# Tizen SDK Annual Report – Key Improvements

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# Introduction

# Tizen SDK Release History

**Samsung Gear-S2**

**Next Tizen Mobile**

**Next Tizen SDK**

**Samsung Z130H**

- One SDK Supporting Multi-version
- UI Hierarchy Viewer
- Enhanced Developer Certification
- Mobile/Wearable/TV/Micro(IoT)

**Tizen 2.4 SDK**

- Circle UI
- Rotary Device Support
- Wearable Native(C/C++)
- Mobile/Wearable

- HD Resolution
- Storyboard
- Wearable Native UI Builder
- Resource Manager
- Stale Object Checker / T-trace
- New Installer / Update Manager
- Online Sample / Document
- Mobile

**Tizen 2.3.1 SDK**

- Mobile Native(C/C++)
- Native UI Builder
- Enventor
- Mobile/Wearable
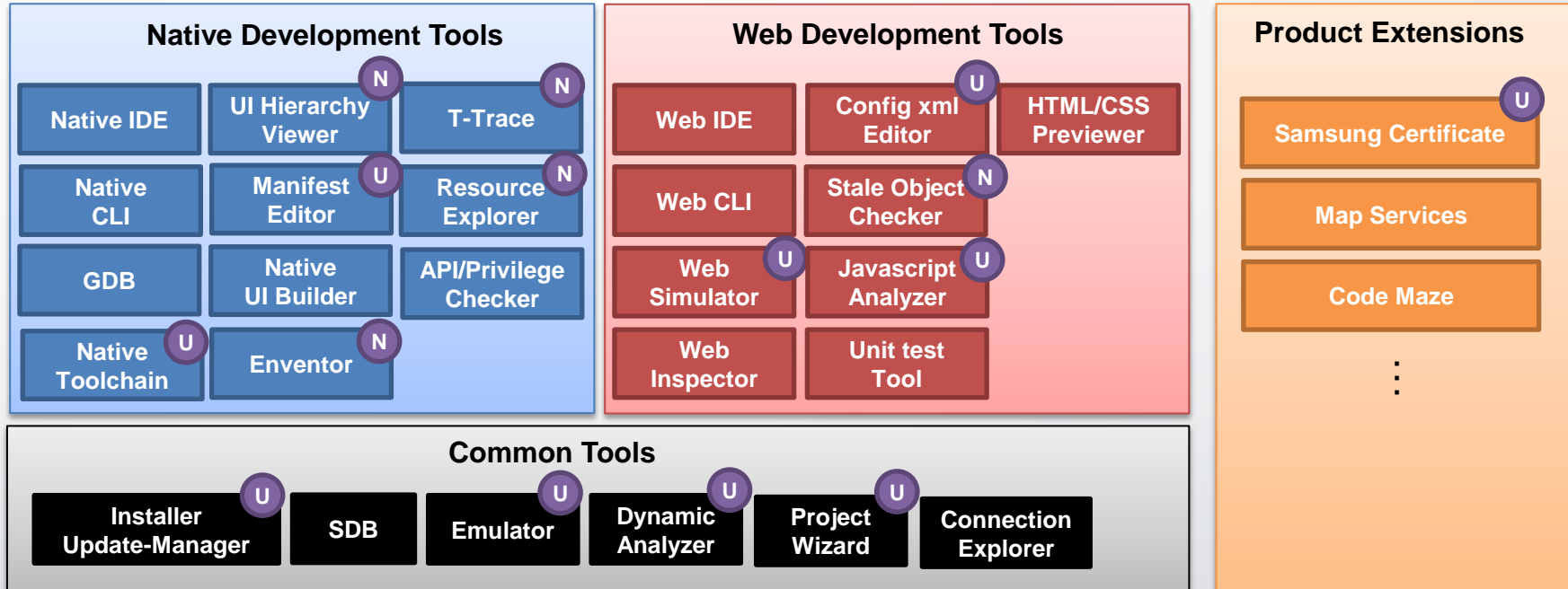
**Tizen 2.3 SDK**

| February 2015 | September 2015 | October 2015 | Planned |

# Tizen SDK Architectural Overview

- **Tools of Tizen SDK have updated and extended to increase developer's efficiency and usability**

