

IOT with Azure

2019
Global Azure
BOOTCAMP



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#whoami



Yogesh Ojha

Cyber Security Analyst
Tata Consultancy Services

- Hardware Hacker
- IOT & Mobile Application Security
- Loves building mobile apps!
- Loves to build and play with Robots, break them very often!
- Machine Learning Enthusiast



What is IOT?



The Internet currently connects people to people (P2P) and is now being called Internet Phase 1.

The next Phase of the Internet is just beginning, and will connect people to everyday devices (M2P), and everyday devices to each other (M2M).



The IoT is being called the fourth industrial revolution, and is expected to have value of over \$10 trillion by 2025.



McKinsey Global Institute

What is IOT?



The Internet currently connects people to people (P2P) and is now being called Internet Phase 1.

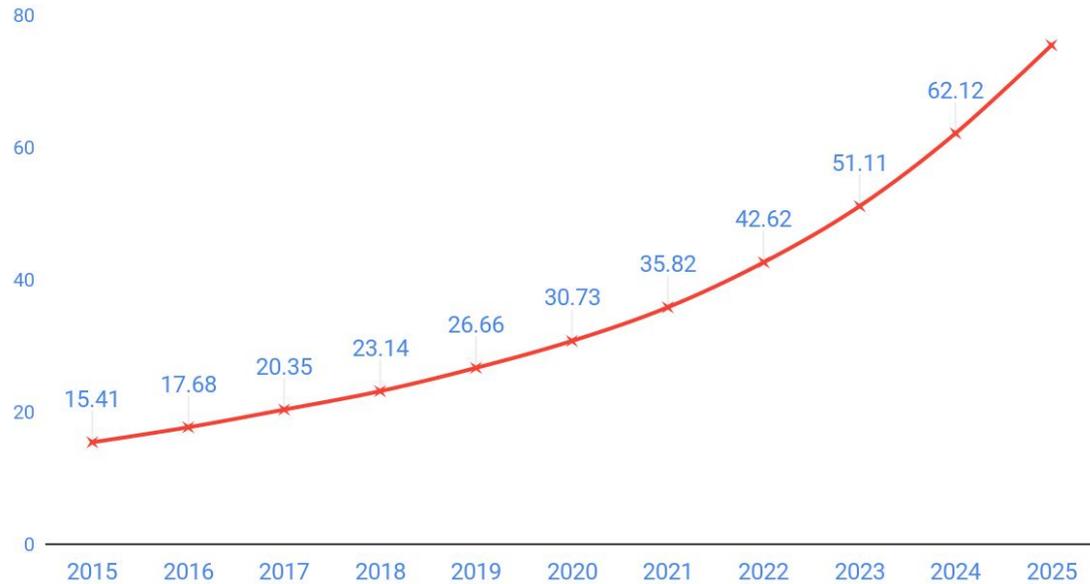
The next Phase of the Internet is just beginning, and will connect people to everyday devices (M2P), and everyday devices to each other (M2M).

IoT is creating a giant network where all the devices are connected to each other and providing them with the capability to interact with each other. This is driving the automation to a next level where devices will communicate with each other and make decisions on their own without any human interventions.

