Developing a Bluetooth® Low Energy Solution to Connect Edge Devices to the Cloud

An End-to-End, Scalable Edge-to-the-Cloud Platform Powered by STMicroelectronics and AWS IoT Greengrass

Edge Device Data Gathered in the Cloud

STMicroelectronics and Klika Tech Co-created an end-to-end solution for rapidly developing a scalable Edge-to-Cloud solution that channels data to AWS services. The integration of STMicroelectronics Microcontrollers and sensors and AWS Greengrass creates a powerful edge-to-cloud solution with secure, bi-directional communication.

The solution highlights the power of Bluetooth® and low energy technologies, along with an ST-powered gateway, as a way for businesses to unlock a multitude of IoT benefits. It empowers business to tap into most popular edge communication protocol to harness edge device data. From operations monitoring and energy management, to asset tracking and supply chain optimization, it gives businesses an Edge-to-Cloud solution that can be scaled for success.

- Newest STM32WB55 Nucleo board and SensorTile.box as edge multi-sensor devices
- Best-in-class system performance for code execution, data transfers and data processing
- High integration: large range of embedded memory densities and advanced peripherals
- Power efficiency

INDUSTRIES AND APPLICATIONS

The platform can be tailored to solve connectivity challenges for a wide range of industries including

- Connected Healthcare
- Asset Tracking
- Smart Construction
- Smart Buildings
- Connected Retail
- Smart Office

aws

AWS IoT INTEGRATION

AWS IoT services leveraged to provide an end-to-end IoT solutions platform include:

- AWS IoT Core
- Amazon S3
- AWS Cloud Formation
- Amazon EC2
- Amazon Greengrass
- AWS Lambda

Challenge

The IoT continues to open windows into business efficiencies. Solutions that leverage wireless sensors in combination with more powerful edge gateways, are particularly emerging as a means to extend visibility out to the very edge of operations. The power of data-driven decisions has elevated Bluetooth Low Energy as a key networking solution. However, building a network made of thousands of disparate devices presents many challenges. These include managing for scalability, incorporating devices from varying manufacturers, and accounting for power consumption needs of devices. Ultimately, a sensor-based solution must come with assurance that data is secure, and can be made available in real-time in usable formats.

Solution

A platform that leverages AWS services and ST Microcontrollers for secure BLE connectivity and communication between edge devices and the AWS Cloud. ST's STM32MP157C-DK2 delivers an edge processing power connecting Bluetooth nodes and the AWS Cloud acting as Amazon Greengrass-powered gateway. Data collected by the gateway is processed and forwarded to the cloud where serverless, AWS-based backend includes a web application for visualizing device data.

Features and Benefits

A platform that can be used by a variety of industries for efficient, rapid development of a scalable edge infrastructure with open connectivity standards and built-in enterprise-grade security. ST's MCU provides high performance, real-time capabilities, digital signal processing, low-power and low-voltage operation, and reliable connectivity. As a gateway to AWS Services, it is a device-to-cloud solution for creating and managing smart environments at commercial scales. It saves time and resources by removing the need for custom firmware development or wireless device programming experience.

