Software Practice 3

- Today’s lecture
- Today’s Task

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ARTIK
ARTIK, cloud platform for IoT

- Device-agnostic and scale to all IoT applications
Communication to Artik

- Artik cloud supports two versions of communication
  - Realtime communication
    - Receive data actively while devices are alive
  - Interactive communication (Today)
    - Receive data when user requests some data
    - Send data/action also when user requests to do so

- Both above types use special socket named as WebSocket
WebSockets in Artik

- **Firehose WebSocket**
  - To listen to messages sent by the source devices that the application monitors

- **Device channel WebSocket (Today)**
  - To receive messages targeted to your applications or devices
  - Allows the applications or devices to send messages back to Artik
Overall Execution Flow

1. Send Action
   - ACTIONS
   - TURN DEVICE
   - ON / OFF
   - Monitor data

2. Send Action
   - ACTIONS
   - TURN DEVICE
   - ON / OFF
   - Send data

3. Data
   - Exchange
   - Platform for IoT
   - Developers

4. State
   - Report Temp
   - data

My Temp Device
API Execution Flow

Sensor sending data

Send data to ARTIK with REST API

onAction() in sensor's data channel websocket

Send action turn on / off in data channel websocket

App monitoring data

onMessage() in app's firehose websocket

ARTIK
Application Part & Sensor Part

**APPLICATION PART**
- Send turn on/off action through data channel websocket(app) when button clicked
- Monitor data in real time through firehose websocket
- Show data in real time

**SENSOR PART**
- If turning on, send turn the spray on or off at each 1 second (REST API)
- Receive action through data channel websocket(sensor)
- Check action whether it is turned on or off
DEVICE MANIFEST FOR ACTION
Application Overview
Properties of Fire Sensor

Field
- onFire: true if fired, else false

Action
- None

Field
- power: spray water when true, else stop spraying

Action
- turnOn: set the device on for responding the fire sensor
- turnOff: set the device off
Go to Artik Dashboard

- [https://developer.artik.cloud](https://developer.artik.cloud)
- Click “Water spray device”
Setup New Manifest

[Image: Website screenshot showing the setup process for a Water spray device (sim) with options for selecting and configuring the device.]
Define Device Actions
Define Device Field

Device Fields
Describe fields for each piece of data produced by this device.

Device Actions
Describe actions that this device is capable of receiving.

Activate Manifest
Publish this device manifest on the ARTIK cloud services platform.

- **turnOn**
  - Power On

- **turnOff**
  - Power Off

Next: Activate Manifest
Activate Manifest

The active manifest describes the capabilities of your device type to other users and devices on the ARTIK cloud services platform. Use fields and actions to describe the data that this device type produces and accepts.

### Device Fields
Describe fields for each piece of data produced by this device.

- **power** (Boolean)

### Device Actions
Describe actions that this device is capable of receiving.

- **turnOn** (Action)
- **turnOff** (Action)

Your manifest is ready to be activated and does not require approval before going live. Activating this manifest will replace the current manifest. The device type will stay private.

**Fields**

- **power** (Boolean)

**Actions**

- **turnOn** (Action)
- **turnOff** (Action)

[Activate Manifest]
HOW TO SEND ACTION FROM ANDROID TO ARTIK DEVICE
Sample Screen on Mobile Phone
Sample Screen on Mobile Phone

1. Get message from Firehose
2. Open Device Channel
3. Send action with Device Channel

Fire sensor:
onFire : false
Water spray:
power : false

DeviceChannel started for
08f4cf82c0b44526a1a14b959a330b2
# Data Log of Artik Devices

## Filters

<table>
<thead>
<tr>
<th>Device</th>
<th>Recorded At</th>
<th>Received At</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Sensor on First Floor</td>
<td>May 17 2018 16:05:20.000</td>
<td>May 17 2018 16:05:20.431</td>
<td>&quot;onFire&quot;:true</td>
</tr>
<tr>
<td>Water Spray on Third Floor</td>
<td>May 17 2018 16:05:30.000</td>
<td>May 17 2018 16:05:30.694</td>
<td>&quot;power&quot;:false</td>
</tr>
<tr>
<td>Fire Sensor on First Floor</td>
<td>May 17 2018 16:05:20.000</td>
<td>May 17 2018 16:05:20.431</td>
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<td>May 17 2018 16:05:20.430</td>
<td>&quot;power&quot;:false</td>
</tr>
<tr>
<td>Fire Sensor on First Floor</td>
<td>May 17 2018 16:05:10.000</td>
<td>May 17 2018 16:05:10.437</td>
<td>&quot;onFire&quot;:true</td>
</tr>
</tbody>
</table>

## Screenshots

![Artik Devices Data Log](image-url)
Data Log of Artik Devices
Develop Artik application & mobile application

- Consists of Artik application
  - Fire detection and water spray system
  - 3 Fire detection sensors – virtually on 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd} floor
    - (Field) onFire – Integer; strength of fire varying from 0 to 100, no fire if “onFire = 0”
  - 3 Water spray machine – virtually on 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd} floor
    - (Field) power – String; “stop”, if no fire
      “weak”, if 0 < onFire < 33
      “mid”, if 33 <= onFire < 67
      “strong”, if 67 <= onFire <= 100
  - (Action) turnOn – no param; turn on the device
  - (Action) turnOff – no param; turn off the device
[Lab – Practice #11]

- Group the fire detectors and the water spray machines on the same floor respectively
  - if status of any device changed on the same floor, update TextView like given examples represented in next slide

- Durability
  - The application should not be stopped until the application stopped or clicking stop button
[Lab – Practice #11]

- Sample screens

![Sample screens image]