

Core Types



see what you can learn

Outline

- **DependencyObject**
- **Visual, UIElement and ContentElement**
- **FrameworkElement and FrameworkContentElement**
- **Freezable**

DependencyObject

- CLR properties are very basic
- **DependencyObject** and **DependencyProperty** fill gaps
- **Base class of many WPF types**

Property Requirements

Change Notifications

Default Values

Type Coercion

Data Binding

Attached Properties

Validation

Inheritance

Styling

DependencyProperty

```
public class Foo : DependencyObject
{
    public double Roughness
    {
        get { return (double) GetValue(RoughnessProperty); }
        set { SetValue(RoughnessProperty, value); }
    }

    public static readonly DependencyProperty RoughnessProperty =
        DependencyProperty.Register("Roughness", typeof(double),
            typeof(Foo), new UIPropertyMetadata(0.0));
}
```

Metadata

- Default value
- Change callback
- Coercion callback

Change Notification

```
public static readonly DependencyProperty RoughnessProperty =  
    DependencyProperty.Register("Roughness", typeof(double),  
        typeof(Foo),  
        new UIPropertyMetadata(0.0, OnRoughnessChanged));  
  
private static void OnRoughnessChanged(DependencyObject source,  
    DependencyPropertyChangedEventArgs e)  
{  
    Foo target = (Foo) source;  
    target.OnRoughnessChanged(e);  
}  
private void OnRoughnessChanged(DependencyPropertyChangedEventArgs e)  
{  
    ...handle change...  
}
```

Attached Properties

```
<AnyElement Foo.Bar="42" />
```

```
public static double GetBar(DependencyObject obj)
{
    return (double) obj.GetValue(BarProperty);
}

public static void SetBar(DependencyObject obj, double value)
{
    obj.SetValue(BarProperty, value);
}

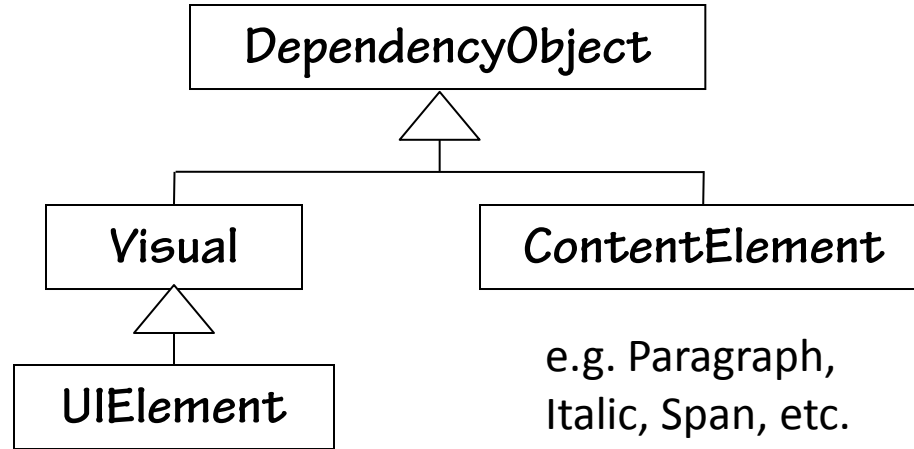
public static readonly DependencyProperty BarProperty =
    DependencyProperty.RegisterAttached("Bar", typeof(double),
        typeof(Foo), new UIPropertyMetadata(0.0));
```

Inheritance

- By containment hierarchy (not type)

