

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



Consumer Packaged Goods – Amazon Dash



Consumer Packaged Goods – Amazon Dash



Consumer Packaged Goods – Amazon Dash

Key Features amazondash



1.125 IN

6.375 IN

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.

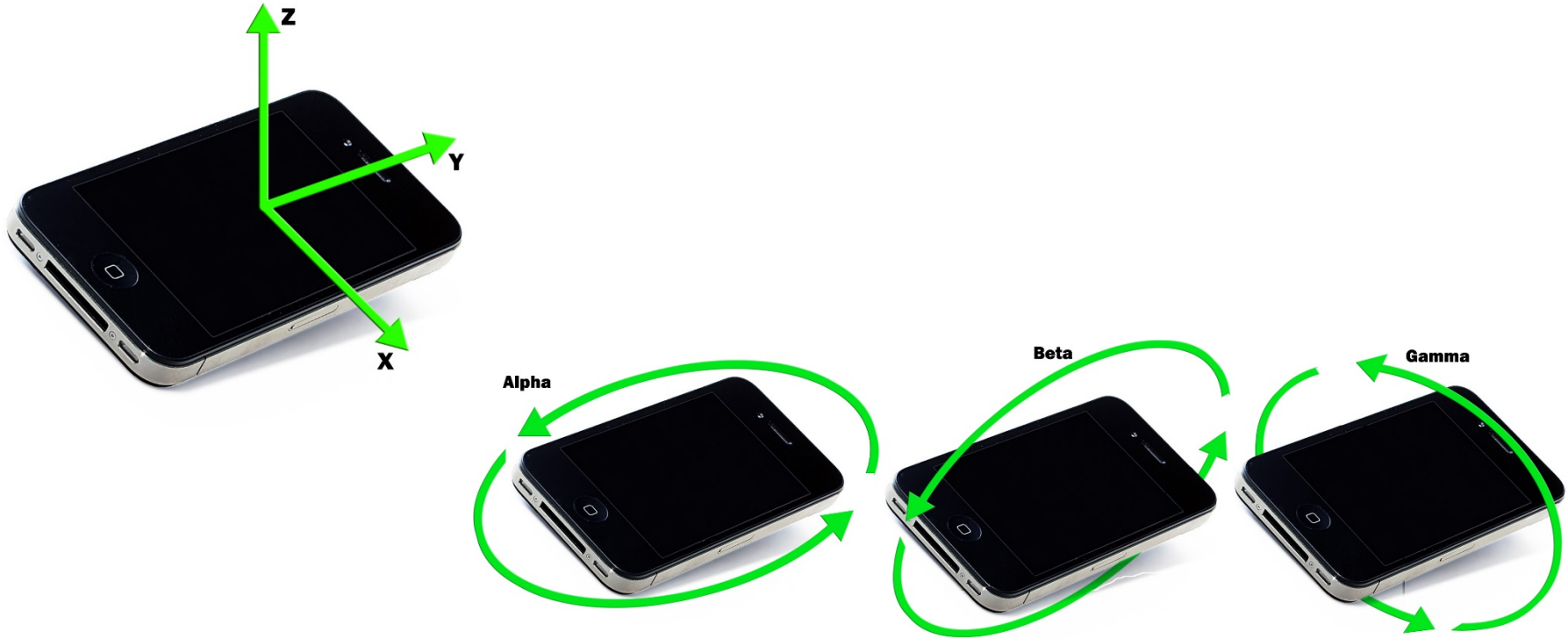
SCAN IT
Point at what you want and Dash adds it to your list. Scan a week's worth of groceries in minutes. Dash recognizes millions of items available on AmazonFresh and Amazon.com.

