Information-technology Promotion Agency, Japan
About this document
This document describes "MOSST", one of the tools for evaluating trustworthiness of OSS, as well as the basic operation procedure to show the evaluation result of OSS.

Intended audience of this document
This document is intended for IT system professionals who are involved in use of OSS. The description in this document assumes that the reader has a basic knowledge of software development and installation.

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Furthermore, TM and (R) are not mentioned in each case in this document.
## Change History

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<tr>
<td>2011.8.24</td>
<td>Initial version</td>
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<tr>
<td>2012.3.30</td>
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1. Introduction

1.1. Contents of this document

OSS (Open Source Software) has gained wide application, as fundamentals of IT system, and its trustworthiness and sustainability gains significant importance. Furthermore, evaluation from various perspectives should be required not only for quality of software itself, but also for maintainability, potential legal issues, and support scheme of development community.

IPA participates in QualiPSo (Quality Platform for Open Source Software) network initiated by European Commission (EC), and facilitates tools for evaluating OSS trustworthiness under its international cooperation.

This document describes installation procedure of the tool named "MOSST".

1.2. Intended audience of this document

This document is intended for IT system professionals who are involved in use of OSS. The description in this document assumes that the reader has a basic knowledge of software development and installation.

1.3. About MOSST

MOSST (Model for OSS trustworthiness) is an open source software trustworthiness model designed for evaluating quality of OSS products in a quantitative manner. MOSST provides various analyses for source code, as well as user interface with which analysis result can be visually presented. MOSST involves the following tools.

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For details of each tool used by MOSST, please refer to the following QualiPSo website:

< http://www.qualipso.org/mosst-champion >
2. Before installing MOSST

2.1 Preconditions

2.1.1. Operating environment

• Hardware

Operation has been confirmed under the following environment:

- CPU 3GHz or faster
- Memory 2GB or above
- Disk 20GB or above

• Software

Installation procedure assumes that the following software products have already been installed on the
operating environment.

For details on how to get each prerequisite software product or for its installation, please refer to the URL
of each product respectively.

- CentOS 5.6(*1) - http://www.centos.org/
- Java JDK 1.6.0 - http://www.java.com/
- Apache Tomcat 5.5.23 - http://tomcat.apache.org/
- MySQL 5.0.77 - http://www.mysql.com/
- Subversion 1.6.11 - http://subversion.tigris.org/
- qt4 4.2.1(*2)
- qt4-devel 4.2.1(*2)
- bison 2.3(*2)
- flex 2.5.4a(*2)
- gcc-c++ 4.2.1 (*2)
- gcc 4.2.1 (*2)
- Git 1.7.4 - http://git-scm.com/
- Perl 5.8.8 - http://www.perl.org/

*1 : Operation has been confirmed only under 32 bit environment.
*2 : Available from yum repositories.
2.1.2. Preparation

1. Create `[tomcat_root]/bin/setenv.sh` file and edit it as follows:

```bash
#!/bin/sh
CATALINA_OPTS=-Xms1024m -Xmx1024m -XX:MaxPermSize=256m
PATH=${PATH}:/usr/local/bin
```

2. Once the file is created, add execute permission.

```
# chmod 755 setenv.sh
```

3. If proxy server setting is required:

1) Add the following lines to CATALINA_OPTS in `[tomcat_root]/bin/setenv.sh` file.

```
-DproxySet=true -DproxyHost=[Proxy server host name] -DproxyPort=[Proxy server port number]
-Dhttp.nonProxyHosts=localhost
```

2) Add proxy server setting to `/etc/profile` file.

```
# vi /etc/profile
export http_proxy = [Proxy server URL]:[Port number]
export https_proxy = [Proxy server URL]:[Port number]
```

3) Set proxy server to `/root/.subversion/servers` file for `svn` command.

```
http-proxy-host = [Proxy server host name]
http-proxy-port = [Proxy server port number]
```

2.2. Precautions for installation

2.2.1. About user to execute installation

Please ensure to execute installation as root user.

2.2.2. About configuration values

Some tools require additional steps to set user name/password, directory etc.

In this document, the default values may be used for procedure description, whereas other values can be configured. If you configure using the values other than the default values described here, please proceed to read further procedure by using your values instead of default.

2.2.3. About file names

Changing names of files which are downloaded from websites or extracted from an archive may result in errors in further procedure. Please do not change any of these file names.
3. **Kalibro Service**

3.1. **Preparing for installation**

Install and configure applications required for Kalibro Service.

1. **Installing perl modules**

   In order to use Analizo, perl modules are required to be pre-installed.

   Please install the following perl modules: These modules are available for download at [http://search.cpan.org/](http://search.cpan.org/) or other websites.

