



Deliverable D32.3
Factsheet #1
“Consumer Marketplace”

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List of Abbreviations

IDE	Integrated Development Environment
JDK	Java Development Kit
SVN	Subversion (versioning control system)
RI	Reference Implementation

Table of Contents

1	AVAILABILITY AND CONTACTS.....	4
2	ARCHITECTURE AND FUNCTIONALITIES.....	5
2.1	INTRODUCTION	5
2.2	SUMMARY OF REQUIREMENTS	5
2.2.1	<i>Functional Requirements</i>	5
2.2.2	<i>Supporting requirements</i>	5
2.3	TECHNOLOGIES.....	6
2.4	ARCHITECTURE.....	6
2.5	KEY CONCEPTS	6
2.5.1	<i>Marketplace Instance</i>	7
2.5.2	<i>Store</i>	7
2.5.3	<i>Offering (Service)</i>	7
2.5.4	<i>Service Provider</i>	7
2.6	THE MARKETPLACE GE EXTERNAL COMPONENT – RELATIONSHIP TO FI-WARE OPEN SPEC APIs.....	7
3	TECHNICAL INFORMATION	11
3.1	SERVICE REQUIREMENTS	11
3.1.1	<i>Operating systems</i>	11
3.1.2	<i>Java development kit</i>	11
3.1.3	<i>Database</i>	11
3.2	DEVELOPMENT ENVIRONMENT	11
3.3	TECHNICAL DETAILS	11
4	LICENSING.....	12
4.1	SERVICE LICENSE.....	12
4.2	THIRD PARTY LICENSES	12
5	TECHNICAL MANUAL	13
5.1	INSTALLATION	13
5.2	RETRIEVING SOURCES FROM THE SVN	13
6	USER MANUAL.....	14
7	FUTURE PLANS.....	18
7.1	IMPLEMENTATION OF FURTHER REQUIREMENTS AND OPTIONAL FEATURES	18
7.2	FEDERATION OF MARKETPLACE INSTANCES	18
7.3	PERFORMANCE AND SCALABILITY	18
8	REFERENCES	19

1 Availability and Contacts

Version	1.0
Availability	Source is available from the MSEE svn repository
Accompanying specification and design document	Deliverable D32.1a: FI Platform Federation specifications and architecture – M12
Source control	svn://repo.nimbus-ware.com/MSEE/SP3/WP32/D32.3/trunk/consumer-marketplace
Contact person	Jerry Dimitriou – ep6@singularlogic.eu

2 Architecture and Functionalities

2.1 Introduction

The purpose of the Consumer Marketplace is to provide an infrastructure for MSEE so that service end-users (consumers, manufacturing ecosystem members) will be able to seek and compare service offerings. The Consumer Marketplace implements the business logic of creating and managing stores in federated FI-WARE Marketplace instances, as well as displaying service offerings in them, bringing together Service Providers and Consumers.

2.2 Summary of Requirements

2.2.1 Functional Requirements

Requirement ID	Description
CMC-1	Browsing of stores
CMC-2	Administration of stores (registration & update)
CMC-3	Management of offerings per store (CRUD)
CMC-4	Browsing of offerings per store
CMC-5	Search stores with text
	<i>This functionality will be fully implemented in the second prototype</i>
CMC-6	Search offerings
	<i>This functionality will be fully implemented in the second prototype</i>
CMC-7	Store listing by category and provider
CMC-8	Service listing per category and/or store
CMC-9	Service attributes comparison side-by-side
CMC-10	Keyword/phrase annotations on Services and Offerings
CMC-11	Reviews and ratings
OPTIONAL	<i>This is an optional feature in Marketplace Open Spec and has not been implemented for the first prototype</i>
CMC-12	When viewing a service offering, also provide 'related offerings'
	<i>This functionality will be implemented in the second prototype</i>

2.2.2 Supporting requirements

Requirement ID	Description
CMS-1	Registration of Service Providers
CMS-2	Browse consumers & providers profiles
CMS-3	Registration of Service Consumers
OPTIONAL	<i>This optional requirement has not been implemented for the first prototype</i>
CMS-4	Access control at service level: a Service Provider may specify which Service Consumers view a service.
OPTIONAL	<i>This optional requirement has not been implemented for the first prototype</i>

2.3 Technologies

The Consumer Marketplace provides a REST API frontend and a GUI web app frontend; both are served by a Java web container (eg. Apache Tomcat) based on common Java frameworks for web and enterprise applications development, including Spring, JPA/Hibernate and Apache CXF framework.

