Microsoft

Maximizing Internet Explorer in Windows Embedded Compact 7

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Windows Embedded Compact 7

About Douglas Boling

- Independent consultant specializing in Windows Mobile and Windows Embedded Compact (Windows CE)
  - On-Site Instruction
  - Consulting and Development
- Author
  - Programming Embedded Windows CE
    - Fourth Edition

Agenda

- Internet Explorer for Embedded Basics
- Tuning IE for Embedded
- Skinning IE for Embedded
- Embedding IE for Embedded

Internet Explorer for Embedded

- New Internet Explorer
  - Based on IE 7
  - Some performance updates from IE 8 added
    - JScript engine from IE 8 400% faster
- Flash 10.1 renderer shipped with OS
- Gesture support
  - Pinch to zoom
  - Swipe to pan

Internet Explorer for Embedded

- Extensive performance work on page display
  - Quicker rendering
  - Quick gesture response
  - Significantly faster JScript engine
- Two sample browser applications
  - Classic IESample
  - XAML skin version

Configuring the Browser

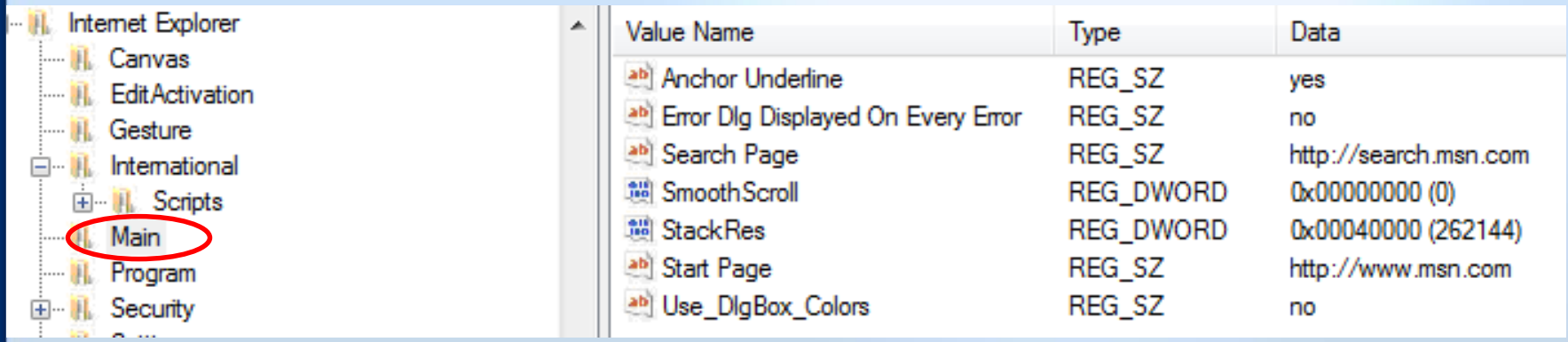
- Most of the browser functionality provided by rendering engine
- Can be configured in a variety of ways
  - Registry
    - Huge number of settings in the registry
  - Extension DLLs
    - Help with performance and how controls are rendered

User Agent String

- In WEC 7 User agent string is set
  - "Platform"="Windows Phone OS 7.0; Trident/3.1; IEMobile/7.0“
- CE 6 allowed User Agent to be set in Control Panel
  - Standard Inet control panel applet doesn’t allow this in WEC 7
- Need to change user agent string to avoid “Mobile” rendering
  - "Platform"="Windows NT 6.1“
- Look under key
  - [HKLM]\Software\Microsoft\Windows\CurrentVersion\Internet Settings\5.0\User Agent

Basic Configuration

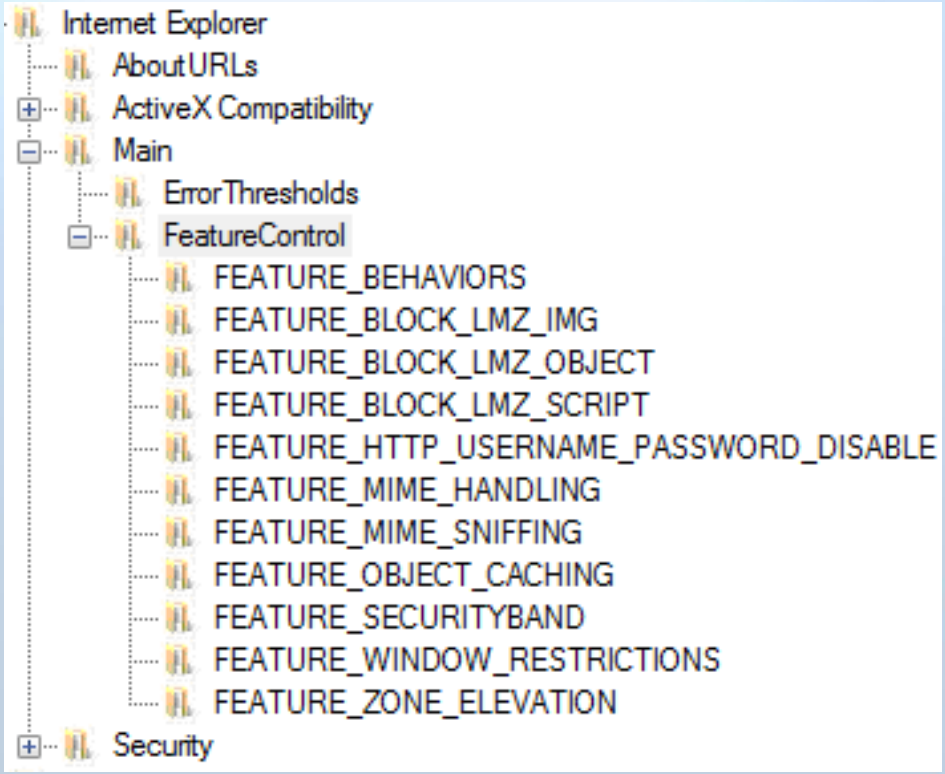
- [HKLM]\Software\Microsoft\Internet Explorer\...