   - Statistics-OnLine 0.02
   - Class-Accessor 0.34
   - Getopt-Euclid 0.2.3
   - Graph 0.94
   - List-Compare 0.37
   - MRO-Compat 0.11
   - Statistics-Descriptive 3.0201
   - Sub-Uplevel 0.22
   - Test-Class 0.36
   - Test-Exception 0.31
   - YAML 0.73

2. **Installing Doxyparse**

   Move to any directory, and install Doxyparse.

   ```
   # git clone https://git.gitorious.org/analizo/doxyparse.git
   # cd doxyparse
   # ./configure --with-doxyparse
   # make
   # make install
   ```

3. **Installing SLOCCount**

   Move to any directory, and install SLOCCount.

   ```
   # tar -zxvf sloccount-2.26.tar.gz
   # cd sloccount-2.26
   # make
   # make install
   ```
Verify SLOCCount.

```
# sloccount --version
2.26
```

4. Installing Analizo

Move to any directory, and install Analizo.

```
# git clone https://git.gitorious.org/analizo/analizo.git
# cd analizo/
# perl Makefile.PL
# make
# make install
```

Verify Analizo.

```
# analizo --version
analizo version 1.15.0
```

5. Installing JPackage utilities

Install JPackage utilities.

```
# yum install jpackage-utils
```

Create configuration file.

Generate new `/etc/yum.repos.d/jpackage.repo` and edit it as follows:

```
# vi /etc/yum.repos.d/jpackage.repo

[package-generic]
name=JPackage (free), generic
mirrorlist=http://www.jpackage.org/jpackage_generic.txt
failovermethod=priority
gpgcheck=1
gpgkey=http://www.jpackage.org/jpackage.asc
enabled=1
protect=0

[package-rhel]
name=JPackage (free) for Red Hat Enterprise Linux $releasever
mirrorlist=http://www.jpackage.org/jpackage_rhel-$releasever.txt
failovermethod=priority
```
gpgcheck=1

gpgkey=http://www.jpackage.org/jpackage.asc

enabled=1

protect=0

[jpackage-generic-nonfree]

name=JPackage (non-free), generic

mirrorlist=http://www.jpackage.org/jpackage_generic_nonfree.txt

failovermethod=priority

gpgcheck=1

gpgkey=http://www.jpackage.org/jpackage.asc

enabled=1

protect=0
3.2. Installing Kalibro Service

Move to any directory, and install Kalibro Service.

```
# wget http://ccsl.ime.usp.br/redmine/attachments/download/74/KalibroService-0.2.zip
# unzip KalibroService-0.2.zip
# cd KalibroService-0.2
# mkdir [tomcat_root]/webapps/KalibroService
# mv * [tomcat_root]/webapps/KalibroService/
# cd [tomcat_root]/webapps/KalibroService
# unzip KalibroService.war
```

3.3. Configuring Kalibro Service

1. Based on kalibro.ini.sample, create configuration file (/root/.kalibro/kalibro.ini) and edit it.

```
# mkdir /root/.kalibro
# cp [tomcat_root]/webapps/KalibroService/kalibro.ini.sample /root/.kalibro/kalibro.ini
# vi /root/.kalibro/kalibro.ini

--------------------------
#loader-directory = /usr/share/tomcat6/.kalibro/projects
loader-directory = /root/.kalibro/projects
--------------------------
```

2. Restart Tomcat.

```
# service tomcat restart
```

3.3.1. Configuring MySQL

1. Set root user password.

```
# mysqladmin -u root -h localhost password 'mosst'
```

2. Create database and user for Kalibro.

```
# mysql -u root -p
Enter password:

mysql> create database kalibro;
mysql> create user 'kalibro'@'localhost' identified by 'kalibro';
mysql> grant all on kalibro.* to 'kalibro'@'localhost';
```
mysql> flush privileges;
mysql> select User, Host, Password from mysql.user;

+---------+-----------------------+------------------+
|  User   |  Host                   |  Password          |
+---------+-----------------------+------------------+
| root    | localhost             | 521dcf1049624965  |
| root    | localhost.localdomain |                   |
| root    | 127.0.0.1              |                   |
|         | localhost              |                   |
|         | localhost.localdomain  |                   |
| kalibro | localhost             | 29eae752278f62ff  |
+---------+-----------------------+------------------+

6 rows in set (0.01 sec)

3.4. Verifying Kalibro Service

Connect to http://localhost:8080/KalibroService using web browser, and confirm that the page is shown.
4. Spago4Q

4.1. Installing Spago4Q

Download archived file into any directory, and install it.

```
# wget http://www.qualipso.org/sites/default/files/spago4q-qualipso-1.2.zip
# unzip pago4q-qualipso-1.2.zip
# cd spago4q-qualipso-1.2
# ls
README   SpagoBIBirtReportEngine    SpagoBISDK   s4q-qps clean 20100613 1755.sql
SpagoBI  SpagoBIJasperReportEngine mysql-connector-java-3.1.13-bin.jar server.xml
# mv Spago* [tomcat_root]/webapps/
```

4.2. Configuring Spago4Q

1. Editing [tomcat_root]/conf/server.xml

   Copy lines 47 through 59 of (any directory)/spago4q-qualipso-1.2/server.xml file, and paste them to
   the same place in [tomcat_root]/conf/server.xml file.

