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Silverlight Performance on Windows Phone 7

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Agenda

- Back to Basics
 - Silverlight Threading on the Phone
 - Performance debugging
- Real-World app pain points
 - ListBox
 - Memory
 - Networking
 - Popup
- Tools Demo / Information
- Summary / Q&A

- WhitePaper
 - <http://bit.ly/aSJHS8> - doc
 - <http://bit.ly/9A93TN> - samples
- Shane's Channel 9
 - <http://bit.ly/9h3V7u>
- PDC Talk
 - <http://bit.ly/cvVvY4>

Further Reading



The Usual Reaction...

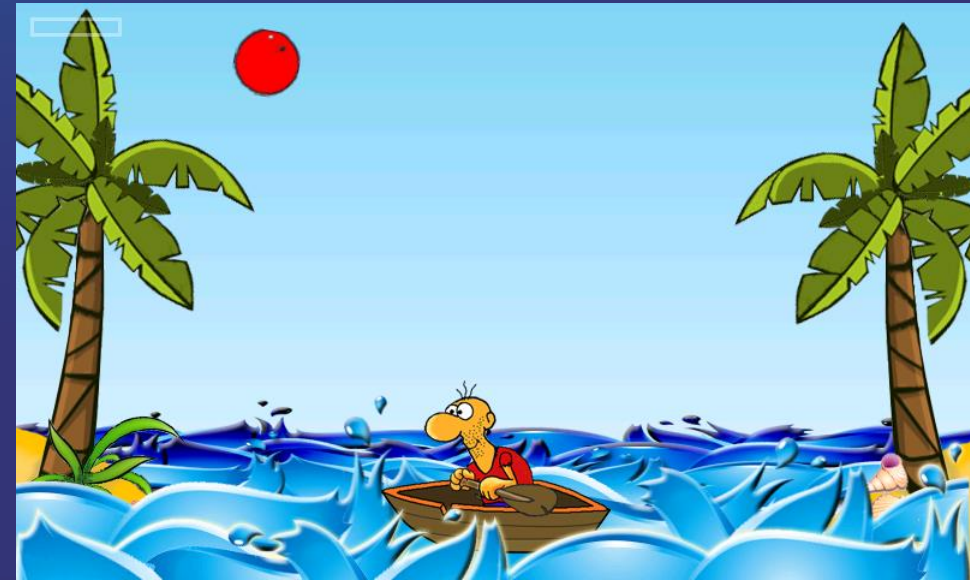


Back to Basics

Castaway

Threading, Redraw and FillRate Problems

Early prototype of "Hungry Castaway"
By Roger Peters (SmartyPantsGaming.com)



