

# Microsoft Smart Buildings IoT Hackathon

## Objective

Put in to practice what you've learnt the last 2 days, learn some more, share and have fun.

## Theme

The theme for the Hackathon is "Smart Buildings".

This should provide plenty of scope for scenarios such as energy management, lighting, security, building facilities management. Smart Buildings could be workplaces, living spaces, warehouses, hospitals, public spaces etc.

## Agenda

Time	Agenda	Notes
9:00-9:15	Hackathon briefing	Dave Glover Introduction
9:15-5:00PM	Roles and responsibilities, ideate, crack the code, write the presentation	All 6 groups work to on their demo
5:00-6:00PM	Presentation of your hack	6 groups each with no more than 10 mins to present
6:00PM	Awards	Nigel to present the award

## Preparation

1. Review this document:)
2. Your [Development Laptop](#) is ready
3. You have a GitHub user id
4. Review the [sample code](#)
5. Review [Azure IoT Suite](#)

## Teams

- 6 teams of 4 Developers + 2 AEMs people
- Suggest a mix of Azure and Device skills
- Create a team name which will also be used for GitHub Repository name

## Mentors

- Dave Glover (DPE AUSTRALIA) <dglover@microsoft.com>
- Nigel Parker <nigel.parker@microsoft.com>;
- Seok Chern Ngan (Adecco) <a-seon@microsoft.com>
- Wellington Perera <[wellip@microsoft.com](mailto:wellip@microsoft.com)>;
- Fukiat Julnual <[fukiat.julnual@microsoft.com](mailto:fukiat.julnual@microsoft.com)>;
- Toan Huynh <[Toan.Huynh@microsoft.com](mailto:Toan.Huynh@microsoft.com)>;
- Chris Misola <[bmisola@microsoft.com](mailto:bmisola@microsoft.com)>

## Hardware

Teams will be provided with the following.

- 2 x Raspberry Pi 3s per team including SD Cards and Power
- 2 x Raspberry Pi Sense HATs per team

## Developer Machine Setup

Please come prepared with a developer spec machine with the following setup

- Developer Spec Laptop running Windows 10 Anniversary Update (14393) with **admin** rights.
- Visual Studio 2015 Update 3 (Community Edition or above)
  - Universal Windows App Development Tools 1.4.1 and Windows 10 SDK (10.0.14393)
  - [IoT Core Project Template](#)
- [Windows 10 IoT Core Dashboard](#)
- [IoT Hub Device Explorer](#)
- [Windows IoT Remote Client from the Windows 10 App Store](#)

## Pre-Cache Windows IoT Core Nuget Packages

Create and Build a test Windows IoT Core project. The purpose is to pre-cache the required NuGet packages on to your PC before the Hackathon as they are large downloads.

## Source Code Repository

- GitHub Organisation: <https://github.com/bkchackathon>
- All developers should have a GitHub user id which will be added to [www.github.com/bkchackathon](https://github.com/bkchackathon).
- Teams to create own repository using team name

## Raspberry Pi Operating System

Windows 10 IoT Core or Raspbian Linux.

Whichever you are more comfortable with, want to explorer further and/or suits your customer profile.

## Raspberry Pi Sense HAT

This HAT has a great selection of sensors, a display and a joystick.

- There are temperature, barometric and humidity sensors.
- You could use the accelerometer to simulate an earthquake, a lift vibrating in need of maintenance.
- The joystick presses to simulate the number of people in an area or using a facility such as the bathroom.
- The magnetometer (compass) to simulate the sun or wind direction.
- You could use the LED display to graph data, simulate blinds opening and closing or lights being turned off and on.

These are just some ideas, let your imagination run wild.

## Pi Sense Hat Specification

The Pi Sense HAT has an 8x8 RGB LED matrix, a five-button joystick and includes the following sensors:

- Gyroscope
- Accelerometer
- Magnetometer (compass)

- Temperature
- Barometric pressure
- Humidity

For more information, see <https://www.raspberrypi.org/products/sense-hat>

#### Drivers

- Windows 10 IoT Core: <https://www.nuget.org/packages/Emmellsoft.IoT.RPi.SenseHat/>
- Raspbian Linux: <https://www.raspberrypi.org/products/sense-hat/>

#### Azure IoT Hub Raspberry Pi Sample Code

- Azure IoT Hub and Windows IoT Core C# [Samples](#)
- Azure IoT Hub and Raspberry Pi on Rasbian Linux Python [Sample](#)
- Maker Den Windows IoT Core, IoT Hub, Stream Analytics and Power BI [Guide](#)
- Other samples at [www.github.com/gloveboxes](http://www.github.com/gloveboxes)

#### Azure IoT Suite

Azure IoT Suite ships with two samples that could provide a useful starting point.

See <https://azure.microsoft.com/en-us/suites/iot-suite>

- Predictive maintenance
- Remote monitoring

#### Azure Resources

##### IoT Hubs

- There will be 6 (one for each team) Azure IoT Hubs setup centrally with a message limit of 400000 messages per day. Alternatively feel free to use your own IoT Hub on your own subscription.
- Details of the central IoT Hubs will be provided on the day

##### Azure other

It is assumed that other Azure services such as Stream Analytics, web sites etc will be hosted in a developer's own Azure accounts. See how to [provision a trial Azure](#) account if you do not have one.

#### Power BI

If you do not have a Power BI account, then one will be provided on the day.

#### Team Presentation

You should have a working concept ready to present to the group by 5pm.

- 10 minutes to present per team
- Overview of solution
- Key learnings