

HyWAI for Web of Things

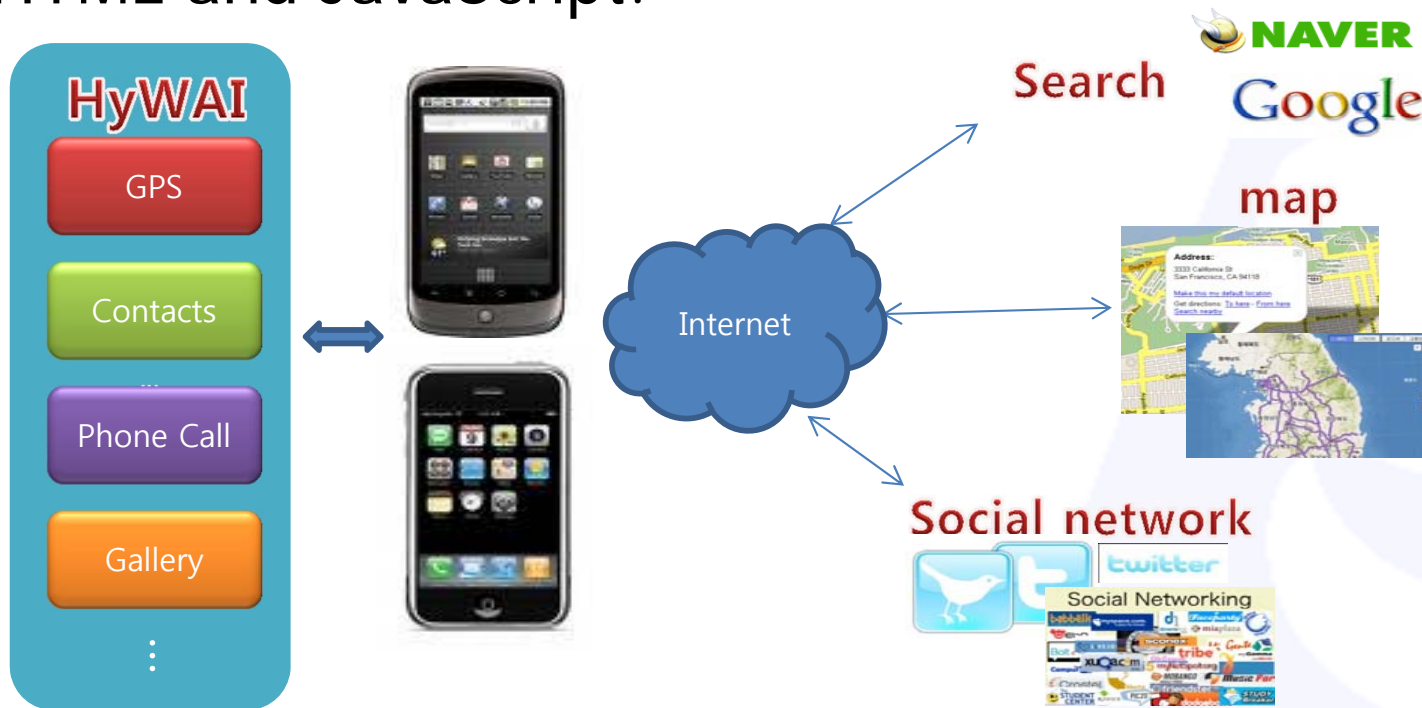
ETRI

Jonathan Jeon (Jonghong Jeon, 전종홍)



Introduction

- ❑ **HyWAI** is an HTML5 based Hybrid Web Application platform that allows you to author native applications with web technologies and get access to APIs and app stores.
- ❑ HyWAI leverages web technologies developers already know best... HTML and JavaScript.



HyWAI : Hybrid Web Application Interface

History

- ❑ Version 0.5 (Dec 2009)
 - Support iOS 2.x, Android 1.x
 - Considering interoperable with W3C Device APIs
- ❑ Version 1.0 (Dec 2010)
 - Support iOS 3.x, Android 2.x
- ❑ Version 2.0 (Dec 2011)
 - Support iOS 5.x, Android 4.x
 - Implement NFC API (partially)
- ❑ Version 2.1 (Dec 2012)
 - Support iOS 6.x, Android 4.x
 - Implement NFC API (partially), File API (partially)
- ❑ Version 3.0(for Web of Things) + Server feature
 - Support iOS 7.x, Android 4.x
 - Implement Sensor APIs(Ambient Temperature, Humidity, ...)
 - Considering interoperable with W3C Device APIs, Sysapps APIs



Introduction - How HyWAI Works

❑ Build your app once with **web-standards**

- Based on HTML5, HyWAI leverages web technologies developers already know best... HTML and JavaScript.

