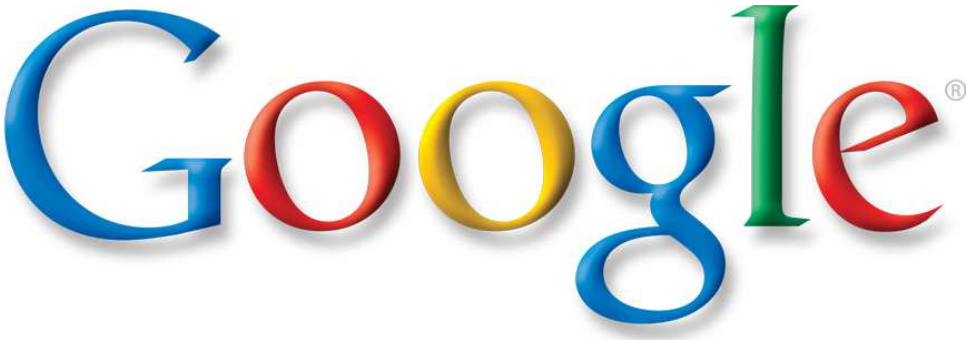
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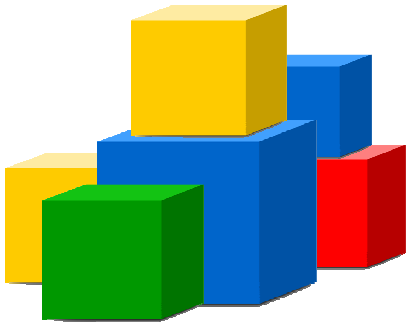
Fireside Chat:
The Google Web Toolkit Team

May 31, 2007



What Is Google Web Toolkit (GWT)?

- Build Ajax apps with Java™ technology
- What makes GWT interesting?
- GWT ≠ applets
- GWT is much more than a compiler

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Hello, Ajax (Demo)

```
public class Hello implements EntryPoint {
  public void onModuleLoad() {
    Button b = new Button("Click me",
        new ClickListener() {
          public void onClick(Widget sender) {
            Window.alert("Hello, Ajax");
          }
    );
    RootPanel.get().add(b);
  }
}
```

Source: Insight Express Survey of 1000 home Internet users (June 2004)

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GWT Brings Software Engineering To Ajax

- Any Java IDE (or no IDE…you rebel, you)
- Rapid edit/test/debug/refactor cycle
- Unit testing
- Reuse through jars
- Take advantage of OO design patterns
- Javadoc
- Compile-time errors
  - You don't miss 'em until they're gone

Source: Insight Express Survey of 1000 home Internet users (June 2004)

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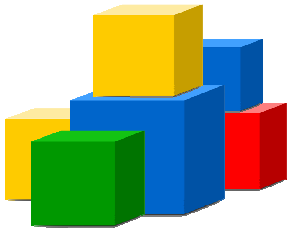

Common Questions About GWT

Browser Support

Which browsers does GWT target?

- Firefox 1.0, 1.5, 2.0, …
- Internet Explorer 6, 7, …
- Safari 2.0, …
- Opera 9.0, …

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Browser Support

Do I have to wait for the GWT compiler to be updated when a new browser version comes out?

- Definitely no!
- JavaScript itself is consistent across browsers
  - The DOM API is the real culprit
  - All browser-specific code in GWT is in user libraries
  - The GWT compiler produces browser-independent script
- New browser versions tend to be backwards-compatible
- Even a totally new browser needs only small tweaks
  - Derive a version of the DOMImpl class for the desired browser
- Key point: GWT was designed to never be a roadblock

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Deployment

Do I have to run Java infrastructure on my server?

