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

D.2.7: Friendly Testing report

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1 Introduction

1.1 About this document

Friendly Testing report describes the different test operations linked to the different Portals and Generic Enablers of the FIWARE project.

This document contains relevant information for Generic Enabler owners to identify possible bugs in the same way that give us an overview about the possible problems of use of the platform. The document is separated on each of the important test group and each of the tests includes, but not necessarily is limited to, information such as:

- Summary and outcomes of the activities, including the different issues created in JIRA.
- Scope of the test to be realized, what have been tested and what not, including the description of the issues that what taking from the Testing project with their links.
- Test Environment and Tools used and how it is applicable.
- Test Types that have been applied.
- Test Detailed Report, detailed information about the execution of the different tests.

The teams involved in Friendly Testing are different from those who did the Q&A activities in each component and they provide a fresh view of the whole environment and the entire platform.

1.2 Intended Audience

The document targets interested parties in improvement of the performance and easy utilization of Generic Enablers developed in the FIWARE project. Additionally, this document is considered public in order to show details about the open process that we are following in the execution of the friendly testing procedure.

1.3 Context

FIWARE offers the possibility to deploy your Generic Enabler through the FIWARE Lab, in which you have the possibility to deploy your own resources in the cloud in order to install after that your own Generic Enabler instances. It is known as FIWARE Lab. Under this environment are installed and used all the portals that are being used in FIWARE (Cloud, Data, Mashup and Store), but developers and/or entrepreneurs together with any user can also use the different Generic Enablers outside of the platform.

Through this premise, the different tests were separated between the use of the different portals of the FIWARE and the use of the main Generic Enablers taking into consideration that we want to use them both in the FIWARE Lab and outside of it if a user requires it.
1.4 Structure of this document

The document is structured in the following way:

- Firstly, we give a description of the different activities that the friendly testers have been following in order to identify the different bugs of the portals and Generic Enablers. We differentiate between Phase 1 and Phase 2 tests
  - During Phase 1, friendly testers will be concentrating on the execution step by step of all the components in order to identify any possible bugs or no-friendly interface of the different portals and Generic Enablers.
  - During Phase 2, friendly testers will concentrate on the development of some examples taking into account the different available Generic Enablers and their manuals.
  
  Taking into account that we have only 2 months to develop this activity, we have been concentrating only in the more used components.

- Secondly, detailed information is given about the procedure that we have followed in order to identify a new issue in any of the components and publish it into the Jira.
- Thirdly, a detailed description of the tests that have been developed during the Phase 1
- Fourthly, a detailed description of the tests that have been developed during the Phase 2
- Last but not least, we conclude with an analysis of the different issues that were created and an analysis in this short period of time of the resolution of some of them, in order to see the evolution in time of the different bugs that we have identify during the friendly testing sessions.

1.5 Associated document

This deliverable has to be observed together with the content that we have developed under the Jira instance (http://jira.fi-ware.org) in which it is reflected all the issues that have been created associated to the different issues that we have identified.
2 Description of the Task Force

Under the name of a Task Force, we want to identify the different steps that we are following in order to identify the issues that any developer may find when they try to approach FIWARE for the first time, even if (s)he has not had the opportunity to attend any of our Bootcamps and/or Technical Workshops. The difference here is that friendly testers report the different issues that they have identified in a proper document and introduce these issues inside of the tracker system in order to identify the bugs of the system, while other developers may decide to give up when they find the first issue. This will allow us to understand what has to be fixed and what are the different problems that we need to resolve as soon as possible.

In order to develop this activity, the Task Force is divided into two different phases:

- **Phase 1**, in which we make an intensive analysis of the more important Generic Enablers (Orion Context Broker, IDAS, IoT Discovery, NEC IoT Broker, Kurento, EspR4FastData and MrCoAP) and different portals that FIWARE Lab provides to the users (Cloud, Mashups, Store, Data and Account).

- **Phase 2**, in which we develop a set of examples making use of the documentation in order to evaluate the correctness of them when a new user tries to use them. Besides of evaluation of documentation, other objective is to evaluate how easy is for developers to take this technology and generate their own examples. This activity can go through the creation of new video tutorials in the same way to the update of some manuals if it was required.

Some last remarks:

- We know that you are an experienced developer. Therefore, you may infer how some little issue you find can be overcome. However, please report that issue so that we can fix it. Take into account that some third developers may not be so much experienced; therefore they may not be able to overcome the same issue. Of course, do not wait for the issue to get solved in order to continue with testing.

- Issue your reports in English and try to provide as much details as possible to make our task easier and solve issues as fast as possible.

- Any typo or improvement on language of available documentation is welcome.

- Don’t focus just on issues/problems. Any suggestion for enhancement is welcome.

- If you are blocked at any point and you don't know how to continue, please let us know. Send an email to FIWARE-friendly-testing-coordination at lists dot fi-ware dot org

- And provide in the description of the issue, details about the owner of the issue (I mean your email) in order to facilitate the traceability of that issue.
• Last but not least, I would like to remark that any email about issue that you detect must have the following schema subject:

[Friendly-Tester]<[Name of GE]> Description

Where “Name of GE” is optional, but will help us to redirect the issue.

Last but not least, the friendly testers team will be compound by the Université De Franche-Comté (FEMTO-ST), One Source Consultoria Informática LDA (OneSource), Universidad de Las Palmas de Gran Canaria (ULPGC) and Bitergia (Bitergia). It was agreed with the EC that the original Project FIWARE and the FIWARE continuation Project (code named “Fi-Core”) would both contribute resources to the Friendly Testing. The contribution of Fi-Core was substantiated in the effort of Bitergia. From a practical point of view and to provide a comprehensive account of the testing, it makes complete sense to integrate the tasks of all the contributors from different projects in a single monolithic document regardless of formal constraints.

In the following subsections, we provide more details about the different activities that we planned to follow in the different phases.

2.1 Phase 1: Definition of the Friendly Testing Use Cases

In the first phase of the Task Force, we define exhaustive tests in order to be developed during the time of this activity. The friendly testers are focused only on one individual Generic Enabler or FIWARE Lab Portal in order to work on it and find any problem. Special Mention has the Cloud Portal, due to its high complexity with lots of regions and complex functionalities; it has lots of associated tests that could be shown in the following sections (see section 3.2 for more details). The description of the different use cases is the following:

• Regarding the Cloud (https://cloud.lab.fi-ware.org/)
  o Make sure that everything works fine and it is intuitive enough. The Cloud Portal includes actually 17 regions. It is proposed to divide them in groups of 6 regions to be assigned to all of you.
  o Make sure that there is enough helpful and accurate documentation as well as video tutorials in order to use all the functionalities shown in this portal.
  o Make an exhaustive test of all functionalities of the portal for each of the available regions.
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- Provide feedback both if it is detected an error, sees something wrong, any “cryptic” error or information message after the execution of any operation and anything that could be considered that the User Experience should be improved.

- Test all images in the image catalogue in order to see if they can be used.

- Some images correspond to Generic Enablers, friendly testers should check not only that they could deploy the image but also check that the corresponding Generic Enabler can be used on it after the instantiation of the image. For this purpose, take the information provided by the own Generic Enabler (User & Programmers guide) in which these details should be described.

- This group will be formed by:
  - ULPGC tester #1, regions: Spain, Trento, Lannion, Waterford, Berlin, and Prague.
  - OneSource tester #1, regions: Mexico, PiraeusN, PiraeusU, Zurich, Karlskrona, and NITOS_UTH.
  - FEMTO-ST tester #1, regions Budapest, SophiaAntipolis, Poznan, Gent, Stockholm.

  - Check the Data content in the web site ([https://data.lab.fi-ware.org/dataset](https://data.lab.fi-ware.org/dataset)).
  - In the Datasets, select randomly 20 datasets with different format and check that it can be download them and they have the appropriate format that it is indicated.
  - By selecting a specific dataset, check that it can be previewed it.
  - By selecting the link (URL) in the preview dataset page, it can obtain the data.
  - Check that the Organizations show properly information, the same for groups.
  - Check that the About page content is shown the name and links correctly.
  - This group will be formed by:
    - ULPGC tester #2

- Regarding Store Portal ([https://store.lab.fi-ware.org/](https://store.lab.fi-ware.org/))
Check the content of the Store in order to see how it is working, taking into account the different options. Check that the USDL downloaded can be used properly.

For each Widgets/Mashups, check that the content of Main Info, Legal, Pricing and Resources are suitable.

Check that it can be obtained Widgets/Mashups by introducing data in the Acquire offering.

This group will be formed by:

- **ULPGC tester #2**

Regarding Mashup-Wirecloud ([https://mashup.lab.fi-ware.org](https://mashup.lab.fi-ware.org))

- Read the documentation about the Wirecloud in order to see the use of the component.
- Add several widgets to your environment.
- Connect them.
- Rename your workspace.
- Change preferences of your environment.
- Create a new workspace.
- Upload the new widget to the list of the resources that you have previously.
- Check the marketplace functionality.

This group will be formed by:

- **ULPG tester #3**

Regarding Account Management portals available on the FIWARE Lab ([https://account.lab.fi-ware.org/home](https://account.lab.fi-ware.org/home))

- Create new organizations
- Register new application to the previous created organizations.
- Add new member to the organization with his/her roles.
- Change the role of the user and try to access to the Cloud, Store and Mashup Portals.
Delete an organization.

Update profile of an organization.

Add an application with its name, description URL, Callback URL and application logo (this last one is optional).

Manage the different roles and permissions. Try to create new roles and the permissions associated to them.

Take the OAuth2 Credentials and, following the documentation of the IdM, try to use it in order to authenticate the application that it was created (this application could be a mock application without any functionality except the authentication process).

This group will be formed by:

- **Bitergia tester #1.**

Regarding the Generic Enablers found in (http://catalogue.fi-ware.org/enablers)

For each GE do the following:

- Install the GE in a local machine following its standard installation procedure as defined in its official documentation and check and see that everything goes as expected.

- Go through the documentation on an already installed instance of the software. See that the examples work, that is up to date and that it all makes sense as a whole.

- Install the GE in a machine deployed in FIWARE Lab that is not preconfigured with the software already (bare OS) and see that everything goes as expected.

The different GEs are assigned as follows:

- **Bitergia**: Orion Context Broker and IoT IDAS.

- **OneSource**: Kurento, IoT IDAS, CEP, Adv, Web based UI.

- **ULPGC**: IoT Broker, IoT Discovery, Adv. Web based UI, CEP.

- **FEMTO-ST**: EspR4FastData, MrCoAP,
2.2 Phase 2: Definition of the Friendly Testing Developer Examples

We have planned the following activities for the second phase in which friendly testers are focused on:

- Develop and document the open source code for example applications you will be asked to develop (to be defined during the first phase)
- Help to improve existing documentation and, overall, tutorials (written or video tutorials)

Taking into consideration these details, the different defined examples are the following:

- **1st**
  - Take some wirecloud solutions already developed and published in the store and improve it in order to provide new functionalities.
  - Develop new wirecloud components, integrated into the store portal, which provide best user interaction or new functionalities that it is not currently covered.
  - Record a video tutorial about these processes.
  - Document all the processes in order to see how we can use it.
  - Responsible: ULPG tester #3.

- **2nd**
  - Given a COMOS instance with WebHDFS and HIVE installed on it.
  - Create new dataset in HDFS.
  - Provide access to this dataset through HIVE and show the data in a wirecloud widget (maps, graphics, or whatever). Do not expend a lot of time to improve a widget here, just take one to use. If you have time, deploy a new one, it is a plus not mandatory.
  - Introduce some map/reduce process inside the COSMOS in order to process or analyse the dataset.
  - Update the documentation if it is needed.
  - Provide video tutorials about the example that you develop.
  - Responsible: ULPG tester #2.

- **3rd**
  - Using the CKAN functionality that allows to introduce a service endpoint to publish open data, provide a connection to the CKAN portal in order to publish information coming from the Orion Context Broker and develop and Access Control to the data per organization and users based on the Access Control and Identity Management GEis.
  - Provide video tutorials in which you explain how to create the solution.
  - Provide a how to manual in order to explain 3rd parties or developer the different steps that you adopted.
  - Responsible: Bitergia
• 4th
  o Given a datasets that you want to give to the community. Check the different steps that you have to follow to publish then using different file formats like CSV, XML, etc.
  o Provide a detailed manual about the different steps that you had to follow in order to do it.
  o Implement a button (not the current message in the CKAN portal) in order to request access to the data and improve the Store application to assign permissions to the users.
  o Provide a video tutorial about the steps that you have to do in order to develop this example.
  o Responsible: **OneSource**

• 5th
  o Given a CKAN datasets that you upload to the platform following the manuals and associated to an external DB.
  o Develop a trigger in the external database (you can decide which database to use) in order to automatically update the dataset when a change in the DB happens.
  o If you have time, you can decide to connect this operation with an Authentication Control System (IdM and/or AC) in order to secure all this process.
  o Generate a Manual (how to) about the step-by-step procedure to do it.
  o Generate Video tutorials about the example that you develop.
  o Responsible: **ULPG tester #1**.

• 6th
  o Follow the previous items introduced in the Phase 1, check that those that have been closed by developers where really resolved, both in the HelpDesk project in Jira and in the corresponding Chapter project in Jira.
  o Provide different report about those details in order to show a resume of the overall activity followed by the project.
  o This include all the Cloud, Account and Data Portal, Store portal and Wirecloud.
  o Concentrate only on the Jira issues that were changed from “In Progress” to “Closed”.
  o Provide details about any issue that was incorrectly closed or resolved.
  o Responsible: **FEMTO-ST**

Instructions on how to proceed with phase 2 regarding the development of example applications using FIWARE GEs are as follows:

• For all example projects
- **Design an application** using the suggested GEs. You are free to implement more GEs or other software as the application architecture demands them.

- **Run through the documentation** related to the GEs you want to use in your application, providing feedback on any trouble you may have through the usual channels. If you find something that doesn't make sense or plain doesn't work please report it.

- **Generate documentation** on how you developed your sample application. This may include a wiki, a tutorial, a guide and/or a video. It has been suggested that the documentation may be hosted in the Github repository where the code will reside, but it is up to you.