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

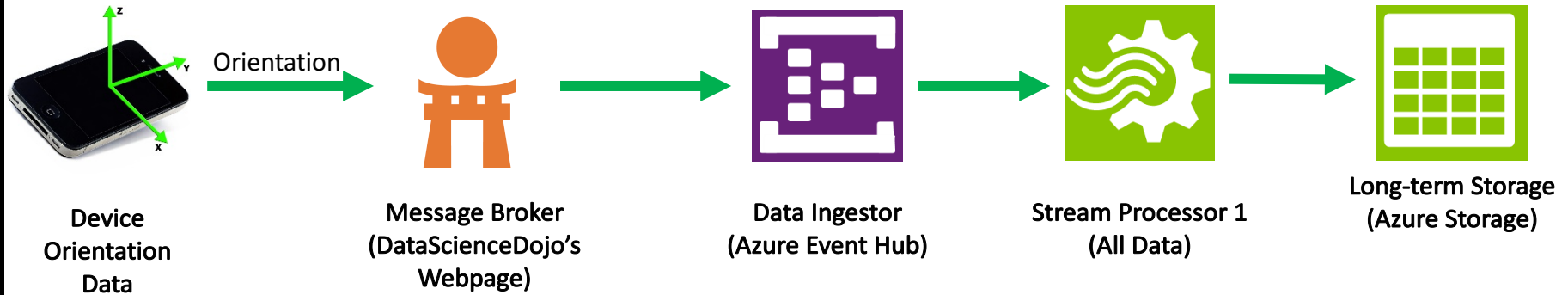
STURDY DESIGN
Dash is made to withstand busy households, so go ahead and grab it with flour on your hands to order more supplies.

