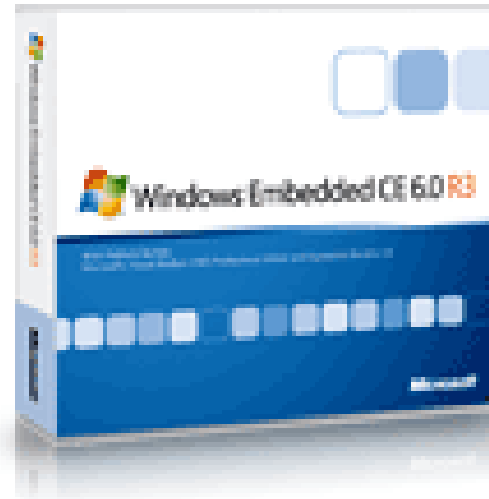


Silverlight for Windows Embedded



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Silverlight for Windows Embedded

Silverlight for Windows Embedded is a new application framework that allows OEMs to create innovative user experiences

Empowers OEMs to easily differentiate their device using the Expression Design Suite while working in a native C++ environment

OEMs can now leverage the huge design community of Web and desktop developers

Expression Blend



XAML

```
<Grid x:Name="LayoutRoot">  
  <Grid.ColumnDefinitions>  
    <ColumnDefinition Width="*" />  
    <ColumnDefinition Width="*" />  
  </Grid.ColumnDefinitions>  
  <Grid.Background>  
    <LinearGradientBrush>  
      <GradientStop Color="White" />  
      <GradientStop Color="Blue" />  
    </LinearGradientBrush>  
  </Grid.Background>  
  <Button Margin="42,33,42,33" />  
</Grid>
```

Microsoft Silverlight Web App



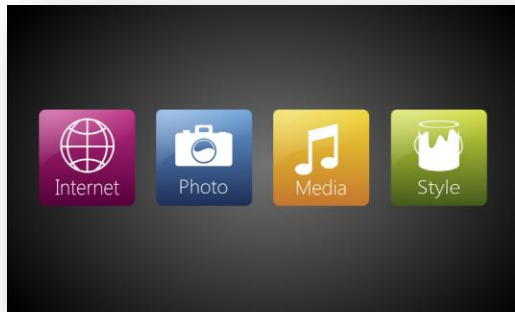
Device UX

Microsoft .NET Windows Presentation Foundation

Desktop App

Silverlight for Windows Embedded

- Silverlight[®] for Embedded Devices!
- Native C++ application model
- H/W acceleration
- Subset of Silverlight 2.0
- Shells and Application Uis
- **DEMO**



Internet Explorer Embedded

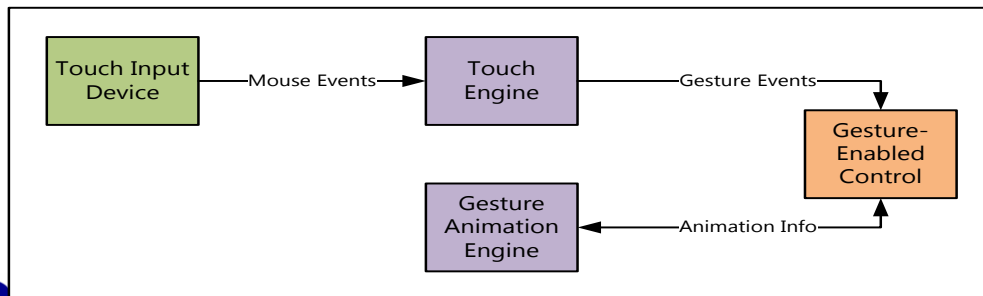
- Internet Explorer[®] 6.0 Rendering Engine
- Tiling Engine for Panning and Zooming
- H/W acceleration
- XAML sample UI
- **DEMO**



Gesture Support

Touch and gesture input enables natural interaction with devices and applications

- Driver level OS support and physics engine offers consistent experience
- Gestures Available
 - Flick vertically through a long list
 - Flick horizontally across parallel lists
 - Pan to reposition images and text
 - Custom gestures created by OEM



Introduction to Silverlight for Windows Embedded

- What is Silverlight for Windows Embedded?
- How do I get Silverlight for Windows Embedded?
- What hardware is compatible?
- What are the design assumptions?