- GWT does not require any particular server-side support
  - Just an HTTP server :-)
  - Wait, no: you can even run GWT apps from file:// URLs
- The GWT compiler produces standalone JS
- Only GWT RPC needs a Java back end
- GWT can work with any back end you choose
  - PHP, JSP, JSF, ASP.NET, …
- GWT includes libraries to ease integration
  - HTTP, JSON, XML, …

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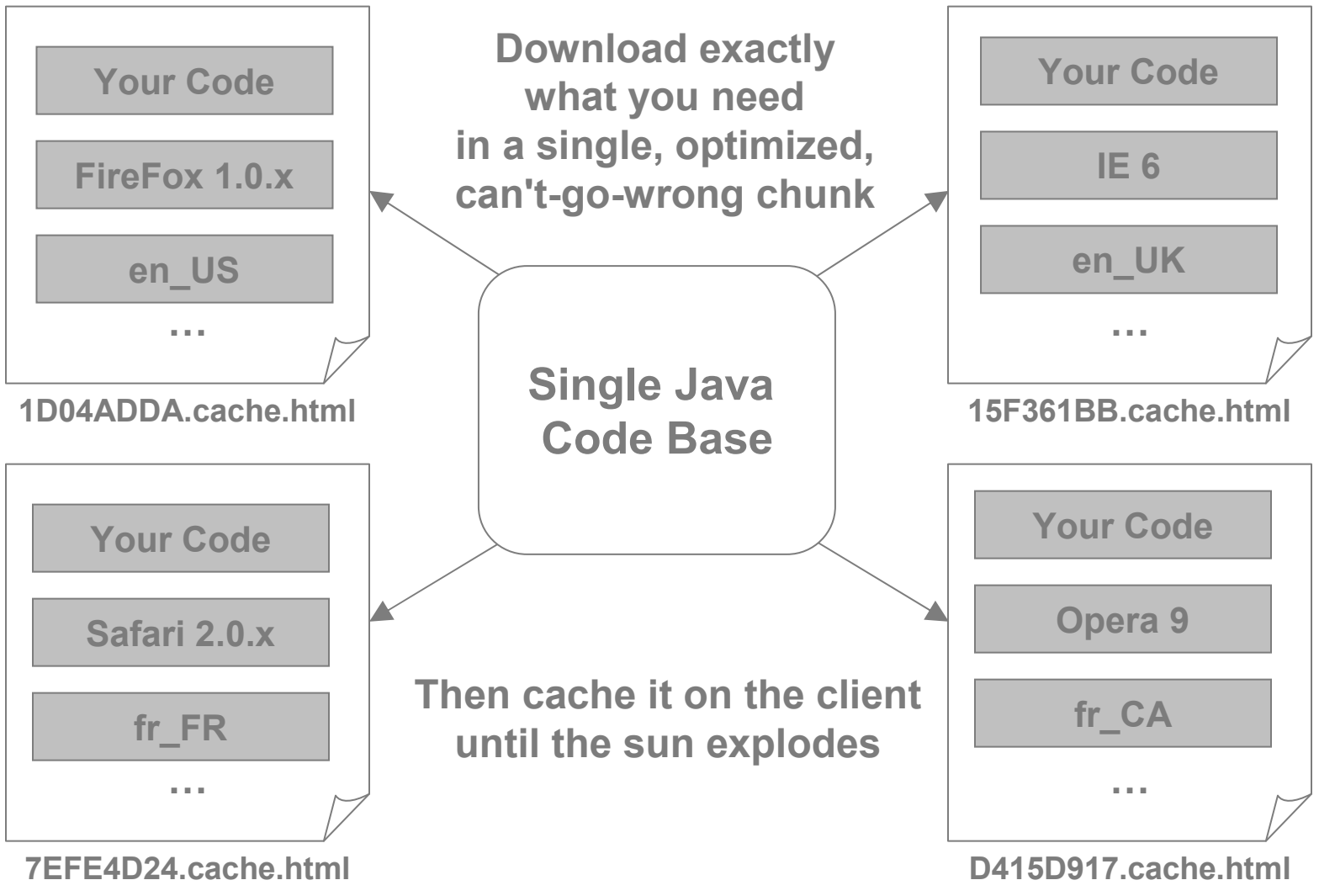
Deployment



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Integration

Does GWT have to control the entire page?
I can't rewrite my app from scratch!