- Please consider using in your application GEs that are more horizontal in function such as Cosmos, Wirecloud or Orion Context Broker.

  - **Bitergia**
    - Orion Context Broker
    - IoT
  
  - **SourceOne (Hugo Fonseca)**
    - Kurento
    - CEP
  
  - **SourceOne (Joao Gonzalves)**
    - IoT
    - Wirecloud

  - **UPLG**
    - 3D-UI-XML3D and/or WebTundra
    - IoT
    - CEP

  - **FEMTO-ST**
    - IoT
3 Management of the Friendly Testing procedure

3.1 General description of Testers project

We have planned to developed different issues in the Jira. Those issues are related to the description of tasks that we have identified in previous section. Besides of the different issues, we need to assign them to concrete users in order to make a follow in time of their resolution. Due to this, we need to identify each of the users that can access the Testers Jira project and work with the different issues. Obviously, these users have their own Jira account in order to work inside the Testers project. Besides, they will have also the possibility to send emails to the HelpDesk projects in order to reflect any issue found during this activity.

Apart from the general users, we need to define the owner of the project, which will be in charge to create the corresponding Jira components. Components are the different product over which we want to make the testing process. In our case, they are the different Generic Enabler that we have identified plus the different FIWARE Portals that we want to check. Project owner is also responsible to define or change the status of some issues if he or she sees that the status of it if incorrect. Additionally, owner can change the status if the impediment arisen is cleared.

In the following table we can see the different actors involved in the Friendly Tester procedure.

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<thead>
<tr>
<th>Group</th>
<th>Person</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULPGC</td>
<td>Pablo Fernandez Muñiz</td>
<td>FIWARE at ulpgc dot es</td>
</tr>
<tr>
<td>Bitergia</td>
<td>Alvaro del Castillo</td>
<td>acs at bitergia dot com</td>
</tr>
<tr>
<td>OneSource</td>
<td>Paulo Simoes</td>
<td>psimoes at onesource dot pt</td>
</tr>
<tr>
<td>FEMTO-ST</td>
<td>Fabrice Bouquet</td>
<td>fabric dot bouquet at femto-st dot fr</td>
</tr>
<tr>
<td>Owner</td>
<td>Fernando López</td>
<td>fernando dot lopezaguilar at telefonica dot com</td>
</tr>
</tbody>
</table>

The following sections give more details about the different projects that friendly tester have to manage together with the mechanism to publish new issues in HelpDesk Project and the definition of the workflow of the issues in Testers project.
3.2 Issues created in Testers project

We have to keep in mind that there are two Jira projects in which we have to work:

- Testers project ([http://jira.fi-ware.org/browse/TEST](http://jira.fi-ware.org/browse/TEST)) reflects the different activities assigned to the friendly testers. The issues in this project come from the description of activities that we have developed in section 2.
- HelpDesk project ([http://jira.fi-ware.org/browse/HELP](http://jira.fi-ware.org/browse/HELP)) reflects the different issues that the user of the FIWARE Lab find in the different Generic Enablers and/or FIWARE Portals. We reuse this projects to publish any issue related our identified issues coming from the friendly testing process.

In the following sections we provide more information about the mechanism that friendly tester are following to publish any issue in the HelpDesk project (section 3.4). This section gives details about all the issues that have been created by the owner of the Testers Project in order to reflect the different activities described in section 2.

The result of that operation gives us the creation of 161 issues distributed between different Generic Enablers and FIWARE Portals. We can see a distribution of all the issues in the Figure 3.1.

![Figure 3.1: Distribution of the different issues created in the Jira Testers project.](image-url)
We have to notice that around 56% of the issues correspond to the FIWARE Cloud Portal due to its complexity. The rest of Generic Enablers and FIWARE Portals have a homogeneous distribution of issues between 4 and 7 that reflect more or less the more important activities to use with those components. We have to keep in mind that we have identified more issues than friendly testers can check during the short period of time. By conclusion, we have assigned only around 65% of all issues to the different team. Keep in mind that an issue assignation is equivalent to move the issue from Open status to In Progress status. More details about the different status in the workflow of the Testers project together with the different transition can be found in the section 3.3. It can be found a resume of the assigned issues in Figure 3.2.

3.3 Workflow of the Testers issues

The creation of the Jira issues related to the Friendly Testing activities was made following the details explained in the section 2. In order to work with the different issues, we have created a specific Workflow in JIRA how you can see in the Figure 3.3:. By default all the issues are created Open.
The Status of the issues/task in Jira and their meaning are (in order):

- **TODO**: the issue is open but not assigned.
- **IN PROGRESS**: the issue/task is assigned to some of the friendly testers and starting the activity on it.
- **IMPEDED**: if you detect that there is some problem, which blocks the execution of the issue/task. Please, describe what is the problem in order that we can resolve the impediment and continue with the activity.
- **ANSWERED**: when you have response asking for more information about the problem or you give details about that the problem will be resolve in a release x.y.z (actually the last option not be common for us due to the nature of our activity).
- **CLOSED**: when the issue/task is finished and, if it is needed, some emails are sent to the mailing list.
It is defined a set of transitions, as you can see in the Figure 3.3; which allows us to move from one state to another depending on the different events that can be found:

- **Create**, this operation will be developed by the Testers project lead when a new issue is introduced in the Jira project.
- **Start Testing**, the operation to assign an issue to a concrete team/person and start to work on it. Basically the progress in the activity related to a specific issue starts with the assignment of the issue to the concrete person. This operation is realized by the project lead.
- **Dismiss**, this operation allows us to redraw some of the issues (tests) if after the creation, the functionalities to test was dismissed from the Portal or Generic Enablers. To be done by the friendly testers.
- **Answered**, this operation allows us to ask for more details about the concrete issue. To be done by the friendly testers.
- **Reopen**, if a previous closed issue was checked again and we detect that this issue continue work inappropriately, we could reopen the issue to test again the Portal or Generic Enabler. To be done by the friendly testers and/or by the project lead.
- **Impediment arose**, due to any general failure or any other problem like no available resources, it is possible that you cannot work in the corresponding issue. When this is the case, you have the opportunity to launch an impediment in order to inform about the problem in order to know and resolve it as soon as possible. To be done by the friendly testers.
- **Impediment cleared**, the project lead can change the status from IMPEDED to IN PROGRESS when the impediment was cleared.

3.4 Procedure to create new issues in HelpDesk project

During the process to test the different Generic Enablers is possible that friendly testers find some bugs, documentation mistakes and/or user experience not appropriate. It is necessary to define the appropriate mechanism in order to publish those problems in the tracking systems defined by FIWARE project (Jira). Currently, FIWARE project has defined a mechanism in order to create automatically new bugs through emails. There are two different email accounts depending on the test activity that we want to follow:

- FIWARE-lab-help at lists dot fi-ware dot org, in order to report any general problem that can be found during the testing process.
- FIWARE-tech-help at lists dot fi-ware dot org, if there is a problem while using the different APIs provided by the Generic Enablers used.
Any time that some friendly tester sends a message to any of the above channels, a new ticket is created in a JIRA HelpDesk ticketing system (HELP project in the Jira). Then, the 1st and 2nd support level teams\(^1\) will analyse it, in the most trivial cases respond directly your request for help and if they do not know how to do it, they will pass the ticket to someone from the FIWARE development teams who will take care of it.

The next step is the definition of the appropriate information to be sent by email. HelpDesk support level and/or Generic Enable developer team receive only an issue in Jira with the problem that was identified. Consequently, we need to give as much details as possible in order to resolve any ambiguity in the definition of the issue and make life easier for them. Due to this, we define the following information to be sent in the body of the emails:

- **Responsible**, team in charge to carry out the given test. It helps us to follow back the resolution of all the issues when the HelpDesk support level decides to clone it into the appropriate chapter project (Cloud, Data, IoT, Security, etc.).
- **Description**, the description of the test. It gives details about what did the friendly testers do when they found the problem on any Generic Enabler or Portals.
- **Tested GE(s)**, explain what Generic Enabler is being tested.
- **Environment**, this describe if you are using the FIWARE Lab environment to test the Generic Enabler or you are using a local environment in which you deploy the instance of the component.
- **Instance**, enumerated values: private instance, global instance. It gives details about the use of the Generic Example. If it is used the global instances of some Generic Enablers, like Orion Context Broker or Wirecloud it should reflect global instance here, nevertheless you should specify private instance.
- **(Optional)** In case that friendly testers are testing the FIWARE Lab. The email should include description of the region in which you are testing. Besides, the project Id should be nice to be sent too. It appears on the bottom of the cloud portal when any operation is made on it. Actually, this information should be included in the description of the test.

Additionally, each of the emails should have the following subject schema:

- **[Friendly-Tester]<[Name of GE]> Description**

Where “Name of GE” is optional, but will help us to redirect the issue without going into details of the description.

\(^1\) The definition of the different level support and the people that are working on it, is out of scope of this document. If you want to get more info about that procedure and the people involve on that, please refer to the appropriate document in the XIFI and FIWARE Project.
Some last remarks:

- It may infer how some little issue you find and that friendly testers can be overcome. However, please report that issue so that we can fix it. Take into account that some third developers may not be so much experienced; therefore they may not be able to overcome the same issue. Of course, do not wait for the issue to get solved in order to continue with testing.

- Any typo or improvement on language of available documentation is welcome.

- Do not focus just on issues/problems. Any suggestion for enhancement is welcome.
4  Portals testing execution

4.1  Cloud Portal tests

Following the indications of the section 2.1, we have separated the test environment in three groups, depending on the friendly tester:

- **Group 1**, regions: Spain, Trento, Lannion, Waterford, Berlin, and Prague.
- **Group 2**, regions: Mexico, PiraeusN, PiraeusU, Zurich, Karlskrona, and NITOS_UTH.

In the following sections, we show each of the activities and issues that we have identified grouped by groups or in deeper level talking about regions.

4.1.1  Summary

The FIWARE Lab Cloud tests started with ad-hoc testing in order to get an overview of the environment. After this short first step, a more methodical procedure was employed, mainly according to the JIRA review of the procedure. Afterwards, the testing started by following the JIRA documentation. Several issues were generated on JIRA.

In this section we tested the Cloud Portal functionalities, which mainly consisted in deploying different virtual machines that implement some GEi of the FIWARE stack. We noticed that the performance over the time and over the regions of the platform varies considerably so it is difficult to make a correct evaluation of the system in general. If we only make a comparison between the ‘Spain’ region and the others tested by the ULPGC group, we find that ‘Spain’ region has a better stability and the majority of the services work. We think that more stability and coherence among regions are needed if it is going to be used in a production environment.

The created issues by ULPGC team can be verified at [http://jira.fi-ware.org/issues/?filter=-2&jql=reporter%20%3D%20%22pablo.fernandez%22%20AND%20summary%20~%20%22%5BCloud%5D%22%20ORDER%20BY%20createdDate%20ASC%20](http://jira.fi-ware.org/issues/?filter=-2&jql=reporter%20%3D%20%22pablo.fernandez%22%20AND%20summary%20~%20%22%5BCloud%5D%22%20ORDER%20BY%20createdDate%20ASC%20)

Now we proceed to list all the issues that we have found:

4.1.1.1  Design issues

- **Design with low contrast. Reported on October 22.** The chosen colours for the design are very low contrast. It is a problem if a user has a bad quality monitor or vision problems. The design clearly does not follow the Web Content Accessibility Guidelines recommended by W3C.
Future Internet Core Platform

- **Showing “important info” message repeatedly. Reported on October 22.** An “important info” message is displayed each time the user returns to the Cloud Portal main page. This behaviour could be a little annoying for the user.

- **Field errors are shown in two languages. Reported on October 22.** When a user fills a field incorrectly the displayed error is written in a combination of English with Spanish.

- **No help text is displayed when the mouse is over an image button. Reported on October 30.** Image buttons do not display text when a mouse is over them. Maybe displaying a short message that describes what action is performed by the button would help the user understand better the application.

- **If an instance has a large name it cannot be fully displayed in Instances section. Reported on October 30.** Error messages are not user friendly. Reported on October 30. Most error messages have not a description and they simply provide an error number.

- **Some elements are not visible while launching an image if there are too many security groups defined. Reported on October 30.** If there are a lot of security groups created while trying to launch a new VM from an image, the step where the user has to select the *keypair* and security groups is not correctly displayed. The user cannot see the *keypair* field or the next button because the window has a fixed height, the focus is in the *Security Groups* title and the scrollbar is not displayed instead of overflowing the content.

- **There is no adequate tier description in Blueprint templates. Reported on October 30.** There is no tier description and the user does not know what is going to be installed. For example, the user must intuit that poi_dp3.3.3 references to the version number 3.3.3 of the Point of Interest Data Provider GEi.

- If width of browser’s window is too small, left and top menus disappear. This issue prevents the user from accessing to the different sections.

- **Modal window of detaching a volume stays on screen.** Create a volume, attach it to an active instance. Then try to detach the attached volume. It will succeed. But the issue is that the "Manage Volume Attachments" modal window stays on the screen with the possibility to click again on Detach Volume button witch leads in a JavaScript error expected because the volume has already been detached.

4.1.1.2  **General issues:**

- **Problems showing Blueprint’s tiers with slow connections. Reported on October 30.** When a blueprint’s name is clicked, associated tiers should be displayed, but if someone tries to do it with a slow connection apparently nothing happens (except that blueprint is selected). After waiting a long time, associated tiers are displayed. Due to this behaviour, the user can think that the system does not work or the action does not exist. It is recommended to notify in some way that the content is loading. Either way, it would be clearer if this action could be executed from the menu “Actions”.

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• Too much time loading data of select box while adding a tier. Reported on October 30. While trying to add a tier to a blueprint, select boxes take too much time to load (more than 15 seconds).

• Some elements of Create Tier are not clear. Reported on October 30. While trying to add a tier to a Blueprint, the purpose of the icon field and the blue circle is not clear.

