Microsoft

Sydney Kotlin Meetup

Building an End to End Secure, Scalable IoT
Serverless Solution

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https://github.com/gloveboxes/iot-ttn-kotlin-azure-functions

Agenda

- Solution Overview
- Azure Java/Kotlin Support
- Serverless with Functions
- Real-time communications with web apps and SignalR
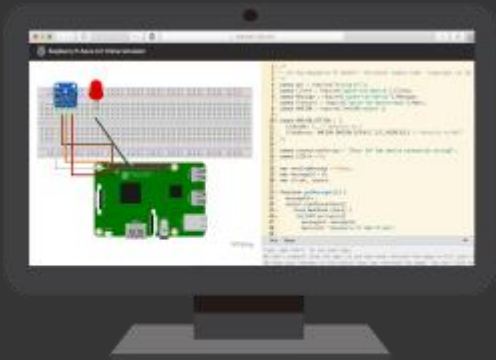- Azure Storage and Static Websites

West Central US
West US 2
West US
US Gov Arizona
US Gov Texas
South Central US
US Gov Iowa, Central US
Canada East
Canada Central
North Central US
US DoD East
East US, East US 2, US Gov Virginia
US DoD Central
Brazil South

Norway West
Norway East
West Europe
Germany West Central
UK South
Germany North
North Europe
Germany Northeast
UK West
Germany Central
France Central
Switzerland North
France South
Switzerland West

UAE North
UAE Central
West India
Central India
South India

South Africa North
South Africa West

China North, China North 2
Korea Central
Japan East
Korea South
Japan West
China East, China East 2
East Asia
Southeast Asia

Australia East
Australia Central, Australia Central 2
Australia Southeast
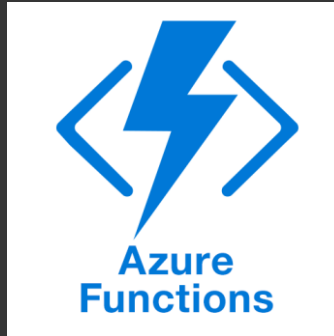
54 Azure regions in 140 countries
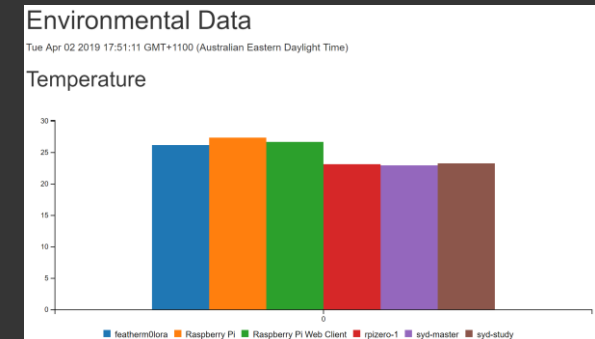
What we will cover

Simulated
Raspberry Pi
(Azure IoT Hub)