Growth of IOT

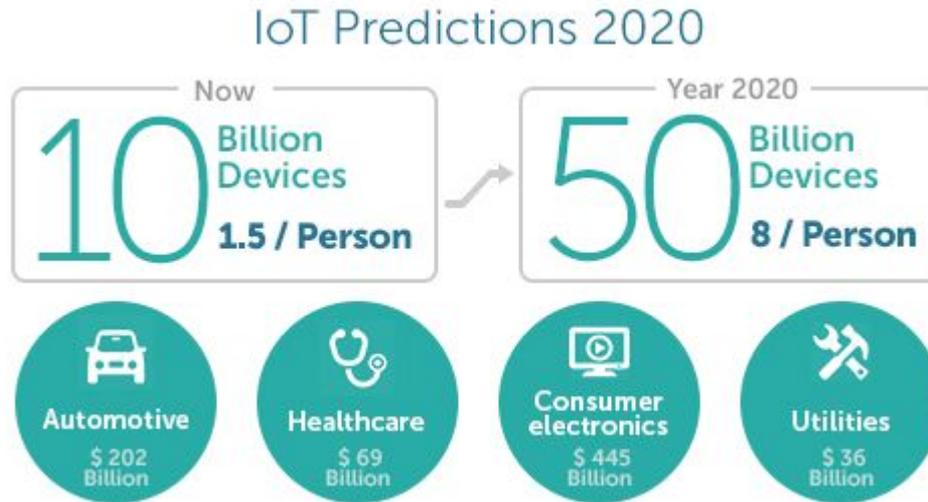


Number of IOT devices Connected in Billions



Source: Statista, 2018

IOT Prediction

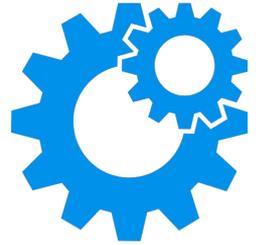
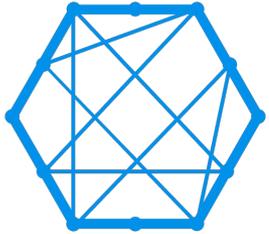


Source: Gigashield

What's more in IoT?