2.4 Architecture

The architecture of Consumer Marketplace is the standard 3-tier web application architecture:

- A frontend layer that provides Consumer Marketplace functionality via a REST API and a web application UI.
- A synchronous request-response processing layer that handles API- and UI-originated requests, implementing the core business logic of Consumer Marketplace.
- Information management layer (database, logging)

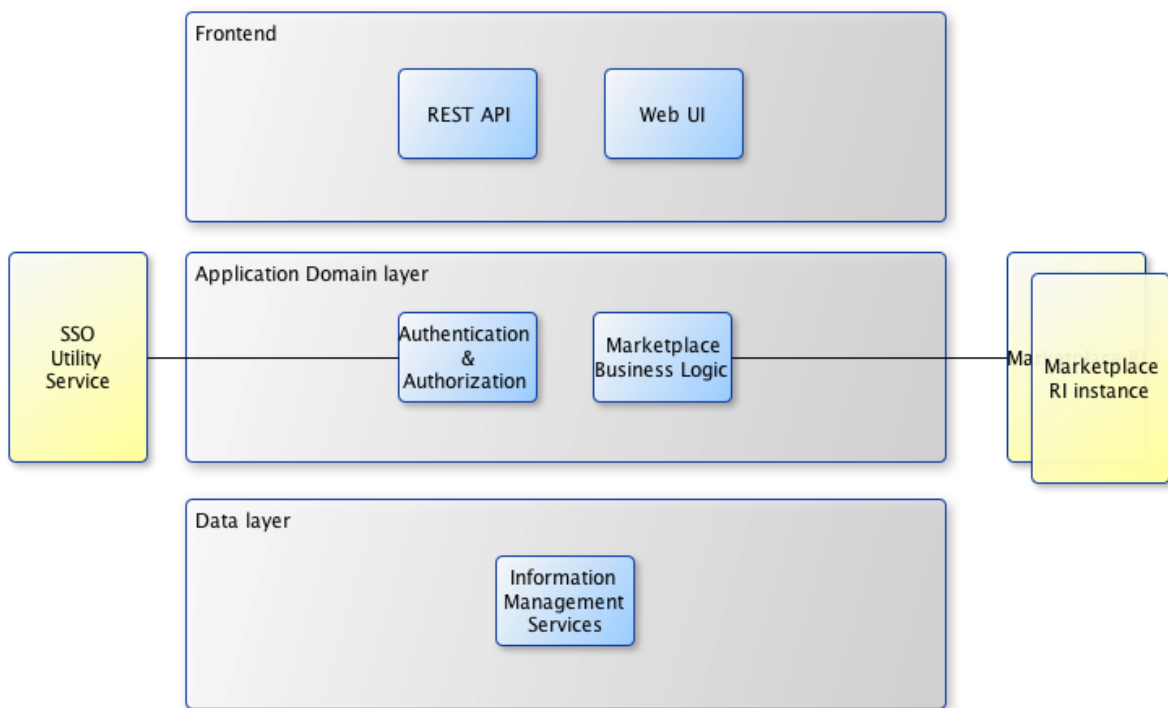


Figure 1 Architectural overview of Consumer Marketplace

Additionally, Consumer Marketplace depends on external FI-WARE Marketplace RI instances (<https://github.com/service-business-framework/Marketplace-RI>) to which it provides federated access.

2.5 Key concepts

A brief description of the key entities in the Consumer Marketplace domain model is depicted in the following diagram.

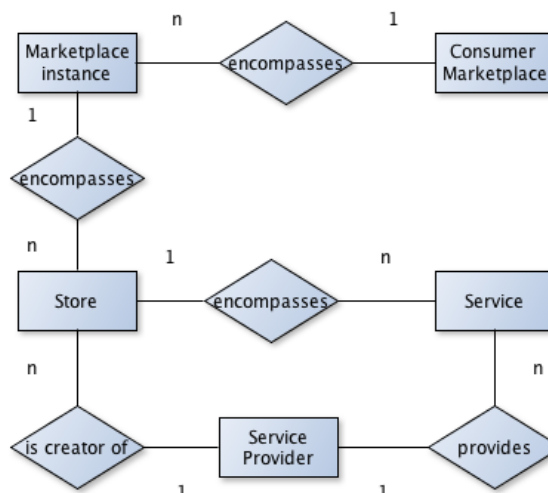


Figure 2 Key entities of Consumer Marketplace Domain model

2.5.1 Marketplace Instance

A **Marketplace Instance** is a deployed instance of the [Marketplace Open Spec](#) which implements the Search, Registration and Offerings Marketplace APIs. We will be using the [Marketplace RI](#) (Reference Implementation) Generic Enabler. A single instance of the Consumer Marketplace may interface with several federated **Marketplace Instances**.

2.5.2 Store

Each **Marketplace Instance** encompasses several **Stores**, however a **Store** can only exist within the context of a single **Marketplace Instance**. A **Store** contains several **Offerings (Services)** and is created by a single **Service Provider**.

