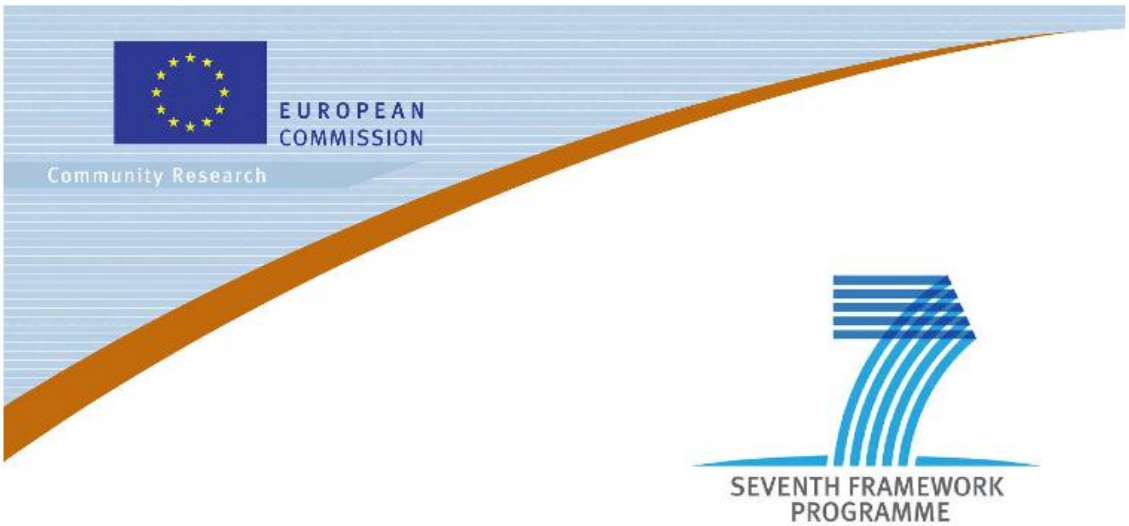


Private Public Partnership Project (PPP)
Large-scale Integrated Project (IP)

D.3.3.1b: FI-WARE Installation and Administration Guide

Project acronym: FI-WARE
Project full title: Future Internet Core Platform
Contract No.: 285248
Strategic Objective: FI.ICT-2011.1.7 Technology foundation: Future Internet Core Platform
Project Document Number: ICT-2011-FI-285248-WP3-D.3.3.1b
Project Document Date: 2012-10-25
Deliverable Type and Security: Public
Author: FI-WARE Consortium
Contributors: FI-WARE Consortium

1.1 Executive Summary

This document has the same contents as the previous issue of Release 1. The reason why it is released again is that FI-WARE has made an effort to create a unified and improved format. This is one of the key documents generated in the past that are provided in the new enhanced format for the sake of uniformity and readability. This document describes the installation and administration process of each Generic Enabler developed within in the "Application and Services Ecosystem and Delivery Framework" chapter. The system requirements for the installation of a Generic Enabler are outlined with respect to necessary hardware, operating system and software. Each GE has a section dedicated to the software installation and configuration process as well as a section, which describes sanity check procedures for the system administrator to verify that the GE installation was successful.

1.2 About This Document

The "FI-WARE Installation and Administration Guide" comes along with the software implementation of components, each release of the document referring to the corresponding software release (as per D.x.2), to facilitate the users/adopters in the installation (if any) and administration of components (including configuration, if any).

1.3 Intended Audience

The document targets system administrators as well as system operation teams of FI-WARE Generic Enablers from the FI-WARE project.

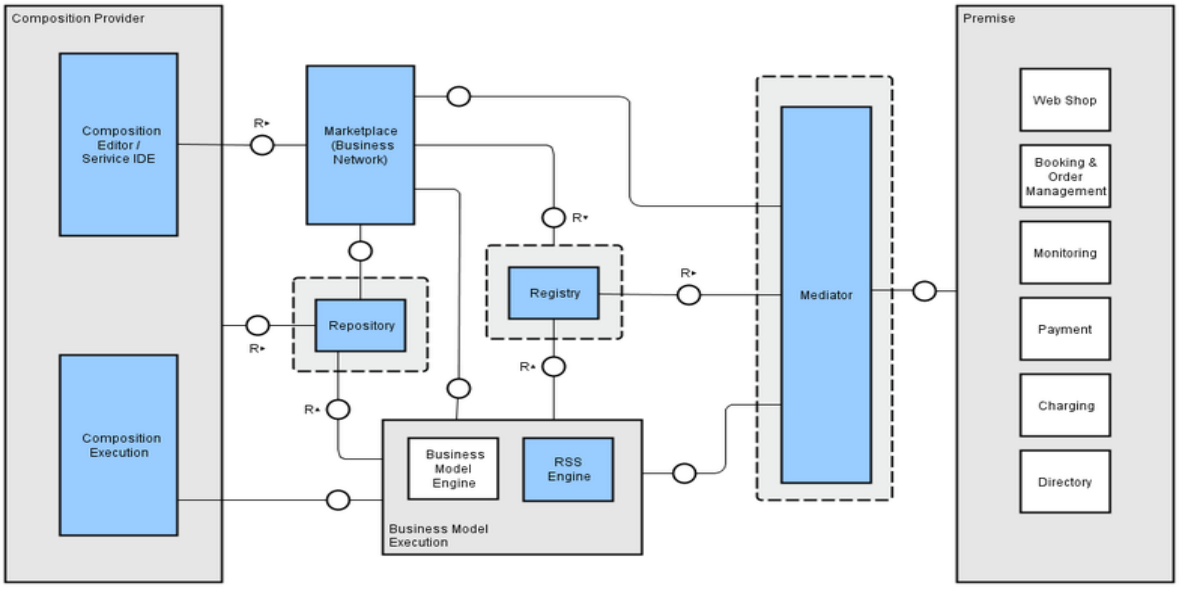
1.4 Chapter Context

The Generic Enablers for the Apps Chapter together can be used to build the core infrastructure for enabling a sustainable ecosystem of applications and services of future internet application domains, which foster innovation as well as cross-fertilization. In particular the Apps Generic Enablers supports unified description and publishing of services, matching demand and offering via marketplace capabilities, creating composed value added services and service networks, and monetization and revenue sharing, all in a complementary and harmonized business framework.
The concept of the Generic Enabler implies that there can be several possible implementations. These implementations might even differ in their implementation approach. There are various degrees of flexibility in the non-functional properties or functional profile of the Generic Enabler description. For example the Composition Editor GE has 4 different implementations, relying on four different concepts and mechanisms for composition (event-based, data-driven, mash-ups, business process composition). The reason is that there is no one-fits-all solution for all kinds of composition. Although the generic functionality is to create composite services and applications out of existing services by composing or connecting the parts, resulting in a new service, the mechanisms and tools for composition are quite different. Which concrete enabler implementation is used, depends on the context, the requirements of the use cases and the availability of interfaces in the target infrastructure. So a GE defines the generic functionality and gives a number of specifications that are to be used to be compliant.
Not every GE has a RESTful Web interface. Especially the composition editors expose their functionality mainly through a User Interface. This case requires the interface to be described in an abstract way (e.g. what a user can do) and illustrated by screenshots of specific enabler implementations.
A couple of basic enablers are important to realize the vision of such a service business framework which enables new business models in an agile and flexible way:

- **Repository** - defines a standard way of publishing service description in the Web in a scalable way.
- **Registry** - serves as a common database layer for run-time configuration and defines a common model and access interface.
- **Marketplace** - defines a standard way to access market places in order to find and compare offerings from different stores and provides further functionality to foster the market for future internet applications and services in a specific domain.

- **Revenue Sharing System** - provides a common scheme and protocols for the calculation and distribution of revenues according to the agreed business models.
- **Service Composition** - to compose existing services to value added composite services and applications, which can be monetized in the Business Framework.
- **Mediator** - enables the interoperability between future internet services and applications and also allow to interface to existing enterprise systems.

