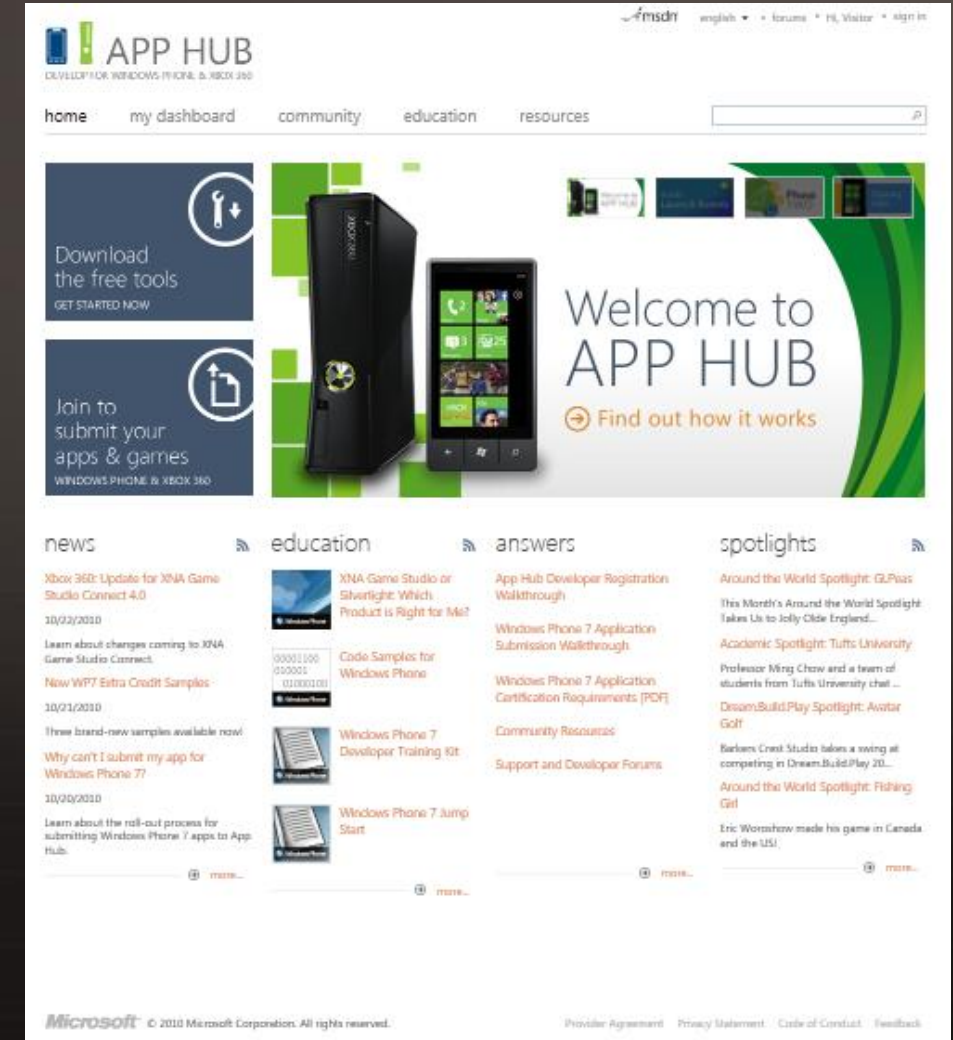


pdcc10

Resources

- » Download the *Windows Phone Developer Tools* from App Hub
 - › <http://create.msdn.com>
- » Join to submit your Apps & Games
 - › <http://create.msdn.com>
- » XNA Education Roadmap
 - › <http://create.msdn.com/en-us/education/roadmap>
- » Silverlight Video Resources
 - › <http://www.silverlight.net/learn/videos/windows-phone/>
- » WP7 Training Kit
 - › <http://channel9.msdn.com/Learn/Courses/WP7TrainingKit>