• Name filter fails in Create Tier. Reported on October 30. When adding a tier to a blueprint, you cannot use a name with spaces because the filter detects it, but if a name with “_” is used the filter is passed and an error is raised when trying to create the tier. This also occurs if the character “.” is used or if the name length exceeds 30 characters.

• VMs resources are limited to default flavours. Reported on October 30. While creating a new instance, the user can assign a flavour that describes how much resources will have the instance. Other PaaS providers offer the possibility of using custom resources for each instance.

• Cannot modify the resources of a VM after it was created. Reported on October 30. After creating an instance, its resources cannot be modified. It is a problem because it is not a scalable solution when other PaaS providers offer scalable solutions.

• Keypairs only can be downloaded just after its creation. Reported on October 30. Keypairs only can be downloaded just after we create them. If a user has a problem with his personal device where the keypair is stored, the user will not be able to access the VMs associated with the keypair ever again because a VM cannot change its associated keypair.

• Lack of consistency between Blueprints instances and Instances. Reported on October 30. When a blueprint is launched it appears in blueprint instances section and the corresponding VMs in instances section. If a blueprint instance is terminated the associated VMs persist. If a VM or more are terminated the blueprint persists.

• Cannot cancel “frozen” operations. Reported on October 30. When an operation takes too much time to finish, the user would want to cancel it. Cancel button is not provided and, if the user uses the esc key, the operation windows disappeared, but the loading wheel persists, preventing the user from performing any action. In this case, the user must use a new browser window because refreshing it does not work either.

• It is difficult to allocate an IP (low IP pool). Reported on October 30. Notwithstanding having not exceeded the user IP quota, the system does not allow getting a new one. There are no more IPs available to be used.

• Deploying an instance sometimes takes too long. Reported on October 30. Deploying an instance sometimes takes too long. This is compounded when the deployment is scheduled.

• Google Chrome gets frozen sometimes. Reported on October 30. Sometimes Google Chrome gets frozen while trying to perform an action. The browser stays in the status “esperando conector” (waiting for connector in English). If you want to continue using the system, you must restart the web browser because refreshing the page or closing and opening it again does not work.

• Keypairs and Security Groups are not shared between regions. Reported on October 30. Keypairs and security groups are not shared between regions. If a user
have instances in more than one region and want the same *keypair* or *security group* for different instances allocated in different regions, he must replicate it manually. Consistency problems may occur.

- **No disk space available in some regions. Reported on October 30.** There is a NaN GB Available disk in some regions (at least Trento, Lannion, Waterford, Berlin and Prague), so the system does not allow creating new instances.

- **Annoying behaviour for automatic added security groups. Reported on October 30.** Each time a Blueprint template from the *Open Catalogue* is cloned, a new security group is added, even if it was cloned before and its associated security group remains. This causes a bunch of security groups to be created. If the template and associated instances are terminated, the security group remains; this could make the management of the security groups difficult.

- **Cannot clone Blueprint templates (in some regions). Reported on October 30.** Each time a user tries to clone a blueprint template from the *Open Catalogue* a 500 error occurs in the next regions: Trento, Lannion, Waterford, Berlin and Prague.

- **Cannot launch instances from images (in some regions). Reported on October 30.** Each time a user tries to launch an instance from an image, an unspecified error occurs in the following regions: Trento, Lannion, Waterford and Berlin.

- **Possible inconsistency between *Storage Containers* and regions.** *Storage Containers* are not shared between regions. If the web is used to interact with the containers there is no problem, but if the CDMI API is used instead, there is no mechanism for selecting the region. Probably you select the region by IP but the tutorial ([https://forge.fi-ware.org/plugins/mediawiki/wiki/FIWARE/index.php/Object_Storage_-_User_and_Programmers_Guide#2._Use_initial_token_to_get_tenant](https://forge.fi-ware.org/plugins/mediawiki/wiki/FIWARE/index.php/Object_Storage_-_User_and_Programmers_Guide#2._Use_initial_token_to_get_tenant)) does not specify anything related to it.

- **400 error occurs in background while trying to create a new instance without enough memory.** If a user tries to launch a new instance when he has exceeded his memory quota, an error occurs in background but not in the current window. The user can continue creating the instance, but he will get the error in the last step in the launch instance window.

- **Volume not attached and no errors displayed.** When trying to attach a volume to an instance and failing, no error is showed, the only message displayed was that the volume was attached, but it was not. In spite of this message, if a user checks the list or sees already attached images while trying to attach to a new instance, the user does not see any associated instance.

- **Sometimes, local IP address does not appear while trying to associate a floating IP.** While trying to associate a floating IP, the local IP address of instances are not displayed, resulting in the floating IP not being associated. This issue occurs randomly.

- **Flavours are not shared among regions (Reported as Spain has less flavours for create instances than other regions). Reported on October 24.** Regions do not have the same flavours to create instances. This is a lack of coherence.

- **Login and password to access a VM via vnc. Reported on October 28.** While trying to access a VM via the vnc a login and a password are required. Sometimes they are
different than the “root” default values. Those access credentials should be mentioned and accessible to the end user.

- **VM’s trouble with keyboard recognition. Reported on October 28.** When a VM is displayed via vnc for the second time (open a VM with vnc, close it and open it again), the vnc does not respond anymore to the user input. Another problem encountered is when the user uses an AZERTY (French layout) keyboard, the vnc display has trouble sending special characters such as: ;., ....

- **User session timeout not shown.** When a user doesn’t do any action the session in the cloud portal is timed out but nothing is show to the end user. Any action he tries to make while being timed out fails until he refreshes his browser.

4.1.1.3 **Spain region issues:**

- **Error cloning Orion Blueprint template. Reported on October 24.** Trying to clone the Orion Blueprint results in a 400 error. This error happens randomly.

- **Cannot find requested image of Orion Blueprint template. Reported on October 24.** While trying to launch the Orion Blueprint template, a “Cannot find requested image” error occurs. This error happens randomly.

- **Orion blueprint template does not have Orion Context Broker installed. Reported on October 23.** If a user launches the Orion Blueprint template, the resulting instance does not have the Orion context broker installed. It can be checked accessing the VM via ssh, and listing the content of the /etc/init.d/ folder.

- **orion-cluster Blueprint template does not have Orion Context Broker installed. Reported on October 24.** If a user launches the orion-cluster blueprint template, the resulting instance does not have the Orion Context Broker installed. It can be checked accessing the VM via ssh, and listing the content of the /etc/init.d/ folder.

- **CEP Blueprint template does not have CEP installed. Reported on October 30.** If a user launches the CEP Blueprint template, resulting instance does not have the CEP installed. Can check accessing the VM via ssh, and trying to find the ProtonApp.jar file. launchProton.sh file cannot be found either.

- **CEP image does not have CEP installed. Reported on October 30.** If a user launches the CEP image, the resulting instance does not have the CEP installed. It can be checked accessing the VM via ssh, and trying to find the ProtonApp.jar file, launchProton.sh file cannot be found too.

- **Cannot connect to CentOS-6.3-x86_64 instance via ssh with port 22.** In spite of having the correct security groups with the port 22 open, it is not possible to connect to the instance of the CentOS-6.3-x86_64 image.

- **Cannot connect to eidas-sbc-img instance via ssh port 22. Reported on October 30.** In spite of having the correct security groups with the port 22 open, it is not possible to connect to the instance of the eidas-sbc-img image.

- **Node.js is not installed in NodejsMysql Blueprint template. Reported on October 30.**
- **Cannot log in to MySQL server in NodejsMysql Blueprint template.** Reported on October 30. Cannot log in to the installed MySQL server installed in the NodejsMysql Blueprint template because the root password is changed and not specified in the documentation.

- **Wirecloud Blueprint template does not work due to a WSGI problem.** Reported on October 30. Cannot use Wirecloud due to a server error related to WSGI.

- **Wirecloud-apps-monetization Blueprint template cannot be installed.** Reported on October 30. After few hours trying to install the wirecloud-apps-monetization Blueprint template an installation error occurs.

- **Cannot connect to augmented-reality-img instance via ssh port 22.** Reported on October 30. In spite of having the correct security groups with the port 22 open, it is not possible to connect to the instance of the augmented-reality-img image.

- **Cannot connect to access-to-control-gei-tha-3.3.3-1 instance via ssh with the associated keypair.** Reported on October 30. In spite of having the correct security groups with the port 22 open and an associated keypair, it is not possible to connect to the instance of the access-control-gei-tha-3.3.3-1 image.

- **Download corrupted pdf file using the CDMI API.** Reported on 31 October. When a pdf file is uploaded to object storage using the web, if the user downloads it from the web, the file is ok, but if it is downloaded with the CDMI API, the resulting file is corrupted.

- **Cannot create volumes.** Cannot create volumes in the ‘Spain’ region. An error is displayed but not specified.

- **cloud-rendering-r3.3.3 does not have tundra installed.** Cloud rendering image from ‘Spain’ region does not work. At least it does not have tundra installed. The documentation refers to https://github.com/realXtend/tundra and in that repository the readme file specifies that after installation the tundra command is available.

- **“After installing you will find the Tundra (and TundraConsole on Windows) executable from the install directory, run Tundra --help for available command line parameters.”** End to end testing url does not work either (http://<VM-IP>:3000/service/receiver?test=true)

- **Cannot connect to CentOS-6.3-x86_64 instance with keypair.** Reported on November 10. In spite of having an associate keypair, it is not possible to connect to the instance of the CentOS-6.3-x86_64 image with it.

4.1.1.4 **Prague region issues:**

- **Cannot allocate IP in Prague region.** Reported on 31 October
- **Prague region does not have not Storage Containers.** Reported on 31 October
- **Prague region does not have the Containers section in the Storage menu.** Reported on 31 October.
4.1.1.5 **Trento region issues:**

- *Invalid flavorRef provided* error while trying to launch Orion Blueprint template. Reported on October 24. “Invalid flavorRef provided” error occurs while trying to launch Orion blueprint template. Before launching the template the user has been clicked in “edit template” but cancelled without modifying anything.
- *Cannot find requested image* error while trying to launch Orion Blueprint template. Reported on October 24. “Cannot find requested image” error occurs while trying to launch Orion blueprint template.
- *503 error* while trying to clone orion-cluster Blueprint template. Reported on October 24. “503” error occurs while trying to clone orion-cluster blueprint template. Despite this, you can try to launch the instance but it will fail.
- *500 error* while trying to delete Blueprint template. “500” error occurs while trying to delete orion-cluster Blueprint template with its instances already terminated. User must refresh the webpage if he wants to delete the Blueprint template.
- *Unknown error* while launching an instance and 409 after attempting to reboot it. Reported on October 24. The instance is launched but with the ERROR status without specifying anything. At this point, if the user tries to reboot the instance a 409 error occurs. These errors may be related to the “Not disk space available” issue.

4.1.1.6 **Waterford region Issues:**

- Resource could not be found while trying to launch the centOS-6.3.init image, "Image not found" error occurs when trying to launch the centos-6.3.init image in ‘Waterford’ region.

4.1.1.7 **Mexico region issues:**

- HELP-920 (edit and delete images) none of the image operations such as Edit, Delete seem to be working.
- HELP-913 (unsuitable flavour sizes) if the flavour is not supported by the VM instance it should not be shown as a viable option. This helps to avoid the user trying to launch a given image and getting an error due to the diminutive size of the resources and having to repeat the whole process again.
- HELP-921 (Keypair download) when downloading a created keypair in Safari the file name is Unknown and there is no given file type.
- HELP-395 (delete snapshots) unable to delete an instance snapshot that was created.
When executing the “Delete snapshot” action in the Snapshots section, a modal loading screen is shown and doesn’t disappear. This modal loading screen is also presented in full screen mode, which prevents any other action to be executed in the interface.

- **HELP-470** (clone blueprint) when trying to clone a blueprint template sometimes the error 503 appears with no additional information. Still, the blueprint template is cloned. This seems to happen more frequently when trying to clone multi-tiered templates.

- **HELP-974** (blueprint launch issue) some of the 3 tiered blueprint templates cannot be launched as instances. They present a status of ERROR and no additional information is provided. This is common for all regions tested by Group 2.

### 4.1.1.8 PiraeusN region issues:

- **HELP-936** (number of available floating IPs) when testing the creation and deletion of IPs we are no longer able to obtain any more IP addresses from any of the IP pools. The system does not let us get another IP even when we release unused IPs.

- **HELP-981** (UI information update delay) sometimes upon creating an instance, the system is not able to associate a Floating IP to the instance. The “and to IP Address” field does not present the local IP of the instance. After a refresh of the page, the system is then able to complete the operation correctly.

- **HELP-970** (importing a keypair) when trying to import a keypair we get Error 400 which informs that Keypair data is invalid. I’m pasting the contents of a generated keypair file. We tried it with and without the header and the footer of the RSA key. We think there should be some sort of additional help since it is not clear how the key should be imported.

- **HELP-977** (multiple volumes) when trying to attach a second volume to an instance nothing happens. The system outputs a success message but the volume is not attached.

- **HELP-982** (launching multiple snapshots) the options to launch an instance from a given snapshot in the snapshots side-menu don’t work. Therefore it is impossible to launch several snapshot instances at the same time. The only way to launch snapshots is from the images side-menu.

### 4.1.1.9 PiraeusU region issues:

- **HELP-1005** (volume unlisted) can create and attach a volume but when we login via SSH to the machine, no adequate volume is listed as attached or mounted.

### 4.1.1.10 Zurich, Karlskrona and NITOS_UTH region issues:

- Zurich, Karlskrona and NITOS_UTH presented several more issues at testing time that prevented some cases to be examined. No issues were created because on some causes we didn’t even
had the ability to attach an instance to a network. Nonetheless, when this problem was solved, these regions presented results similar to Mexico, PiraeusN and PiraeusU.

