

Google Web Toolkit

Real- World Experience

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AGENDA

- > GWT short introduction
- > GWT adoption
- > Technology prototyping results
- > Development with GWT
- > Project experience
- > Summary

GWT Short Introduction

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What is Google Web Toolkit?

- > Toolkit, which makes building **portable** and **scalable AJAX** applications **easier**

Why GWT is Different?

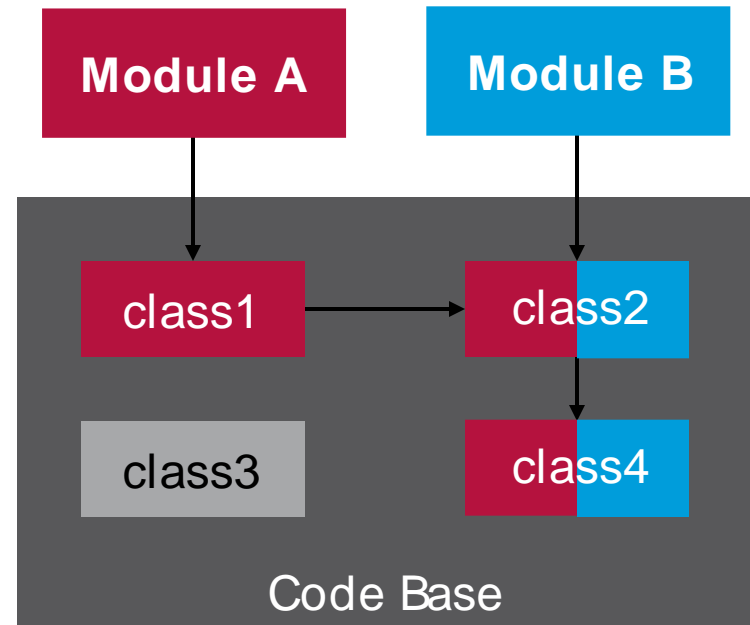
- > Presentation layer is written in Java
 - Widget/ Component model
 - Leveraging existing experience
 - *Design Patterns* and OOP
 - Static typing
 - Java packaging support (JARs)
 - Java IDE support
- > Development model similar to Swing
- > Ajax- oriented

What is Provided?

- > Java to JavaScript compiler
- > Cross-browser support
- > Widget library
- > Remote Procedure Call mechanism
- > Debugging in hosted mode

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Internet Explorer 6

Internet Explorer 7

Opera

Safari

Mozilla

Firefox

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HTML Inputs

Panels

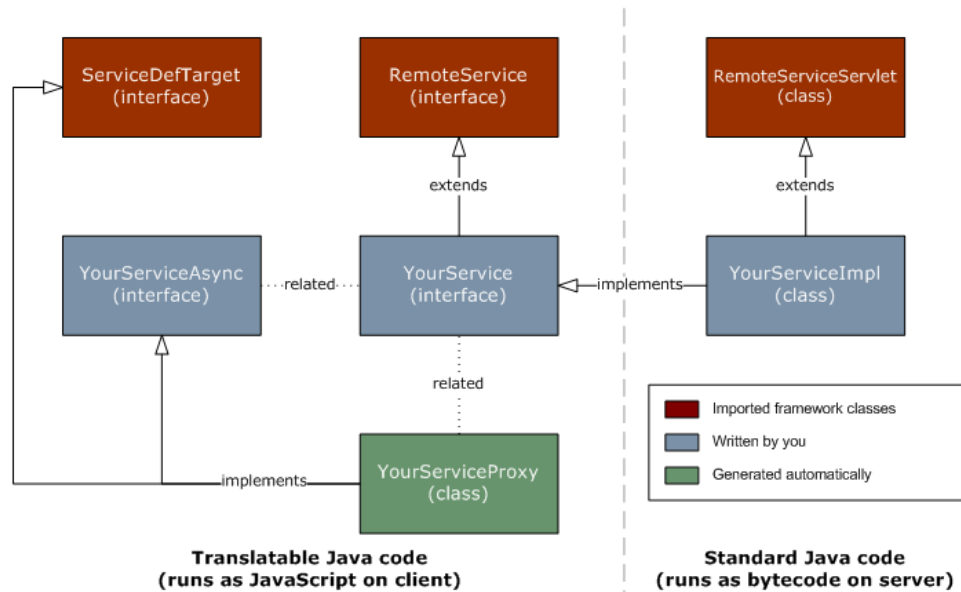
Tables

Text Widgets

File Upload

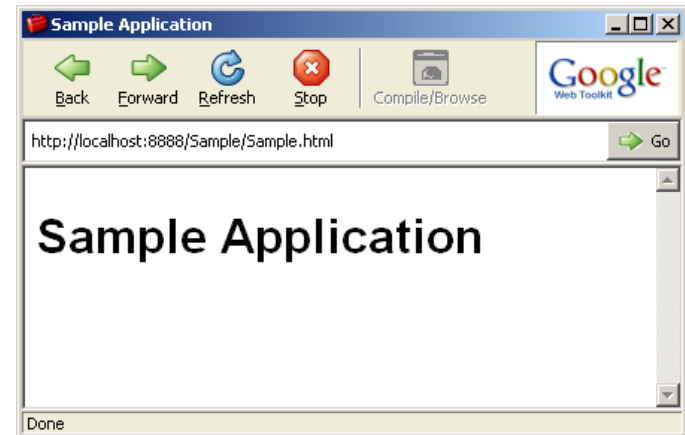
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What Else?

