

# Internet of Things (IoT)

Data Science Dojo

# What is the Internet of Things?

- Connecting any device with an on and off switch to the Internet (and/or to each other)
  - Examples: cell phones, coffee makers, washing machines, headphones, lamps, wearable devices, and almost anything else you can think of
  - This also applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig



Gartner predicts that by 2020 there will be over 26 billion connected devices

The IoT is a giant network of connected "things" (which also includes people).



# Scenario

- You are on your way to a meeting
  - Your car accesses your calendar and already knows the best route to take
  - If traffic is heavy, your car might send a text to the other party notifying them that you will be late

# Potential Impact of IoT

- Your alarm clock wakes up you at 6 am and then notifies your coffee maker to start brewing coffee for you
- Your office equipment knew when it was running low on supplies and automatically re-ordered more
- The wearable device you use in the workplace tells you when and where you were most active and productive and shares that information with other devices that you used while working

# Consumer Packaged Goods – Amazon Dash



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Key Features

amazon<sup>®</sup>dash



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**SAY IT**  
Say what you want and Dash finds it for you. Just press and hold the voice button to speak into the microphone. It's voice search that actually works.

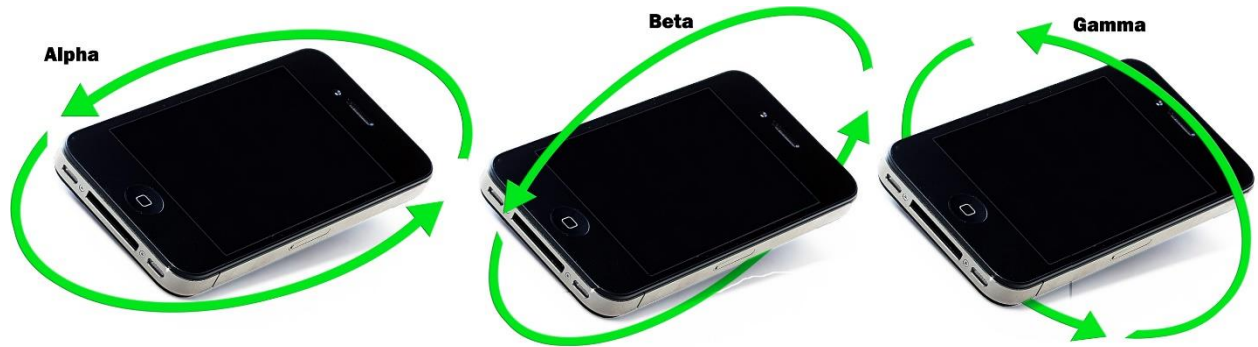
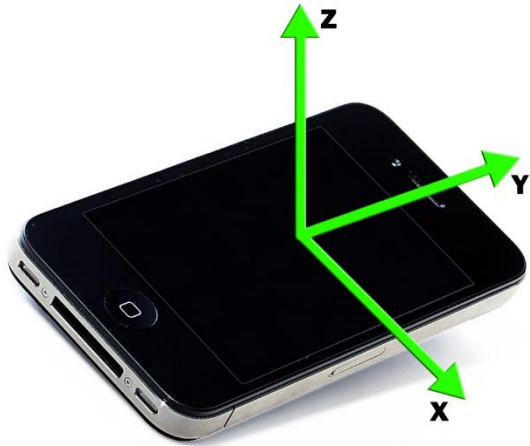
**SCAN IT**  
Point at what you want and Dash adds it to your list. Scan a week's worth of groceries in minutes. Dash recognizes millions of items available on AmazonFresh and Amazon.com.

