The pain of versions

The

Subversion Repository Search Engine

(SupoSE)

www.supose.org

Web Site:

www.soebes.com

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blog.soebes.com

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Agenda

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2. The Requirements
3. Ideas
4. Basic Concepts
5. Basic Architecture
6. The components
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1. The Fundamental Idea

- We would like to search for different items within Subversion repositories.

  – Why and How?

1. The Fundamental Idea

- We don't know the particular revision number

- We don't know the range of time

- We don't know which file etc.

- We don't know in which file in which revision etc.

- ...

1. The Fundamental Idea

- But what we know…
  - It must be in the Repository

    Somewhere ;-)

1. SupoSE was Born...

- The **Su**bversion Re**po**sitory **S**earch **E**ngine....

  - SupoSE for short....

2. The Requirements

- In which Revision the Ticket #76 has been solved ?

  – You have to search within the log messages of all revisions.

    Note: This only works if you put in the needed information into the log message.

2. The Requirements

- Which Tags or Branches did or do exist within the current project?

  - Search for directories in all folders and revisions.
    - This needed to find deleted folders (e.g. Tags or Branches) as well.

2. The Requirements

- In which documents did we used the term(s) "…" ?

  - Search within the contents of the versioned items in all revisions and all folders (branches/tags/trunk).

2. The Requirements

- In which file did we used the method "executeTestXYZ" ?

  - Search within the contents based on context sensitive informations (parsed files of particular type).

  - For example Java, Perl, Python, Ruby ….files.

2. The Requirements

- Where do we used the property name „xyz…"?

  – Search for property names

- Which files/revisions etc. do have the property "xyz…" with the particular value "content"?

  – Search for particular property values

2. The Requirements

- The search process shouldn't be limited to a single Repository.

  - In usual industrial setup's you will find multiple Subversion Repositories.

3. Ideas

- If we would scan the whole Repository every time we do a query it would be:
  - to slow....
  - it will produce a high load on the repository server.

  So this is no option.

3. Ideas

- We have basicly two phases:
  - Initial Phase
    - Reading the content from the Repository and indexing it.
  - Update Phase
    - Read the changed/added contents of the Repository and indexing it.

3. Ideas

- We need to do a full-text search:
  - Many search engines working this way.
  - e.g. The Eclipse Search works the same way…
  - And many others too…

3. Ideas

- How could we update the index?
  - Using Hook scripts to update the indexed informations
    - Pro:
      - Only if something changes

3. Ideas

- How could we update the index?
  - Using Hook scripts to update the indexed informations
    - Con:
      - Slow down commit performance
      - Need to change the Repositories
      - May be we don't have access to repository server.

3. Ideas

- Indexing the Repositories based on the existing access permission of SVN users.
    - Pro:
        - No need to change the repositories.
    - Con:
        - Not everything can be indexed.
        - Performance

3. Ideas

- Scan the repositories based on file://// access.
  - Pro:
    - Very fast
    - No need for authorization
      - We can scan everything