- GWT does not force you to start over!
- Attach code to existing pages with a <meta> tag

```
<html>
…<meta name="gwt:module" content="…"/>
…<h1>Welcome to GWTravel Services</h1>
…<div id="reservationWizard">
…</html>
```

- Your Java source is as loosely-coupled as you need

```
Panel p = RootPanel.get("reservationWizard");
Wizard wiz = new ReservationWizard();
p.add(wiz);
```

- Works with any HTML-generating server approach

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Integration

Does GWT work with JSF, JSP, YUI, ASP, …?

- GWT makes very few assumptions about the page
- Your compiled app has an encapsulated namespace
- JavaScript Native Interface (JSNI)

```
// This is Java source
private native String flipName(String name) /*-{
  // This is JavaScript source
  var re = /(\w+)\s(\w+)/;
  return name.replace(re, "$2, $1");
}-*/;
```

- Call back and forth from Java source to JS with JSNI
- Great for interop or hand-tweaking script

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Library Support

What does the GWT library include?

- User Interface
  - DOM, Events, Widgets, Panels, Composites, …
- Client/Server Communication
  - HTTP, RPC, JSON, XML
- Application Infrastructure
  - History, Timer, IncrementalCommand
- Quality and Usability
  - Unit Testing, Benchmarking, Internationalization
- …

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Application Size

How big are GWT apps? Doesn't the compiler create bloated script?

- Handwritten script is smaller for small tasks (< 100 lines)
  - Beyond that, GWT's compiler size and speed optimizations will ultimately win
- Compiler optimizations matter more as your app grows
  - Dead code removal, type tightening, polymorphism removal, inlining, …
  - Aggressive (safe!) compression of generated JS
- We think of new optimizations all the time
  - Original KitchenSink is 97K recompiled under GWT 1.4
    - 20% smaller than in GWT 1.0
    - It's 29K zipped

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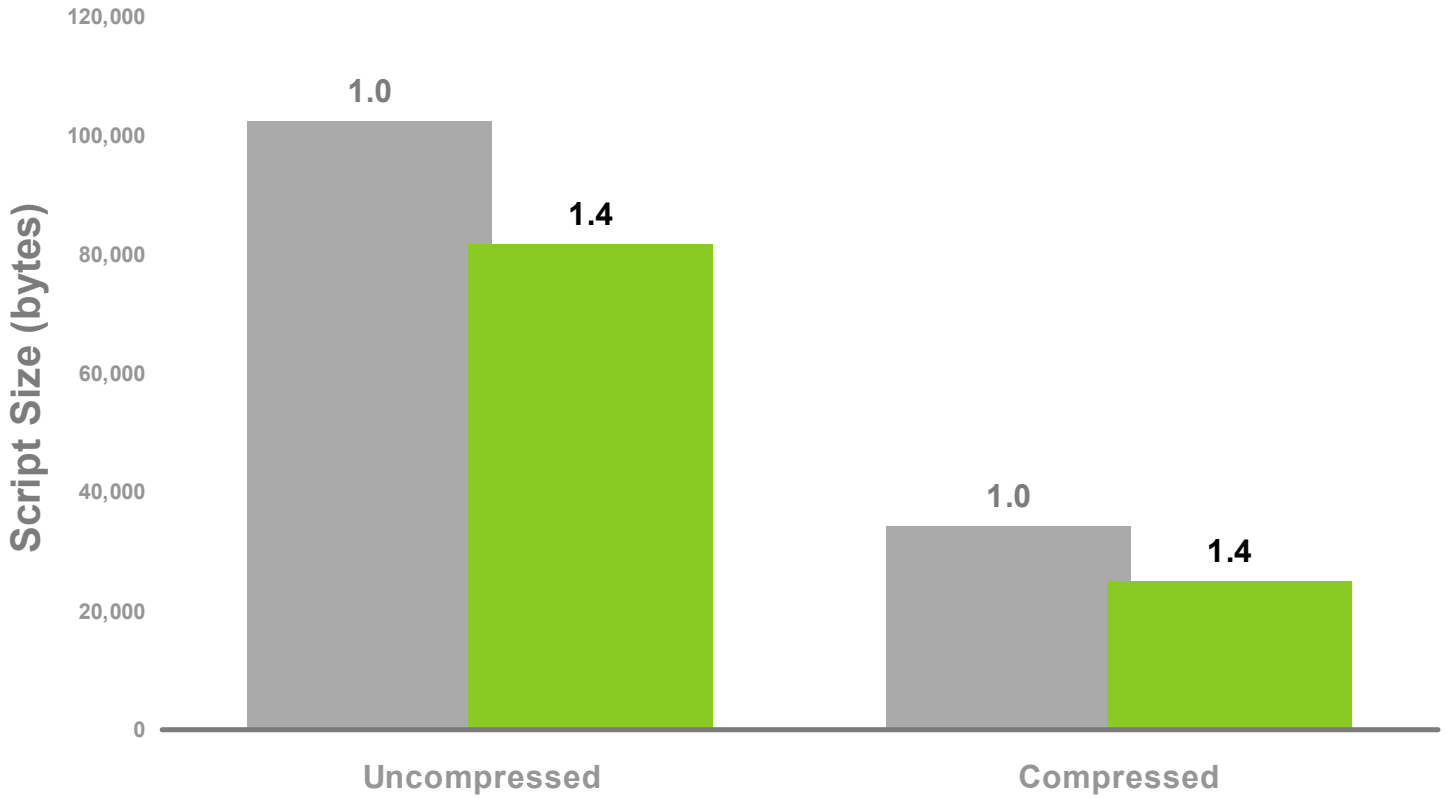
Application Size

