

2011Esri中国开发者大会

ArcGIS Microsoft Silverlight/WPF API——高级篇

Esri中国(北京)有限公司 马克玲

讨论话题...

- 用户体验和RIA应用程序设计
- Silverlight API的可扩展性
- 如何提升Graphics性能
- WPF/Silverlight/WP高效代码重用

用户体验和RIA应用程序设计

高效地使用地图

- 何时展现你的Web地图应用...
 - “茫然失措...”
 - “我现在该做什么？”
 - “哪些图标符号是我假设要使用的？”
- 设计应用
 - 保持简洁
 - 简洁是关键

Demo : 用户体验和RIA应用程序设计

以地图为中心的应用 以表单为中心的应用

```
function init() {
    var map = new esri.Map("map");
    var tiledLayer = new esri.layers.ArcGISImageServiceLayer(
        "http://services.arcgis.com/ESRT/Imagery_2010/MapServer/0");
    map.addLayer(tiledLayer);
}
```

Demo : Silverlight API的可扩展性

自定义符号

自定义控件模板

自定义数据源

```
function init() {  
    var map = new esri.Map("map");  
    var tiledMapServiceLayer = new  
        esri.layers.ArcGISTiledMapServiceLayer("http://services.esri.com/ArcGIS/rest/services/WorldTopographic/MapServer/0");  
    map.addLayer(tiledMapServiceLayer);  
  
    function getdriveTimePolys(result){  
        var features = result.features;  
        var f=0, feature;  
        for (var feature = f; feature < result.features.length; feature++) {  
            if (result.features[feature].symbol == null) {  
                var symbol = RedSymbol();  
                result.features[feature].symbol = symbol;  
            }  
            else if (result.features[feature].symbol == null) {  
                var symbol = SimpleLineSymbol();  
                result.features[feature].symbol = symbol;  
            }  
            else if (result.features[feature].symbol == null) {  
                var symbol = PolylineSymbol();  
                result.features[feature].symbol = symbol;  
            }  
            else if (result.features[feature].symbol == null) {  
                var symbol = PolygonSymbol();  
                result.features[feature].symbol = symbol;  
            }  
        }  
    }  
}
```

