Tizen .NET

Transition of Tizen Developer Environment

Samsung Electronics | S/W Center | Sung-Jae Lee, Seungkeun Lee
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Productivity

C/C++
Tizen Studio 1.0.1 Release

Tizen Studio 1.0.1 is now available!
Tizen Studio

- Release Tizen Studio 1.0 with New UX
- Intuitive User Interface & light-weight Tools without unnecessary modules
- Tizen Studio 1.0.1 supports 2.3.2 platform (Gear S3)
Introduce Tizen .NET
.NET is …

- The development platform used by millions of developers
- Create apps and services on any device and OS
- Amazing performance and great developer productivity

Request / second (millions) based on preliminary internal tests.

* https://www.microsoft.com/net/intro
Improve development experience

- Managed language, garbage collection, reflection, ...
- .NET framework, ASP.NET, ...
- IntelliSense, historical debugging, ...

Visual Studio

C#
Easy cross-platform development

- Runs on Windows, macOS and various Linux distributions including RedHat and Ubuntu
- Supporting Portable Class Libraries based application development
- Now defines .NET Standard API
Easy IoT development

- .NET connects Cloud and Devices with same language
- ASP.NET is an open source web framework for building modern web apps and services
- Windows 10 IoT Core runs .NET
Tizen’s .NET support

Language

SOSCON SAMSUNG OPEN SOURCE CONFERENCE
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<th>Managed Language</th>
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<td>C/C++</td>
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C#

- A multi-paradigm programming language, developed by Microsoft
- Designed as a primary language for Common Language Infrastructure (ECMA-335)

![Diagram of C# features]

- Collections
- Threading
- File I/O
- LINQ
- Delegates
- many more...
Preference & Popularity

- 4th popular programming language in the world
- 1.16 million developers worldwide

* http://www.tiobe.com/tiobe-index/
Performance

- VM based language
- 2~3 times slower than C, 5 times faster than JavaScript
- Better performance with AOT (Ahead of Time Compilation) and .NET Native

* [http://benchmarksgame.alioth.debian.org/u64q/which-programs-are-fastest.html](http://benchmarksgame.alioth.debian.org/u64q/which-programs-are-fastest.html)
Implementation - .NET Core

- General purpose development platform; Runtime & Standard Library
- Maintained by Microsoft and the .NET community on GitHub
- Supporting Windows, macOS and Linux, and can be used in device, cloud, and embedded/IoT scenarios.

* https://docs.microsoft.com/en-us/dotnet/articles/core/
Tizen’s .NET support

Language

API & Framework
Tizen Platform-Specific API

- Covers all Tizen Native APIs
- OOP design
- Currently, 30% of Native APIs are converted in C#
- Will support 4,758 APIs from 100 modules, by early 2017
.NET Standard API

- A set of APIs to unify the .NET Framework, .NET Core, and Xamarin platforms
- Developers using existing skills, teams, and code to build Tizen apps
- “One library to rule them all”
Xamarin API & Xamarin.Forms

- Efficient cross-platform development
- Build native UIs for iOS, Android and Windows a single, shared C# codebase
- Now, Tizen also
Introduction to Xamarin.Forms

- Create cross-platform user interfaces, quickly
- Share more code across iOS, Android & Windows Phone
- Provide more than 40 controls, pages and layouts
3 Key Components

- **Page** represent cross-platform mobile application screens

- **Layout** is container used to compose views into logical structures

- **View** is the controls displayed on the user interface
Pages

- Most prominently used as the top level UI element

* Reference: https://www.xamarin.com/forms
Layouts

- Typically contains logic to set the position and size of child elements

* Reference: https://www.xamarin.com/forms
Views

- Activity Indicator
- BoxView
- Button
- Date Picker
- Editor
- Entry
- Image
- Label
- List View
- Map
- OpenGL View
- Picker
- Progress Bar
- Search Bar
- Slider
- Stepper
- Table View
- Time Picker
- WebView
- Entry Cell
- Image Cell
- Switch Cell
- Text Cell
- ...
Custom Components

3 Key Concepts

- **MVVM** (Model-View-View Model)
- **XAML** (Extensible Application Markup Language)
- **Data Binding**
MVVM

- Provides a clean separation between application logic and the UI
- Easier to test, maintain and evolve
XML-based markup language that is used to describe user interface

```xml
<?xml version="1.0" encoding="utf-8"?>
<ContentPage x:Class="MainPage">
    <StackLayout>
        <Label Text="Hello, Forms!" TextColor="Red"/>
    </StackLayout>
</ContentPage>
```

```csharp
public class MainPage : ContentPage
{
    public MainPage ()
    {
        Content = new StackLayout
        {
            Children = {
                new Label
                {
                    Text = "Hello, Forms!",
                    TextColor = Color.Red
                }
            }
        };    
    }
}
```
Data Binding

- Process that establishes a connection between the application UI and business logic
- Essentially the bridge between your binding target and your binding source

Amazing apps with Xamarin

* Reference: https://www.xamarin.com/customers
Tizen Application with Xamarin.Forms

Shared C# App Logic
Xamarin.Forms on Tizen

Xamarin.Forms
- ContentPage
- StackLayout
  - Label
  - Button

Platform Renderer
- ContentPage Renderer
  - Layout Renderer
    - Label Renderer
    - Button Renderer

Native UI Framework (EFL)
- elm_box
- elm_label
- elm_button

C# Platform Independent

Tizen Specific

C
Tizen’s .NET support

Language  API & Framework  Tools
Visual Studio Tools for Tizen

Now build Tizen applications with Visual Studio in C#
Visual Studio Tools for Tizen

- Provides device emulators and an extension to Visual Studio
- IntelliSense and debugging capabilities
- Tizen supports for TVs, Wearables, and other IoT devices will be added in future release
Visual Studio Tools for Tizen
Demo Video
by
Sidharth Gupta

https://channel9.msdn.com/events/Connect/2016/200
https://developer.tizen.org/development/preview
Samsung collaborates with Microsoft on open source projects

Enabling .NET support for the Tizen operating system running on 50 million Samsung devices, including TVs, wearables, mobile and other IoT devices, around the world.
Samsung joined the .NET foundation Technical Steering Group in June 2016

- Contributing in the area of ARM support to .NET Core, and Xamarin.Forms for Tizen
Teams

- More than 100 developers in Samsung
- From Korea, China, India, Russia and Poland ...
Tizen .NET

- Tizen’s .NET support will be officially released and shipping on Samsung devices, including SMART TVs, in 2017
THANK YOU