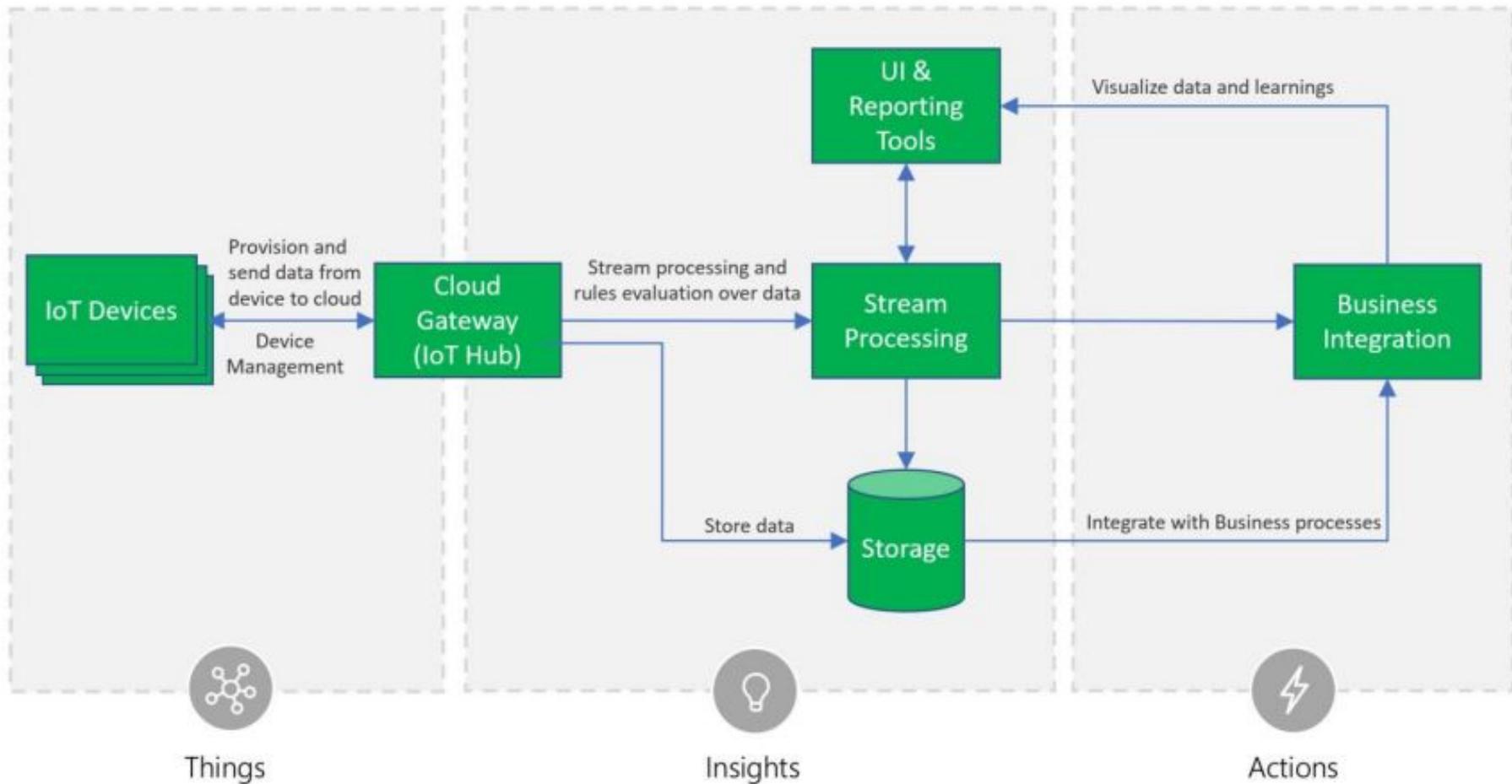
IOT Architecture

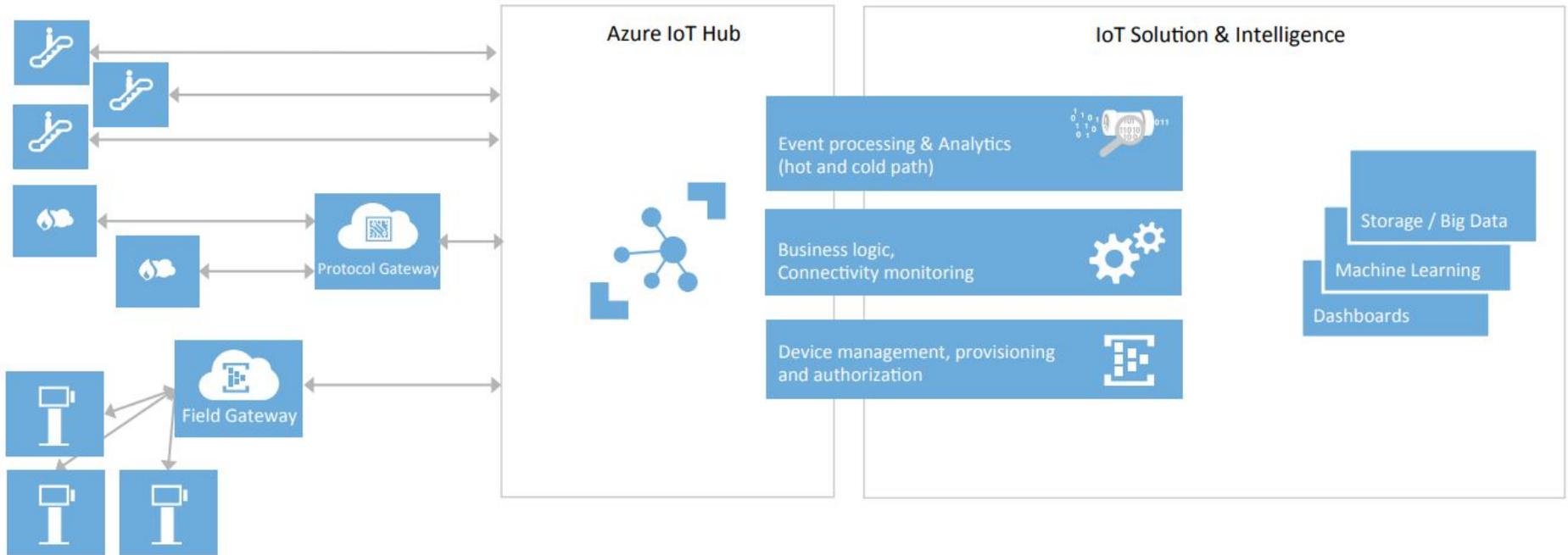


Things
Generate Data

Insight
Based on
Generated Data

Action
Based on
Insight





Azure



Azure

Azure IoT Hub



Azure IoT Hub

Azure IoT hub



Establish

Bi-directional communication with billions of IoT devices



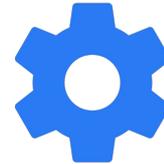
Authenticate

Per device for security-enhanced IoT solutions



Register

Devices at scale with IoT Hub Device Provisioning Service



Manage

IoT devices at scale with device management



Extend

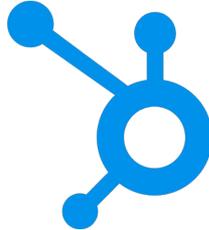
Power of the cloud to your edge device

Why Azure IoT hub?



