alexa, turn up the smart home market

Voice-enabled devices have moved in and made themselves at home. From light switches to coffee pots to security controls, manufacturers have found creative ways to make nearly every device more helpful around the house. And consumers are loving it!

According to an IDC study, the market for smart home devices is on track to double from 2019, reaching 1.46B units by 2023.<sup>1</sup> The growth comes from an increased comfort level among customers with voice-enabled devices, which results from increased exposure to devices such as Alexa speakers. The uptick also stems from manufacturers using voice user interface (VUI) to differentiate their products.

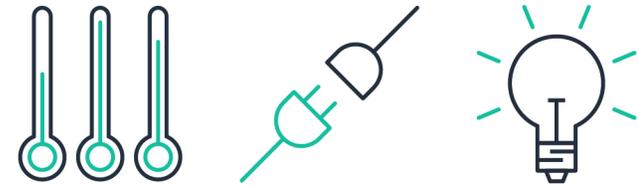
However, device makers walk a fine line between increasing customer value and increasing their operating costs and complexity. To embed voice capabilities in their devices, they must navigate:

- 1. Choosing the underlying technology:** Building and managing smart devices requires a chipset, an application, and connectivity cloud services. While any one of these areas can be challenging to develop on its own, combining all three can be prohibitively complex.
- 2. Coordinating services across vendors:** In lieu of running an in-house team, companies may hire vendors for application development, IoT platform management, and post-deployment support. This can become complicated and time consuming quickly.
- 3. Maximizing profit in a price-sensitive market:** Manufacturers in highly competitive segments are looking for ways to improve the user experience of their devices without investing heavily in new technology so that they can keep prices low.

Device makers need a comprehensive, cost-effective solution to reduce the complexity of building voice-enabled smart devices.

<sup>1</sup> Source: IDC Worldwide Quarterly Smart Home Device Tracker, June 25, 2019  
<https://www.idc.com/getdoc.jsp?containerId=prUS45303919>

## Highest Growth Segment for Smart Home Devices



*The Other Devices* category, including thermostats, lights, and plugs has a CAGR growth rate of **over 25%**, making it the highest growth segment for smart home devices.

Source: IDC Worldwide Quarterly Smart Home Device Tracker, June 25, 2019

# Alexa, run my device too

Amazon Web Services (AWS) reduces the complexity and cost of adding voice technology to connected devices with the Alexa Voice Service (AVS) Integration for AWS IoT Core. AWS IoT solutions make it easy for device makers to build and manage scalable IoT applications that collect, process, analyze, and act on data generated by smart consumer products without having to manage any infrastructure. AWS IoT Core enables you to easily and securely connect your devices to the cloud and reliably scale to billions of devices and trillions of messages. The AVS Integration for AWS IoT Core enables you to make any of these connected devices an Alexa Built-in device.

By building with AVS Integration for AWS IoT Core, you can quickly, easily, and securely build differentiated consumer products that allow customers to control their devices with voice commands through Alexa. You can even connect products with one another to create a truly ambient experience in which customers can talk directly to Alexa to control many devices and experiences within their surroundings.

The AVS Integration for AWS IoT Core makes it possible for you to produce these voice-enabled experiences on low-cost devices by offloading compute and memory intensive tasks from physical devices to the cloud. Now, device makers can produce Alexa Built-in functionality even on the most resource-constrained devices that have very little space for additional hardware, such as light switches and bulbs, thermostats, and home appliances. Deployment solutions include built-in microphones and speakers capable of playing back dialog, alerts, and the news.

Whether you're new to smart devices or have experience building voice-enabled IoT devices, AVS Integration for AWS IoT Core reduces the development complexity and cost and can help you get to market faster than ever before with entirely new categories of Alexa Built-in products. Additionally, Libre Wireless Technologies provides pre-qualified hardware kits as well as integration services to help you get up and running even faster.

Alexa Built-in is a category of devices created with the Alexa Voice Service (AVS) that have a microphone and speaker. Customers can use the wake word "Alexa" to receive voice responses and content instantly from any Alexa Built-in device, and to execute commands to other devices in their surroundings that are certified as Works With Alexa (WWA). [Alexa Built-in devices](#) can receive the Alexa Built-in badge to show they deliver high-quality Alexa experiences, and become eligible for exclusive marketing opportunities with Amazon.



## Lower your cost and footprint

By offloading compute and memory intensive workloads to the cloud, AVS Integration for AWS IoT Core lowers the Alexa Built-in production costs up to 50% and lowers the hardware requirements from 100MB to 1MB of RAM, opening up new possibilities for Alexa Built-in device types.

# Alexa, give me the highlights on AVS

With AVS Integration for AWS IoT Core, you can turn any device into an Alexa Built-in device and differentiate your offering. Leveraging AWS IoT Core — a managed cloud service that lets connected devices easily and securely interact with cloud applications and other devices — brings simplicity, flexibility, and consistency to the end user experience. Make your product part of your consumer’s ambient experience in the home, office, or hotel by using AVS Integration for AWS IoT Core to:



## Lower the cost of producing an Alexa Built-in device

- Simplify firmware development using AVS interfaces, now accessible via a single, secure AWS IoT reserved topic for MQTT (Message Queuing Telemetry Transport)
- Offload compute and memory intensive workloads to the cloud and lower the hardware requirements on a device
- Reduce the engineering cost of producing an Alexa Built-in device up to 50%



## Get to market faster with help from AWS Partners

- Select pre-qualified hardware kits from AWS Partners that work with AWS IoT Core by default
- Use AWS Partner service integrations for connectivity and to help with environment considerations

