Extending Tizen Native Framework with Node.js

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Contents

- Native or Web?
- Why JavaScript, Node.js?
- Proposed Architecture
- Sample Applications
- Going Forward
API Choices

Native or Web?
Is there any Alternative?
Design Principles

• Easy to Develop

• Easy to Extend

• Lightweight and Fast
Design Principles & Decision

• Easy to Develop
  ➔ JavaScript

• Easy to Extend

• Lightweight and Fast
Design Decision - Why JavaScript?

- Most Popular Programming Language on the Planet

Top 20 Popularity Rank in GitHub (# of Projects)

Popularity rank in Stack overflow (# of Tags)

http://redmonk.com/sogrady/2015/07/01/language-rankings-6-15/
**Design Decision - Why JavaScript?**

- Most Desirable technology / language to work with in near future

<table>
<thead>
<tr>
<th>Technology</th>
<th>Desired (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android</td>
<td>17.70%</td>
</tr>
<tr>
<td>JavaScript</td>
<td>15.40%</td>
</tr>
<tr>
<td>Python</td>
<td>14.80%</td>
</tr>
<tr>
<td>Node.js</td>
<td>14.60%</td>
</tr>
<tr>
<td>AngularJS</td>
<td>13.20%</td>
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<tr>
<td>Java</td>
<td>10.50%</td>
</tr>
<tr>
<td>iOS</td>
<td>9.40%</td>
</tr>
<tr>
<td>Raspberry Pi</td>
<td>8.50%</td>
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<td>Swift</td>
<td>8.50%</td>
</tr>
<tr>
<td>C#</td>
<td>8.00%</td>
</tr>
</tbody>
</table>

Design Decision - Why JavaScript?

• Presence everywhere from Web to Enterprise
Design Decision - Why JavaScript?

• Presence everywhere from Web to Enterprise

• Now even in Drones and Robots!
Design Principles & Decision

- Easy to Develop ➔ JavaScript
- Easy to Extend ➔ Node add-ons
- Lightweight and Fast
Design Decision - Why Node.js?

• Popular JavaScript Runtime
• Event Driven Programming
Design Decision - Why Node.js?

• Popular JavaScript Runtime
  • Event Driven Programming
  • Very Active Community
  • Enterprise Ready

http://www.modulecounts.com/
Design Decision - Why Node.js?

• Popular JavaScript Runtime
  • Event Driven Programming
  • Very Active Community
  • Enterprise Ready
  • Popular framework choice in IOT space
Design Principles & Decision

- Easy to Develop
  ➔ JavaScript

- Easy to Extend
  ➔ Node add-ons

- Lightweight and Fast
  ➔ JavaScript binding for Native APIs
Proposed Architecture
Tizen Architecture

Status quo
Proposed JavaScript Framework

After

Native(C or C++) Applications

JavaScript Framework

Web Framework

Web Applications

Native Framework

App Framework | Graphics & UI | Multimedia | Messaging | PIM | Web
| Security | System | Base | Connectivity | Telephony | Location

Linux Kernel & Device Drivers

Web API

Tizen
JavaScript Framework

• Native APIs via Node add-ons
Tizen Specific add-ons

- Tizen Native Node
- DALi (3D UI Toolkit)
- Lifecycle Manager
- Event Loop Integration (gcontext)
- Logging
Inside Native Node

- Interface to Native APIs
- Dynamic Plugin Loading
- API Privilege Check
- Native –JS API mapping
Sample JS Applications
Bluetooth Object Push

Scenarios:

1. Bluetooth Activation / Deactivation
2. Bluetooth Device Discovery
3. Device bonding, service connection
4. Object transfer and object receive using Object Push Profile
Bluetooth – Device Discovery Flow

**JS APP**
- discoverDevices()

**Native node**
- callSync()
- Load()
- createNativePlugin()
- OnLoad()
- checkAccess()
- BluetoothAdaptor_discoverDevice()
- DeviceDiscoverSuccessCallback()
- FireEvent()

**Plugin loader**
- BT_API
- BT_JS_APP

**Native Context**
- BT Plugin- C++
- BT_Adaptor

**BT Plugin- C++**
- BT_Adaptor
- BT_Adaptor_DEVICE_DISCOVERY_STARTED
- BT_Adaptor_DEVICE_DISCOVERY_FOUND
- BT_Adaptor_DEVICE_DISCOVERY_FINISHED

**Bluetooth Adaptor**
- Core
- DiscoveryStatusChangeCB()
- DiscoveryStatusChangeCB()
- DiscoveryStatusChangeCB()
North Korea video shows two on trial for watching America...

【太・哈】Bboy BMOUTH in Taipei, Taiwan _ YAK FILMS

【5BB0Y】Floor Wars 2015 Bboy Battles Copenhagen Denmark

Birth scene, Bordwalk empire, Geburt im Films

**NETFLIX**

*The Great Dance*
Tablo Morinate

**GOOGLE TREND**

1. Tom Franks
Retrieved least 200,000
Related searches: rickie pond

**SPOTIFY**

Ringa ding
Mikie Round
JS application vs. Web application

Memory comparison

Launch Time

Node.js : 12.8 MB
Going Forward...
Roadmap

- JS Binding for all Native APIs
- Sample Apps, Test Harness
- JS framework Optimization
- EFL Integration
- SDK support
- VM Agnostic Node
JS Framework in IOT?

- Deployable to IOT devices
- For resource constrained devices
  - Node.js -> IOT.js
  - V8 -> Jerry Script
To Sum up..

• Whole Nine Yards of Native Framework to JavaScript Developer

• Seamless extension to libraries /packages of developer’s choice

• Easier & Faster Application Development

• More developers contributing to Tizen Eco-System
Thank You!