Meet Crosswalk
New HTML5 Runtime

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Outline

- What is Crosswalk and why do we need it?
- Architecture – how Crosswalk is constructed?
- Features for Tizen 3.0
- How to Contribute
- Demo

What and Why

What is Crosswalk

- **New HTML5 runtime based on Blink and Content Module**
- **Designed for Tizen but also for Android**
  - Supports also Linux, Mac and Windows
- **The HTML5 runtime for Tizen 3.0**
  - Replaces the WebKit based Tizen 2.x WRT
- **Open source - started in Sep-2013**
- **6 weeks release cadence. Stable, Beta and Canary channels**
- **GitHub for code and reviews. JIRA for features and bugs. FreeNode for IRC.**

Crosswalk Project Goals

- **Fully open source project – embraces participation**
- **Based on W3C standards and landing zone for new draft APIs**
- **Bring web applications to the next level – closer to native**
- **Backwards compatible with Tizen 2.x WRT**
- **Easy adaptation for downstream projects**
  - Tizen, Tizen SDK, Cordova, Intel XDK
- **Good co-operation with upstream projects**
  - Chromium, Blink, Skia, V8, Wayland

Why do we need new HTML5 Runtime

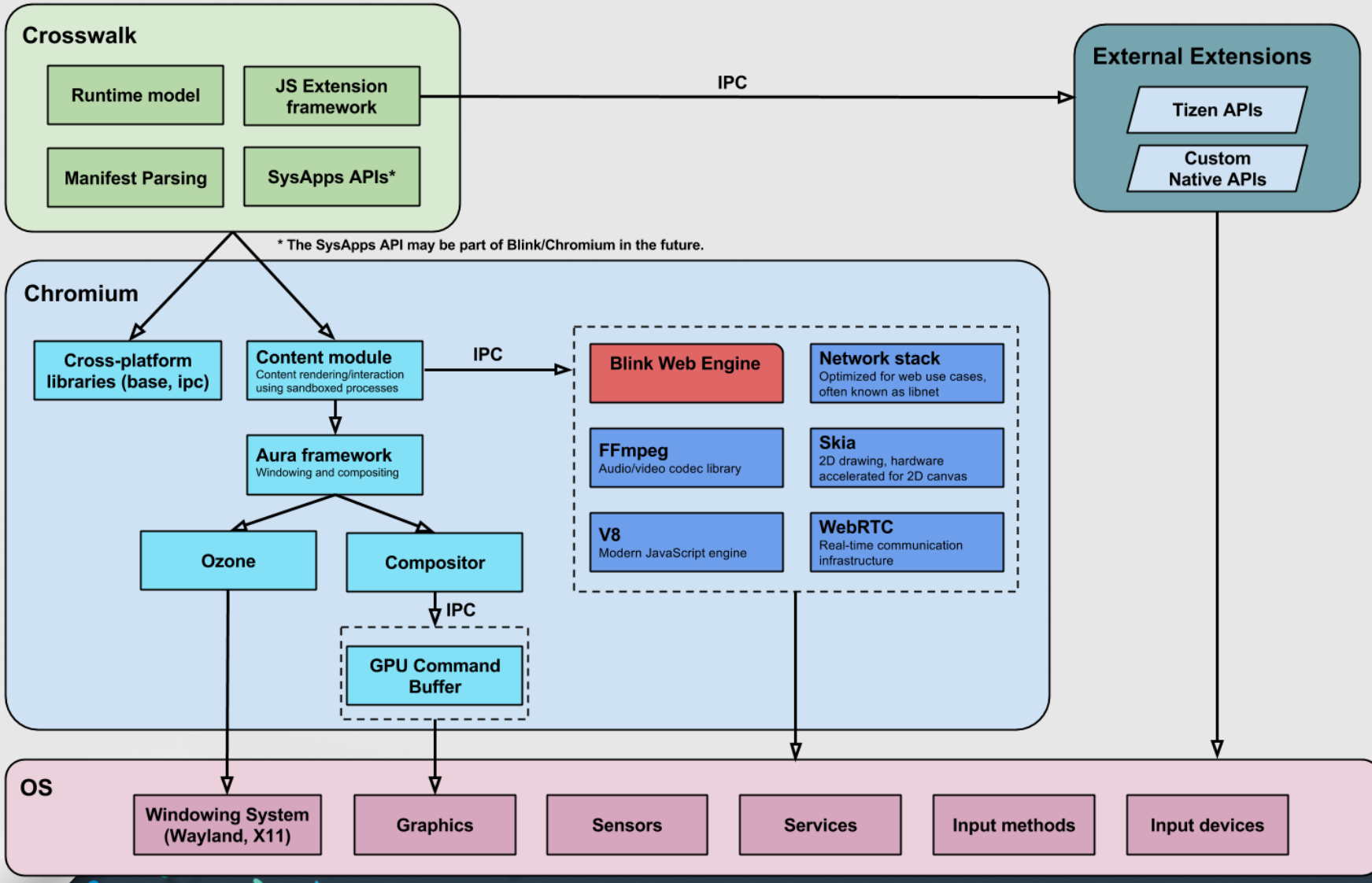
- Fear of WebKit project not meeting the Tizen needs
- During 2013 Blink rendering engine became live
- We believe Blink is the most competitive HTML5 engine
- Lot of other companies and communities has made the same conclusion and moved using Blink
- Google is very open and willing to accept contributions to Blink

