

Objectives

- Finish Collaboration tools
- Tracking Problems
- Bugzilla

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Collaboration System Problems

- Locking a whole file
 - Only need to lock part of the file
- Cross-cutting concerns
 - Need small parts across a whole bunch of files
- What are pertinent changes?
 - What if we “just” modified comments
 - Considered a conflict, but it's not a big deal

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One Approach: Collaborating at Finer Granularities

- Break Java classes into smaller *fragments*
- User executes *queries* to get parts of classes
 - Useful when changes spread over multiple classes
 - Don't need to lock whole class, just relevant parts
- Similar ideas to Find-Concept and Dora
 - Create a concern/relative neighborhood that developer will work on

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Coven: Framework for Collaborative Software Development

- **C**ollaborative **V**ersioning **E**nvironment
- Goal: wide-area collaboration among many users
- Central coordination space for collaborative programming
- Primary researcher: Mark Chu-Carroll, IBM
 - Now at Google

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Example Java Fragments

```

package test;           Organization of code

import java.io.*;       Libraries to use
import java.util.*;     Class declaration

public class Foo extends Bar implements IBar

protected int _index;   Instance variables
protected String _name;

public static void main( String args[] ) {
    ...                  Method definition
}
  
```

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Compound Artifacts (CA)

- Compound Artifacts (CA): collection of artifacts/fragments
- One CA is a **Virtual Source File** (VSF)
- Fragment can belong to more than one CA
- More than one organization of the source code

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Syntactic Merging

- Text-based merging can't handle ...
 - Unimportant changes in comments
 - Changes in line breaks/spacing to make code more readable
- Syntactic merger can ignore these conflicts

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Semantic Merging

- What about conflicts that are semantically the same?
 - Ex. Using a variable in the same way but has a different name
- Semantic merging handles these conflicts

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TRACKING PROBLEMS

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What's a Problem?

- A *problem* is a questionable property of a program run
 - It becomes a *failure* if it's incorrect...
 - ...a *request* for enhancement if missing...
 - ... and a *feature* if normal behavior

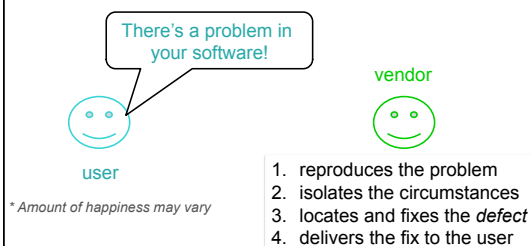
It's not a bug, it's a feature!

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Problem Life Cycle



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Challenges

- How do I organize the life cycle?
- Which problems are currently *open*?
 - Haven't been diagnosed, fixed
- Which are the most severe problems?
- Did similar problems occur in the past?

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Problem Report

- A problem comes to life with a **problem report**
- Includes all information vendor needs to fix problem
- Also known as **change request** or **bug report**

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Example Problem Report

From: me@dot.com
To: you@there.org
Subject: Crash
 Your program crashed.
 (core dumped)

- Core dump: recorded state of the working memory of a computer program at a specific time, generally when the program has terminated abnormally (crashed)
- Email content similar to many CS111 students' emails to me when they want to know why something went wrong in their program


What does the report tell you?

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Example Problem Report #2

From: me@dot.com
To: you@there.org
Subject: Re: Crash
 Sorry, here's the core
 <core, 14MB>

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Example Problem Report #3

From: me@dot.com
To: you@there.org
Subject: Re: Crash
 You may need this too,
 just in case
 <data, 148GB>


- What's the problem with these problem reports?

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Example Problem Report #3

From: me@dot.com
To: you@there.org
Subject: Re: Crash
 You may need this too,
 just in case
 <data, 148GB>

- What's the problem with the problem reports?
 - Limited information about what the problem is, what caused it
 - Information is scattered across 3 emails

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What To Report

- The product release
- The operating environment
- The problem history
- A one-line summary
- Expected and experienced behavior

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Product Release

- Typically, some *version number* or otherwise unique identifier
 - Required to reproduce the problem

Perfect Publishing Program 1.1 (Build 7E47)

- Generalize: Does the problem occur only in this release?