An integration of ST's newest MCUs and AWS services enables instant Edge-to-the-Cloud connectivity using Bluetooth Low Energy to an Amazon Greengrass powered gateway. The STM32MP157C-DK2 platform enables bi-directional communication and management of firmware and configuration updates.
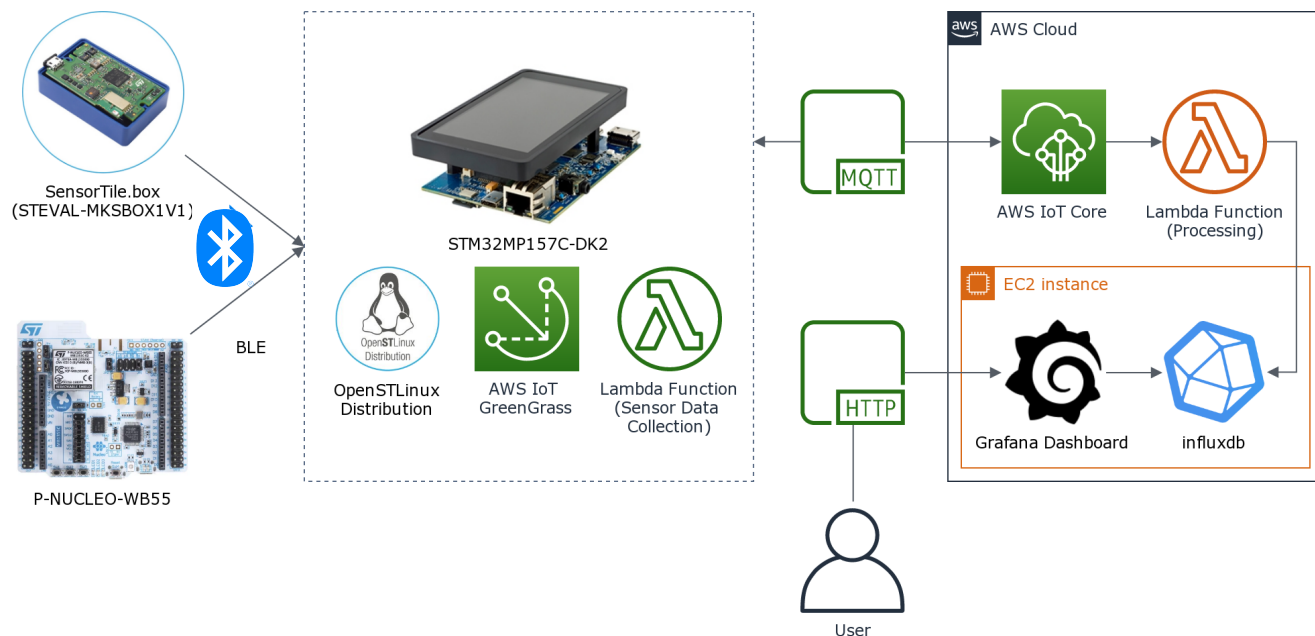
The Gateway as represented by ST STM32MP157C-DK2 runs custom Linux distribution based on Yocto Linux. It runs Amazon Greengrass inside. Collected data is sent to AWS IoT Core. In the AWS cloud it is processed by several Lambda functions and presented in real-time via a Grafana-based dashboard.

AWS IoT Greengrass enables edge device capabilities including local compute, messaging, data caching, sync, and ML inference. Edge devices are empowered to act locally on their data while still using the cloud for management, analytics, and storage. A web-based user interface simplifies monitoring, management and updating of gateways. ST solutions for Bluetooth handle all communications from node to gateway and support of standard protocols and SDKs for connectivity to a wide range of edge devices for a scalable commercial IoT solution.

ST is a global semiconductor leader delivering intelligent and energy-efficient products and solutions that power the electronics at the heart of everyday life. ST's products are found everywhere today, and together with our customers, we are enabling smarter driving and smarter factories, cities and homes, along with the next generation of mobile and Internet of Things devices. By getting more from technology to get more from life, ST stands for life.augmented. In 2018, the Company's net revenues were $9.66 billion, serving more than 100,000 customers worldwide.

Further information can be found at www.st.com

Klika Tech is an IoT & Cloud product and solutions development company headquartered in the U.S. with development and management locations across Europe and North America. Founded in 2013 by business-oriented technologists, Klika Tech co-creates end-2-end hardware, embedded, and software solutions for wearables, smart home/building/city platforms, connected healthcare, smart retail, connected agriculture, asset tracking, automotive, smart mobility, and cloud IoT hub integrations. Klika Tech is an AWS Advanced Consulting Partner and Service Delivery Partner for AWS IoT Core Services.

For more information, email: contact@klika-tech.com