(N) New components    (U) Updated Components

## Native Development Tools

| Native IDE | UI Hierarchy Viewer (N) | T-Trace (N) |
| Native CLI | Manifest Editor (U) | Resource Explorer (N) |
| GDB | Native UI Builder | API/Privilege Checker |
| Native Toolchain (U) | Enventor (N) | |

## Web Development Tools

| Web IDE | Config xml Editor (U) | HTML/CSS Previewer |
| Web CLI | Stale Object Checker (N) | |
| Web Simulator (U) | Javascript Analyzer (U) | |
| Web Inspector | Unit test Tool | |

## Product Extensions

| Samsung Certificate (U) |
| Map Services |
| Code Maze |
| ⋮ |

## Common Tools

| Installer Update-Manager (U) | SDB | Emulator (U) | Dynamic Analyzer (U) | Project Wizard (U) | Connection Explorer |

# Updated Features

- **Common Features**

  - Multiple Platform Version Support

  - SDK Install / Update

  - Install add-on SDK

  - Setup Developer Certificate (Only Samsung Devices for Security Purpose)

  - Online Documents

- **Application Development Features**

  - Application Model & Programming

  - Run, Debug and Profile
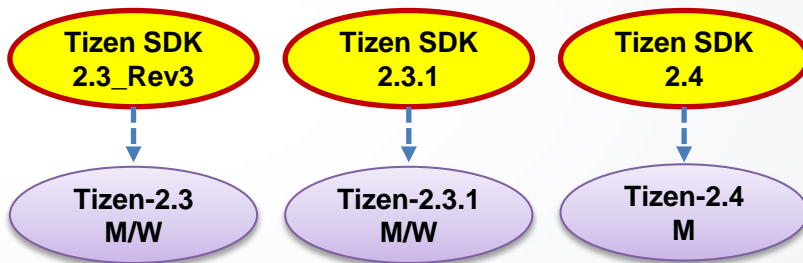
Updated Features
– Common

# One SDK supporting Multiple Platform Version

- **SDK tools and Platforms were tightly coupled**

  - App Developers should use the proper SDK supporting required platform version

**AS-IS**
**<Tizen 2.4>**

| Tizen SDK 2.3_Rev3 | Tizen SDK 2.3.1 | Tizen SDK 2.4 |
|---|---|---|
| Tizen-2.3 M/W | Tizen-2.3.1 M/W | Tizen-2.4 M |

- **An Integrated SDK will support multiple platform version (Planned within 2015).**

  - App Developers can select the platform version by their attention.

**TO-BE**
**<Next SDK>**

Next Tizen SDK

| Tizen-2.3 M/W | Tizen-2.3.1 M/W | Tizen-2.4 M |
|---|---|---|
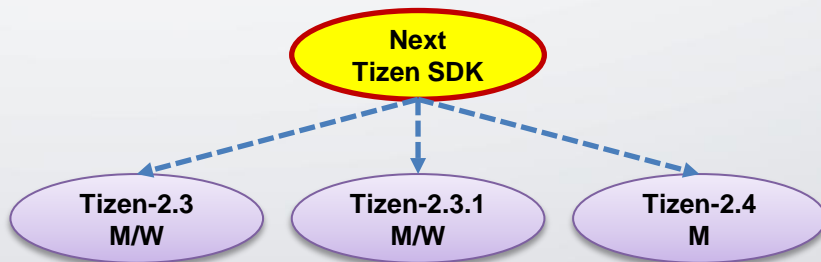
# Installer & Update Manager Newly Updated (1/2)

## Install Manager of Tizen 2.3

- Heavy SDK Image Size ( ≒ 2.5 GB)
  - Tools and Platforms are in one image
- Uninstall all of packages only
- Not easy to check packages to be updated

**AS-IS**
**<Tizen 2.3>**

## Installer & Update Manager of Tizen 2.4

- Reduces Initial Install Size ( ≤ 400MB)
  - Tools and Platform are separated.
- Can uninstall selected packages
- Easy to check packages to be updated from download server

**TO-BE**
**<Tizen 2.4>**

# Installer & Update Manager Newly Updated (1/2)

- **Separate The Installation Step into 2 parts**
  - Initial Installation – Common IDE, CLI and Can develop web application
  - Update Manager After Installation
    - Can install Platform Binaries, Emulator and Simulator by selecting versions and profiles
    - Can develop Native Application

**AS-IS**
**<Tizen 2.3>**

| Install Manager | Download SDK Image | Install SDK | Application development |

Over 2.5Gb

**TO-BE**
**<Tizen 2.4>**

| Installer | Install | Web app development |

Under 400Mb

| Update Manager (On-demand Package Installation) | Application development |

Native Tools, Emulator, Add-ons....