3. Ideas

- Scan the repositories based on file:////
  access.
  - Con:
    - Installation on the SVN
      Repository server
    - Load of the SVN Server (peek
      load for the initial phases).
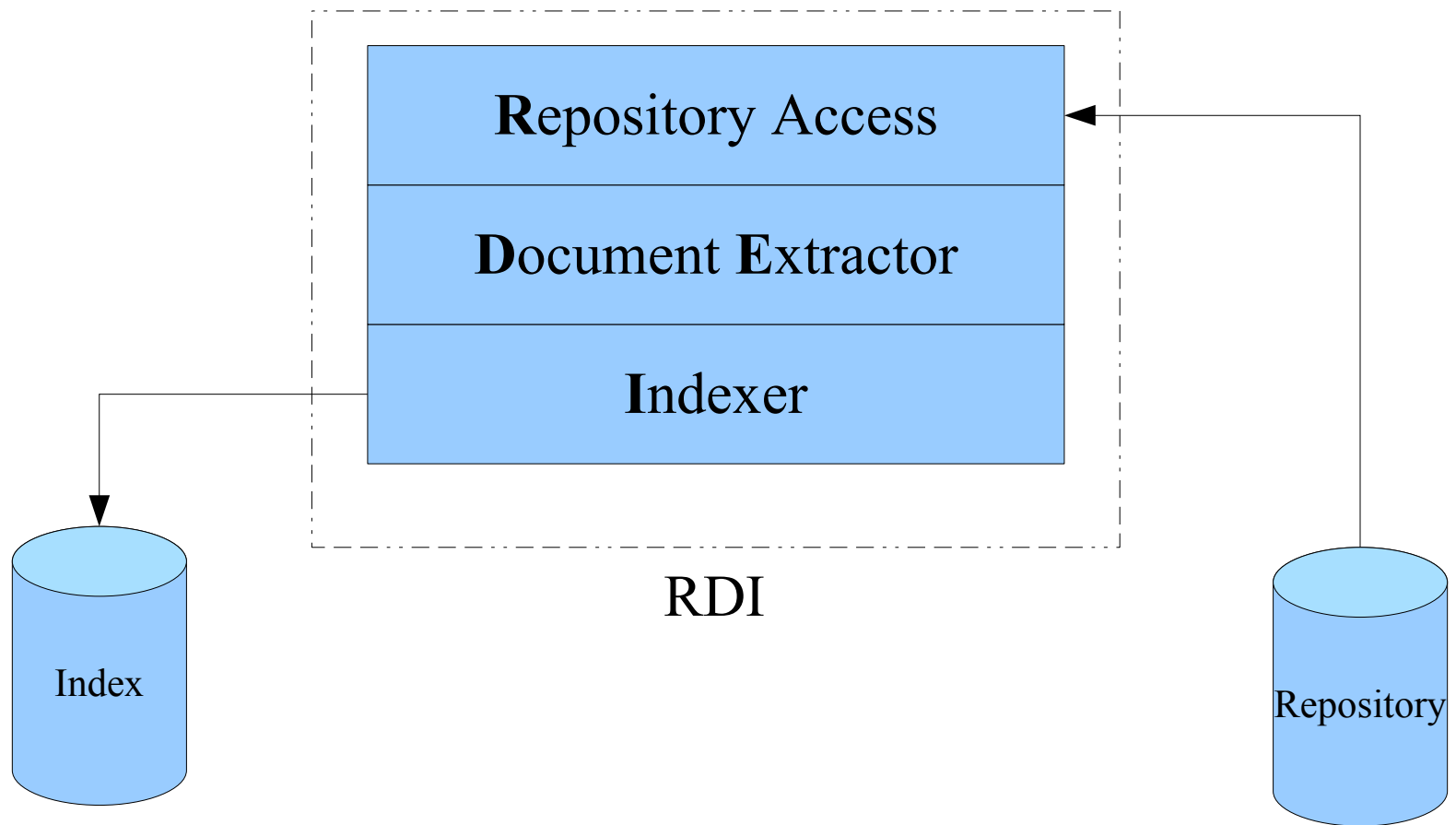   - Permissions on items in
      repository.

4. Basic Concepts

- Scan the repositories and indexing the information we need.

  - Use the file:/// protocol to access the Repository as preferable method.

  - Use other protocols (http, https or svn) if needed.

4. Basic Concepts

- Scan on a scheduled base for example daily or hourly etc.

- Should be made configurable.

5. Basic Architecture

5. Basic Architecture

- The Repository Access
  - Read information from the Repository.
    - Revisions
    - log messages
    - filenames, folders
    - properties
    - contents of files

5. Basic Architecture

- The Document Extractor
    - Extract information from different kind of document types which can easily be indexed.
        - PDF,
        - HTML, XML,
        - OpenOffice, MS Office
   - etc.

5. Basic Architecture

- The Document Extractor

    - Archive types like .tar.gz, zip etc. are supported in two ways.