IoT Hack Day Project

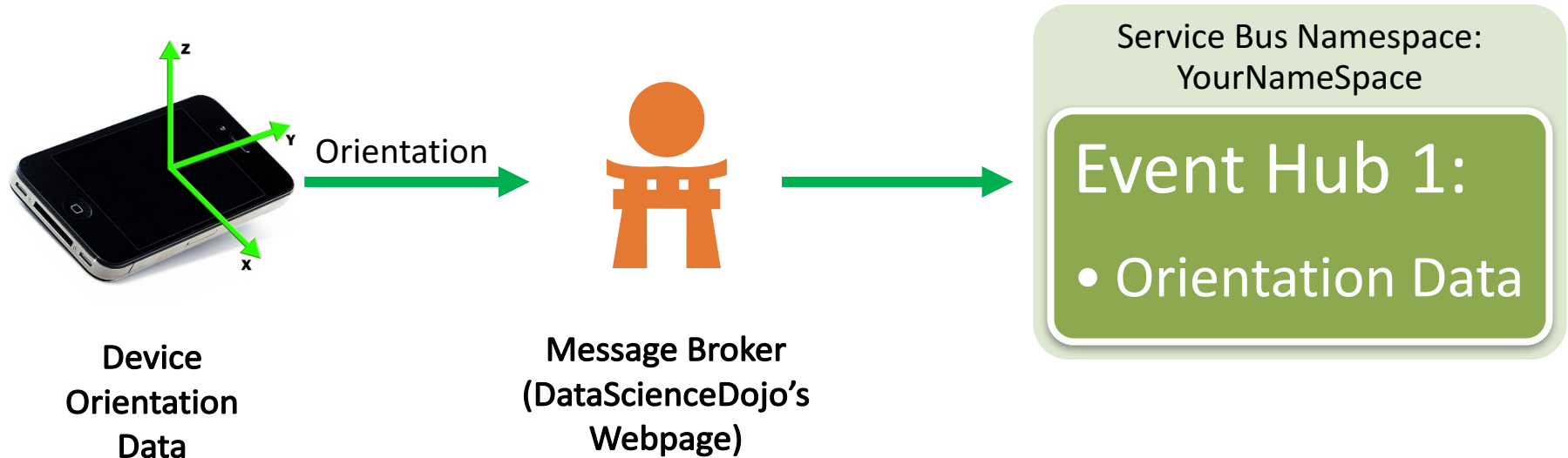
Smart Device Orientation



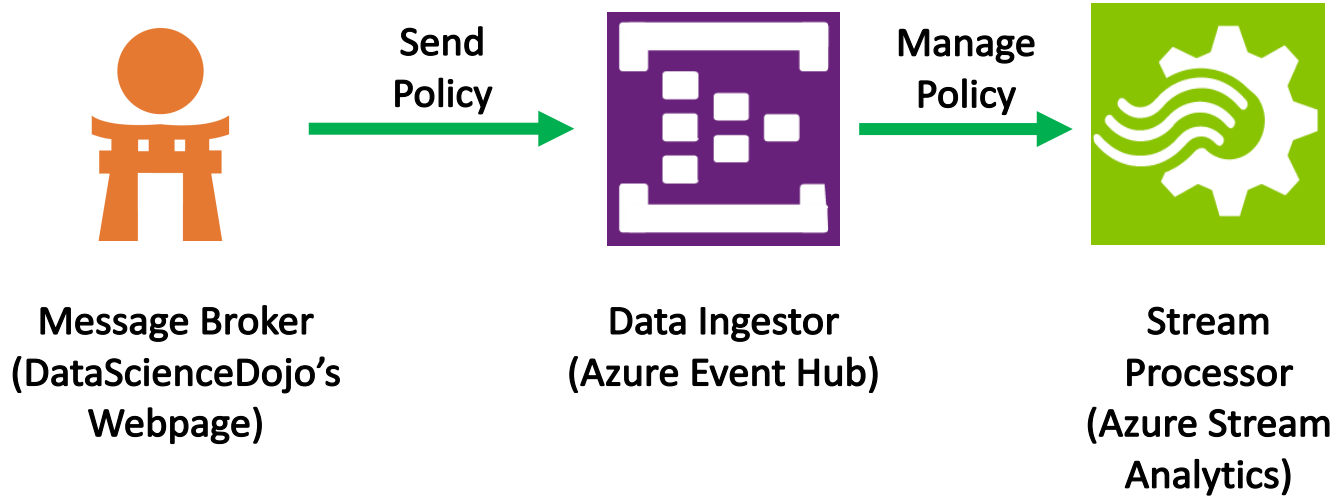
Pipeline



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

field required

Endpoint Connection String

field required

Test Connection

Stream Data

Device Orientation

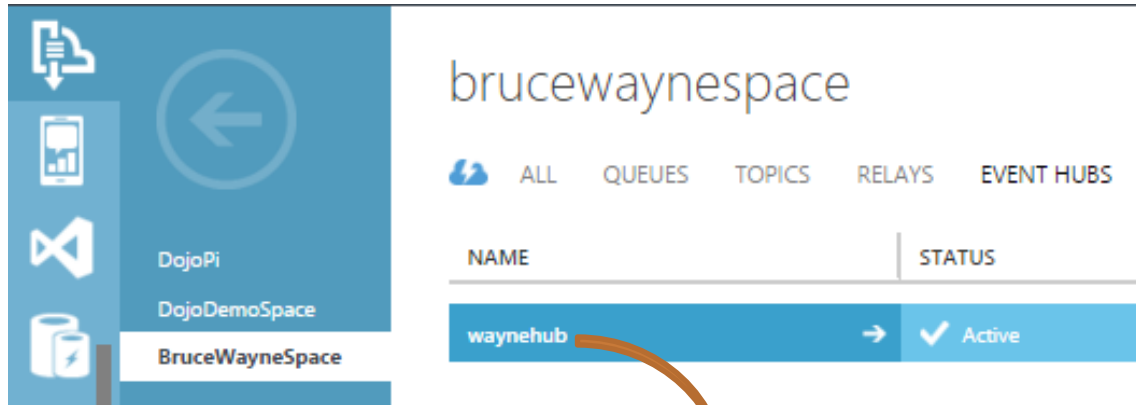
Event Supported
Tilt Left/Right [gamma]
Tilt Front/Back [beta]
Direction [alpha]