Architecture
for Tizen 3.0

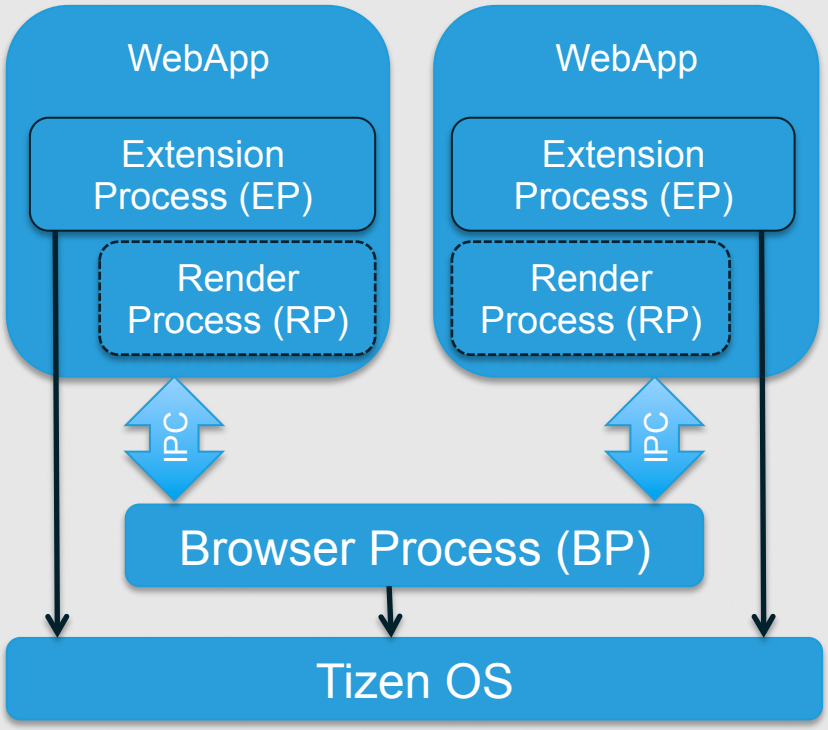
Crosswalk Architecture Goals

- **Based on Blink and selected parts of Chromium**
- **Work on the upstream to enable features we need**
- **Minimize the changes on Crosswalk Blink and Chromium**
- **API extensions in separate repositories**
  - Tizen Device APIs, Cordova APIs, early or experimental W3C APIs

Crosswalk Architecture - Modules



Crosswalk Architecture - Runtime



- Shared process model
- BP is shared with all WebApps
- WebApp contains EP and RP
- RP is sandboxed and can't do OS calls
- RP delegates OS calls to BP via IPC
- EP is not sandboxed and can do OS calls
-