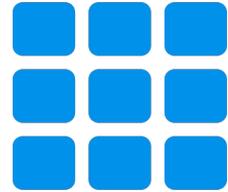
Secure

End to End Security
provided



Open

Use any device, OS, data
source, software or
service



Scalable

Enable millions of devices
and terabytes of data in
most regions worldwide

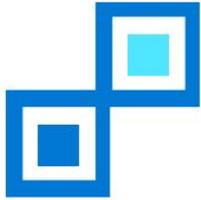
Security in Azure IOT Hub



Internet of Things without Security is
Internet of Threats



Azure IOT Edge



Network Constraints

If bandwidth between the devices and the cloud is limited, there is an incentive to do more edge processing.



Response Time

If there is a requirement to act on a device in near real-time, it might be better to process the response in the device itself, such as a robot arm that needs to be stopped in an emergency.



Regulatory and Safety

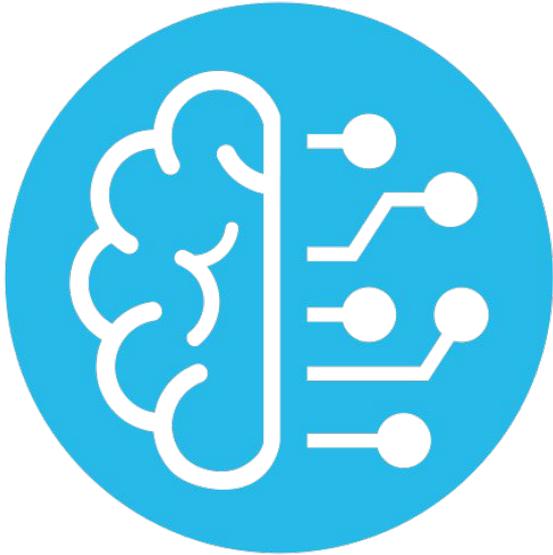
Some devices should not always be connected to the cloud because of the consequences if one were compromised, such as a jet engine. Additionally, regulations may prevent some data from being sent over the network.

SDK Availability



							iOS
Send Telemetry	✓	✓	✓	✓	✓	✓	✓
Control a device	✓	✓	✓	✓	✓		
Communicate between device streams	✓	✓				✓	
SSH/RDP using device streams	✓	✓				✓	

What else has Azure for you?



Azure Machine Learning

A Python-based machine learning service with automated machine learning and edge deployment capabilities.

AI apps and agents

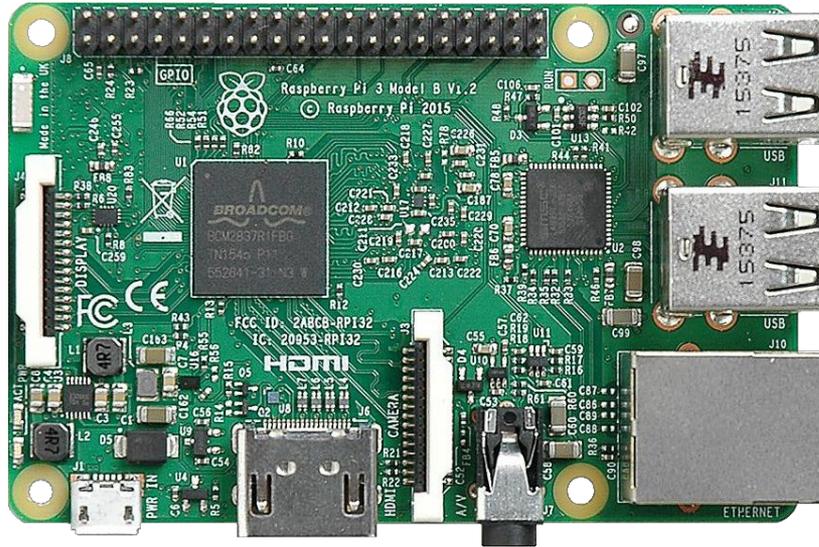
Cognitive Services



Getting started with Azure IoT Hub

What do I need to get started?