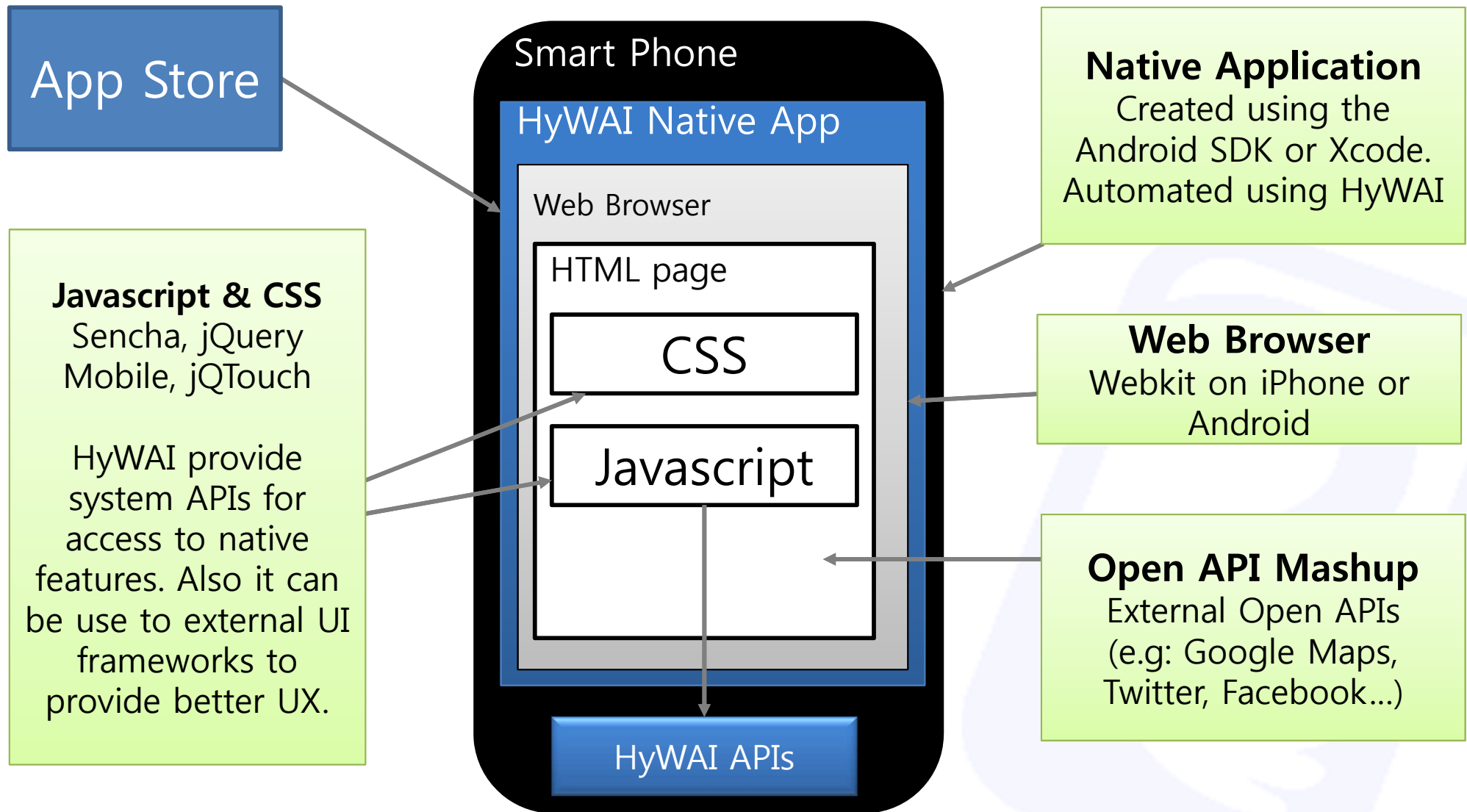
❑ Wrap it with **HyWAI**

- Using HyWAI build you can get access to native APIs.