# Improved Developer's Certification

- **Certification Process for** *Samsung Devices*

  - Request in Web site & Receive by e-mail

  - Register process is *NOT* simple

  - ➢ Make developer's VOC on registering in SDK

- **Improvement on Issuing process**

  - Register immediately with add-on SDK

  - Opening service at the end of 2015



**AS-IS**

Developer

SDK          Developer.Samung.com     Cert. Server

**TO-BE**

SDK          Relay Server          Cert. Server
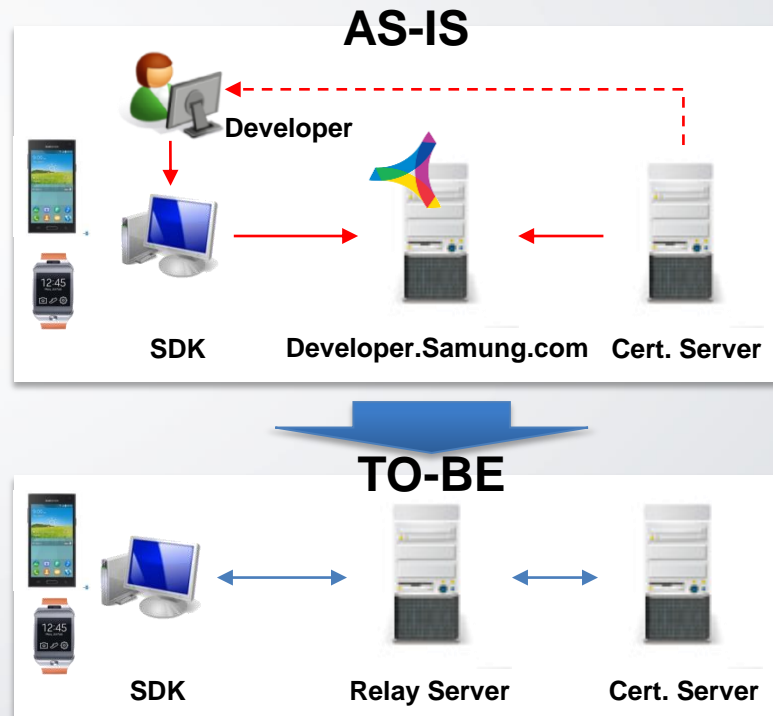
# Documentation – Dev Guides

- **Restructured & Go to online**
  - Dev Guides are restructured for reducing duplication and maintenance
  - Developers can navigate Dev guides easily through developer.tizen.org

**AS-IS**
**<Tizen 2.3>**

| Getting Started with Tizen | Tizen Mobile Web App Programming | Tizen Wearable Web App Programming | Tizen Mobile Native App Programming |
|---|---|---|---|
| | Tools | Tools | Tools |
| | Tutorials | Tutorials | Tutorials |
| | Guides | Guides | Guides |
| | API References | API References | API References |

**TO-BE**
**<Tizen 2.4>**

| Getting Started with Tizen | Tools | Tutorials | Guides | API References |
|---|---|---|---|---|
| | Common | Web | Web | Web |
| | Web | Native | Native | Native |
| | Native | | | |

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Updated Features
– Application Model & Programming

# Enhanced Programming Model for Native Application (1/3)

- **New application models for more real world**
    - Watch (for wearable only)
    - IME
    - Widget (on home screen)



**Watch**

**IME**
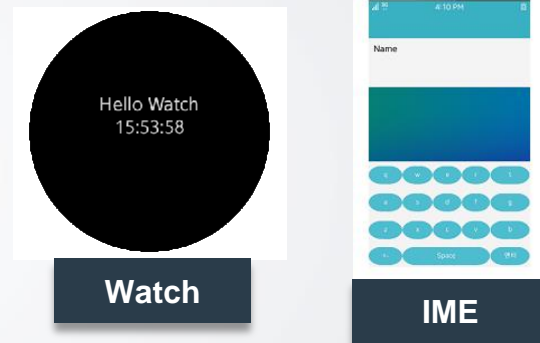
- **TEP for rapid test and update**
    - A new separate package to contain large files
    - No repeated installation of unchanged files
    - TEP: Tizen Expansion Package
    - TPK: Tizen Package