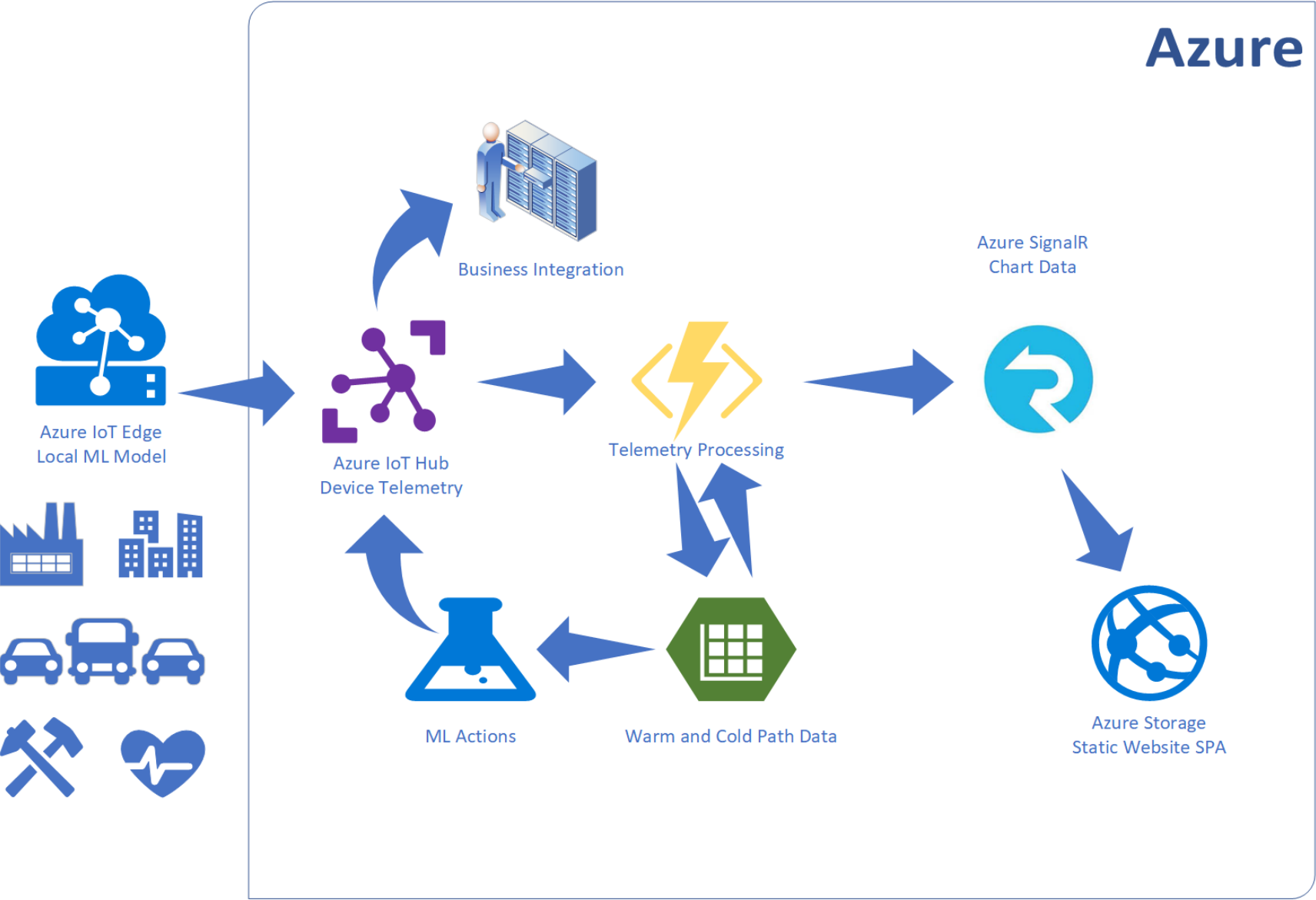Raspberry Pi Simulator

Serverless &
Kotlin Azure
Functions

Serverless Websites
(Azure Storage Static
Websites)

1ˢᵗ Class Support for Java on Azure Services

Native and idiomatic support for Java applications.

Azure Functions
- Java SE 8
- Java SDK
- Plugins for Maven, Eclipse, and IntelliJ
- VS Code Extension (manage; local/remote debug)

Azure Service Fabric
- Java API
- Java SDK
- Maven Dependencies and Plugins
- Eclipse Plugins and VS Code Extensions

Azure App Service
- Java SE 8
- Tomcat 8.5, 9.0
- Maven Plugin
- Eclipse & IntelliJ Plugins
- VS Code Extension (Manage)

Azure Cosmos DB
- Java SDK for synchronous connections
- Java SDK for asynchronous (reactive) style
- Support for MongoDB/Cassandra APIs
- Open Source SDKs

Azure Application Insights
- Java SDK for user-defined instrumentation
- Java Agents for auto instrumentation
- Eclipse Plugin
- Open Source SDKs

Azure SDKs for Java
- Management APIs (CRUD Azure services)
- REST-to-Java APIs (idiomatic low-level REST
- Fluent APIs (idiomatic service features)
- **Over 50+ services covered**
- Open Source SDKs

Serverless with Azure Functions

What is Serverless?