如何提升Graphic的性能

```
function init() {  
    var map = new esri.Map("map");  
    var tiledMapServiceLayer = new  
        esri.layers.ArcGISTiledMapServiceLayer(  
            "http://services/ESRI/Imagery_World_2D/  
            map.addLayer(tiledMapServiceLayer);  
}
```

```
function getdriveTimePolys(result){  
    var features = result[0].features;  
    var f=0, feature;  
    for (var feature = f; feature < result[0].features.length; feature++) {  
        if(feature == polySymbolRed.setFeature)  
            varSymbol1.setFeature(polySymbol1);  
        else if(feature == polySymbolGreen.setFeature)  
            varSymbol2.setFeature(polySymbol2);  
        else if(feature == polySymbolBlue.setFeature)  
            varSymbol3.setFeature(polySymbol3);  
        else if(feature == polySymbolYellow.setFeature)  
            varSymbol4.setFeature(polySymbol4);  
        else if(feature == polySymbolPurple.setFeature)  
            varSymbol5.setFeature(polySymbol5);  
        else if(feature == polySymbolGrey.setFeature)  
            varSymbol6.setFeature(polySymbol6);  
        else if(feature == polySymbolBlack.setFeature)  
            varSymbol7.setFeature(polySymbol7);  
        else if(feature == polySymbolWhite.setFeature)  
            varSymbol8.setFeature(polySymbol8);  
        else if(feature == polySymbolOrange.setFeature)  
            varSymbol9.setFeature(polySymbol9);  
        else if(feature == polySymbolTeal.setFeature)  
            varSymbol10.setFeature(polySymbol10);  
        else if(feature == polySymbolDarkBlue.setFeature)  
            varSymbol11.setFeature(polySymbol11);  
        else if(feature == polySymbolLightBlue.setFeature)  
            varSymbol12.setFeature(polySymbol12);  
        else if(feature == polySymbolDarkGreen.setFeature)  
            varSymbol13.setFeature(polySymbol13);  
        else if(feature == polySymbolLightGreen.setFeature)  
            varSymbol14.setFeature(polySymbol14);  
        else if(feature == polySymbolDarkRed.setFeature)  
            varSymbol15.setFeature(polySymbol15);  
        else if(feature == polySymbolLightRed.setFeature)  
            varSymbol16.setFeature(polySymbol16);  
        else if(feature == polySymbolDarkGrey.setFeature)  
            varSymbol17.setFeature(polySymbol17);  
        else if(feature == polySymbolLightGrey.setFeature)  
            varSymbol18.setFeature(polySymbol18);  
        else if(feature == polySymbolDarkOrange.setFeature)  
            varSymbol19.setFeature(polySymbol19);  
        else if(feature == polySymbolLightOrange.setFeature)  
            varSymbol20.setFeature(polySymbol20);  
        else if(feature == polySymbolDarkTeal.setFeature)  
            varSymbol21.setFeature(polySymbol21);  
        else if(feature == polySymbolLightTeal.setFeature)  
            varSymbol22.setFeature(polySymbol22);  
        else if(feature == polySymbolDarkDarkBlue.setFeature)  
            varSymbol23.setFeature(polySymbol23);  
        else if(feature == polySymbolLightDarkBlue.setFeature)  
            varSymbol24.setFeature(polySymbol24);  
        else if(feature == polySymbolDarkDarkGreen.setFeature)  
            varSymbol25.setFeature(polySymbol25);  
        else if(feature == polySymbolLightDarkGreen.setFeature)  
            varSymbol26.setFeature(polySymbol26);  
        else if(feature == polySymbolDarkDarkRed.setFeature)  
            varSymbol27.setFeature(polySymbol27);  
        else if(feature == polySymbolLightDarkRed.setFeature)  
            varSymbol28.setFeature(polySymbol28);  
        else if(feature == polySymbolDarkDarkGrey.setFeature)  
            varSymbol29.setFeature(polySymbol29);  
        else if(feature == polySymbolLightDarkGrey.setFeature)  
            varSymbol30.setFeature(polySymbol30);  
        else if(feature == polySymbolDarkDarkOrange.setFeature)  
            varSymbol31.setFeature(polySymbol31);  
        else if(feature == polySymbolLightDarkOrange.setFeature)  
            varSymbol32.setFeature(polySymbol32);  
        else if(feature == polySymbolDarkDarkTeal.setFeature)  
            varSymbol33.setFeature(polySymbol33);  
        else if(feature == polySymbolLightDarkTeal.setFeature)  
            varSymbol34.setFeature(polySymbol34);  
        else if(feature == polySymbolDarkDarkDarkBlue.setFeature)  
            varSymbol35.setFeature(polySymbol35);  
        else if(feature == polySymbolLightDarkDarkBlue.setFeature)  
            varSymbol36.setFeature(polySymbol36);  
        else if(feature == polySymbolDarkDarkDarkGreen.setFeature)  
            varSymbol37.setFeature(polySymbol37);  
        else if(feature == polySymbolLightDarkDarkGreen.setFeature)  
            varSymbol38.setFeature(polySymbol38);  
        else if(feature == polySymbolDarkDarkDarkRed.setFeature)  
            varSymbol39.setFeature(polySymbol39);  
        else if(feature == polySymbolLightDarkDarkRed.setFeature)  
            varSymbol40.setFeature(polySymbol40);  
        else if(feature == polySymbolDarkDarkDarkGrey.setFeature)  
            varSymbol41.setFeature(polySymbol41);  
        else if(feature == polySymbolLightDarkDarkGrey.setFeature)  
            varSymbol42.setFeature(polySymbol42);  
        else if(feature == polySymbolDarkDarkDarkOrange.setFeature)  
            varSymbol43.setFeature(polySymbol43);  
        else if(feature == polySymbolLightDarkDarkOrange.setFeature)  
            varSymbol44.setFeature(polySymbol44);  
        else if(feature == polySymbolDarkDarkDarkTeal.setFeature)  
            varSymbol45.setFeature(polySymbol45);  
        else if(feature == polySymbolLightDarkDarkTeal.setFeature)  
            varSymbol46.setFeature(polySymbol46);  
        else if(feature == polySymbolDarkDarkDarkDarkBlue.setFeature)  
            varSymbol47.setFeature(polySymbol47);  
        else if(feature == polySymbolLightDarkDarkDarkBlue.setFeature)  