This set of self-contained enablers, described in this document, represents only an initial starting point for a future business framework. It is expected that supplemental enablers (e.g. for contracting, quotation ...) will be developed outside the FI-WARE projects.
The Business Framework has been designed to inter operate with each other relying on Linked USDL as common uniform description format for services, which does not only focus on technical aspects of service but also covers business aspects as well as functional and non-functional service attributes. Linked USDL itself is not a Generic Enabler, since it is a data format and vocabulary specification. Nevertheless, it will be introduced as an Open Specification, which is used by different enablers in their provided and consumed APIs.
The Applications and Services Generic Enablers are named according to their main functionality. While the role names, introduced in the FI-WARE Vision (Aggregator, Broker, Gateway ...), are used to describe the stakeholders of the service ecosystem in an abstract way, the enablers names now are referring to concrete software components.
The following diagram gives an example of how the Generic Enablers can be combined to form a concrete architecture for a Service Business Framework.



More information about the Apps Chapter and FI-WARE in general can be found within the following pages:

http://wiki.fi-ware.eu
Architecture_of_Applications_and_Services_Ecosystem_and_Delivery_Framework
Materializing_Applications/Services_Ecosystem_and_Delivery_Framework_in_FI-WARE

1.5 Structure of this Document

The document is generated out of a set of documents provided in the public FI-WARE wiki.
For the current version of the documents, please visit the public wiki at http://wiki.fi-ware.eu/
The following resources were used to generate this document:

D.3.3.1b FI-WARE Installation and Administration Guide front page
Repository - Installation and Administration Guide
Marketplace - Installation and Administration Guide
Application Mashup - Wirecloud - Installation and Administration Guide
Service Mashup - Mashup Factory - Installation and Administration Guide
Light Semantic Composition - Installation and Administration Guide
Service Composition - Installation and Administration Guide
Mediator - Installation and Administration Guide

1.6 Typographical Conventions

Starting with October 2012 the FI-WARE project improved the quality and streamlined the submission process for deliverables, generated out of the public and private FI-WARE wiki. The project is currently working on the migration of as many deliverables as possible towards the new system.
This document is rendered with semi-automatic scripts out of a MediaWiki system operated by the FI-WARE consortium.

1.6.1 Links within this document

The links within this document point towards the wiki where the content was rendered from. You can browse these links in order to find the "current" status of the particular content.
Due to technical reasons not all pages that are part of this document can be linked document-local within the final document. For example, if an open specification references and "links" an API specification within the page text, you will find this link firstly pointing to the wiki, although the same content is usually integrated within the same submission as well.

1.6.2 Figures

Figures are mainly inserted within the wiki as the following one:

```
[[Image:....|size|alignment|Caption]]
```

Only if the wiki-page uses this format, the related caption is applied on the printed document. As currently this format is not used consistently within the wiki, please understand that the rendered pages have different caption layouts and different caption formats in general. Due to technical reasons the caption can't be numbered automatically.

1.6.3 Sample software code

Sample API-calls may be inserted like the following one.

```
```

```
http://[SERVER_URL]?filter=name:Simth*&index=20&limit=10
```

1.7 Acknowledgements

The current document has been elaborated using a number of collaborative tools, with the participation of Working Package Leaders and Architects as well as those partners in their teams they have decided to involve.

1.8 Keyword list

FI-WARE, PPP, Architecture Board, Steering Board, Roadmap, Reference Architecture, Generic Enabler, Open Specifications, I2ND, Cloud, IoT, Data/Context Management, Applications/Services Ecosystem, Delivery Framework , Security, Developers Community and Tools , ICT, es.Internet, Latin American Platforms, Cloud Edge, Cloud Proxy.

1.9 Changes History

Release	Major changes description	Date	Editor
v1	First Verion	2012-10-30	SAP
v2	Final Version	2012-11-06	SAP

1.10 Table of Contents

2 Repository - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

2.1 Repository Installation and Administration Guide

The purpose of this document is to describe how to install and administrate the software necessary to run the Repository on a server. The Repository itself is a Java Web Application, packaged in a WAR file and relies on a MongoDB NoSQL database system.

2.2 System Requirements

This section covers the requirements needed to install and use the Repository.

2.2.1 Hardware Requirements

The following table contains the minimum resource requirements for running the Repository:

Resource	Requirement
CPU	1-2 cores with at least 2.4 GHZ
Physical RAM	1G-2GB
Disk Space	25GB The actual disk space depends on the amount of data being stored within the Repositories NoSQL database System.</ref>

2.2.2 Operating System Support

The Repository has been tested against the following Operating Systems:

- Ubuntu 11.04 and 11.11, 12.04 LTS
- Microsoft Windows 7

NOTE: This Installation Guide describes the installation process on a Linux based System.

2.2.3 Software Requirements

In order to have the Repository running, the following software is needed:

- MongoDB 2.x - mandatory
- Java 1.6.x - mandatory
- Application Server, Apache Tomcat 6.x - mandatory
- Repository Software - mandatory
- Mongo Shell - optional (JavaScript shell that allows you to execute commands on the internal data store of the Repository from the command line)

2.3 Software Installation and Configuration

2.3.1 Install all required software packages

All the mandatory dependencies can be easily installed on a debian based Linux distribution using `apt-get`:

```
$ sudo apt-get install mongodb
$ sudo apt-get install java6-runtime
$ sudo apt-get install tomcat6 tomcat6-docs tomcat6-admin
```

2.3.2 MongoDB Configuration

The next step is to create the Repository internal database named e.g. "test". You may need to have root permissions to do that.

```
$ mongo
$ use test
```

As default the Database saves its data in `/var/lib/mongodb`. Since all the Resources you upload to the tepository are stored there, the size of this folder can grow rapidly. If you want to relocate that folder, you have to edit `/etc/mongodb.conf`

1. mongodb.conf
1. Where to store the data.

dbpath=/var/lib/mongodb

2.3.3 Application Server Configuration

It is possible to use the Apache Tomcat Application server as is, that is, without any further configuration. However, it is recommended to allow incoming connections to the Repository only through HTTPS. This can be achieved by using a front-end HTTPS server that will proxy all requests to Repository, or by configuring the Application Server in order to accept only HTTPS/SSL connection, please refer to this link for more information.

2.3.4 Repository Configuration

Now you can deploy the Repository software to your Application Server. For that you have to copy the Repository WAR package into the "webapp" folder of Apache Tomcat. To install it on other Java Application Servers (e.g. JBoss), please refer to the specific application server guidelines.

2.4 Sanity check procedures

The Sanity Check Procedures are those activities that a System Administrator has to perform verify that an installation is ready to be tested. Therefore there is a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

2.4.1 End to End testing

To quickly check if the application is running, please open

```
http://SERVER_URL:TOMCAT_PORT/FiwareRepository/v1/
```

in your web browser. If you receive the message "Please specify a collection", the Application Server is running and the Repository is deployed correctly.

2.4.2 List of Running Processes

You can execute the following command to check whether the Tomcat web server and the MongoDB database are running:

```
ps -ax | grep 'tomcat\|mongo'
```

The resulting output should show a message text similar to the following:

```
$ ps -ax | grep 'tomcat\|mongo'


  646 ?        Ssl    0:53 /usr/bin/mongod --config
/etc/mongodb.conf
 1100 ?        Sl     0:12 /opt/bitnami/java/bin/java -
Djava.util.logging.config.file=/opt/bitnami/apache-
tomcat/conf/logging.properties
                     -XX:MaxPermSize=512m -Xms256m -Xmx512m -
Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
                     -Djava.endorsed.dirs=/opt/bitnami/apache-
tomcat/endorsed -classpath /opt/bitnami/apache-
tomcat/bin/bootstrap.jar
                     -Dcatalina.base=/opt/bitnami/apache-tomcat -
Dcatalina.home=/opt/bitnami/apache-tomcat
                     -Djava.io.tmpdir=/opt/bitnami/apache-
tomcat/temp org.apache.catalina.startup.Bootstrap start
 3824 pts/3    S+     0:00 grep --color=auto tomcat\|mongo
```

2.4.3 Network interfaces Up & Open

To check the ports in use and listening, execute the command:

```
$ sudo netstat -ltp
```

The produced output must be somehow similar to the following:

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address
State       PID/Program name
tcp        0      0 localhost:28017         *:*
LISTEN      646/mongod
tcp        0      0 localhost:27017         *:*
LISTEN      646/mongod
tcp6       0      0 [::]:8009               [::]:*
LISTEN      1100/java
```

2.4.4 Databases

The last step in the sanity check, once that we have identified the processes and ports, is to check the database to be up and accept queries. For that, we execute the following commands:

```
$  mongo test
$  show dbs
```

to connect to the mongo database on the server. It should show a message text similar to the following:

```
$  mongo test
MongoDB shell version: 2.0.4
connecting to: test

show dbs
local   (empty)
test    4.3625GB
```

2.5 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator has to take in order to locate the source of an error in a GE implementation. Once the nature of the error is identified by these tests, the system admin very often hasto resort to more concrete and specific testing in order to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section. The following sections have to be filled in with the information or an “N/A” (“Not Applicable”) where needed.

2.5.1 Resource availability

The resource load of the Repository strongly depends on the number of concurrent requests received as well as free main memory and disk space:

- mimimum available main memory: 256 MB
- mimimum available hard disk space: 10 GB

2.5.2 Remote Service Access

N/A

2.5.3 Resource consumption

Resource consumption strongly depends on the load, especially on the number of concurrent requests.

- the main memory consumption of the Tomcat application server should be between 48MB and 1024MB. These numbers can vary significanatly if you use a different application server.

2.5.4 I/O flows

The only expected I/O flow is of type HTTP or HTTPS, on ports defined in Apache Tomcat configuration files), inbound and outbound. Requests interactivity should be low.

3 Marketplace - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

3.1 Marketplace Installation and Administration Guide

The purpose of this document is to describe how to install and administrate the necessary software on a server so that it can run the Marketplace.
The Marketplace itself is a Java Web Application, packaged in a WAR file and relys on a SQL database.

3.2 System Requirements

This section covers the requirements needed to install and use the Marketplace.

3.2.1 Hardware Requirements

The following table contains the minimum resource requirements for running the Marketplace:

Resource	**Requirement**
CPU	1-2 cores with at least 2.4 GHZ
Physical RAM	2G-4GB
Disk Space	10GB The actual disk space will depend on the amount of data being stored within the Marketplace.</ref>

3.2.2 Operating System Support

The Marketplace has been tested against the following Operating Systems:

- Ubuntu 11.04 and 11.11, 12.04 LTS
- Microsoft Windows 7

NOTE: This Installation Guide describes the isntalltion process on a Linux based System.

3.2.3 Software Requirements

In order to have the Marketplace running, the following software is needed:

- Database Manager - MySQL (5.5) Server - mandatory
- MySQL Client - mandatory
- Java 1.6.x - mandatory
- Application Server, Apache Tomcat 6.x - mandatory
- Luke - optional (development and diagnostic tool, which can access the Fi-Ware Marketplace search index)
- Marketplace Software

3.3 Software Installation and Configuration

All the mandatory dependencies can be easily installed on a debian based Linux distribution using `apt-get`:

```
$ sudo apt-get install mysql-server mysql-client
$ sudo apt-get install java6-runtime
$ sudo apt-get install tomcat6 tomcat6-docs tomcat6-admin
```

3.3.1 Database Configuration

The next step is to create the Marketplace internal database named "marketplace". You need to have administrator permissions in MySQL. This usually means that you have to use the MySQL root user with the password you chose during the installation process.

```
$ sudo /etc/init.d/mysql start
$ sudo mysqladmin -u root -p[MYSQL_ROOT_PWD] create marketplace
```

Running the Marketplace requires access to the MySQL tables defined in the Marketplace software package. The DB schema should contain several tables that can be created using the SQL Script from Marketplace software "ddl_mysql5.sql"

```
$ mysql -u root -padmin
use marketplace;

// ddl_mysql5.sql statements
create table Localuser (LOCALUSER_ID integer ...
...
...
...
```

3.3.2 Application Server Configuration

It is possible to use the Apache Tomcat Application server as is, that is, without any further configuration. However, it is recommended to allow incoming connection to the Marketplace only through HTTPS. This can be achieved by using a front-end HTTPS server that will proxy all requests to Marketplace, or by configuring the Application Server in order to accept only HTTPS/SSL connection, please refer to this link for more information.

3.3.3 Marketplace Configuration

Before you deploy the Marketplace software to your Application Server you have to configure the database.properties file according to your environment.
File Location: marketplace.war/WEB-INF/classes/properties/database.properties

```
jdbc.driverClassName=com.mysql.jdbc.Driver
jdbc.url=jdbc:mysql://localhost:3306/marketplace
jdbc.username=[YOUR_DB_USER]
jdbc.password=[YOUR_DB_PASSWORD]
```

To enable the fulltext search to run properly, you have to specify a folder where the search indexes should be stored.
File Location: marketplace.war/WEB-INF/classes/properties/marketplace.properties

```
lucene.IndexPath=[PATH_TO_INDEXES]
```

The Marketplace WAR package can now be installed by copying it into "webapp" folder of Apache Tomcat. To install it on other Java Application Servers (e.g. JBoss), please refer to their specific application server guidelines.

3.4 Sanity check procedures

The Sanity Check Procedures are those activities that a System Administrator has to performe to verify that an installation is ready to be tested. Therefore there is a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

3.4.1 End to End testing

To quickly check if the application is running open

```
http://SERVER_URL:TOMCAT_PORT/FiwareMarketplace/v1/registration/stores/
```

in your web browser. If a user login pops up, the Application Server is running and the Marketplace is deployed correctly.

3.4.2 List of Running Processes

You can execute the following command to check that the Tomcat web server and the MySQL database are running:

```
ps -ax | grep 'tomcat\|mysql'
```

It should show a message text similar to the following:

```
$ ps -ax | grep 'tomcat\|mysql'
```

```
  689 ?        S      0:00 /bin/sh
/opt/bitnami/mysql/bin/mysqld_safe --defaults-
file=/opt/bitnami/mysql/my.cnf --port=3306
                     --socket=/opt/bitnami/mysql/tmp/mysql.sock --
datadir=/opt/bitnami/mysql/data --log-
error=/opt/bitnami/mysql/data/mysqld.log
                     --pid-file=/opt/bitnami/mysql/data/ip-10-234-
150-94.pid --lower-case-table-names=1
 1055 ?        Sl     0:01 /opt/bitnami/mysql/bin/mysqld.bin --
defaults-file=/opt/bitnami/mysql/my.cnf --basedir=/opt/bitnami/mysql
                     --datadir=/opt/bitnami/mysql/data --plugin-
dir=/opt/bitnami/mysql/lib/plugin --user=mysql --lower-case-table-
names=1
                     --log-error=/opt/bitnami/mysql/data/mysqld.log
--pid-file=/opt/bitnami/mysql/data/ip-10-234-150-94.pid
                     --socket=/opt/bitnami/mysql/tmp/mysql.sock --
port=3306
 1100 ?        Sl     0:07 /opt/bitnami/java/bin/java -
Djava.util.logging.config.file=/opt/bitnami/apache-
tomcat/conf/logging.properties
                     -XX:MaxPermSize=512m -Xms256m -Xmx512m -
Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
                     -Djava.endorsed.dirs=/opt/bitnami/apache-
tomcat/endorsed -classpath /opt/bitnami/apache-
tomcat/bin/bootstrap.jar
                     -Dcatalina.base=/opt/bitnami/apache-tomcat -
Dcatalina.home=/opt/bitnami/apache-tomcat
                     -Djava.io.tmpdir=/opt/bitnami/apache-
tomcat/temp org.apache.catalina.startup.Bootstrap start
 1533 pts/2    S+     0:00 grep --color=auto tomcat\|mysql
```

3.4.3 Network interfaces Up & Open

To check wether the ports in use are listening, execute the command:

```
$ sudo netstat -ltp
```

The expected results must be somehow similar to the following:

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address
State       PID/Program name
```

```
tcp        0      0 localhost:mysql         *:*
LISTEN      1055/mysqld.bin
tcp6       0      0 [::]:8009               [::]:*
LISTEN      1100/java
```

3.4.4 Databases

The last step in the sanity check, once that we have identified the processes and ports is to check the database that has to be up and accept queries. For that, we execute the following commands:

```
$  mysql -u [DB_USER] -p
$  use marketplace;
$  show tables;
```

It should show a message text similar to the following:

```
+-----------------------+
| Tables_in_marketplace |
+-----------------------+
| localuser             |
| rating                |
| ratingcategory        |
| ratingcategoryentry   |
| ratingobject          |
| ratingsystem          |
| service               |
| store                 |
+-----------------------+
8 rows in set (0.00 sec)
```

3.5 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator has to take to locate the source of an error in a GE. Once the nature of the error is identified by these tests, the system admin can resort to more concrete and specific testing to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section. The following sections have to be filled in with the information or an “N/A” (“Not Applicable”) where needed.