No infrastructure **headaches**

Scales on demand

Very **cheap** to run

Functions as a Service (FaaS)

- Functions as a Service
  - Single Responsibility, Short Lived, Stateless, Event Driven & Scalable
- Azure Functions (Implementation of FaaS)
  - Great Local Developer Experience
  - Hosting Flexible
    - Consumption Plan, App Service Plan, Premium, and Container
  - Consumption plan
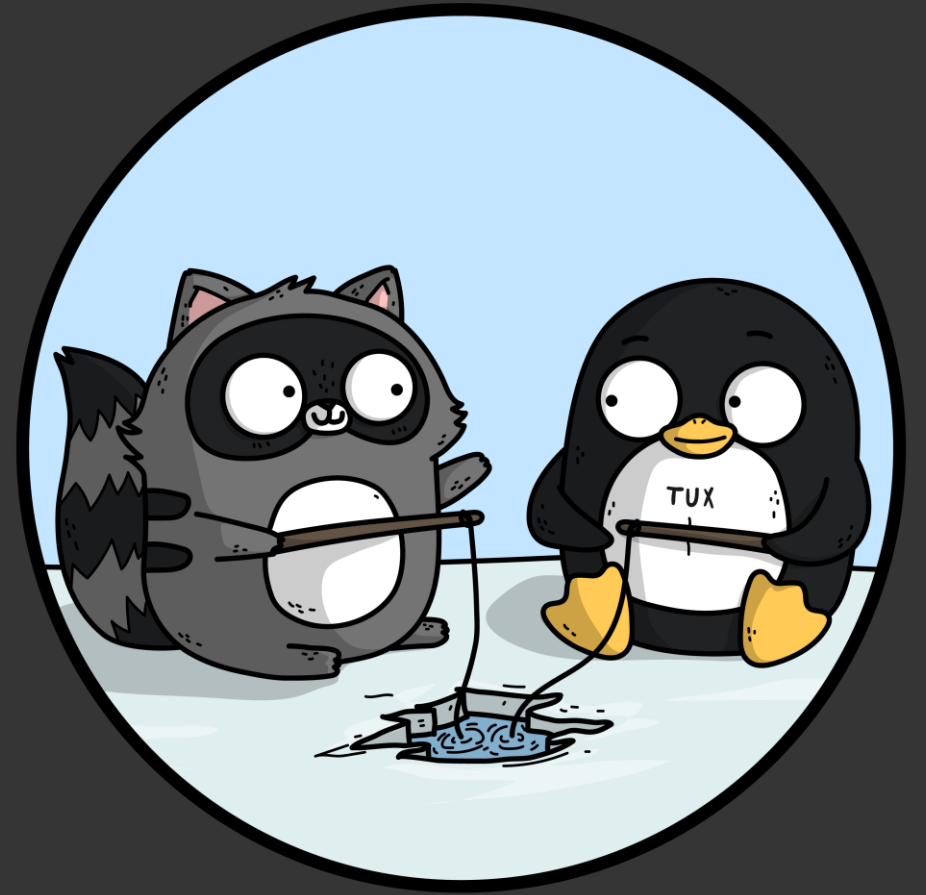   - Free grant of 1 million requests and 400,000 GBs per month
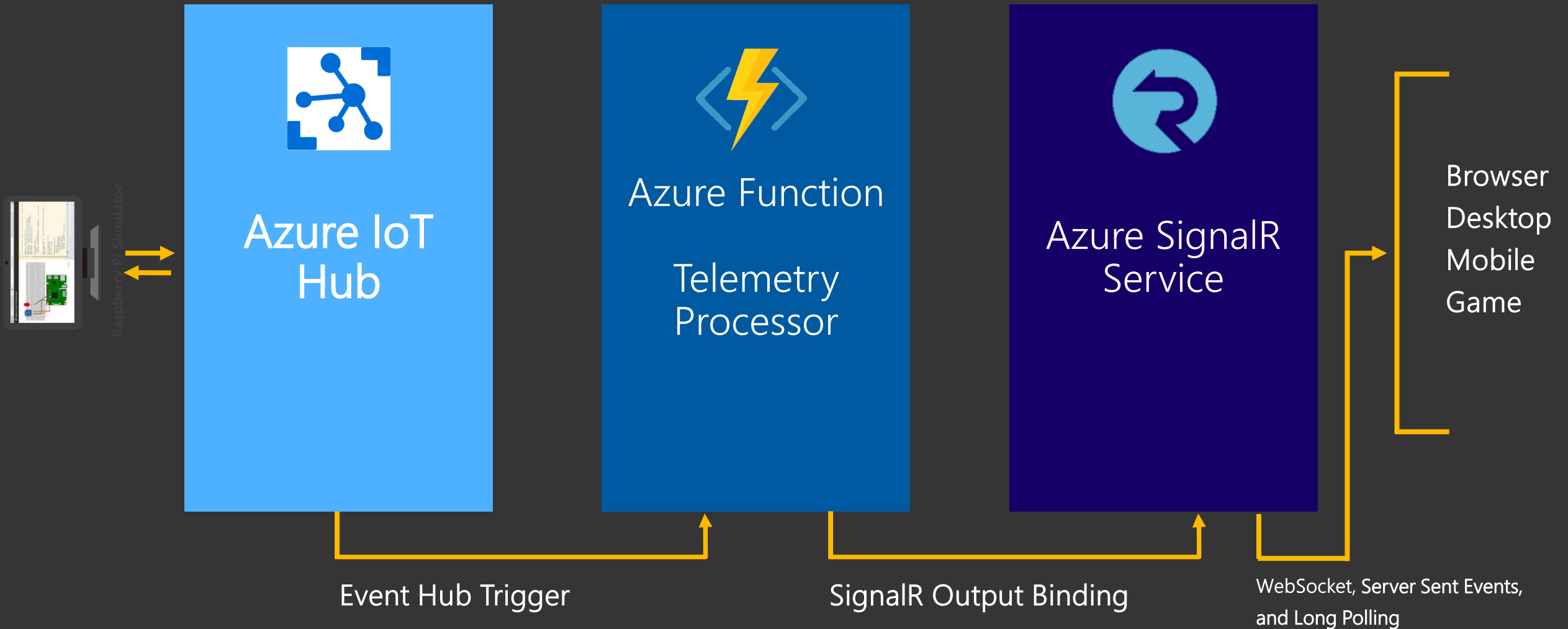 - Open Source https://github.com/Azure/Azure-Functions

