

SINGTEL X MICROSOFT IOT HACKATHON

BRIEFING SESSION - 17 DEC 2018



AGENDA



Welcome & Opening

- Introduction : Why Singtel x Microsoft
- The retail business challenge



Azure - Internet of Things (IoT)

- Overview of Microsoft Azure IoT
- Tip : How to accelerate your IoT Application



IoT Solutions, Sensors & Devices

- Singtel IoT Sense and environmental sensor
- Dev Kit by Renesas



The Hackaton Journey

- Hackaton milestones
- Consultation sessions and 2-days workshop



Q&A

THE BUSINESS CHALLENGE



RETAIL CHALLENGE

Teams need to choose and solve one or more of the challenges listed below for retailers such as supermarkets, convenience stores, fashion and lifestyle shops and shopping malls:

Increase sales

1. Elevate customer satisfaction and improve retail experience in the store.
2. Enhance path to purchase through omni-channel and experiential retail.
3. Achieve greater insight about customers to provide better personalization.

Increase productivity

4. Improve productivity of bricks and mortar retail and/or supply chain staff.
5. Improve employee engagement and retention rates of retail staff and/or supply chain staff
6. Overcome operational inefficiencies in the supply chain (e.g. inventory management, energy usage, rental costs, etc.)

For more information, visit www.singtel.com/iothackathon

AZURE INTERNET OF THINGS

BY MICROSOFT



WHAT IS INTERNET OF THINGS (IOT) ?





Connected chillers are back online 9x faster than unconnected equipment, avoiding more than \$300,000 in hourly downtime costs



Reduced its accident rate by 25% and fuel usage by 20%, **reporting annual savings of \$1.8 million**



Cut down-time cut for each packaging line by up to 48 hours, **saving €30,000 for customers**



thyssenkrupp

Data from sensors and systems to create valuable business intelligence and **reduce downtime by 50%**



Keeping farmers informed about irrigation, disease control diseases, and pest has led to **increased yields of 30%, and a 20% reduction in water use**



Licorice extruders on Twizzler's production line are performing at peak optimization, **saving over \$500K/year on materials alone**



Rolls-Royce

Rolls Royce "power by the hour" model provides maximize availability by cutting fuel consumption by 1% and up to \$250,000 per plane, per year.

Rockwell Automation

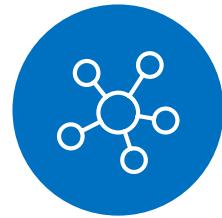
Access to production and supply chain data worldwide, **reduced downtime costs by as much as \$300,000 per day**



Enabled customers to transport more than **1M additional tons of cargo, and reduce fuel consumption by 17%**



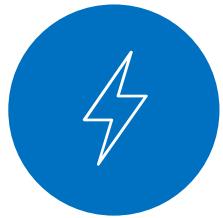
DEFINING IOT



Things



Insights



Action

Compute

 Virtual Machines	 Virtual Machine Scale Sets
 Azure Container Service	 Azure Container Registry
 Functions	 Batch
 Service Fabric	 Cloud Services

Networking

 Virtual Network	 Load Balancer
 Application Gateway	 VPN Gateway
 Azure DNS	 Traffic Manager
 ExpressRoute	 Network Watcher

Storage

 Storage: Blobs, Tables, Queues, Files, Disks	 Data Lake Store
 StorSimple	 Azure Backup
 Site Recovery	

Monitoring & Management

 Azure Portal	 Azure Resource Manager	 Azure Advisor	 Azure Monitor	 Log Analytics	 Automation	 Scheduler
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Web & Mobile

 Web Apps	 Mobile Apps
 Logic Apps	 API Apps
 Content Delivery Network	 Media Services
 Search	

Databases

 SQL Database	 SQL Data Warehouse
 SQL Server Stretch Database	 DocumentDB
 Redis Cache	 Data Factory

Intelligence & Analytics

 HDInsight	 Machine Learning
 Cognitive Services	 Azure Bot Service*
 Data Lake Analytics	 Power BI Embedded
 Azure Analysis Services	

Internet of Things & Enterprise Integration

 Azure IoT Hub	 Event Hubs
 Stream Analytics	 Notification Hubs
 BizTalk Services	 Service Bus
 Data Catalog	

Security + Identity

 Security Center	 Key Vault
 Azure Active Directory	 B2C
 Domain Services	 Multi-Factor Authentication

Developer Services

 Visual Studio Team Services	 Azure DevTest Labs
 VS Application Insights	 API Management
 HockeyApp	 Developer Tools
 Service Profiler*	

TIP 1 : DIRECTORY OF AZURE SERVICES

<https://azure.microsoft.com/en-us/services/>

The screenshot shows the Microsoft Azure homepage with the 'Products' menu selected. Below it, the 'Azure products' section is displayed, featuring a search bar and a list of service categories. The 'AI + Machine Learning' category is highlighted, showing various services like Azure Batch AI, Azure Databricks, and Azure Search.

Microsoft Azure

Contact Sales: 800-852-6071 Search My account Portal Sign in

Overview Solutions Products Documentation Pricing Training Marketplace Partners Support Blog More [Free account >](#)

Azure products

Browse or search for Azure products

Select a category:

- AI + Machine Learning
- Analytics
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things
- Management and Governance
- Media
- Migration
- Mobile
- Networking
- Security
- Storage
- Web

Search products

AI + Machine Learning

[Learn more >](#)

Azure Batch AI Easily experiment and train your deep learning and AI models in parallel at scale	Azure Bot Service Intelligent, serverless bot service that scales on demand
Azure Databricks Fast, easy, and collaborative Apache Spark-based analytics platform	Azure Search Fully-managed search-as-a-service
Bing Autosuggest Give your app intelligent autosuggest options for searches	Bing Custom Search An easy-to-use, ad-free, commercial-grade search tool that lets you deliver the results you want
Bing Entity Search Enrich your experiences by identifying and augmenting entity information from the web	Bing Image Search Search for images and get comprehensive results
Bing News Search Search for news and get comprehensive results	Bing Speech Convert speech to text and back again to understand user intent
Bing Spell Check Detect and correct spelling mistakes in your app	Bing Video Search Search for videos and get comprehensive results

THE INDUSTRY'S MOST COMPREHENSIVE PORTFOLIO

Solutions (PaaS)

Azure IoT Suite (PaaS)

Preconfigured solutions for common IoT scenarios

Solutions (SaaS)

Microsoft IoT Central
IoT SaaS

Microsoft Dynamics
Connected Field Service

Technologies (PaaS)

Device support

Azure IoT Device SDK

Azure IoT certified devices

Security Program for Azure IoT

Windows 10 IoT

IoT

Azure IoT Hub

IoT Hub Device Provisioning Service

Edge

Azure IoT Edge

Data and Analytics

Azure Stream Analytics

Azure Time Series Insights

Azure Machine Learning

Cosmos DB

Azure HD Insight

Azure Data Lake Analytics

Azure Data Lake

Visualization and Integration

Microsoft Flow

Azure Logic Apps

Notification Hubs

Azure Websites

Azure Active Directory

Microsoft Power BI

Azure Monitor

TIP 2 : REUSE

<https://www.azureiotsolutions.com/Accelerators>



Remote Monitoring

By Microsoft

Connect and monitor your devices to analyze untapped data and improve business outcomes by automating processes.



Connected Factory

By Microsoft

Accelerate your journey to Industrie 4.0 - connect, monitor and control industrial devices for insights using OPC UA to drive operational productivity and profitability.



Predictive Maintenance

By Microsoft

Anticipate maintenance needs and avoid unscheduled downtime by connecting and monitoring your devices for predictive maintenance.



Device Simulation

By Microsoft

Streamline your IoT solution development by using simulated IoT devices to both build and test your solution throughout the software development lifecycle.