2.5.3 Offering (Service)

Each **Service** consists of a link to its USDL document, a pricing model and the classification of the service.

2.5.4 Service Provider

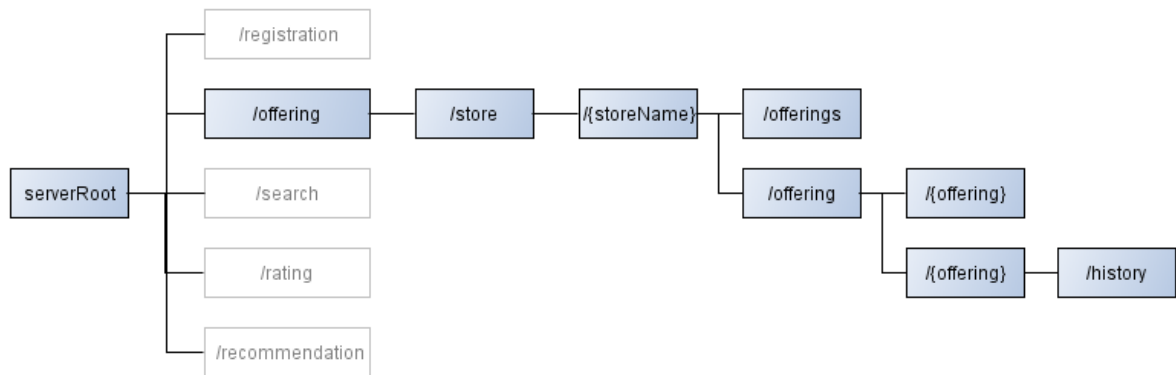
Service Providers register their stores with the **Marketplace instances** of their choice and publish service offerings to their **Stores**.

2.6 The Marketplace GE External Component – Relationship to FI-WARE Open Spec APIs

The Reference Implementation of the Marketplace Generic Enabler is provided as open source software by SAP under a modified BSD license (<https://github.com/service-business-framework/Marketplace-RI>). Technically, it is a Spring Framework-based Java web application which can be deployed on any servlet container (e.g. Apache Tomcat) and is backed by a relational database (MySQL 5 is suggested).

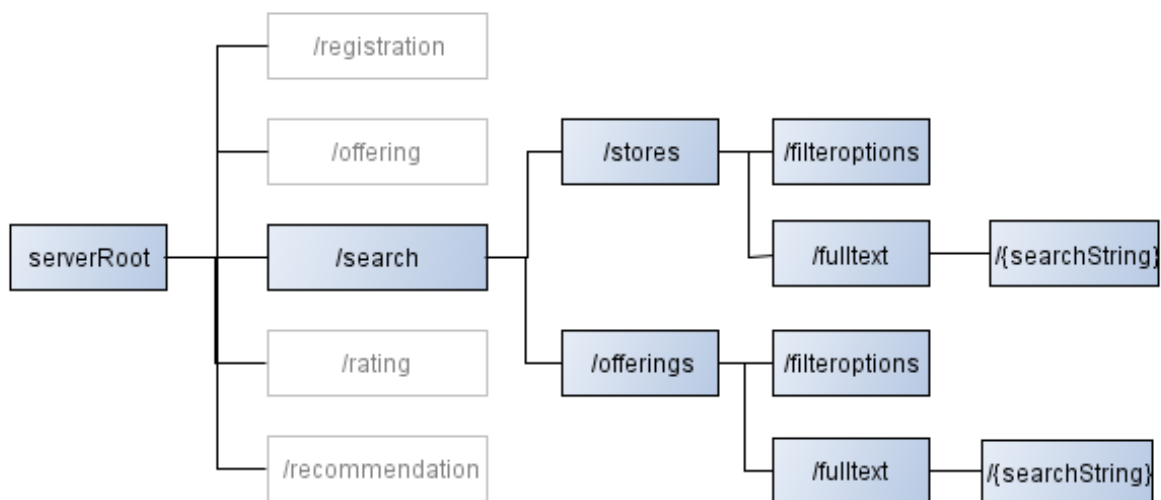
The Marketplace RI (Reference Implementation) provides implementations for the following RESTful APIs.

