Hipikat:
A Developer's Recommender

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Introduction

Hipikat

- suggests artifacts that might be useful to a developer for a task underway

Prototype instantiated for Eclipse

- client as an Eclipse plug-in
- daily updates with Eclipse development

The problem

Best knowledge about a software system:

- resides in developers' heads
- spread via informal and lightweight processes

What happens in virtual teams?

- Time and distance separation
- Communication more difficult

Mentoring and support weak or non-existent

The virtual alternative

Everybody collaborates via the Internet

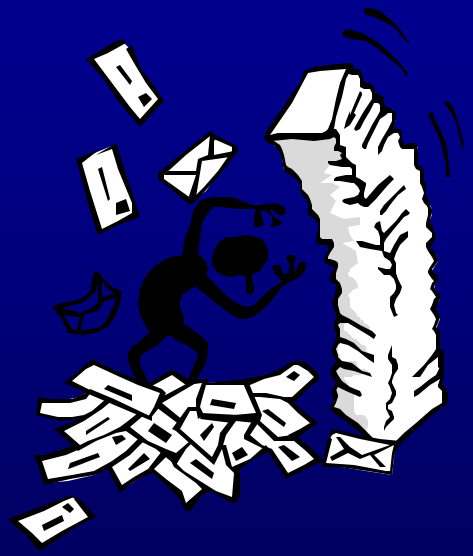
Turn electronic communication into an asset:

- Source code versioning
- Archives of electronic communication
- Test information
- Design decisions

Give developers access to this implicit and latent group memory

Information is there

Information overload:
- hundreds of emails and newsgroup postings every week



Searching it is
- tedious and time-consuming

The solution

Create a group memory of all artifacts in the project

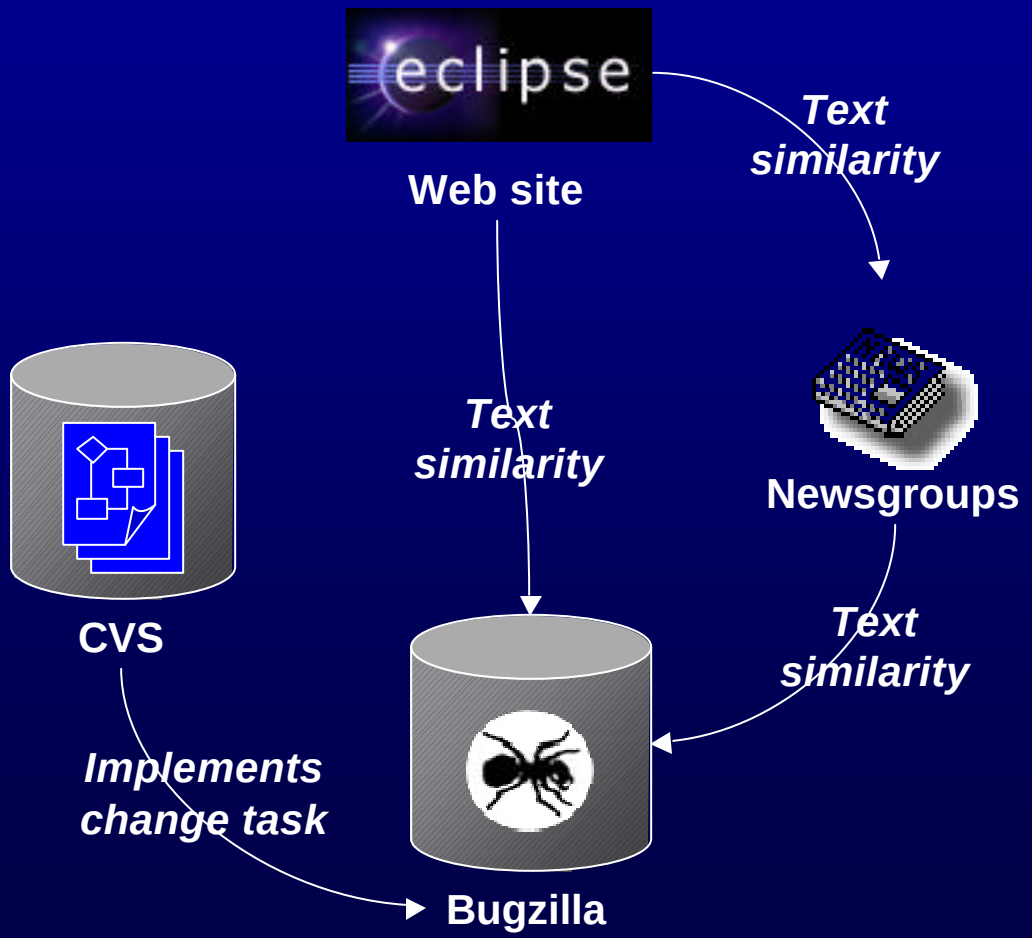
Recommend artifacts that might be of value when performing a task