KitchenSink recompiled with GWT 1.4



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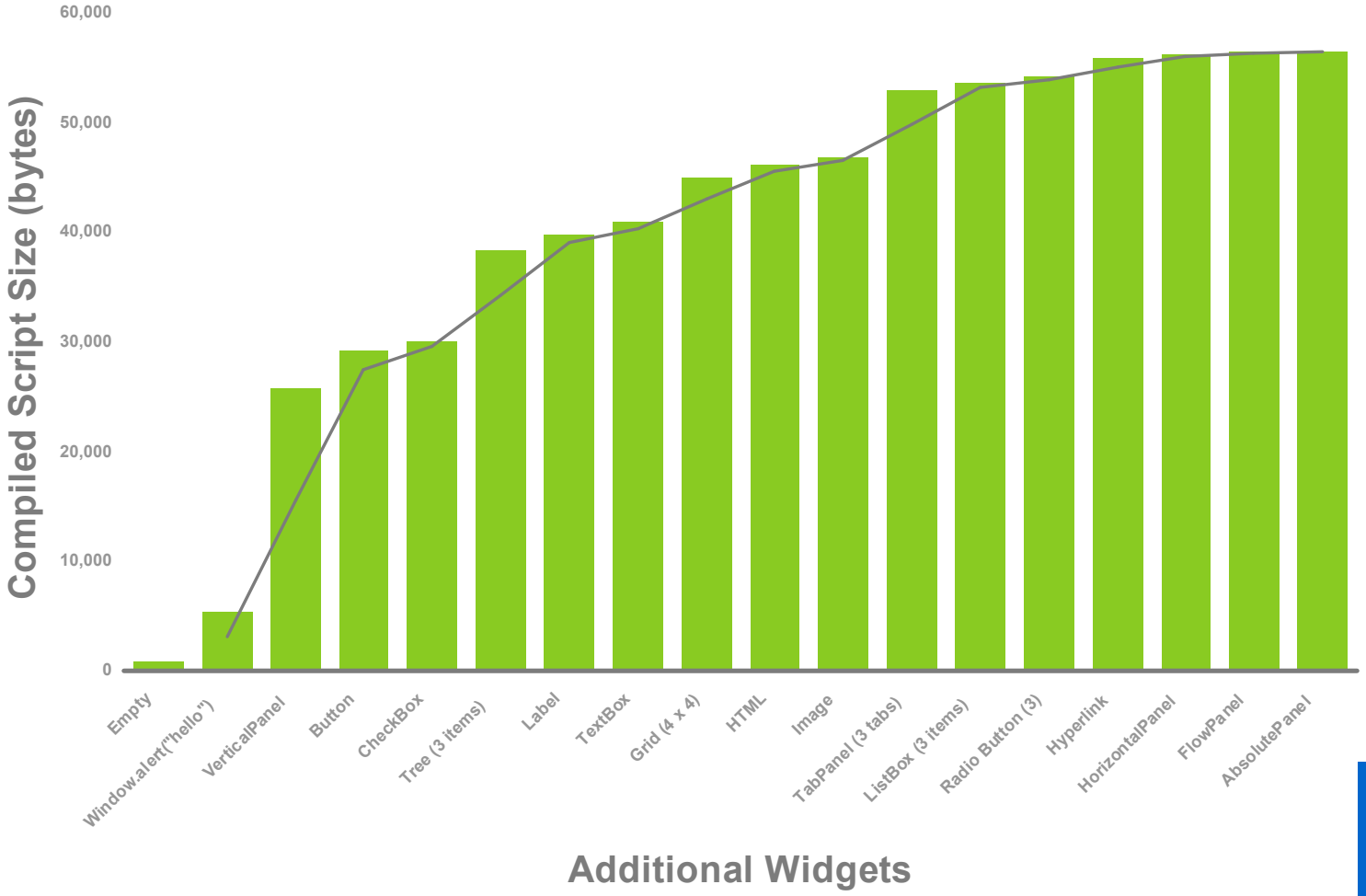
Application Size