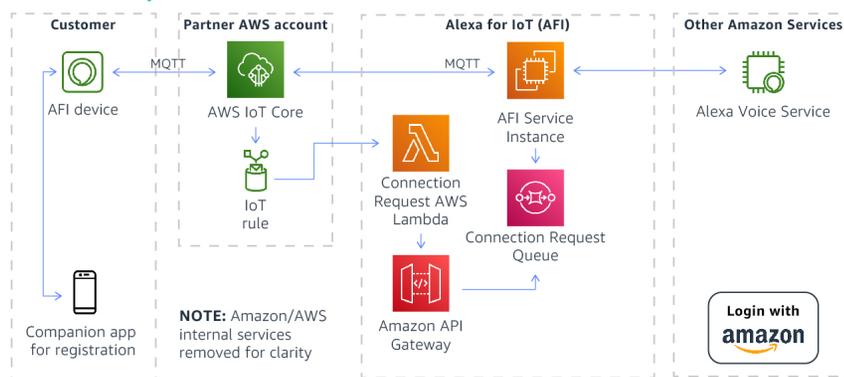


## Apply Alexa Voice to devices of all shapes and sizes

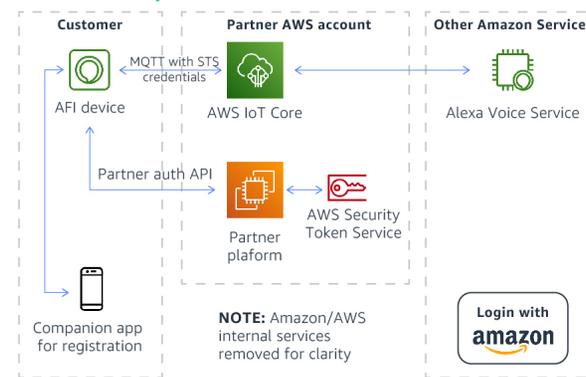
- Rely on cloud resources to overcome device resource limitations such as size or weight
- Become the first voice-enabled product in your category

A customer can use digital certificates or tokens for service authentication with AWS IoT Core. Standard implementation uses AWS IoT Core to manage certificates and policies directly. Alternatively, you can authenticate with a pre-signed credential from AWS Security Token Service (STS) that AWS IoT Core can trust.

### Standard implementation



### Alternate implementation



# Alexa, tell me about Libre's turnkey solution for AVS and AWS IoT Core

Libre works closely with AWS to integrate AWS services into a simplified low-cost turnkey IoT device with MQTT.

- The Libre PCBA module can be integrated into any home appliances easily with all the tools and support provided.
- The Libre IoT Voice module can be integrated into appliances and controlled with voice, mobile APP, or web browser. It can also be managed and monitored remotely from anywhere with secure access.
- Data collection helps OEMs with strategies for support and services.

## Benefits of Libre Solution

**Development package:** Hardware package includes SDK for module and mobile application, MIC placement guides, and factory tools.

**Low-cost solution:** The Libre module portfolio covers all price points depending on the end product specification. Security and stability are paramount across all solutions.

**Reduced time to market:** Libre provides complete end-to-end design support, firmware, mobile application, voice tuning, cloud support, certification, and MP guidance to facilitate a reduced product development cycle.

**Voice tuning and certification:** Libre can assist or take control of the complete product tuning for voice and certification on behalf of a customer.



# Universal Voice Remote for Hogar Controls

## Challenge

Hogar Controls needed to develop a voice-operated solution that could control multiple products and appliances around the home from one simple new remote.

## Solution

Libre supported the ability for users to control every device in a room by simply speaking to the device. AWS services, including AWS IoT Core, automate the manual operations. Now the Hogar Controls infrared (IR) smart voice remote, enabled with Libre's voice module built on AWS, listens to the command, processes it, and executes the order, all in under a second.

## Outcomes

Users are able to speak to the smart voice remote to switch to their favorite channels on set-top boxes or TVs. They can ask the air conditioner (AC) to be set a specific temperature. The voice assistant recognizes voices and changes, such as volume or the AC's fan speed, even without an input from the user.



# Alexa, get this party started

Follow the [Getting Started Guide](#) to jumpstart using the AVS Integration for AWS IoT Core.

## Libre Development Kit

The Libre Development Kit offers a full range of options with developers or ODMs/OEMs to customize or add options to control the appliances or device controls with voice with AVS and AWS services.

- FreeRTOS-based low cost, low power, and low footprint module with AWS IoT Core connection by default with a fleet provisioning option.
- Connectivity to expand the cloud communication to other external devices over WiFi, BLE, Zigbee, and IR.
- Easy speaker provisioning option with inbuilt codec on the development board with headphone/speaker output.
- Digital or analogue microphone options for translating the voice to action with AVS and AWS IoT Core.
- Basic peripheral devices like GPIO, SPI, UART, I2C, etc.

[www.librewireless.com](http://www.librewireless.com)

To learn more about the AVS Integration, view the [AWS IoT Core feature page](#).

See the [AWS Region Table](#) for the current list of supported regions for AWS IoT Core.



Copyright, 2021 reserved Libre Wireless:

This message is produced and distributed by

Libre Wireless | Tower B, Ground Floor, Embassy Heights, 13,  
Magrath Rd, Ashok Nagar, Bengaluru, Karnataka 560025, India

[librewireless.com/security.html](https://librewireless.com/security.html)