4.1.1.11 **Budapest region issues:**

- **Launching Marketplace Blueprint Error.** After cloning the marketplace blueprint template, the attempt to launch it fails with an “Cause: 0 error”
- **503 Error while cloning nodeJsMsql blueprint template.** While cloning the nodeJsMsql blueprint template from the catalogue of images a 503 error shows but the template is cloned and deploys correctly.
- **503 Error while cloning Kurento blueprint template.** While cloning the Kurento blueprint template from the catalogue of images a 503 error shows but the template is cloned and deploys correctly.
- **503 Error while cloning orion blueprint template.** While cloning the orion blueprint template from the catalogue of images a 503 error shows but the template is cloned and deploys correctly.
- **503 Error while cloning orion-cluster blueprint template.** While cloning the orion-cluster blueprint template from the catalogue of images the 503 error shows. The template does not deploy after this error.
- **Password change error.** Change a password of an instance before launching it. Launch the session and try accessing it via vnc or console. The new instance does not take the new password in consideration.
- **Snapshot creation not showing in snapshot page.** After taking a snapshot of a running instance, a success message shows that the operation has succeeded but the snapshot is not listed in the snapshot page.
- **Error cloning Business-Framework-Consumption.** Clone of the Business Framework Consumption results in error statement.

4.1.1.12 **SophiaAntipolis region issues:**

- **Terminating an instance that is in error status.** Terminate an instance that that was launched and that gives an Error status is not working. The instance shows that it is in deleting status but it has no effect.
- **Launch instance error.** While trying to launch any instance in the SophiaAntipolis region the status of the instance results in error systematically.
- **Create volume error.** While trying to create any volume in the SophiaAntipolis region the status of the volume results in error systematically.
- **No Default Network.** No default network is configured in order to connect the VM to it.
- **Clone of blue print template Error.** While trying to clone any blueprint template from the catalogue the error “Error: Infrastructure error Error creating server: “Cannot find requested image”

4.1.1.13 **Poznan region issues:**
- **Blueprint template catalogue unavailable.** When trying to access the blueprint template catalogue it is empty and the browser console shows a bunch of 503 Service unavailable errors.

4.1.1.14 **Gent region issues:**
- All errors are similar to SophiaAntipolis region.

4.1.1.15 **Stockholm region issues:**
- **Error cloning Business-Framework-Consumption.** Clone of the Business Framework Consumption results in error statement.
- **500 Error while attaching volume.** Error 500 occurs when the end user tries to attach a volume of 1GB “The server has either erred or is incapable of performing the requested operation.”
- **503 Error while launching * Image CentOS-6.5-x64 *.** The image stays in Status: BUILD Task: scheduling Power State: NO STATE even after ~ 30 min and refreshing the page.
- **400 Error: Associating floating IP Error.** After creating an XIFIpublicACREO IP and trying to allocate it to an image launched the error: “Error. Unable to associate floating IP”, "code": 400 is shown.

4.1.2 Scope

**Regions group 1**
We have tested the object storage API for the ‘Spain’ region and all Blueprint templates and images for the next regions: Prague, Spain, Trento, Waterford, Lannion and Berlin.

**Regions group 2**
The tests were performed across several regions/servers such as, Mexico, PiraeusN, PiraeusU, Zurich, Karlskrona and NITOS_UTH. According to the task allocation on JIRA the test cases presented below were analysed.

**Regions group 3**

D.2.7: Friendly Testing report 34
The tests were performed across several regions/servers such as, Budapest, SophiaAntipolis, Poznan, Gent and Stockholm according to the task allocation on JIRA. All JIRA test case are accessible from this link: http://jira.fi-ware.org/browse/TEST-XX where XX represents the task number, i.e. for TEST-31 go to: http://jira.fi-ware.org/browse/TEST-31

4.1.3 Test Environment and Tools

Regions group 1

The system where tests were performed was an OSX 10.5 using the last versions of Chrome and Firefox web browsers. We also used the Terminal tool to access the virtual machines via SSH or to make some advanced tests in console.

To test Blueprint templates we cloned each one from the open catalogue, and launched it after we added the keypair, the automatic created security groups and a custom security group with the port 22 opened in order to access it later. Finally, we assigned a public IP to the VM, if more than one was created we assigned it to the machine that offers the service.

To test the images we added the keypair and the security groups with the port 22 and all the others that the application needed open and launched it. Finally, we assigned a public IP to the resulted VM.

To ensure the proper functioning of the element tested, we used the sanity checks procedures described in the official documentation if they are provided and if not, we used the basic operations that the elements implement.

For tests related to storage API, we used the web interface and the curl command line tool. We created new containers and files, downloaded and deleted it using the two mechanism and we verified that the changes done using the web interface, appeared consulting with the curl command and vice versa.

We also tested the volume creation and assignation to an existing VM from the web interface.

Regions group 2

The tests were performed mainly on an OS X 10.10 machine with Safari 8.0 and Chrome 38.

Regions group 3

Browser: Chrome Version 38.0.2125.104
Operating System: Linux version 3.13.0-37-generic (buildd@roseapple) (gcc version 4.8.2 (Ubuntu 4.8.2-19ubuntu1)) #64-Ubuntu SMP Mon Sep 22 21:30:01 UTC 2014
The test was performed by region. For each region we took all the tasks that were necessary to be done and we have done them integrally.

4.1.4 Test Types

Regions group 1

Tests were focused on checking that GEi and other services provided by images, Blueprint Templates or the object Storage work, regardless of another non-functional characteristics. Nonetheless we collaterally found some issues related to the platform performance or the user experience. These issues are detailed with the others in the section 4.1.1.

If we get into details of what kind of test were done, we find different categories with several levels:

Tests for images:
1. The element can be deployed.
2. The element can be accessed.
3. The element has installed the correct GEi or services.
4. The GEi or services work correctly.

Tests for Blueprint templates:
1. The element can be cloned.
2. The element can be deployed.
3. The element can be accessed.
4. The element has installed the correct GEi or services.
5. The GEi or services work correctly.

Tests for Object Storage:
- Volumes:
  1. A volume can be created.
  2. A volume can be attached/detached.
  3. A volume is accessible from the instance that it is attached.
- Containers:
  1. A container can be created.
  2. Files can be uploaded (via web UI or REST API).
  3. Files can be downloaded (via web UI or REST API).
4. Coherence between web UI and REST API.

Regions group 2

The tests were focused on checking that the services provided by Instances, Images, Flavours, Floating IPs, Security Groups, Keypairs, Containers, Volumes, SDC Management and Blueprints work.

Tests for instances:

1. Pause an instance.
2. Unpause an instance and see that it is running (access via ssh).
3. Suspend an instance.
4. Resume an instance and see that it is running (access via ssh).
5. Reboot an instance.
6. Change the password of an instance and check it.
7. Take a snapshot of a VM and see it in the snapshots list.

Tests for images:

1. Check images.
2. Try to edit an image.
3. Try to delete an image.
4. Launch an image.
5. Go to instances and see if you can access via VM Display.

Tests for Flavours:

1. Use the different flavours and check that the VM that you deploy has the corresponding resources indicated in the flavour.

Tests for Floating IPs:

1. Allocate IP to project.
2. Associate IP.
3. Check that you can go into the VM using your keypair.
4. Disassociate IP.
5. Release floating IP.
6. Release several floating IPs at the same time.

Tests for Security Groups:

1. Create a security group with different values of name and description (check the different values that are accepted in the textbox).
2. Edit security group rules.
3. Add a new rule with values between -1 and max port, type of protocol, CIDR and source.
4. Add a new rule with exactly the same parameters.
5. Delete the parameters.
6. Try to create a TCP rule for one port, try to create a UDP rule with the same ports.
7. Try to create a ICMP rule.
8. Assign a rule to a VM and see that the values assigned work with you.
9. Select one security group and delete it.
10. Select several security groups and delete them.

Tests for Keypairs:
1. Check that different keypair names are allowed (try numbers, punctuation marks, characters and a mix of them).
2. Import a keypair.
3. Check that the creation of a keypair shows you a link to download the public key at the end of the process (in different browsers).
4. Delete a keypair.
5. Select several keypairs and delete them.

Tests for Containers:
1. Create a container.
2. Delete a container.
3. Upload an object (less than 1Gb).
4. Upload an object (bigger than 1Gb).
5. List objects of a container.
6. Download object.
7. Copy object.
8. Delete containers with object inside and delete objects within a container.

Tests for Volumes:
1. Create volume with different combinations of characters in its name.
2. Attach a volume to an instance.
3. Check inside the instance that the volume was really created.
4. Delete a volume attached to an instance.
5. Delete an instance with a volume attached.
6. Detach a volume from an instance.
7. Delete a volume available (not attached to an instance).

Tests for SDC management over a VM instance:
1. Launch a new instance of the base image type (repeat the process for each base image).
2. Go to the list of instances and select the new one and go to the Overview information of it, select from the list of the software several SWs to be installed in it.
3. Check that the SW is really installed.
4. Repeat the process by checking the different base images and SW to be installed in order to check both of them.

Tests for Blueprint templates:
1. From the blueprint template/catalogue select each of them in order to clone them.
2. Select the new cloned template and deploy it.
3. Check that the SW is up and running.

**Regions group 3**

In order to validate all the functionalities of the cloud portal in the regions Budapest, SophiaAntipolis, Gent, Stockholm and Poznan, we have done an exhaustive testing of the online application.

All tests have been performed in a similar way without taking into account the region. As a matter of fact, all the functionalities should behave in the same way and should not depend on the region where it is being made.

The tests where 100% functional black box test.

![Black Box Testing Approach](image)

**Figure 4.1: Black Box Testing Approach**

As we see in Figure 4.1, our test case input comes from the JIRA tasks, the application is the FIWARE Cloud Portal and finally our test case output is the results we see on the browser screen.

The black box test is efficient because the end user should not worry what is happening in the application. He asks the system to execute a task and he awaits its results to be delivered properly.

**4.1.5 Test Detailed Report**

**Regions group 1**
As is said in the 4.1.3 section, tests were done following the instructions detailed in each GEi official documentation after deploy the corresponding Blueprint template or instance.

In order to test a Blueprint Template, we change to the region that is going to be tested, we access Blueprint Template section and then we open the Open Catalogue. Once here, we select the correspondent template and clone it. We ensure that the keypair is correctly settled by editing the cloned template. Now we proceed to launch the instance and to assign a public IP. If the instance has been deployed rightly, we can test if the Generic Enabler works. To accomplish this objective, we access the official documentation of the Generic Enabler and we execute the Sanity Check procedures as described. If there are no Sanity Check procedures in the documentation, we try its basic operations.

In order to test all images, we access Images section and launch the image that is going to be tested. In the options we set the correspondent keypair and security groups. Note that we always use a general security group with the ports 22 and 80 opened and another, with the ports used by the GEi if it is needed. Once the image has been launched, we assign a public IP to it. If all this steps have been done successfully, we can proceed to test the associated Generic Enabler. If the image doesn’t have a GEi like the Ubuntu server image, we test if it is possible to access the image via ssh and to install packages. To test that an image that contains a GEi we access its official documentation and we execute the Sanity Check procedures as described. If there are no Sanity Check procedures in the documentation, we try its basic operations.

In order to test the Object Storage, we have done two types of test:

- To test the volumes, we created them with different sizes and names and then, we tried to associate them with different already created images.
- In a first stage, to test the Containers, we created new ones and then, we uploaded and downloaded several files and we verified that their contents had not changed. In a second phase we perform the same test but using the REST API. We test also the coherence between changes done through the REST API and the web UI.

Regions group 2

A more detailed view on the tests, which were performed, is presented below:

- Instances:


  Instance operations:
  
  o Pause an Instance [OK]. Appears to be working on the servers, which we can log into via SSH.
  o Unpause an instance and see that it is running (access via SSH) [OK]
  o Suspend and instance [OK] appears to be working on the servers, which we can log into via SSH.
  o Resume an instance and see that it is running (access via SSH) [OK]
Future Internet Core Platform

- Reboot an instance [OK]
- Change the password of an instance and check it [Reported HELP-994]
- Take a snapshot of a VM and see if it appears in the snapshots list [OK].

Some servers had problems regarding the inability to have a working instance (Mexico); impossibility of establishing an SSH connection (PiraeusN, Zurich); changing the password having no effect (PiraeusU); inability to run instances due to unavailability of networks (Karlskrona, NITOS_UTH).

• Images

Image tested: TEST-42, TEST-43, TEST-44, TEST-45, TEST-46 and TEST-47. Image operations:

- Check images [OK]
- Try to edit an image [Reported HELP-920]
- Try to delete an image [Reported HELP-920]
- Launch an image [OK]
- Go to instances and see if you can access via VM display [OK]

Some servers had some issues regarding the inability to run instances due to unavailability of networks (Karlskrona, NITOS_UTH).

• Flavours

Flavour tested: TEST-54. Flavour operations:

- Use the different flavours and check that the VM that you deploy has the corresponding resources indicated in the flavour. [Reported HELP-913, HELP-972]

Regarding the Mexico server, if the flavour is not supported by the VM instance it should not be shown as a viable option. This helps to prevent the user from trying to launch a given image and getting an error due to the reduced size of the resources and having to repeat the whole process again. The tester was unable to launch several types of images, such as Ubuntu Server 14.04.1 x64, CentOSx64 and marketplace- ri-R2.3. He tried doing so with the small and medium flavours and also tried with and without security groups and key pairs. The current status of the images is ERROR, and no further information can be obtained.

Regarding the Zurich server, it could not be connect via SSH to verify the CPU and RAM allocation according to the flavour.
Regarding Karlskrona and NITOS, it could not be tested due to not being able to adequately deploy instances.

- **Security**

Floating IPs tested: TEST-57. Floating IPs operations:

- Allocate IP to Project [Reported HELP-936, HELP-981]
- Associate IP, check that you can go into the VM using your keypair [OK]
- Disassociate IP [OK]
- Release one floating IP [OK]
- Release several floating IPs at the same time [OK]

Several servers still have some issues regarding floating IPs. Mexico cannot have a working instance, therefore cannot test the floating IPs. PiraeusN cannot associate sec_ext_net IPs but net04_ext are successfully associated with an instance; cannot connect to instance through SSH; and cannot associate more than one floating IP. Zurich cannot associate sec_ext_net IPs but net04_ext are successfully associated with an instance; and cannot connect to instance through ssh. Karlskrona and NITOS could not run.