There is no answer to the question, "How big is the GWT library?"



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Application Speed

How fast are GWT apps? Couldn't I write faster apps by hand?

- Likely to be true for very small apps
- Unlikely to be true for non-trivial apps due to compiler and class library optimizations
- Avoiding memory leaks is itself a big speed challenge
- (See next slide for experimental data)

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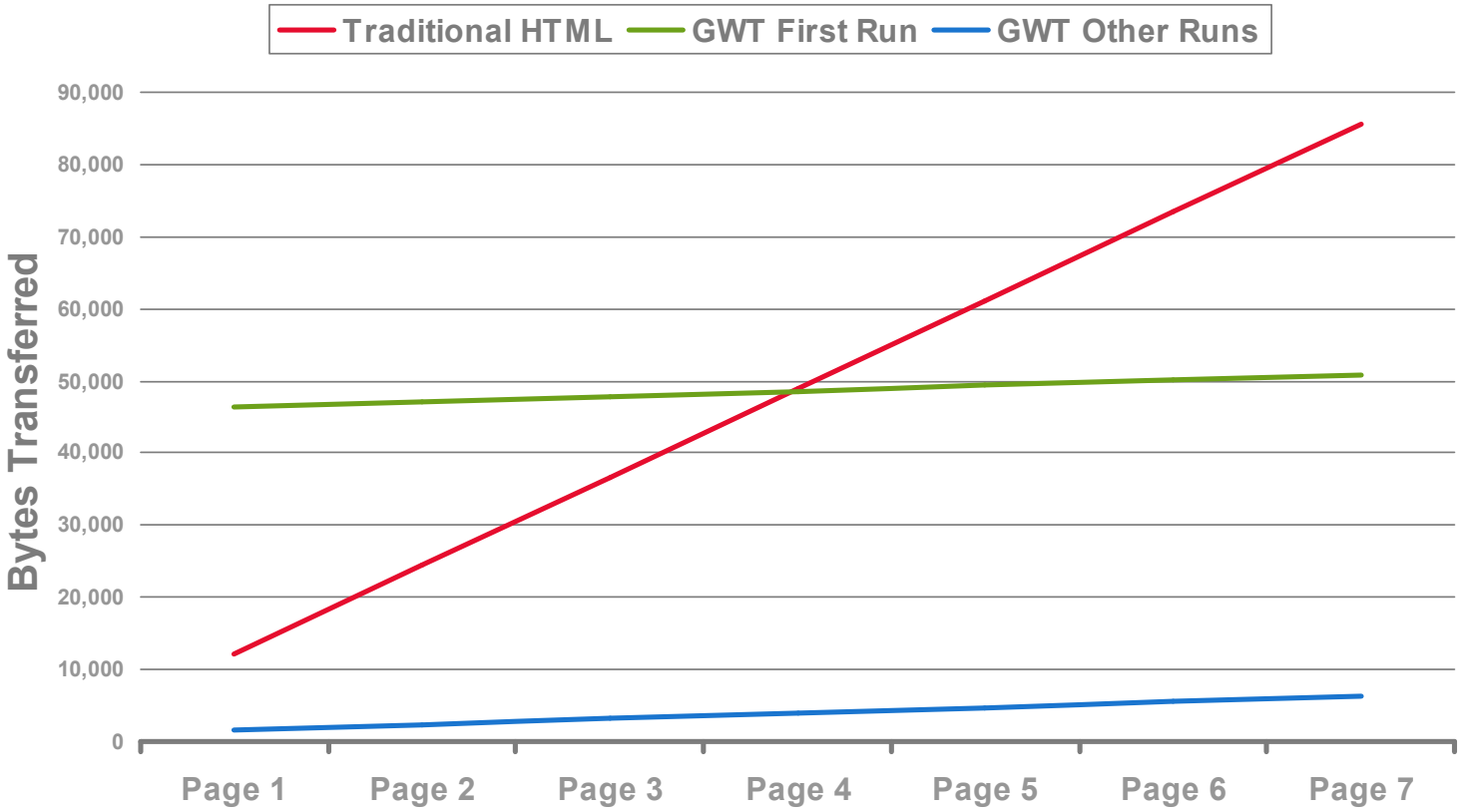
Application Speed

