SoftwareEntwicklung ▸ Beratung ▸ Schulung

The pain of versions

The

Subversion Repository Search

Engine

(SupoSE)

www.supose.org

Web Site:
www.soebes.com
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Agenda

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2. The Requirements
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4. Basic Concepts
5. Basic Architecture
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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 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.

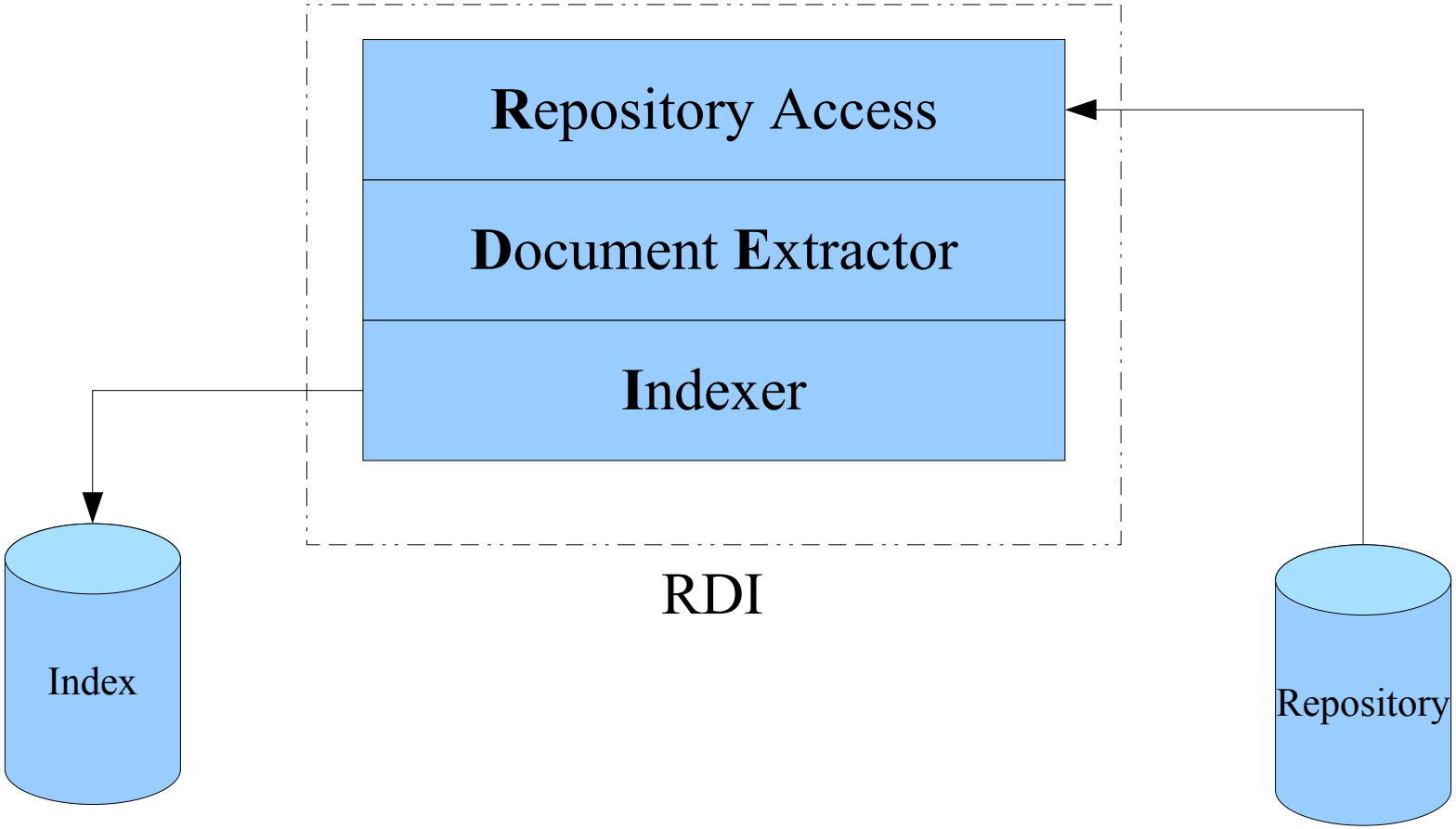
- **Use the file:/// protocol to access the Repository as preferable method.**
- **Use other protocols (http, https or svn) if needed.**

