

The pain of versions

The

Subversion Repository Search

Engine

(SupoSE)

www.supose.org

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www.soebes.com

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Agenda

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A. Examples

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 Subversion Repository
Search Engine....**

- 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 basically 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.

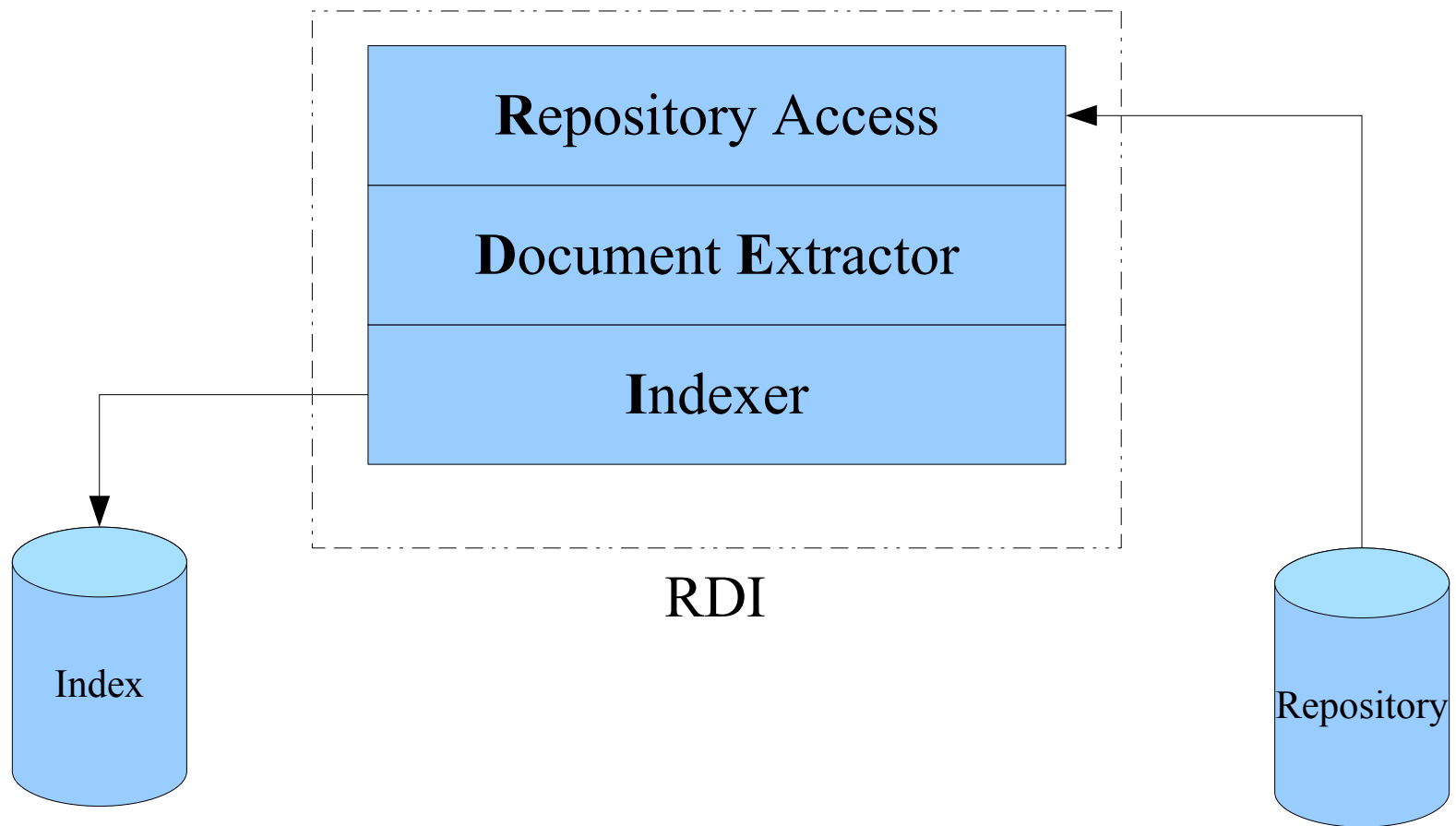
- Use the file:/// protocol to access the Repository as preferable method.**
- Use other protocols (http, https or svn) if needed.**