3.5.1 Resource availability

The resource load of the Marketplace strongly depends on the number of concurrent requests received as well as on the free main memory and disk space:

- mimimum available main memory: 256 MB
- mimimum available hard disk space: 2 GB

3.5.2 Remote Service Access

N/A

3.5.3 Resource consumption

Resource consumption strongly depends on the load, especially on the number of concurrent requests.

- the main memory consumption of the Tomcat application server should be between 48MB and 1024MB. These numbers can vary significantly if you use a different application server.

3.5.4 I/O flows

The only expected I/O flow is of type HTTP or HTTPS, on ports defined in Apache Tomcat configuration files), inbound and outbound. Requests interactivity should be low.

4 Application Mashup - Wirecloud - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

4.1 The Wirecloud Mashup Editor & Execution Engine GEs Installation

This page contains the Installation and Administration Guide for the Wirecloud Mashup Platform, a reference implementation of the Application Mashup Generic Enabler, based on the [1] Open Source project. The corresponding online documentation is continuously updated and improved, and provides the most appropriate source to get the most up-to-date information on installation and administration.

4.1.1 Requirements

In order to get Wirecloud up and running, the following software is needed:

- A Database Manager (MySQL, PostgreSQL, Sqlite3...)
- Python 2.5, 2.6 or 2.7. Python 3 and other versions are not supported.
- Django 1.3
- South 0.7.3+
- lxml
- BeautifulSoup
- django-compressor 1.2a2
- rdflib 3.1.0+

Most of software above can be easily installed both in Debian Wheezy and Ubuntu Oneiric using `apt-get`:

```
$ sudo apt-get install python-django python-django-south python-beautifulsoup python-lxml python-pip
```

However, the last two software packages have to be installed using `pip`:

```
$ sudo pip install django-compressor==1.2a2 rdflib

If pip warns you that the 1.2a2 version of compressor is not available, please use django-compressor==dev instead.
```

NOTE: Wirecloud also depends on the Marketplace, Store and Repository GEs. In order to run properly, these GEs must be correctly installed already.

4.1.2 Getting the source code

The Wirecloud source code is available from the GitHub Wirecloud repository.
To get the latest release of the code, you can choose between two options (you will need 'root' privileges) :

- Go to the Wirecloud repository on GitHub and click on the ZIP button to download the repository as a zip file, or just click on this link. Then unzip the file on **`/opt/wirecloud`**
- Or use a GIT client to get the latest development version via Git:

```
# cd /opt
# git clone git://github.com/Wirecloud/wirecloud.git
```

4.1.3 Database installation and configuration

To set up the database engine, it is necessary to create a configuration file called **`local_settings.py`** in the **`/opt/wirecloud/src`** directory with the following content:

```
DATABASES = {
      'default': {
            'ENGINE': '',
            'NAME': '',
            'USER': '',
            'PASSWORD': '',
            'HOST': '',
            'PORT': '',
     }
}
```

The database connection must be defined in that configuration file by modifying the **`DATABASE`** setting. You can use any of the database engines supported by Django.
By default Wirecloud is configured and prepared to use a SQLite database. However, this database is just recommended for giving Wirecloud a try. In order to make use of this configuration, you only have to make sure that you have already installed the SQLite module for python:

```
$ sudo apt-get install python-pysqlite2
```

The following examples show how to configure SQLite and PostgreSQL databases.

4.1.3.1 *SQLite*

Setting up a SQLite database can be just accomplished within seconds by using the following parameters into the `local_settings.py` file:

```
DATABASES = {
      'default': {
            'ENGINE': 'django.db.backends.sqlite3',
            'NAME': '<dbfile>',
            'USER': '',
            'PASSWORD': '',
            'HOST': '',
```

```
            'PORT': '',
    }
}
```

where **<dbfile>** is the full path to the database file.
Remember to have the `python-pysqlite2` module installed:

```
$ sudo apt-get install python-pysqlite2
```

Finally, please take into account that SQLite database is **not recommended for production purposes**. It is only useful for evaluation purposes.

4.1.3.2 *PostgreSQL*

For production purposes, PostgreSQL database is a much better choice. To do so, the following parameters must be set in `local_settings.py`:

```
DATABASES = {
    'default': {
            'ENGINE': 'django.db.backends.postgresql_psycopg2',
            'NAME': '<dbname>',
            'USER': '<dbuser>',
            'PASSWORD': '<dbpassword>',
            'HOST': '',
            'PORT': '',
    }
}
```

where `<dbname>` represents the name of the database, and `<dbuser>` is the name of the user with privileges on the database.
First install the object-relational database system:

```
$ sudo apt-get install postgresql
```

And then the python interface to the PostgreSQL database `python-psycopg`:

```
$ sudo apt-get install python-psycopg2
```

Afterwards you have to create the project Database. We assume that your user has super administrator permissions in PostgreSQL. This usually means that you have to login as the postgres user (i.e. `$ sudo su postgres`).
Both the PostgreSQL database and its user can be created with the following commands:

```
$ createuser <dbuser> [-P]
$ createdb --owner=<dbuser> <dbname>
```

If you want to create a password protected user you must use the `-P` option.

If you want to create a database called 'wirecloud' and a user called 'wc_user' with privileges on this database, you should write the following:

```
$ createuser wc_user [-P]
$ createdb --owner=wc_user wirecloud
```

Finally, it is also needed to allow local connections to the database, i.e. from the computer you are installing Wirecloud. To do so, add the following rules to the beginning of the `/etc/postgresql/X.X/main/pg_hba.conf` file. In other words, the following two rules MUST be the first two rules of the file:

```
# TYPE  DATABASE            USER            CIDR-ADDRESS
METHOD
local   wirecloud           wc_user
trust
local   test_wirecloud      wc_user
trust # only necessary for testing Wirecloud
```

Reload `pg_hba.conf` in PostgreSQL server with the following command:

```
$ sudo service postgresql reload
```

And finally, restart PostgreSQL and check if your user has access using this command:

```
$ psql wirecloud -U wc_user
```

4.1.3.3 *Database population*

Before running Wirecloud, it is necessary to populate the database. This can be achieved by using this command:

```
# python manage.py syncdb
```

This command creates some tables and asks you if you want to create a Django superuser. This user is required to login into Wirecloud and to be able to perform administrative tasks; please respond yes. An example of the command output, where user/password are admin/admin, is the following:

```
...

You just installed Django's auth system, which means you don't have
any superusers defined.
Would you like to create one now? (yes/no): yes
Username (leave blank to use 'wirecloud'): admin
E-mail address: admin@c.com
Password: ***** (admin)
Password (again): ***** (admin)
```

Finally, whenever the wirecloud code is updated, the database must be migrated (and this is one of those times):

```
# python manage.py migrate
```

Note: It is strongly recommended to perform a full database backup before starting to migrate wirecloud to a new version.

