



Google  
Developers



# The History and Future of Google Web Toolkit

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# History



# 2005 Google Maps

Get directions My places

**San Francisco, CA**

Directions Search nearby Save to map more ▾

Explore this area >

**Photos**

**Places**

- San Francisco Cable Car Museum
- Westin St. Francis
- Grace Cathedral

Ad - Why this ad?

**What To Do In San Francisco**  
San Francisco Entertainment Guide.  
WhereTraveler Free Travel Guide.  
[www.wheretraveler.com/SanFrancisco](http://www.wheretraveler.com/SanFrancisco)

See your ad here >

Sausalito Golden Gate National Recreation Area Angel Island State Park Treasure Island

USS San Francisco Memorial Z The Presidio Log Cabin & Lawn Pacific Heights Russian Hill Embarcadero

San Francisco

Golden Gate Park Potrero Hill

Sunset District Bernal Heights Portola Bayview

Lake Merced Park Excelsior Visitacion Valley

Satellite Traffic



# Timeline

- GWT 1.0 (2006)
- GWT 1.3 (2007) First Open Source Release, OSX support
- GWT 1.4 (2007) JUnit and ImageBundle
- GWT 1.5 (2008) Java 1.5 support, Overlay Types, DOM API, CSS Themes, Linkers
- GWT 1.6 (2009) EventHandlers, EMMA Support, WAR support, Parallelized Builds
- GWT 1.7 (2009) Newer browser support, IE8, GPE and AppEngine
- GWT 2.0 (2009) DevMode, DraftCompile, UIBinder, LayoutPanel, CodeSplitter, ClientBundle, CssResource
- GWT 2.1 (2010) RequestFactory, Editor Framework, Validation, MVP, Cell Widgets
- GWT 2.2 (2011) GWT Designer, HTML5 support
- GWT 2.3 (2011) Better AppEngine integration
- GWT 2.4 (2011) Maven and RequestFactory enhancements



# Where we are today.

- SDK downloaded over 1 million times
- 100,000+ Active Developers
- Deep Integration with Eclipse, IntelliJ, Spring STS/Roo
- Used by Google products such as AdWords, Flights, Wallet
- Fun things: GwtQuake, Angry Birds for the Web
- GWT Today is a mature, high quality, code base.