2. Changing default language

   Change the default language from Italian to English.

   ```
   # cd [tomcat_root]/webapps/SpagoBI/WEB-INF/conf/config/
   # vi spagobi.xml
   <LANGUAGE_SUPPORTED>
   <LANGUAGE default="false" language="it" country="IT" />
   <LANGUAGE default="true" language="en" country="US" />
   <LANGUAGE default="false" language="fr" country="FR" />
   <LANGUAGE default="false" language="es" country="ES" />
   </LANGUAGE_SUPPORTED>
   ```

4.2.1. Configuring MySQL

1. Creating MySQL user and table

   Based on lines 47 through 59 of (any given directory)/spago4q-qualipso-1.2/server.xml file, create
   MySQL user and table.

   ```
   # mysql -u root -p
   Enter password:
   mysql> grant all on ".*" to 'spago4q'@'localhost' identified by 'spago4q';
   ```
```sql
mysql> flush privileges;
mysql> create database spago4q;
```

2. **Importing sql file**

   Import "s4q-qps clean 20100613 1755.sql" file in (any directory)/spago4q-qualipso-1.2/ directory.

   (space characters included in the file names should be escaped.)

   ```bash
   # mysql -u root -p spago4q < (any given
directory)/spago4q-qualipso-1.2/s4q-qps\ clean\ 20100613\ 1755.sql
   Enter password:
   ```

3. **Deploying driver**

   Deploy MySQL driver into tomcat/lib directory.

   ```bash
   # cp (any given directory)/spago4q-qualipso-1.2/mysql-connector-java-3.1.13-bin.jar [tomcat_root]/lib/
   ```

4.3. **Verifying Spago4Q**

1. Restart Tomcat.

   ```bash
   # service tomcat restart
   ```


   1) Confirm that login with the following account is successful.

      In further procedure, please use this account when logging onto Spago4Q as administrator.

      User: s4qadmin
      Password: s4qadmin

   2) Confirm that the language is set to English.

      An England flag icon which appears on upper-right means that the language is set to English.
5. Quality Platform

5.1. Installing Quality Platform

Download archived file into any directory, and install it.

```
# wget http://qualipso.org/sites/default/files/quality-platform_0.zip
# unzip quality-platform_0.zip
# mkdir [tomcat_root]/webapps/quality-platform
# cp quality-platform.war [tomcat_root]/webapps/quality-platform/
# cd [tomcat_root]/webapps/quality-platform/
# unzip quality-platform.war
```

5.2. Configuring Quality Platform

Change endpoint and path settings section of

```
# user settings
business_user=biuser
business_password=biuser
role=/spagobi/user

# endpoint and path settings
protocol=http
host=localhost
port=8080
contextPath=SpagoBI
controllerPath=servlet/AdapterHTTP
spagoBI_url=http://localhost:8080/SpagoBI/
```

5.3. Verifying Quality Platform

Connect to http://localhost:8080/quality-platform/ using web browser, and confirm that login is successful.

User: s4qadmin
Password: s4qadmin
6. Macxim Server

6.1. Installing Macxim Server

Download archived file into any directory, and install it.

```
# wget http://qualipso.org/sites/default/files/Macxim-2.1.zip
# mkdir [tomcat_root]/webapps/macxim
# unzip Macxim-2.1.zip –d [tomcat_root]/webapps/macxim
```
6.2. Configuring Macxim Server

6.2.1. Configuring MySQL

1. Create MySQL user.

```
# mysql -u root -p
Enter password:
mysql> create user 'macxim'@'localhost' identified by 'macxim';
mysql> flush privileges
```

6.2.2. Setting up Macxim

1. After restarting Tomcat, connect to the following URL:

   http://localhost:8080/macxim

2. Confirm the screen titled Macxim Setup - Checking prerequisites, then click on "next".

   Note that if any setting item does not appear with ✔, "next" is not shown.

   * If any Memory relevant item appears with ⚠, refer to 2.1.2 Preparation and verify settings associated with memory in [tomcat_root]/bin/setenv.sh.
3. On Macxim Setup screen, enter the following data and click on Save and continue button. Mandatory items are shown with * mark.

**Macxim Setup**

**Database options**

To set up your Macxim database, enter the following information.

**Database name:** *

The name of the mysql database your Macxim data will be stored in. It must exist on your server before Macxim can be installed.

**Database host:** *

localhost

If your database is located on a different server, change this.

**Database port:** 3306

If your database server is listening to a non-standard port, enter its number.

**Database username:** *

**Database password:**

**Create database:**

✔

Check to create the database schema, otherwise the existing one will be used.