            varSymbol48.setFeature(polySymbol48);  
        else if(feature == polySymbolDarkDarkDarkDarkGreen.setFeature)  
            varSymbol49.setFeature(polySymbol49);  
        else if(feature == polySymbolLightDarkDarkDarkGreen.setFeature)  
            varSymbol50.setFeature(polySymbol50);  
        else if(feature == polySymbolDarkDarkDarkDarkRed.setFeature)  
            varSymbol51.setFeature(polySymbol51);  
        else if(feature == polySymbolLightDarkDarkDarkRed.setFeature)  
            varSymbol52.setFeature(polySymbol52);  
        else if(feature == polySymbolDarkDarkDarkDarkGrey.setFeature)  
            varSymbol53.setFeature(polySymbol53);  
        else if(feature == polySymbolLightDarkDarkDarkGrey.setFeature)  
            varSymbol54.setFeature(polySymbol54);  
        else if(feature == polySymbolDarkDarkDarkDarkOrange.setFeature)  
            varSymbol55.setFeature(polySymbol55);  
        else if(feature == polySymbolLightDarkDarkDarkOrange.setFeature)  
            varSymbol56.setFeature(polySymbol56);  
        else if(feature == polySymbolDarkDarkDarkDarkTeal.setFeature)  
            varSymbol57.setFeature(polySymbol57);  
        else if(feature == polySymbolLightDarkDarkDarkTeal.setFeature)  
            varSymbol58.setFeature(polySymbol58);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol59.setFeature(polySymbol59);  
        else if(feature == polySymbolLightDarkDarkDarkDarkBlue.setFeature)  
            varSymbol60.setFeature(polySymbol60);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol61.setFeature(polySymbol61);  
        else if(feature == polySymbolLightDarkDarkDarkDarkGreen.setFeature)  
            varSymbol62.setFeature(polySymbol62);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol63.setFeature(polySymbol63);  
        else if(feature == polySymbolLightDarkDarkDarkDarkRed.setFeature)  
            varSymbol64.setFeature(polySymbol64);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkGrey.setFeature)  
            varSymbol65.setFeature(polySymbol65);  
        else if(feature == polySymbolLightDarkDarkDarkDarkGrey.setFeature)  
            varSymbol66.setFeature(polySymbol66);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkOrange.setFeature)  
            varSymbol67.setFeature(polySymbol67);  
        else if(feature == polySymbolLightDarkDarkDarkDarkOrange.setFeature)  
            varSymbol68.setFeature(polySymbol68);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkTeal.setFeature)  
            varSymbol69.setFeature(polySymbol69);  
        else if(feature == polySymbolLightDarkDarkDarkDarkTeal.setFeature)  
            varSymbol70.setFeature(polySymbol70);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol71.setFeature(polySymbol71);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol72.setFeature(polySymbol72);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol73.setFeature(polySymbol73);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol74.setFeature(polySymbol74);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol75.setFeature(polySymbol75);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol76.setFeature(polySymbol76);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkGrey.setFeature)  
            varSymbol77.setFeature(polySymbol77);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkGrey.setFeature)  
            varSymbol78.setFeature(polySymbol78);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkOrange.setFeature)  
            varSymbol79.setFeature(polySymbol79);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkOrange.setFeature)  
            varSymbol80.setFeature(polySymbol80);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkTeal.setFeature)  
            varSymbol81.setFeature(polySymbol81);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkTeal.setFeature)  
            varSymbol82.setFeature(polySymbol82);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol83.setFeature(polySymbol83);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol84.setFeature(polySymbol84);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol85.setFeature(polySymbol85);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol86.setFeature(polySymbol86);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol87.setFeature(polySymbol87);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol88.setFeature(polySymbol88);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkGrey.setFeature)  
            varSymbol89.setFeature(polySymbol89);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkGrey.setFeature)  
            varSymbol90.setFeature(polySymbol90);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkOrange.setFeature)  
            varSymbol91.setFeature(polySymbol91);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkOrange.setFeature)  
            varSymbol92.setFeature(polySymbol92);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkTeal.setFeature)  
            varSymbol93.setFeature(polySymbol93);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkTeal.setFeature)  
            varSymbol94.setFeature(polySymbol94);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol95.setFeature(polySymbol95);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkDarkBlue.setFeature)  
            varSymbol96.setFeature(polySymbol96);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol97.setFeature(polySymbol97);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkDarkGreen.setFeature)  
            varSymbol98.setFeature(polySymbol98);  
        else if(feature == polySymbolDarkDarkDarkDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol99.setFeature(polySymbol99);  
        else if(feature == polySymbolLightDarkDarkDarkDarkDarkDarkDarkRed.setFeature)  
            varSymbol100.setFeature(polySymbol100);  
    }  
}
```