- **Security Groups tests: TEST-60. Security operations:**

- Create a security group with different values of name and description [OK]
- Edit security group rules [OK]
- Add a new rule and check values between -1 and max port, type of protocol, CIDR and source [Reported HELP-934]
- Add a new rule with exactly the same parameters [OK]
- Delete rules [OK]
- Try to create a TCP rule for one port [OK]
- Try to create a UDP rule with the same ports [OK]
- Try to create a ICMP rule [OK]
- Assign the rule to a VM and see that the values assigned work [Reported HELP-978]
- Select one security group and delete it [OK]
- Select several security groups and delete them [OK]

- **Keypairs tests: TEST-63. Keypairs operations:**

- Check that different names of keypairs are allowed [OK]
- Import a keypair [Reported HELP-970]
Check that the creation of a keypair shows a link at the end in order to download [Reported HELP-921]
Delete a keypair [OK]
Select several keypairs and delete them [OK]

There are some problems regarding keypairs on all servers, such as the importation of a keypair not being user friendly and the fact that the system presents a message suggesting the automatic download of the keypair, which never happens. Also, on Safari the downloaded keypair has “undefined” for name and file extension.

- **Storage**

Containers tests: TEST-69. Containers operations:
- Not supported on all tested servers.

- **Volumes tests: TEST-72. Volumes operations:**
  - Create a volume with different combinations of characters in its name [OK]
  - Attach a volume to an instance [Reported HELP-977]
  - Check inside the instance that the volume was really created [Reported HELP-1005]
  - Delete a volume attached to an image [OK]
  - Delete an instance with a volume attached [OK]
  - Detach a volume from an instance [OK]
  - Delete a volume available [OK]

On the working instance it was verified that the volume was not present when connecting via SSH. Furthermore, no more than one volume could be attached to an instance.

- **Snapshots**

Snapshot tests: TEST-69. Snapshot operations:
- Check to launch an instance from snapshots [OK]
- Select several instances and launch them [Reported HELP-982]
- Edit an image [OK]
- Select one snapshot and delete it [Reported HELP-395]
- Select several instances and delete them [Reported HELP-395]
There are some system issues common to all servers regarding the selection of snapshots and the deletion of them.

- **Blueprints**

  Blueprint tests: TEST-85. Blueprint operations:
  
  - From the blueprint template/catalog, select each of them in order to clone it [Reported HELP-470]
  - Select the new cloned template and deploy it [Reported HELP-974]
  - Check that the SW is up and running [OK]

  There are some issues regarding the cloning of some templates with more than one tier. Also, when correctly cloned these templates create issues, due to their multi-tiered nature.

**Regions group 3**

In this section we will describe precisely how tests where realised. All those operations were performed on all the regions that were affected to group 3: Budapest, SophiaAntipolis, Gent, Stockholm and Poznan.

To test the operations that an instance can realise, we first select an image from the images links under “Compute” menu, we try to edit it and to delete it (right click on an image row), then launch it (click on launch button) with a specific flavour and with (if created) /without a keypair. We eventually ended up trying all the flavours available in the region and test several keypair creation. We wait for its status to be in RUNNING mode. The first step after that is to check if the VM is accessible over VM display (vnc): click on the instance you want to connect to it and go to “Connection” tab. You will find a button “View Display” that will open a window displaying the VM.

Jira tasks number, full & partial coverage by those steps:

- Images: TEST-48 TEST-49 TEST-50 TEST-51 TEST-52
- Flavours: TEST-55
- Keypairs: TEST-64

After that or while the instance is deploying, we can proceed to create a floating IP and download a security keypair. Those steps allow us to test the Keypairs Floating IPs and Security Groups. Indeed we will open a port 22 and allocate the public floating ip to the newly created instance. It will also allow us to test the ssh connection to the instance. Jira tasks number, full & partial coverage by those steps:

- Security Groups: TEST-61
- Keypairs: TEST-64
We repeat those steps several times, > 2 times when possible due to IP pool limit.

Once we have instances launched and running with public ip associated to it, we do the basic operation as pause, unpause, create a snapshot, launch created snapshot, create volume, attach volume to instance, delete a volume attached to an instance, et cetera.

After the tests are performed, we try to clean the Cloud Portal of the additions that has been made: delete one by one/ grouped of instances, floating IPs, volumes, etc.

For every error encountered an email is sent to the FIWARE lab help mailing list.

For more information about how the tasks are done, we watched the pretty complete tutorial available in the Help&Info section: help.lab.fi-ware.org.

The exact same operation where made to blueprint instance at the difference that they are cloned or created before launching them.

4.2 Data Portal

4.2.1 Summary

In this subtask we have checked the Data Portal, giving focus to the user experience. We conducted tests for every section in the portal, using the functionality in order to see how it works, reading the provided information in order to know if it is appropriate for the portal and also clicking on the links we found to see if they redirect us to the expected page.

Issues can be verified at: http://jira.fi-ware.org/issues/?filter=-2&jql=reporter = "pablo.fernandez" AND summary ~ "%5C]%5BChecking Data%5D %5C" ORDER BY createdDate ASC

As a result of the testing process, we found the following issues, ordered by section:

4.2.1.1 Datasets issues

- **Wrong URL in the main Download button for a dataset. Reported on 2014-11-05.** The “Download” button in the main dataset page redirects you to a wrong URL or to an about:blank page instead of giving you the chance of downloading the resource. On the other hand, no problems are found for the “Download” button that is inside the preview area for that dataset and you can download the resource there.

- **Not necessary Additional Info area without information is shown. Reported on 2014-11-05.** In the main dataset page, an “Additional info” table is shown below the dataset description. Sometimes no extra information was included, but the table is still
there. It is not an error, but it will be better if the table is hidden when no extra information exists for the dataset.

- **A “Go to resource” button instead of the “download” button was seen. Reported on 2014-11-05.** When a dataset is not able to generate a preview, the “download” buttons that are in the main dataset area and in the “More information” area change their names and symbols and become a “Go to resource” button, but its functionality still are allowing you to download the resource. As well, as it says nothing about a download, you would think the one included in the “More information” area have another functionality (in the tester’s case, he thinks it is a “Go to the main area for the resource” button) but instead of that, the button asked us about downloading the resource. It is not an error, but that could generate some kind of confusion, so we suggest renaming it again to “Download”.

- **Data API broken link. Reported on 2014.11.05.** When acquiring data from Store, a new browser window will be opened showing more information about the data just acquired. There is a Data API button users can click on. If you click on that button, a popup message will be displayed on screen and gives you the possibility to check more information in the ‘main CKAN Data API and DataStore documentation’ but the truth is the link is broken. The link we are talking about is the following one: [http://docs.ckan.org/en/latest/datastore.html](http://docs.ckan.org/en/latest/datastore.html).

- **Madrid Transport finder filter issue. Reported on 2014.11.05.** In this data acquired we found its finder filter does not work properly. It gives you the possibility to search data but the truth is whatever word we type to filter by, it gives no results. This happens in the finder filter that appears on the opened browser window when acquiring Madrid Transport data from the Store. Here is the link we are talking about: [https://data.lab.fiware.org/dataset/madrid-transport-evolution/resource/206106bf-5196-4562-9adb-97cb9f5aabad](https://data.lab.fiware.org/dataset/madrid-transport-evolution/resource/206106bf-5196-4562-9adb-97cb9f5aabad).

- **Handler error shown at the More Information area for a dataset. Reported on 2014.11.05.** For those datasets in which a preview cannot be generated, a More Information area is shown instead of the Preview one. That is OK, because no preview was generated and you still want to show more details about the resource, but the new area also shows an error message that says: “No preview available - No handler defined for data type: <format>“. As you do not expect a preview, it will be better if you set hidden this error message.

- **Although a dataset can generate a preview, the More Information area appears instead of the Preview area and the preview is shown inside its description. Reported on 2014.11.05.** For a certain example (NGSI format), the Orion data is being shown inside the description and you can consider that a preview, but there is no Preview but More Information area for that dataset. The handler error that we explain in a previous error is also displayed.

- **The URL provided in the Preview / More Information area is wrong. Reported on 2014.11.05.** The “Download” button in the Preview / More Information area redirects you to a wrong URL or to an about:blank page instead of giving you the chance of downloading the resource. This issue is analogous but not the same one as in the main dataset page download button.
• **Mozilla Firefox browser freezes when you try to preview a certain JSON dataset. Reported on 2014.05.11.** Attempting to preview the FIWARE-ost-lisbon-case dataset, that is in JSON format, using the Mozilla Firefox browser, you can see in the screen the name of the resource, the URL for downloading the resource and a “Loading” message. The browser apparently freezes forever (at least more than 3 minutes, time in which the tester decide to close the navigator) and you cannot use any tab in the browser. Using Google Chrome for the same action, the dataset is shown perfectly fine after a loading time of about 5 seconds. For other JSON samples, as [https://data.lab.fi-ware.org/dataset/cancellati-dall-anagrafe/resource/98476652-8270-424d-aa89-cfaa83656a4d](https://data.lab.fi-ware.org/dataset/cancellati-dall-anagrafe/resource/98476652-8270-424d-aa89-cfaa83656a4d), the preview works perfectly fine, so we think this issue is strongly related with the content of the chosen resource.

• **During a preview, you can ask for a range of records larger than the total number of records within the dataset. Reported on 2014.05.11.** When you are looking for data using the preview tool, you will find that there is a record range selector in the toolbar included over the record table. The range selector allows you to introduce numbers bigger than the maximum number of records. An example could be [800 - 900] in a dataset that has 721 records (Sevilla - Equipamientos de Sevilla - CSV). When you insert that range, an “Unknown records” message is shown and the record table is displayed empty. That is not bad at all, but it could be even better if you just avoid that possibility.

• **A zip resource is damaged and told us about an Apache Tomcat 400 error for a certain dataset. Reported on 2014.05.11.** For a certain dataset that contains 2 ZIP resources, those resources can be downloaded apparently fine by anyone but you cannot unzip its content, so they are useless. The referred dataset was “Valencia: Tráfico y transportes / Aparcabicis (Shape/ZIP and KML/ZIP formats)” [https://data.lab.fi-ware.org/dataset/valencia-traficotrans-aparcabicis](https://data.lab.fi-ware.org/dataset/valencia-traficotrans-aparcabicis). Opening those ZIP resources with a text editor, you could see a html-like error messages that told us it is a "Apache Tomcat - HTTP Status 400: The request sent by the client was syntactically incorrect ()." As well as the zips for another datasets that are similar to this one (example: [https://data.lab.fi-ware.org/dataset/valencia-urbaninfra-ejescalle](https://data.lab.fi-ware.org/dataset/valencia-urbaninfra-ejescalle)) are working properly, we suspect it is just a local dataset error.

• **An “API Endpoint” instead of the “Download” button was seen for a certain dataset. Reported on 2014.05.11.** When a dataset is not able to generate a preview, the "download" button that is in the “More information” area changes its name and symbol and becomes an “API Endpoint” button, but its functionality is still allowing you to download the resource. This is analogous to the “Go to resource” issue that we reported before but not exactly the same, because only the “More information” area download button changed its name. As well as it says nothing about a download you are going to think that button has another functionality relative to the API, but instead of that, the button asked us about downloading the resource. This issue may generate confusion to a new user, so we suggest renaming that button again to “Download”.

• **A 404 - Resource not found is shown when you try to download RTF resources from a certain dataset. Reported on 2014.05.11.** When you try to download the RTF resources by any of the ways you are able to do it for a certain dataset, a FI-Lab error
message that says “404- Resource not found” is shown and you cannot get your document, so those resources are useless.

4.2.1.2 Groups issues

- **The groups have no datasets associated:** Reported 6 November. We cannot see any dataset included into the checked group, so at this time that group is apparently useless. Groups affected by this issue: All of them but Santé, that has a single dataset associated.

- **Cultural group is duplicated in the Groups area of the Data Portal.** Reported 6 November. Two copies of the same group (named Cultural) can be found. One of them has complete description on what it is and the other one has no information at all. Nowadays it does not matter, because no one of them have datasets, but in the future this issue can generate some kind of confusion on users (What group should I search if I want to look for cultural data? I found two cultural groups!), so we suggest removing one of them. Groups affected by this issue: Cultura

4.2.1.3 Organizations issues

- **The organization didn’t upload datasets.** No datasets can be found for the checked organization. Organizations affected by this issue: Las Palmas de Gran Canaria, Torino

4.2.1.4 About issues

- **The CKAN Tour link included in the page redirects to the Feature Overview link.** Reported on 2014.11.05. The fourth link included in the page, that refers to CKAN Tour, redirects to the Feature Overview website. This website is also included in the About page as the fifth link. That is not an error, but as well as two links point to the same website, maybe you want to delete one of them.

4.2.2 Scope

The tests we had conducted for Data Portal were the following:

- Check the data content by the following steps:
  - Select 20 datasets with different format in a random way and checking if the resources have the appropriate format and are able to download.
  - For those datasets, try a preview and determine if it is possible or not.
  - Try also if the URL given for a resource included in those datasets allows the user to get the data.
• Check the organizations and groups’ pages in order to see if they have appropriate information.
• Check the content of About page to see if the name and links are correct.

4.2.3 Test Environment and Tools

Our tests were performed directly on the Data Portal, using different browsers such as Mozilla Firefox and Google Chrome, and replicating our experiments for each browser, in order to see if you can interact well with the portal at every moment, no matter with the conditions the user has.

4.2.4 Test Types

Our tests were based on doing normal actions a user wants to do with the resources included in the Data Portal, like downloading and previewing data, in order to take notes about the user experience while working with the Data Portal. No performance tests were made.

A selection strategy was designed in order to define the target datasets for our testing process. You can see that strategy in the section 1.2.5.

Most of the tests were conducted successfully. However, some minor issues were detected during the experiment, most of them are cases in which a single issue was replicated for more than a resource.