App Project

```
tizen-manifest.xml
/bin/
/lib/
/res/
/shared/res/
```

**/tep/a.mp4**

Target/Store

org.tizen.myapp.tpk
size : 50MB

org.tizen.myapp.tep
size : 2GB

**Tizen Expansion Package**
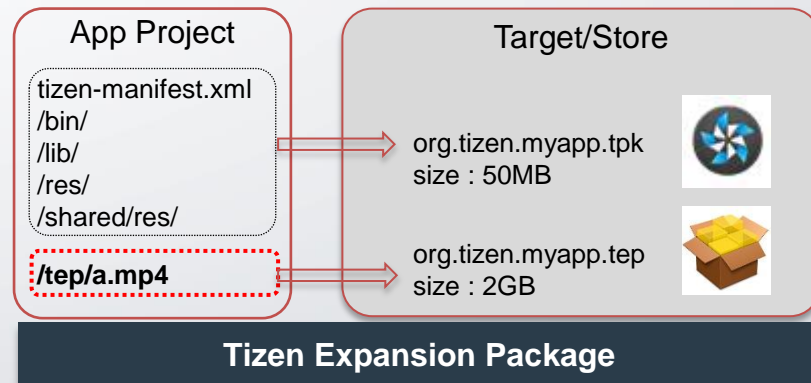
✓ **How to support multi-devices?**

• **PO File Editor to write multilingual programs**
  – Easily edits multilingual messages applied to .po files for GNU gettext



**Project Explorer**

**PO File Editor**
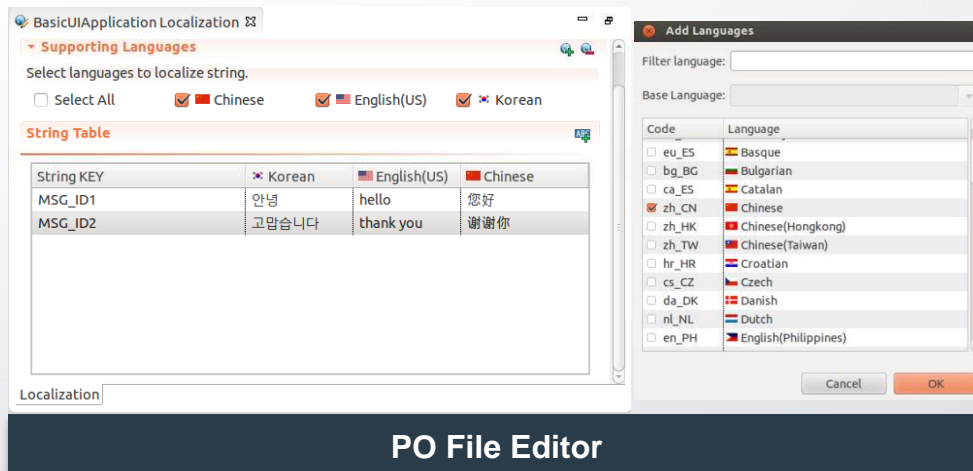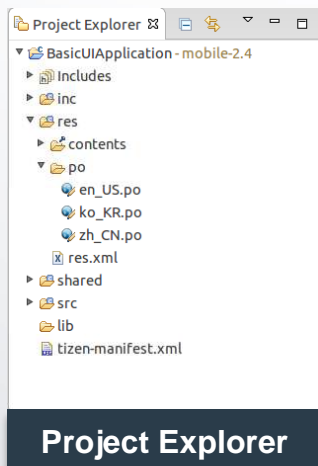
# Enhanced Programming Model for Native Application (3/3)

- **Efficient Resource Management**
  - Supports multiple devices without re-packaging
    - Resources under res/contents according to locale and screen density
    - All-in-one packaging with res.xml
  - Resource Manager (planned in 2.4)
    - Shows all resource configurations
    - Easily edits the resources in drag/drop way