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Operating Environment

- Typically, *version information* about the operating system
- Can be simple ("Windows 98 SE") or complex ("Debian Linux 'Sarge' with the following packages...")
- Generalize: In which environments does the problem occur?

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Problem History

- Steps needed to *reproduce* the problem
 - Create "bug.ppp"
 - Print on the default printer...
- If the problem cannot be reproduced, it is unlikely to be fixed
- Simplify: Which steps are relevant?

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Expected Behavior

- What should have happened according to the user:

The program should have printed the document.

- Reality check: What is the understanding of the user?

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Observed Behavior

- The *symptoms* of the problem — in contrast to the expected behavior

The program crashed with the following information:

*** STACK DUMP OF CRASH (LemonyOS)

```
Back chain  ISA  Caller
00000000  SPC  0BA8E574
03EADF80   SPC  0B742428
03EADF30   SPC  0B50FDDC  PrintThePage+072FC
SnicketPC unmapped memory exception at
          0B512BD0 PrintThePage+05F50
```

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A One-Line Summary

- Captures the essence of the problem

PPP 1.1 crashes when printing

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Things to Avoid

- Humor
 - PPP (oops, gotta go to the restroom :-) ...
- Sarcasm
 - Here's yet another "never-to-be-fixed" bug
- Attacks
 - If you weren't too incompetent to grasp...

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If we're developing a large software application, as good as we may be, we're going to have bugs...

A lot of them....

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Managing Problems

- Alternative #1: *A Problem File*
 - Only one person at a time can work on it
 - History of earlier (fixed) problems is lost
 - *Does not scale*
- Alternative #2: *A Problem Database*
 - Examples: Bugzilla, JIRA

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Classifying Problems

- Severity
- Priority
- Identifier
- Comments
- Notification

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Problem Severity

- **Enhancement.** A desired feature
- **Trivial.** Cosmetic problem
- **Minor.** Problem with easy workaround
- **Normal.** "Standard" problem
- **Major.** Major loss of function
- **Critical.** Crashes, loss of data or memory
- **Showstopper.** Blocks development

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Priority

- Every new problem is assigned a *priority*
- The higher the priority, the sooner the problem will be addressed
- Priority is *independent* from severity
- Prioritizing problems is the main tool to control development and problem solving
- In Bugzilla, available priorities range from P1 (most important) to P5 (least important)

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Identity

- Every new problem is assigned an **identifier**
 - Also known as PR—problem report—number or bug number
- The identifier is referenced in all documents during the debugging process

Subject: PR #3427 is fixed?

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Comments

- A developer can attach **comments** to a problem:

I have a patch for this. It's just an uninitialized variable, but I still need a review.

- Comments may also include files, documents, etc.

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Notification

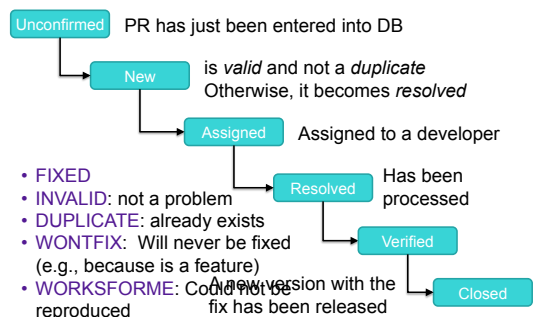
- Developers and users can attach an e-mail address to a problem report
- They will be notified every time the report changes

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Simplified Problem Lifecycle



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Management

- Who enters problem reports?
- Who classifies problem reports?
- Who sets priorities?
- Who takes care of the problem?
- Who closes issues?