4.2.5 Test Detailed Report

We decided to select the 20 datasets according to the following criteria:

• Every organization that had uploaded datasets at the moment of the experiment must be represented with at least a dataset in the sample.
• Since at the moment of the test, there were more datasets in the sample than organizations, the organizations that uploaded a bigger number of datasets had to have more weight in the sample.
• The sample had to have as different formats as possible.
• Since there were more formats than datasets in the sample, we should select the most representative formats for our sample.
• If a pair organization-format had more than a dataset, the selection of a dataset had to be conducted by a random function ([1 - number of datasets])

In order to follow all these steps, we selected the following pairs organization - format:
Table 4.1: Organization-format selection for Data Portal testing

<table>
<thead>
<tr>
<th>Organization</th>
<th>Format</th>
<th>Datasets</th>
<th>Chosen dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logroño</td>
<td>XLS</td>
<td>1</td>
<td>1 - Indicadores</td>
</tr>
<tr>
<td>Santander</td>
<td>NGSI</td>
<td>1</td>
<td>1 - Outsmart sensors</td>
</tr>
<tr>
<td>Lisboa</td>
<td>JSON</td>
<td>1</td>
<td>1 - FIWARE-ost-lisbon-case</td>
</tr>
<tr>
<td>Sevilla</td>
<td>CSV</td>
<td>4</td>
<td>2 - Equipamientos de Sevilla</td>
</tr>
<tr>
<td>Vigo</td>
<td>CSV</td>
<td>5</td>
<td>3 - Movimientos de buques</td>
</tr>
<tr>
<td>Lleida</td>
<td>KML</td>
<td>2</td>
<td>2 - Mapa paradas de autobús</td>
</tr>
<tr>
<td>Alcobendas</td>
<td>XML</td>
<td>13</td>
<td>4 - Presupuestos municipales</td>
</tr>
<tr>
<td>Alcobendas</td>
<td>RSS</td>
<td>4</td>
<td>2 - Cursos</td>
</tr>
<tr>
<td>Valencia</td>
<td>GeoJSON</td>
<td>64</td>
<td>29 - Urbanismo e Infraestructuras: Red de hidrantes de protección contra incendios</td>
</tr>
<tr>
<td>Valencia</td>
<td>ZIP</td>
<td>61</td>
<td>40 - Tráfico y Transportes: Aparcabicis</td>
</tr>
<tr>
<td>Rotterdam</td>
<td>PDF</td>
<td>17</td>
<td>4 - Rijnhaven kabels en leidingen ondergrond</td>
</tr>
<tr>
<td>Rotterdam</td>
<td>GML</td>
<td>5</td>
<td>2 - Servicepunt Sport</td>
</tr>
<tr>
<td>Rotterdam</td>
<td>DOC</td>
<td>5</td>
<td>1 - Verkeers Informatie Locatie Database</td>
</tr>
<tr>
<td>Málaga</td>
<td>SHP</td>
<td>172</td>
<td>86 - Información SIG Mapa Estratégico de Ruido de Málaga - Tráfico rodado vehículos Índice Lnoche</td>
</tr>
<tr>
<td>Málaga</td>
<td>KMZ</td>
<td>1</td>
<td>1 - Planos de barrios de Málaga</td>
</tr>
<tr>
<td>Málaga</td>
<td>XLSX</td>
<td>1</td>
<td>1 - Atención a emprendedores - Indicadores 2013</td>
</tr>
<tr>
<td>Trentino</td>
<td>RDF</td>
<td>146</td>
<td>123 - Trentino: Biotopi di interesse comunale -pup-</td>
</tr>
<tr>
<td>Trentino</td>
<td>DXF</td>
<td>3</td>
<td>3 - Comune di Trento - Localizzazione pubblici esercizi</td>
</tr>
<tr>
<td>Trentino</td>
<td>RTF</td>
<td>1</td>
<td>1 - Produzione fotovoltaica su edifici PAT</td>
</tr>
<tr>
<td>Trentino</td>
<td>CSV - semicolon</td>
<td>28</td>
<td>21 - Elenco progetti co-finanziati dall'Unione Europea</td>
</tr>
</tbody>
</table>
4.3 Store Portal

4.3.1 Summary

In this phase, we checked the Store Portal, giving focus to the user experience and paying attention to the performance too. We conducted tests for every section in the portal, using the functionality in order to see how it works and reading the provided information in to know if it is appropriate for the portal.

Issues can be verified at: http://jira.fi-ware.org/issues/?filter=-2&jql=reporter = "pablo.fernandez" AND summary ~ "%5C%5Bstore%5D %5C" ORDER BY createdDate ASC

As a result of this phase, we detected the following issues, ordered by subtask:

4.3.1.1 Check the contain of the store

- **Resource registering form - Selectable Content type - domain values.** The resource registering form is working fine. Maybe it could be better if the “Control-type” field allows you to choose between regularly used options, like “application/x-widget+mashable-application-component”, or there should be any help to know how to fill this box.

- **Non-clickable checkbox when selecting a resource to add into an offering. Reported on 2014.11.05.** In the fourth step of “Create new offering”, you have a selection panel for resources to add. All the elements in the panel have a checkbox at its right corner. Clicking on that checkbox does nothing, so you are forced to click on the name of the resource if you want to check or uncheck that resource.

- **Buttons for documentation and homepage should not be shown if those aren’t defined. Reported on 2014.11.05.** If you upload an offering without document and homepage references, buttons will appear in the description for documentation and homepage that you can click, but nothing happens. It should be better if you can disable that buttons when no documentation neither homepage references are indicated for the offering.

- **Offering deletion issues. Reported on 23 October.** Two types of issues happened randomly during an offering deletion. In the first of those issues, the offering continues in “My offerings” area with a red tag what indicates that it was deleted, but it is still there. At the second one, the offering continues in “My offerings” area with an “Acquired” green tag, giving you the impression that it was never deleted. You can also try to delete it again: that generates an error alert that warns you that offering is already deleted. In spite of these issues, the offering was always deleted properly from WStore and Marketplace.

- **Upload offering - Instructions for setting a Default URL for notification. Reported on 2014.11.05.** At the first step of uploading process, you can mark “Default URL for notification”. That generates you an error, “No default URL specified for notification”, at the end of the process [step 4]. That is not bad at all, but it would be better if that error includes instructions on how to set that default URL.
• **Offering uploaded to the Store with URL resources sometimes cannot be installed in the Marketplace. Reported on 2014.11.05.** Sometimes, an uploaded offering that includes an URL resource cannot be installed and used in the marketplace properly. Instead of it, an “unknown” tag was attached to the widget, instead of the expected “widget” - “pack” - “mashup” tag and the install button became a “details” button. Note that you are able to download the URL resource directly when you purchase it, so it is NOT a resource registration issue neither an upload issue. In spite of this issue, it happens randomly and you can install the widget most of the times.

• **You can purchase a paid CKAN dataset in the WStore without paying for it. Reported on 2014.10.23.** While we are checking the resources information of a CKAN data set, you can see a [X.XX €] button below the icon. If you decide to click it and fill all the steps with fake information, you can acquire a paid CKAN dataset without paying. An invoice PDF with your fake information is generated and you can access the data without any problem.

• **General FILAB issue - Lack of consistency in user account information between the different areas included in FILAB. Reported on 2014.10.23.** In a computer in which two Fi-Lab accounts are used with some frequency, session errors could be found so, in fact, you can use two accounts at the same time. The pattern detected is that you can use an account in Cloud-CKAN-Account areas and another one in Store-Mashup areas. This issue would be extremely annoying if you acquire an offering with CKAN resources at the Store with the first account and you try to check for your resource in CKAN, because the second account is active for CKAN. That means you can see your recently acquired CKAN resource only if the same resource was acquired for the other account, although you acquired your CKAN resource without any problem.

• **Creating new “edit” and “delete” buttons for a review. Reported on 2014.10.30.** After you create a review for an offering, the review is shown in Main Info section for that offering. That is good, but it could be better if you create buttons to edit or delete that review, because maybe a user wants to change something in the review, add more impressions or just delete it.

• **Resources header without content. Reported on 2014.10.30.** If you acquire an offering, which includes only an application, and you decide to click on “Resources” button (upper-left corner of the details area for the offering, below the offering icon), you will see that a pop-up will be displayed. Inside it, a header titled “Resources” can be read, but no content exists below that header. It is not an error, but it will be better if that header is not included into the text for the pop-up to display.

• **Weird error alert found when you click on the USDL editor magnifier button. Reported on 2014.10.30.** During an offering upload process, you can edit your own USDL using the advanced editor provided by the Store. In that editor, there are three buttons in the lower-left corner of the screen. Clicking on the magnifier button, two pop-ups are launched. One of them refers to a repository, the second one is a JavaScript alert that says “error”. We have no explanation about its meaning and, as well the Repository dialog is created and you can work with it, we do not know why an error message is launched.

• **Annoying distribution of buttons and input components inside Calendar form in USDL Advanced editor. Reported on 2014.10.31.** If you need to fill a date gap in the USDL editor, a
calendar form will be opened. At the bottom, you could see that Now and Done buttons overlaps both “Minute” text and bar. That makes hard to do actions like pressing Now and Done buttons, and also it gives a bad-looking impression to the user.

- **USDL Editor dialogs have no scrollbar even when its content is larger than the dialog itself. Reported on 2014.11.05.** Some dialogs included in the USDL Editor have very large content but the Editor does not include a scrollbar. Although you are able to drag the content, the first time you use the Editor website you will have some kind of confusion about this topic.

- **The USDL Editor settings button does not work. Reported on 2014.11.05.** During an offering upload process, you can edit your own USDL using the advanced editor provided by the Store. In that editor, there are three buttons in the lower-left corner of the screen. If you click on the settings button, nothing will happen.

- **Bad Gateway error appears during an application upload with USDL URL provided. Reported on 2014.11.05.** In the second step of the upload process for an offering, you can choose between “Basic USDL”, “Upload USDL” and “Provide USDL URL”. If you decide to choose the third one, including a URL that points to a well-created USDL .RDF file, a Bad Gateway error will be shown at the end of the upload process.

- **CSS and text error at the second step of the new application registering process. Reported on 2014.11.05.** When you upload a logo image in the second step of the new application process, that image will overlap the “examinar” button, which is over the logo. Note there that “examinar” and the text right of that button are in Spanish, but the rest of the website is written in English.

- **No moderation applied to the reviews for an offering in the Store. Reported on 2014.11.05.** Comments that you left as a review for an offering do not have any moderation, but are published automatically. This behaviour allows you to introduce spam or inappropriate comments.

- **External application was created before we finished the registering process: Reported on 2014.11.05.** While we were trying to register an application in Account area in order to upload it later as an offering into the Store, we saw that the registering form you should fill has 3 steps, but you only need to fill the first one in order to create the application. This behaviour implies that you could decide to abort the registration at step 2 (choose an icon for the application) but you will find later that the application whose registration you stopped is actually registered and ready. It is not an error, but maybe it could generate confusion to the users, because they would expect the application is going to be registered at the end of the process.

- **You can create several identical external applications and copy applications from another user. Reported on 2014.11.05.** While we were creating external applications in order to upload them as offerings into the Store, we realized that you can register identical applications. That means same name, same URL, same callback URL. That allows you to create an application that is just a copy from an existing application that was created by another user and then you can upload your copy into the Store as if the application is really yours. You can even register the same application the number of times you want, leading on an unnecessary redundancy and maybe (depending on that number of times) a database space problem.
• A “Document for the given offering doesn’t exists” error is shown while you are trying to delete an open offering that isn’t uploaded to the Store: Reported on 2014.11.05. If you decide to delete an open offering you created before but you have not uploaded yet to the Store, an error message that says “The document for the given offering doesn’t exists” will be displayed and the offering will not be deleted. New attempts to delete the same offering will result in an error message without text and the offering will not be still deleted.

• You cannot bind a mashup resource created in your Mashup area to a new open offering. 2014.11.05. One of the steps you are going to pass through while you are creating an offering is the “Bind resources” step (fourth one). You can add your resources at that point or you can add them later by clicking on the Advanced Operations-> Bind Resources button for an offering. You can create resources by two ways:
  1. Uploading them using the Provider Options->Create Resources
  2. Publishing a workspace you have in the Mashup Area.

   When you try to bind a resource created from the second way, you will find that you could do it properly if the offering is not marked as open, but you cannot find the resource in the resources list if you mark your offering as open. This issue happens when you are creating the offering and also when you try to bind the resource after the offering creation.

4.3.1.2  Check that you can obtain a widget/mashup by introducing data in the Acquire offering.

• Old version in video tutorial: Reported on 2014.10.29. Video tutorial for WStore (included at FI-Lab// Help&Info and also at http://edu.fi-ware.org/course/index.php) was recorded using a previous version of WStore.

• Tax information form can be filled with fake data. Reported on 2014.10.29. Tax information form allows you to enter fake information in an offering request. Non-numerical data for Postal Code is also accepted.

• A single download pop-up for every single resource within the offering is been launched. Reported on 2014.10.29. When you enter the information for an offering, every single resource asks you automatically for a place to save its download. That is not an error but could be annoying if the offering includes lots of resources, because you have to click “OK” for every widget within the offering. It would be better if the offering asks you for a single .zip download that includes all resources inside it.

• Confusing process to install and use resources from an offering in the mashup. Reported on 2014.10.29. Using resources from a downloaded offering is extremely confusing. You have the impression you are ready to use them when you download your first offering from the WStore, but its resources do not appear in “My Resources” (Mashup area) and you could think something was wrong during the install process. Apparently, the truth that nobody said in WStore Video Tutorial is that you are not ready to use the resources only with the download,
but you are forced to look for your offering in Mashup-Marketplace and click “Install” before you start using it.

4.3.1.3  For each Widgets/Mashups, check that the content of Main Info, Legal, Pricing and Resources are adequate.


- **No license neither clauses specified. Reported on 2014.10.29.** The offering has a legal information tab in the details area, but there is not any license, clause or “terms and conditions” text defined. Offerings affected: Carga electrica barra, Valencia Carga Electrica, Sevilla Test, TestBerl, TestingFIWAREAddData, Test4Store2, Offering name.

- **Lack of main information: Reported on 2014.10.29.** The main information tab, in the details area for the offering, exists but it has no description for the offering. Offerings affected: Test4Store2, DlmApp1

- **404 - Dataset not found Error. Reported on 2014.10.20.** If you try to look for the data included in your offering after purchasing it, a 404 error will be shown, indicating that the resource you are asking for does not exists. Offerings affected: Pharmacies in Ile de France.