- > Java to JavaScript compiler
- > Remote Procedure Call mechanism
- > Cross-browser support
- > Debugging in hosted mode
- > JavaScript optimization
- > Internationalization
- > Widget library
- > JRE Emulation
- > Unit testing support
- > JavaScript obfuscation
- > Java Script Native Interface
- > XML Parsing
- > Rich Text Editor
- > ...

GWT Adoption

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Who We Are?

- > C.T.Co is an IT outsourcing group
- > Located in Riga, Latvia (Lettland)
- > Focused on the European market
- > More than 128 employees (less than 256)
- > Most of the projects are Java based



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Our Client

- > *Fortune 500* corporation in Insurance industry
- > Based in Zurich
- > “Typical enterprise”
- > 100s of *JavaEE* applications
- > Technology standardization process

Enterprise Requirements

- > Branding
- > Integrations
- > Response time
- > User base
- > Remote network locations
- > Security
- > Clustering
- > Availability
- > Intranet Application

Project Details

- > Project A – Portal Application
 - 7 months
 - 25 developers
 - ~3000 classes

- > Project B – Web-based OLTP Tool
 - 4 months
 - 5 developers
 - ~1000 classes

Prototyping

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Prototyping Goals

- > Try GWT on building enterprise level application
- > See how it fits into existing environment
- > Measure performance
- > How development model changes?

- > Replace Struts and JSPs with GWT and see what happens...

Integration with Other Frameworks

Checked how hard is to integrate with

- > Existing code base
- > Existing frameworks

How Fast is JavaScript?

- > How much time is needed for GWT to do ?
 - Parsing ~200K JavaScript < 200 ms
 - First RPC request ~ 3 sec
 - RPC request < 200 ms
 - Simple rendering < 300 ms

Server Memory Usage

- > Memory Usage is significantly lower
 - No String concatenations
 - Smaller Session State
 - Smaller Footprint
- > Up to 8 times less memory per request

Ease of Use

- > Much more easier than with JavaScript
- > Java Developers like it
- > Custom components are easy to create
- > “View Page Source“ does not work
- > Spagetti code without preliminary design

Full- blown MVC Framework?

- > GWT out-of-the-box does not provide:
 - > Input validation
 - > Data binding
 - > Rich widget library

Development

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Design Considerations

- > Minimal dependencies on GWT
- > Proper layering
- > Reusable components
- > Single entry point
- > Model, which enables reflection

Shared Code

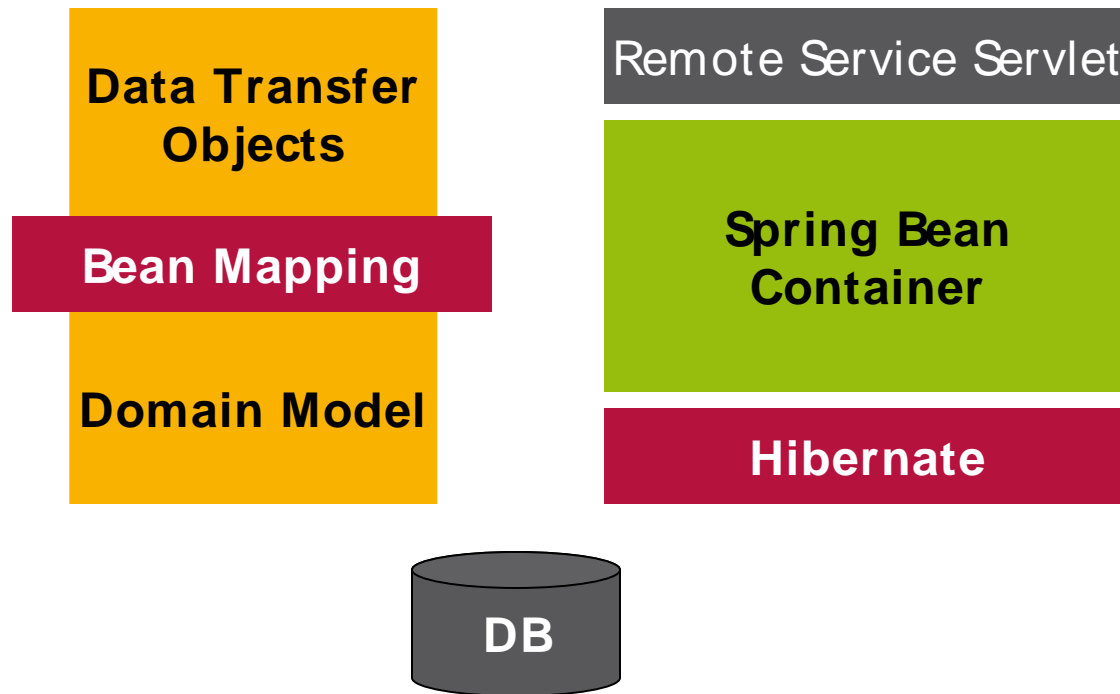
- > Code can be shared between client and server
- > Typical examples are:
 - Client side validation
 - Constant mapping