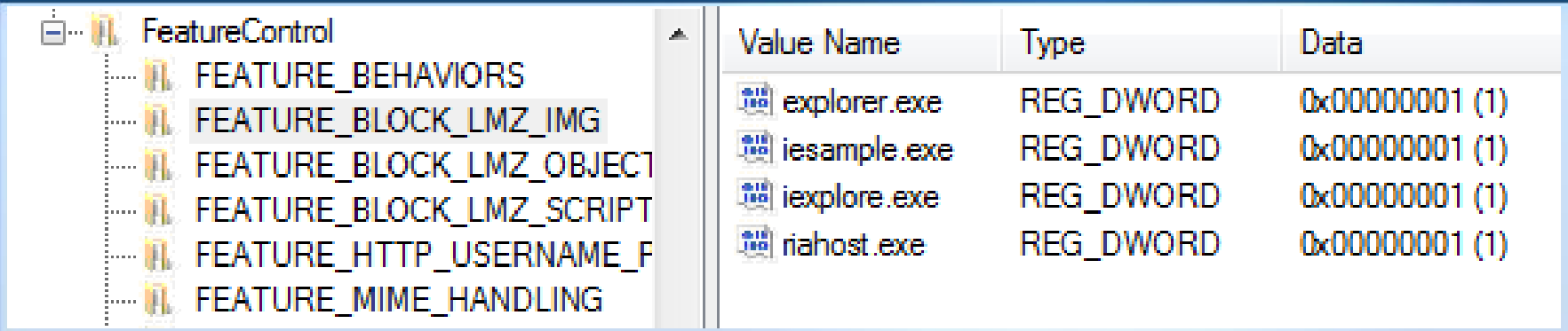
- Basic home and search page settings

IE Feature Control

- [HKLM]\Software\Microsoft\Internet Explorer\...
- Restrictions on the functionality of IE
- Restrictions are same as the desktop
- May want to disable
  - On secure web sites



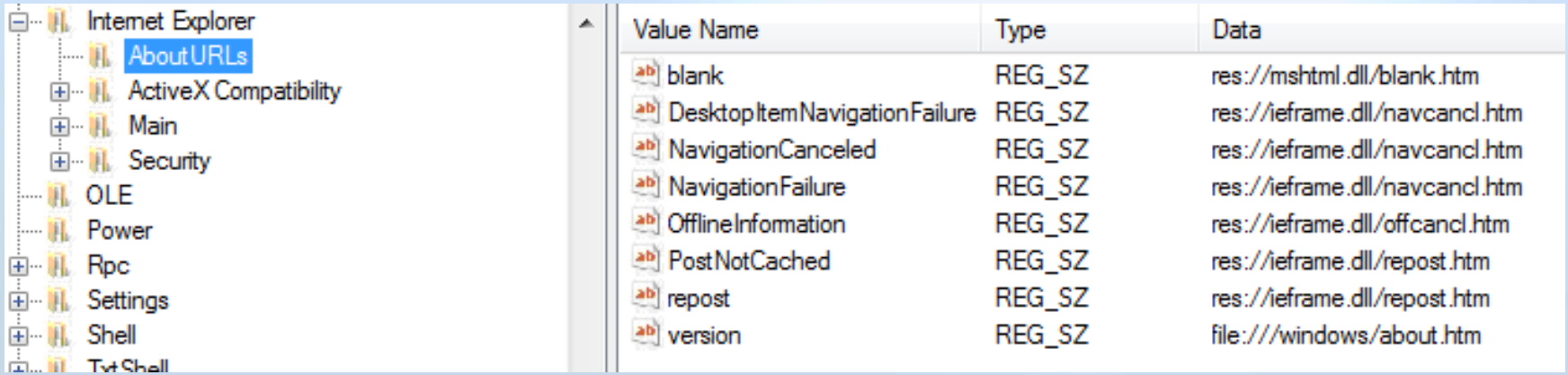
IE Feature Control



- To disable restriction, set application name value to 0
- If application name not present, security default values used

Default Pages

- [HKLM]\Software\Microsoft\Internet Explorer\...