AZURE IOT SOLUTION ACCELERATORS

Singtel X Microsoft IoT Hackathon

-  **End-to-end implementation**
-  **Completely customizable**
-  **Open-source microservices based architecture**
-  **Device connectivity and management**
-  **Dashboards, visualization and insights**
-  **Workflow automation and integration**
-  **Command and control**
-  **Preconfigured solutions**
 -  **Remote Monitoring**
 -  **Connected Factory**
 -  **Predictive Maintenance**
 -  **Device Simulation**

ACCELERATE TIME TO VALUE

Start quickly for common IoT scenarios



- Get started in minutes
- Modify existing rules and alerts
- Add your devices and begin tailor to your needs

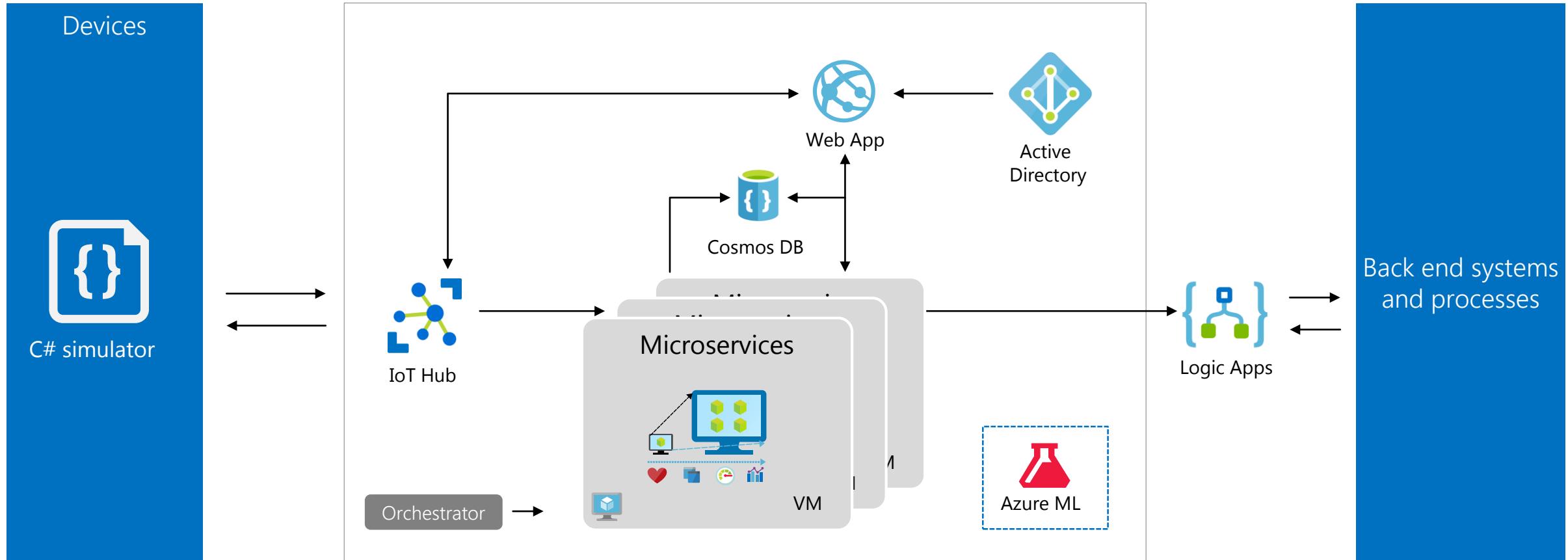
Finish with your IoT application

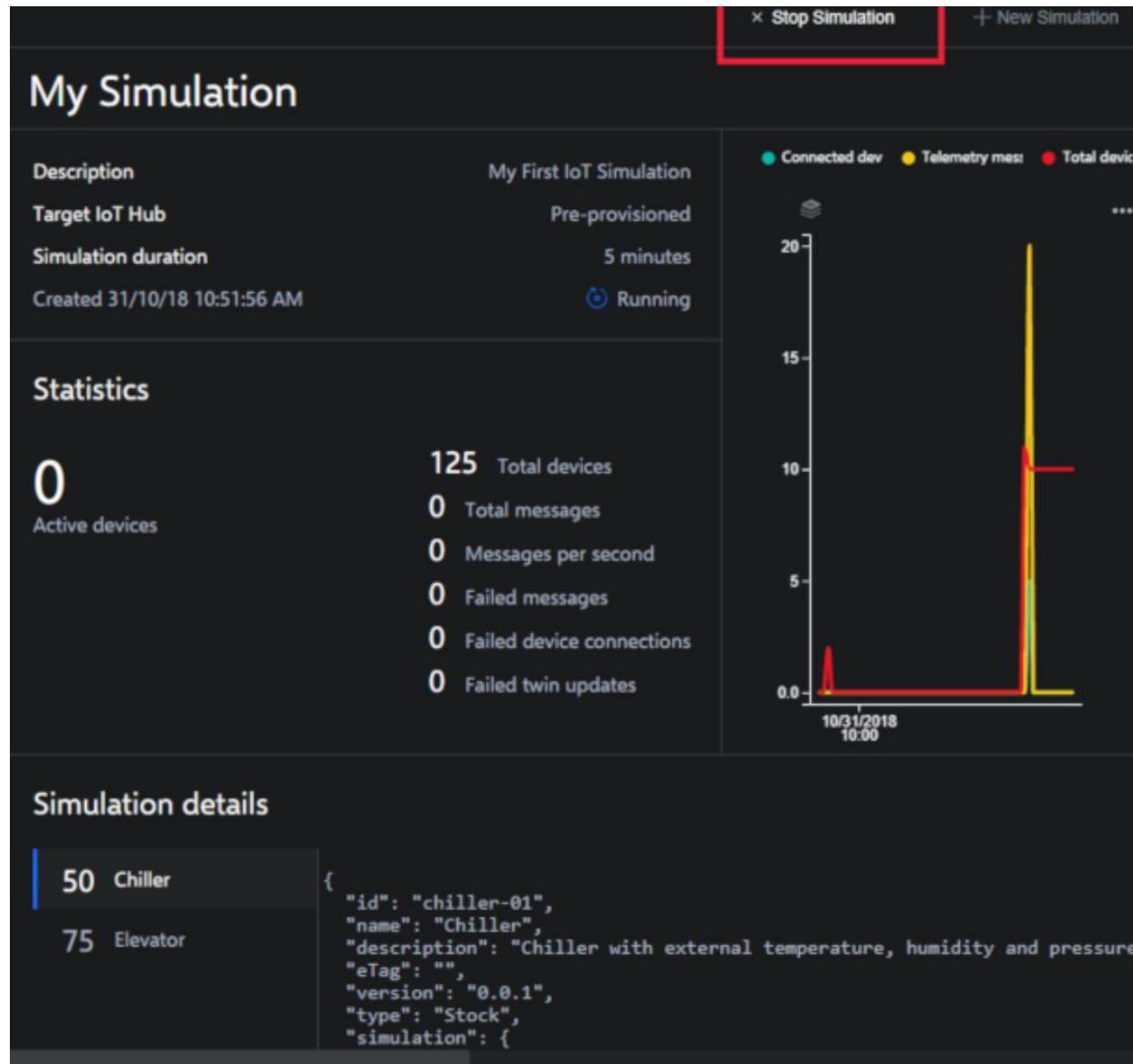


- Fine-tuned to specific assets and processes
- Highly visual for your real-time operational data
- Integrate with back-end systems

COMPONENTS OF A PRECONFIGURED SOLUTION

Remote monitoring | Predictive maintenance | Connected factory | Device Simulation





Dashboard Microsoft Azure IoT Device Simulation

Get started

Build basic or advanced simulated devices that look and act like the real thing. Gather, process, analyze, act on data, and use it for end-to-end solution testing. Choose from the following if you'd like help getting started.

