Module 10

"MVVM Design Patterns [Deeper Dive]"

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Agenda

- MVVM Frameworks
- Patterns for Common Problems
- Concluding Remarks

The Jungle of MVVM Frameworks

- Caliburn
- Catel
- Cinch
- ClientUI
- Excalibur
- **MVVM Light**
- Prism
- Simple MVVM
- Vidyano
- … + many more

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MVVM Light Toolkit

- Developed by Laurent Bugnion of GalaSoft
  - http://www.galasoft.ch/mvvm/
- Patterns
  - ViewModel Locator / IoC
  - Stateful and Stateless ViewModel
  - Message Bus
  - View Service
  - …
- Provides
  - Project Templates
  - Infrastructure and Helper Classes
  - Snippets
  - NuGet packages

MVVM light toolkit

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Stateful ViewModel Pattern

- Controls do not have state – ViewModel does!
- Easier to test
- Decouples business logic from UI

- MVVM Light Toolkit provides NuGet package
  - **`ViewModelBase`** + snippets

```
public class MainViewModel : ViewModelBase
{
    public string FirstName
    {
        get => firstName;
        set
        {
            ...
            RaisePropertyChanged();
        }
}
```

Message Bus Pattern

- Need to synchronize viewmodels
  - Without tightly coupling them!
  - **`Messenger`** provides loosely coupled communication

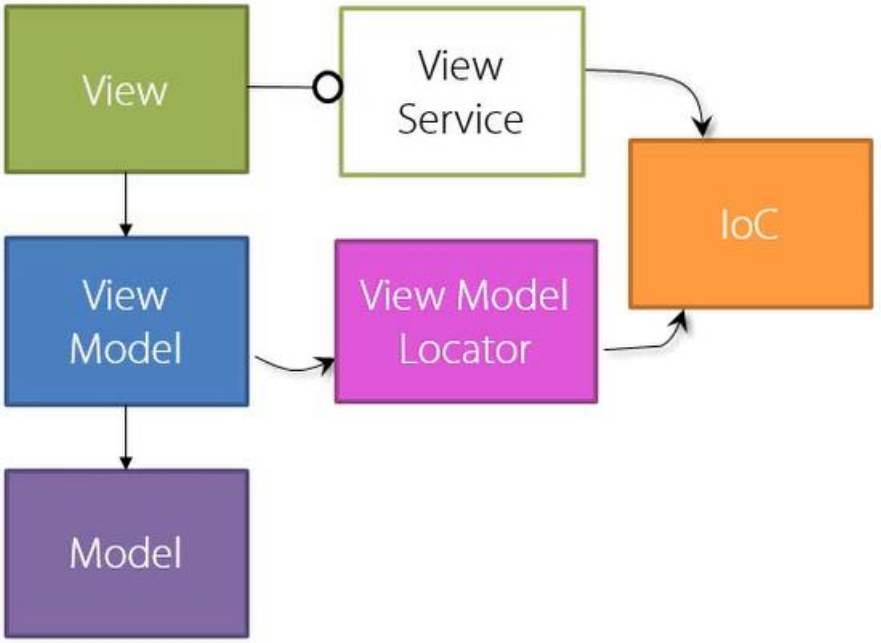
- Note that WPF 4.5 provides "live shaping"
  - **`CollectionViewSource.`**
    - **`IsLiveSortingRequested`**
    - **`IsLiveFilteringRequested`**
    - **`IsLiveGroupingRequested`**

Inversion of Control Pattern

- It is really helpful to make use of an IoC container
  - Unity
  - SimpleIoc
  - …
- This will allow simple setup of many nice features, e.g.
  - Design-mode vs. runtime models, view models and services
  - View Service Pattern
  - …
- MVVM Light Toolkit provides the **`SimpleIoc`** helper

View Services Pattern

- Cardinal rule of MVVM
  - Never look "up"…!
- ViewModel should never call View methods, e.g.
  - Prompts
  - Message boxes etc.



- Solution is to create View Services to break potential circular dependency between View and ViewModel

Attached Behaviors Pattern

- Nikhil Kothari
  - In 2008 discovered the sheer power of attached properties
  - Attaches "unavailable" behavior to UI elements, e.g. **`Command`**
- Blend Team went to improve it to **`Behavior<T>`** class
  - In **`System.Windows.Interactivity`** namespace
    - **`EventTrigger`**
    - **`InvokeCommandAction`**
- Examples may include
  - Providing **`Command`** property
  - Converting events to commands
  - Drag 'n Drop
  - Setting focus to elements
  - … + many more
- MVVM Light provides **`EventToCommand`** behavior similar to **`InvokeCommandAction`**

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Summarizing…

- Many variations and alternative sub-patterns exist
- MVVM keeps a clear and clean separation
- MVVM is in many ways like ”re-learning” WPF
- MVVM is often difficult upon new first encounters
- MVVM frameworks support sets of sub-patterns

- Choose the approach which suits YOU
- But stay as consistent as possible…
  - Uncle Google might be your enemy here

MVVM is "going global..." ☺

- Works for any XAML-based formalism
  - WPF
  - UWP
  - Xamarin.Forms
- Adapted by
  - KnockoutJS
  - Angular

Summary

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