**Database root password:**

Set mysql root password in case you want to automatically create database and users.

**Macxim File System options**

To set up your Macxim database, enter the following information.

**Remove Sources:** *

- YES, REMOVE SOURCES

Macxim download source code from svn repositories and store sources in Tomcat/Weblapps/Macxim/WEB-INF/project_checkout. Do you want to remove downloaded source files after the analysis?
# Administrator account

The administrator account has complete access to the site; it will automatically be granted all permissions and can perform any administrative activity. This will be the only account that can perform certain activities, so keep its credentials safe.

**Username:**

macxim_admin

Spaces are allowed; punctuation is not allowed except for periods, hyphens, and underscores.

**Password:**

**Confirm password:**

# Spago4Q connector options

To set up your Macxim database, enter the following information.

**Spago4Q base url:**

Spaces are allowed; punctuation is not allowed except for periods, hyphens, and underscores.

**Spago4Q username:**

Spaces are allowed; punctuation is not allowed except for periods, hyphens, and underscores.

**Spago4Q password:**

---

1. **Database name**
   - Enter name of database for Macxim.

2. **Database host**
   - Change becomes necessary when database is located on a different server.

3. **Database port**
   - Port number for database specified in <2>.

4. **Database username**
   - User name created in section 6.2.1 Configuring MySQL.

5. **Database password**
   - User password created in section 6.2.1 Configuring MySQL

6. **Create database**
   - Put a check.
<7> Database root password
MySQL root password created in section 3.3.1 Configuring MySQL

<8> Remove Sources
Do not change.

<9> Username
User name of Maxim's administrator: macxim_admin

<10> Password
Password of Maxim's administrator: macxim_admin

<11> Confirm password
Re-enter password specified in <10>.

<12> Spago4Q base url
http://localhost:8080/SpagoBI

<13> Spago4Q username
User name of Spago4Q's administrator: s4qadmin

<14> Spago4Q password
Password of Spago4Q's administrator: s4qadmin

4. Confirm that the settings have been made correctly (a message "Maxim has been configured properly" appears).
7. **Macxim Extractor**

7.1. **Downloading Macxim Extractor**

Download archived file into any directory, and extract it.

```
# wget http://www.qualipso.org/sites/default/files/Macxim-Spago4q-integration-1.4.zip
# unzip Macxim-Spago4q-integration-1.4.zip
```
7.2. Importing Model

1. Log on to Spago4Q as administrator.
2. Select Tools > Import/Export, click on Browse button in Import section on the right, select "macxim_model.zip" in the directory in which the files are extracted, and then click on import button.

3. While keeping default settings of selection items on Role Associations, Engine Associations, and Engine Associations screens, click on next button.

4. On Meta-data conflicts screen, select "Yes" to message prompt "Overwrite the existing meta-data with the exported one?".
5. On Import/Export screen, confirm that Macxim is added to Tools in tree structure view in Export section on the left.
7.3. Importing Extractor

1. Log on to Spago4Q as administrator.
2. Select Extractors > Import/Export, click on Browse button in Import section on the right, select "macxim_extractor.zip" in the directory in which the files are extracted, and then click on Import button.

3. On Import/Export screen, confirm that MACXIM_EXTRACTOR_PRCS is added in tree structure view in Export section on the left.

7.4. Configuring Macxim Extractor

1. Copy the following files into [tomcat_root]/webapps/SpagoBI/ directory.

   ```
   # cp macxim-commons-2.0.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
   # cp macxim-spago4q-extractor-2.0.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
   # cp macxim-ws-client-axis1-2.0.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
   ```

2. Restart Tomcat.

   ```
   # service tomcat restart
   ```

3. Log on to Spago4Q as administrator.
4. Select Extractors > Extraction Processes and click on View Operation button of MACXIM_EXTRACTION_PRCS.
5. Click on View Operation button of MACXIM_EXTRACTION.

6. Edit macxim_url, macxim_username, and macxim_password, respectively.
   - macxim_username: macxim_admin
   - macxim_password: macxim_admin
   - macxim_url: http://localhost:8080/macxim/

7. Click on Insert button on upper-right.
   - Name: macxim_endpoint
   - Value: http://localhost:8080/macxim/services/Macxim_WS.Macxim_WSHttpEndpoint/

8. Select Extractors > Source Types and click on View Data Source button of MACXIM_WS.

9. Click on View Data Sources Parameter button of MACXIM_WS.

10. Edit username, password, and endpoint, respectively, and save them.
    - username: macxim_admin
    - password: macxim_admin
    - endpoint: http://localhost:8080/macxim/services/Macxim_WS.Macxim_WSHttpEndpoint/
7.5. Creating Fact Table
1. Log on to Spago4Q as administrator.
2. Select Extractors > Data Interfaces and click on Select button of Macxim.
3. Click on Create Fact Table button, and confirm that it completes successfully.