- **Mashups included as a resource in the offering needs you to install some dependencies in order to use it inside the mashup area. Reported on 2014.10.29.** After you download and install a mashup offering, some mashups require you to install some dependencies in order to work. It only happens for one widget, so we think something was lost during the offering upload.

4.3.2  Scope

The tests we had conducted for Store Portal were the following:

1. Check the content of the Store in order to see how it is working, taking into account the different options. Check also that the USDL downloaded can be used properly.
2. For each Widgets/Mashups, check that the content of Main Info, Legal, Pricing and Resources are correct.
3. Check that you can obtain a widget/mashup by introducing data in the Acquire offering.
4.3.3 Test Environment and Tools

Our tests were conducted directly on the Store Portal, using different browsers such as Mozilla Firefox and Google Chrome, and replicating our experiments for each one, in order to see if you can interact well with the portal at every moment, no matter with the conditions the user has.

Some tests required to do extra actions in other FIWARE Lab sections like Mashup, Account or Data, using tools like USDL editor or uploading files to servers outside FIWARE Lab in order to test some user actions which involved URLs.

We also needed to create a testing mashup example and a testing application example to complete some uploading tests: that means we used code editors and a web server for the application example.

4.3.4 Test Types

Our tests were based on doing normal actions a user wants to do with the Store Portal, like acquiring and downloading widgets, mashups and data collections, reading information and writing reviews, and also creating and publishing new offerings, using resources from the Mashup platform, hard disk or URLs.

As well as the Store Portal is intended to be a platform that provides a user with tools in order to design his own widget-based webpage, and also a platform that allows a user to contribute with more content, we paid special attention to the user experience.

We also took some notes on the portal performance, analysing items like response times to cases like looking for a widget in the Store.

4.3.5 Test Detailed Report

The tests we conducted involved checking for every single option available in the user forms we found to complete actions like registering an offering. That means if there were 4 different ways to follow a step of the process and another 2 ways to follow the second step, the same process would be made 8 times, using a different combination each time.
4.4 Mashup Portal

4.4.1 Summary

In this phase we have checked the Mashup Portal, giving focus to both user experience and performance. We conducted tests for every section in the portal, using the functionality in order to see how it works and reading the provided information in order to know if it is appropriate for the portal.

Issues can be verified at: http://jira.fi-ware.org/issues/?filter=-2&jql=reporter%20%3D%20%22pablo.fernandez%22%20AND%20summary%20~%20%22%5C%22%5Bwirecloud%5D%20%5C%22%5D%20ORDER%20BY%20createdDate%20ASC%20

As a result of these activities, we generate the following issues, ordered by subtask:

4.4.1.1 Read the documentation of Wirecloud:

- User’s manual not available. Reported on 2014.10.31. If the user clicks on the User’s Manual of a widget, the browser will open a new tab but no information is going to be displayed. This happened, for example, with the Weather Example widget. The opened tab is empty. The same thing happened with the Linear Graph widget.

- Widget documentation empty. Reported on 2014.10.31. Even though the link is available it does not show any information to the user. We clicked on “Documentation” link, the browser opened a new tab but no information was displayed.

- Home page link not available. Reported on 2014.11.03. If a user clicks on a specific widget there is a home page link but the truth is it is not available.

- Video tutorials in bad quality: Reported on 2014.11.03. We played the video tutorials in order to get more information about Wirecloud. While playing a video, in the link specified below, some parts of the video were in bad quality and it was very hard to read something on the screen.

- Broken video tutorial links. Reported on 2014.11.03. We were trying to get more information about Wirecloud so we visited the official documentation where there are some video tutorials. When we tried to view one of them the link to the video tutorial was broken.

- Spelling error found in documentation. Reported on 2014.11.03. While reading the official FIWARE documentation we found a spelling error in the explanation of the type of operators. The spelling error is the following one: “Data targets operators: Operators that are provided information and use it to do some tasks. For example, a operator that receives some information and push it to a web service.” It should be ‘an operator’ instead of ‘a operator’. The link to that documentation is: https://forge.fi-ware.org/plugins/mediawiki/wiki/FIWARE/index.php/Application_Mashup_-_Wirecloud_-_User_and_Programmer_Guide#Widget_and_Operator_development
4.4.1.2 **Add several widgets**

- **Many windows opened when acquiring a widget. Reported on 2014.10.31.** We logged in using the wirecloud.test.ulpgc@hotmail.com account. We went to the store and clicked on Multimedia Pack widget. Then we clicked on ‘Free’ and the page launched a form to ask for our address. When we submitted the form many browser’s windows were opened and finally it showed us a .PDF file with the widgets details.

- **Unable to add a widget to dashboard directly from detailed view. Reported on 2014.10.31.** If a user clicks on the Marketplace and goes to a detailed view of a widget, there is no way to add that widget to the current workspace. The user has to go first to the Store section and install that widget. Then, the user should be able to add it to the dashboard. It would be helpful to tell the user the steps to acquire, install and add a widget to the mashup.

- **Weather widget example gives an exception. Reported on 2014.10.31.** We logged in and went to the store to acquire a widget named Weather Widget Example. We went back to the mashup view and add it to the dashboard and immediately this widget gives an error. It is important to mention that this exception is thrown without having made any connections between the widgets using the wiring map. If the user clicks on the warning icon the page displays a log message. If the user goes to the wiring map in order to correct the given mistake, the widget is displayed with no properties. Even if the user clicks on the widget settings and tries to add a new key property, nothing happens and shows the same error.

- **Possible type of data inconsistency error not specified. Reported on 2014.10.31.** We logged into FIWARE Lab and acquired some widgets. We went to the mashup and started adding some of those widgets, YouTube Browser and Linear Graph, in order to test them. Then, we clicked on wiring map and made connections between these two widgets to check if it was possible. We went back to the mashup view and clicked on a video in the YouTube Browser video and then the Linear Graph widget gave an exception. We think the reason why this exception was thrown is the type of data Linear Graph is expecting to be connected to. A help message telling the type of data Linear Graph accepts would be very useful. After closing the window shown in the picture ‘Linear graph gave an exception_1’, the workspace did not work and it was stuck.

- **Remove tab confirmation issue. Reported on 2014.10.31.** In the mashup view users are able to add as many tabs as the want and work with them. This is useful in case users have many widgets in use and it is a way to organize them. The problem is that if a user clicks on the button to remove a particular tab the system does not ask for confirmation and may take the user to lose its work.

4.4.1.3 **Connect widgets**

- **It is not intuitive that users have to enable the connections between the widgets to make the mashup work. Reported on 2014.10.30.** If a user adds two widgets to the dashboard and tries to make them work there will be no response. To make this happen, the user has to go the wiring map and make the corresponding connections between widgets. Thus, every
modification made on a widget will affect the rest of the widgets connected to it. It would be helpful if a hint message tells the user how to make the connections between widgets.

- **Error loading the wiring the map. Reported on 2014.10.30.** If a user adds two widgets, makes the corresponding connections, deletes one of those widgets and tries to load the wiring map again, it would give an error in the loading process. After that, the user has to delete the widget in the wiring map too. After this last step no error is shown.

- **Operator’s position is not very visible: Reported on 2014.10.30.** In the wiring map, users can play with widgets and operators. Widgets are displayed at the top-left corner of the page but the operator link is not very good positioned.

- **The wiring connections worked but mashup did not work. Reported on 2014.10.30.** In the wiring map shown there are three widgets connected: YouTube Browser, Wikipedia and Linear Graph. Thus, if a user clicks on a video in the YouTube widget, the name of the video will be used as a new entry to search in Wikipedia and the resulting article will be used as an input to the Linear Graph widget. This wiring map did not throw an exception. Back to the workspace, if we click on a video, the Wikipedia widget throws an exception. It would be helpful to tell the user the kind of data the Wikipedia widget input is expecting.

- **Widget not found warning. Reported on 2014.10.30.** We were developing a new widget and making connections between it and another widget. We had to make some changes in the code, so we uninstalled the previous version of the widget and then uploaded the new one. We clicked on ‘Wiring’ and saw the previous version of the widget had not been uninstalled successfully because of a warning message displayed on screen.

- **Multi Connector use not very intuitive. Reported on 2014.10.30.** In the wiring map users are able to make connections between the widgets in the mash up. In fact, there is a multi connector that allows users to make multiples connections between the same widget endpoint and others. Thus, users can right-click the endpoint and select the option ‘Add multi connector’. The issue we found was that it is not very intuitive to make a multi connector work. Users may think they just have to drag and drop the multi connector to the endpoint of the widget they want to connect it with. Actually, they have to drag and drop the multi connector in order to place it in a proper position and then, they have to drag and drop the endpoint of the other widget they want the first one to be connected to and connect it to the multi connector. Basically, they have to connect the first endpoint to the multi connector and then take the other endpoint and connect it to the multi connector and do this in two steps. It would be much easier if users could make a multi connector work in just one step.

- **Useless multi connector utility. Reported on 2014.10.30.** We do not understand the actual utility of multi connectors. As far as we were concerned, the multi connector helped users to make multiple connections between the same widget endpoint and others endpoints. That seemed helpful but the truth is we can also make multiple connections between the same endpoint without making any use of the multi connector. That is the reason why we found it useless.

- **Operators warning message does not appear. Reported on 2014.10.30.** When working with Entity Service operator we got an error while playing with the mashup. The problem was we
were not able to check what the error was about because even though we clicked on the error icon no information was found.

- **Remove widget issue.** In the mashup view users can add as many widgets as they want and then, they can remove them if they want to. We were working in the mashup view with many YouTube Browser widgets in order to test them. As their performance was correct, we deleted all of them except for the first one. Then, we went back to the wiring map to make some connections and the wiring map showed two YouTube Browser widgets when there were just one of them in the mashup. In fact, the wiring map allowed us to make connections with that extra widget but nothing happened in the mashup view since that widget did not really exist.

4.4.1.4  **Change preferences of your environment**

- **Negative cell height and width. Reported on 2014.10.31.** In the mashup view users are able to change the environment settings such as the margin between widgets, cell height and cell width. The problem is that users can type a negative value for both cell height and width. When the user clicks on ‘save’ and goes back to the mashup view, that settings are applied.
- **Unable to change preferences of the environment from the wiring map view. Reported on 2014.10.31.** Users are unable to change their preferences of the environment from the wiring map view. There is an option button but if users click on it nothing happens and no options are displayed.
- **Tab preferences issue. Reported on 2014.10.31.** In the Mashup view users can add as many tabs as they want. They can also change tabs preferences but the problem is that the form accepts negative values. After saving those preferences the widget would be displayed.
- **Negative tab values preferences persistence issue.** In the mashup view users can change the environment settings. One thing they can do is setting tab preferences. As it is said in the issue below, users can type negative values in the preferences form, causing the widgets to be bad displayed. Another issue we have found is that even though we reset the positive values in the form, the widgets remain badly displayed. Even though we typed positive values nothing happened and then the settings tab got stuck.
- **Preferences settings applied to just one widget in the mashup when there are two of them. Reported on 2014.10.31.** We had two widgets in our mashup and wanted to change our preferences settings. Thus we clicked on ‘Settings’ and changed the value of grid columns and cell height. The problem we found was, although we had two widgets in the mashup, the changes only were applied to one of them.
- **No reset preferences button. Reported on 2014.10.31.** There is no way to reset the preferences settings to the initial value. In the settings tab we cannot see any button to approach this issue and the problem is that, apparently, the only way to get a widget back to its initial settings is to remove it and then add it the mashup again. It is also important to mention that although we manually entered their initial values no changes were applied to the widgets.
4.4.1.5 **Marketplace**

- **Connection error when clicking on Marketplace. Reported on 2014.10.23.** Sometimes it takes too much time to load the Marketplace and it also could give an error when trying to connect to it.

- **There are a lot of widgets not rated. Reported on 2014.10.23.** I logged in using the wirecloud account and went to the marketplace to get some widgets and start using them. When the marketplace is displayed, it seems any widget has been rated. That could make a user think no one has ever entered the site and could get a bad press of the whole page.

- **The Marketplace takes too much to load the widgets. Reported on 2014.10.23.** When viewing the widgets in the marketplace, if the user scrolls down the page, the marketplace loads more widgets but it takes at least three seconds to make them visible to the user. This could make the user get tired of the response time and sometimes it could take him or her to give up.

- **System does not check data filled in the Acquire form for the Marketplace. Reported on 2014.10.23.** When a user is about to download or acquire a widget inside the marketplace, a new pop-up window asks the user for his or her address but it does not check if the given information is correct. Therefore, you can enter improper data instead of a valid address.

- **Widget acquired but not shown in the resources list. Reported on 2014.10.23.** We logged in and went to the store and acquired a widget named Multimedia Pack. Then, if we click on Store we can see that widget classified as ‘Acquired’. The problem is that when we try to add that widget to our mashup, it does not appear on the list of available widgets so we are unable to use it.

- **Difference between marketplace and store not clear. Reported on 2014.10.30.** The difference between marketplace and store is not defined and could take a user to confusion. Both the marketplace and the store give the users the possibility to acquire a widget, so what is the real difference between them? It would be helpful if this difference it is defined.

- **Marketplace finder filter does not work properly. Reported on 2014.10.30.** If we go to the marketplace and want to make use of the finder filter we can see it does not work as expected. For instance, we wanted to filter by the word ‘city’ and there were two widgets as result. One of them had the word ‘city’ on its name but the other one had nothing to do with the word ‘city’.

- **Store finder filter does not work properly. Reported on 2014.10.30.** If we go to the store and want to make use of the finder filter we see it does not work as expected. We had the same issue as with the marketplace finder filter. Once again, we typed the word ‘city’ in the finder filter and there were two widgets as result. The same as the issue above. One of them had the word ‘city’ on its name but the other one had nothing to do with the word ‘city’.

- **Purchased button not visible. Reported on 2014.10.30.** In the ‘Account’ section there is a ‘purchased’ button we can click on it if we want to check our purchased applications. The issue is that the button it is not very visible and it is hard to find it for the first time.

