Collaborative Software Development

Joining the Apache Project

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Once upon a time ... mid 1994

- Rob McCool and the NCSA httpd 1.3
  - public domain source code
  - beta testers
- Mosaic (Netscape) Communications grabs RobM
  - httpd development stagnates
  - HTTP specification returns to life
- Patches proliferate
  - webmasters exchange patches via www-talk@info.cern.ch

Once upon a time ... Feb. 1995

- Private e-mail discussion starts, proposing to
  - compile individual patches into a single source base
  - provide feedback to new NCSA team
  - ensure that the results remain open source and HTTP a non-proprietary, implemented standard
- Brian Behlendorf offers workspace on Hyperreal
- We decide how to decide (the voting process)
- Apache is chosen for the group name
- Discussion moves to new-httpd@apache.org

Founders

Brian Behlendorf	HotWired, California
Roy Fielding	UC Irvine, California
Rob Hartill	LANL, New Mexico
David Robinson	Cambridge, UK
Cliff Skolnick	Sun Microsystems, California
Randy Terbush	Zyzzyva, Nebraska
Robert Thau	MIT, Massachusetts
Andrew Wilson	Elsevier, Oxford, UK

Development Constraints

- Globally distributed
  - multiple time zones, varying work schedules
  - synchronous communication is expensive, conflicting
- Voluntary organizational environment
  - no Apache CEO, manager, or even secretary
  - organizational roles are shared, rotated
- Heterogeneous development platforms
  - any required tools must be ubiquitous
- Communication is limited to e-mail

Development Process Evolution

- Patch - Vote - Build
  - +1 = yes, 0 = *shrug*, -1 = no/veto
  - three +1 and no veto required for patch approval
  - small quorum consensus emphasizes code review
- Voters - Vote Coordinator - Release Builder
  - recognized that roles are separable, allowing rotation
- Concurrent Versioning System (CVS)
  - distributed the build task, avoiding costly merges
  - free-for-all versus propose-vote-commit
- STATUS agenda and Commit-then-Review

Shared Information Space

- www.apache.org
  - information for users, official public releases
- **dev.apache.org**
  - project guidelines and information for developers
  - tips for development and building a release
  - mailing list and tool information
- bugs.apache.org
  - problem report database
- modules.apache.org
  - third-party module registry

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Mailing Lists @apache.org

- apache-announce
  - used only for important announcements to users
- new-httpd
  - primary developer discussion area
- apache-cvs
  - notifications of changes to shared repositories
- apache-bugdb
  - notifications of problem report creation/update
- others for related projects
  - http://dev.apache.org/mailing-lists.html

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Development Tools

- ssh: Secure Shell remote login facility
  - http://www.cs.hut.fi/ssh/
- CVS: Concurrent Versioning System
  - http://www.cyclic.com/cyclic-pages/CVS-sheet.html
- GNATS: Problem Reporting and Tracking System
  - http://www.alumni.caltech.edu/~dank/gnats.html
- Any ANSI C compiler
  - gcc or egcs recommended for *nix
  - MS Visual C++ 5.0
- gdb (or your favorite debugging tools)

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How to Join the Apache Project

- Apache is a meritocracy
  - contribute, contribute, contribute
- Not just for hackers
  - documentation
  - problem report filtering
  - testing
  - problem report resolution (bug fixing)
  - performance and security profiling
  - new features and portability enhancements
- The Apache Group

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Where Help is Needed

- 1.3.x is approaching stasis
  - documentation and problem reports
  - experimental modules, protocol extensions, WebDAV
  - maintaining project agenda and support software
- 2.0 is being designed, prototyped
  - layered abstractions for multithreading, shared memory, portability, and protocol streams
  - new configuration language and run-time interface
  - more flexible, detailed module hooks and API
  - front-end caching and proxy/gateway awareness

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Discussion

- What would help you to help us?
- Places to see:
  - Front Door — www.apache.org
  - Developer Notes — dev.apache.org
  - PR Database — bugs.apache.org
  - Apache Week — www.apacheweek.com
- www.ics.uci.edu/~fielding/talks/apachecon98/

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