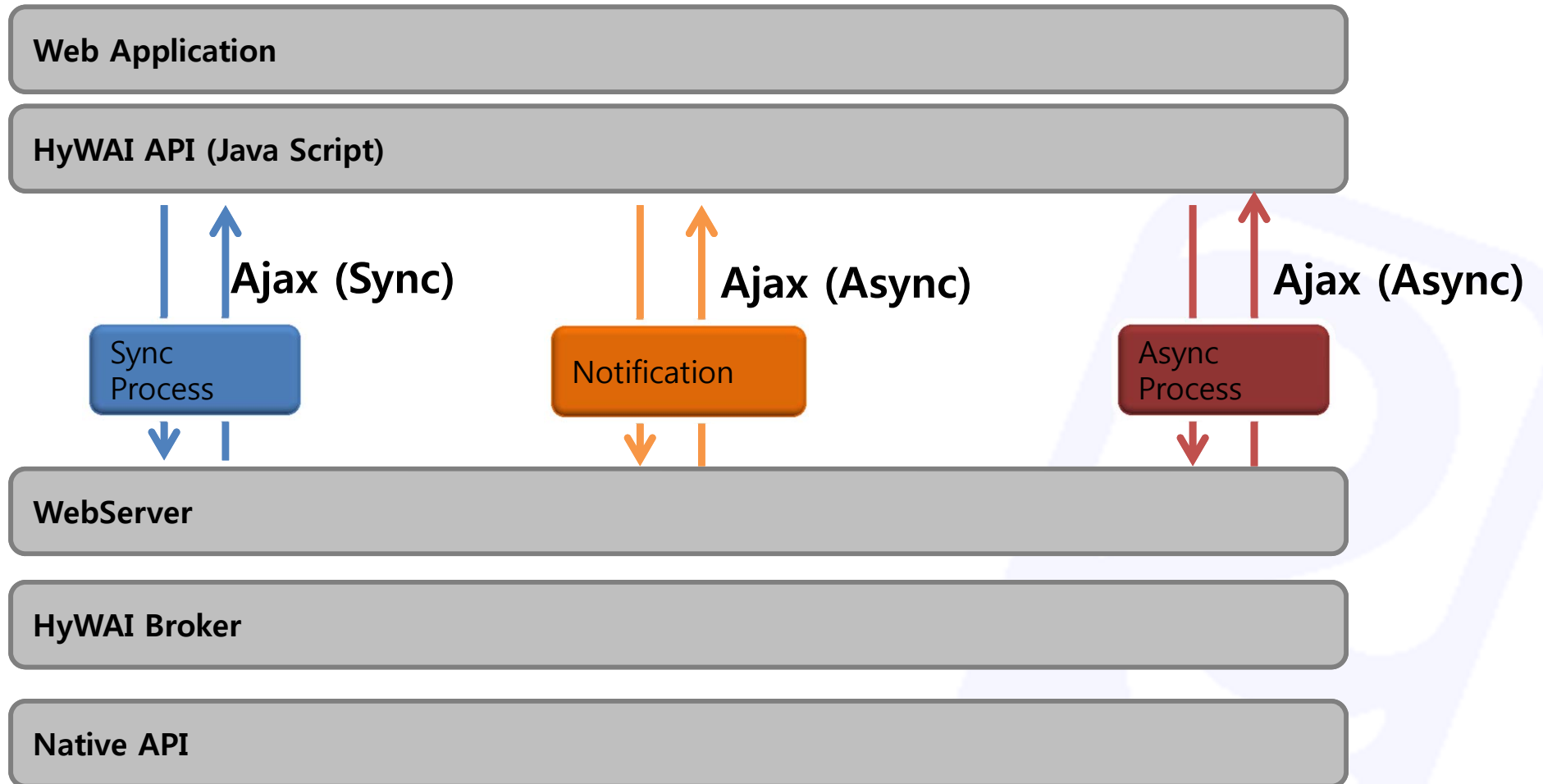
❑ Deploy to **multiple** platforms!

- HyWAI uses standards-based web technologies to bridge web applications and mobile devices.