- similar changes
- related email discussions
- relevant project Web pages

Minimal changes to existing work practices

Information schema

- Artifacts from various information sources
- Infer “linkages” within and across sources
- Issue-tracking system at the centre



Eclipse.org

Intense development

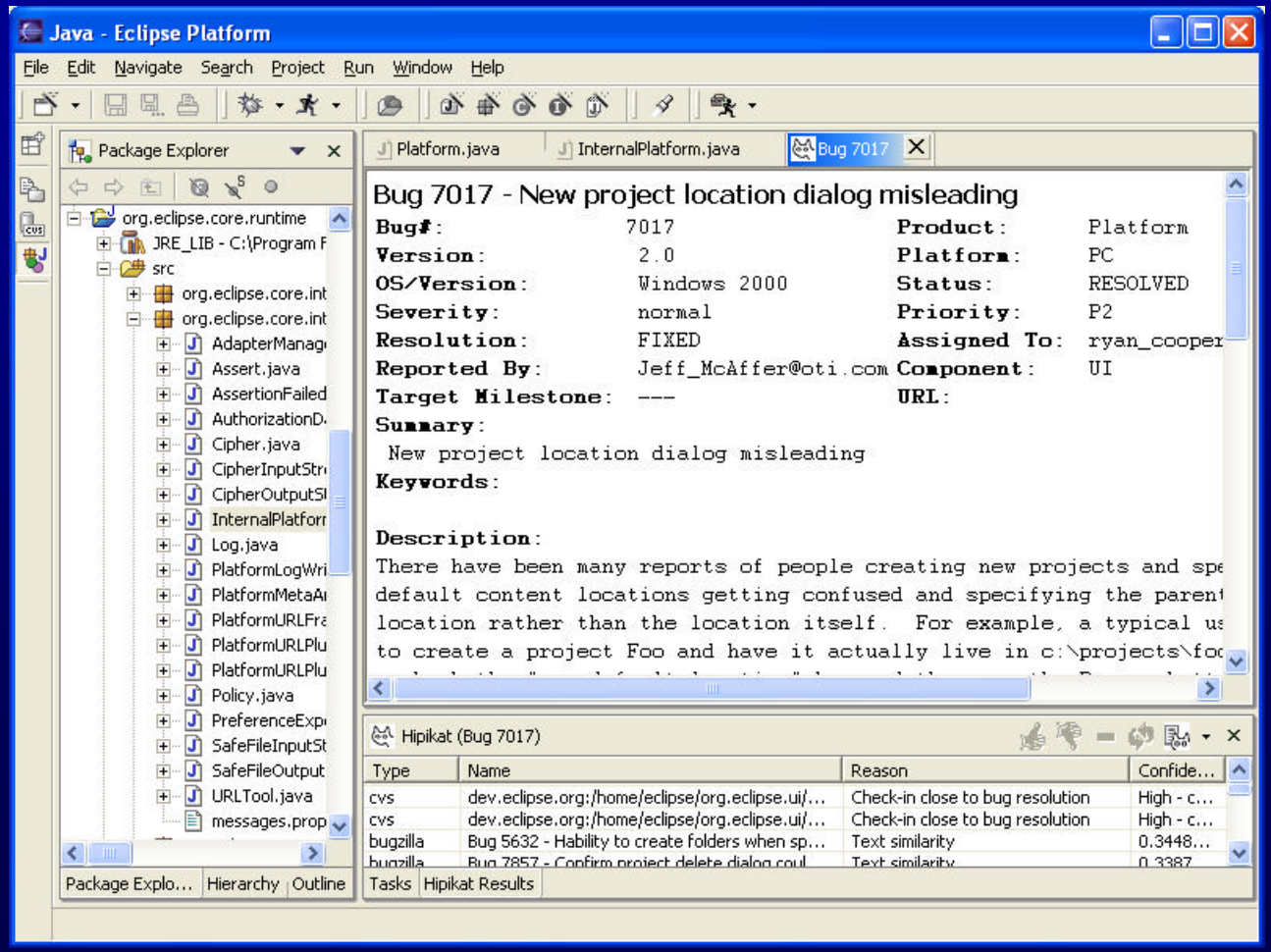
- Avg. 170 revisions checked in daily (in Oct.)
- Avg. 47 new bug reports entered into Bugzilla
- Avg. 149 comments/day on existing reports

