Scalable Web Programming

CS193S - Jan Jannink - 1/26/10
Administrative Stuff

- We’ll be team building on Thursday
- Much went well with assignments
- We’ll review some IT type problems
Some APIs Used

- Visualization, Maps, Voice
- Search (google, yahoo)
- Twitter
- Facebook
- SmartGWT
Submitting Code

- Goal: always work out of the box

- Problems
  - package external jar files properly
  - deleted files still referenced
  - Java version (5 or 6)
  - missing DOM elements, or documentation
Weekly Syllabus

1. Scalability: (Jan.)
2. Agile Practices
3. Ecology / Mashups
4. Browser / Client
5. Data / Server: (Feb.)
6. Security / Privacy
7. Analytics*
8. Cloud / Map-Reduce
9. Publish APIs: (Mar.)*
10. Future

* assignment due
Today’s Themes

- Evolution of the browser
- First impressions
- First line of defense
- Agile UI
- RESTful object lifecycle
Tip of the Iceberg
Browser Prehistory

- Java applets “killer app” for Netscape (1995)
- Applets are heavyweight
  - secure sandbox
  - compilation
  - monolithic
- Javascript
Browser 2.0

- IE5 (1999), Firefox
- XMLHttpRequest
- Gmail, Google Maps, Mashups
- Chrome, V8 javascript compiler
- iPhone, Android
- GWT
Headaches

- Incompatibilities
  - threading, javascript syntax, java version

- Performance
  - unpredictability, initial latency

- Security
  - XSS, CSRF, Firebug (debugger)
Flash

- About 90% of browsers have it
- ActionScript is well proven tech
- Environment separate from browser
  - security, cookies, testing
- Coding platform separate
Google Example

- Move all apps to the cloud
- Build faster browsers, better Javascript
  - Chrome
  - V8
- Tune performance for mobile platforms
  - Android, Chrome OS
First Impressions
First Impressions

- Pre visit (mouth of the funnel)
  - site referrals, marketing
- Site visit
  - dreaded “What does this site do?” question
- Bounce rate
- Transaction/Signup
The Funnel

More Sophisticated Conversion Funnel

- 100% Website visitors
- 10% Sign-up to trial
- 9% Login to account
- 5% Active users
- 1% Paying users
- 0.8% Staying users (>12 months)
Perfect Mouse Trap

- Simplicity - clear message
- Simplicity - memorable difference
- Simplicity - explainable value
First Line of Defense

- Fundamental security limits on the client side
- Set a defensive bar
  - code compression, obfuscation
  - security is an ongoing process
- Perform client & server side validation
Agile UI

- Rapid end user feedback loop
- Site instrumentation
  - heat map visualization
  - Google analytics
- Roll out learnings, Repeat cycle
- Avoid feature bloat
RESTful Lifecycle
RESTful Lifecycle

Put
RESTful Lifecycle

Get

Object

Put
RESTful Lifecycle

- Put
- Object
- Post

Actions:
- Get

Flow:
- Put -> Object
- Object -> Post
- Post -> Get
- Get -> Object
- Object -> Put

Flow Diagram:
RESTful Lifecycle

- Get
- Object
- Post
- Put
- Delete
RESTful Data Path

Client

Browser

Web Servers

Cache

Server Logic

Flow Control Points
GWT

- First complete rich client platform
- End to End coding in a single language
- Good dev., testing, maintenance cycles
- Google Wave implementation proof point
Worth Checking Out

- Powerful Javascript
  - http://www.chromeexperiments.com/

- Startup Metrics for Pirates
  - http://www.slideshare.net/dmc500hats/startup-metrics-for-pirates-sf-jan-2010
Q & A Topics

- Transparency in Browser & Client systems
- User driven development cycles
- Other development models