Offerings API



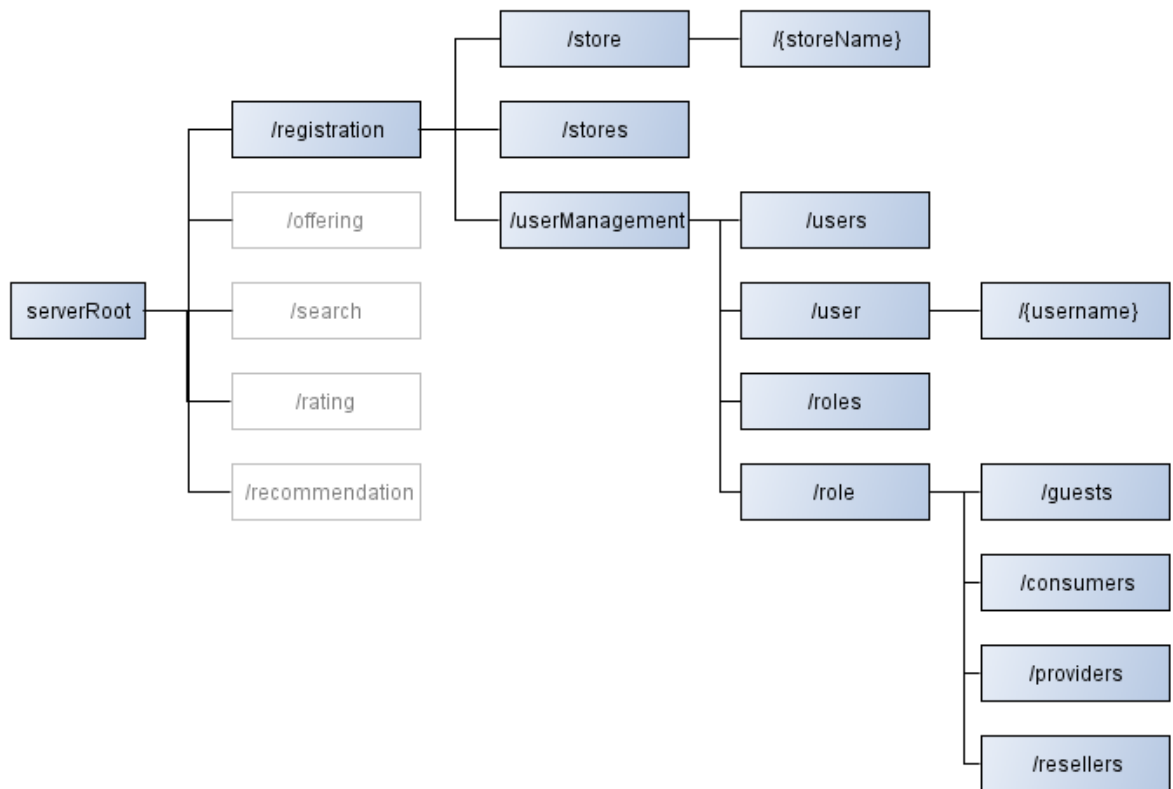
Offering is the term used in FI-WARE context as an equivalent to Service. Each offering belongs to a single store and is described by a set of attributes. Marketplace RI parses services description from USDL documents and populates its indexes and database for further queries.

Search API



Search API provides full-text search capabilities, powered by Lucene indexes of service metadata.

Registration API



Registration API supports CRUD (create/read/update/delete) operations on Store and User entities. It is important to note that even though it is planned for Marketplace GE to interface with the Identity Management GE, the current Marketplace RI implements users management via a local users database.

The following table summarizes the FI-WARE Open Specs relevant to Consumer Marketplace.

Description	Link
Marketplace Open Specification	http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/FIWARE.OpenSpecification.Apps.Marketplace
Marketplace Offerings Open RESTful API Specification	http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Offerings Open RESTful API Specification %28PRELIMINARY%29
Marketplace Search Open RESTful API Specification	http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Search Open RESTful API Specification %28PRELIMINARY%29
Marketplace Registration Open RESTful API Specification	http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Registration Open RESTful API Specification %28PRELIMINARY%29

Project ID 284860	MSEE – Manufacturing Services Ecosystem	
Date: 26/3/2013	Annex to D32.3 – FI Platform Federation first prototype	

3 Technical Information

3.1 Service requirements

The Consumer Marketplace is a deployable WAR that can be used in any java web app server (e.g. Apache Tomcat). It depends on one or more deployed instances of FI-WARE Marketplace RI (<https://github.com/service-business-framework/Marketplace-RI>), providing federated access to their functionality.

3.1.1 Operating systems

No specific constraint. (This module has been successfully installed and tested on Windows 7 Enterprise Edition and Mac OS X).

3.1.2 Java development kit

This module has been developed, compiled and tested with the latest version of Oracle JDK 7u17 (<http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html>).

3.1.3 Database

Consumer Marketplace uses MySQL Database engine.

3.2 Development environment

Consumer Marketplace uses Maven for build & dependency management.

3.3 Technical details

Nature	Source code
Programming Language	Java
Development Tools	Maven
Additional libraries	Spring Apache CXF JPA/Hibernate
Application Server	Apache Tomcat 7 (any Java webapp server should be fine)
Database	MySQL

4 Licensing

4.1 Service license

To be defined.