**EASY SETUP**  
Dash connects to your home's Wi-Fi network with a simple setup.

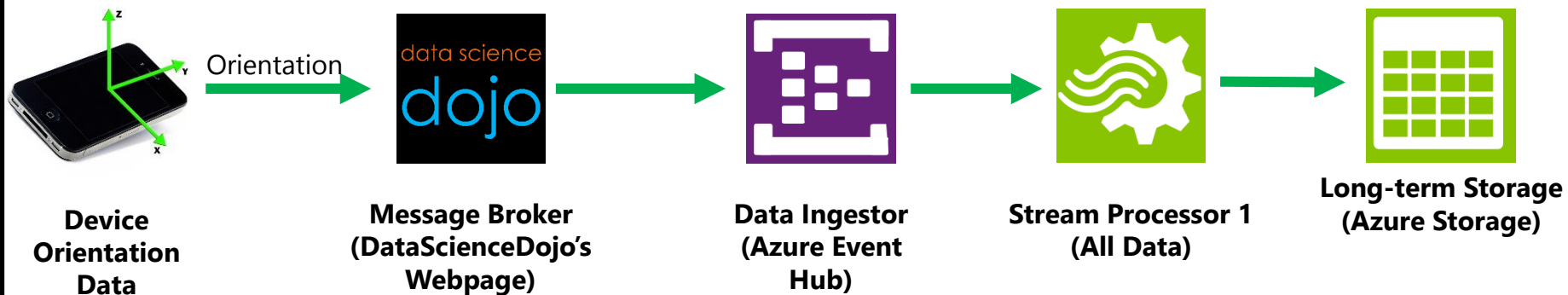
**STURDY DESIGN**  
Dash is made to withstand busy households, so go ahead and grab it with flour on your hands to order more supplies.