demo

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Desktop Threading Model

UI
Thread



`new Thread()`
`ThreadPool.QueueUserWorkItem(BackgroundTask)`

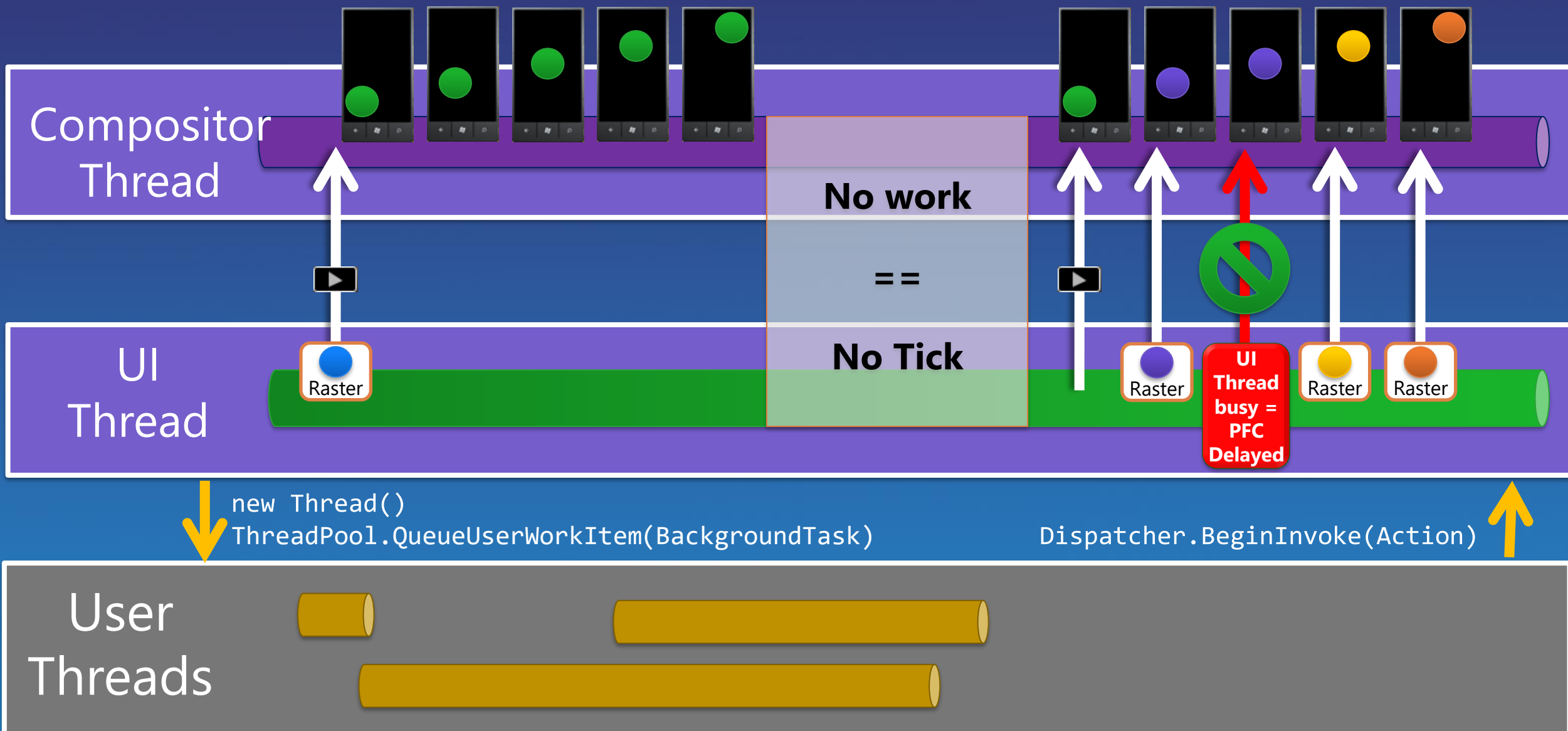
`Dispatcher.BeginInvoke(Action)`



User
Threads