7.6. Verifying Macxim Extractor
1. Select Extractors > Extraction Processes and click on View Operation button of MACXIM EXTRACTION PRCS.
2. Click on Select button of MACXIM EXTRACTION.
3. Click on Test Operation Extraction button, and select Yes in Confirm dialog.
4. On Test Operation Result screen, confirm that the message "No result found" appears.
   (This is applicable when evaluation project is not yet registered.)
8. JaBUTi

8.1. Installing JaBUTi Web Service

Download archived file into any directory, and install it.

```bash
# wget http://ccsl.icmc.usp.br/redmine/attachments/download/65/jabuti-service-1.0.zip
# unzip jabuti-service-1.0.zip
# ls
jabuti-service-1.0.war  jabuti-service-1.0.zip  jabutiservice.sql
# mkdir [tomcat_root]/webapps/jabuti-service-1.0
# mv jabuti-service-1.0.war [tomcat_root]/webapps/jabuti-service-1.0/
# cd [tomcat_root]/webapps/jabuti-service-1.0/
# jar xvf jabuti-service-1.0.war
```

8.2. Downloading JaBUTi Extractor

1. Move to any directory, and download archived file.

```bash
# wget http://www.qualipso.org/sites/default/files/jabuti-spago4q-extractor-1.0.zip
# unzip jabuti-spago4q-extractor-1.0.zip
# ls
lib             jabuti-model-1.0.zip            jabuti-extractor-1.0.zip
```

2. Stop Tomcat.

```bash
# service tomcat stop
```

3. Copy extracted files under lib directory into [tomcat_root]/webapps/SpagoBI/WEB-INF/lib directory.

```bash
# cp ./lib/* [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
```

4. Start Tomcat.

```bash
# service tomcat start
```

8.3. Configuring JaBUTi Web Service

8.3.1. Configuring MySQL

1. Create database and user.

```bash
mysql> Create database jabutiservice
mysql> Grant all on jabutiservice.* to 'jabutiservice'@'localhost' identified by 'jabutiservice';
mysql> Flush privileges;
```

2. Load sql file extracted in section 8.1 Installing JaBUTi Web Service*.

```bash
# mysql -u [[superuser]] -p -D jabutiservice < (any given directory)/ jabutiservice.sql
```
8.3.2. Setting properties

1. Edit [tomcat_root]/webapps/jabuti-service-1.0/WEB-INF/classes/jabuti.properties file as follows:

   ```
   db.url=jdbc:mysql://localhost/jabutiservice
   db.user=jabutiservice
   db.password=jabutiservice
   JABUTI_TOMCAT_PROJECT_HOME=[tomcat_root]/webapps/jabuti-service-1.0/
   JABUTI_PERSISTENCE_HOME=[tomcat_root]/webapps/jabuti-service-1.0/jabuti_project
   ```

2. Add access permission to the directory which is specified as JABUTI_PERSISTENCE_HOME.
   This directory is used to store project files.
   
   ```
   # chmod 775 [tomcat_root]/webapps/jabuti-service-1.0/jabuti_project
   ```

3. Restart Tomcat.

   ```
   # service tomcat restart
   ```


   ```
   *****************************************************init
   Database connection: OK
   Persistence directory: OK
   ProbedNode loaded OK
   *****************************************************init
   ```

8.4. Configuring JaBUTi Extractor

8.4.1. Importing Model

1. How to avoid error

   At the time of writing this document, downloaded asset available at http://www.qualipso.org/ website causes an error at import. The following steps allow to avoid this error:

   1) Extract jabuti-model-1.0.zip under the directory used in section 8.2 Downloading JaBUTi Extractor.

   2) Edit extracted jabuti-model-1.0/metadata/metadata.script file as follows:

      ```
      (Correct spelling errors.)
      Replace Behaviour (starting with upper case) with Behaviour (starting with upper case), and behaviour (all lower case) with behaviour (all lower case).
      ```

   3) Archive jabuti-model-1.0 directory under which edited metadata.script file is located, again in a zip format.
--- Further procedure describes importing Model. ---

2. Log on to Spago4Q as administrator.

3. Select Tools > Import/Export, click on Browse button in Import section on the right, select "jabuti-model-1.0.zip" in the directory in which the files are extracted, and then click on import button.

4. While keeping default settings of selection items on Role Associations, Engine Associations, and Engine Associations screens, click on next button.

5. On Meta-data conflicts screen, select "Yes" to message prompt "Overwrite the existing meta-data with the exported one?".
6. On Import/Export screen, confirm that JaBUTi is added to Tools in tree structure view in Export section on the left.
8.4.2. Importing Extractor

At the time of writing this document, downloaded asset available at http://www.qualipso.org/ website causes an error at import. The following steps are required to avoid this error.

1. Creating Extractor (Source Types)
   1) Download empty.jar to a directory with read permission.

```
# wget http://ccsl.icmc.usp.br/redmine/attachments/download/42/empty.jar
```

   2) Log on to Spago4Q as administrator.