Introduction to Silverlight for Windows Embedded

- What is Silverlight for Windows Embedded?

- H • Silverlight 2 Web Core Ported to Win32/CE
- E • API ported from C# to C++
- W • Single Gesture and Window Tiling Engine Support
- W • Silverlight for Windows Embedded used to render graphics on your main display in a exclusive window
 - No need for a browser to display and interact with content
 - Allows you, the designer and developer, the freedom to design an application or an entire device User Experience and not be confined to traditional forms, colors, and styles.

Introduction to Silverlight for Windows Embedded

- What is Silverlight for Windows Embedded?
- How do I get Silverlight for Windows Embedded?

- W • Included with Windows Embedded CE 6.0 R3
- W • Simply check the Platform Builder Catalog option for Silverlight for Windows Embedded
- Include the necessary header files in your application

Introduction to Silverlight for Windows Embedded

- What is Silverlight for Windows Embedded?
- How do I get Silverlight for Windows Embedded?
- What hardware is compatible?

- **W** Any hardware platform that has a display and the correct amount of system RAM to hold the Display Frame Buffer and run the program is sufficient

- Recommended Hardware

- ARM V4 micro-processor
- 550 MHZ processor
- 256 MB RAM
- 2-D Graphics Processing Unit (GPU) with DirectDraw or OpenGL interface

Introduction to Silverlight for Windows Embedded

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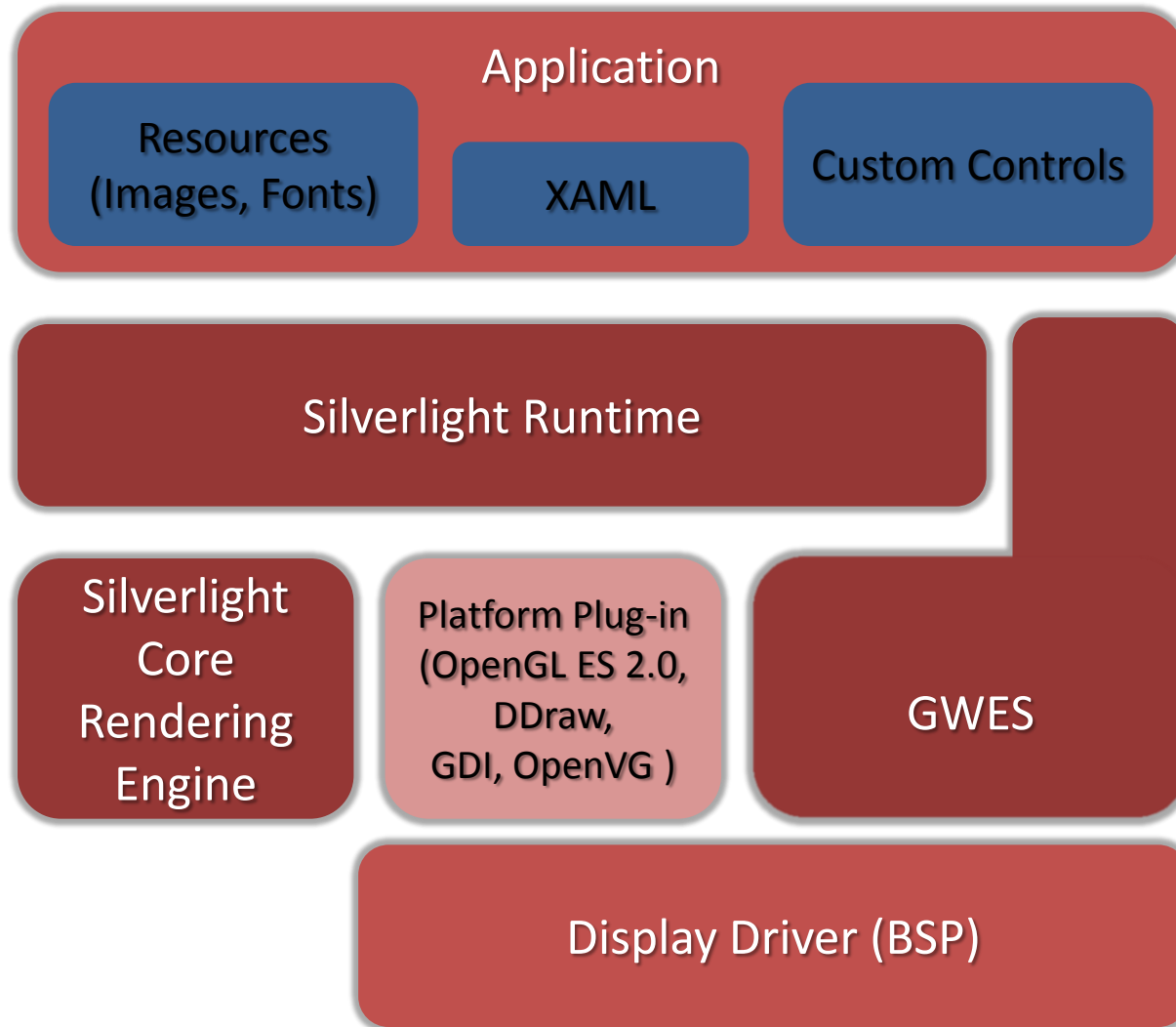
In order to have 100% XAML compatibility your XAML must be designed with Expression Blend based on a Silverlight 2 Web Project