Resource Management Model



Project Explorer



Resource Manager
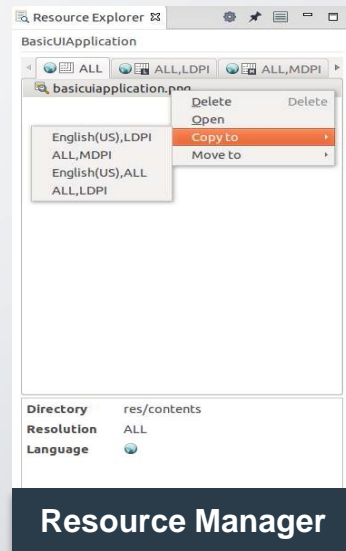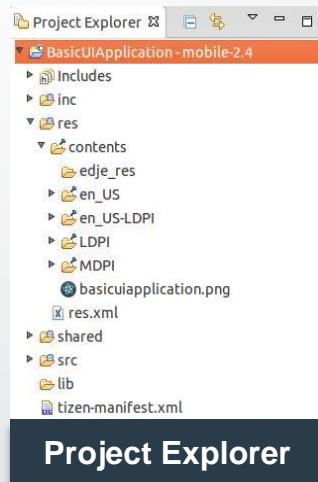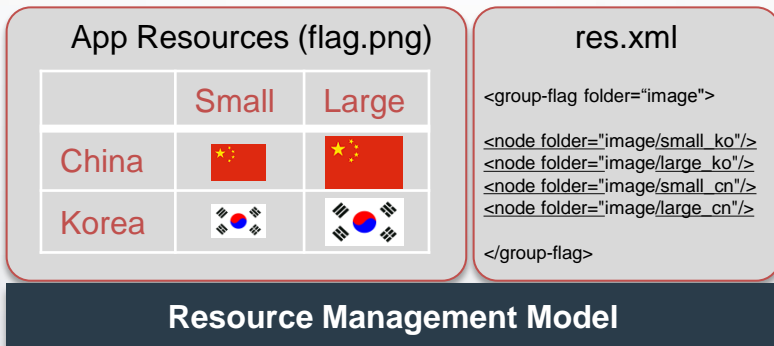
# Online Sample

✓ **Problems in offline sample**
  ➤ Lazy update depending on SDK release
  ➤ Unclear classification of sample types
  ➤ No search or filter

• **Online sample**
  – Up-to-date samples available without SDK update
  – Useful search and profile filter
  – Plenty of well-categorized samples
    • Web: Application, Communication, Contents, General, Graphics, Hybrid, Multimedia, Sensor, Social, Storage, System, UI
    • Native: AppFW, Base, Graphics, Locations, Multimedia, Network, Social, System, UI
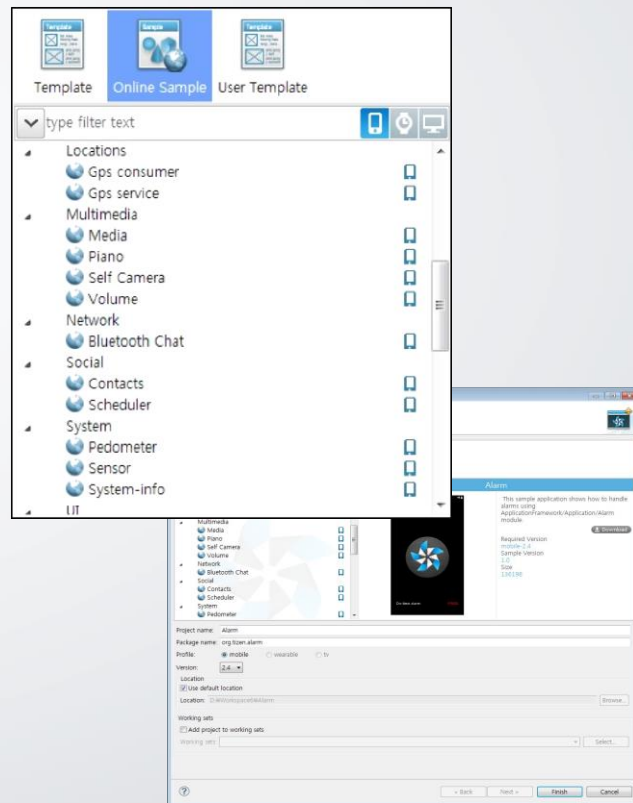
# Easy UI Programming for Native Application (1/2)