        - Just use the filename

        - Extract the contents of the archives and extract the information as well.
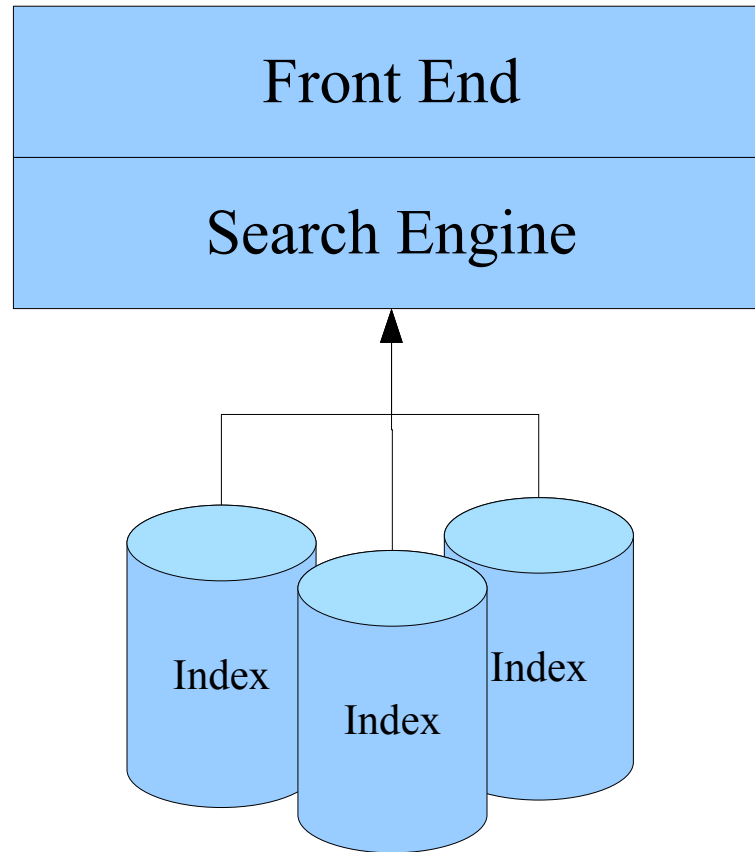
5. Basic Architecture

- The Indexer
  - File name, folder name
  - Contents as the extractor has delivered it.
  - Log message
  - Revision number
  - Meta Information like properties etc.