HyWAI Technology



HyWAI API Architecture



HyWAI APIs

- applauncher
- calendar
- contact
- file
- gallery
- mediacapture
- messaging
- nfc
- sensor
- sysinfo
- task
- telephony
- ui
- util

<http://www.w3c.or.kr/hywai/api/>

Demo



Scenario

- ❑ I'd like to show you how can we using the Web APIs(Device APIs, sysapps APIs) for Web of Things

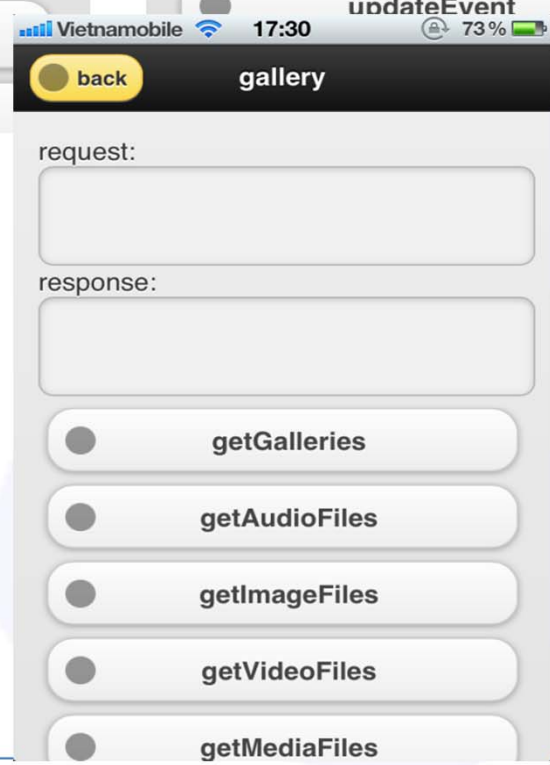
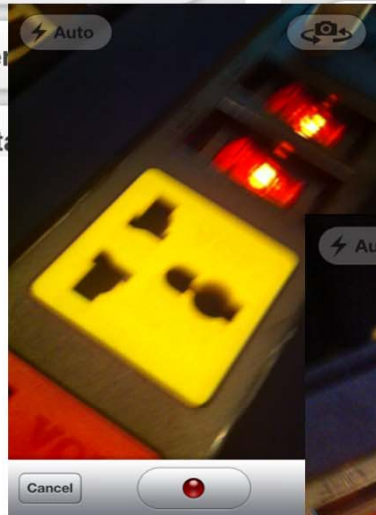
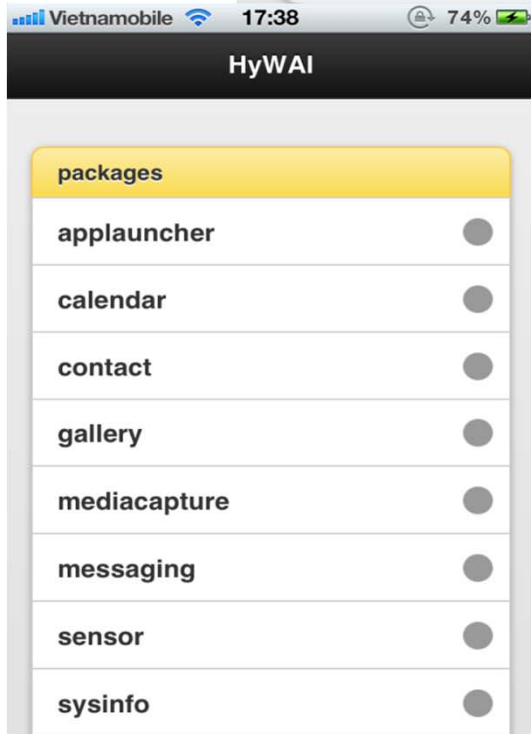
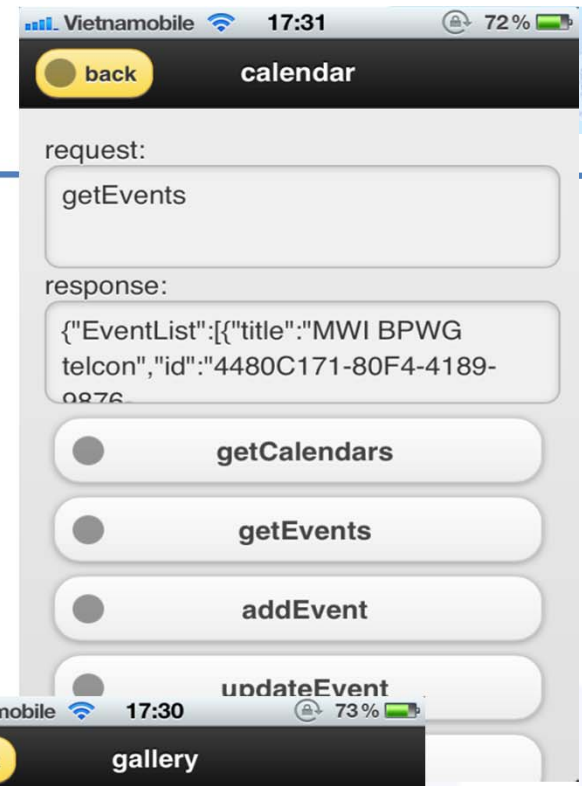
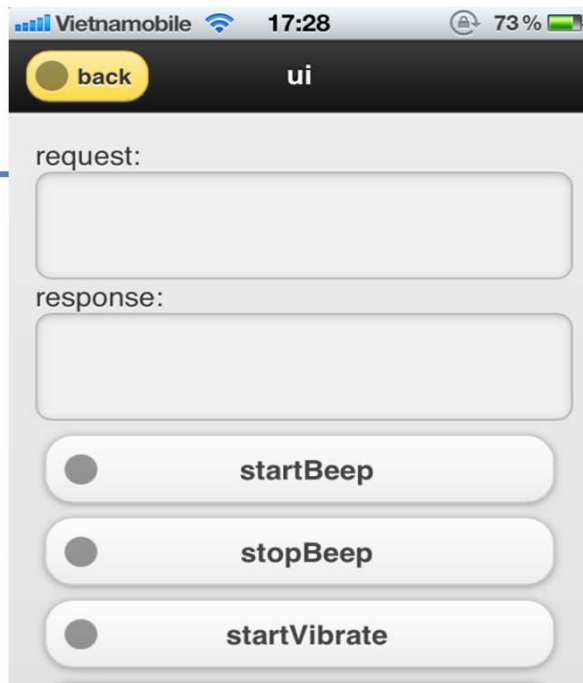
- ❑ Scenario 1 (by iPhone):
 - Hybrid Web Application
 - Device APIs and remote control

