

## Leveraging WPF in Windows Embedded

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## Overview of WPF Windows Presentation Foundation

- UI Framework Introduced in .NET 3.0
- Rich UI Development Using Extensible Application Markup Language (XAML)
- Clear Separation of Design and Business Logic
- WPF/e Used in Silverlight

## What is XAML?

- The XML language used to create WPF Applications
- Declarative rather than procedural
- XAML gets compiled into an object definition

## Anatomy of a XAML File

```
<Window xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
  x:Class="AirportKiosk.Window1"
  x:Name="Window" Title="Window1"
  Width="640" Height="480">
  <Grid x:Name="LayoutRoot">
    <Grid Width="100" Height="100">
      <Button Content="Hello">
        <Button.Background>
          <Brush>Orange</Brush>
        </Button.Background>
      </Button>
    </Grid>
  </Grid>
</Window>
```

## Code Behind

- Event declared in XAML
- Logic implemented in a code-behind file (C#, VB.NET, or any other .NET language)

```
<Button Content="Hello" x:Name="Button1"
  Click="Button1_Click">
  <Button.Background>
    <Brush>Orange</Brush>
  </Button.Background>
</Button>
```

## Code Behind (continued)

```
public partial class Window1
{
  public Window1()
  {
    // Load our component from XAML
    InitializeComponent();
  }

  public void Button1_Click(object sender,
    RoutedEventArgs e)
  {
    MessageBox.Show("Hello!");
  }
}
```

## Data Binding

- XAML UI can be bound to CLR objects or XML
- Properties can also be bound to ADO.NET and objects associated with Web Services and Web Properties
- Sort, filter and group views can be generated on top of the data

## Data Templates


```
<ListBox ItemsSource="{Binding
  Source={StaticResource photos}}" ...>
<ListBox.ItemTemplate>
  <DataTemplate>
    <Image Source="{Binding Path=FullPath}"
      Height="30"/>
  </DataTemplate>
</ListBox.ItemTemplate></ListBox>
```

## Leveraging WPF for Embedded Device

- Perfect for applications where UI is key
  - ATM
  - Kiosk
  - Point of Sale
  - Jukebox
- The Silverlight Option
  - Very small footprint for small devices
  - Deployment and servicing is simplified
  - Tradeoffs when in the browser

# demo

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# Quebec toolkit







## Why Windows Embedded "Quebec"??

- Custom Windows-based operating system leveraging
  - Windows 7 features, developer scenarios and ecosystem
  - Embedded enabling features
- Win32 application and driver compatibility
- Large developer and partner community
- Enterprise server and tools integration
- Off-the-shelf hardware and drivers (x86 and x64)
- Partner solutions for real-time support, management, monitoring
- Sample device types
  - Kiosks, thin clients, point of service, automation, gaming, medical imaging, DVR, grid computing
  - Martini mixer



## New Technologies Enabling New Embedded Scenarios

 <p><b>Kiosks</b></p> <ul style="list-style-type: none"> <li>Power management</li> <li>Multi-touch</li> <li>Surface</li> <li>Internet Explorer 8</li> <li>Audio improvements</li> <li>Silverlight</li> </ul>	 <p><b>Thin clients (mobile, desktop)</b></p> <ul style="list-style-type: none"> <li>Remote Desktop Protocol 7</li> <li>Power management</li> <li>Internet Explorer 8</li> <li>Windows Media Player</li> <li>Audio</li> <li>Audio improvements</li> <li>Webcam</li> <li>Cloud computing</li> <li>Sync Edge</li> </ul>	 <p><b>Medical imaging</b></p> <ul style="list-style-type: none"> <li>64-bit support</li> <li>Audio improvements</li> <li>Multi-touch</li> <li>Surface SDK</li> </ul>
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## New Technologies Enabling New Embedded Scenarios

 <p><b>Industrial Automation (HMIs, Controllers)</b></p> <ul style="list-style-type: none"> <li>Power management</li> <li>Sensor SDK</li> <li>Cloud computing</li> <li>Powershell</li> </ul>	 <p><b>Gaming</b></p> <ul style="list-style-type: none"> <li>Webcam</li> <li>Multi-touch</li> <li>Surface</li> <li>Audio and graphics improvements</li> </ul>	 <p><b>Martini Mixers</b></p> <ul style="list-style-type: none"> <li>Multi-touch</li> <li>Surface</li> <li>Cloud computing</li> </ul>
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## Windows Embedded Developer Experience

- Same development tools as desktop
  - Visual Studio 2010
  - .Net 3.5 WPF, WCF
  - Silverlight/Expression Web
  - DirectX, Direct 3D
- Porting applications and drivers to Quebec
  - Sysinternals suite for dependency analysis
- Windows embedded toolkit
  - Support for embedded developer scenarios

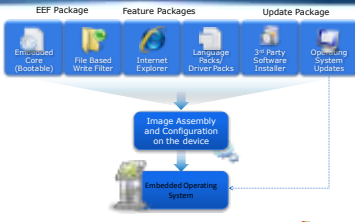


## Windows Embedded Developer Experience

- Embedded device scenarios
- Read-only devices
  - EWF, EWF HORM, FBWF, registry filter
  - Public APIs
- Boot from removable media
  - USB, CD, DVD
- Custom shell support
- Light-weight management
  - Device update agent





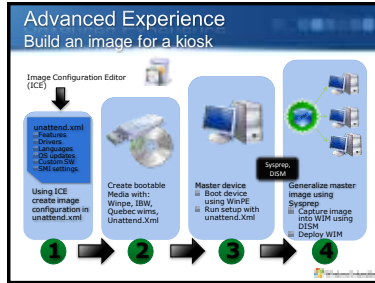
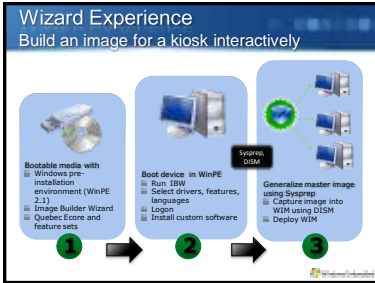
## Quebec Image Building Concepts



## Feature Sets And Packages

- Feature set is an operating system functionality area
  - Windows Media Player
  - Internet Explorer
  - Network security
- Feature set is composed of 1 or more packages



- ### About the Toolkit
- The toolkit provides a rich set of utilities to help support the development lifecycle of an Embedded Windows OS
    - Analysis of target machine
    - Configuration of embedded run-time image
    - Building of embedded run-time image based on configuration
    - Online tweaking and testing of embedded run-time
    - Capture of final embedded run-time image to be deployed
    - Deploy captured image to many devices
  - Based on the Windows AIK/OPK

### Resources

- [www.microsoft.com/teched](http://www.microsoft.com/teched)  
 Sessions On-Demand & Community
- [www.microsoft.com/learning](http://www.microsoft.com/learning)  
 Microsoft Certification & Training Resources
- <http://microsoft.com/technet>  
 Resources for IT Professionals
- <http://microsoft.com/msdn>  
 Resources for Developers

[www.microsoft.com/learning](http://www.microsoft.com/learning)  
 Microsoft Certification and Training Resources

# Q&A

## Leveraging WPF

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Your potential. Our passion.™