4.2 Third party licenses

Third party software	License
Spring	Apache License version 2.0
Hibernate	LGPL v2.1
Apache CXF	Apache License version 2.0
Apache Commons HTTP Client	Apache License version 2.0

5 Technical Manual

5.1 Installation

For quick & easy setup of a FI-WARE Marketplace RI instance, on which to use the Consumer Marketplace, a Vagrant (<http://vagrantup.com>) configuration is available that will:

- setup a virtual machine with Linux
- setup MySQL
- setup Oracle Java & Apache Tomcat
- checkout Marketplace RI sources from github.com
- compile and deploy Marketplace RI to Apache Tomcat

Given that a FI-WARE Marketplace RI instance is available (either via Vagrant or other means), installation of Consumer Marketplace is a matter of:

- setting up a MySQL database via the provided schema creation script
- deploying the provided ConsumerMarketplace WAR to Apache Tomcat.

5.2 Retrieving sources from the SVN

Source code for the Consumer Marketplace modules is available at MSEE project SVN repository:

`svn://repo.nimbus-ware.com/MSEE/SP3/WP32/D32.3/trunk/consumer-marketplace`

6 User Manual

Consumer Marketplace webapp is accessible via a web browser. Assuming it is deployed to a default Tomcat installation on localhost, Consumer Marketplace will be available at URL <http://localhost:8080/marketplace/>

