

Presentation of
“CVSSearch: Searching through
Source Code using CVS Comments”

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Problem

- Searching unfamiliar or large code bases is difficult
- Determine best practices in an ecosystem
- Find undocumented modules

Previous Approaches

- Link documentation to code modules
 - Easy for man pages \leftrightarrow C
 - Difficult otherwise
- Search code for keywords, patterns
 - awk, grep, lex, perl

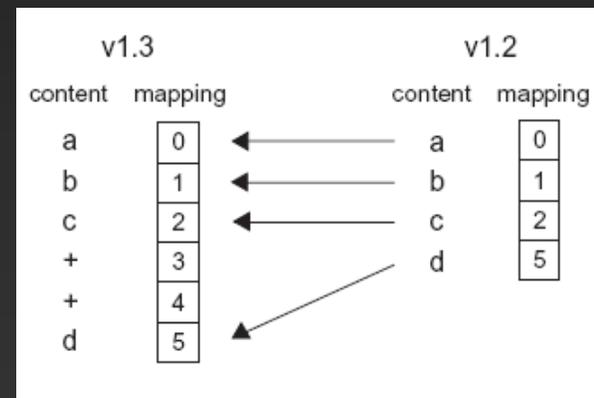
Ideas

- CVS comments often verbose
 - Implications
 - Tradeoffs
 - Issues
 - Bugs
 - Dissemination to team
- CVS comments collected through time
- Bug fixes, change requests are discussed in CVS comments, not discussed in code

Solution

- Parse CVS changes
- Attach each line of code change to the CVS commit comment where the change appeared
- Accumulate a series of comments for each LOC
- Index, search

Line \ Revision	1.3	1.2	1.1
1	a	a	a
2	b	b	b
3	c	c	-
4	+	d	-
5	+		d
6	d		



Tool

- “Conceptual grep”
- Search for several terms
- Searches an OR expression of your terms
- Returns ranked list of files
- Drill-down to LOC referenced in search

Netscape: <2>

File Edit View Go Communicator Help

Your query "password" matched 18 files

- [kdenetwork/kmail/kmacctexpop.cpp](#), matched lines: 71 [68 cvs matches] [5 grep matches]
- [kdenetwork/kmail/kmheaders.cpp](#), matched lines: 15 [15 cvs matches]
- [kdenetwork/kmail/configuredialog.cpp](#), matched lines: 5 [5 cvs matches] [1 grep matches]
- [kdenetwork/kmail/kmreaderwin.h](#), matched lines: 7 [7 cvs matches] [1 grep matches]
- [kdenetwork/kmail/kmmmainwin.cpp](#), matched lines: 5 [5 cvs matches]
- [kdenetwork/kmail/kmheaders.h](#), matched lines: 2 [2 cvs matches]
- [kdenetwork/kmail/kmaccount.cpp](#), matched lines: 4 [4 cvs matches]
- [kdenetwork/kmail/accountdialog.cpp](#), matched lines: 12 [12 grep matches]
- [kdenetwork/kmail/kmacctexpop.cpp](#)
- [kdenetwork/kmail/kmaccount.cpp](#)
- [kdenetwork/kmail/kmreaderwin.h](#)
- [kdenetwork/kmail/kppbase.cpp](#)
- [kdenetwork/kmail/kmmmainwin.cpp](#)
- [kdenetwork/kmail/kmcomposer.cpp](#)
- [kdenetwork/kmail/accountdialog.cpp](#)
- [kdenetwork/kmail/kmfilterdlg.cpp](#)
- [kdenetwork/kmail/kmmmessage.cpp](#)
- [kdenetwork/kmail/kpp.cpp](#), n

Netscape: CVSSearch: kdenetwork/kmail/kmacctexpop.cpp <4>

File Edit View Go Communicator Help

kdenetwork/kmail/kmacctexpop.cpp Strong Match...Weak Match for this file.

Matched Lines for "password":

```
[cvs] Keyword found in CVS comment for this line.
[grep] Keyword found in this line of source.
[both] Keyword found by both cvs and grep.

[both] 21: #include <qlayout.h>
[both] 36: #include <kwin.h>
[both] 37: #include <kbuttonbox.h>
[both] 130: QString msg = i18n("Please set P
[both] 163: mStorePasswd = config.readNUMEntry("
[both] 252: void KMacctExpPop::clearPasswd()
[both] 253: {
[both] 254:     mPasswd = "";
[both] 255:     mStorePasswd = FALSE;
[both] 256: }
[both] 269: //-----
[both] 302: const
[both] 307: // for a new username and password l
[both] 308: QLabel *l;
[both] 312: KWin::setIcon(winId(), kapp->icon()
[both] 313: if (!caption.isNull())
[both] 316: QGridLayout *ql = new QGridLayout(th
[both] 318: QPixmap pix(locate("data", QString::
[both] 319: if (!pix.isNull()) {
[both] 320:     l = new QLabel(this);
[both] 321:     l->setPixmap(pix);
[both] 322:     l->setFixedSize(l->sizeHint());
[both] 323:     ql->addWidget(l, 0, 0);
[both] 324: }
[both] 326: l = new QLabel(i18n("You need to sup
[both] 327:     "password to access t
[both] 328:     this);
[both] 329: l->setFixedSize(l->sizeHint());
[both] 330: ql->addWidget(l, 0, 1);
[both] 332: l = new QLabel(i18n("Server:", this
318: QPixmap pix(locate("data", QString::fromLatin1
319: if (!pix.isNull()) {
320:     l = new QLabel(this);
321:     l->setPixmap(pix);
322:     l->setFixedSize(l->sizeHint());
323:     ql->addWidget(l, 0, 0);
324: }
325:
326: l = new QLabel(i18n("You need to supply a us
327:     "password to access this mail
328:     this);
329: l->setFixedSize(l->sizeHint());
330: ql->addWidget(l, 0, 1);
331:
332: l = new QLabel(i18n("Server:", this);
333: l->setMinimumSize(l->sizeHint());
334: ql->addWidget(l, 1, 0);
335:
336: l = new QLabel(act->host(), this);
337: l->setMinimumSize(l->sizeHint());
338: ql->addWidget(l, 1, 1);
339:
340: l = new QLabel(i18n("Login Name:", this);
341: l->setMinimumSize(l->sizeHint());
342: ql->addWidget(l, 2, 0);
343:
344: usernameLEdit = new QLineEdit(login, this);
345: usernameLEdit->setFixedHeight(usernameLEdit-
346: usernameLEdit->setMinimumWidth(usernameLEdit
347: ql->addWidget(usernameLEdit, 2, 1);
348:
349: l = new QLabel(i18n("Password:", this);
350: l->setMinimumSize(l->sizeHint());
351: ql->addWidget(l, 3, 0);
352:
353: passwdLEdit = new QLineEdit(this, "NULL");
354: passwdLEdit->setEchoMode(QLineEdit::Password
```

CVS Comments: Click on cvs link to show associated cvs comments.

Mario: new password dialog, some cosmetic fixes

Navigation icons: back, forward, search, etc.

Contributions

- Longitudinal searching
- Attaches change-time comments to lines of code
- Links related concepts from search terms

Positive

- Uses previously unused information from CVS
- Augments traditional tools and remains flexible
- Useful interface
- Learning tool

Negative

- Limited to code bases with good change commit comments
- Did not beat traditional tools consistently
- Evaluation method unclear, real world evaluation necessary
- Only KDE code