4.1.4 Final steps

Make sure the `/opt/wirecloud/src/catalogue/media`, `<wirecloud>/src/deployment/gadgets` and `<wirecloud>/src/deployment/tmp` directories exist and the server has sufficient permissions to write on them. To do so:

```
# chgrp -R www-data /opt/wirecloud/src/deployment/tmp
/opt/wirecloud/src/deployment/gadgets \
        /opt/wirecloud/src/catalogue/media
# chmod g+wrX -R /opt/wirecloud/src/deployment/tmp
/opt/wirecloud/src/deployment/gadgets \
        /opt/wirecloud/src/catalogue/media
```

The `/opt/wirecloud/src/settings.py` file allows you to set several options in Wirecloud. If **`DEBUG`** is **`False`** you will need to collect Wirecloud static files using the following command and answering 'yes' when asked:

```
$ python manage.py collectstatic
```

If you use the runserver command (not recommended for production) you will have to call it with the `--insecure` switch in order to make it serve the static files when not debugging.
In addition, you should serve the static files with a fast performance http server like Nginx or Apache. Django has documentation for this topic.
Finally, you can compress css and javascript code files for better performance using the following command:

```
$ python manage.py compress
```

Note: Don't forget to rerun the *collectstatic* and *compress* commands each time the wirecloud code is updated.

4.1.4.1 *Integration with Django "sites" framework*

Wirecloud uses the hostname provided by the http request when building internal URLs. This behaviour is usually good for normal use.
However, when the sites framework is installed, Wirecloud make use of it to obtain the domain to use when building internal urls. This is very useful when the hostname of the request doesn't match the public name of the Wirecloud server.

4.1.5 Running Wirecloud

We recommend running Wirecloud based on an Apache Web Server. However, it is also possible to run it using the Django internal web server, just for testing purposes.

4.1.5.1 *Running Wirecloud using the Django internal web server*

Please note:

- Be aware that this way of running Wirecloud should be used for evaluation purposes. Do not use it in a production environment.

To start Wirecloud, type the following command:

```
$ python manage.py runserver 0.0.0.0:8080 --insecure
```

Then, go to **http://computer_name_or_IP_address:8080/** where `computer_name_or_IP_address` is the name or IP address of the computer on which Wirecloud is installed, and use the username and password you provided when populating the database to sign in on the platform.

4.1.5.2 *Integrating Wirecloud with Apache*

If you choose to deploy Wirecloud in Apache, the `libapache2-mod-wsgi` module must be installed (and so does Apache!). To do so, type the following command:

```
$ sudo apt-get install apache2 libapache2-mod-wsgi
```

Then you have to create a `django.wsgi` file anywhere, but we recommend to have it inside your wirecloud installation (i.e. `/opt/wirecloud/src/apache/django.wsgi`):

```
import os
import sys
path = '<path_to_wirecloud/src>'
if path not in sys.path:
    sys.path.insert(0, path)
os.environ['DJANGO_SETTINGS_MODULE'] = 'settings'
import django.core.handlers.wsgi
application = django.core.handlers.wsgi.WSGIHandler()
```

Please, pay attention that you set the right path to the wirecloud/src directory (i.e. `/opt/wirecloud/src`)

Finally, add the following lines in the main *virtualhost* to the Apache's *sites-available* configuration file, usually located in `/etc/apache2/sites-available/default`:

```
<VirtualHost *:80>
        ...
        ### Wirecloud ###
        WSGIScriptAlias / <path_to_django_wsgi>
        WSGIPassAuthorization On
        Alias /static <path_to_wirecloud/src/static>
        <Location "/static">
```

```
                    SetHandler None
                    <IfModule mod_expires.c>
                            ExpiresActive On
                            ExpiresDefault "access plus 1 week"
                    </IfModule>
                    <IfModule mod_headers.c>
                            Header append Cache-Control "public"
                    </IfModule>
            </Location>
            <Location "/static/cache">
                    <IfModule mod_expires.c>
                            ExpiresDefault "access plus 3 years"
                    </IfModule>
            </Location>
            ...
    </VirtualHost>
```

Again, pay special attention to the paths to the `django wsgi` file and the `/opt/wirecloud/src/static` directory.
Once you have the site enabled, restart Apache

```
# apache2ctl graceful
```

and go to http://computer_name_or_IP_address/ to get into Wirecloud.

4.2 Sanity check procedures

The Sanity Check Procedures are the steps that a System Administrator will take to verify that an installation is ready to be tested. This is therefore a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

4.2.1 End to End testing

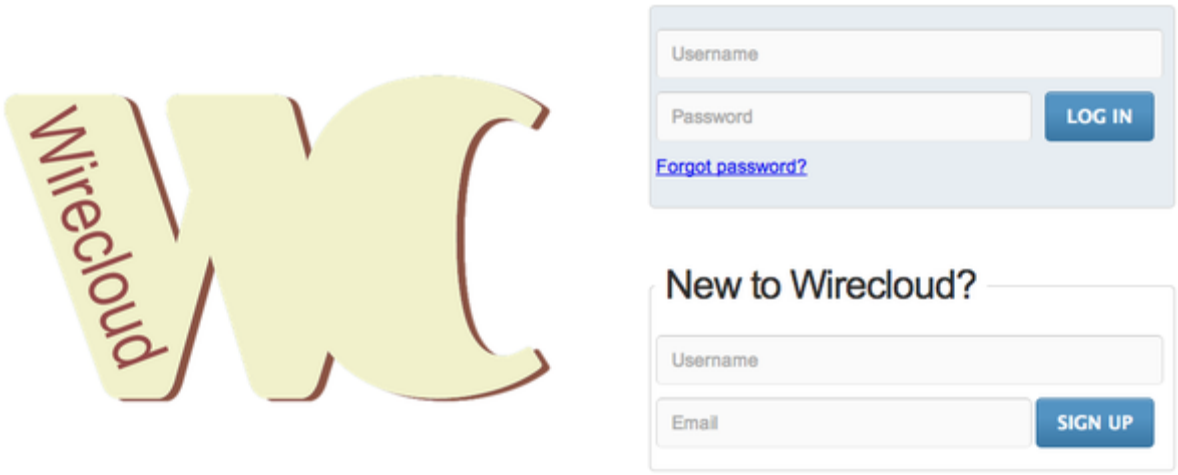
To quickly check if the application is running, verify that

```
http://computer_name_or_IP_address/
```

can be reached in your web browser, where:

- `computer_name_or_IP_address` is the name or IP address of the computer on which Wirecloud is installed.

The following user login form should appear:



And then, type admin/admin as the user/password combination (or the user and password used in the "Database population" step of this guide). Performing this step, you will check the Wirecloud Mashup platform is running and correctly deployed, and its database has been properly set up and populated.

4.2.2 List of Running Processes

We need to check that the Apache web server and the Postgres database are running. Wirecloud uses a python interpreter, but it will not be listed as it runs embedded into apache2. If we execute the following command:

```
ps -ewF | grep 'apache2\|postgres' | grep -v grep
```

It should show something similar to the following:

```
$ ps -ewF | grep 'apache2\|postgres' | grep -v grep
postgres  1631     1  0 25212  9452   0 Jul03 ?        00:00:19
/usr/lib/postgresql/9.1/bin/postgres -D /var/lib/postgresql/9.1/main
-c config_file=/etc/postgresql/9.1/main/postgresql.conf
postgres  1702  1631  0 25208  3784   0 Jul03 ?        00:00:47
postgres: writer process
postgres  1703  1631  0 25208  1452   0 Jul03 ?        00:00:39
postgres: wal writer process
postgres  1704  1631  0 25462  2964   0 Jul03 ?        00:00:16
postgres: autovacuum launcher process
postgres  1705  1631  0 17370  1660   0 Jul03 ?        00:00:18
postgres: stats collector process
root      3811     1  0 50067 10848   0 13:13 ?        00:00:00
/usr/sbin/apache2 -k start
www-data  3818  3811  0 68663 39820   0 13:13 ?        00:00:00
/usr/sbin/apache2 -k start
```

```
www-data  3819  3811  0 68687 39448   0 13:13 ?        00:00:00
/usr/sbin/apache2 -k start
www-data  3822  3811  0 68901 40160   0 13:13 ?        00:00:00
/usr/sbin/apache2 -k start
```

4.2.3 Network interfaces Up & Open

To check the ports in use and listening, execute the command:

```
$ sudo netstat -ltp
```

The expected results must be something similar to the following:

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address
State       PID/Program name
tcp        0      0 localhost:postgresql    *:*
LISTEN      1631/postgres
tcp        0      0 *:http                  *:*
LISTEN      3811/apache2
```

or these ones in case the machine is configured to use IPv6:

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address
State       PID/Program name
tcp        0      0 localhost:postgresql    *:*
LISTEN      1631/postgres
tcp6       0      0 [::]:http               [::]:*
LISTEN      3811/apache2
```

4.2.4 Databases

The last step in the sanity check, once that we have identified the processes and ports, is to check the different databases that have to be up and accepting queries. If we execute the following command:

```
$ psql -U wc_user wirecloud
```

It should show a message text similar to the following:

```
psql (9.1.4)
Type "help" for help.
```

```
wirecloud=>
```

4.3 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator will take to locate the source of an error in a GE. Once the nature of the error is identified with these tests, the system admin will very often have to resort to more concrete and specific testing to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section.