Demo

- Creating an Azure Function with IntelliJ
  - Adding Maven Archetype
  - Azure-Function:Add
  - Convert to Kotlin
  - Azure-Function:Run
    - -DenableDebug
  - Raspberry Pi Simulator

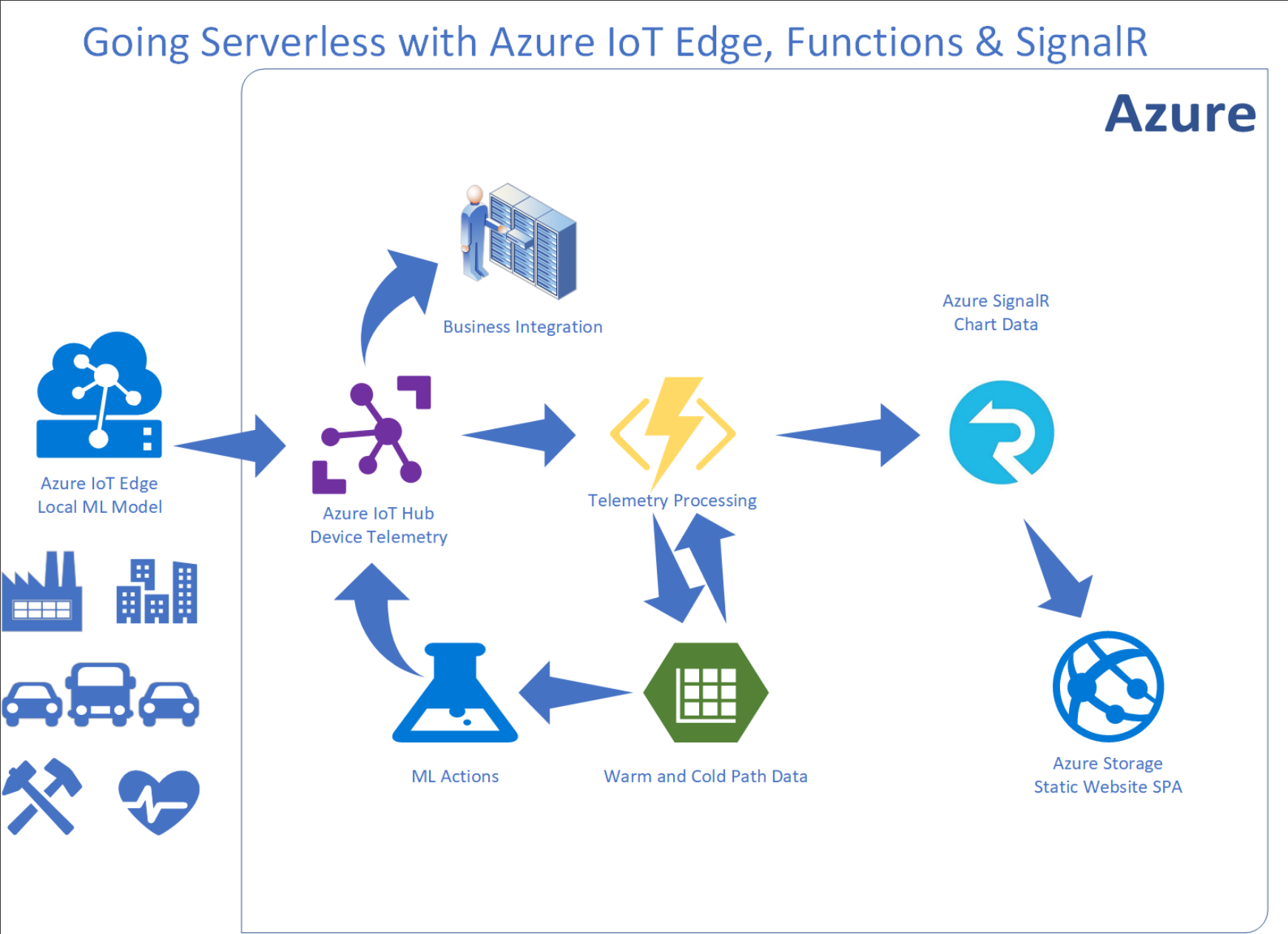# Serverless Web Pages & Azure SignalR

SignalR in Action

Raspberry Pi Simulator

Azure IoT Hub

Azure Function

Telemetry Processor

Azure SignalR Service

Browser
Desktop
Mobile
Game

Event Hub Trigger

SignalR Output Binding

WebSocket, Server Sent Events, and Long Polling

Demo

- SignalR Trigger
- Azure Storage Static Websites and Single Page Apps

Going Serverless with Azure IoT Edge, Functions & SignalR

Resources

- Create your first Azure function with Java and IntelliJ
- Create your first function with Java and Maven
- Maven Archetype For Azure Functions
- Microsoft Azure Storage Client SDK
- Azure SignalR Service Documentation
- Static website hosting in Azure Storage
- Demoed Solution on GitHub (gloveboxes)
- Remote Debugging Java Azure Functions

■■ Microsoft

DEVELOPER
ADVOCATE