

- Joe Hewitt: web development evolved
- Integrated with Firefox:
  - at your finger tips, instant on
  - direct reflection of DOM, CSS
  - inspect, direct manipulation of debugger
- Huge hit with Web 2.0 developers
- Open sourced Dec. 2006
- Active development ended w/1.05 ~ May 2007



- Firebug awesome, but no eval() debugging
  - eval() widely used in Web 2.0
  - Basis for Dojo toolkit, JSON data
  - No debugging support for eval() in Firebug or Venkman
- How to extend Firebug to support eval()?
  - Ok, in reality it looked like a bug fix at first...



# **Example code, dynamic Javascript eval**

```
// Load the code dynamically
var req = new XMLHttpRequest();
req.open('GET','payloadCatsAndDucks.js', false);
req.send(null);
eval( req.responseText ); // line 23

// Now use the code
prod( new duck() );
prod( new cat() );
prod(); // call point of error
```

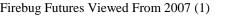


```
// Load the code dynamically
var req = new XMLHttpRequest();
req.open('GET','payloadCatsAndDucks.js', false);
req.send(null);
eval( req.responseText); // line 23
                                       function prod( animal) { // line
// Now use the code
                                           animal.say();
                                       };
prod( new duck());
prod( new cat());
prod(); // call point of error
                                       var duck = function() {
                                          this.say = function() {
                                             dump('quack\n');
                                        var cat = function() {
                                          this.say = function() {
                                              dump('meow\n');
                                           };
```

# The eval() code looks overlaid on caller



- jsd.scriptHook(script) (script means
  "function" in Mozilla JS)
  - script can be top-level, nested, event, eval, or Function
  - both top-level and eval scripts have no functionName
  - top-level scripts are on top of the stack, eval are not: we have a test
  - Ooops: no stack frame in this scriptHook!
  - Ok, set a breakpoint in the script at PC=0, return
- jsd.breakpointHook(frame, type, rv)
  - Remove our breakpoint, use **frame** to decide if we have an eval
  - Create a unique ID for buffer, data: URL
  - Store eval source and metadata in side table
- Breakpoints, stack traces, error messages:
  - Detect eval-frames, use side table





- Ok, its big hack, but it works!
  - Did I mention that eval() is critical to Web 2.0?
  - Did I mention that Firebug 1.0 was open source but not active?
  - How to complete contribution?
- Create 1.1 to contribute eval() debugging
  - Build alpha versions
  - Incorporate key bug fixes to draw users
  - Contribute to discussion group to build trust
  - Recruit to broaden impact: Max Stepanov from Aptana joins
  - Beta releases, respond to bug reports

### **Demo time**



#### **■** Features

- eval()
- executable lines marked
- Call stack side panel
- Firefox 3.0 compatiblity
- New XHR spy implementation
- extended plugin architecture
- editor interaction API
- bug fixes
- Firebug 1.1.0b7 1471 downloads in Oct. 2007
  - Firebug-1.1.0b9 will be 1.1.0. Probably.
- ...but it's slow



#### ■ Performance

- create performance tests (done)
- MD5 instead of encodeURIComponent (done)
- Delay add line numbers (in debug)
- re-do script side tables
- performance analyze
- static/dynamic user interaction (?)
- new Function() (done)
- bug fixes



- Expand dev team Not announced!
  - John Barton, IBM Almaden
  - Max Stepanov Aptana, JSD expert
  - Steve Souders, the YSlow guy, Yahoo
  - Dion Almaer Google, Ajaxian founder
  - Joe Hewitt Facebook, Firebug creator
  - TBD Mozilla, the Firefox people
- Invest time to create corporate sponsors
  - To sustain Firebug open source effort
  - On-site demos/talks
  - Encourage company-specific plugins
  - Intern program



# Chromebug: Firebug for Chrome

- Multi-window/multi-DOM support
- chrome urls, Firefox components, extensions
- Avoid eating your own arm
- Goal: do more than Venkman+DOMInspector
- demo



## More ambitious features

- Break on mutation events
- Event/Execution monitoring
- Direct JSON support
- Update w/o reload
- In-place Need to size and prioritize these edit assistance
- Integrated JS/C++ crash analysis
- GC/Memory footprint tools
- ...could go on for pages



#### ■ jsDebug 2.0 for Web 2.0

- JSD Built in support for dynamics
- redesign API (stack frames pls!)
- Writable PC/frames
- All-event hook
- GC/Memory hooks
- Migrate firebug-service via shim API

#### ■ Mozilla 2

■ Debug Support for Tamarin

#### ■ Webkit

- implement jsDebug 2.0 for webkit
- primary focus would be mobile



#### Source svn at code.google.com

- trunk 1.05 (stable)
- branches/eval 1.1.0b9 (beta, no tracing)
- branches/firebug1.1 1.1.0 (beta w/tracing)
- branches/firebug1.2 1.2aX (unstable)

#### Downloads

- 1.0: getfirebug.com Nice, compelling, easy install
- 1.1.0b: fireclipse.xucia.com obscure, adequate

#### Documentation

- Bug tracking on code.google.com kinda lame
- Discussion group
- FAQ short
- 1.0 docs nice but Needs up date for 1.1



## **Firebug 1.1.1**

- Bug fix/contained feature migration track
- Merge diffs from 1.2
- Pro: shorter release cycle
- Con: shorter release cycle
- Con: patch management overhead
- Summary: would require a dedicated engineer

## Would be nice, but its not practical now



## Firebug 1.2feature1a

- Create feature branches
- Each feature branch to track 1.2, merge on accept
- Pro: independent feature progress
- Con: loss of oppportunisitic fixes
- Con: coordination on main branch
- Summary: a good choice for mixed-commitment team



- A growing, diverse group relies on Firebug
  - Need a stable fallback release
- Complex, multiple use-model tool
  - Plan for long beta cycle
- Many cool short and long range ideas
  - Cool ideas need user input too
- Proposal: Four download pages on GetFirebug
  - Firebug Museum: old stable releases (no updates)
  - Firebug Stable: one stable release
  - Firebug Dev: beta release (updates to self then stable)
  - Firebug Labs: experimental features (updates to self then beta on merge)



- Joe Hewitt's Firebug is web development evolved
  - but it's a bug-eat-bug world out there
- Development tools need our support
  - Javascript is not a toy language, it's a vital economic engine
  - We need to build more and better development tools for Javascript
  - We need to attract JS development tools developers!