   3) Select Extractors > Source Types.

   4) Click on Insert button on upper-right, and then edit as follows:
      - Name: JabutiServiceUpload
      - Extractor Class: br.usp.jabuti.spago4q.JabutiUploadExtractor

   5) Click on Save button and then Back button.

   6) Click on ViewDataSources button of JabutiServiceUpload.

   7) On DataSourcesList screen, click on Insert button on upper-right, and then edit as follows:
      - Name: JabutiServiceUpload-Valinhos

   8) Click on Save button and then Back button.

   9) Click on ViewDataSourcesParameters button where Source Type is JabutiServiceUpload and Data Source is JabutiServiceUpload-Valinhos.

10) On Data Source Parameter List screen, click on Insert button on upper-right, and then edit as follows:
    - Name: SERVICE_URL
    - Value: http://localhost:8080/jabuti-service-1.0/services/JaBUTiService1_0?wsdl
11) Click on Save button and then Back button, and again click on Insert button on upper-right, and then edit as follows:
- Name: EMPTY_FILE
- Value: [tomcat_root]/webapps/jabuti/empty.jar

12) Click on Save button and then Back button.

2. Creating Data Set
   1) Log on to Spago4Q as administrator.
   2) Select Extractor > Data Interface, click on Insert button on upper-right, and then edit as follows:
      Name: DIRECT_METRIC
      Description: Data Interface to load DIRECT_METRICs
      Table Name: DIRECT_METRIC
      Data Source: SpagoBI

3) Click on Save button and then Back button.
4) Click on View Interface Field button of DIRECT_METRIC.
5) Click on Insert button , edit as follows, and then create 3 Interface Fields.

- **Name**: Resource
  - **Type**: String
  - **Key**: Put a check.

- **Name**: Metric
  - **Type**: String
  - **Key**: Put a check.

- **Name**: Value
  - **Type**: Double
  - **Sensible**: Put a check.

6) Confirm that Interface Field is displayed as created on Interface Field List screen, and then click on Back button.

7) Click on Select button of DIRECT_METRIC.

8) Click on Create Fact Table button , and confirm that it completes successfully.

3. Creating Extractor (Extraction Processes)

1) Log on to Spago4Q as administrator.

2) Select Extractors > Extraction Processes, click on Insert button , and then edit as follows.

   - **Name**: JabutiExtractionProcess
   - **Coordinator class**: it.eng.spago4q.extractors.DefaultCoordinator

3) Click on View Operations button of JabutiExtractionProcess.

4) On Operation List screen, click on Insert button on upper-right, and then edit as follows:

   - **Name**: JABUTI UPLOAD
   - **Data Source**: JabutiServiceUpload-Valinhos
   - **Interface Type**: DIRECT_METRIC

5) Click on TestOperationParameter button and confirm that the message "No operation test found" appears.

6) Click on Save button and then Back button, and again click on Insert button on upper-right, and then edit as follows:

   - **Name**: JABUTI ANALYSIS
   - **Data Source**: JabutiServiceUpload-Valinhos
   - **Interface Type**: DIRECT_METRIC

7) Click on TestOperationParameter button and confirm that the message "No operation test found" appears. Then, click on Save button and then Back button.

8) Click on ViewOperationParameter button of JABUTI UPLOAD.
9) On Operation Parameter List screen, click on Insert button on upper-right, and then edit as follows:
- Name: XPATH
- Value: /GenericItems/GenericItem

10) Click on Save button and then Back button , and again click on Insert button on upper-right, and then edit as follows. Then, click on Save button and Back button .
- Name: OPERATION
- Value: UPLOAD

11) Again click on Back button , and on Operation List screen, click on ViewOperationParameter button of JABUTI ANALYSIS.

12) On Operation Parameter List screen, click on Insert button on upper-right, and then edit as follows. Then, click on Save button and Back button .
- Name: XPATH
- Value: /GenericItems/GenericItem

13) Again click on Insert button on upper-right, and then edit as follows. Then, click on Save button and then Back button .
- Name: OPERATION
- Value: ANALYSIS

14) Again click on Back button , and on Operation List screen, click on ViewOperationField button of JABUTI UPLOAD.

15) On Operation Field List screen, click on Insert button on upper-right, edit as follows, create 3 Operation Fields, and then click Back button .
- Name: Metric Interface Field: Select Metric
- Name: Resource Interface Field: Select Resource
- Name: Value Interface Field: Select Value

16) On Operation List screen, click on ViewOperationField button of JABUTI ANALYSIS.

