ANALYZING THE AJAX APPLICATION PERFORMANCE

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Summary

- AJAX subsystems
  - AJAX Stack for Internet Explorer
  - Performance Measurement
  - JScript Profiler
  - Enhancements in JScript Engine for Internet Explorer 8
    - Native JSON Support

AJAX SUBSYSTEMS

KEY FACTORS THAT IMPACT THE PERFORMANCE OF AN AJAX APPLICATION

AJAX Subsystems in Internet Explorer

- Network
  - Client Server Response
  - Asynchronous Data Exchange

AJAX Subsystems in Internet Explorer

- Network
  - Parser
  - Layout
    - Computes the layout of the various components

AJAX Subsystems in Internet Explorer

- Network
  - Parser
  - Layout

AJAX Subsystems in Internet Explorer

- Network
  - Parser
  - Layout
    - Converts data (HTML, CSS, XML, etc.) to native object model format
AJAX Subsystems in Internet Explorer

- Network
- Parser
- Layout
- Rendering
  - Final painting of the page
  - Any subsequent updates

AJAX Subsystem timing across 30 sites
PERFORMANCE MEASUREMENT

JSCRIPT PROFILER

Javascript Profilers

Source Code Instrumentation
- Manual
- Automatic
- Works for all browsers
- High profiling overhead
- Difficult to handle dynamic code (eval)

Script Engine Instrumentation
- Export profile data
- Provide a callback
- Browser specific
- Relatively lower overhead
- Provides more control
  - Dynamic Code
  - Built-ins

IE8 JScript Profiler

- Uses new profiler API’s introduced in IE8 Beta 2
- Profiles
  - JScript code execution
  - JScript built-in methods
    - May be called implicitly
    - May be called multiple times (recursive)
- Easy to use and lightweight
  - No setup required – part of IE8
  - Single click operation

IE8 JScript Profiler (contd)

- Performance data in two views
  - Functions
  - Call Tree
  - See multiple reports
  - Export data to CSV
  - Preserves data across page navigation / refreshes
  - Handles anonymous functions
    - Give a inferred name based on a heuristic logic

IE8 JScript Profiler (contd)

Anonymous functions

```javascript
var Shape = {
    Area : function (){{...}} //anonymous function 1
};

Foo = function (){{...}} //anonymous function 2
```

The two anonymous functions are named “Area” and “Foo” respectively.

JSCRIPT PROFILER DEMO
IE8 JScript Profiler – Internals
- Host creates the script engine(s)
- Script Engine creates Logger when profiling is enabled
- Logger handles
  - Callbacks from the script engine
  - Logs performance data
- Profiler Core collects and displays the performance report

IE8 JScript Profiler API
- IActiveScriptProfilerControl
  - Used to start and stop profiling
  - Methods
    - StartProfiling
    - StopProfiling
    - SetProfilerEventMask
- IActiveScriptProfilerCallback
  - Handles callbacks from the script engine
  - Used to log performance data
  - Methods
    - Initialize
    - Shutdown
    - ScriptCompiled
    - FunctionCompiled
    - OnFunctionEnter
    - OnFunctionExit

Documentation and details available on MSDN

ENHANCEMENTS IN JSCRIPT ENGINE
NATIVE JSON SUPPORT
- De-facto wire format
- Simple
  - JScript like syntax
- Secure
  - Avoids eval
- Performant
  - Eval based parsers
  - XML

Native JSON Support
- Based upon ECMAScript "3.1" proposal (as implemented by Douglas Crockford's json2.js)
- How to use it
  - Global JSON object - remember it's a built-in
  - JSON.parse (text [, reviver()])
  - JSON.stringify (value [, replacer] [, space])
- Available in all IE8 modes
- Speed gains (JScript based implementations)
  - 10x gains in serialization
  - 3x gains in deserialization

JSON DEMO
QUESTIONS?

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**Resources**

- JSON Documentation
  - Search MSDN for “JSON” - filter for JScript
  - JSON - [http://www.json.org/](http://www.json.org/)
  - Get IE8 Beta 2 from [http://microsoft.com/ie/ie8](http://microsoft.com/ie/ie8)

THANK YOU

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Your feedback is important to us.
Download IE8 Beta 2, and send us your feedback.