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

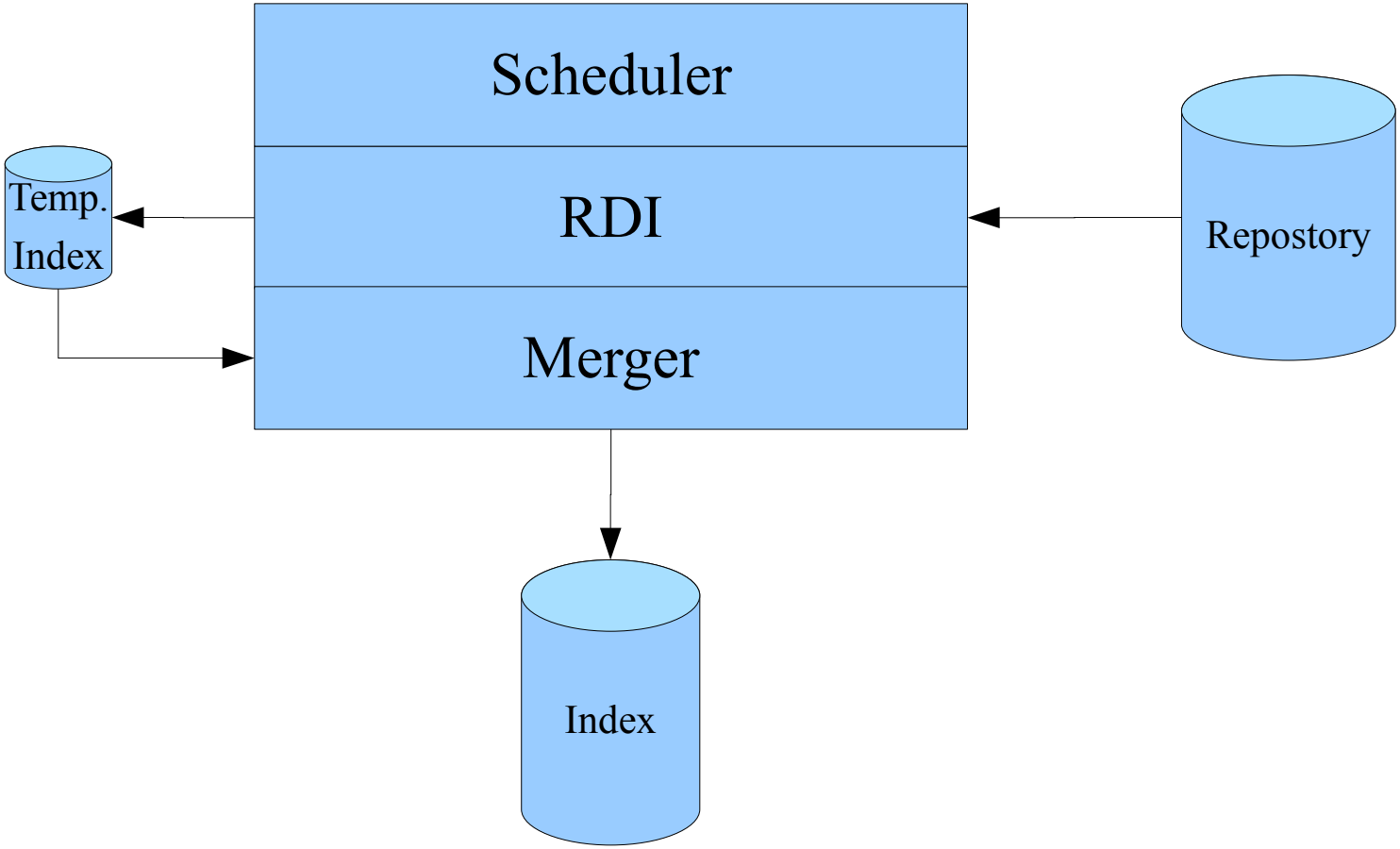
- **Archive types like .tar.gz, zip etc. are supported in two ways.**
- **Just use the filename**
- **Extract the contents of the archives and extract the information as well.**

5. Basic Architecture

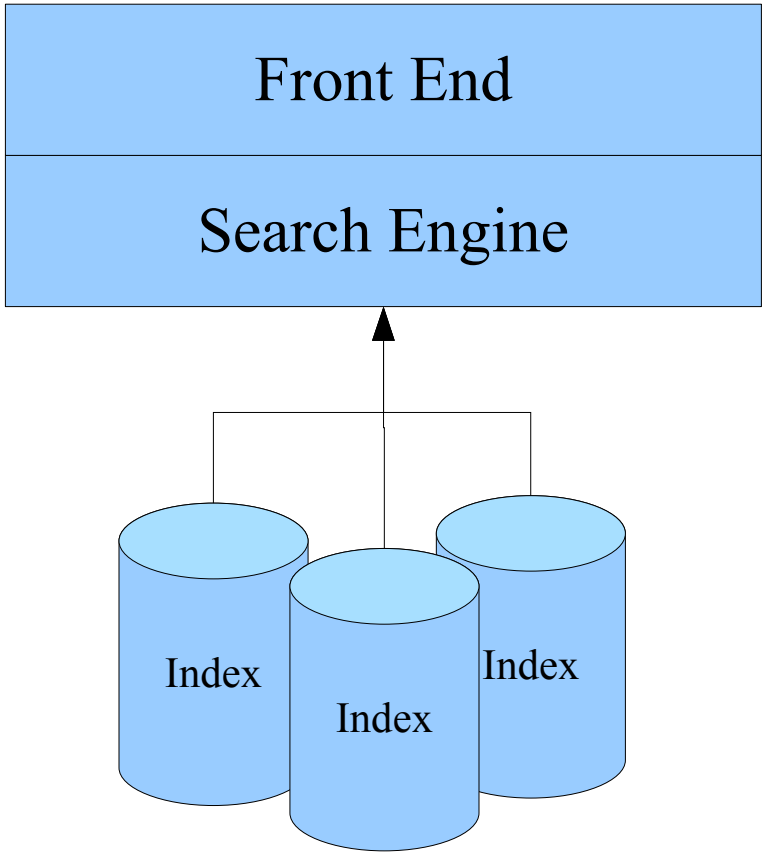
The Indexer

- **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?

supose

```
search
--index index.Supose
--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.