✓ **UI authoring tool vs. text editor?**

• **UI Builder: Easy and fast way to develop UI application**
  – Designs views by drag and dropping in WYSIWYG editor
  – Easily binds logic programming by code generation of event handler stubs
  – Storyboard to design view and event flows in visual way

• **Enventor to design UI widget**



Design Views

WYSIWYG design

Native UI Builder

Storyboard

Design View Flows

Source Code Generation

Enventor

Design Widget
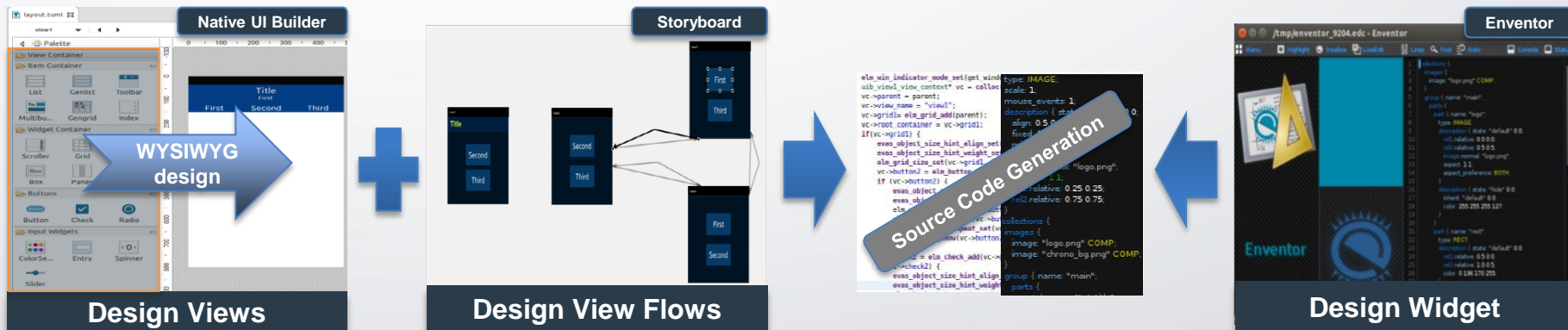
# Easy UI Programming for Native Application (2/2)

- **A short clip of UI Builder (application making in 2m30s )**



Create project
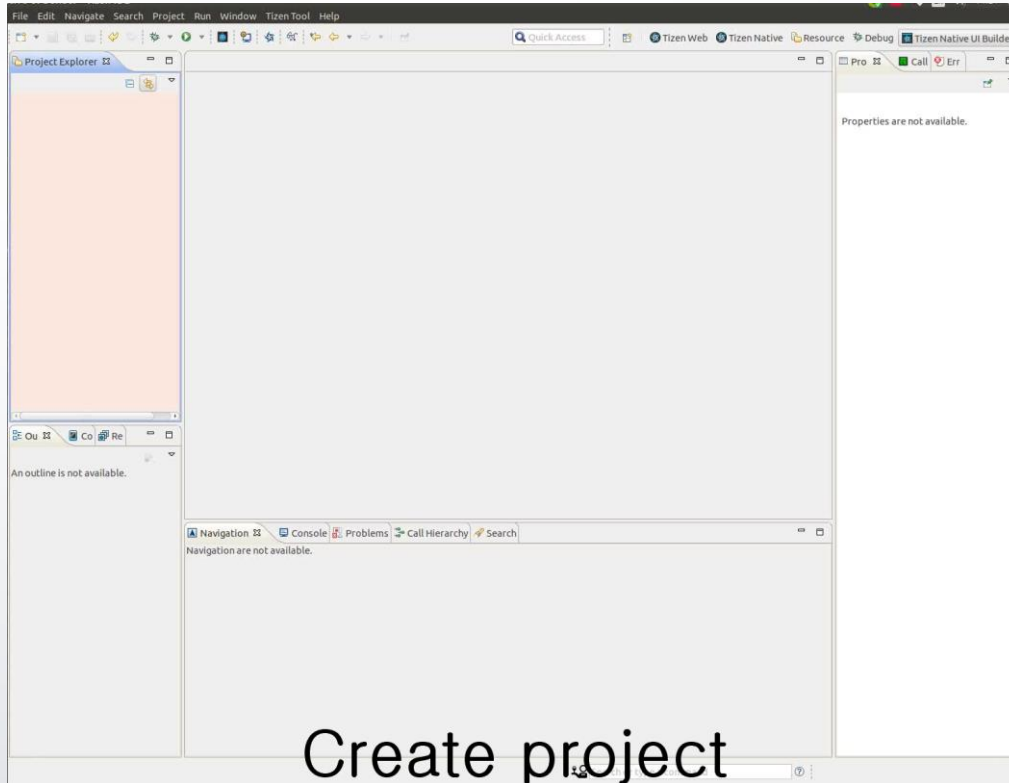
# JavaScript Analyzer (JSA) for Web Application
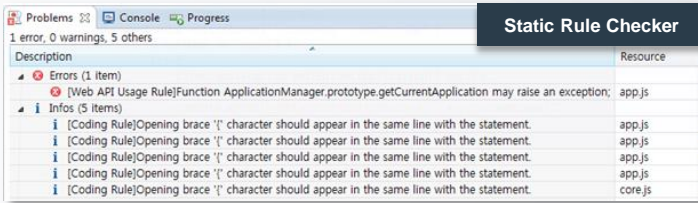
✓ **How to write more stable web application?**