5. Basic Architecture
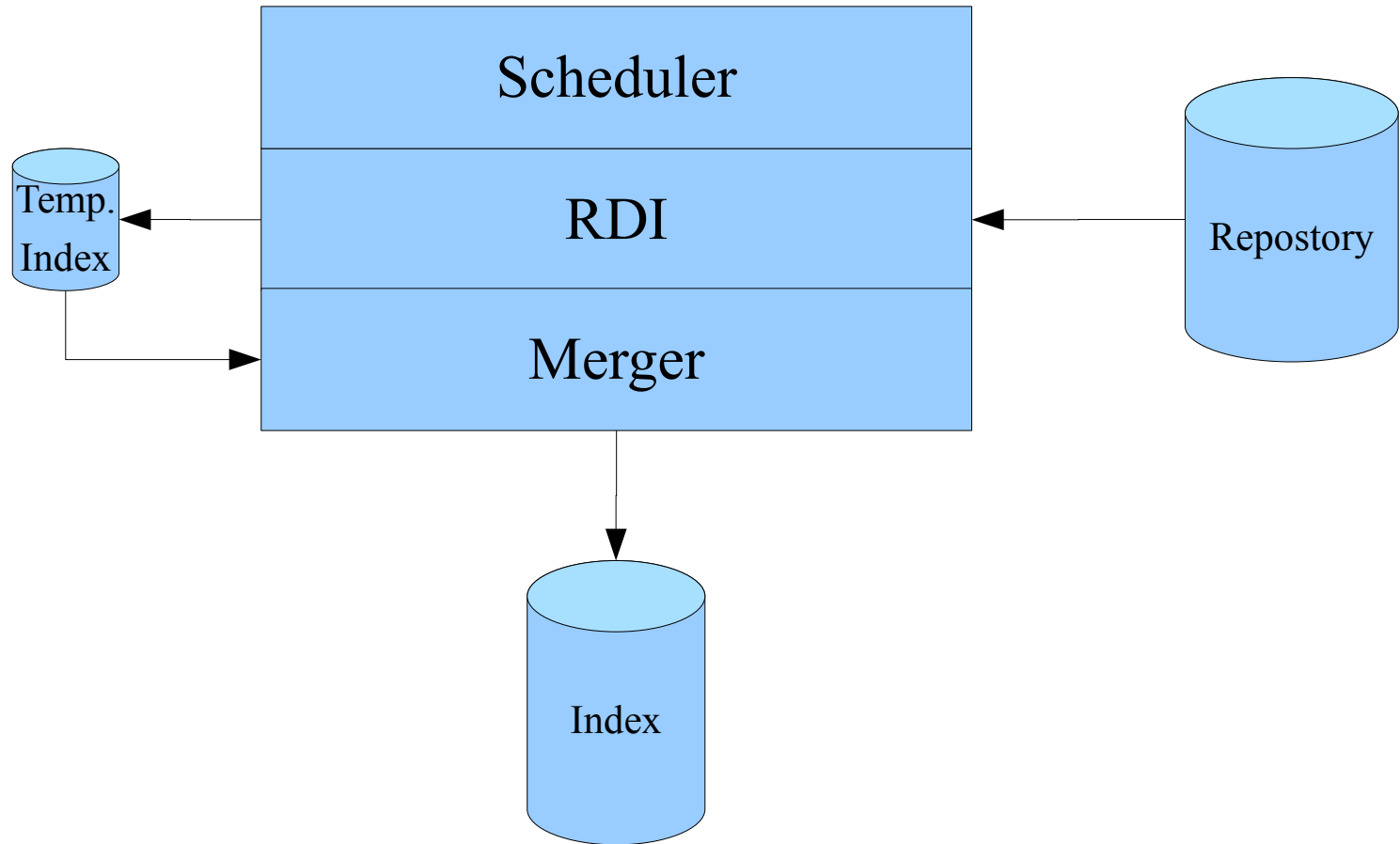
5. Basic Architecture

6. The components

- Accessing the Subversion Repository via Java only:
  - SVNKit Library
    - No need to install Subversion client
    - No external Working Copy etc. needed.

6. The components

- Full Text searching capabilities:
  - Apache Lucene
    - Searching capabilities
    - Indexing capabilities
    - Query language

6. The components

- Scheduled running of Jobs:
  - Quartz Framework
    - Cron like execution of Jobs etc.
    - No external Configuration needed.

6. The components

- Access and extract information from different file types:

  - Tika Framework

    - Word, Excel, PowerPoint, PDF, OpenOffice, Archives like zip, tar.gz, tar.bz2 etc.

6. The components

- Parsing of different Languages:

  – Java

    • via existing Java Grammar based on ANTLR 3.0

7. Open Questions

- Security for the indexed results

  - Authorization of the Search Engine

- What about restrictions for the search results ?

- What about property changes?

  - How do we get informed about them? Hook Scripts ?

7. Open Questions

- What if a repository has path-based authorization and what will happen if this has been changed?

  – What about the already indexed informations?

  – What about the search result?

8. Roadmap

- Releases
  - 0.7.0 (Branch)
    - Refactoring for SOAP/RESTlet and Web-Front-End
  - 0.6.2 Calypso (Currently working on it).
    - Bug Fixing some parts, Update to Tika 0.5 / SVNKit 1.3.1 / Java 1.6

8. Roadmap

- Recognize renaming of files/folders.

- Improve/simplify search for daily usage

- Improve/simplify configuration of the indexing processes

8. Roadmap

- GUI
  - Web based
- May be PlugIn's
  - trac, Eclipse, Redmine etc.
- Enhance documentation (DocBook Maven?)
- Enhance Command line interface
  - Better output etc.

8. Roadmap

- Make the whole part part runnable in Tomcat/JBoss/Glassfish etc.

- Performance ?

- Clustering?

9. Current State

- Currently Command Line Based only.

- Indexing of a single or multiple (scheduled) repositories working

  - Results can be stored into different destination indexes

- Searching currently only via command line or via Luke (Swing)

A. Examples

- Scanning of a single Repository

```
supose
   scan
   --url URL_to_Repository
   --create
   --index index.Repos
```

A. Examples

- Which tags existing in SupoSE Repository?

```
supose
    search
    --index index.Supose
    --query "+tag:*"
```

A. Examples

- Do exist Word files in this repository?

```
supose
    search
    --index index.Supose
    --query "+filename:*.doc"
```

A. Examples

- What is part of revision 100 of the particular repository?

```
supose
    search
    --index index.Supose
    --query "+revision:100"
```

B. Performance

- Currently the scan of the SupoSE repository itself (with 112 Revisions) via http:// (Internet)

  – This has taken ca. 25 Minutes ;-(

- A scan of Repository (2.8 GiBi) with 12.168 Revisions via file:/// protocol took ca. 37 minutes.

- 40222 Repos via file protocol took 52 minutes.

On-line Sources I

- [1] Homepage SupoSE
  - http://www.supose.org
- [2] SVNKit pure Java Subversion Library
  - http://www.svnkit.com
- [3] Quartz Framework
  - http://www.opensymphony.com/quartz/
- [4] ANTLR
  - http://www.antlr.org

On-line Sources II

- [5] Lucene Framework

  - http://lucene.apache.org

- [6] Tike Framework

  - http://lucene.apache.org/tika/

Questions?

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- Thank you for your attention.