Fast startup and server interactions



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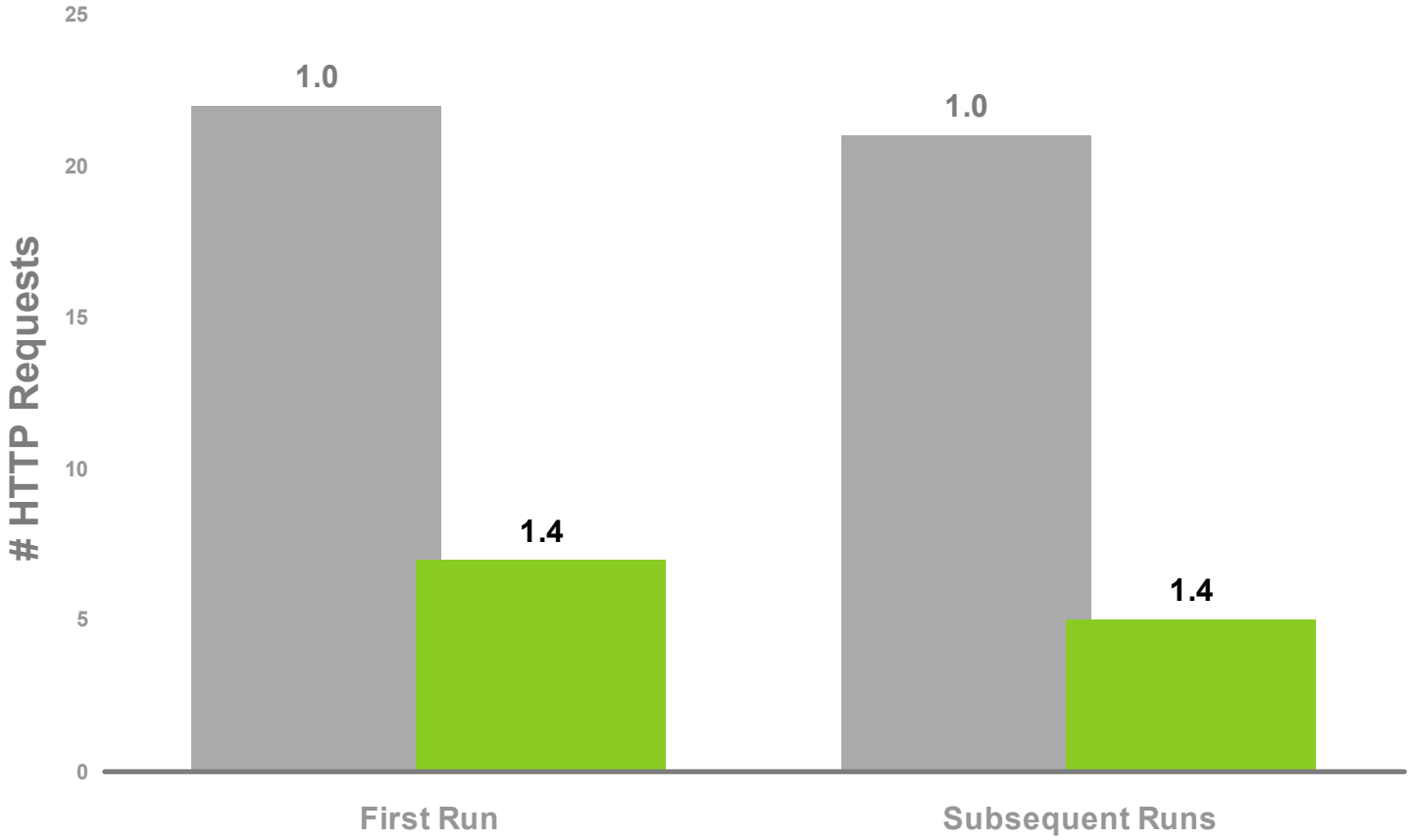
Application Speed