Reference Architecture

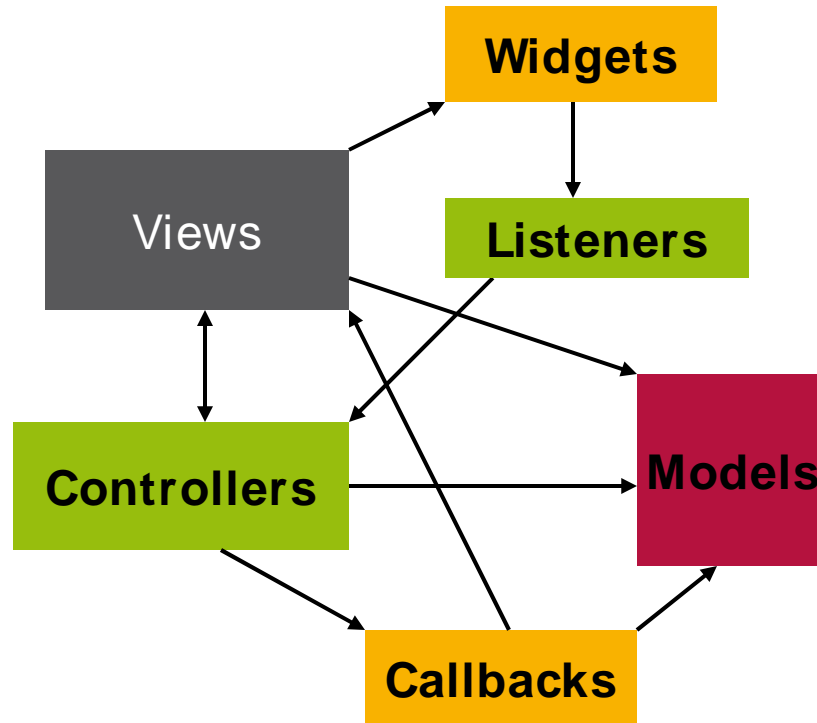
GWT Module 1

GWT Module 2

GWT Module 3



Client Side Architecture



Integration with Other Technologies

- > JavaScript libraries - JQuery, Calendar and other fancy stuff
- > JSP output
- > Spring
- > Hibernate
- > Portlets (JSR- 168)

Portlet Concept

- > Each portlet is a small GWT application
- > Each portlet is reloaded independently
- > Interportlet communication on the client level
- > Screen content is configurable

Automated Testing

- > Unit testing is problematic, but achievable
- > Screen clicking requires additional efforts
- > Should be considered early

Product Maturity

- > No critical GWT bugs met in two projects
- > One in hosted mode
- > One in IE6 widget implementation
- > Easy migration from 1.3 to 1.4

- > No functional difference between JavaScript and Hosted mode

Findings

- > Internet Explorer supports two simultaneous requests (by default)
- > It is possible to have OutOfMemory on the browser
- > Straightforward rendering performance is poor

Overall Impressions

- > Harder than Struts
- > Needs certain mind shift
 - Is it Java or JavaScript I am writing !?
 - Requests are asynchronous
 - Serialization
- > Fallback solutions are easy

Retrospectives

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Observations

- > Pure UI Developers cease to exist
- > CSS skills are primary
- > Easier to build advanced Ajax than to emulate Struts
- > Hosted mode is absolutely necessary
- > Used GWT in unnatural ways
 - Single entry point
 - Servlet filter emulation

Common Widget Library

- > Should be extracted from the first projects
- > Packaged into Jar
- > Possible to reuse on enterprise level

Technical Constraints (1)

GWT feels like Java except:

- > No reusable libraries (even Apache Commons)
- > Limited reflection mechanism
- > No multithreading
- > No BigDecimal type
- > No SimpleDateFormat
- > ...

Technical Constraints (2)

- > Hosted Mode ignores web.xml
- > Packaging constraints
 - Unit tests
 - Package “*client*” is required

Technology Advantages

- > Faster development of advanced features
- > Reusable components
- > Scalability (memory, cpu)
- > Cross-browser compatibility

Summary

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Summary

GWT is good enough to be used in “large enterprise projects”

> Pros

- Stateless architecture
- Sophisticated UI tricks made easy
- Cross-browser portability (except CSS)
- Stable technology

> Cons

- Framework on top of GWT is required
- Provided widget library is not enough
- Difficult project start-up time

GWT Future

- > GWT 1.5 is coming with Java 5 and other improvements
- > Emerging frameworks and widget libraries
- > Can be used not only in Java applications
- > More GWT projects for us...

Q&A Time

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