- **Rule Checker of static analysis**
  - Detects potential errors
    - Web API misuse
    - API version compatibility & missing API privilege
  - Checks compliance to coding guides

- **Stale Object Checker of dynamic analysis**
  - Dynamically detects possible memory leaks
  - Finds the problematic JavaScript objects
  - Locates the site creating problematic objects
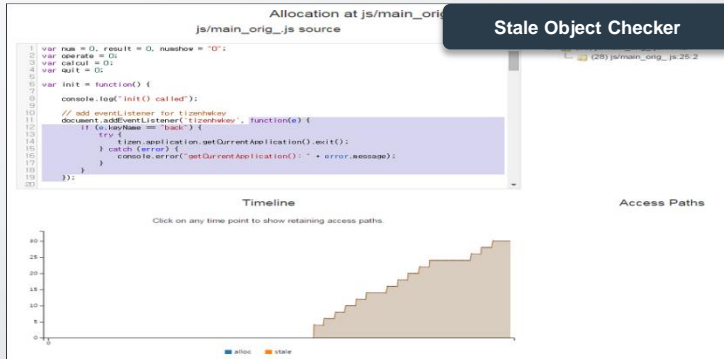


Static Rule Checker

**Coding Rule Violations**



Stale Object Checker

**Staleness Monitoring**
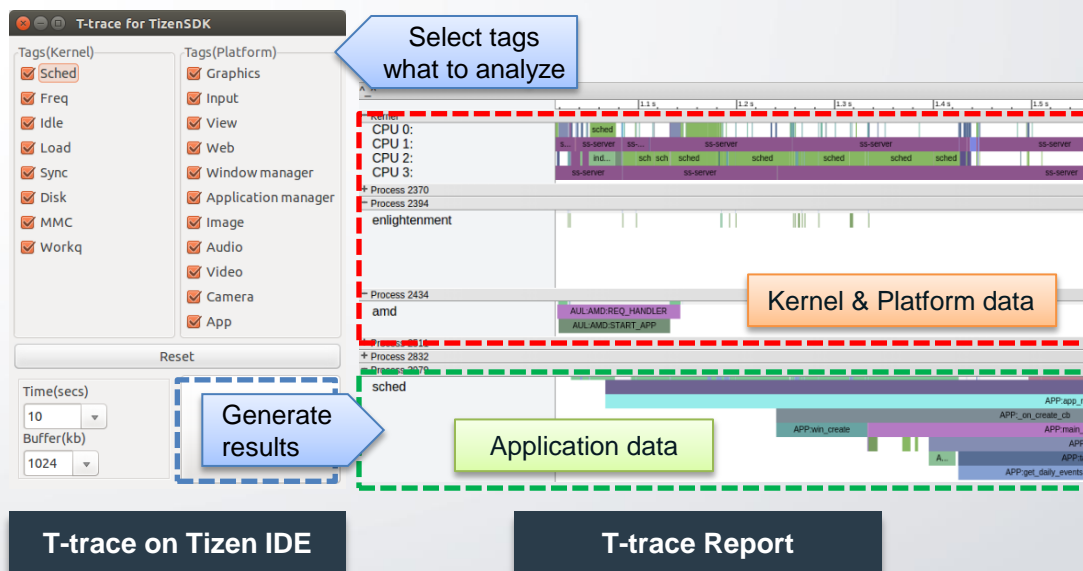
Updated Features
– Run, Debug and Profile

# T-trace: New Profiling Tool for Platform and Native Application

- **A profiling tool for Tizen platform and native application**

- **Provides various data from**
  - Tizen Platform (pre-defined)
    - Graphics, Input, Multimedia,
    - Application/Windows manger, ...
  - Kernel (pre-defined)
    - Scheduling,
    - CPU Load/Frequency ...
  - Application (user-defined)



Select tags what to analyze

Kernel & Platform data

Generate results

Application data

**T-trace on Tizen IDE**

**T-trace Report**

# Enhanced Emulator (1/2)
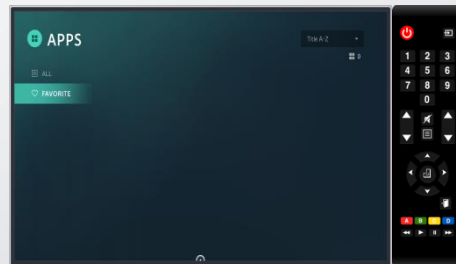