如何在客户端渲染数以万计的graphics?

- 用户真的想同时在客户端看到数百万的要素吗？
- 大量要素下载到客户端将需要多长时间？
- 尝试并限制同时显示的要素数
 - 在缩小时，使用MaximumResolution 属性来隐藏图层
 - 将要素整合为簇，以“集合”的形式显示要素。
 - 让用户选择感兴趣区域，并仅为那个区域显示数据（例如：`FeatureLayer.Mode = Selection`）

优化符号

- 简单的符号模板比复杂的渲染更快
- 尽可能的共享资源 (brushes 等等)
- 通常影响渲染性能的因素：
 - Binding
 - Visual States
 - Disable Hit Test(IsHitTestVisible= “False”)
- PictureMarkerSymbol 性能，参考：
<http://esriurl.com/PictureMarkerPerformance>

低效的Marker symbol:

```
<esriSymbols:MarkerSymbol x:Key="MySymbol">  
    <esriSymbols:MarkerSymbol.ControlTemplate>  
        <ControlTemplate>  
            <Grid>  
                <Ellipse Width="{Binding Symbol.Size}"  
                    Height="{Binding Symbol.Size}"  
                    Fill="{Binding Symbol.Brush}" />  
            </Grid>  
        </ControlTemplate>  
    <esriSymbols:MarkerSymbol.ControlTemplate>  
</esriSymbols:MarkerSymbol>
```

高效的Marker symbols

```
<esriSymbols:MarkerSymbol x:Key="MySymbol">  
    <esriSymbols:MarkerSymbol.ControlTemplate>  
        <ControlTemplate>  
            <Ellipse Width="10"  
                    Height="10"  
                    Fill="Red" />  
        </ControlTemplate>  
    <esriSymbols:MarkerSymbol.ControlTemplate>  
</esriSymbols:MarkerSymbol>
```

Demo : 如何提升Graphics性能

WPF/Silverlight/WP高效代码重用

```
function init() {
    var map = new Esri.Map("map");
    var tiledMapServiceLayer = new
        layers.ArcGISTiledMapServiceLayer(
            "http://services.arcgis.com/ESRI/Imagery/ArcGis
            Map.addLayer(tiledMapServiceLayer);
}

function getDriverTimePolys(results) {
    var features = results[0].features;
    var feature = features[0];
    var f = feature.attributes;
    for (var i = 0; i < f.length; i++) {
        if (f[i].symbolId == 1) {
            var symbol1 = f[i].symbol;
            if (symbol1.type == "esriSymbologyPolyline") {
                var simpleLineSymbol = symbol1.simpl
                    .strokeWidth = 1;
                symbol1.color([0, 100, 0]);
                symbol1.size = 1;
                symbol1.capStyle = "square";
                symbol1.joinStyle = "miter";
                symbol1.miterLimit = 1;
                symbol1.lineDash = [5, 5];
                symbol1.lineJoin = "miter";
                symbol1.lineWidth = 1;
                symbol1.outlineWidth = 1;
                symbol1.type = "esriSymbologyPolyline";
            }
        }
    }
}
```