- Currently set to resources in IEFrame and mshtml DLLs

Renderer Performance

- Internet Explorer renderer and Silverlight for Embedded use the same acceleration plug in
  - Allows hardware acceleration of rendering
- Enable in registry
  - **[HKCU]\Software\Microsoft\InternetExplorer\Gesture**
    - **ICSRenderMethod** **Set to 1 to use plug in, 0 for GDI**
    - **ICSRenderPlugin** **Set to name of plug in DLL**
      - IcsRendererDDraw.dll
      - IcsRendererOpenGL.dll
- Not set by default in registry

Learning from the Internet Explorer Examples

- There are three different examples using the browser
  - IESample — Classic example
  - IEEXR — XAML skinned example
  - HTMLHelp — Help application that uses browser
- One was removed from WEC 7
  - IESimple — HTMLHelp almost as simple
- Lots more code in \wince700\public\ie7
  - Know the code!

Public IE Sample Code

- \Wince700\public\ie7\oak
  - Htmlhelp — Simple app that uses browser control
  - IEexr — XAML skinned browser
  - IESmaple — Classic browser example
  - IETheme — Skins renderer buttons, scroll bars and such
  - IEThmxp — Resources to skin like XP
  - Inetcpl — IE Control panel code
  - Inetcpl_exr — XAML skinned IE control panel
  - UrlmonUI — Allows interception of URLMon dialogs
  - WinInetUI — Allows interception of WinInet dialogs

IESample

- Classic IE browser sample in WE Compact
  - Standard Win UI look and feel
  - Code in C++ using Win32 and COM interfaces
- Supports
  - Autocomplete text in the navigation edit box
  - Back / Forward navigation
  - Favorites
  - Two user interfaces
    - Standard UI
    - “Pocket IE” UI

IE 7 with Silverlight

- IE browser with XAML-based chrome
  - XAML driven UI
  - Loads IE browser window and communicates via COM
- Supports
  - Back Forward navigation
  - Favorites
  - Multiple screens using ‘thumbnails’
  - Zoom

Learning from IE 7 with Silverlight

- Frankly, a better demonstration of Silverlight than using IE
- Doesn't used WEST auto generated code
- Does provide additional example code
  - For example, code that can zoom the browser control

Skinning IE

- Replacing Dialog Boxes and Message Boxes
  - URLMonUI
  - WinINetUI
- Two entry points
  - IsDialogBoxHandled — Provides reason code for dialog
  - IsMessageBoxHandled — Provides text for content and title
- Return code indicates action
  - ERROR_CALL_NOT_IMPLEMENTED — Display default dialog/msg box

Changing Look and Feel of HTML Controls

- IETheme DLL provides controls for HTML renderer
  - Button
  - Scroll Bar
  - List Box
  - Combo Box
  - Edit Box
- Unfortunately, current implementation doesn't allow overriding of full screen list picker

Embedding IE Control in an App

Embedding IE

- The HTML renderer is an ActiveX control with COM interfaces
- It can be instantiated like any other COM control
- IESimple Example removed from WEC 7
  - HTMLHelp is simplest current example of using browser control
  - Find IESimple in Windows Embedded CE 6 if possible
- The control has a vast array of COM interfaces
  - Fortunately, same interfaces as the desktop

Things a Hosting App Must Do

- Stack size
  - The thread creating the browser window must have a larger stack
    - Proper size is in the registry
    - At least 128KB
  - In all the examples, each browser window gets its own thread
  - Beware the cross threading impacts for Win32 code
- Initializing COM
  - The browser is a COM object

Things a Hosting App Must Do

- Declare a series of GUIDs
  - There are a series of GUIDs that are not defined in the standard include files with the SDK. These can be found in the examples

```
DEFINE_GUID(CLSID_WebBrowser,
DEFINE_GUID(IID_IWebBrowser,
DEFINE_GUID(IID_IWebBrowser2,
DEFINE_GUID(DIID_DWebBrowserEvents,
DEFINE_GUID(DIID_DWebBrowserEvents2,
DEFINE_GUID(IID_IWebBrowserApp,
```

Fielding Events

- All examples show browser window as C++ class derived from a set of classes
  - IOleContainer,
  - IOleClientSite,
  - IOleInPlaceSite,
  - IServiceProvider,
  - DWebBrowserEvents2,
  - IDocHostUIHandler,
  - IDocHostShowUI,
  - IHTMLOMWindowServices
- Implementation very basic

Zoom

- There are two “zooms”
- Text zoom provides scaling for the fonts
  - OLECMDID_ZOOM
- Browser zoom provides pan/zoom familiar with mobile users
  - OLECMDID_OPTICAL_ZOOM
  - OLECMDID_OPTICAL_GETZOOMRANGE

Summary

- Don’t be afraid to utilize the powerful Browser
- Always implement hardware acceleration of possible
  - Not enabled by default
- Tune IE
  - User Agent string
  - Security settings
  - Dialog box interception
- Use the Source!
  - The example code *is* the documentation

Questions…

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