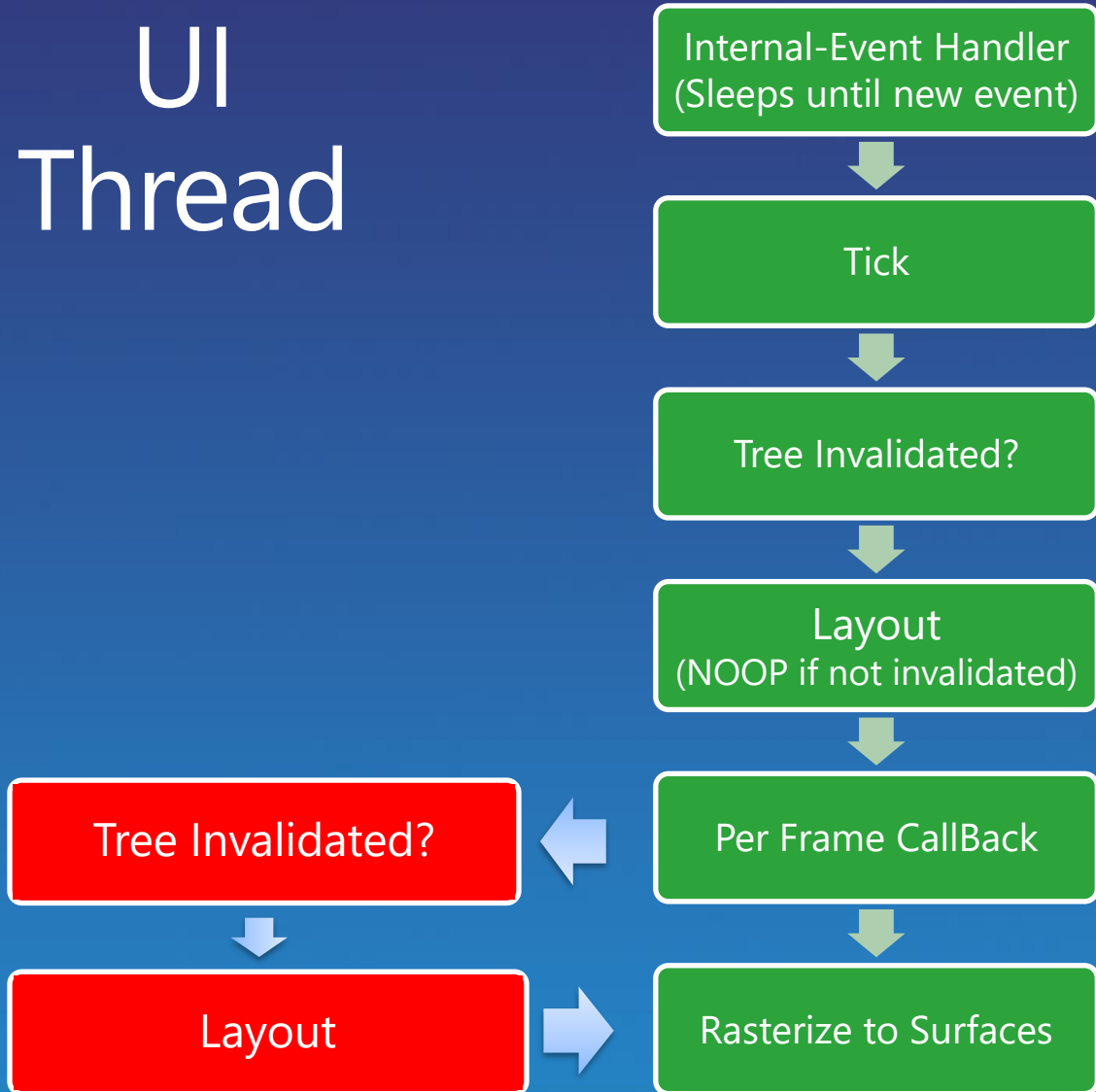


Phone Threading Model

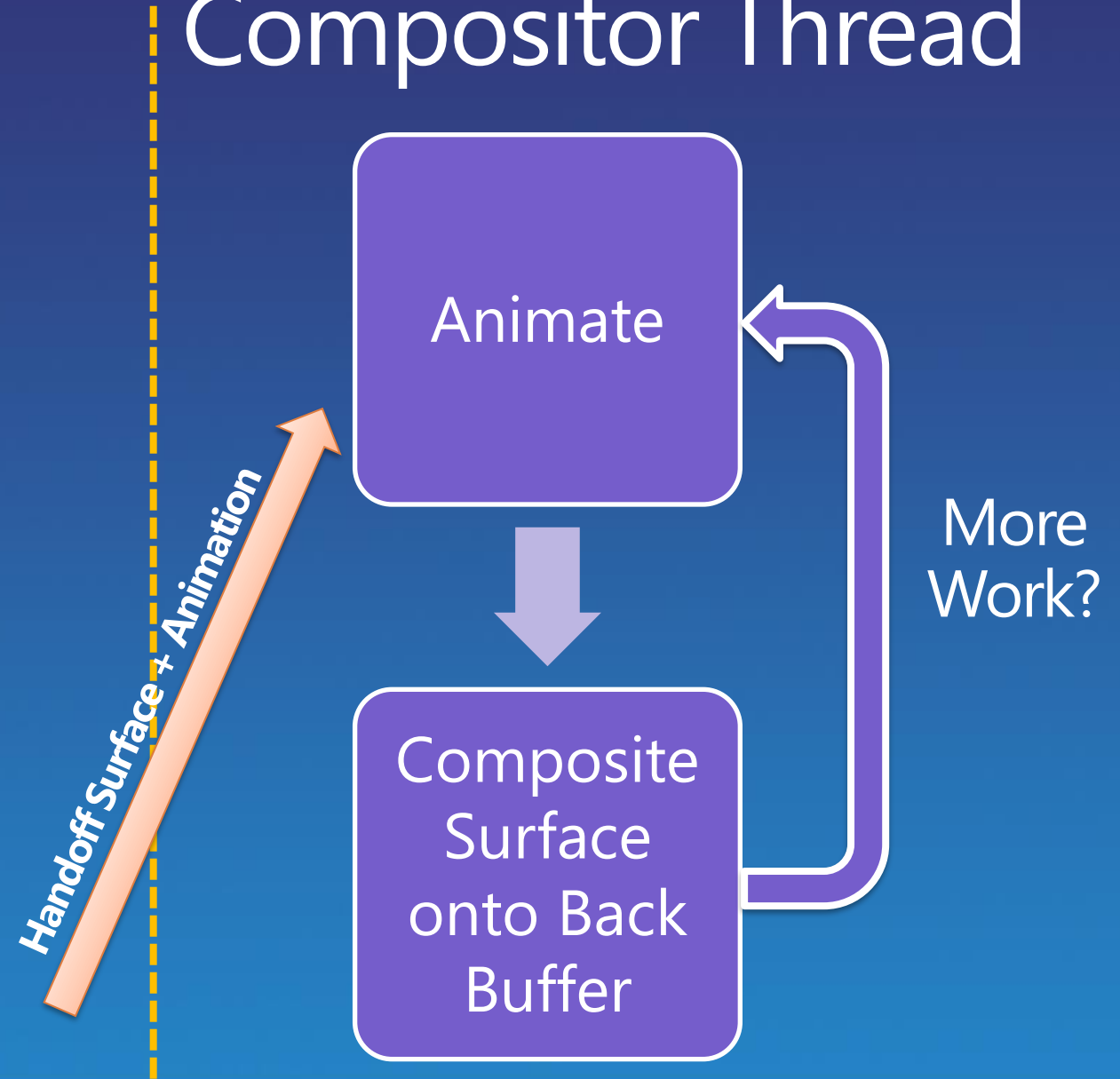


Thread Responsibilities

UI Thread



Compositor Thread



What gets kicked off the compositor thread

- Anything that modifies the base texture of an object
- Opacity Mask