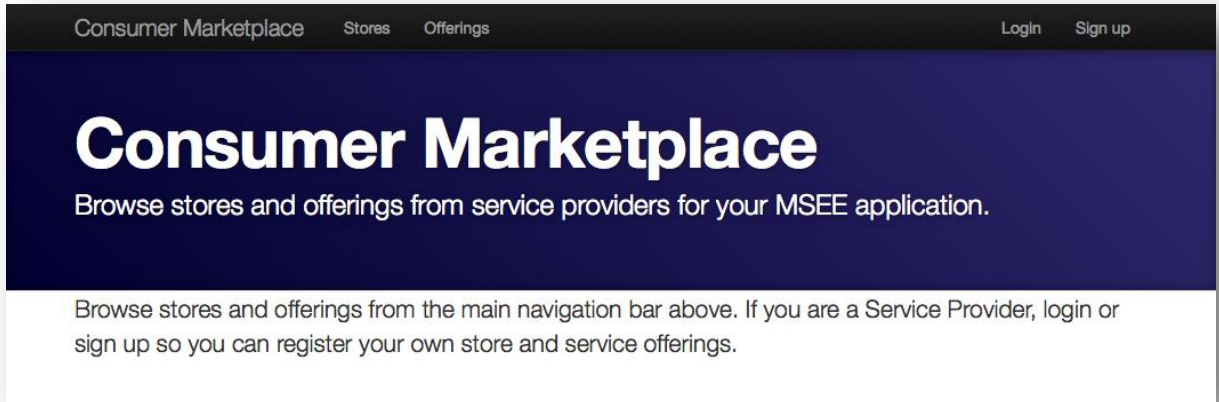


Figure 3 Consumer Marketplace home page

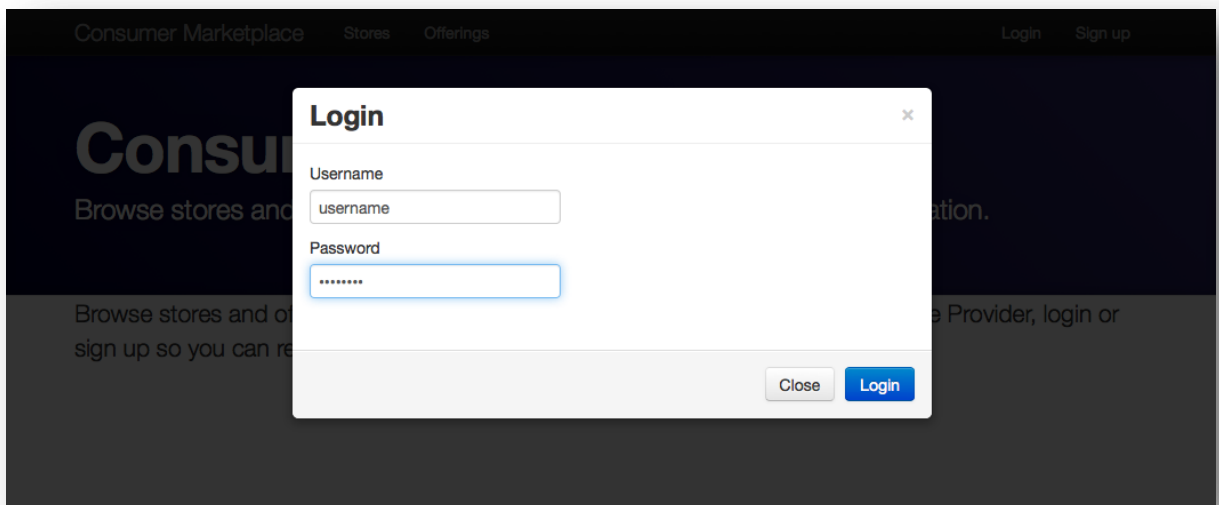
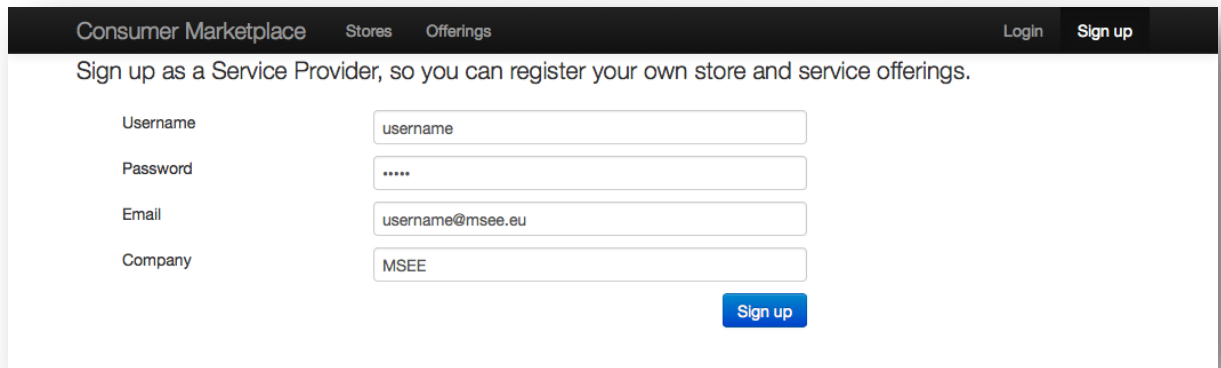


Figure 4 Login as a service provider

Service Providers need to register or login if they already have an existing account. The registration form requires service providers to provide some standard required data (email, username & password, company). Additionally, each Service Provider may setup a set of ‘trusted’ FI-WARE Marketplaces of those federated by Consumer Marketplace; these are the default FI-WARE Marketplaces to which the Service Provider’s stores & services will be published by default.



Consumer Marketplace Stores Offerings Login **Sign up**

Sign up as a Service Provider, so you can register your own store and service offerings.

Username

Password

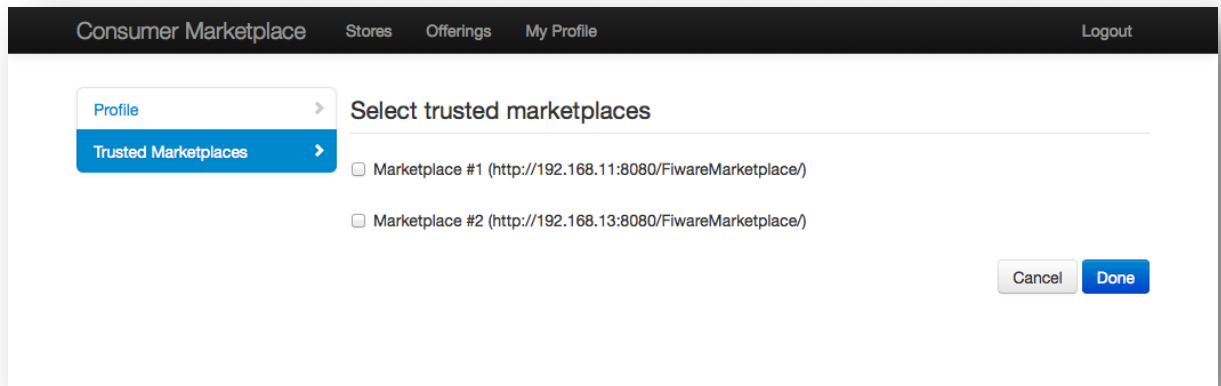
Email

Company

Sign up

Figure 5 Sign up form for Service Providers

When logged-in as a Service Provider, the additional ‘My Profile’ option appears in the navigation menu, which provides options to manage basic profile data and trusted marketplaces.



Consumer Marketplace Stores Offerings **My Profile** Logout

Profile >

Trusted Marketplaces >

Select trusted marketplaces

☐ Marketplace #1 (http://192.168.11:8080/FiwareMarketplace/)

☐ Marketplace #2 (http://192.168.13:8080/FiwareMarketplace/)

Cancel **Done**

Figure 6 Service provider indicates trusted marketplaces

All users can browse stores and service offerings in the Consumer Marketplace without having to login. However, when logged-in as a Service Provider, an additional ‘My Stores’ view allows them to view and manage stores they have created, including creating new or updating existing stores.