Features
for Tizen 3.0

New features and APIs

- **Web Components (http://www.w3.org/TR/components-intro/)**
  - Future of the web app design
- **Service Worker (http://www.w3.org/TR/service-workers/)**
  - Closing the gap between the native and web applications
- **Responsive Design**
  - Media queries (L4), @viewport (http://dev.w3.org/csswg/css-device-adapt/)
  - PIcture element, srcset attribute
- **Native Client**
  - Portable version, pNaCl
- **Manifest (http://w3c.github.io/manifest/)**
  - Standard manifest for web applications
- **W3C SysApps: Raw Sockets (http://www.w3.org/2012/sysapps/tcp-udp-sockets/)**
- **W3C SysApps: Device Capabilities (http://www.w3.org/2012/sysapps/device-capabilities/)**
- **W3C SysApps: App URI (http://www.w3.org/2012/sysapps/app-uri/)**

New features and APIs (cont.)

- **W3C Promises API**
- **W3C Resource Timing API (http://www.w3.org/TR/resource-timing/)**
- **W3C User Timing API (http://www.w3.org/TR/user-timing/)**
- **W3C Ambient Light API**
- **W3C GamePad API**
- **W3C NFC API**
- **EcmaScript SIMD**
- **W3C WebRTC**
- **W3C Web Animations**
- **HTML5 input enhancements**
  - context menu, pattern attribute, data list element, autocomplete
- **Beacon (http://www.w3.org/TR/beacon/)**
- **Vehicle API (IVI)**
- **DLNA API (IVI)**

Existing 2.x Web Features are supported

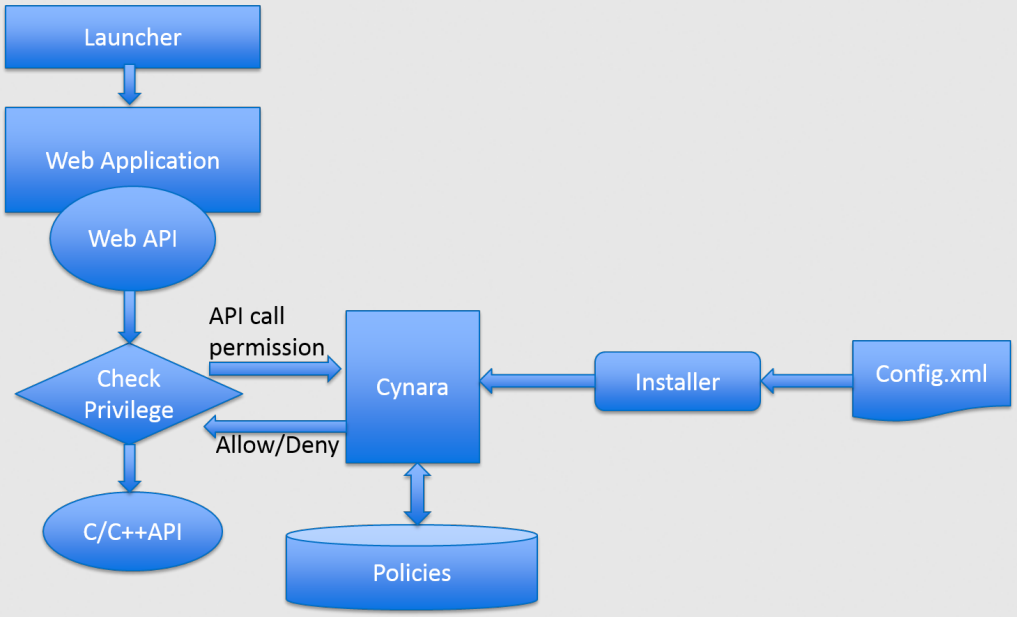
All the 2.x major features supported including

- **Tizen Device APIs**
- **Security model and API permissions**
- **WebView for EFL applications**
- **W3C Widgets including Tizen extensions**
- **Cordova 3.x APIs**
- **W3C APIs (latest versions). Notable updates below.**
  - CSS selectors (level 1&2)
  - Touch Events
  - SVG
  - Server Sent Events
  - Indexed DB
  - CORS
  - Drag and Drop
  - Web Notifications

Security

- **Tizen 3.0 new security model**
  - Compact 3-domain Smack policy for access control
  - Cynara policy checker service for API permission control
- **Crosswalk will be supporting both (Smack and Cynara)**
- **API permission checks are for**
  - All Tizen Device APIs
  - Experimental W3C APIs (e.g. SysApps APIs)
  - W3C Geolocation, getUserMeadia, FullScreen, Web Notifications and Storage APIs (WebSQL, IndexDB, and FileSystem)