4.3.1 Resource availability

Wirecloud should run fine with a minimun of 512 MB of available RAM (1024 MB recommended) and 10 GB of hard disk space

4.3.2 Remote Service Access

N/A

4.3.3 Resource consumption

Resource consumption strongly depends on the load, especially on the number of concurrent users logged in.

- The main memory consumption of the Apache Web server should be between 64 MB and 1024 MB.
- Postgresql should consume a small amount of memory, not more than 64 MB.

4.3.4 I/O flows

The only expected I/O flow is of type HTTP, on port defined in Apache Web Server configuration files.

5 Service Mashup - Mashup Factory - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

5.1 Composition Editor Mashup Factory

This document is intended as an installation and an administration guide for usage of the Service Mashup GE implementation named Mashup Factory.

5.2 System Requirements

This section covers the requirements needed to install and use the Service Mashup Editor and Execution Environment.

5.2.1 Hardware Requirements

The following table contains the minimum resource requirements for running the Composition Editor:

Resource	**Requirement**
CPU	1-2 cores with at least 2.4 GHZ
Physical RAM	2G-4GB
Disk Space	10GB The actual disk space will depend on the amount of data being stored within the Composition Editor.

5.2.2 Operating System Support

The Composition Editor has been tested against the following Operating Systems:

- Ubuntu 10.04.4 LTS

NOTE: This Installation Guide describes the isntalltion process on a Linux based System.

5.2.3 Software Requirements

In order to have the Composition Editor running, the following software is needed:

- Java 1.6.x - mandatory
- Application Server, Apache Tomcat 6.x - mandatory
- Composition Editor Software

5.3 Software Installation and Configuration

The Composition Editor Mashup Factory will be hosted in a Virtual Machine in the Testbed.
The GE instance owner (DT) is in charge of the installation of the package.
The Composition Editor GE (DT) is packaged as several .war archives. The following steps will take you through the binary distribution installation on Unix/Linux systems.

```
   1. Download the Composition Editor GE binary distribution from
the repository.

   2. Copy the .war archives from the binary distribution to the
webapps directory of an Apache Tomcat 6 instance.

   3. Extract the exist.zip archive from the binary distribution and
copy the directory 'exist' and its content to the webapps directory
of the Apache Tomcat 6 instance.

   4. Restart the tomcat server
```

5.3.1 Application Server Configuration

It is possible to use the Apache Tomcat Application server as is, without any further configuration. However, it is recommended to allow incoming connection to the Composition Editor only through HTTPS. This can be achieved by using a front-end HTTPS server that will proxy all requests to Composition Editor, or by configuring the Application Server in order to accept only HTTPS/SSL connection, please refer tothis link for more information.

The Execution Engine of the Mashup Factory is a 3rd party BPEL engine that is no longer available to the public. The following description was extracted from the 3rd party BPEL engine installation guide. This documentation was provided by www.activebpel.org. There is no responsibilty about correctness by Mashup Factory.
The Execution Engine Mashup Factory will be hosted in a Virtual Machine in the Testbed.
The GE instance owner (DT) is in charge of the installation of the package.
Run the script install.bat (Windows) or install.sh (Unix). It copies the contents of lib into $CATALINA_HOME/shared/lib and creates the directory $CATALINA_HOME/bpr, where BPEL process .bpr archives are deployed.

```
   % cd activebpel

   activebpel% install.sh
```

When running install.sh on Unix, you may need root privileges.

5.3.2 Composition Editor Configuration

Edit the Tomcat users file 'conf/tomcat-users.xml' and add your desired users with the role 'authUser'.

5.3.3 Composition Execution Engine Configuration

There are a few server parameters that are configurable via a small XML file named aeEngineConfig.xml, which is is found in the directory $CATALINA_HOME/bpr. Configuration changes made via the BpelAdmin configuration page, normally found at http://SERVER_URL:TOMCAT_PORT/BpelAdmin/config.jsp, are saved to this file.

5.4 Engine Status Information

When the servlet engine (for example, Tomcat) is running, there are two Web pages available that display information about the server: the Axis Web services listing and the ActiveBPEL engine admistration page.

5.4.1 Axis Web Services Listing

The page at http://SERVER_URL:TOMCAT_PORT/active-bpel/services is generated by Axis (modify the host and port to suit your installation). It lists all of the Web services that are available. This list is independent of the ActiveBPEL engine; the engine hands Web services to Axis to deploy. Each service lists its available operations and has a "wsdl" link next to its name. Clicking on that link causes Axis to generate the WSDL for that Web service and send it to your browser. (If your browser does not display anything, then you can use your browser's "Save Link As..." feature to save the WSDL to your computer and look at it that way.) The format for each WSDL link is .../services/ServiceName?wsdl so you can type the link in directly if you desire.

5.4.2 ActiveBPEL Engine Adminstration

The Web page at http://SERVER_URL:TOMCAT_PORT/BpelAdmin/ is the ActiveBPEL engine adminstration page (again, modify the host and port to suit your installation). From that page you can see and edit the engine's configuration parameters and click the links on the left to see information about the deployed and active BPEL processes.
The engine configuration parameters are described in the online help available from the BpelAdmin pages.
Clicking on "Deployed Processes" displays a list of the BPEL processes deployed within the engine.
Clicking on "Active Processes" displays by default a list of the BPEL processes that are running, have completed, or faulted. Click on "Running" or "Complete" in "Process Filter Selections" to limit the process display to those states.
Clicking on "Receive Queue" displays a list of queued receives.

5.5 Sanity check procedures

The Sanity Check Procedures are the steps that a System Administrator will take to verify that an installation is ready to be tested. This is therefore a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

5.5.1 End to End testing

To quickly check if the application is running open

```
http://SERVER_URL:TOMCAT_PORT/mamsCore/mamsCore.jsp
```

in your web browser (Firefox mandatory). If a user login pops up, the Application Server is running and the Composition Editor is deployed correctly. To quickly check if the application is running open

```
http://SERVER_URL:TOMCAT_PORT/BpelAdmin
```

in your web browser. If the ActiveBpel console pops up, the Application Server is running and the Composition Engine is deployed correctly.

5.5.2 List of Running Processes

You can execute the following command to check that the Tomcat web server is running:

```
ps -ef | grep tomcat
```

It should show something similar to the following:

```
$ ps -ef | grep tomcat

root      5311     1  0 00:12 ?        00:04:09 /usr/lib/jvm/java-6-
sun/bin/java -XX:MaxPermSize=512M
-Xmx1500m -Xdebug -
Xrunjdwp:transport=dt_socket,address=2875,suspend=n,server=y
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -
Djava.util.logging.config.file=/usr
/local/tomcat6/conf/logging.properties -
Djava.endorsed.dirs=/usr/local/tomcat6/endorsed -classpath
:/usr/local/tomcat6/bin/bootstrap.jar -
Dcatalina.base=/usr/local/tomcat6 -Dcatalina.home=/usr/local
/tomcat6 -Djava.io.tmpdir=/usr/local/tomcat6/temp
org.apache.catalina.startup.Bootstrap start
root     13618  5880  0 10:25 pts/0    00:00:00 grep tomcat
```

5.5.3 Network interfaces Up & Open

To check the ports in use and listening, execute the command:

```
$ sudo netstat -ltp
```

The expected results must be something similar to the following:

```
Active Internet connections (only servers)
```

```
Proto Recv-Q Send-Q Local Address           Foreign Address
State       PID/Program name
tcp6       0      0 localhost:8009              [::]:*
LISTEN      8423/java
```

5.5.4 Databases

MashupFactory uses an XML database which is deployed as a webapp in the tomcat container (included in the binary distribution). To check whether the database is up and running open the page http://SERVER_URL:TOMCAT_PORT/exist in a web browser.