Optimizing Performance for Silverlight Windows Phone 7 Applications

Oren Nachman
Software Design Engineer
Microsoft Corporation

orena@microsoft.com
<http://www.nachmore.com>
<http://blogs.msdn.com/orena>

Agenda

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



Back to Basics

Castaway

Threading, Redraw and FillRate Problems



demo

Early prototype of "Hungry Castaway"
Roger Peters
SmartyPantsGaming.com



Desktop Threading Model



UI
Thread

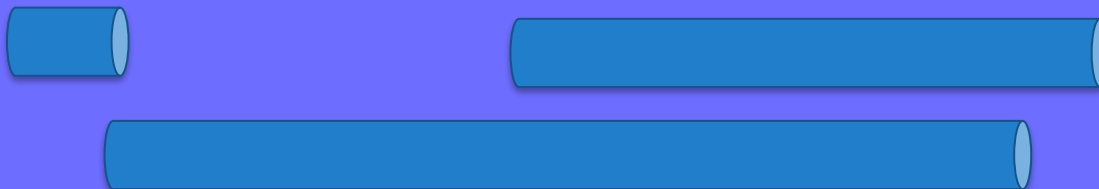


`new Thread()`
`ThreadPool.QueueUserWorkItem(BackgroundTask)`

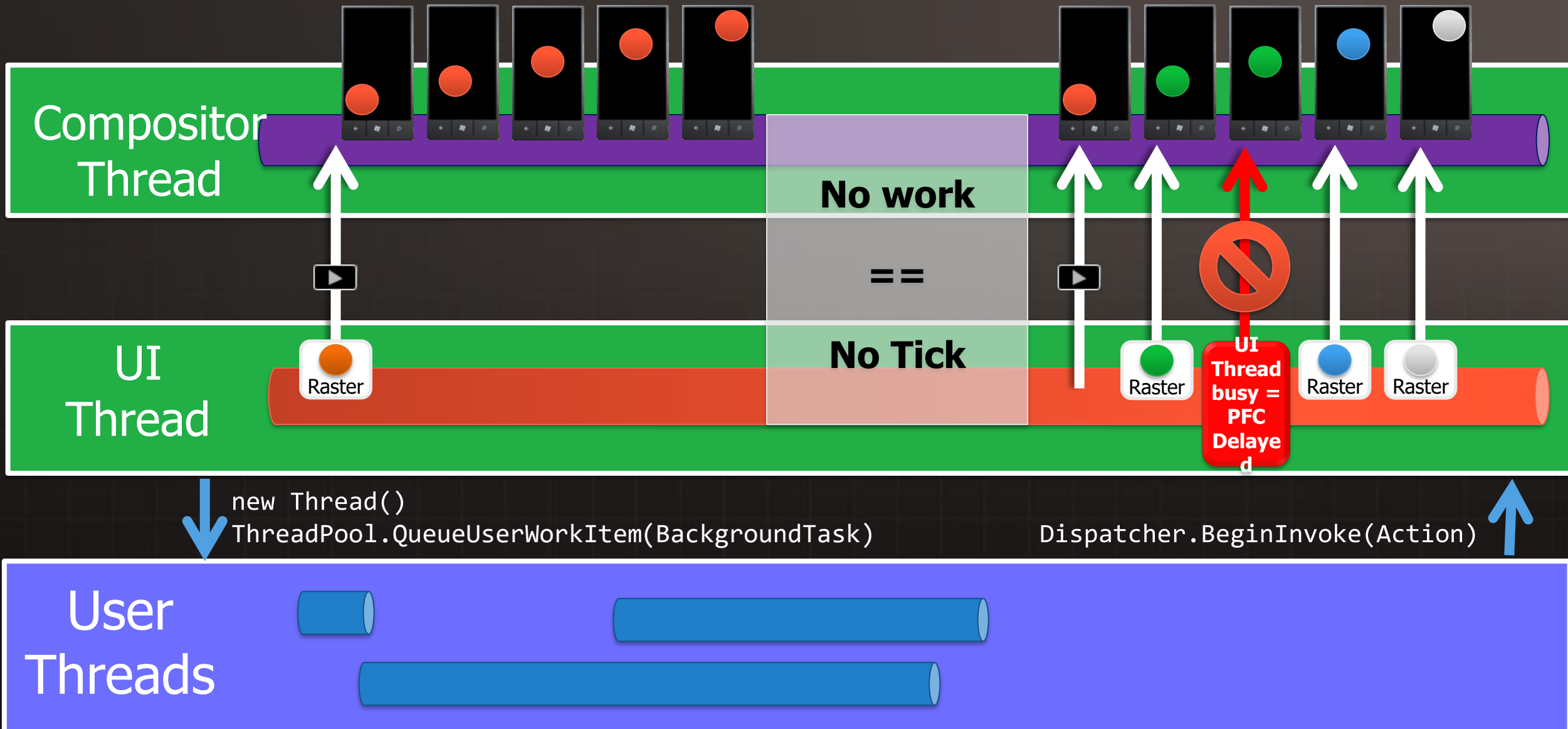
`Dispatcher.BeginInvoke(Action)`



User
Threads

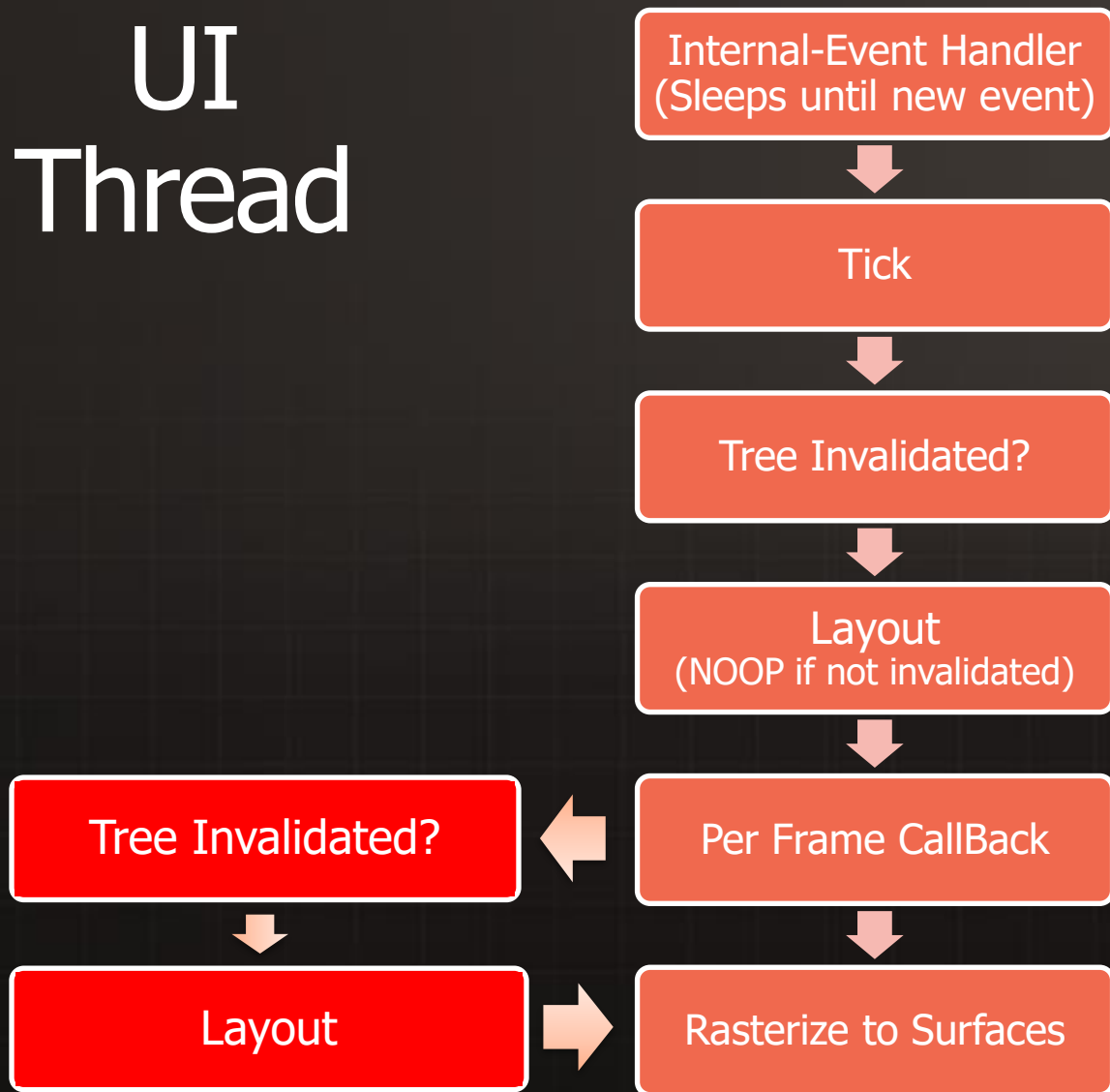


Phone Threading Model

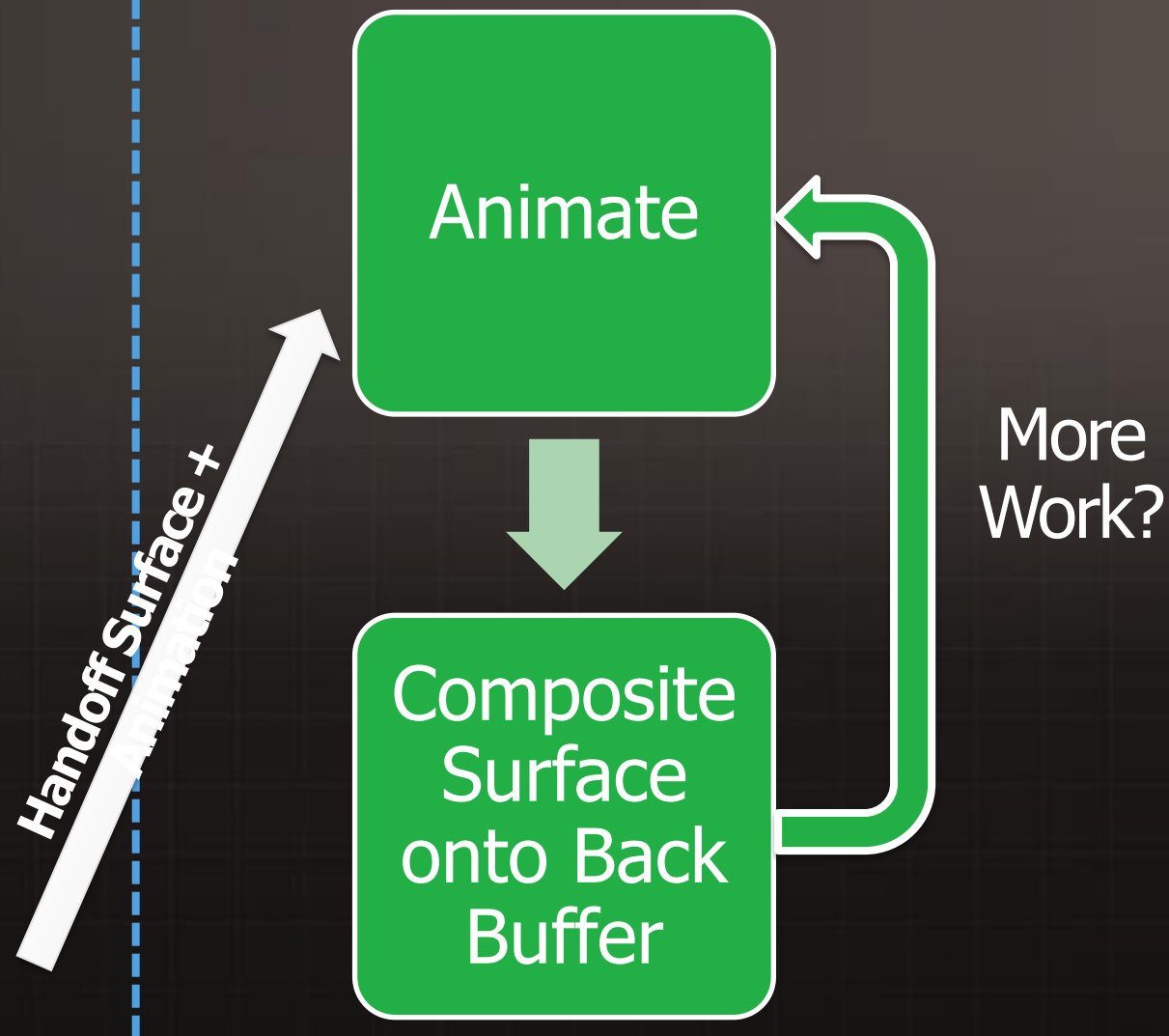


Thread Responsibilities

UI Thread



Compositor Thread



Castaway

The Solution



demo

Early prototype of "Hungry Castaway"
Roger Peters
SmartyPantsGaming.com





Pain Points