代码重用的优势

- 写一次！
 - 重用 (WPF), 重用 (Silverlight), 重用 (Phone), 重用 (Xbox ?) , 重用 (? ? ?)
 - 换句话：三倍你的生产力
- 总是同步DataContract
为服务器端和客户端编译数据契约——简单重用

如何实现？

- 写一次，但是：
 - Test, Test, Test...
 - 换句话：三倍你的测试投入
- 不同的屏幕——不同的体验
- Silverlight 是WPF的子集
 - 但是 Silverlight 发展的速度快于WPF!
- Windows Phone 版本总是落后于Silverlight

Demo : Silverlight/WPF/WP代码复用

实现细节

- 为平台指定代码使用编译条件：
 - #if WINDOWS_PHONE
 - //Windows phone 7
 - #elseif SILVERLIGHT
 - // Silverlight
 - #else
 - // .NET
 - # endif

实现细节——样例

- 在主题样式声明上不同：

Silverlight/Phone:

```
Public HoverControl(){  
# if SILVERLIGHT  
    this.DefaultStyleKey = typeof(HoverControl);  
#endif  
}
```

WPF:

```
Static HoverControl(){  
# if !SILVERLIGHT  
    DefaultStyleKeyProperty.OverrideMetadata(  
        typeof(HoverControl),  
        new FrameworkPropertyMetadata(typeof(HoverControl)));  
#endif  
}
```

实现细节：

- Xaml条件：
 - 在XAML中不能包含编译条件！
 - 这意味着可能必须要复写XAML

```
<Grid x:Name="LayoutRoot" Background="White">
    <controls:HoverControl>
#if SILVERLIGHT
    <TextBlock Text="Hello from Silverlight" />
#else
    <TextBlock Text="Hello from .NET" />
#endif
    </controls:HoverControl>
</Grid>
```

Xaml reader

- *#if SILVERLIGHT*
- element = XamlReader.Load(xaml);
- *#else*
- using(MemoryStream xamlStream=
- new MemoryStream(UTF8Encoding.Default.GetBytes(xaml)))
- element = XamlReader.Load(xamStream);
- *#endif*

Create bitmap

- `BitmapImage bmi = new BitmapImage();`
- `#if !SILVERLIGHT`
- `bim.BeginInit();`
- `#endif`
- `Image img = new Image();`
- `bmi.UriSource = new Uri(strUrl, UriKind.Absolute);`
- `#if SILVERLIGHT`
- `img.ImageFailed += img_ImageFailed;`
- `#else`
- `bmi.DownloadFailed += bmi_DownloadFailed;`
- `bmi.EndInit();`
- `#endif`
- `img.Source = bmi;`

Stop — start animations

- *# if SILVERLIGHT*
 - myStoryboard.Begin();
 - myStoryboard.Stop();
- *#else*
 - myStoryboard.Begin(element,true);
 - myStoryboard.Stop(element);
- *#endif*

事件触发顺序的差异？

- <UserControl Loaded="UserControl_Loaded">
 - <my: Control Loaded = "MyControl_Loaded" />
 - </UserControl>
-
- Constructor
 - Loaded
 - OnApplyTemplate

Silverlight

- 1、UserControl Constructor
- 2、MyControl Constructor
- 3、MyControl Loaded
- 4、UserControl Loaded
- 5、MyControl.OnApplyTemmplate

WPF

- 1、UserControl Constructor
- 2、MyControl Constructor
- 3、MyControl.OnApplyTemmplate
- 4、UserControl Loaded
- 5、MyControl Loaded

二进制的兼容性

- 装配集共享
 - 为Silverlight 4编译的
 - 可以在WPF中重用
- 然而
 - 仅下列装配集是支持的：
 - MsCorlib.dll
 - System.dll
 - System.Core.dll
 - System.ComponentModel.Composition.dll
 - Microsoft.VisualBasic.dll
 - 没有UI 逻辑
- Windows Phone:
 - 编译为Silverlight 3, 可原样重用

底线：

- 你可以重用绝大多数的代码，也应该重用！
- ...但是：注意不同屏幕的开发差异：
 - Web : 链接，导航，沙箱
 - Desktop: 菜单，多窗口，文件访问
 - Phone: 触控为中心，更小的屏幕



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分 享 地 理 价 值