Graphics hardware and plug-in support should be sufficient for what you are trying to accomplish. If you want vertex shading support, then your hardware and display driver must support this.

Feature	WPF Win32 Windows	SL Silverlight 2 Web	SWE Silverlight for Windows Embedded
Runs in a Web Browser		X	
Works Cross Platform (Windows/Mac/Linux)		X	
Available in CE6 R3			X
Designed for Embedded Devices			X
Supports Native C++ Code			X
Supports Managed Code / Requires .NET	X	X	
Expression Blend Tooling Support	X	X	X
2D Hardware Acceleration	X		X
3D Hardware Acceleration	X		
Animation Support	X	X	X
Transparency Support	X	X	X
Supports Built-in Video Controls	X	X	
DeepZoom		X	
Custom Controls	X	X	X
Sub-Classing Controls	X	X	
Win32 Control hosting			X

What is Silverlight for Windows Embedded

Composed of?



Silverlight for Windows Embedded Tools

- What is Expression Blend?
- How does Silverlight for Windows Embedded incorporate with Visual Studio 2005/Platform Builder?

Silverlight for Windows Embedded Tools

- What is Expression Blend?
- How does Silverlight for Windows Embedded
in
Bu
atform

- GUI/IDE Tool used to design and create XAML
- Can be used to create complete applications
 - Design XAML
 - Write application logic in C#
 - Display and test in a Browser Window
- Generated XAML is compatible with Silverlight for Windows Embedded
 - Drop generated XAML files into your Silverlight for Windows Embedded subproject
- Design on your target will look, function, and feel just like the design on your workstation

Silverlight for Windows Embedded Tools

- What is Expression Blend?
- How does Silverlight for Windows Embedded incorporate with Visual Studio 2005/Platform Builder?

- Use Visual Studio 2005 and Platform Builder to
 - Create your basic Win32 CE application subproject
 - Fill your WinMain to initialize the Silverlight for Windows Embedded engine
 - Parse your XAML
 - Write your call-back handlers
 - Start a dialog box to display your Silverlight Application
- Can also use a Target SDK and Smart Application project
 - Include the necessary headers and libraries

Silverlight Application Sample

Guitar Switch Project

DEMO



Microsoft®
Silverlight™



Advanced Design Techniques

- Advanced XAML Design Techniques
 - Do as much work as you can in XAML
 - Use Visual States more often than Storyboards
 - Visual States can contain self triggered storyboards, animations, and transitions
 - Create “Macro States” for your entire project.
 - I.e. if you have a Media Player device depending on what screen you are on, make it a state. Home state, PhotoViewer state, Media Player state etc...
 - Maintain a Z layer index scheme
 - If in a certain Visual State, other objects do not need to be seen, then modify the z index accordingly. This will help with performance and video memory allocation.