Listbox

Common Scenarios from everyday apps



demo

LowProfileImageLoader
UI Thread Callbacks
Virtualized vs Non-Virtualized
Load & Bind vs `INotifyCollectionChanged`

ListBox

- » 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



demo

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!

Extreme Real World

- » Simplify your templates
- » Be careful with ValueConverters
- » Inline your XAML
 - › Bind to things that change
 - › Inline things that don't
- » DelayImageLoader Tips:
 - › Watch your memory usage
 - › Watch out for container recycling
 - › Reverse order of image loading
 - › Load the images closer to what the user is doing
 - › In long lists download ListBox viewport only



Networking

- » Use `HttpWebRequest` 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)*

Windows Phone 7 at PDC 2010

» Day 1 – Thursday 10/28

Kodiak	11:30 – 12:30	Building WP7 Apps with Windows Azure
Kodiak	2:00 – 3:00	Things I Wish I Knew Three Months Ago about Building Windows Phone 7 Applications
Kodiak	3:15 – 4:15	Optimizing Performance for Silverlight Windows Phone 7 Apps
McKinley	4:30 – 5:30	3-Screen Coding: Sharing code between Windows Phone, Silverlight, and .NET

» Day 2 – Friday 10/29

Hood	11:30 – 12:30	Things you Need to Know Before Building XNA Framework Games
Hood	2:00 – 3:00	Real World Analysis and Optimization of XNA Framework Games on WP7

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://blogs.msdn.com/b/delay/archive/2010/10/04/there-s-no-substitute-for-customer-feedback-improving-windows-phone-7-application-performance-now-a-bit-easier-with-lowprofileimageloader-and-deferredloadlistbox-updates.aspx>

The Microsoft logo is centered on a dark gray background. It features the word "Microsoft" in a white, bold, sans-serif font. The letters are closely spaced, and the overall design is clean and professional. The logo is the primary focus of the slide.