Who Am I

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- Tizen Core UIFW EFL Developer
- Enlightenment/EFL Open Source Committer
What is this talk about?

- Making frameworks and applications **scalable in UI** perspective.
- **Enlightenment Foundation Libraries**
Audience Introductions

- What is your expertise?
  - Application Development
  - Platform Development
  - Design
  - Marketing
Tizen – Mobile/Wearable

- 2.2.1 SDK
- Test Devices
  - RD-PQ, RD-210

- 1.0.0 beta2 Wearable SDK
Tizen – Camera, Gear 2

- NX300, NX300M, and etc.
- Gear 2, Gear 2 Neo
Various Tizen Profiles

- Mobile, IVI, Wearable, TV, Camera, PC, …
- **Scalability** is important.
What is Scalability?

- Supporting different
  - resolutions, screen sizes, devices, and profiles.
Tizen Architecture

Applications
- Web Applications
- Native Applications
- Core Applications

Web Framework
- W3C/HTML5
- Device API
- WRT

Native Framework
- Social/Content
- Locations
- Etc.

Core Framework
- App FW
- Graphics & UI
- Multimedia
- Web
- Messaging
- Location
- Security
- System
- Base
- Connectivity
- Telephony
- PIM

Kernel
- Linux Kernel & Device Drivers
Tizen Application Development Model

- Web Applications: HTML5 + CSS + JavaScript + jQuery
- Native Applications: C++
- Core Applications: C or C++

<table>
<thead>
<tr>
<th>Platforms \ Areas</th>
<th>Mobile</th>
<th>Gear 2</th>
<th>NX300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>O</td>
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<td>Native</td>
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<td>Web</td>
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- But wait, they have something in Common
- **Core** Framework!
Does anyone know about EFL?

- Many applications are written in EFL on NX300 and Gear 2.
- EFL not ELF
  - EFL may not be an ELF... but it's as pretty as one. :)

NO! YES!
What is EFL?

- **Toolkit**
  - A set of libraries which provides a wide range of functionalities
  - [http://www.enlightenment.org/](http://www.enlightenment.org/)

- **Enlightenment Foundation Libraries**
  - Created to support E17 development
  - Targeted at embedded since day 1
    - Also effective on desktops
  - Always focused on staying lean while providing fanciness
  - The heart of the Graphics component of Tizen
Why is EFL used on Tizen?

- Performance
- Small memory footprint
- GUI, Logic separation
- Themeable
- Animations
- H/W acceleration
- Various back-end engine
- Flexible
- Scalable
EFL (Edje + Elm)
EFL Block Diagram
Edje

- A complex **graphical design and layout** library.
- A graphical user interface without writing a line of C code.
- Creates visual layouts from compiled EDC script
  - EDC is completely separate from application code
  - Can be changed at or during runtime
- **Layouts include**
  - Images, Colors
  - Animations, Behaviors
- **Supports relative, absolute positioning.**
Edje

- Separation of layout and logic
  - a graphical part: GUI Layout binary (edj)
  - a functionality: Executable logic binary (C)

- Utility
  - edje_cc: compile edc to edj
  - edje_decc: de-compile edj to edc

< Compile Time >

< Run Time >
Edje

- **EDC Script**

```json
collections { - list the groups.
    group { - the list of parts and programs that compose a given edje object.
        images {} - list each image file that will be used in the edc.
        parts {
            part {} - the most basic design elements of the group.
                (ie. RECT, TEXT, IMAGE, SWALLOW, TEXTBLOCK, GROUP, BOX, TABLE, EXTERNAL)
        }
    }
    programs {
        program {} - manipulates the different interface elements and serve as a bridge between
                        the application and interface.
    }
}
```
Elementary

- Widget Set
- 75 widgets
  - Non-Containers - Bg, Button, Check, Entry, Label, List, Icon, Win, …
  - Containers - Box, Conformant, Grid, Layout, Panes, Scroller, Table, …
- Fast, Finger friendly, Scalable, Themeable, …
Elementary

- Elementary also uses Edje for its layout.
How to achieve Scalability?

- Relative Positioning (1)
How to achieve Scalability?

- Relative Positioning (2)
How to achieve Scalability?

- Scale Factor

Higher Resolution + Scale Up
How to achieve Scalability?

- Border
  - < Original Background Image >
  - < Expand Without Border >
  - < Expand With Border >

- Finger Size
  - < Expand Without Border >
  - < Expand With Border >
There is more!

• Elementary Configuration
  • You can change the configuration based on your needs.

• Configurations
  • Scale, finger size, engine, scroll, focus, profile, …

• Profile: a set of the configurations
  • default, standard, mobile, tv, wearable, …
Demo
Demo

- Elementary Test
- Terminology
EFL Tools for a better Scalability

- Enventor
- Eflete
- Elm theme viewer
EFL Applications on Tizen SDK

• Install Platform SDK

• EFL Application Template
Summary

- Tizen supports various profiles over a lot of device categories.
- EFL makes you write scalable GUI applications over various profiles with a good performance and small memory footprints.
- It's open. You can start it now.
Questions?