Crosswalk and Cynara



- Policy is created during WebApp installation
- API permission is checked against the policy during runtime
- Policy contains <application context>, <privilege> tuple
- Permission check has simple answer: ALLOW, DENY or ASK USER

How to Contribute

for Crosswalk

Source Code and Build

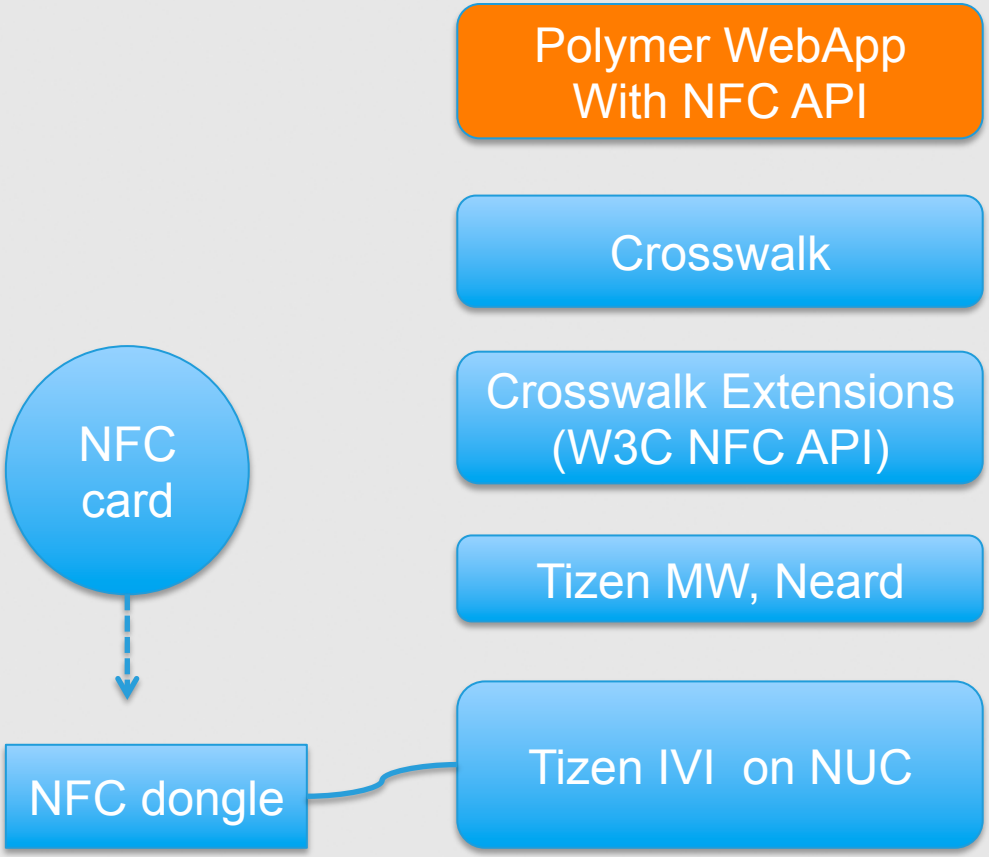
- **Upstream is in GitHub**
  - https://github.com/crosswalk-project
  - Multiple repositories – for Tizen the relevant are
    - crosswalk
    - tizen-extensions-crosswalk
- **Tizen.org is updated daily from the upstream**
  - platform/framework/web/crosswalk.git
  - platform/framework/web/tizen-extensions-crosswalk.git
- **Build and Install**

```
$   git clone ssh://poussa@review.tizen.org:/platform/framework/web/crosswalk.git
$   gbs build -A x86_64 # RPM is ready for device installation
$   rpm -ivh crosswalk-7.35.139.0-0.x86_64.rpm # On the device.
```

Demo

Demo – W3C NFC API and Sample App

- Web Components
- Polymer
- Crosswalk
- Tizen Extension
- Promises
- W3C NFC API
- NFC tag
- Tizen IVI on NUC
- Android Phone



http://www.w3.org/TR/nfc/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