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Summary

- Reports about problems encountered in the field are stored in a *problem database*
- A problem report must contain everything relevant to reproduce the problem
- It is helpful to set up a standard set of items that users must provide (product release, operating environment...)

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Problem Reports Summary

- An effective problem report...
 - is well-structured
 - is reproducible
 - has a descriptive one-line summary
 - is as simple and general as possible
 - is neutral and stays with the facts

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Summary

- A typical problem life cycle starts with an *unconfirmed* status
- It ends with a *closed* status and a specific resolution (such as fixed or worksforme)

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BUGZILLA

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What is Bugzilla?

- Bug-tracking system
- Used by a large number of projects
 - Mozilla
 - Linux Kernel
 - NASA - Endeavour Shuttle and International Space Station
 - Eclipse: <http://bugs.eclipse.org/bugs/>
 - Facebook: <http://bugs.developers.facebook.com/>



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History

- Originally written by Terry Weissman



"What have they done to my baby!"

 - Replacement for Netscape's in-house bug tracking software
- Taken over by Tara Hernandez



"My head feels so much lighter after the lobotomy."

 - Infrastructure Engineer at Pixar
- Currently, lead is Dave Miller



Too Ugly for a Photo

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History

- First version written in Tcl
- Version 2.0: Ported to Perl
 - Released as open source on Sept. 19, 1998

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Uses

- Software and hardware bug tracking
- Systems administration
- IT support queues

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Benefits

- Improve communication
- Increase product quality
- Improve customer satisfaction
- Ensure accountability
- Increase productivity
- Bugzilla can adapt to multiple situations

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Design Principles

- Focus: bug system/track software defects
 - Could be technical support ticket system, task management tool, or project management tool
- Run on freely available, open source tools
 - May run on commercial DBs, tools, and OSs but not at expense of open source support
- Speed and efficiency
 - Lightweight implementation
 - Minimize calls to DB, don't generate speed-sucking HTML, don't fetch more data than needed, etc.
- Portability
 - Use SQL - not DB-specific calls
 - Browser agnostic
 - Follow applicable standards

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Features

- Defect Tracking
 - Add, Find, Assign Responsibility, Close, Reopen
- Multiple Versions/Modules for Software
- Reporting/Chart Creation
- Flexible Authentication/Authorization
- Support for Multiple Languages

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Features

- Optimized database structure for increased performance and scalability
- Excellent security to protect confidentiality
- Advanced query tool that can remember your searches
- Integrated email capabilities
- Editable user profiles and comprehensive email preferences
- Comprehensive permissions system

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Requirements

- CGI-enabled Web Server
 - e.g., Apache, IIS
- Database
 - Currently supports MySQL, PostgreSQL, and Oracle
- Perl
 - A large number of Perl modules

Result: Tricky installation

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Limitations

- Unwieldy installation routine
 - Included scripts improve some
- **Customizing** an installation not easy
- **Integration**
 - Other components and tools can be difficult
 - CVS, Subversion, Test-case generators, etc.
- Generalization
 - Support more databases
 - Make it easier to optionally enable and disable features
 - Modularity in terms of features and in the UI
 - Allow customization of other previously hardcoded features, like resolutions and statuses

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Future

- Improve installation
- Expand database support
- More extensibility/modularity
 - User Interface
 - Features
- More flexible security

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CVS Tags

- Bugzilla_Stable - latest stable release
- BUGZILLA-3_2_3 - 3.2.3 specifically
- BUGZILLA-3_2-STABLE - latest 3.2.x stable release
- BUGZILLA-3_2-BRANCH - latest 3.2 pre-release code

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Mozilla's Bugzilla

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Sp <https://bugzilla.mozilla.org/>

The New Look of Bugzilla

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<https://landfill.bugzilla.org/bugzilla-tip/>