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

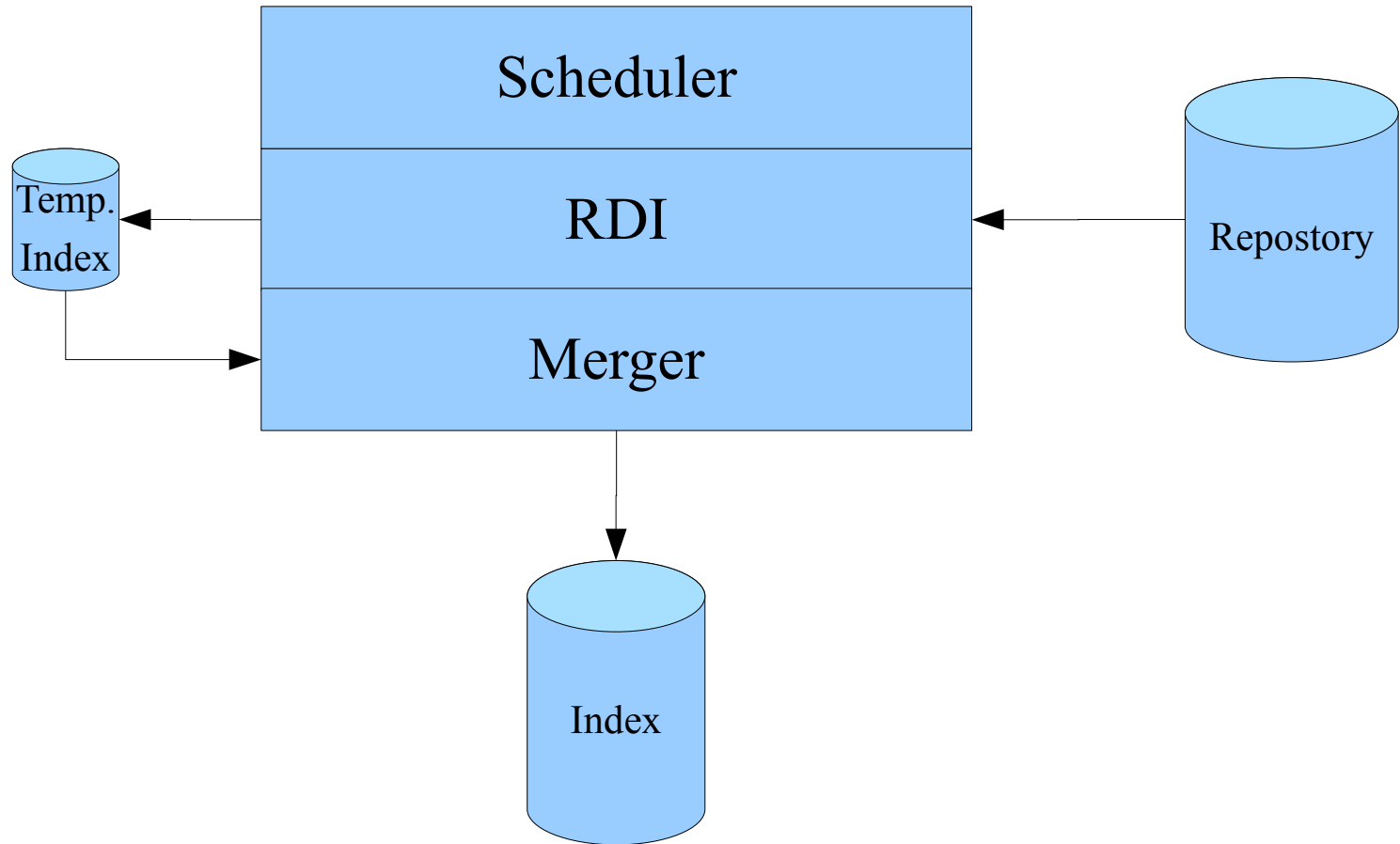
- Archive types like .tar.gz, zip etc. are supported in two ways.
- Just use the filename
- Extract the contents of the archives and extract the information as well.