Active developer lists

- Over 100 articles/day on newsgroups

Daily Hipikat updates

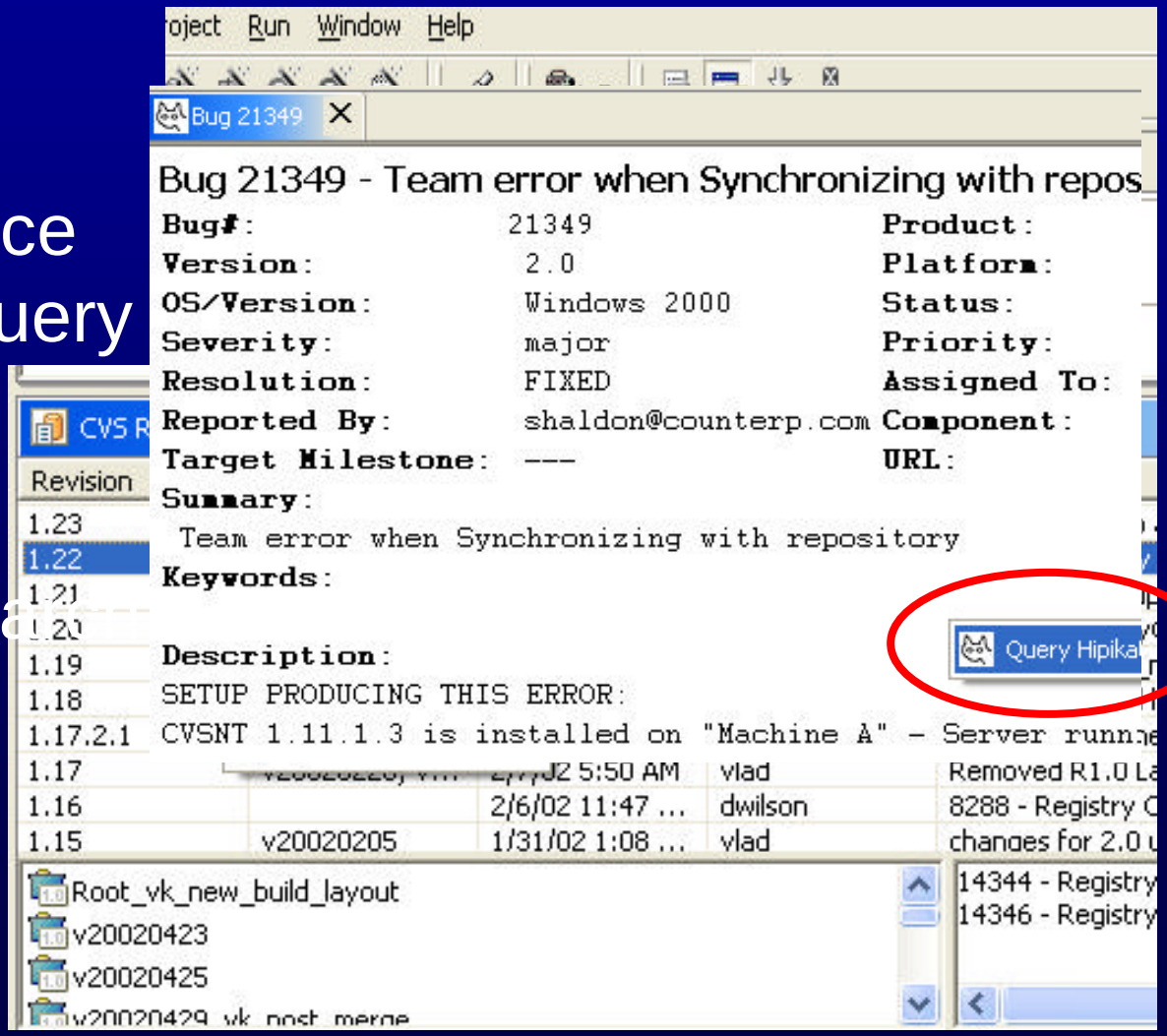
Hipikat in Eclipse



Accessing Hipikat

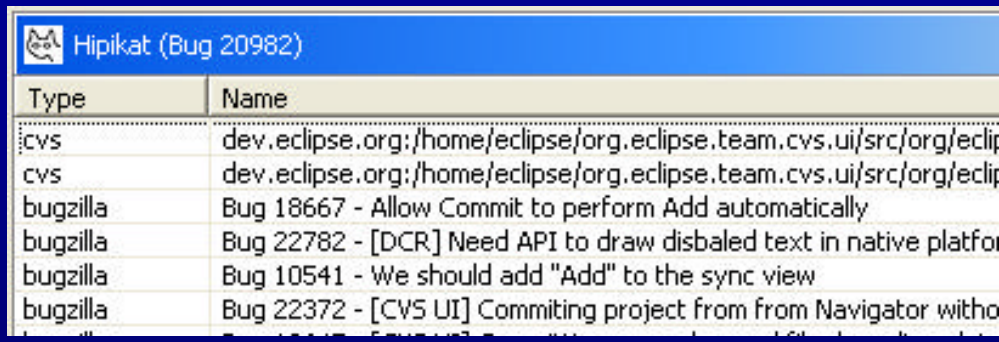
Any artifact in the Eclipse Workspace can serve as a query point

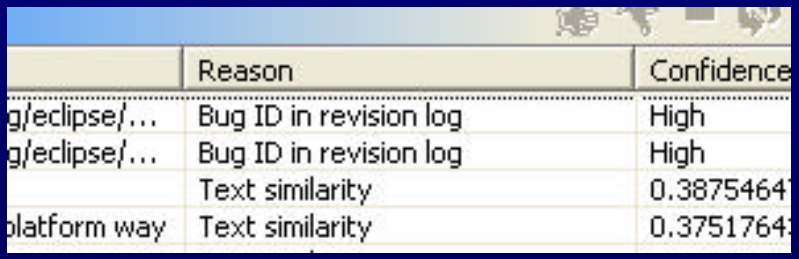