17) On Operation Field List screen, click on Insert button on upper-right, edit as follows, create 3 Operation Fields, and then click Back button .
- Name: Metric Interface Field: Select Metric
- Name: Resource Interface Field: Select Resource
- Name: Value Interface Field: Select Value

18) Select Extractors > Extraction Processes and click on View Operations button of JabutiExtractionProcess, and Select button of JABUTI UPLOAD, and then Test Operation Extraction button . In Confirm dialog, click on Yes.
On Test Operation Result screen, confirm that the message “No result found” appears.
(This is applicable when evaluation project is not yet registered.)
19) Repeat the same steps for JABUTI ANALYSIS.

20) Select Extractors > Extraction Processes and click on ViewOperations button ✓ of JabutiExtractionProcess, and Select button ✗ of JABUTI ANALYSIS, and then Test Operation Extraction button 🎨. In Confirm dialog, click on Yes. On Test Operation Result screen, confirm that the message "No result found" appears. (This is applicable when UPLOAD is not performed for evaluation project.)
8.5. Installing JaBUTi Service GUI

Download archived file into any directory, and install it.

```bash
# wget http://www.qualipso.org/sites/default/files/jabuti-service-gui-1.1.zip
# cd [tomcat_root]/webapps/jabuti-service-1.0
# mkdir jabuti-service-gui
# cd jabuti-service-gui
# unzip (any given directory)/jabuti-service-gui-1.1.zip
```

8.5.1. Configuring JaBUTi Service GUI

Make settings on [tomcat_root]/webapps/jabuti-service-1.0/jabuti-service-gui/conf/jabuti-gui.properties file.

```
END_POINT=http://localhost:8080/jabuti-service-1.0/services/JaBUTiService1_0?wsdl
JABUTI_PERSISTENCE_HOME=./projects
```

8.5.2. Verifying JaBUTi Service GUI

Confirm that startup is successful.

```bash
# sh ./run.sh
or
# java -jar jabuti-service-gui-scripts-1.0.jar
```
9. StatCVS/StatSVN

9.1. Downloading StatCVS/StatSVN

Download archived file into any directory, and install it.

```
# wget http://www.qualipso.org/sites/default/files/statcvs-statsvn-software_0.9.2.zip
# unzip statcvs-statsvn-software_0.9.2.zip –d [tomcat_root]/webapps/
```

9.2. Installing StatCVS/StatSVN Web Service

Copy war file.

```
# cd [tomcat_root]/webapps/statcvs-statsvn-software-0.9.2/statcvs-svn-webservice-0.9.2
# cp StatToolsService.war [tomcat_root]/webapps/
```

9.3. Configuring StatCVS/StatSVN Web Service

1. Editing configuration file

```
# cd [tomcat_root]/webapps/StatToolsService/WEB-INF/classes/config/
# ls

cacheManagerConfig.xml  loaderConfig.xml  svnToolsConfig.xml
```

1) Edit cacheManagerConfig.xml as follows. Specify in absolute path.

```
<?xml version="1.0" encoding="UTF-8"?>
<CacheConfig>
  <StoragePath>[tomcat_root]/webapps/StatToolsService/CacheStorage</StoragePath>
</CacheConfig>
```

2) Edit loaderConfig.xml as follows. Specify in absolute path.

```
<?xml version="1.0" encoding="UTF-8"?>
<LoaderConfig>
  <LoaderFactories>
  </LoaderFactories>
  <WorkspacePath>[tomcat_root]/webapps/StatToolsService/RepoHolder</WorkspacePath>
  <Loaders>
  </Loaders>
</LoaderConfig>
```

2. Restart Tomcat.

```
# service tomcat restart
```
3. Confirmation

Connect to http://localhost:8080/StatToolsService/cacheManager and confirm that StatCVS-StatSVN Web Service Status is shown.
9.4. Copying jar files

Copy statToolsExtractor-0.7.jar under installation directory and jar files under dependencies into [tomcat_root]/webapps/SpagoBI/WEB-INF/lib directory.

```bash
# cd [tomcat_root]/webapps/statcvs-statsvn-software-0.9.2/statcvs-svn-extractor-0.9.2/
# cp statToolsExtractor-0.7.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
# cd dependencies/
# cp *.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
```

9.5. Importing Model

1. Log on to Spago4Q as administrator.
2. Select Tools > Import/Export, click on Browse button in Import section on the right, select "statcvs_svn_model_310111.zip" in the directory in which the files are extracted, and then click on import button.
3. While keeping default settings of selection items on Role Associations, Engine Associations, and Engine Associations screens, click on next button.
4. On Meta-data conflicts screen, select "Yes" to message prompt "Overwrite the existing meta-data with the exported one?".

5. On Import/Export screen, confirm that StatSVN is added to Tools in tree structure view in Export section on the left.
9.6. Importing Extractor

1. Log on to Spago4Q as administrator.

2. Select Extractors > Import/Export, click on Browse button in Import section on the right, select "statcvs_svn_extractor_310111.zip" in the directory in which the files are extracted, and then click on Import button.

3. On Import/Export screen, confirm that STATCVS_STATSVN_EXTRACTOR_OPERATION is added in tree structure view in Export section on the left.