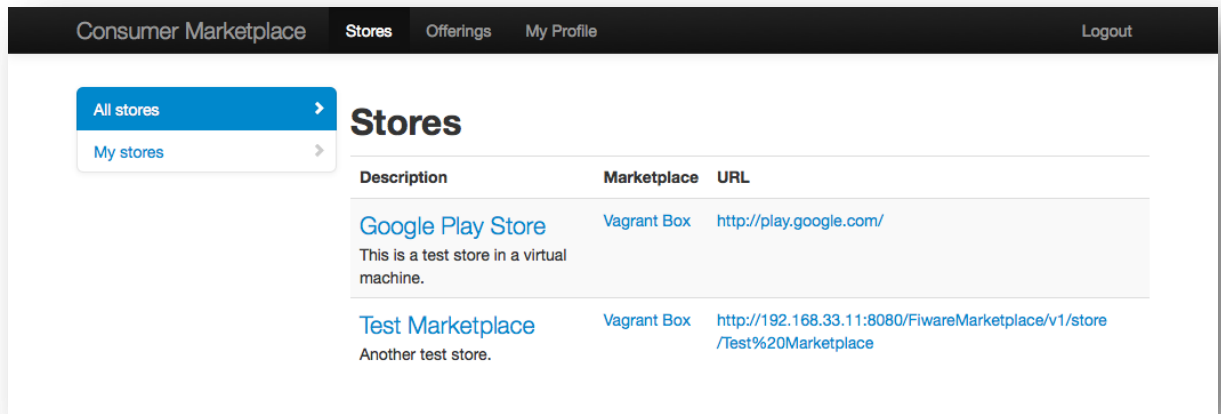


Figure 7 View of all stores. When logged-in as a Service Provider, store management options are available under 'My Stores'

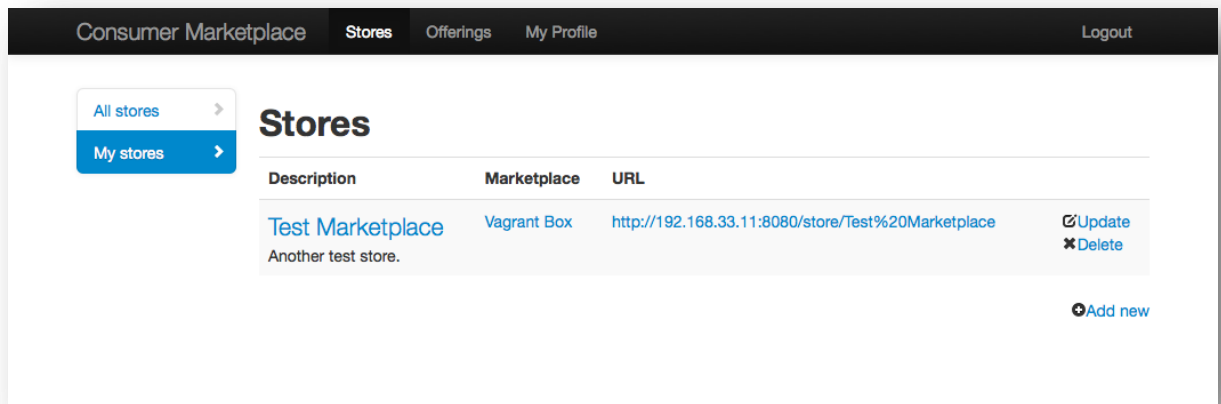


Figure 8 Managing 'My Stores' as a Service Provider

Similarly to stores browsing and management, service offerings are available for all users to browse and Service Providers can manage their own service offerings.