Hipikat keyword search from the Eclipse search dialog

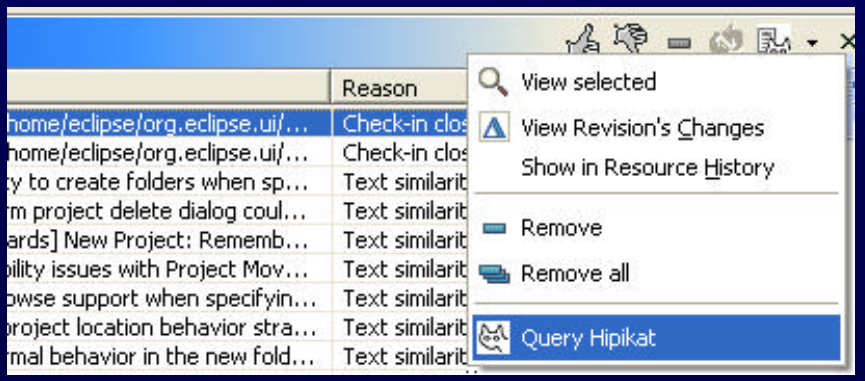


Viewing results

- Matching artifacts listed in the Hipikat view
- Includes reason for recommendation and confidence
- Can make further queries on the recommendations







Example 1: Using the API

Change task:

Adding files to version control

Immediate goal:

Traverse the directory tree looking for unmanaged resources

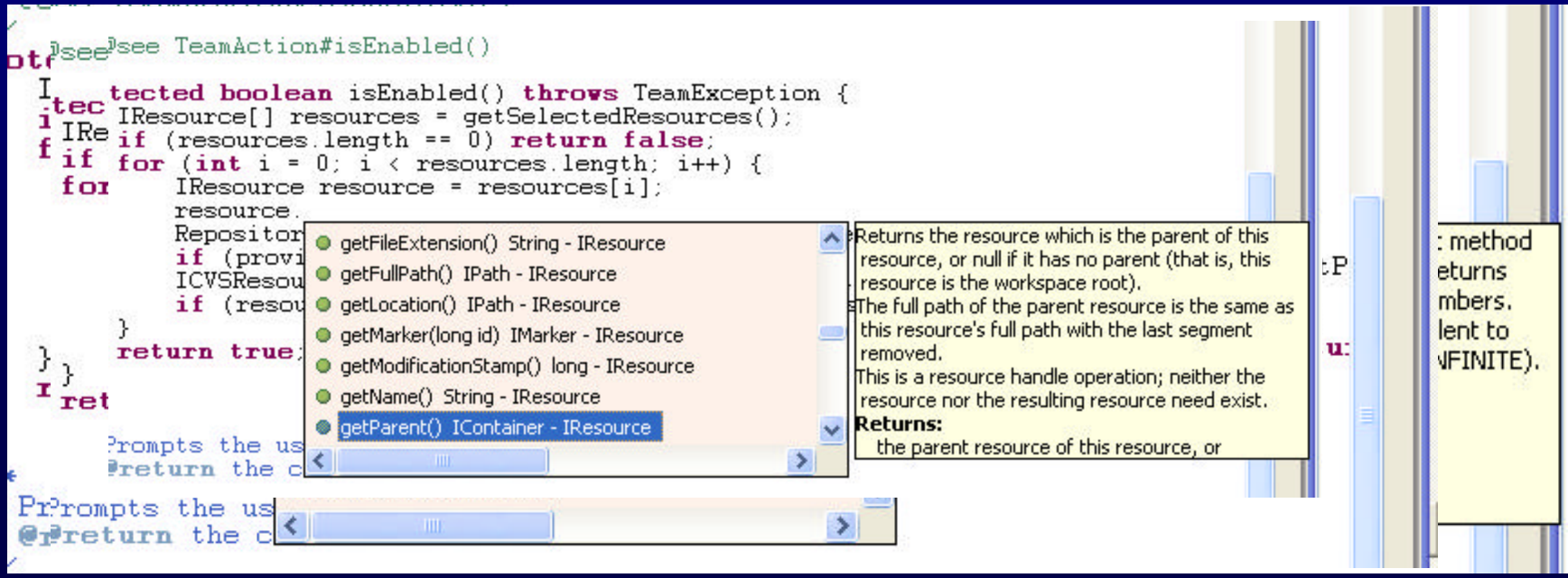
Relevant Eclipse API:

IResource interface with its subinterfaces

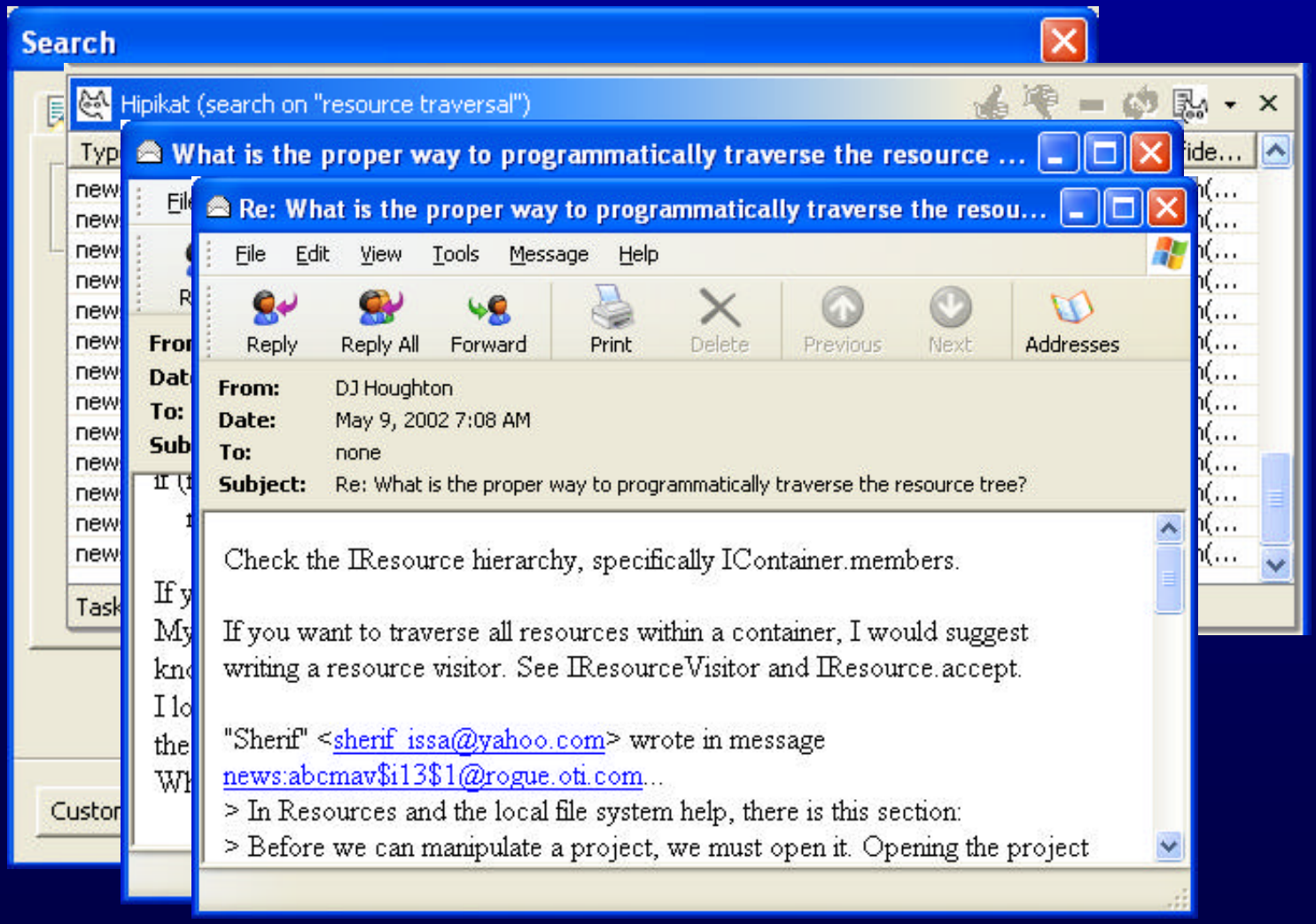
IFolder and *IFile* represent resources in the file system