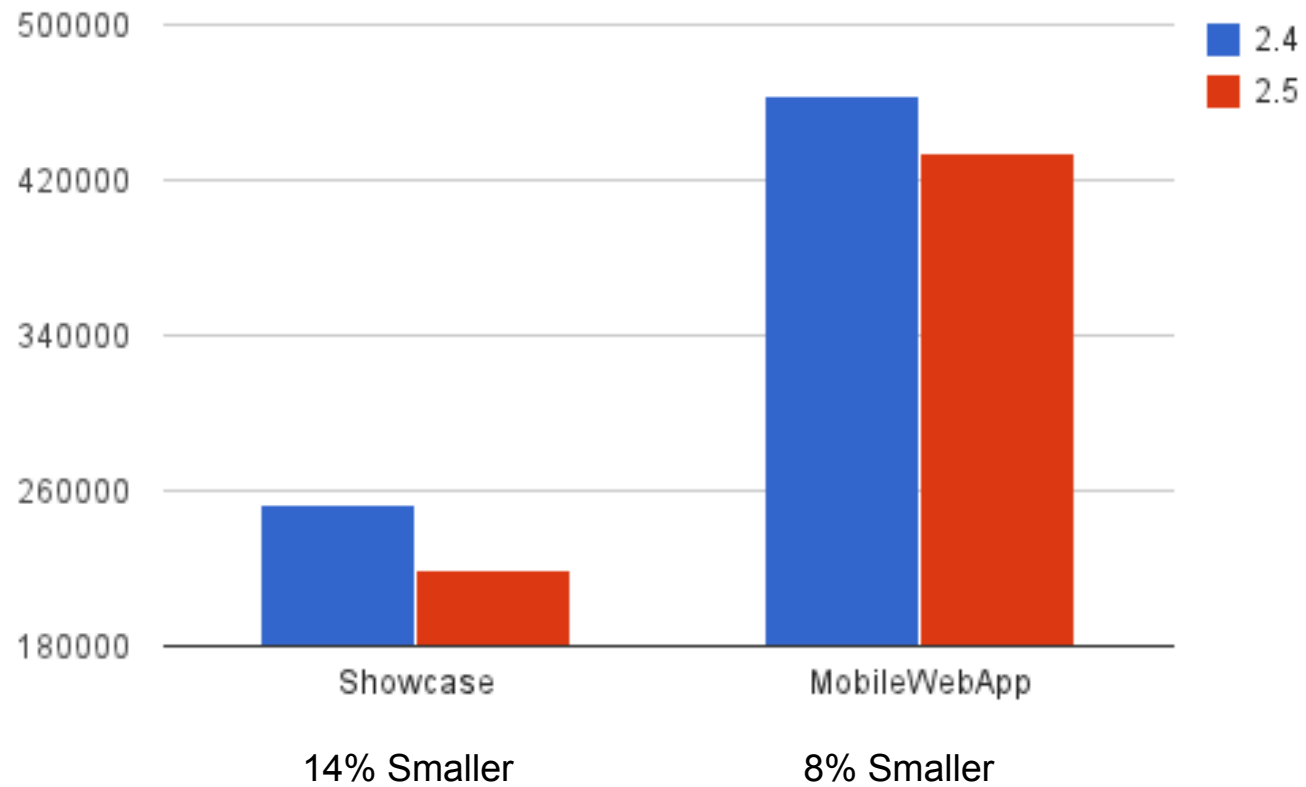
# Introducing GWT 2.5

- New Compiler Optimizations
- Closure Compiler Integration
- Code Splitter Improvements
- Better Stack Traces with SourceMaps
- Real Time Compiles with SuperDevMode
- UiBinder and CellWidget updates
- I18N and ARIA/Accessibility improvements
- Elemental - High performance, feature complete, HTML5