Using Bugzilla

- User Experience team is relatively new
 - Dedicated to making user experience more effective and efficient
- Bugzilla's Bugzilla:
 - <https://bugzilla.mozilla.org/>
 - Search for uiwanted or useless-UI
 - Search for your last name

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Geek Humor: Zarro Boogs Found

- A goofy way of saying that no bugs found matching your query

"Way back when, when Netscape released version 4.0 of its browser, we had a release party. Naturally, there had been a big push to try and fix every known bug before the release. Naturally, that hadn't actually happened. (This is not unique to Netscape or to 4.0; the same thing has happened with every software project I've ever seen.) Anyway, at the release party, T-shirts were handed out that said something like "Netscape 4.0: Zarro Boogs". ...

"So, when you query for a list of bugs, and it gets no results, you can think of this as a friendly reminder. Of *course* there are bugs matching your query, they just aren't in the bugsystem yet..."
--Terry Weissman

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A Problem Report

Bugzilla@Mozilla - Bug 398627 make icons for "always ask" and "save file" actions in Applications prefpane
Last modified: 2008-03-17 22:21:22 PDT

Home | New | Search | Find | Reports | Requests | New Account | Help | Log In

Bug List: (5 of 41) First Last Prev Next Show last search results

Bug 398627 - make icons for "always ask" and "save file" actions in Applications prefpane Last Comment

Status: ASSIGNED Whiteboard: Keywords: Product: Firefox Component: File Handling Version: Trunk Platform: All All Importance: P4 normal (vote) Target Milestone: Firefox 3 beta3 Assigned To: Alex Faaborg QA Contact: file.handling@firefox.bugs	Reported: 2007-10-04 15:55 PDT by hlyk.Meloy [rmyk] Modified: 2008-03-17 22:21 PDT (history) Flags: mconnor: blocking-firefox3- mconnor: wanted-firefox3-
--	--

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Another Problem Report

Bugzilla@Mozilla - Bug 292593 multiline tab bar
Last modified: 2009-04-24 10:24:16 PDT

Home | New | Search | Find | Reports | Requests | New Account | Help | Log In

Bug List: (7 of 41) First Last Prev Next Show last search results

Bug 292593 - multiline tab bar Last Comment

Status: NEW Whiteboard: Keywords: uiwanted Product: Firefox Component: Tabbed Browser Version: Trunk Platform: All All Importance: -- enhancement (vote) Target Milestone: --- Assigned To: Nobody; OK to take it and work on it QA Contact: tabbed.browsers@firefox.bugs URL: Depends on: Blocks:	Reported: 2005-05-02 03:10 PDT by petar.gervai Modified: 2009-04-24 10:24 PDT (history) Flags: highmind63: wanted-firefox3.6?
---	---

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Newer UI

Bugzilla - Bug 3958 screen shows horror pic when trees cut down
Last modified: 2006-05-31 11:35:25 PDT

Home | New | Search | Find | Reports | Requests | Help | New Account | Log In | Forgot Password

Bug List: (1 of 1) First Last Prev Next Show last search results

Bug 3958 - screen shows horror pic when trees cut down

Status: NEW Product: WorldControl Component: PoliticalBackstabbing Version: 1.0 Platform: PC Windows XP Importance: P1 normal (vote) Target Milestone: --- Assigned To: Tara Hernandez QA Contact: URL: Whiteboard: Keywords: stupid Depends on: Blocks:	Reported: 2006-05-31 11:35 PDT by Carol Place Modified: 2006-05-31 11:35 PDT (history) CC List: 0 users (show) See Also: Large text box: free text: A multiple-select box: Drop Down List: --- Date Time:
---	---

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How did UI change?

Related Tools

- JIRA
 - Commercial bug and issue tracker
- Trac
 - Issue tracking plus version control and Wiki

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Last Week!

- Wednesday: Milyn and Tasktop
- For Friday: Read Refactoring paper
 - Post summary on Sakai
- Assignment 6 redos due on Friday too
- Still need your presentation slides from Friday

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