A hardware!!!



Getting started with Azure IoT Hub

What do I need to get started?

Azure Active Subscription



The screenshot displays the Microsoft Azure portal interface. The top navigation bar includes the 'Microsoft Azure' logo, a search bar containing 'iot hub', and a user profile for 'yogesh.ojha11@hotmail.com' with the role 'DEFAULT DIRECTORY'. The left-hand navigation pane lists various services, with 'Azure Active Directory' at the bottom. The main content area shows the 'IoT Hub' resource page for the 'Default Directory'. It features a table of subscriptions under the heading 'Subscriptions: Azure Pass - Sponsorship'. The table has columns for 'NAME', 'TYPE', 'RESOURCE GROUP', 'LOCATION', and 'SUBSCRIPTION'. One item is listed: 'bbs-iot-hub-demo' of type 'IoT Hub', located in the 'iotResource' resource group in the 'Southeast Asia' region, under the 'Azure Pass - Sponsorship' subscription.

NAME	TYPE	RESOURCE GROUP	LOCATION	SUBSCRIPTION
bbs-iot-hub-demo	IoT Hub	iotResource	Southeast Asia	Azure Pass - Sponsorship

Getting started with Azure IoT Hub



What do I add my device to IOT Hub?

IoT hub Microsoft

Basics

Size and scale

Review + create

Create an IoT Hub to help you connect, monitor, and manage billions of your IoT assets. [Learn More](#)

PROJECT DETAILS

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

* Subscription ⓘ

Azure Pass - Sponsorship



* Resource Group ⓘ

Select existing...



[Create new](#)

* Region ⓘ

West US



* IoT Hub Name ⓘ

Name your IoT Hub

Getting started with Azure IoT Hub

What do I add my device to IOT Hub?



IoT hub
Microsoft

Basics **Size and scale** Review + create

Each IoT Hub is provisioned with a certain number of units in a specific tier. The tier and number of units determine the maximum daily quota of messages that you can send. [Learn more](#)

SCALE TIER AND UNITS

* Pricing and scale tier ⓘ S1: Standard tier
[Learn how to choose the right IoT Hub tier for your solution](#)

Number of S1 IoT Hub units ⓘ 1
This determines your IoT Hub scale capability and can be changed as your need increases.

Pricing and scale tier ⓘ S1	Device-to-cloud-messages ⓘ Enabled
Messages per day ⓘ 400,000	Message routing ⓘ Enabled
Cost per month 1652.41 INR	Cloud-to-device commands ⓘ Enabled
	IoT Edge ⓘ Enabled
	Device management ⓘ Enabled

Advanced Settings

Getting started with Azure IoT Hub

What do I add my device to IOT Hub?



IoT hub
Microsoft

Basics Size and scale **Review + create**

BASICS

Subscription ⓘ	Azure Pass - Sponsorship
Resource Group ⓘ	iotResource
Region ⓘ	Southeast Asia
IoT Hub Name ⓘ	iot-bbsr-demo-1

SIZE AND SCALE

Pricing and scale tier ⓘ	S1
Number of S1 IoT Hub units ⓘ	1
Messages per day ⓘ	400,000
Cost per month	1652.41 INR

Any Questions?

More Getting Started Tutorials on Azure IoT hub!

- <https://azure.microsoft.com/en-in/services/iot-hub/>
- <https://www.c-sharpcorner.com/article/what-is-azure-iot-hub/>
- <https://www.pluralsight.com/courses/azure-iot-hub-developers-getting-started>

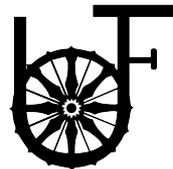
 yogesh.ojha11@gmail.com

 Yogesh Ojha

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