4. Restart Tomcat.

```
# service tomcat restart
```
9.7. Configuring StatCVS/StatSVN Extractor

1. Log on to Spago4Q as administrator.

2. Select Extractors > Extraction Processes and click on View operations button ✓ of STATCVS_STATSVN_EXTRACTOR_PRCS.

3. Select STATCVS_STATSVN_EXTRACTOR_OPERATION and click on View operation parameter button ✓.

4. Click on Select button 🔍 of STATCVS_STATSVN_WEBSERVICE_ENDPOINT, edit values of STATCVS_STATSVN_WEBSERVICE_ENDPOINT, and then click on Save button保存.

   ```
   ```

5. Connect to configured endpoint URL

   ```
   ```

   using web browser, and confirm that it can be accessed.

6. Select Extractors > Data Interfaces and click on Select button 🔍 of PROJECT_ANALYSIS_DATA.

7. Click on Create Fact Table button 🔴 on upper-right and confirm that it completes successfully.

8. Restart Tomcat.

   ```
   # service tomcat restart
   ```
10. Kalibro Extractor

10.1. Downloading Kalibro Extractor

Download archived files into any directory.

```bash
# wget http://ccsl.ime.usp.br/redmine/attachments/download/72/kalibro-spago-extractor.jar
# wget http://ccsl.ime.usp.br/redmine/attachments/download/51/KalibroExtractionProcess.zip
# wget http://ccsl.ime.usp.br/redmine/attachments/download/50/KalibroKpiDocument.zip
```

10.2. Copying jar files

Copy kalibro-spago-extractor.jar to `[tomcat_root]/webapps/SpagoBI/WEB-INF/lib`.

```bash
# cp kalibro-spago-extractor.jar [tomcat_root]/webapps/SpagoBI/WEB-INF/lib/
```

10.3. Importing Model

1. Log on to Spago4Q as administrator.
2. Select Tools > Import/Export and show Import/Export screen. Select Tools > Import/Export, click on Browse button in Import section on the right, select "KalibroKpiDocument.zip" in the directory in which the files are extracted, and then click on import button.
3. While keeping default settings of selection items on Role Associations, Engine Associations, and Engine Associations screens, click on next button.
4. Select "Yes" to message prompt "Overwrite the existing meta-data with the exported one?". On Meta-data conflicts screen, select "Yes" to message prompt "Overwrite the existing meta-data with the exported one?".

5. On Import/Export screen, confirm that Kalibro is added to Tools in tree structure view in Export section on the left.

10.4. Importing Extractor

1. Log on to Spago4Q as administrator.

2. Select Extractors > Import/Export, click on Browse button in Import section on the right, select "KalibroExtractionProcess.zip" in the directory in which the files are extracted, and then click on Import button.
3. On Import/Export screen, confirm that KalibroExtractionProcess is added in tree structure view in Export section on the left.

10.5. Configuring Kalibro Extractor

1. Log on to Spago4Q as administrator.
2. Select Extractors > Source Types and click on View Data Source button of KalibroSourceType.
3. Click on View Data Source button of KalibroSourceType.
4. Click on Insert button, and then edit as follows:
   - Name: service-endpoint
   - value: http://localhost:8080/KalibroService/
5. Select Extractors > Extraction Processes and click on View Operation button of KalibroExtractionProcess.
6. Click on View Operation button of KalibroExtractionOperation.
7. Click on Select button of kalibro_endpoint, and then edit and save.
   - Name: kalibro_endpoint
   - Value: http://localhost:8080/KalibroService/
10.6. Creating Fact Table

1. Select Extractors > Data Interfaces and click on Select button of KALIBRO.
2. Click on Create Fact Table button, and confirm that it completes successfully.

10.7. Verifying Kalibro Extractor

1. Select Extractors > Extraction Processes and
2. Click on View Operations button of KalibroExtractionProcess.
3. Click on Select button of KalibroExtractionOperation.
4. Click on Test Operation Extraction button. In Confirm dialog, click on Yes.
5. On Test Operation Result screen, confirm that the message "No result found" appears.
   (This is applicable when evaluation project is not yet registered.)

10.8. Installing Kalibro Desktop as Web Service Client

Download archived file into any directory, and install it.

```
# wget http://www.qualipso.org/sites/default/files/KalibroDesktop-0.2_0.zip
# unzip KalibroDesktop-0.2_0.zip –d [tomcat_root]/webapps/
```

10.8.1. Configuring Kalibro Desktop as Web Service Client

Configuration is available for edit from the menu which appears after startup.
Kalibro Desktop as Web Service Client is sharing configuration file with Kalibro Service. Please make a note of it.

10.8.2. Verifying Kalibro Desktop as Web Service Client

Start Kalibro Desktop as Web Service Client.

```
# cd [tomcat_root]/webapps/KalibroDesktop-0.2
# java -jar KalibroDesktop.jar
```