The number of HTTP requests dictates app performance



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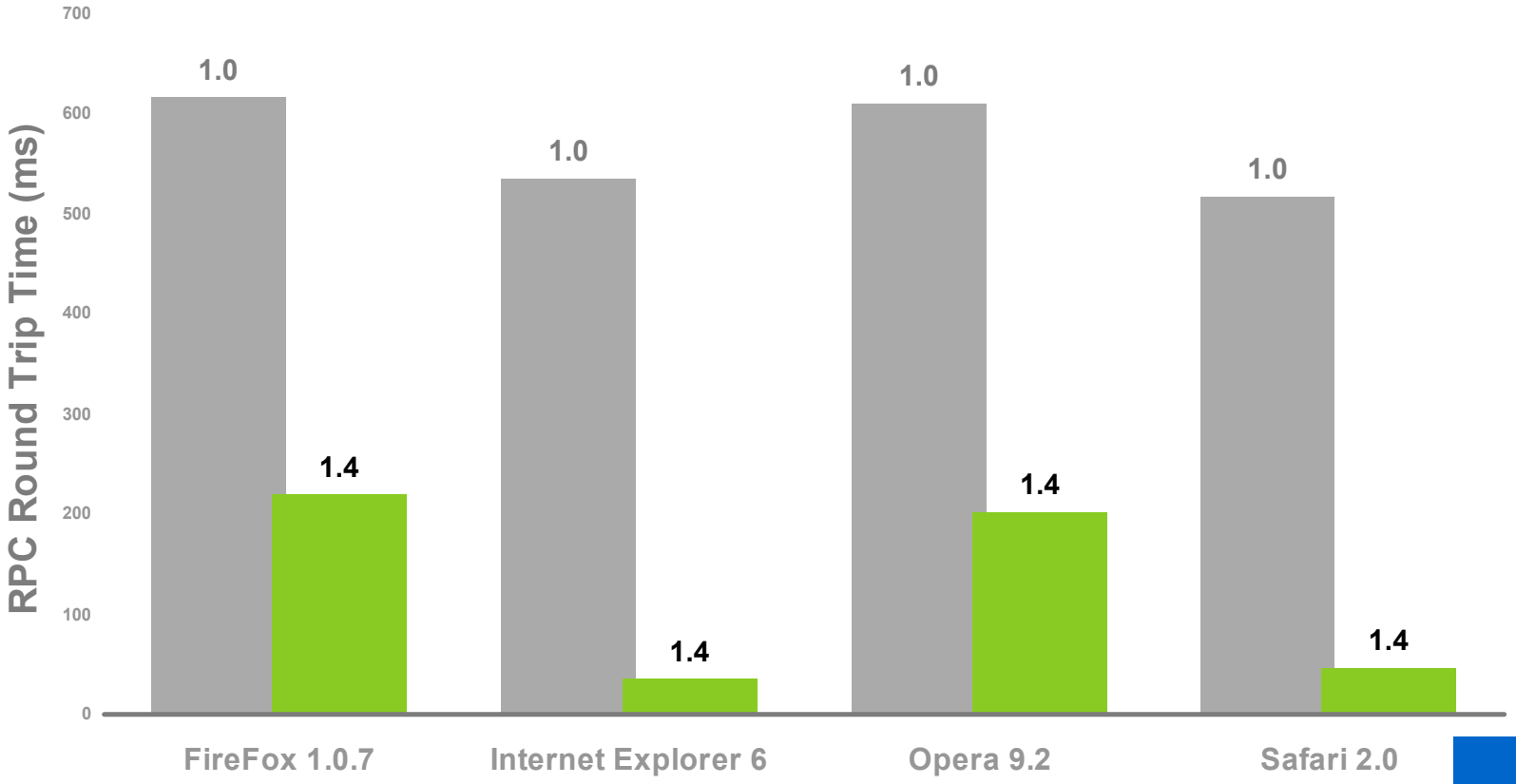
Application Speed