5.6 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator will take to locate the source of an error in a GE. Once the nature of the error is identified with these tests, the system admin will very often have to resort to more concrete and specific testing to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section.

5.6.1 Resource availability

The Resource load of the Composition Editor depends on the number of concurrent requests received as well as free main memory and disk space:

- mimimum available main memory: 256MB
- mimimum available hard disk space: 2GB

5.6.2 Remote Service Access

The administrative console for remotely maintaining service compositions can be accessed at http://SERVER_URL:TOMCAT_PORT/exist/admin.

The administrative console for remotely maintaining service compositions execution can be accessed at http://SERVER_URL:TOMCAT_PORT/BpelAdmin.

5.6.3 Resource consumption

Resource consumption depends on the load, especially on the number of concurrent requests. The main memory consumtion of the Tomcat application server should be between 256MB and 1024MB. These numbers can vary greatly if you use a different application server.

5.6.4 I/O flows

The only expected I/O flow is of type HTTP or HTTPS, on ports defined in Apache Tomcat configuration files), inbound and outbound. Requests interactivity should be low.

6 Light Semantic Composition - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

6.1 Light Semantic Composition Installation and Administration Guide

The purpose of this document is to provide the essential steps for the installation and configuration of the Light Semantic Composer that will make run this component from the initial installation.
The audience of the document is the system administrators that will have to install and configure this Generic Enabler.

6.2 System Requirements

6.2.1 Hardware Recommendations

- RAM:4GB
- Disk: 20GB

6.2.2 Software Requirements

- Java JDL 5.X (or higher). Tested with 1.6.0_24.
- Tomcat 6.X. Tested with 5.5.33 and 6.0.29
- Ant. Tested with 1.7.1
- Python 2.5.2. Tested with (2.7). See appendix
- Postgresql 8.3.x. Tested with 9.0. See appendix

6.3 Software Installation and Configuration

6.3.1 Creating the data base for the Composition Editor

1- start postgres: sudo /etc/init.d/postgresql start 2- poem user creation:
createuser -U postgres -e -P -E poem
Enter password for new role: poem Enter it again: poem Shall the new role be a superuser? (y/n) n Shall the new role be allowed to create databases? (y/n) y Shall the new role be allowed to create more new roles? (y/n) y CREATE ROLE poem ENCRYPTED PASSWORD 'md54fae7683b3e8809f364b0026c885af8c' NOSUPERUSER CREATEDB CREATEROLE INHERIT LOGIN;
3- Database creation
createdb -U postgres -O poem -E utf8 -e poem
CREATE DATABASE poem OWNER poem ENCODING 'utf8'; CREATE DATABASE
4- Populating database:
psql -U postgres -d poem -f db_schema.sql

6.3.2 Deploying the war files.

The following war files must be deployed on the Servlet Container:
• Compel.war • BPMNModule.war • Dtc.war • Axis2.war • Oryx.war • Backend.war • Openrdf-sesame.war • Openrdf.war
After deploying these web application archives, it is necessary also to install the axis2 web service file “Fiware.aar” into the axis2 web application, so it will be necessary to drop this file in the following folder: $TOMCAT_INSTALATION/webapps/axis2/WEB-INF/services/
After finishing this operation, the details of the service should be showed in the axis2 management console.

6.3.3 Configuring the knowledge base

In order to create the repository, it is necessary to Access to the following URL:

- http://[serverIP]:8080/openrdf-workbench/repositories/NONE/create?type=owlim-lite

Load the ontologies in the system
i. Select the created repository
ii. Go to the menu “Add”
iii. Insert the following data:

```
1. URI: show the ontologies below
2. Context: <[ONTOLOGY_URI]>
3. Select  “Select the file containing the RDF data you wish to upload”
4. Select the correspondance ontology file.
```

iv. This process must be done with the following ontologies:

```
1. OntoBPMN.owl, URI: http://dkm.fbk.eu/index.php/BPMN_Ontology
2. POSM.rdf.owl, URI: http://www.wsmo.org/ns/posm/0.2
3. bridge.owl, URI: http://bridge-webn1.atosresearch.eu/bridge
4. integra.owl, URI: http://bridge-webn1.atosresearch.eu/integra
```

6.4 Sanity check procedures

The Sanity Check Procedures are the steps that a System Administrator has to take in order to verify that an installation is ready to be tested. This is therefore a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.
The following sections have to be filled in with the information or an “N/A” (“Not Applicable”) where needed. Do not delete section titles in any case.

6.4.1 End to End testing

Access to the main Web page at http://IP_ADRESS:8080/compel The main Light Semantic Composition Editor should appear.

6.4.2 List of Running Processes

Processes that should be working are

- java instance for the tomcat

bpmn@debianVM:~$ bpmn 1963 1.6 18.1 1952428 342368 pts/0 Sl 13:40 0:33 /usr/bin/java -Djava.util.logging.config.file=/home/bpmn/apache-tomcat-6.0.35/conf/logging.properties -Djava.awt.headless=true -Dfile.encoding=UTF-8 -server -Xms1536m -Xmx1536m -XX:NewSize=256m -XX:MaxNewSize=256m -XX:PermSize=256m -XX:MaxPermSize=256m -XX:+DisableExplicitGC -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djava.endorsed.dirs=/home/bpmn/apache-tomcat-6.0.35/endorsed -classpath /home/bpmn/apache-tomcat-6.0.35/bin/bootstrap.jar -Dcatalina.base=/home/bpmn/apache-tomcat-6.0.35 -Dcatalina.home=/home/bpmn/apache-tomcat-6.0.35 -Djava.io.tmpdir=/home/bpmn/apache-tomcat-6.0.35/temp org.apache.catalina.startup.Bootstrap start

- a postgress instance for the database

postgres 2063 0.0 0.4 51540 9240 ? Ss 13:41 0:00 postgres: poem poem 127.0.0.1(41572) idle

6.4.3 Network interfaces Up & Open

- 5432 --> For the postgres connection
- 8080 --> For the web application

6.4.4 Databases

The GE relies on the use of the Oryx BPEL web editor, which makes use of an internal Progress database called "poem". Detailed information on how to set up Orix can be found at http://code.google.com/p/oryx-editor/wiki/SetupDevelopmentEnvironment.
In case of problems with the Progress DB, the administrator should check the following:
- Open the file build.properties in root dir of the Orys installation to check the name of the database and the user used.
- Using any Progress DB client, check that the database can be opened using the name and user specified in the build.properties file.
- If not, follow the db set up instructions supplied on http://code.google.com/p/oryx-editor/wiki/SetupDevelopmentEnvironment in order to properly install and build the db.

6.5 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator will take to locate the source of an error in a GE. Once the nature of the error is identified with these tests, the system admin will very often have to resort to more concrete and specific testing to pinpoint

the exact point of error and a possible solution. Such specific testing is out of the scope of this section.
The following sections have to be filled in with the information or an “N/A” (“Not Applicable”) where needed. Do not delete section titles in any case.

6.5.1 Resource availability

Minimal System Requirements:
RAM:2GB Storage: 5GB

6.5.2 Remote Service Access

MarketPlace GE: https://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace_-_Unit_Testing_Plan#Unit_Test_9

6.5.3 Resource consumption

- Normal parameters: 2GB memmory consuption, 7GB total file system storage

6.5.4 I/O flows

- Requests to port 8080

7 Service Composition - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

Disclaimer: The sustainability of this Installation and Administration Guide cannot be guaranteed due to internal changes in the project consortium.

7.1 General

The Ericsson Composition Engine implements the "Service Composition" GE and is provided as a combination of SaaS and downloadable software. A new user can register at the following address: http://compositionex.lab.fi-ware.eu.

- The Composition Editor is provided as a downloadable user-end installer for the Windows environment. Once a new user is registered, a link for downloading the Composition Editor installer is provided.
- The Execution Engine is provided as a service (SaaS) and can be found at the following address: http://compositionex.lab.fi-ware.eu:8080. No installation and administration is needed.