5. Basic Architecture

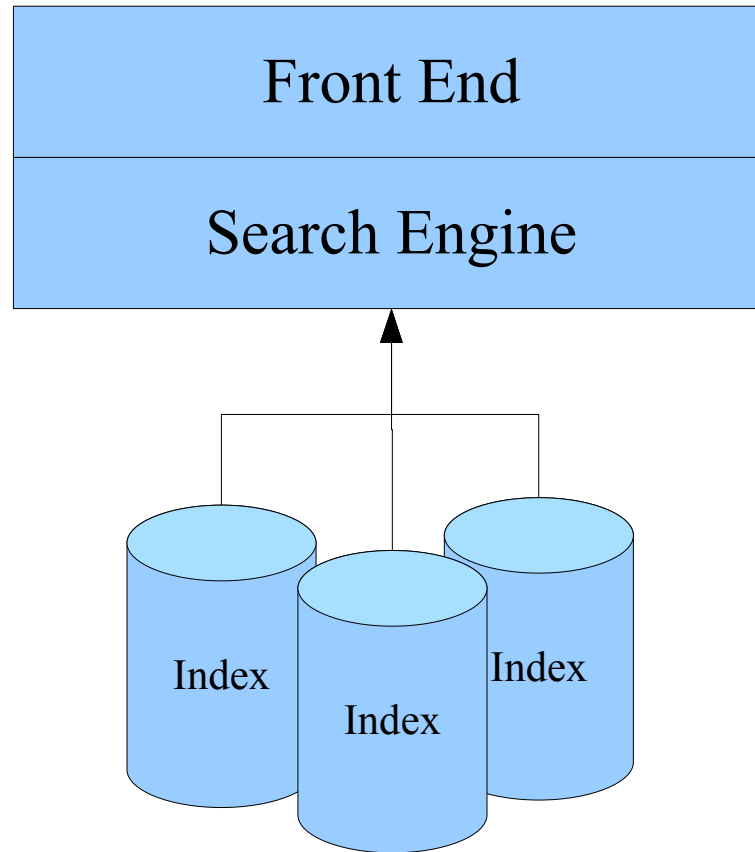
The Indexer

- **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 (currently under development)

- **0.7.1 (Branch)**
 - **Changed structure**
 - **CORE**
 - **CLI**
 - **Web Part**
 - **Integration Tests**

8. Roadmap

Releases

0.7.1 (Branch)

- **Integrate better multi-threading implementation. Simple test has been made.**
- **Improve Web-Front-End**
- **Admin front-end etc.**

8. Roadmap

Releases

- **0.7.1 (Branch)**
 - **Integrate authorization file reading of Subversion (path-based authorization)**
 - **Grammar has already been implemented.**

8. Roadmap

Recognize renaming of files/folders.

- Improve/simplify search for daily usage**
- Improve/simplify configuration of the indexing processes**

8. Roadmap

- **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 runnable in Tomcat/JBoss/Glassfish (Tomcat done).**
- **Performance ?**
 - **0.6.2 enhanced already includes first performance improvement.**
 - **0.7.1 Multi threading (partially implemented)**

9. Current State

- **Indexing of a single or multiple (scheduled) repositories working**
- **Results can be stored into different destination indexes**
- **Searching currently via command line, via simple Web-Interface or via Luke (Swing)**

10. Performance

The Apache Software Foundation Repository with 930,176 (April 2010)

- **Size of the dump file**
 - **ca. 30 GiB**
- **Repository size**
 - **ca. 31 GiB**
- **Time to load the repository**
 - **5 days**

10. Performance

The Apache Software Foundation Repository with 930,176 (April 2010) revisions:

Release	Time	Index Size
0.6.1	5 d	ca. 58 GiB
0.6.2	24 h	the same.
0.7.1	9 h	ca. 54 GiB

Core i7 2.7 GHz 12 GiB RAM

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?

suppose

search

--index index.Suppose

--query "+revision:100"

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.quartz-scheduler.org/>

- [4] ANTLR

- <http://www.antlr.org>

On-line Sources II

- [5] Lucene Framework

- <http://lucene.apache.org>

- [6] Tika Framework

- <http://tika.apache.org/>

Questions?

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Thank you for your attention.