RPC is fast and only getting faster



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Debugging

Isn't it hard to debug the JavaScript that GWT produces?

- If you need to (or just want to) debug the compiled output, the GWT compiler gives you multiple output options using the **`-style`** switch:
  - `OBFUSCATED` – small, efficient, and fast
  - `DETAILED` – nothing is left to the imagination
  - `PRETTY` – useful, readable output
- The output is plain-old JavaScript, so you can use any JS debugger as you would with handwritten script
- By the way, you really will never have to do this
  - You'll be debugging Java source!

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Accessibility

How accessible are GWT applications?

- Good news / bad news
  - GWT apps are as accessible as any Ajax app…
  - …far from perfect
- GWT does have more keyboard support than typical
- And GWT provides a uniform way to add full support when Ajax accessibility features are widely available

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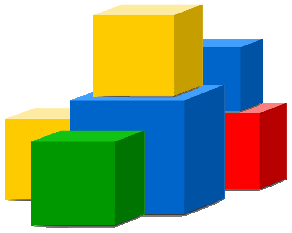

Ten Good Things To Know About GWT

Ten Good Things To Know About GWT

10. The GWT mission statement puts technology second
9. It isn't GWT vs. everything else
8. It isn't the Java language vs. JavaScript
7. We know that abstractions leak
6. GWT has dependency injection and code generation
5. We prefer that GWT makes a good 715th impression
4. Hosted mode is at least as cool as the GWT compiler
3. GWT eats its own dogfood
2. `-noserver` is the flag you are looking for
1. If you have any doubts, trust us and just try it out

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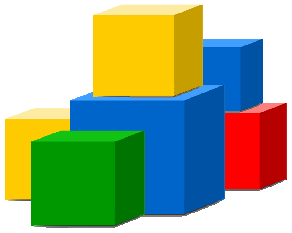
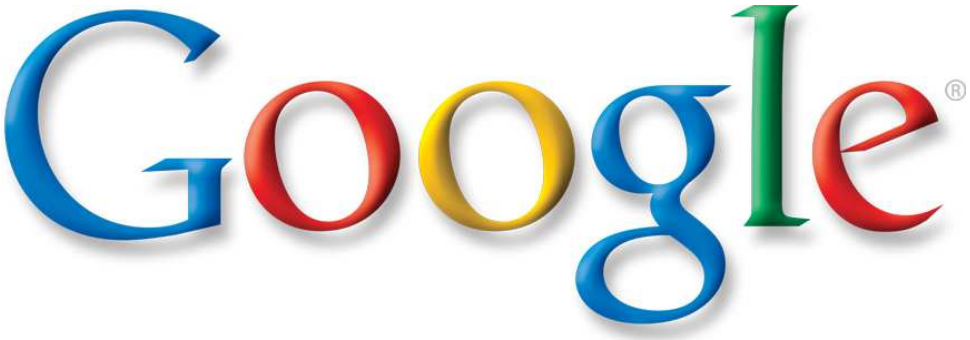


What are your questions?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