We're d

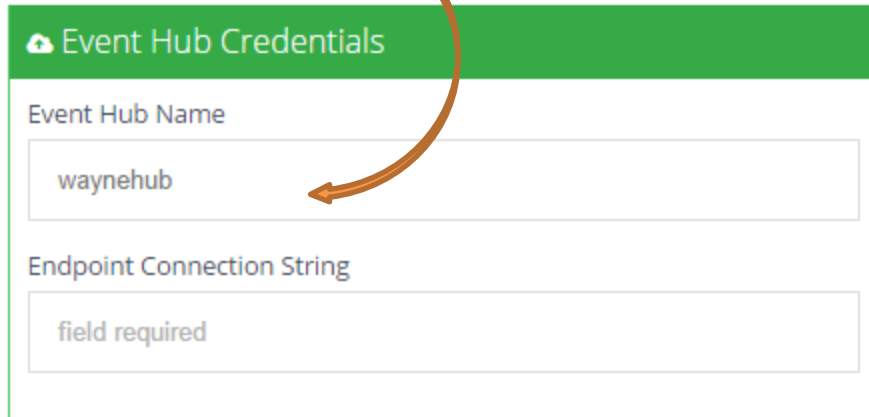
We're
if y
Hi, we
que

Event Hub Name



The screenshot shows the Azure portal interface. On the left is a navigation pane with icons for various services and a list of spaces: DojoPi, DojoDemoSpace, and BruceWayneSpace. The main area displays the 'brucewaynespace' configuration. Below the space name are tabs for 'ALL', 'QUEUES', 'TOPICS', 'RELAYS', and 'EVENT HUBS'. A table lists the event hubs with columns 'NAME' and 'STATUS'. The table contains one entry: 'waynehub' with a status of 'Active'.

NAME	STATUS
waynehub	✓ Active



The 'Event Hub Credentials' form is shown. It has a green header with a cloud icon and the text 'Event Hub Credentials'. Below the header are two input fields. The first field is labeled 'Event Hub Name' and contains the text 'waynehub'. The second field is labeled 'Endpoint Connection String' and contains the text 'field required'. An orange arrow points from the 'waynehub' entry in the table above to the 'Event Hub Name' input field.

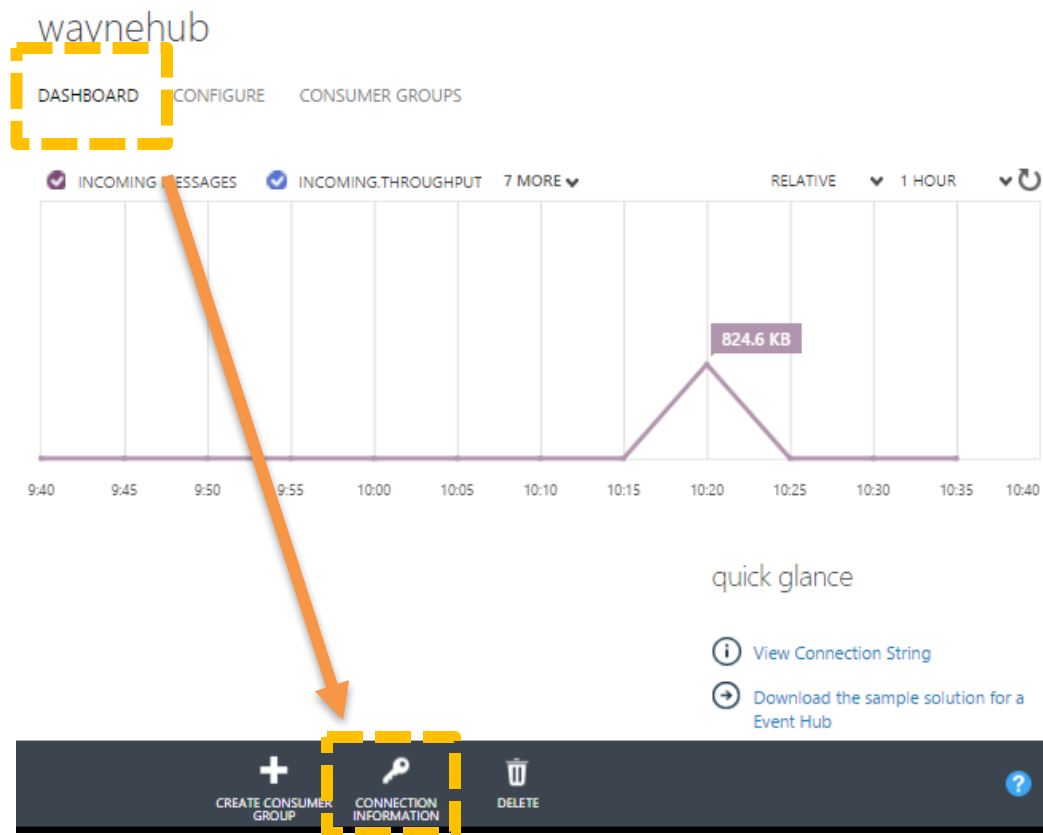
Event Hub Name

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 for 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]

We're

We're

if

Hi, v

qu

QUESTIONS