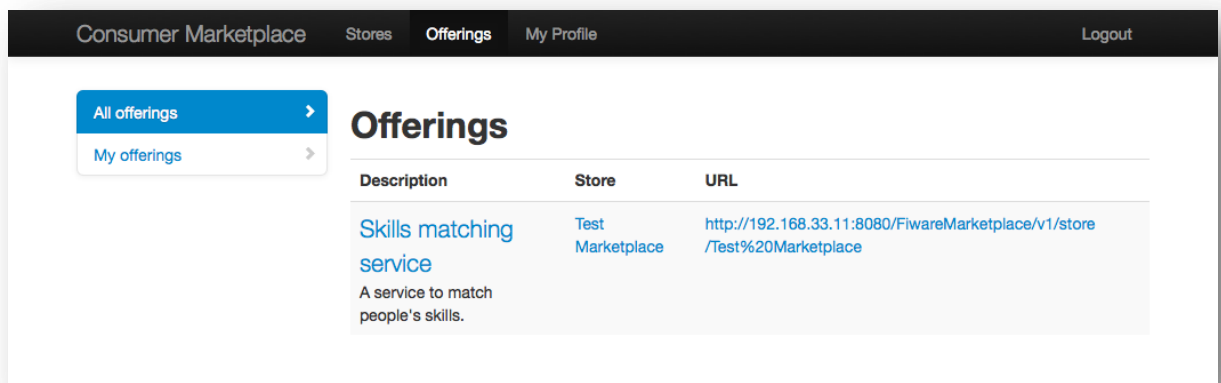


Figure 9 Service Offerings browsing

Finally, administrators are also able to manage the federated FI-WARE marketplace instances available to the specific Consumer Marketplace installation.

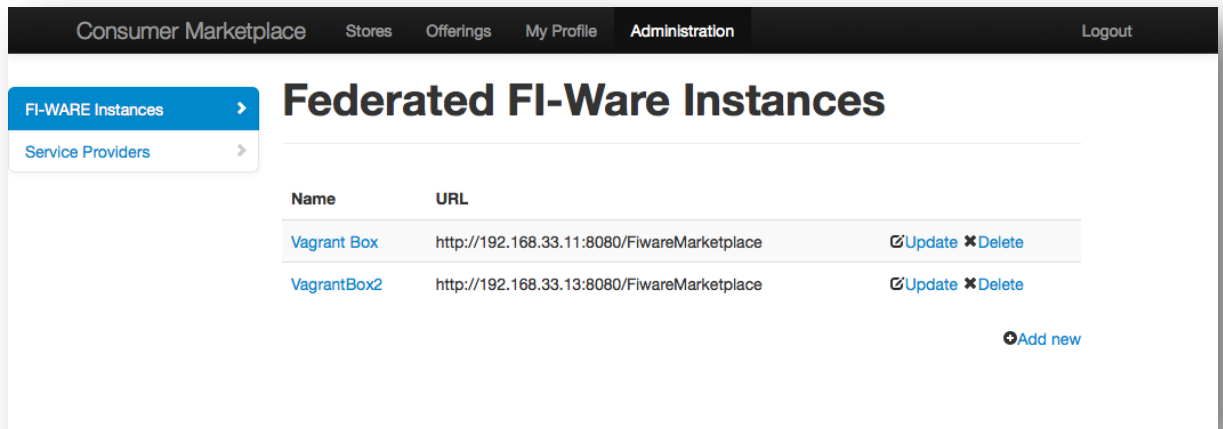


Figure 10 Administrator's view for management of federated FI-WARE Marketplace instances

7 Future plans

7.1 Implementation of further requirements and optional features

A number of requirements and optional features, as summarized in the table of requirements (2.2), will be implemented in the second prototype iteration, include full support for search across stores and offerings, service consumer registration and profile browsing as well as service proposal in ‘related offerings’ section.

7.2 Federation of Marketplace instances

Operations that require dispatching queries to several Marketplace Instances such as Federated Search, are currently implemented in the first prototype as synchronous request/response invocations. For the second prototype, we will consider asynchronous support via callback URL registration: an invoker of the Federated Search API will include in their request a callback URL. Once the federated search is complete, the API will invoke the callback URL with the results appropriately encoded as the POST's body.

7.3 Performance and scalability

Browsing and text search operations may be a performance bottleneck, since the time required to complete each operation will increase with each Marketplace Instance managed by the Consumer Marketplace. We may consider local caching of data at the Consumer Marketplace information management layer in order to scale browsing stores and services functionality, supported by a periodic job which updates the local cache with fresh data from the federated Marketplace Instances.

8 References

D32.1 – FI Platform Federation Specification and Architecture

FI-WARE Marketplace Open Specification - <http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/FIWARE.OpenSpecification.Apps.Marketplace>

SAP Marketplace Reference Implementation Source Code
<https://github.com/service-business-framework/Marketplace-RI>

FI-WARE Open API Specifications

Offerings API: [http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Offerings Open RESTful API Specification %28PRELIMINARY%29](http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace_Offerings_Open_RESTful_API_Specification_%28PRELIMINARY%29)

Search API: [http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Search Open RESTful API Specification %28PRELIMINARY%29](http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace_Search_Open_RESTful_API_Specification_%28PRELIMINARY%29)

Registration API: [http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace Registration Open RESTful API Specification %28PRELIMINARY%29](http://forge.fi-ware.eu/plugins/mediawiki/wiki/fiware/index.php/Marketplace_Registration_Open_RESTful_API_Specification_%28PRELIMINARY%29)