Sample simulation

Get started instantly using a sample simulation. With the sample simulation you can see data flowing to your IoT Hub right away. This will simulate a few trucks sending location, speed and cargo information.

Start a sample simulation

Custom devices

Custom devices allow you to specify exactly what data is sent to your IoT Hub. You can define the different data points to send (e.g. temperature, fuel level, etc.) and provide value ranges to represent data from physical devices.

Create a custom device

Advanced devices

Design complex device behaviors by authoring a custom JSON device definition file and scripting device behaviors in JavaScript. The advanced device experience gives you full control over how your simulated devices behave.

Upload a device model

Don't show me this again
You can always find this on the help menu

Add Device Model

Basic **Advanced**

Create a new simulated device and the telemetry data to be sent from the device to your IoT hub. A single device can send one or more data points (e.g. location, humidity, etc.) allowing you to simulate data coming from real devices.

Device model name: Refrigerator

Model description: A refrigerator with temperature and humidity sensors

Version: 1.0

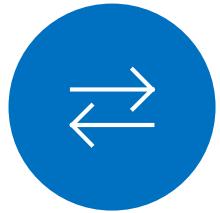
Telemetry data

Set parameters for telemetry sent for the sensor.

DATA POINT	BEHAVIOR	MIN VALUE	MAX VALUE	UNIT
Temperature	Random	-50	100	F
Humidity	Random	0	100	%

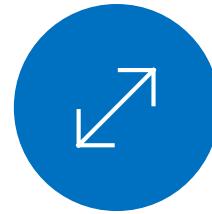
Save **Clear all**

AZURE IOT HUB



Bi-directional communication

- Millions of devices
- Multi-language, open source SDK
- HTTPS/AMQP/MQTT
- Send telemetry
- Receive commands
- Device management
- Device twins
- Queries and jobs



Enterprise scale and integration

- Billions of messages
- Scale up and down
- Declarative message routes
- File upload
- Web sockets and multiplexing
- Azure monitor
- Azure resource health
- Configuration management



End-to-end security

- Per device certificates
- Per device enable/disable
- TLS security
- X.509 support
- IP whitelisting/blacklisting
- Shared access policies
- Firmware/software updates

TIP 3 : DON'T BUILD, USE MANAGED SERVICE AND SERVERLESS

How do I **architect** my app?



Serverless, the architecture for next gen apps

On-Premises

IaaS

Managed

Serverless

PaaS

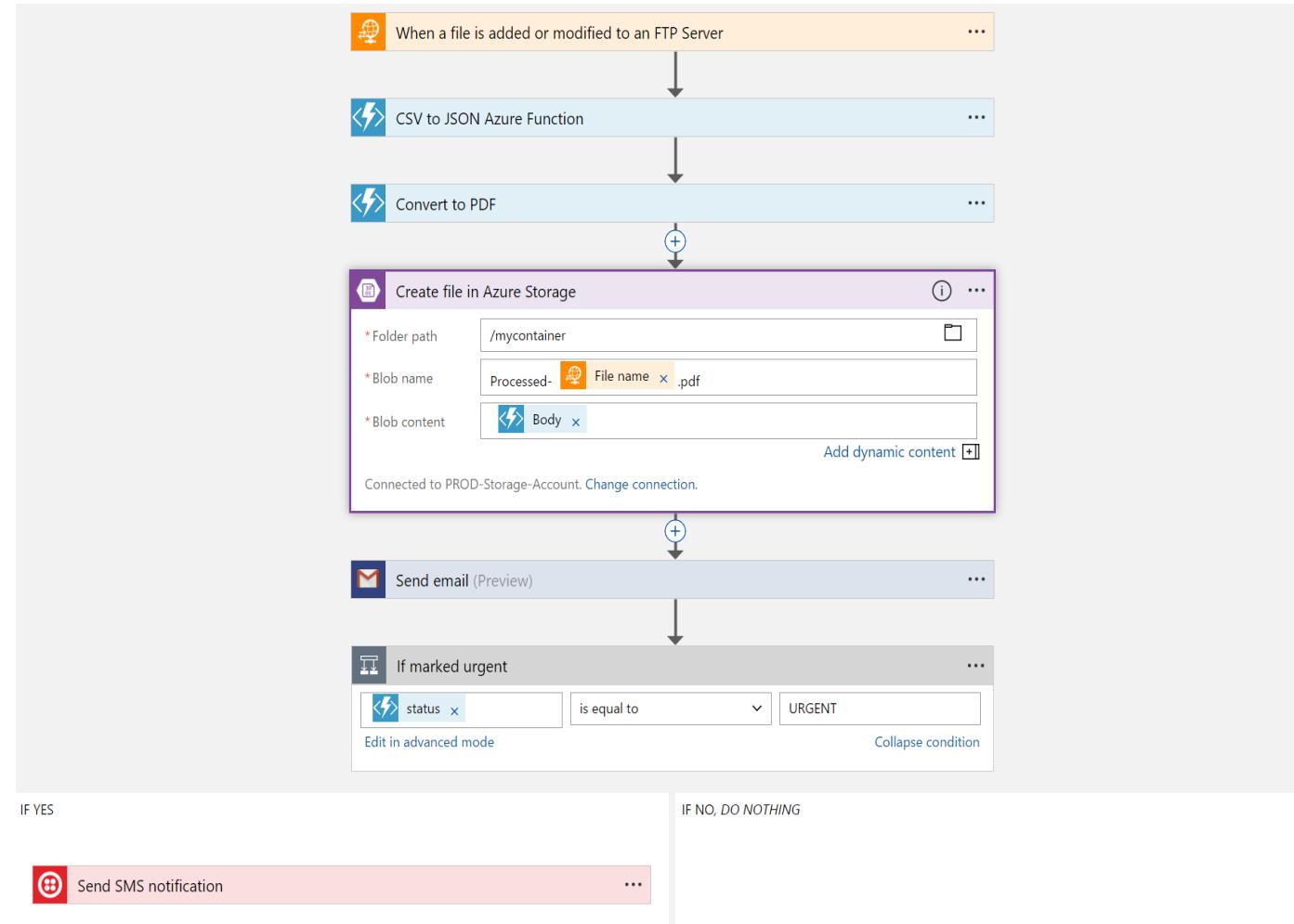
LOGIC APPS

**Visually design workflows
in the cloud**

**Express logic through
powerful control flow**

**Connect disparate
functions and APIs**

**Utilize declarative
definition to work with
CI/CD**



TIP 4 : SEARCH ONLINE, READ THE DOCUMENTS, REUSE THE DESIGN

<https://azure.microsoft.com/en-us/solutions/architecture/>

The screenshot shows the Azure solution architectures page. At the top, there are search filters for Solutions, Products, Tags, and Industries. Below the filters are three sample architecture diagrams: 'Immutable Infrastructure CI/CD using Jenkins and Terraform on Azure Virtual Architecture overview', 'Retail and e-commerce using Azure Database for PostgreSQL', and 'Simple branded website'.

The screenshot shows two pages from the Azure IoT documentation. The left page is titled 'Send telemetry (Java)' under the 'Azure IoT Fundamentals' section. The right page is a tutorial titled 'Visualize real-time sensor data from Azure IoT Hub using Power BI', dated 04/11/2018, which includes a diagram of the data flow from a device to Power BI.

YourIoTHubName : Replace this placeholder below with the name you choose for your IoT hub.