- Non-Rectangular Clips
- Non-Storyboard animation (per-frame callbacks)
 - **CompositionTarget.Rendering**

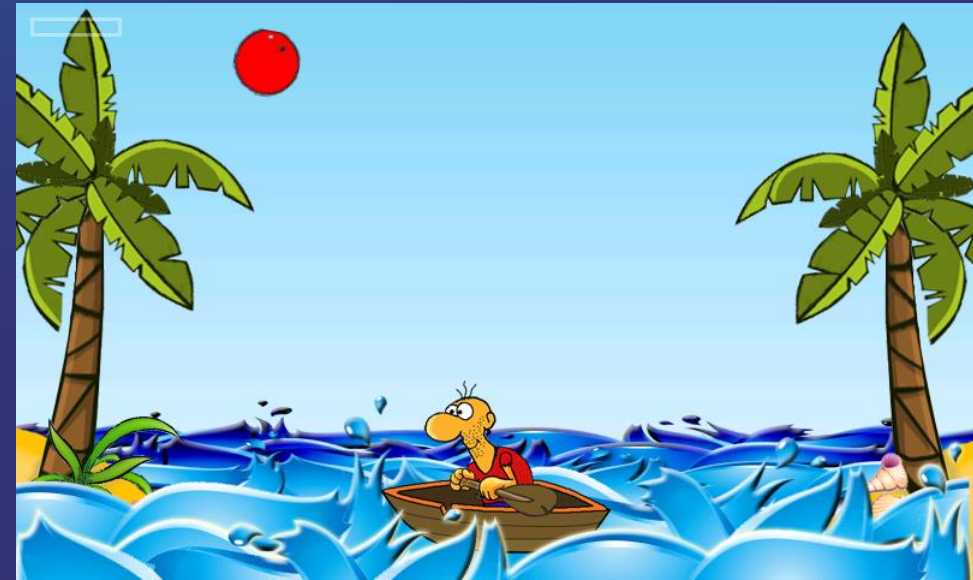
Castaway

The Solution

Early prototype of "Hungry Castaway"
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Reddit for WP7