# IoT Hack Day Project

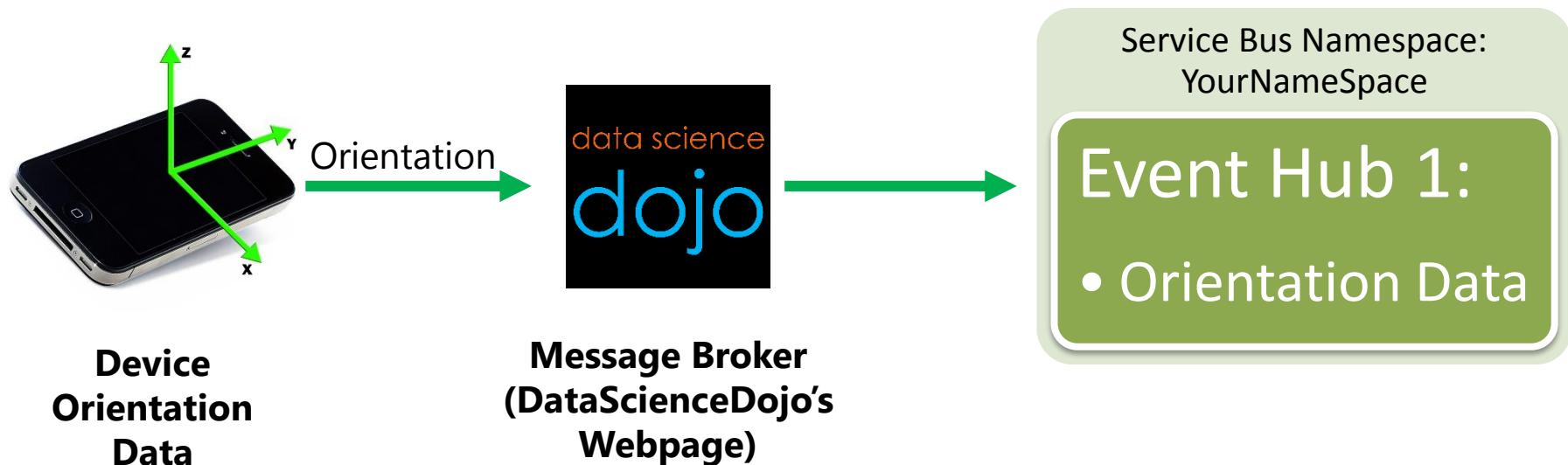
# Smart Device Orientation



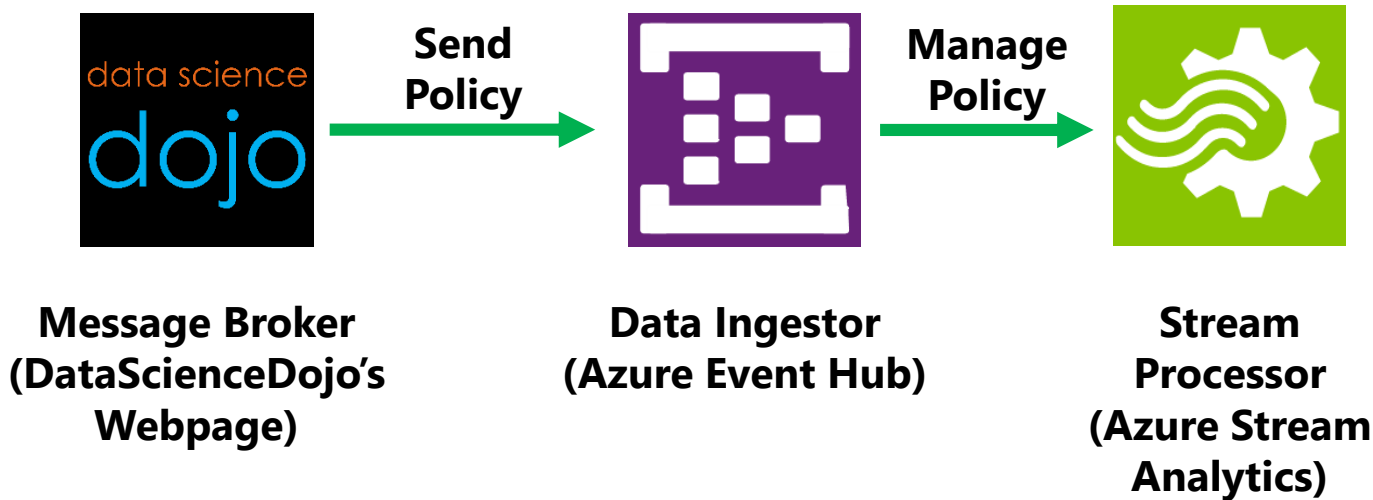
# Pipeline



# Inside the Event Hub



# Setting Policies




# The Streamer

- <http://demos.datasciencedojo.com/app/iot/>

## IoT Phone App

Hooks up your phone's telemetry to the cloud. Takes orientation data (x, y, z) from your phone and sends it into an Azure Event Hub as a stream. Phones use gyroscope, accelerometer, and magnetometer, to detect its orientation for games, apps, and window orientation. This web app will collect the same kind of information a phone app game would, and sends it to an Azure Event Hub.