MyJavaDevice : This is the name given for the registered device. Use MyJavaDevice as shown. If you choose a different name for your device, you will also need to use that name throughout this article, and update the device name in the sample applications before you run them.

```
az extension add --name azure-cli-iot-ext
az iot hub device-identity create --hub-name YourIoTHubName --device-id MyJavaDevice
```

2. Run the following commands in Azure Cloud Shell to get the *device connection string* for the device you just registered: YourIoTHubName : Replace this placeholder below with the name you choose for your IoT hub.

POWER APPS



Easily build apps with a full featured low-code / no-code platform



Connect to all your data with pre-built connectors, custom connectors



Put your data to work with the Common Data Service for Apps



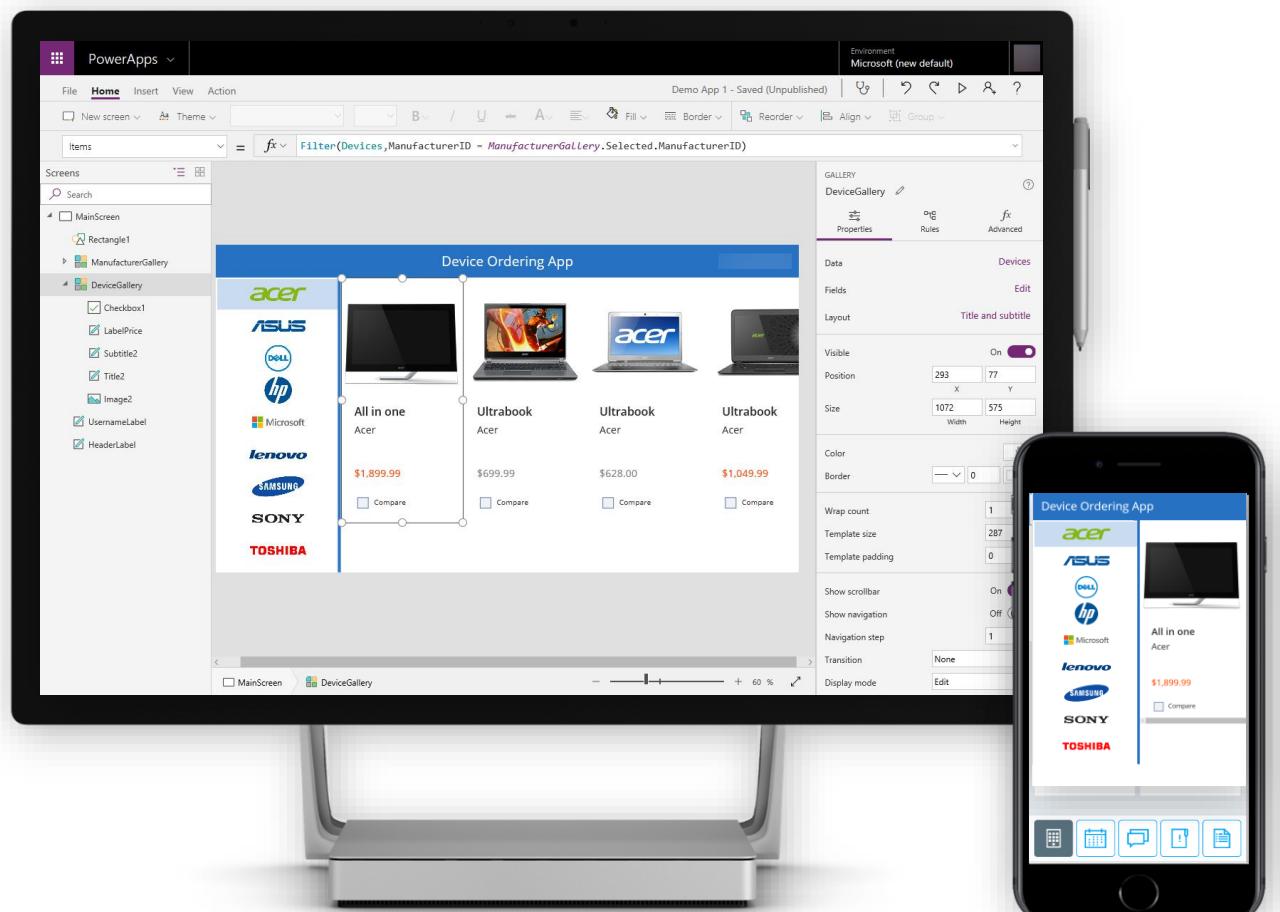
Office 365, Azure, Dynamics 365, Power BI, Microsoft Flow integration



Strong enterprise governance & security



Pro-dev extensibility



IOT SOLUTIONS

SENSORS, DEVICES AND STARTER KITS AVAILABLE FOR THE IOT HACKATHON

Note: Teams will need to indicate the sensors and devices required (in this list or others) for the IoT Hackathon in the proposal submission form. Singtel will provide this to best of our ability. Teams are allowed to bring their own devices for the hackathon.



IOT SENSE

Detects activity and human presence accurately, so businesses can make informed decisions, at the right time.



IOT SENSE

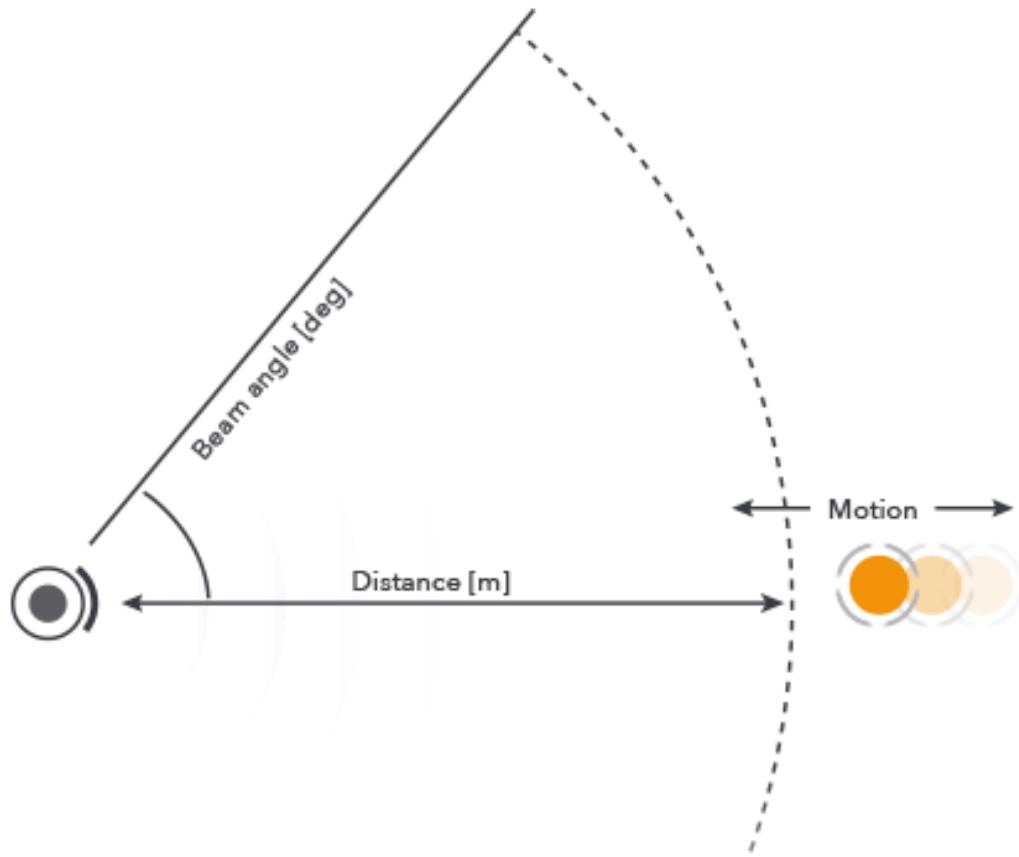


Making things count. Turn knowledge into actions

Whether your business is in the retail, hospitality or healthcare sector, **IoT Sense** detects activity and human presence with immediacy and accuracy so mission critical operations can take place or space optimisation can be done to increase productivity and revenues.