IResource code-assist

Problem: Not immediately obvious how to use the API to traverse the directory tree

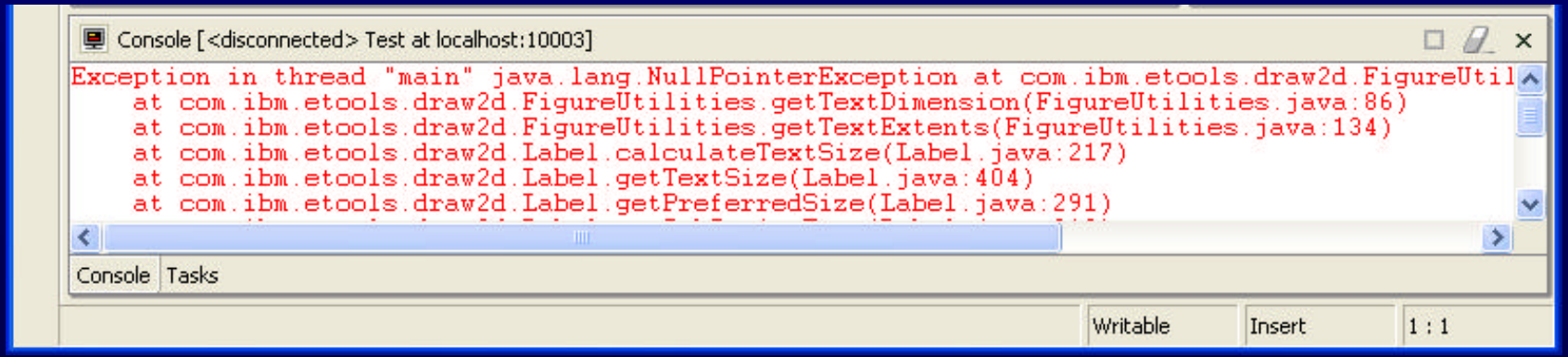


Hipikat search

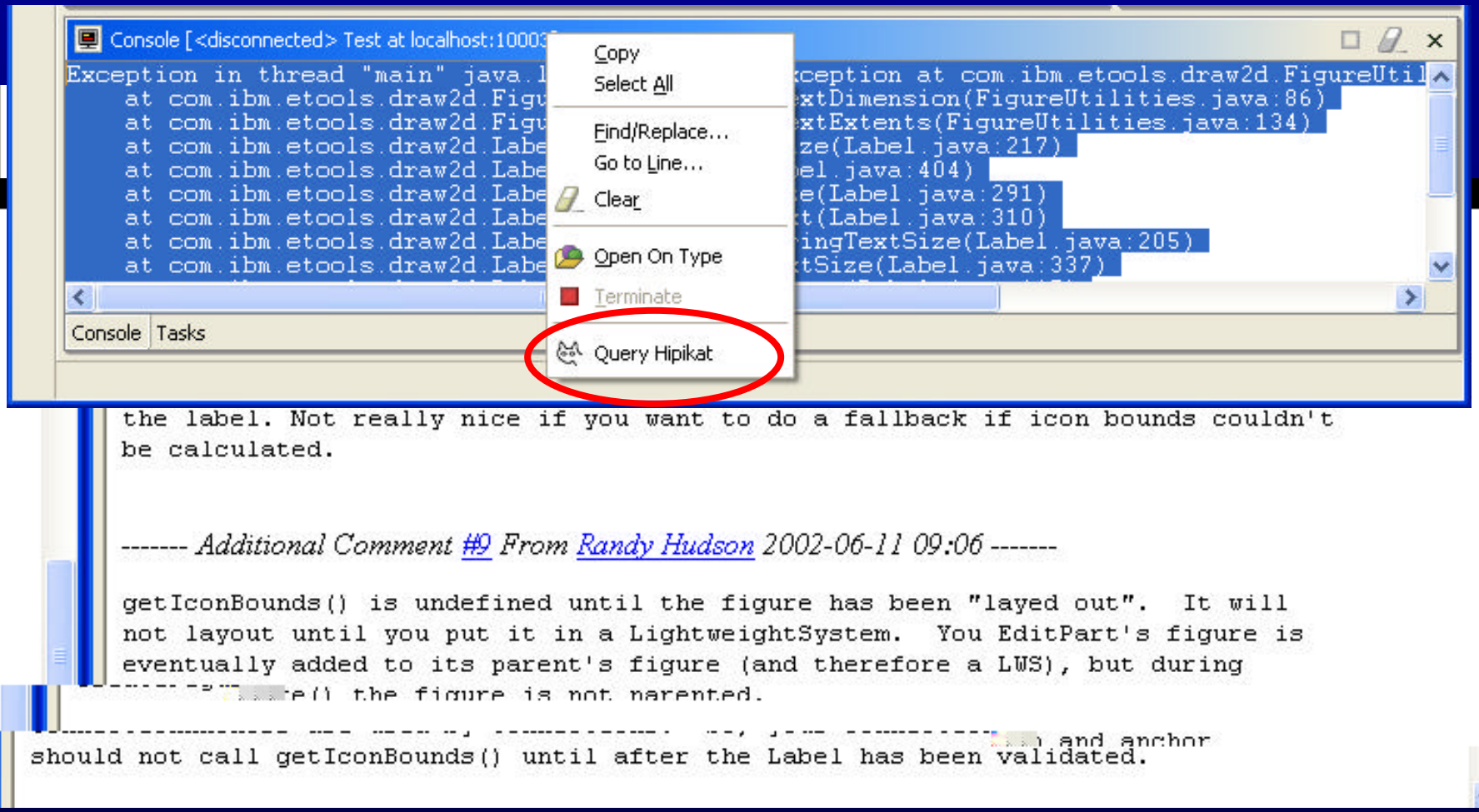


Example 2: Debugging exceptions

- A NullPointerException persistently occurs from Eclipse UI call, although it is not clear why from the documentation
- Eclipse bug?