Advanced Design Techniques (continued)

- Advanced XAML Design Techniques
 - Avoid lots of single Storyboards.
 - For each single storyboard you will need to write code to attach a delegate, start, and stop the storyboard.
 - Use bitmaps for backgrounds rather than complex gradients.
 - The bitmap images can be cached in video RAM rather than re-rendered each frame
 - Avoid lots of opacity changes especially over gradients.
- Advanced Application Development
 - Silverlight for Windows Embedded allows you to embed a Win32 window in a XAML object (note that the corresponding XAML tag is NOT supported in Expression Blend)

Advanced Design Techniques

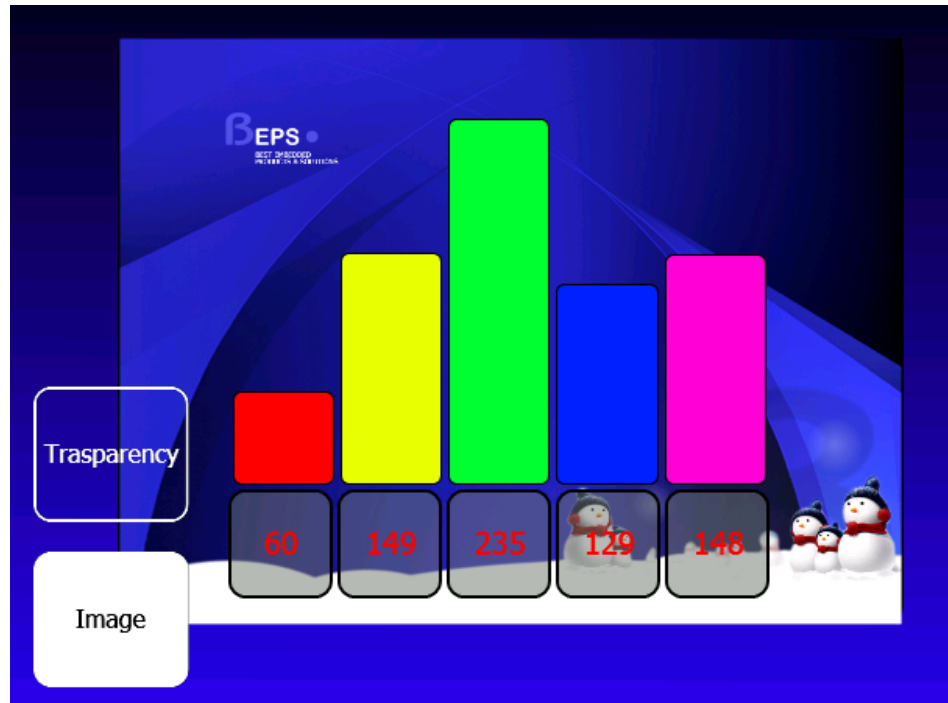
(continued)

- Advanced Application Development
 - How to store XAML files?
 - Using static files allows you to modify the XAML file without having to modify or recompile the source
 - Can be used to quickly and dynamically change the style of your application
 - Storing XAML files in a resource file allows for easier access in code and more organization
 - Also provides a secure environment. XAML files cannot be maliciously modified.
 - There are no notable performance differences between either method.

Silverlight Application Sample

Histogram project

DEMO



Applicability of Silverlight for Windows Embedded

- What can Silverlight for Windows Embedded be used for?

- **Ex**
 - Applications can be designed to replace entire UIs or existing shells
 - With Silverlight every aspect of a shell can be modified. Dialog boxes, warning messages, windows, etc ... can all be completely custom
 - Web browser support can be integrated easily with the Win32 container XAML tag
 - Since code is in C++, integration with existing CE drivers is easy.

Applicability of Silverlight for Windows Embedded

- What can Silverlight for Windows Embedded be used for?
- Expanding your design

- Work with graphic designers to create innovative and immersive application environments
- Don't be restricted to one version. Change your colors and schemes around but don't change the application code.
- Write the entire application in Expression Blend (using C#) first so that you have a clear vision of the flow before starting the C++ application development.