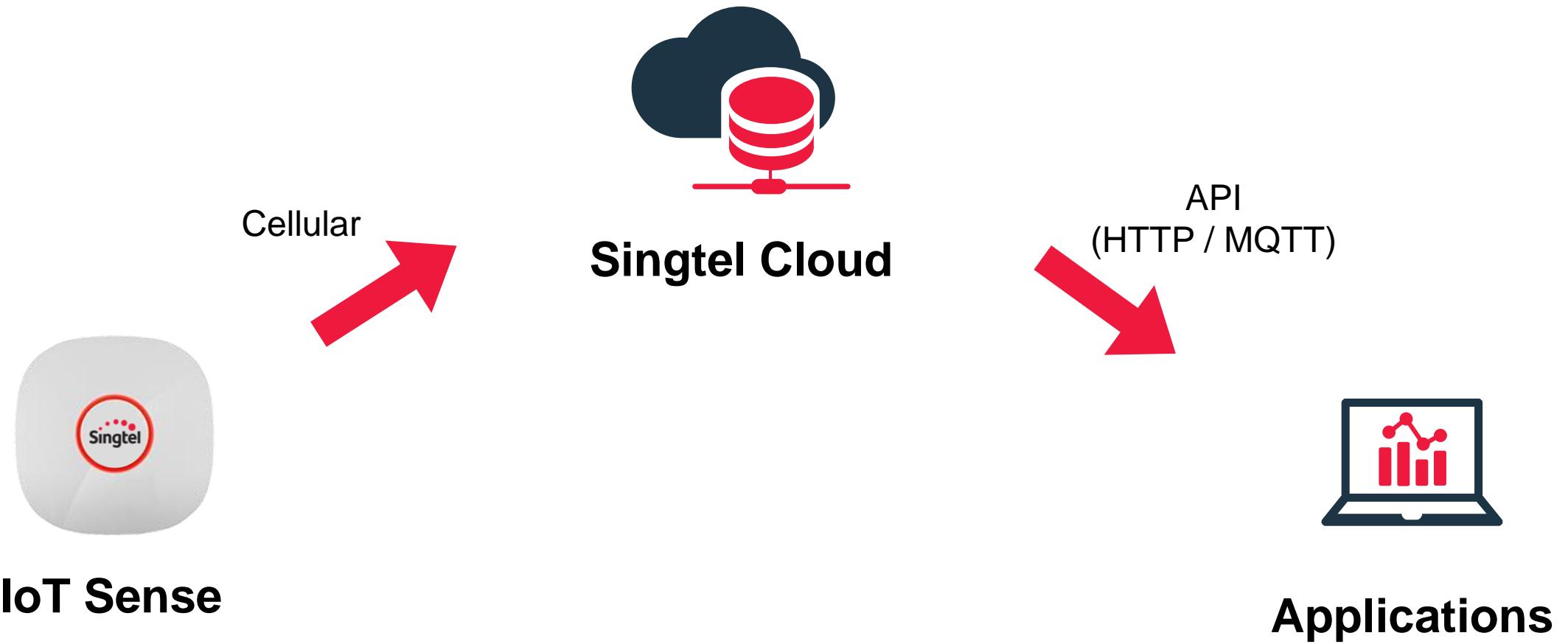
Unlike traditional presence and detection sensors, such as thermal imaging and passive infrared sensors or video analytics cameras, IoT sense measurements are not affected by temperature or captures any personal identifiable information as video feeds would.

HOW IT WORKS



IoT Sense uses **low emission radar** technology to detect objects. Its sensitivity enables it to detect very small movements like the ones from your chest when you breathe, or larger movements such as walking.

ARCHITECTURE

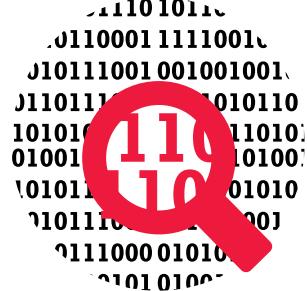


BENEFITS



Hassle-free setup

One-time set up of radars that covers large areas means less devices and installation required.



Better insights with high accuracy

Make informed decisions with highly sensitive presence sensing capabilities.



Not intrusive

Addresses privacy concerns which alternative presence detecting solutions are unable to achieve.

IOT SENSE IN ACTION



APPLICATIONS



SPECIFICATIONS

Characteristics	Descriptions
Coverage	10m radius
Sensitivity	Able to detect minor movements such as a standing and sitting
Technology	Low emission radar
Interference	Minimal interference with environment
Privacy concerns	None. No images or personal identifiable data collected
Power	USB Type-A (5.1V, 2.5A)
Connectivity	Wi-Fi, NB-IoT, Cat-M1, 3G, 4G

For more information, visit www.singtel.com/otsense

THERMO TRACK

Real-time visibility of your assets



THERMO TRACK



Get real time visibility of your product with Thermo Track. Whether your product is in transit or storage, within your premises or not, you will have continuous visibility of the environment your product is kept in.

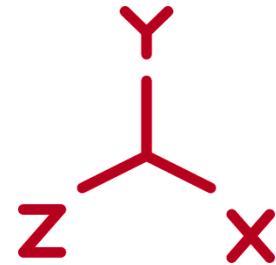
It can detect location by GPS, temperature and relative humidity, light, movement and impact; and rules can be defined and alerts set to ensure product supply chain integrity.

It supports BLE, CAT-M1 and NB-IoT connectivity.