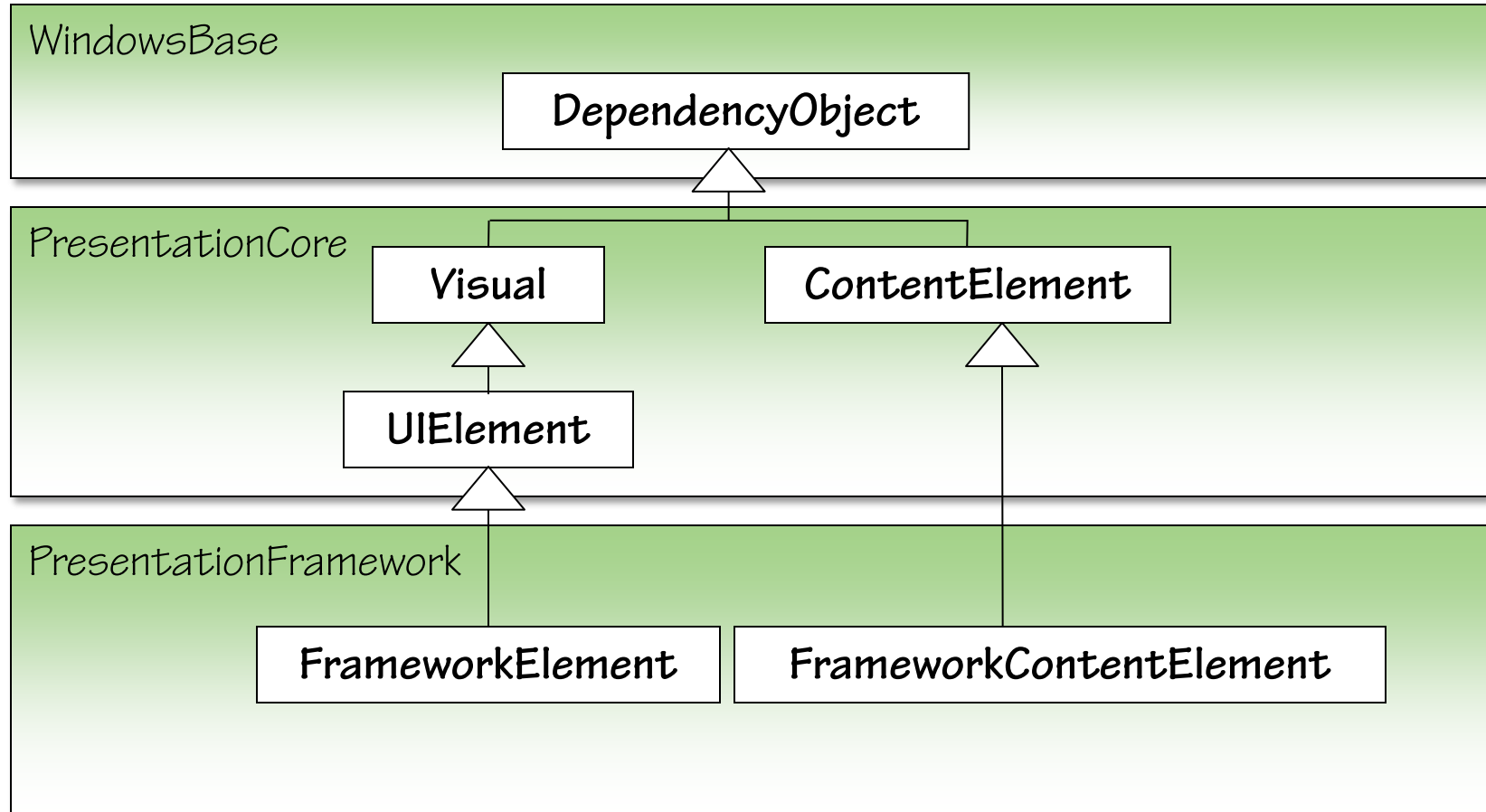
```
public static readonly DependencyProperty RoughnessProperty =  
    DependencyProperty.Register("Roughness", typeof(double),  
        typeof(Foo),  
  
        new FrameworkPropertyMetadata(0.0,  
            FrameworkPropertyMetadataOptions.Inherits));
```


UIElement and ContentElement



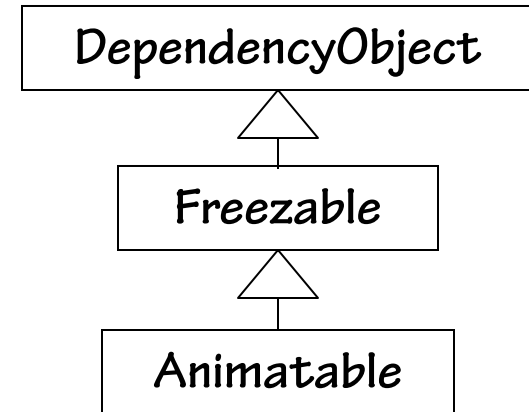
e.g. Button, Ellipse,
TextBlock, etc.

Core and Framework



Freezable & Animatable

- Brushes, Pens
- Geometries, Drawings, Transforms
- BitmapEffect, TextEffect
- Animations
- 3D Models



Summary

- **DependencyObject**
- **Visual, UIElement and ContentElement**
- **FrameworkElement and FrameworkContentElement**
- **Freezable**