# Compiler Optimizations

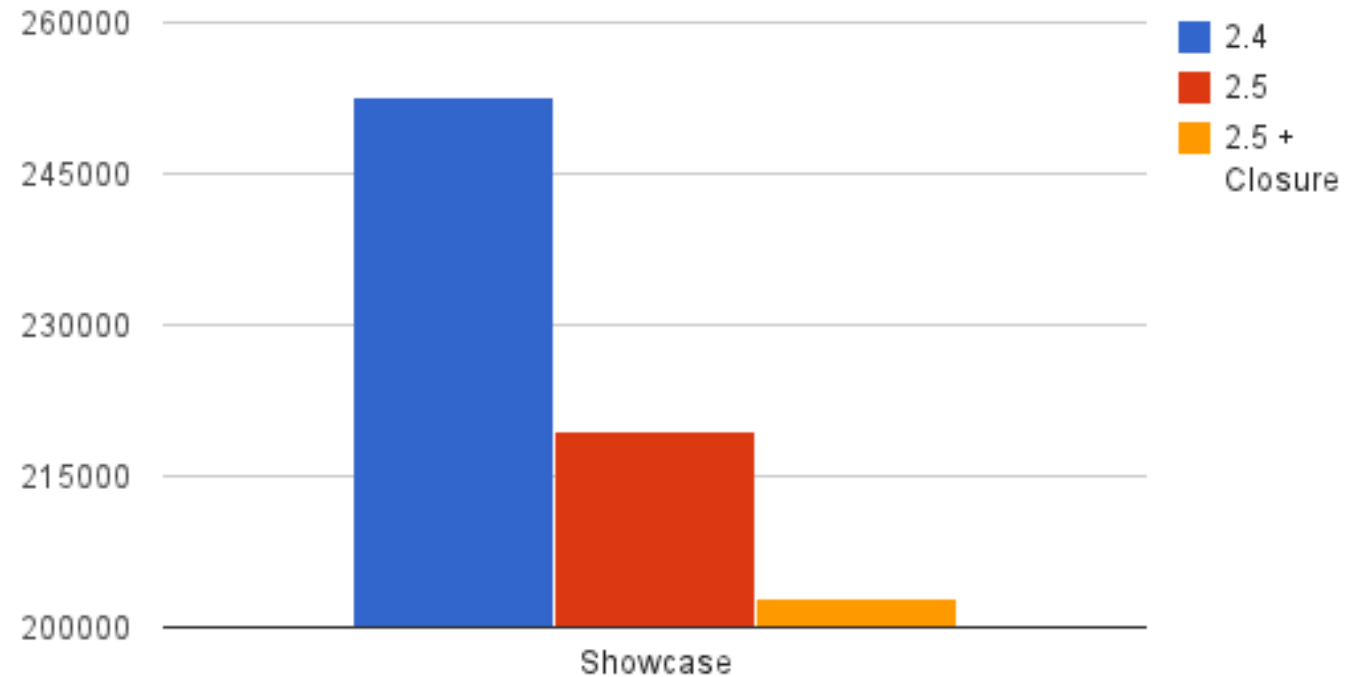
Default Options





# Closure Compiler Integration

GWT 2.4 vs GWT 2.5 + Closure

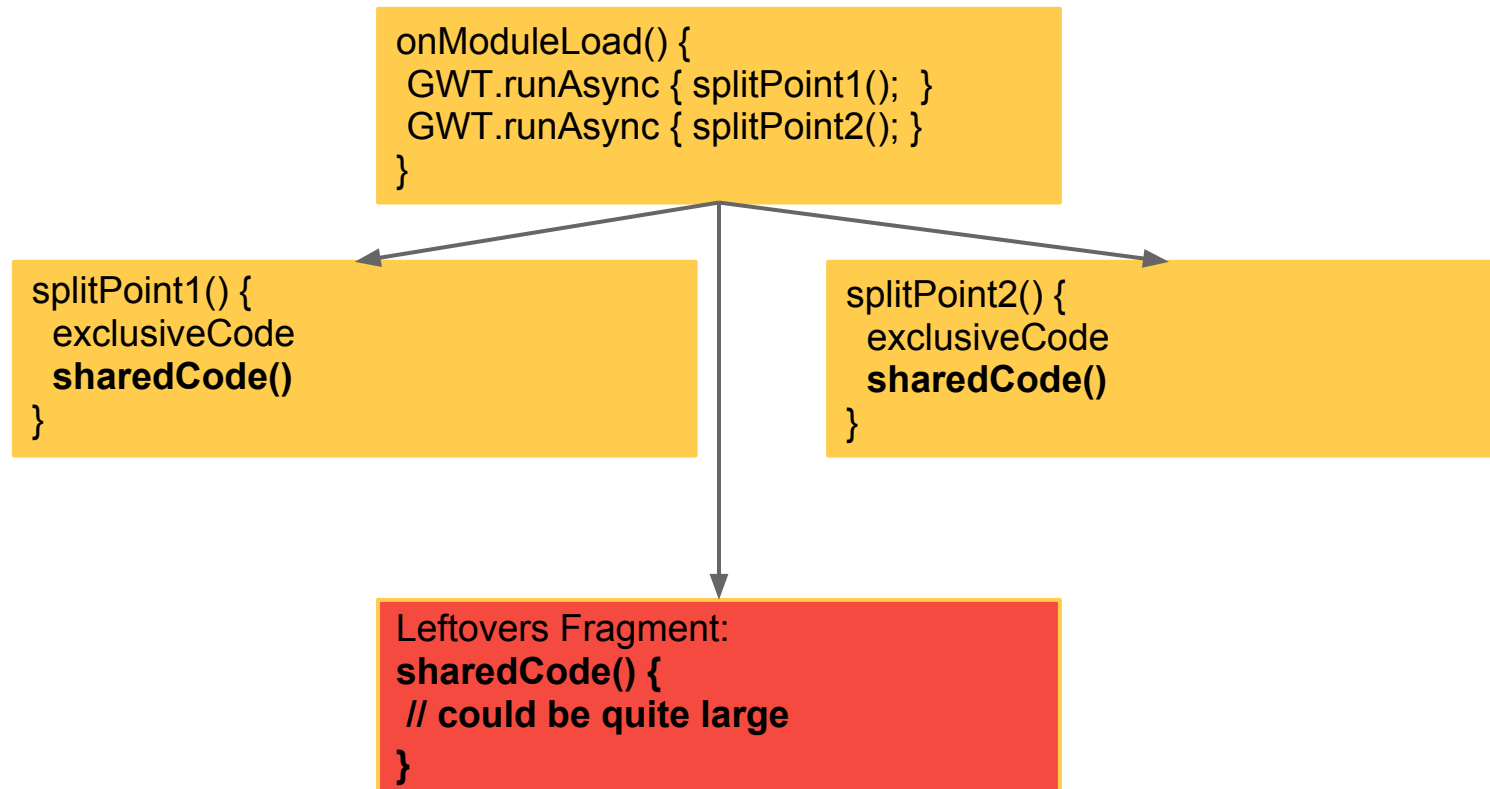


20% Smaller than GWT 2.4



# CodeSplitter Improvements

Problem: Shared code produces large leftovers fragment



# CodeSplitter Improvements

Solution: Merge fragments with lots of common code

```
onModuleLoad() {  
  GWT.runAsync { splitPoint1(); }  
  GWT.runAsync { splitPoint2(); }  
}
```



```
splitPoint1() {  
  exclusiveCode  
  sharedCode()  
}
```

```
splitPoint2() {  
  exclusiveCode  
  sharedCode()  
}
```

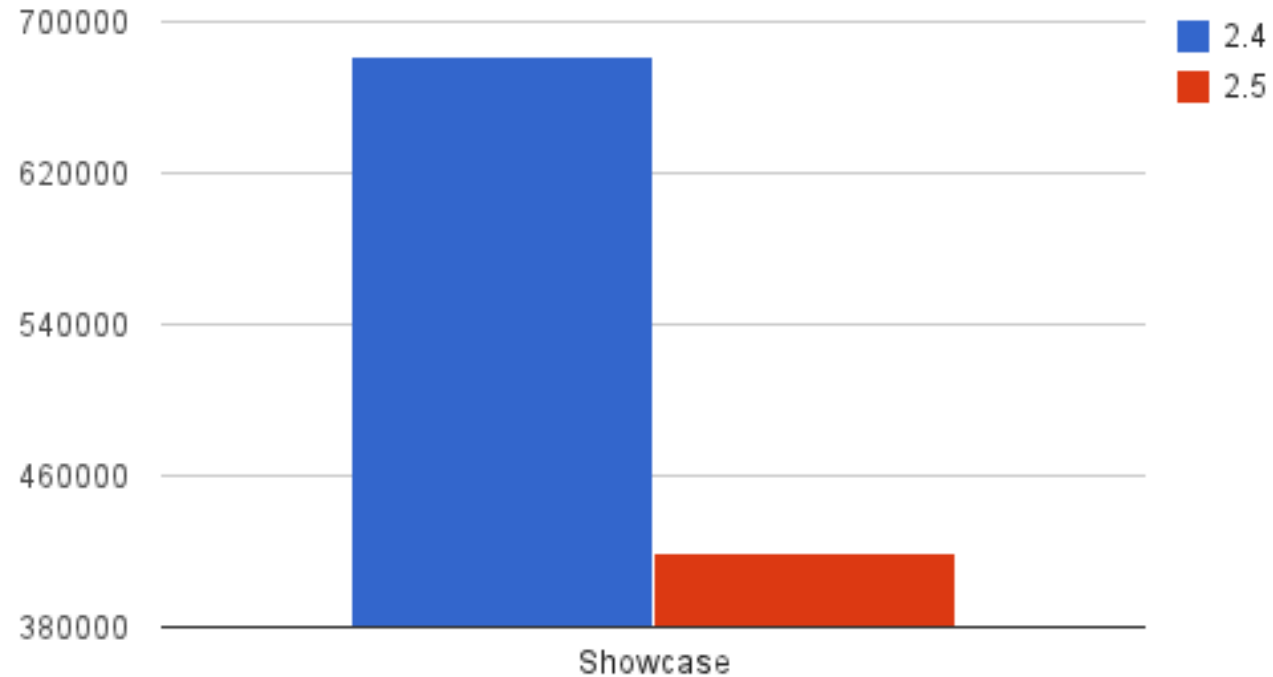
Leftovers Fragment (Now no longer shared outside this fragment)  
**sharedCode()** {  
 // could be quite large  
}

```
Leftovers Fragment:  
// empty
```



# 39% Reduction in Initial Download Size + Leftovers

Showcase using -XfragmentMerge 23



GWT 2.4 681,802 bytes  
GWT 2.5 418,932 bytes



# SourceMaps

- Bidirectional Mapping between Source Language and Compiled JavaScript
  - Supported by GWT, Closure, CoffeeScript, and eventually Dart2js
- Emerging standard for Javascript cross-compilers
- Permits de-obfuscation of Javascript
- Allows GWT to construct more accurate Java stack traces when something goes wrong
- Chrome only for now, Firefox support on the way



# SuperDevMode

Where native C++ plugins fear to tread.