FEATURES



**Temperature &
Humidity**



**3-Axis
Accelerometer**

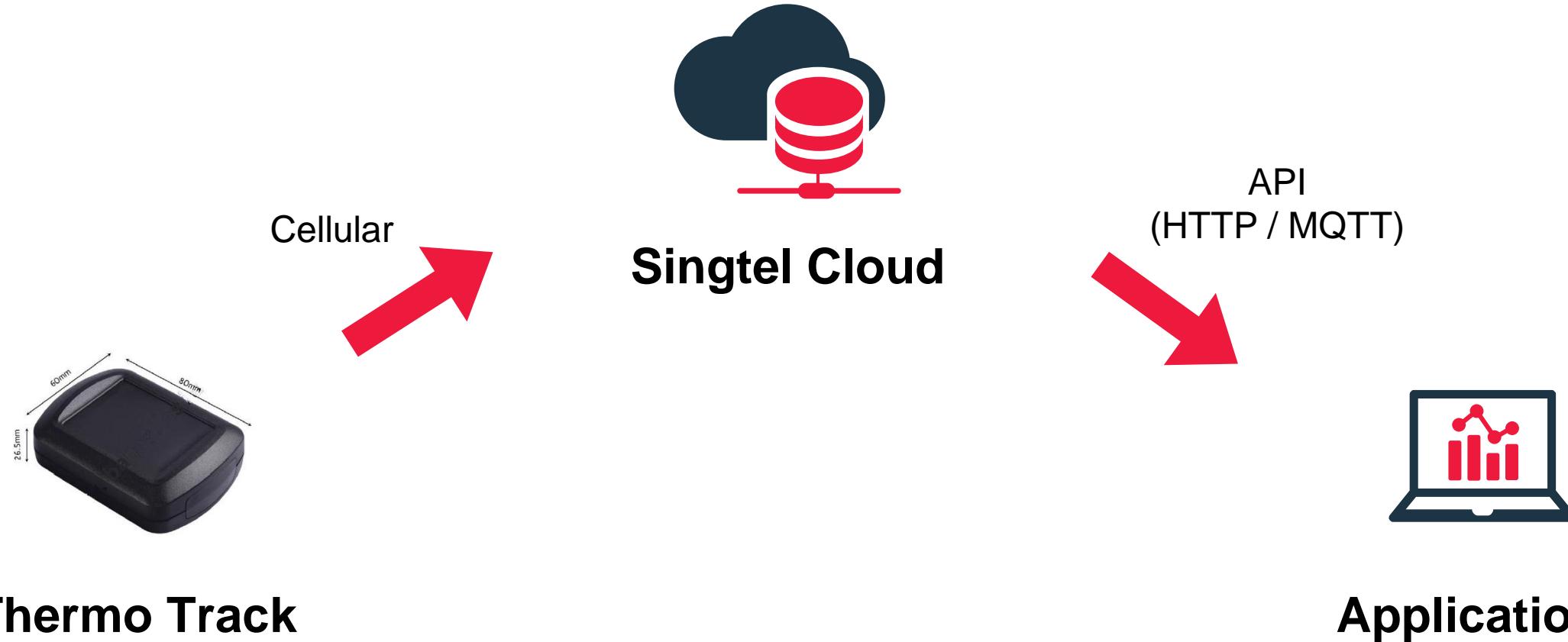


Ambient Light



GPS Location

ARCHITECHTURE



BENEFITS



Plug-and-play design

Zero configuration, fully wireless design simplifies installation



Eliminate manual logging

Automatic continuous monitoring and recording of location and condition assets and goods



Real time alerts

Event-triggered logic and rules, including specific alerts related to issues and delays.



Security

Prevents theft, losses or misplacements by using proximity, tampering and location monitoring throughout the entire supply chain

APPLICATIONS



Cross border
asset tracking



Cold chain
food and healthcare



Temperature
sensitive storage

SPECIFICATIONS

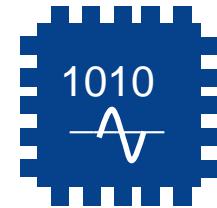
Environmental Sensor	
Temperature	40°C to 85°C (0.3°C accuracy)
Humidity	0% to 100% (2% accuracy)
Ambient Light	0.01 Lux to 64K Lux
Accelerometer	±16g, 3-axis
Location	Up to 5m accuracy outdoor
Coverage	3m to 5m
Power	Battery powered
Connectivity	BLE, NB-IoT, Cat-M1

RENESAS SYNERGY AE-CLOUD2

BY RENESAS



RENESAS ELECTRONICS CORPORATION



Among leading
Japanese
semiconductor
companies

Global operations
in 14 countries
~20,000 staff

Established in 2002.
Formed by
several iconic M&As

Digital, analog & mixed-
signal products for
automotive, industrial &
broad-based
applications

FY2017
~US\$7B
sales

Renesas creates leading semiconductor solutions that spark innovation for a connected world.

RENESAS PRODUCTS

Analog/Power/SOC Devices



Power

- Industrial & Automotive
- IGBT, diodes and Intelligent Power Modules



Analog

- Industrial & Automotive
- DC to DC, Fuel gauge, charging, CMOS Image Sensors, Optical Image Stabilizer, SL BLDC Motor



SOC/ASIC

- Powertrain Control
- ASSP for USM, USB PD and PLC
- Custom ASICs
- ASIC, broad IP portfolio in 40 nm, 28 nm, 16 nm

Microcontroller Devices and Solutions



47000 DMIPs, Multimedia, SoC

- Automotive, 28 nm
- Scalable solutions for Infotainment, Cluster and ADAS



25000 DMIPS, Linux, Android

- Industrial Automotive 45 and 28 nm
- 10 MB SRAM/XIP or DDR Interface



1344 DMIPS, Real Time

- Automotive, 40 nm, 32-bit, 6 families
- 48-484 pins, 80-320 MHz, 256KB-8MB, 1-4 cores



480 DMIPS, FPU, DSC

- Industrial, 40 nm
- 100 µA/MHz, 350 nA standby



44 DMIPS, True Low Power

- Industrial & Automotive, 130 nm, 16-bit
- 66 µA/MHz, 220 nA standby

Microcontroller Platform



RENESAS SYNERGY™ PLATFORM

Solutions Gallery

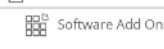
Software



Development Tools



Synergy Software Package



Software Add Ons

Hardware



Kits



Microcontrollers

- Integrated Software, Development Tools, MCUs, Solutions
- Industrial 130 nm and 40 nm

AE-CLOUD2 KIT CONTENT



Part # YSAECLLOUD2



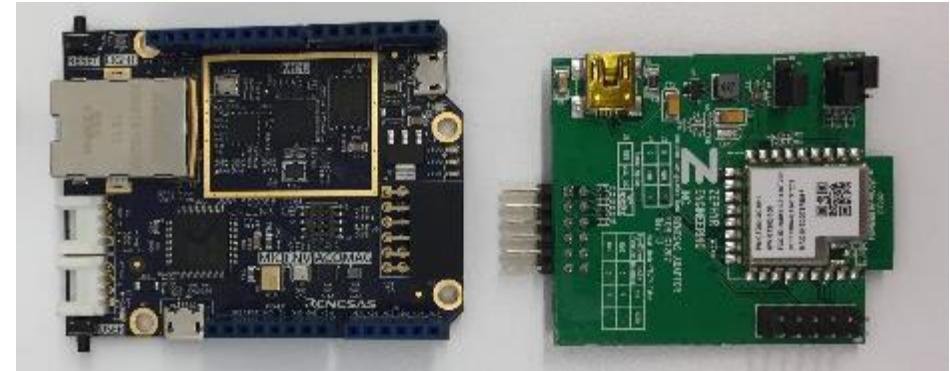
RENESAS AE-CLOUD2 SUPPORT MULTIPLE CONNECTIVITY OPTIONS