7.2 Composition Editor Installation and Administration

For installation, run the downloaded 'setup-ace.exe' and apply your personal preferences. Once the Composition Editor is opened a connection to the Execution Engine is preconfigured. In case the Composition Editor is used within an environment that uses a www proxy the relevant information can be configured in Menu->Edit->Preferences->General->Network Connections. For further information on using the Composition Editor please consult the Service Composition - User and Programmer Guide. No installation and administration is needed within the FIWARE testbed.

7.3 Sanity check procedures

The Sanity Check Procedures are the steps that a System Administrator will take to verify that an installation is ready to be tested. This is therefore a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

7.3.1 End to End testing

Once the Composition Editor is started, the 'ACE Explorer' widow should show the 'ECE4Fiware' node. Expanded, this should show 'Services' and 'Skeletons'. Both 'Services' and 'Skeletons' should be expandable and show the actual loaded services and skeletons.

7.3.2 List of Running Processes

Once the Composition Editor is started, the Windows Task Manager should show an entry in the tab 'Applications' called 'Demo Service Composition Environment - Advanced Composition Editor'. The 'Processes' tab should show the item 'ace.exe'.

7.3.3 Network interfaces Up & Open

N/A

7.3.4 Databases

N/A

7.4 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator will take to locate the source of an error in a GE. Once the nature of the error is identified with these tests, the system admin will very often have to resort to more concrete and specific testing to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section.

7.4.1 Resource availability

The Composition Editor requires for installation 80 MB hard disk. During run-time it requires 70 MB RAM.

7.4.2 Remote Service Access

The Composition Editor talks to the Execution Engine and the Repository. This should only be after specific user actions (load, save, import, etc).

7.4.3 Resource consumption

For RAM, any strong deviation form the figure above is deviant. For CPU only a small percentage CPU load is normal.

7.4.4 I/O flows

The Composition Editor issues only outgoing requests.

8 Mediator - Installation and Administration Guide

You can find the content of this chapter as well in the wiki of fi-ware.

8.1 Mediator Installation and Administration Guide

The purpose of this document is to describe how to install and administrate the necessary software on a server to run the Mediator.
The Mediator itself is a Java Enterprise application based on OSGi Equinox framework and Tomcat appserver, packaged in a tar.gz that includes the application servers.

8.2 System Requirements

This section covers the requirements needed to install and use the Mediator.

8.2.1 Hardware Requirements

The following table contains the minimum resource requirements for running the Mediator:

Resource	**Requirement**
CPU	1-2 cores with at least 2.4 GHZ
Physical RAM	2GB
Disk Space	30GB .</ref>

8.2.2 Operating System Support

The Mediator has been tested against the following Operating Systems:

- Ubuntu 10.04, 12.04 LTS

8.2.3 Software Requirements

In order to have the Mediator running, the following software is needed:

- Java 1.6.x - mandatory

8.3 Software Installation and Configuration

All the mandatory dependencies can be easily installed on a debian based Linux distribution using `apt-get`:

```
$ sudo apt-get install sun-java6-jre
```

The following steps will take you through the binary distribution installation on Unix/Linux systems.

```
   1. Download the  Mediator  binary distribution from the
repository.
   2. Extract the archive where you want the Mediator GE  installed
(e.g. into /opt)
```

```
   3. Set the JAVA_HOME environment variable to your Java home using
the export command or by editing /etc/profile, and add the Java /bin
directory to  your     PATH

   4. Execute the WSO2 ESB daemon script from the bin directory.
e.g. ./daemon.sh start

   5. Check your WSO2 ESB instance using the URL
https://<host>:9443/carbon which will take you to the WSO2 ESB
Management Console. (Note that server start up may take time)

   6. Login as "admin" using the default password "admin"
```

8.3.1 Application Server Configuration

It is possible to leave the Embedded Apache Tomcat Application server as is, without any further configuration. The default configuration allows:

- HTTPS connections at 9443 port for the console
- HTTP connection at 9763 port for the console (redirected to the previous one)
- HTTPS connection at 8243 for the mediation services
- HTTP connection at 8280 for the mediation services

8.4 Sanity check procedures

The Sanity Check Procedures are the steps that a System Administrator will take to verify that an installation is ready to be tested. This is therefore a preliminary set of tests to ensure that obvious or basic malfunctioning is fixed before proceeding to unit tests, integration tests and user validation.

8.4.1 End to End testing

To quickly check if the application is running open

```
https://SERVER_URL:9443/carbon
```

in your web browser. If a user login page is shown, the Mediator is running and deployed correctly.

8.4.2 List of Running Processes

You can execute the following two commands to check that the Mediator is running.
Execute:

```
ps -ef | grep 'Mediator_TI'
```

It should show something similar to the following:

```
root     10287     1  0 11:36 ?        00:00:00
/opt/Mediator_TI_1.1.1-SNAPSHOT/./bin/native/wrapper-linux-x86-32
```

```
/opt/Mediator_TI_1.1.1-SNAPSHOT/./repository/conf/wrapper.conf
wrapper.syslog.ident=WSO2Carbon
wrapper.pidfile=/opt/Mediator_TI_1.1.1-SNAPSHOT/./WSO2Carbon.pid
wrapper.daemonize=TRUE
```

Then execute:

```
ps -ef | grep 'wso2'
```

It should show something similar to the following:

```
root     10289 10287  2 11:36 ?        00:00:42 /usr/lib/jvm/java-6-
sun/bin/java -Xms256m -Xmx512m -XX:MaxPermSize=256m -Dcarbon.home=.
-Djava.endorsed.dirs=lib/endorsed -Dcom.sun.management.jmxremote -
Dwso2.server.standalone=true -Djava.io.tmpdir=tmp -
Dwso2.transports.xml=repository/conf/mgt-transports.xml -
Dcarbon.registry.root=/ -Xms256m -Xmx512m -
Djava.library.path=bin/native -classpath lib/wrapper-
3.2.3.jar:bin/log4j-1.2.13.jar:bin/org.wso2.carbon.bootstrap-
3.2.0.jar:repository/conf -Dwrapper.key=UJlvP2gyHHKc122i -
Dwrapper.port=32000 -Dwrapper.jvm.port.min=31000 -
Dwrapper.jvm.port.max=31999 -Dwrapper.pid=10287 -
Dwrapper.version=3.2.3 -Dwrapper.native_library=wrapper -
Dwrapper.service=TRUE -Dwrapper.cpu.timeout=10 -Dwrapper.jvmid=1
org.tanukisoftware.wrapper.WrapperSimpleApp
org.wso2.carbon.bootstrap.Bootstrap RUN
```

8.4.3 Network interfaces Up & Open

To check the ports in use and listening, execute the command:

```
$ sudo netstat -ltp | grep '9443\|9763'
```

The expected results must be something similar to the following:

```
Active Internet connections (only servers)

tcp6       0      0 [::]:9763               [::]:*
LISTEN      5021/java
tcp6       0      0 [::]:9443               [::]:*
LISTEN      5021/java
```

8.4.4 Databases

N/A

8.5 Diagnosis Procedures

The Diagnosis Procedures are the first steps that a System Administrator will take to locate the source of an error in a GE. Once the nature of the error is identified with these tests, the system admin will very often have to resort to more concrete and specific testing to pinpoint the exact point of error and a possible solution. Such specific testing is out of the scope of this section. The following sections have to be filled in with the information or an “N/A” (“Not Applicable”) where needed. Do not delete section titles in any case.

8.5.1 Resource availability

The resource load of the Mediator strongly depends on the number and the rate of concurrent requests received as well as free main memory:

- mimimum available main memory: 512 MB
- mimimum available hard disk space: 1 GB

8.5.2 Remote Service Access

N/A

8.5.3 Resource consumption

Resource consumption strongly depends on the load, especially on the number and the rate of concurrent requests.

8.5.4 I/O flows

The expected I/O flow is:

- HTTP on port configured (default are: 9763 and 8280) inbound
- HTTPS, on port configured (default are 9443 and 8243), inbound