SERVERLESS IOT DATA PROCESSING

PROBLEM DEFINITION

While multi-tier applications consisting of web, application server and database are foundational to web development and are the starting point for many websites, success will often bring challenges around scalability, integration and agility. For example, how can data be handled in real-time and how can it be distributed to multiple key business systems? These issues coupled with the demands of internet-scale applications drove the need for a distributed messaging system

and gave rise to an architectural pattern of using data pipelines to achieve resilient, real-time systems. As a result, understanding how to publish real-time data to build a data pipeline are crucial skills for developer and architect alike.

In this code lab, we are going to build a weather data pipeline that starts with an Internet of Things (IoT) device, utilizes a message queue to receive and deliver data. Leverages a serverless function to move the data to a data warehouse and then creates a dashboard that displays the information. A Raspberry Pi with a weather sensor will be used for the IoT device and several components of the Google Cloud Platform will be from the data pipeline. Building out the Raspberry Pi, while beneficial, is an optional portion of this code lab

and the streaming weather data can be replaced with a script.

After completing the steps in this code lab, we will have a streaming data pipeline feeding a dashboard that displays temperature, humidity, dewpoint and air pressure.

DESIGN THINKING

→ Google Pub/sub.
→ Deploy a Google Cloud Function.
→ Leverage Google Big Query.
→ Dashboard using Google Data Studio.
→ If we build out the IoT sensor, we will also learn how to utilize the Google Cloud SDK and how to secure remote access calls to the Google Cloud Platform.

If we want to build the IoT sensor portion of this code lab instead of leveraging sample data and a script, we will also need the following

→ Raspberry Pi Zero W with power supply, SD memory card and case.

→ USB card reader.
→ USB hub (to allow for connecting a keyboard and mouse into the sole USB port on the Raspberry Pi)
→ Female-to-female breadboard wires.
→ GPIO Hammer Headers.
→ BME280 sensor.

If we constructed a Raspberry Pi IoT weather sensor, start the script that will read the weather data and push it to Google Pub/Sub.

Google Data Studio turns our data into informative dashboards and reports that are easy to read, easy to share, and fully customizable.

Finally, we now have some hands-on experience with an important architectural pattern that can handle high volumes while maintaining availability.