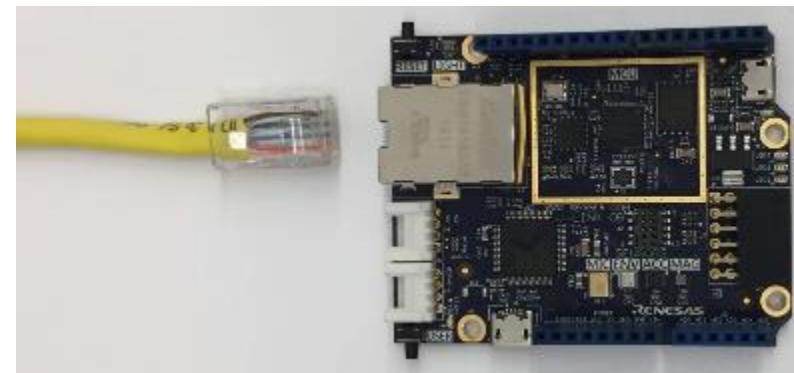
Part # YSAECLOUD2



Cellular: CAT-M1, NB-IoT,
EGPRS

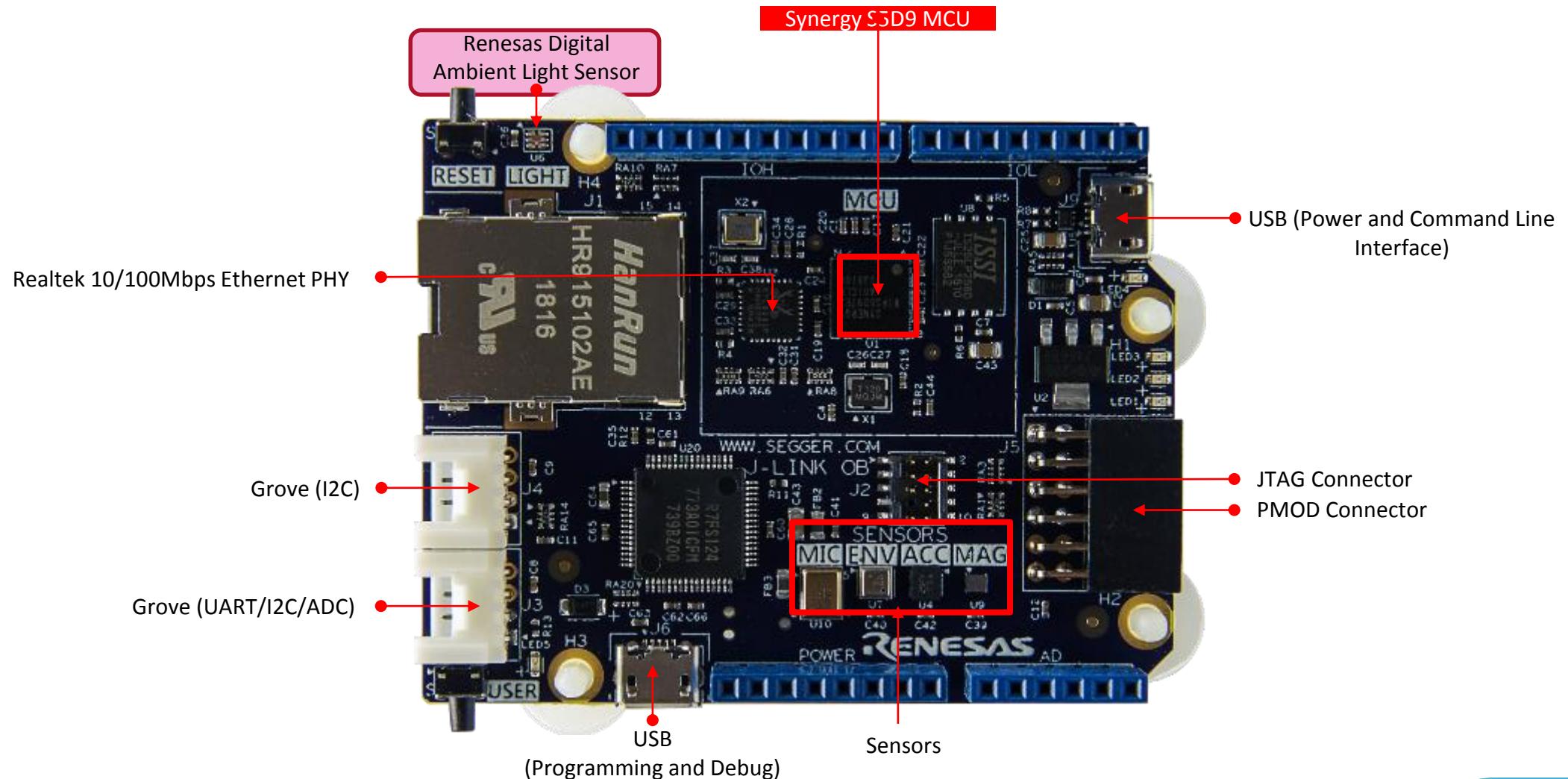


Wi-Fi



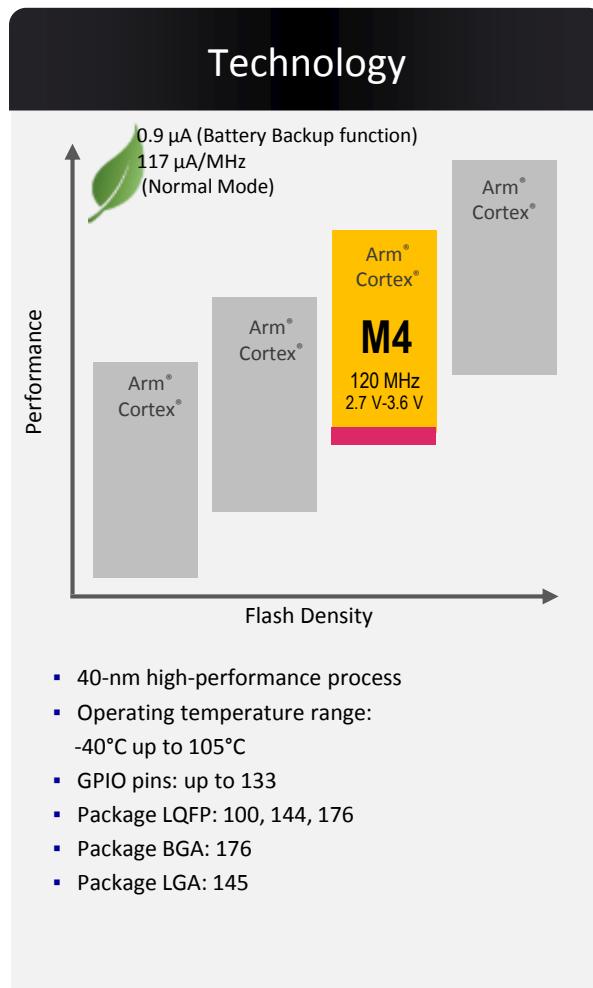
Ethernet

RENESAS SYNERGY S5D9 MCU BOARD



S5D9

MCU Group – 2 MB version Used in AE-CLOUD2 Kit



120 MHz Arm® Cortex®-M4 CPU		S5D9		FPU ARM MPU NVIC ETM	JTAG SWD Boundary Scan
Memory		Memory		Code Flash (up to 2 MB) Data Flash (64KB) SRAM (640 KB) Flash Cache MPUs Memory Mirror Function	12-Bit A/D Converter x2 (24 ch.) 12-Bit D/A Converter x2 High Speed Analog Comparator x6 PGA x6 Temperature Sensor
Analog		Timing & Control		General PWM Timer 32-Bit Enhanced High Resolution x4 General PWM Timer 32-Bit Enhanced x4 General PWM Timer 32-Bit x6 Asynchronous General Purpose Timer x2 WDT	General PWM Timer 32-Bit Enhanced High Resolution x4 General PWM Timer 32-Bit Enhanced x4 General PWM Timer 32-Bit x6 Asynchronous General Purpose Timer x2 WDT
HMI		Timing & Control		Capacitive Touch Sensing Unit (18 ch.) Graphics LCD Controller 2D Drawing Engine JPEG Codec Parallel Data Capture Unit	Capacitive Touch Sensing Unit (18 ch.) Graphics LCD Controller 2D Drawing Engine JPEG Codec Parallel Data Capture Unit
Connectivity		System & Power Management		Ethernet MAC Controller Ethernet DMA Controller Ethernet PTP Controller USBHS CAN x2 Serial Communications Interface x10 IrDA Interface QSPI IIC x3 Sampling Rate Converter External Memory Bus	DMA Controller (8 ch.) Data Transfer Controller Event Link Controller Low Power Modes Multiple Clocks Port Function Select RTC SysTick
Safety		Security& Encryption		ECC in SRAM SRAM Parity Error Check Flash Area Protection ADC Diagnostics Clock Frequency Accuracy Measurement Circuit CRC Calculator Data Operation Circuit Port Output Enable for GPT IWDT	ECC in SRAM SRAM Parity Error Check Flash Area Protection ADC Diagnostics Clock Frequency Accuracy Measurement Circuit CRC Calculator Data Operation Circuit Port Output Enable for GPT IWDT
System & Power Management		Security& Encryption		128-bit Unique ID TRNG AES (128/192/256) 3DES/ARC4 RSA/DSA SHA1/SHA224/SHA256 GHASH	128-bit Unique ID TRNG AES (128/192/256) 3DES/ARC4 RSA/DSA SHA1/SHA224/SHA256 GHASH

SYNERGY ENTERPRISE CLOUD TOOLBOX DEMO

Connects in 10
minutes!