- Fast Refresh without Browser Plugins
- Compile to Javascript in seconds (typically less than 10)
- Source level Java debugging right in your Browser
- Even support mobile browser debugging for Chrome and Mobile Safari
- DEMO TIME!



# UiBinder and CellWidget Enhancements

- Support for rendering CellWidget Cells via UiBinder templates
  - introduces new tagging interface UiRenderer associated with .ui.xml file
  - GWT.create() on UiRenderer generates implementation
  - Rather than bind elements, it is invoked like I18N Message or SafeHtmlTemplate classes
  - Returns HTML with values from Java objects substituted into it
- UiBinder construction/instantiation improvements
  - New IsRenderable/RenderablePanel
  - Binds a UI in a 2-pass process
    - First generate all HTML collecting it into a large string
    - Second, install it into the DOM via innerHTML and bind elements to fields
  - Significantly reduce latency and improve rendering speed
  - Case Study: Orkut. Startup latency reduced by 20%, rendering speed 300% faster



# I18 and ARIA

- Beginnings of support for Server-Side I18N message processing with `GWT.create()`
- New, up-to-date ARIA library based on latest W3C bindings





# Introducing Elemental

Fast, Lightweight, "to the metal" modern web programming for GWT

- Auto-generated completely from actual WebIDL browser files used by JS engines
  - Don't wait for hand wrappers, track the actual browser vendor specs/source
- 100% JavaScript overlay types behind Java interfaces which "melt away" after compilation
- Practically zero overhead
- Every HTML5 feature supported, even the bleeding edge
  - WebGL, WebAudio, WebSockets, WebRTC, Web Intents, Shadow DOM, File API, etc
- New Collection classes optimized for size and performance
  - map directly to underlying JS collections with no overhead
- New JSON library, no wrappers, no overhead, high performance
  - Collections and JSON work on server in non-GWT/non-JS environments too
- Excellent 'thin' library for direct mobile device development or desktop
- DEMO



# Improving GWT's Open Source Community

- To make contributing features or fixes to GWT as effortless as possible
- Maintain a high level of quality you've come to expect
- Allow the community a greater level of participation in GWT's future



# The GWT Steering Committee

- Google goes from gatekeeper to a peer amongst equals
- Responsible for setting project Guidelines, Policies, and Philosophy
- Determines who gets direct commit access to the master branch
- Sets overall future roadmap
- Drawn from mix of individual star contributors and third party vendors you've come to trust



# Steering Committee

- Ray Cromwell (Google)
- Artur Signell (Vaadin)
- Darrell Meyer (Sencha, GXT)
- Mike Brock (RedHat, Errai/JBoss)
- Thomas Broyer (individual contributor)
- Stephen Haberman (Bizo)
- Daniel Kurka (MGWT)
- Christian Goudreau (Arcbees, GWTP Library)



# Some early decisions

- SVN -> GIT
- Two official branches
  - Dev (trunk) - the bleeding edge, lots of commits, may break your apps
  - Beta - representing work on the next release, containing Dev work that has survived quality assurance
- Google will be building apps from Beta, as will others
  - Will change less often than Dev
  - Have a lower probability of breakage



# Where to find us

## New Steering Committee Resources

- Website
  - <http://sites.google.com/gwt-steering> (not published yet, soon)
  - Will have project rules and guidelines, recent meeting minutes, etc
- Mailing List
  - [gwt-steering@googlegroups.com](mailto:gwt-steering@googlegroups.com)





# Sencha

Michael Mullany, CEO



# Vaadin

Joonas Lehtinen, CEO





**"ArcBees is really proud to be a member of the steering committee of GWT. For us it means not only recognition for our active involvement as creator of Gwt-Platform (GWTP), but is also an opportunity to be the voice of our community of users and our clients at this table."**

Christian Goudreau, ArcBees, CEO



**"In this new process mgwt can help to make GWT become the Great Web Technology for mobile"**

Daniel Kurka, mgwt



**"In this new process mgwt can help to make GWT become the Great Web Technology for mobile"**

Daniel Kurka, mgwt

**Finally, we are hiring!**

**Do you want to work on GWT @ Google?**

**Apply at <http://google.com/jobs>**



Q&A



<Thank You!>





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