Grab Source @
<http://redditwp.codeplex.com>

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Pain Points

ListBox

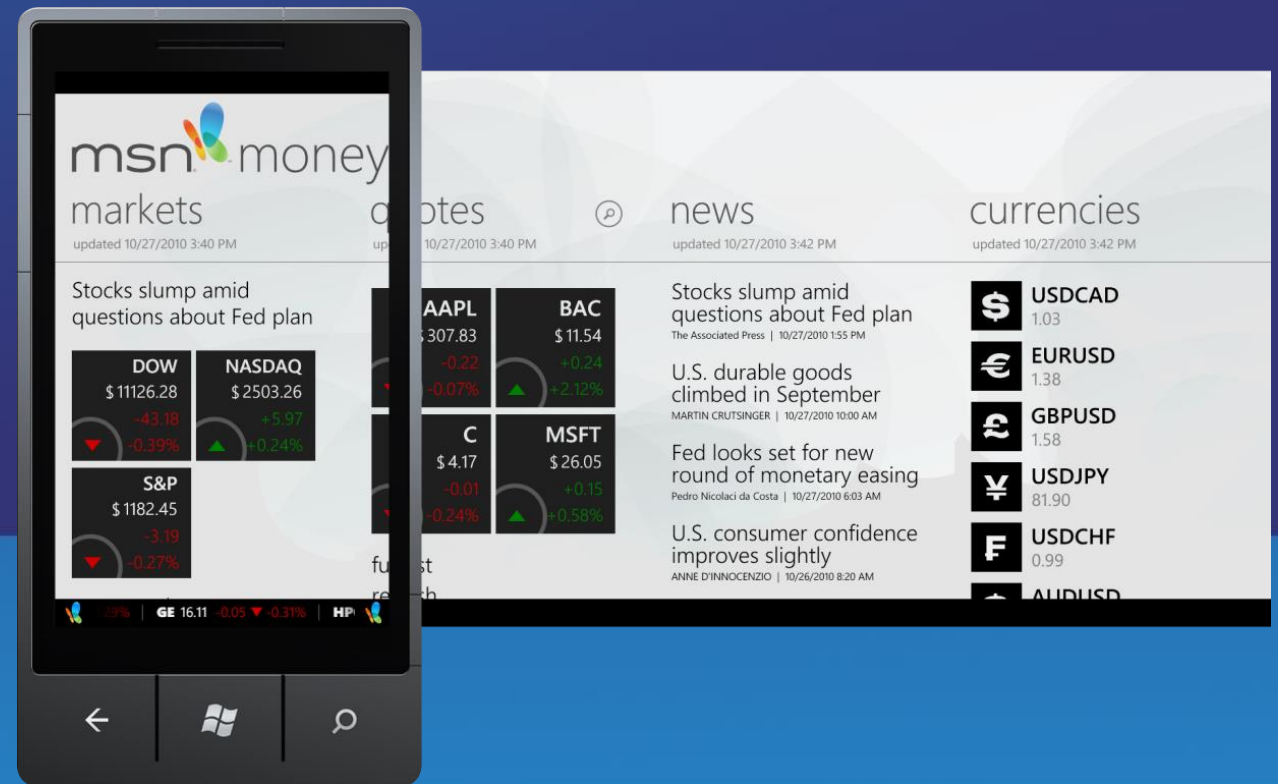
- Toolkit – LongListSelector (silverlight.codeplex.com)
- LowProfileImageLoader (David Anson)
- Watch out for UI thread work during a ListBox action
 - **PrepareContainerForItemOverride**
- Architecture tradeoffs:
 - Virtualized vs Non-Virtualized
 - Accidental dropping of Virtualization
 - Load everything and bind at the end
 - Slow load
 - Populate during loading (**INotifyCollectionChanged**)
 - Possibly jerky while loading

Panorama Points

Walkthrough of common Panorama (and Pivot) issues

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Panorama / Pivot

- Panorama will load all pages – from the get go
- Pivot will collapse pages that are not in or next to view
- Delay load if loading is killing your UI thread
- Binding will bind across all pages!
 - Update your View according to what is in the user's view!

Networking

- Use HttpRequest on Background Thread
 - Background -> Background ThreadPool
 - UI Thread -> UI Thread
- Limit of 6 parallel requests (extras will queue)
- Serialization – JSON, XML, Binary?
 - Network? Payload size will dominate
 - Isolated Storage? Speed will dominate
- Advanced: WiFi? Download larger chunks & in parallel

Popup

- Minimal Hardware Acceleration
- Plan Ahead Instead!
- See blog for full screen popup workaround



Summary

- 60fps is attainable!
 - But don't kill yourselves if you're at 45
- No "blue pill"
 - Use the debug flags!
 - (Counters + RedrawRegions)
 - Plan & test for perf from the start
 - Plenty of resources – use them!
 - Feel free to reach out for help

Winning Patterns!





Q&A *(if time)*

Useful Links

- SLM Perf Team Blog

- <http://blogs.msdn.com/slmpperf>

- Jeff Wilcox's Compositor Thread Progress Bar

- <http://www.jeff.wilcox.name/2010/08/performanceprogressbar/>

- David Anson's LowProfileImageLoader

- <http://bit.ly/ajnDch>

- Oren Nachman

- <http://www.nachmore.com> or <http://blogs.msdn.com/oren>

Licensing Information

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- Back to basics: <http://www.sxc.hu/photo/1099212>
- Pain Points: <http://www.sxc.hu/photo/951860>
- Popup: <http://www.sxc.hu/photo/1197500>
- Extreme: <http://www.sxc.hu/photo/1013657>
- Q&A: <http://www.sxc.hu/photo/1132479>

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