- **Software delivered as a binary**
 - Binary and Quick Start Guide available on cloud.renesassynergy.com
- **Software executes on AE-CLOUD2 kit**
 - Pre-configured for Singtel CAT-M1 and NB-IoT



AE-CLOUD2



- 1 Use Synergy MQTT & TLS to connect to Microsoft Azure
- 2 Quickly compare connectivity with Cellular, Ethernet, and Wi-Fi using Synergy Frameworks
- 3 Visualize sensor data in your own private web based Dashboard
- 4 Use embedded and Dashboard code as a demo and quick way to get started

SUMMARY

- **Synergy Solution for LTE IoT** – very pragmatic and useful as basis to start IoT device design
- Renesas can do it efficiently because Synergy is a platform
- Kit designed with **EMC Best Practices in order to pass RF certifications** for FCC and CE. Kit design available as open source hardware enables excellent reference design for user's developing their own hardware
- More information:
 - [Video](#)
 - [AE-Cloud2 website](#)
 - [Whitepaper](#)

THE IOT HACKATON JOURNEY

BY CREITIVE



DIGITAL CONSULTING PARTNER - IOT HACKATON

Creative is a digital innovation agency supporting companies like Microsoft and Visa. These slides explain how we will be providing a level of support to teams participating in this IoT challenge.

We are a hybrid of four types of agencies:



We represent the agency of the future.



Global Presence

- Asia-Pacific
- Middle East
- Europe
- USA



Our Team

10 digital consultants,
25 developers,
10 designers,
5 media/content specialists

AGENCY OF THE FUTURE FOR LEADING FUTURE-FOCUSED ORGANISATIONS

Recognized as the **agency of the future** by the following **organizations**:



IOT HACKATON JOURNEY



MENTORING AND CONSULTING WORKSHOP

21 Jan 2019
1pm– 5:30pm

- Get you started and prepared before the hackathon.
- Maximise your chance of winning, at least 1 team member to attend this workshop.
- Discover the most compelling value propositions to focus on.
- Gain greater clarity on the concept and what to develop for the prototype.

MENTORING AND CONSULTING WORKSHOP

Consulting and Mentoring Workshop – 21st Jan 2019, 1pm to 5.30pm

Problem Structuring and Exploration

Structuring the problem statement and deep dive in to the problems.

Value Propositions

Discovering the value of the problem that the participants are trying to solve.

Concept Ideation

Ideate around the initial concept and understand it better.

Concept Prioritisation

Analyse the features that can have the most impact and value add to solving the problem.

CONSULTATION WITH CREITIVE

22 – 25 Jan 2019
10am – 5pm

- 1 hour **face-to-face** consultation
- **Solution ideation exercise** to help you consider options and/or flesh out your ideas.
- **Microsoft Teams** will be setup for shortlisted teams for any communication before the event and during the consultation period
- **Prerequisite:** please note that for the consultation to be effective, at least one of your team members needs to have attended the 21 Jan workshop.
- If teams have **questions** outside of consultation period they will be answered via Microsoft Teams or emails.

SINGTEL X MICROSOFT IOT HACKATON

Day 1: Concept Space (Shaping the Concept) – 29th Jan 2019

Concept Deep Dives

Deep dive in to the concept that was prioritised. Understand the concept better and to map out the user journey/wireframes.

Presentation of concepts and receiving feedback

Presenting the finalised concepts and receiving feedback.

Prototype Development

Developing of prototype based on the finalised concept.

Day 2: Prototyping (Developing the Concept) – 30th Jan 2019

Presenting prototypes

Presenting the initial prototype. Updating the status.

Receiving feedback

Gathering feedback from participants on things to improve and what can be done better.

Refining prototypes

Improve the prototype based on the feedback given.

Preliminary business cases & Presentation creation

Develop a business case deck on the concept and prepare for final presentation.

Presentation of business case to judges

Presentation of business case to judges

JUDGING CRITERIA

Teams are judged based on the following criteria.

Criterion

How well the solution addresses the problem statement

How well the solution leverages Azure Microservices and IoT devices

Feasibility of technical implementation

Creativity of the concept

Q & A



QUESTIONS AND ANSWERS

1. What is the problem statement that we are trying to solve?

As this is a retail business challenge, the problem statement focuses on the retail industry such as malls, supermarkets and individual shops. We are looking for innovative IoT solutions to address the following issues:

- How do we help retailers increase sales?
 - We spoke to our retail customers and found that there is currently no IoT solution that directly addresses sales. Whether it's increasing customer satisfaction or getting insights from customer data, teams should develop a solution that can help retailers increase sales.
- How do we help retailers increase productivity?
 - Teams should develop solutions that increase productivity, in areas such as inventory management, operations, employee motivation, etc.

2. How can we get access to the development kits that were shared today?

Let us know what kits you require and we will try our best to accommodate your request. If you are interested in the IoT solutions that were shared earlier in the briefing, do indicate it in the proposal. Teams are also free to bring their own prototypes or solutions for use in the hackathon. Do note that IoT solutions proposed will need to be built on [Microsoft Azure Serverless](#).

QUESTIONS AND ANSWERS

3. Is this briefing session mandatory for all members of my team?

No, it is not mandatory. Teams will be required to submit the names of all members in the proposal, and all members must be present during the hackathon.

4. What are the prizes?

After proposal submission, we will select five qualifying teams to participate in the hackathon. The top three teams will take home [cash prizes](#). The winning team will have the opportunity to work with us on developing their solution. One key consideration is whether the proposed solution is marketable.

5. On the first day of the Hackathon, how much time do we have to develop our prototype?

Your team will have about half a day (from 12 pm) to start work on your prototype based on your finalised concept.

6. What are the differences between the Renesas and Singtel IoT devices shared today?

The two Singtel IoT devices are market-ready industrialised devices which are ready to be used. Renesas is offering a starter kit, which is great for experimenting with different services and sensors.

QUESTIONS AND ANSWERS

7. Do we need to consider costing when drafting our proposal?

The focus of this hackathon is to develop a viable idea for IoT applications in the retail sector. Once the idea has been developed, we will be able help teams with their business plan.

8. What Microsoft Azure services can be used in the competition?

All services can be used. Please refer to the IoT Hackathon slides for a list of recommended services to use. Visit <https://azure.microsoft.com/en-us/services/> to view a directory of products offered on Azure.

9. We would like to implement data analytics and facial recognition. Can that be done?

Yes. Azure has a service called '[Cognitive Services](#)'. Through its API, it can analyse and recognise useful information about an image, and generate a JSON output of the gender of the subject, along with other useful details. Leverage this and other Azure services, which can prove useful in developing your solutions. Think about what you want to build, and don't worry about technology – it will available to support you!

QUESTIONS AND ANSWERS

10. If we were to win, will we have full ownership of this idea? Or will royalties be paid to us?

With the winning idea, we will create a framework that allows your team to continue working on the idea. Your team will be provided with the tools and access to help drive this idea forward and take it to the market. We will also ensure that there will be an appropriate legal framework that addresses ownership issues.

11. How do we submit our proposal?

Submit your proposals via the online form from 18 December 2018 at

<https://www.singtel.com/business/enterprise-solutions/iot-hackathon/submit>. There are six fields to be completed, including:

- What is your business concept?
- How is it going to solve today's business challenge?
- What are some of the sensors and devices that you need?
- Team members details
- Team capabilities

The deadline for proposal submission is on 13 Jan 2019, 2359htd. Drop us an [email](#) for any further questions.

For more information, visit www.singtel.com/iothackathon
or email g-iotmktg@singtel.com