- ❑ Scenario 2 (by Android):
 - Hybrid Web Application
 - Device APIs for Sensors
 - Crowd Sensing with smartphone



Scenario 1 (by iPhone)





Scenario 2 (by Android):



Smartphone & Sensors



| Smartphone Sensors - Present & Future | |
|---|--|
| Present | |
| Type | Measurand |
| 3-axis Gyroscope | Rotation in space - Roll, Pitch, Yaw |
| 3-axis Magnetometer | Location direction (compass) |
| Accelerometer | Acceleration in the X, Y, & Z axes; Vibration |
| Ambient Light | Illuminance (brightness of light) |
| Camera | Images, Video |
| GPS | Location |
| Humidity | Humidity |
| Microphone | Audio |
| Pressure | Pressure (used to determine altitude) |
| Proximity | Nearby objects, without any physical contact |
| Temperature | Temperature |
| Near Future | |
| Type | Measurand |
| 6-dimensional Microscale Motion Accelerometer | Combination of accelerometer and gyroscope |
| 9-axis motion sensor | Combination of accelerometer, compass, and gyroscope |
| Biochemical | Biochemical agents |

Conclusions

- ❑ Web of Things ?
 - The story how to access/control/management the Things by web technologies

- ❑ Device APIs, System level APIs
 - RESTful access of Device capabilities

- ❑ Remote Access of Web Resources
 - How can we access through the firewalls, NATs..

- ❑ Other big issues
 - Philosophical/Conceptual problem
 - What is a Thing in the web of things (Physical ? Virtual ? Everything ?)
 - Identification & Discovery (Services, Resources, Things, Capability..)
 - Management, Caching, Processing, Protocols, Collaboration,
 - Web technologies for small devices (accessory, sensors...)

- ❑ **Web of Things CG could be a starting point to solve these issues**