✓ **Don't you have Tizen devices?**

- **Circular wearable emulator**
  - Shows circular display
  - Supports rotary input using mouse



- **TV emulator (planned)**
  - Enables TV application development without heavy TV devices
  - Provides full-featured remote controller

# Enhanced Emulator (2/2)

✓ **Still hungry for emulator performance?**

- **SMP acceleration**
  - Fully utilizes host PC's multi-cores by the aid of KVM and HAXM
  - Dramatically improves performance up to 3 times when running on quad cores

- **Direct rendering to relax host CPU**
  - Only uses GPU to remove CPU-GPU transition overhead
  - Allows to use more host CPU resources for other programs, such as, IDE
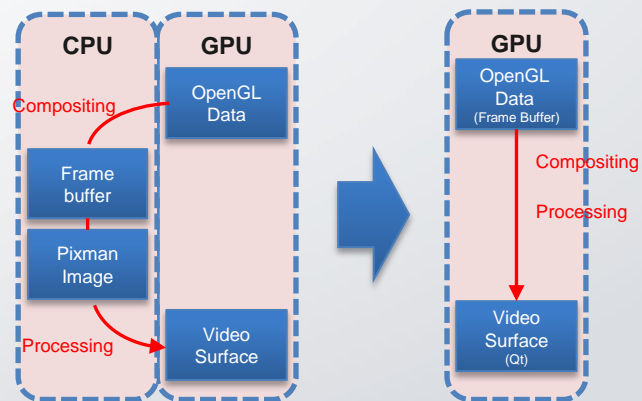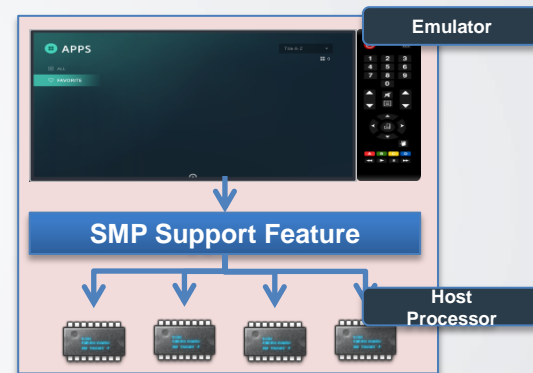
# Wrap-up

# New Benefits from the Latest Tizen SDK

- **Common**

  - Multi-platform support

  - Easy but powerful installation

  - Up-to-date online documentation and samples

  - Simplified developer's certification

- **Tools**

  - Enhanced native programming model and tools

  - Powerful analysis tools

  - State-of-the-art Emulator of high performance

Thank you