GWT with MVP: A Case Study

David Chandler
dchandler@TurboManage.com
http://blog.TurboManage.com

OR…

How I learned to love (Css

&& anonymous() {

inner() {}

classes() {}

});

Who is this guy?

- Wrote first book on running a Web site (1995)
- Written Web apps in perl, ksh, C with lex/yacc, ColdFusion, JSF, GWT
- Most recently, Web architect with Intuit on Internet banking products
- Patent on non-recursive SQL trees
- Working in a startup last 6 mos

Anatomy of a GWT app

What's GWT+MVP?

"Good" practices & patterns

gwt-presenter

gwt-dispatch

Caching, batching, queuing

GWT Tools

Resources

GWT+MVP

- Model View Presenter
  - Way of organizing code analogous to MVC
  - Services ⇔ Presenter ⇔ View
  - View
    - implements interface defined in presenter
    - fires no events of its own
  - Presenter
    - listens for DOM events (ClickHandlers, etc.)
    - listens on event bus
    - calls services

GWT+MVP

Where to put the model?

- Singleton accessible everywhere? (user info)
- Hide it behind services?
- Bits & pieces in each presenter?
- None at all?

Good practice #1

Define the Display interface

- Return interfaces, not Widgets
  - Supports testing, decoupling from view

~~Button~~ getSaveButton();

HasClickHandlers getSaveButton();

Caveat: sometimes you have to write your own

How to untangle

- How can presenters communicate with services and each other?
  - Example: new friend added
  - Does main presenter hold ref to all others?
- Use an *event bus*
- Define your own application events extending GwtEvent
- Presenters add handlers to listen for events

Good practice #2

Let presenter handle all events (even DOM)

- Sometimes hard
- If put click handler in the view, then view would have to call service layer
- Instead, handle in presenter
- display.getSaveButton().addClickHandler…

How to handle Widget collections?

Say, every row in a table has clickable widgets

Ans #1: catch event in parent Widget only

a) each table cell is a DIV. Handle event in containing Widget

Note: parent must be a Widget to receive events (and all of its ancestors)

b) along with this, expose handler reg mechanism through interface

How to handle Widget collections?

What if every row has multiple TextBoxes?

Ans #2: write Display interface with arrays

```
interface Display {
  HasValue<String> getFirstName(int i);
  HasValue<String> getLastName(int i);
  int getNumRows();
  void addRows(int n);
}
```

Guice

Google’s dependency injection framework

Small, light, almost plain English

- ServerModule
- DispatchServletModule
- DispatchTestModule
- ROAUserServiceImpl

Used by gwt-dispatch, useful for unit tests

Google GIN

- Dependency injection for GWT
- Quite useful for MVP implementations
  - Provides access to EventBus, Dispatch, anything “global” your app may need
- Auto-creates Images and Constants
  - Instead of GWT.create(RoaImages.class);
  - Can use
    - bind(RoaImages.**class**).in(Singleton.**class**);
    - @Inject RoaImages images;

gwt-presenter

Open source framework by David Peterson

http://code.google.com/p/gwt-presenter/

Very clean MVP implementation

Uses GIN to bind presenters as singletons

“Place” management

- Automatically syncs GWT History object when fire PlaceRequestEvent in code
- When browser URL changes, fires PRE

gwt-presenter

- Look at wiring (RoaModule, RoaGinjector, RoaMvp, AppPresenter)
- WidgetDisplay
  - asWidget()
- WidgetPresenter
  - onPlaceRequest()
  - Don’t forget to call bind() in constructor!
- WidgetContainerPresenter, DeckPresenter
- Create new presenter & view

gwt-presenter gotchas

Don’t forget to call bind() in constructor!

Loads all presenters at startup

- … and all views
- … with many Widgets in the views

Alternatives

- Temp solution: LazyPresenter replaces onBind() with onFirstRequest()
- Real solution: GWT.runAsync(), working on it…

Command pattern

GWT-RPC basics: every service = 3 classes

- Service interface (LoginService)
- Async version (LoginServiceAsync)
- Server impl (LoginServiceImpl)

```
@RemoteServiceRelativePath("gwtlogin")
public interface LoginService extends RemoteService
{
    public LoginInfo login(String requestUri) throws
      UserNotRegisteredException;
}
```

Command pattern

- Eclipse tooling auto-creates the asyncs
- What if you wanted to add a standard arg to every service call?
  - Like a security token to prevent CSRF
  - Would have to add to every interface, async, and impl UGH
- Or what if you wanted to cache data from service calls?

Command pattern

Turn verbs (methods) into nouns (classes)

~~loginService.login(p1,p2…,callback);~~

```
dispatchService.execute(new LoginAction(),
  new AsyncCallback<LoginResult>()
  {
    handleSuccess(LoginResult result)…
    handleFailure(Throwable caught)…
  }
```

Command pattern

Command pattern benefits

- Send security token in DispatchService and Actions don’t even have to know about it
- Actions and ActionHandlers can extend base classes
- Constructor params are saved with the cmd
- Caching! Batching! Queuing!
- Rollback!

gwt-dispatch

Companion framework by David Peterson

http://code.google.com/p/gwt-dispatch/

Base classes for Action, Result

DisplayCallback automatically calls start/stop view on service call init/return

HiveMind MVP tutorial highly recommended!

gwt-dispatch

- Wiring it up (GuiceConfig, ServerModule, DispatchServletModule)
- Create new Result, Action, ActionHandler
- Call it from presenter

Good practice #3

Stop thinking synchronously!

Pass Callbacks everywhere a trip to the server may be needed

~~ArrayList<User> service.getUsers()~~

service.getUsers(new AsyncCallback() {…});

Extend AsyncCallback with your own

Provide standard handleFailure();

Other standard handling on call or return

Tools

In case I forgot…

- Web Developer Toolbar (Ctrl+Shift+E)
- Firebug (F12)
- YSlow
- Chrome Developer Tools!
- Speed Tracer (runs in Chrome)

Other GWT goodies

DeferredCommand

- Often necessary for setFocus()

Timer

- Good for animation

http://code.google.com/p/gwt-fx/

- Fade, blinds, etc.

Resources

Book

- The CSS Anthology (Rachel Andrew, 3rd Ed.)

Blogs

- HiveMind MVP tutorial
- http://blog.turbomanage.com (lots of gwt-dispatch, gwt-presenter example code)
- Google I/O videos

AppEngine + GWT Training Apr 12-13