 **Event Hub Credentials**

**Event Hub Name**

**Endpoint Connection String**

**Test Connection** **Stream Data**

## Device Orientation

**Event Supported**  
Tilt Left/Right [gamma]  
Tilt Front/Back [beta]  
Direction [alpha]

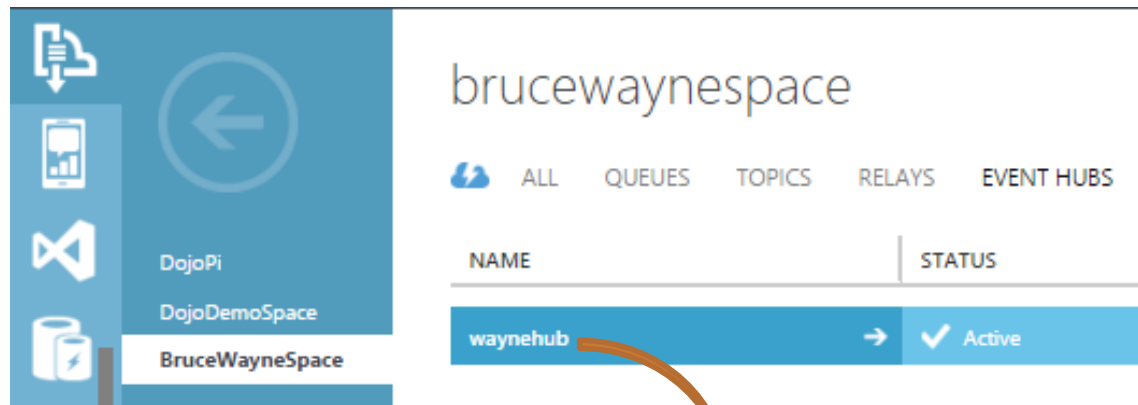


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# Event Hub Name



brucewaynespace

ALL QUEUES TOPICS RELAYS EVENT HUBS

NAME	STATUS
waynehub	✓ Active

Event Hub Credentials

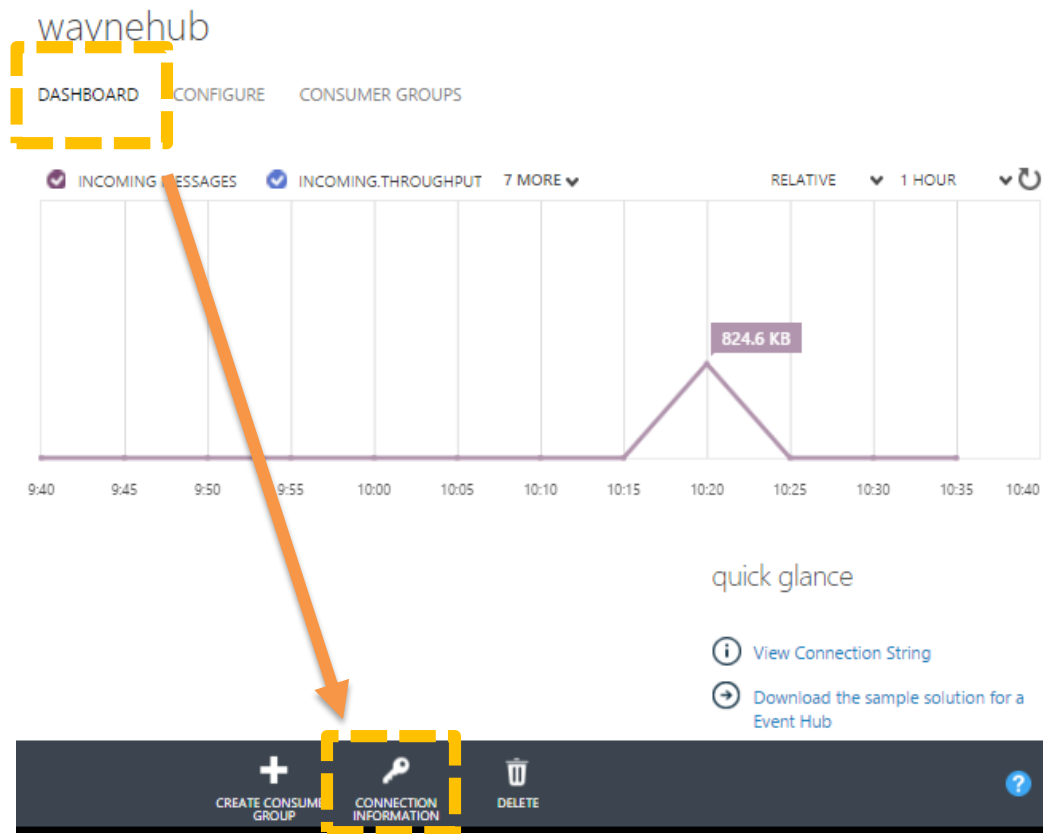
Event Hub Name

waynehub

Endpoint Connection String

field required

# Connection String





# Connection String

Access connection information

Use this connection information to connect to event hub 'waynehub'.

SAS ?

NAME	CONNECTION STRING	
sendkey	Endpoint=sb://brucewaynespace.servicebus.windows.net/;SharedAccessKeyName	

 Event Hub Credentials

Event Hub Name

waynehub

Endpoint Connection String

Endpoint=sb://brucewaynespace.servicebus.windows.net/;SharedAcc

# Testing Connection

IoT Phone App

Hooks up your phone into an Azure Event Hub orientation for game phone app game v

Server Response

Successfully sent test data to the Azure Event Hub.

Okay

Event Hub Credentials

Event Hub Name

waynehub

Endpoint Connection String

Endpoint=sb://brucewaynespace.servicebus.windows.net/;SharedAcc

Test Connection Stream Data

Device Orientation

Event Supported

Tilt Left/Right [gamma]  
Tilt Front/Back [beta]  
Direction [alpha]

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# QUESTIONS