Query on console output



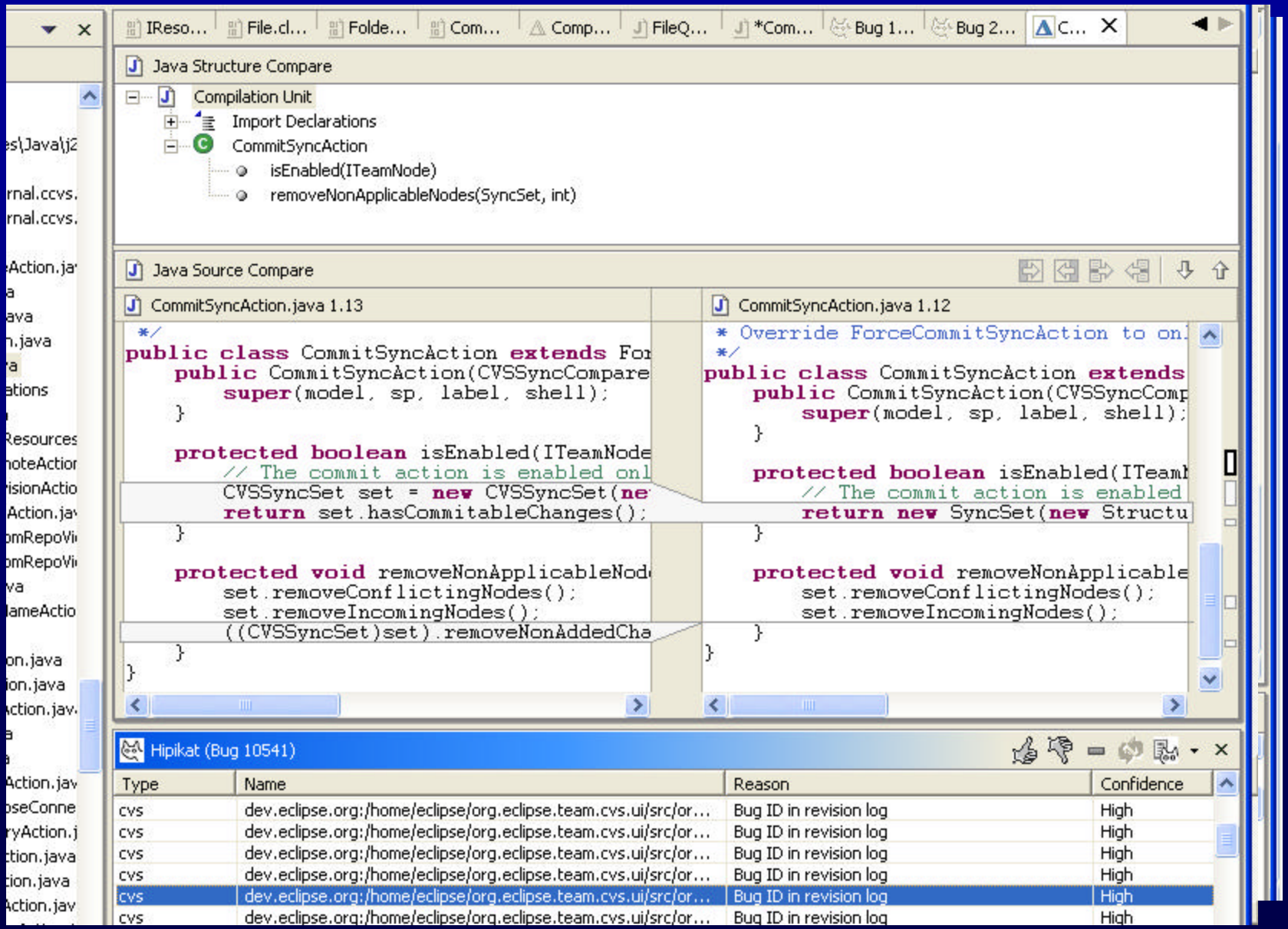
Example 3:Making a change

A project newcomer is about to start working on an enhancement request

Where to start?

Look at similar work that was done in the past, and see how it was implemented

- starting point
- code to reuse
- project idioms and implementation patterns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Bug 1...
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Java Structure Compare
Compilation Unit
Import Declarations
CommitSyncAction
isEnabled(ITeamNode)
removeNonApplicableNodes(SyncSet, int)
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CommitSyncAction.java 1.12
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public CommitSyncAction(CVSSyncCompare
super(model, sp, label, shell);
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return set.hasCommitableChanges();
protected void removeNonApplicableNod
set.removeConflictingNodes();
set.removeIncomingNodes();
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* Override ForceCommitSyncAction to onl
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super(model, sp, label, shell);
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protected void removeNonApplicable
set.removeConflictingNodes();
set.removeIncomingNodes();
Hipikat (Bug 10541)
Type
Name
Reason
Confidence
cvs
dev.eclipse.org:/home/eclipse/org.eclipse.team.cvs.ui/src/or...
Bug ID in revision log
High

Hipikat

A developer's recommender

Prototype instantiated for the Eclipse IDE

Download from

www.cs.ubc.ca/labs/spl/projects/hipikat/

Work supported by CSER and OTI

Project Web site:

www.cs.ubc.ca/labs/spl/projects/hipikat/