- **Acquiring mashups and widget from store issue. Reported on 2014.10.30.** The process of acquiring a new mashup or widget is a little bit tedious. First, we have to go the Store and acquire the mashup or widget we have chosen. Then, instead of being able to add it directly to...
our workspace, we have to go to the marketplace and install it before we can add it to the workspace.

- **Refresh marketplace list issue. Reported on 2014.10.30.** In the marketplace view there is an options button and the first one gives the users the possibility to refresh the marketplace list but the truth is it does not work at all. Even if we make use of the finder filter and then click on ‘Refresh the marketplace list’ nothing happens.

- **No services available. Reported on 2014.10.30.** In the Store view there are three tabs users can click on, one for services, other for data and a final tab for widgets and mashups. The issue is that if a user clicks on the services tab he or she will find nothing since the systems displays a message telling there are no offerings.

- **Difference between data and widgets in the Store not clear. Reported on 2014.10.30.** In the Store view there are three tabs users can click on, one for services, other for data and a final tab for widgets and mashups. The problem we found was that the difference between data and widgets is not clear. At the beginning, users may not know the difference between acquiring a widget and acquiring data. A help message describing what data tab is about will be helpful.

- **Pay data acquired without paying. Reported on 2014.10.30.** We went to the Store and then click on the data tab. Then we choose a pay data and clicked on its price in order to acquire it. The problem we found was we were able to acquire that data without paying anything at all.

- **No difference between all stores and Store Fi-lab. Reported on 2014.10.30.** In the marketplace view there are some filtering options at the left that users can make use of to do more specific searching. One thing they can select is the Store to find the widgets and mashups in. The can choose between all stores and Store Fi-lab but we found there is no difference between them.

### 4.4.1.6 General issues

- **Account’s issues to access FIWARE Lab. Reported on 2014.10.23.** We filled in the sign up form and submitted it but did not receive a confirmation email with the instructions to log in and change user’s password. Even though we clicked on “Didn’t receive confirmation instructions” button, we did not get any email. We checked inbox mail by reloading the page and nothing found. One possibility was that the confirmation email could be treated as spam so we checked spam inbox but still nothing found. After trying hard to access fi-lab, we clicked on “Didn’t receive confirmation instructions” and typed all accounts previously created, including Hotmail and Gmail. We only received the confirmation email to the Hotmail’s account. With that account we were finally able to access Fi-Lab. We signed up using three different accounts, two Gmail accounts and one Hotmail account.

- **Session issues. Reported on 2014.10.23.** In the previous issue, titled ‘Account’s issues to access FIWARE Lab, we explained we could not access FIWARE Lab using a Gmail account. Thus, we had to sign in using another account: pablofm@gmail.com. Then we were logged as Pablo. When we received a confirmation email to the Hotmail account we logged in using that Hotmail account. We clicked on Mashup button and when the page reloaded we were, again, logged as Pablo.
without closing session or changing users. Here are the details about the users and account used:
  o Pablo - pablofm@gmail.com
  o Wirecloud - wirecloud.test.ulpgc@hotmail.com

- **Browser issues. Reported on 2014.10.31.** We logged into the system and waited to FIWARE Lab to load. Then an error message was displayed advising to upgrade the browser to newest version or either try with Firefox or Google Chrome. The next step we took was log in using Firefox browser and repeated the same steps and no error were found.

- **Create new application url issue. Reported on 2014.10.31.** In the Account view users are able to create new applications and organizations. We clicked on create a new application and filled in the form, where we were asked to specify a URL for our application. The issue is that we can type any url we want and the system does not check if it is a correct value.

- **Session switched without notifying the user when creating a new organization. Reported on 2014.10.31.** Users can create new organizations in the Account view. Once a new organization is created the system changes the user session from the previous one to the new organization session without notifying it to the user. This may cause the user to get lost and he does not understand what is really happening.

- **Remove collaborator member issue. Reported on 2014.10.31.** In the Account section, users are able to create new organizations. If users click on that option they have to specify the name of the organization and then they can add members to it. They can add any FIWARE Lab user registered in the system. Users can add a member by mistake and the system give no options to remove it, apparently. To remove the mistaken member, users have to check the list of members for that organization and click in the button ‘1 role’ and disable all options. Then, the system asks if you want to remove that collaborator. The issue is that this way to remove a member is not quite intuitive.

### 4.4.2 Scope

The tests we had conducted for the Mashup Portal were the following:

1. Read the documentation about Wirecloud in order to see the use of the component.
2. Add several widgets to your environment.
3. Connect them.
4. Rename your workspace.
5. Change preferences of your environment.
6. Create a new workspace.
7. Upload to your resources a new created widget.
8. Check the marketplace functionality.
4.4.3 Test Environment and Tools

Our tests were conducted directly on the Mashup Portal, using different navigators such as Safari, Mozilla Firefox and Google Chrome, and replicating our experiments for each navigator, in order to see if you can interact well with the portal at every moment, no matter what the user conditions are.

4.4.4 Test Types

The Mashup Portal is intended to be a workspace for a user to create his own widget-based applications. That means we must pay attention in both performance and user experience areas while we are testing: a user may leave the platform if the workspace is hard to use or if the time response is slower than 20-30 seconds for an action like adding a widget.

We conducted tests on how to add widgets, interconnect them, rename them, creating and removing workspaces, upload widgets from your disk to My Resources or using the Marketplace - Store to acquire published ones.

Another item we took into account was the development utilities that Wirecloud offers to the user: if you want to work with the Mashup portal, sooner or later you will have to develop a widget that contains functionality you cannot find in the Store. If the APIs provided by the platform are hard to use or poorly documented, a user would want to leave the platform, so we decided to include testing on that area by developing some widget examples.

4.4.5 Test Detailed Report

Tests were done taking into account the instructions and advices provided by the Wirecloud platform.

4.5 Account Portal

4.5.1 Summary

We have checked the Account Portal, focusing on the available documentation and the organizations and applications functionality. For the documentation, we reviewed the available documents both on the catalogue (http://catalogue.fi-ware.org) and the FIWARE Academy (http://edu.fi-ware.org/) related to IdM - Keyrock. For the organizations and applications functionality, we did some tests following the actions that a user might take.
4.5.1.1 **Documentation**

- The installation guide referenced on the overview page of the catalogue for the IdM GE is not the same that the one on the documentation page. The one on the documentation page is on the fi-ware.org wiki, while the one on the overview page is on the GitHub project wiki.
- The installation guide available on the documentation guide was outdated and had not been updated since May 29th, 2014. The updates were being made on the version available on the GitHub project wiki. At the time of writing, it has been updated with most, if not all, of the last changes made to the guide on GitHub.
- We found that the user guide, included on the user and programmer guide, is a bit brief, mainly when addressing the management of roles and permissions.
- The programmer guide is just a couple of examples and a link to the API on the GitHub project wiki.
- The videos available on the edu.fi-ware.org site are the best source of information to learn about the OAuth2 interface and how to configure our applications to use it. Having this on a written document and pointers to the examples shown would be better.
- The course on How to authenticate your users in your apps using FIWARE Account is missing the last section of the course (Point 6: Authorizing access to protected resources).

4.5.1.2 **Organizations**

- When setting a logo, be it for an application or an organization, the image preview overlaps the browse button. It does not causes any break on the functionality.
- When editing the organization profile, we can specify the city for our organization on the City field of the info block. This field does not seem to be used when viewing the organization profile. Also, the About field when editing the profile is shown as Description when viewing it.
- When editing the organization, the option to remove the organization depends on the session used. When using a user session, that option will lead to cancelling the user account instead of removing the organization. When using the organization session, this option removes the organization, as expected. This behaviour is still present at the time of writing.
- When adding users to the organization, it is not clearly stated on the form that we need to assign a role to the new users. If we fail to do so, the users will not be added to the organization, but there's no notification or error message of this. Also, for new organizations there's only one role available (owner).
- When assigning roles to users on an organization, the list of selected roles for a user depends on the session used to assign them. Listing the users on an organization when using the organization session lets the user assign roles to those users, and that is ok. Listing the same users on an organization when using a user session (i.e. an owner of the organization) lets the
user assign roles to those users as with the organization session, but those assignments are kept
separate from the ones done with the organization session. This is confusing and is not
explained in the documentation.

- When testing the roles for Cloud, Mashup and Store, at the time of the tests using those roles
did not seem to have any effect on the available actions for the user.

4.5.1.3 Applications

- When setting a logo, be it for an application or an organization, the image preview overlaps the
browse button. It does not cause any break on the functionality.
- There seems to be no way to remove a user from the authorized list of the application. Removing all the roles asks for confirmation to remove the contact, but reloading the list shows
the user still on it, though with no roles.
- When trying to get information on how to use the OAuth2 interface we found that the best
sources of information are the videos available on the FIWARE Academy site, as the
documentation does not provide enough information on how to use it.
- When a user has authorized an application to access its data via OAuth2, there is no visible way
for the user to revoke that authorization, nor has the user any indication of the list of
applications that has been authorized via its user profile.

4.5.2 Scope

We made the following series of tests on the Account Portal:

- Review the available documentation, both on the Catalogue (http://catalogue.fi-ware.org) and
the FIWARE Academy (http://edu.fi-ware.org/), related to IdM - Keyrock, trying to understand
the use of the Account Portal.
- Test the organizations functionality by
  o Creating new organizations.
  o Registering new applications on the organizations.
  o Adding members to the organizations assigning roles.
  o Assign the roles for Cloud, Store and Mashup and try to access and use them.
  o Delete an organization.
  o Update the profile of an organization.
- Test the applications functionality by
  o Adding a new application.
  o Manage the roles and permissions of the application.
  o Use the OAuth2 credentials to authenticate users with the Account Portal on an
application.
4.5.3 Test Environment and Tools

We did our tests using both Mozilla Firefox and Google Chrome web browsers. The tests were made against the global instance of the Account Portal available on FIWARE Labs.

4.5.4 Test Types

For the documentation, we had to review the available documents to check the available information on the use of the Account Portal. This included watching the videos available on the FIWARE Academy related to IdM - Keyrock. For the other tests, we followed the steps that a user would do to perform the above actions on the Account Portal.

4.5.5 Test Detailed Report

4.5.5.1 Documentation

On the Catalogue page for the IdM GE we found documentation links on the overview and documentation sections of the page:

- On the overview section there was links to the following documents:
  - Installation guide on the wiki of the GitHub project page.
  - User and programmer guide on the FIWARE wiki.
- On the documentation section there was links to the following documents:
  - Open Specification
  - Users and programmers guide on the FIWARE wiki, that has:
    - Introduction, with a summary of the availability of the supported interfaces, mainly OAuth 2.0, SCIM 2.0 API and REST API
    - User guide, with a brief description of the available actions for the users of the KeyRock web portal
    - Programmer guide, with a very few examples. The main documentation is available on the GitHub wiki (there's a link on the guide)
    - Further information, which directs the user to a video on the help and info page of FIWARE Lab
  - Installation and administration guide that describes the steps needed to install KeyRock, both locally and deploying on a remote server, though there were some issues that were already reported on Jira.
Courses available on FIWARE Academy:
- Identity Manager Webinar
- How to authenticate your users in your apps using FIWARE Account

There are two available courses on FIWARE Academy about Account Portal/IdM - Keyrock:

- Webinar 31 March 2014: Full recording of a webinar that covers the following topics:
  - First part is an overview of the application and how to use it
  - OAuth 2.0 overview
  - OAuth example client
  - OAuth proxy
  - Q&A
- How to authenticate your users in your apps using FIWARE Account Detailed course on the use of OAuth with the Identity Management GE (using FIWARE Accounts):
  - Introduction, describing the available OAuth scenarios
  - First steps, register account, create organizations, manage roles
  - Authenticate users on web applications with OAuth and FIWARE Account. Full example with code on how to add the OAuth layer to our web application and authenticate users with a FIWARE Account.
  - Authenticate users from native applications with OAuth and FIWARE Account. Full example with code on how to use the OAuth layer on a native application to authenticate user with a FIWARE Account.
  - FIWARE PEP Proxy. How to use the proxy to secure our application API.
  - The last point of the course (present on the list on the introduction) is missing: Authorizing access to protected resources

4.5.5.2 Organizations

- Create new organizations
  To create a new organization, we sign in on the Account Portal with a FIWARE account. Here we see the available organizations on the right and click on the Create link. Then we fill the Name and Description fields of our new organization. We leave the Owners field with the default value. Next we click on the Create Organization button. Once the organization has been created, we can see that the session has changed to the organization.

- Register new application on the organization
  From the home page of our organization we have access to register new applications. Click on the Register link on the right of the applications section to create a new application. Then we must fill the Name, Description, URL and Callback URL for the application. Next we can set our
application logo. If the selected image is too big, we can crop it here. Then click Next to continue. Now we can manage the roles and permissions for the application. For now, just use the default values and click Finish. Now the application has been created, and going back to home, we can see that the application is on the applications list for our organization.

- Update profile of an organization
  First we must go to the organization profile page. To do that, there are several paths that we can follow. From the owner page, we can select the organization from the organizations column on the right, which shows the organization profile. Another path is to select the organizations option from the menu on the left, which shows the list of organizations (by default, our own). Here we can select our organization and that shows the organization profile as before. To edit the organization profile, we must click the edit button next to the organization name.

  Now we can edit the organization profile. First we have a general info block with the name of the organization, an about field (a description) and a city field. After updating the fields and saving the profile changes, we can see the changes on the organization profile page (the Description shows the content of the About field). The city field does not show up on the profile info page.

  Next, we edit the next block of info, the contact information, which is currently empty. We need to fill the E-mail and Website. After saving the changes, the new info shows up on the contact us section of the profile.

  Next is to edit the organization avatar. To choose our own avatar, we click the browse button and select an image file. If the chosen image is too large, the UI gives us the option to crop the image. The avatar can only have an aspect ratio of 1:1, so we can only select a square region. After we are satisfied with the selection, we click the Crop image button and we have our avatar.

  On the previous blocks, clicking the Update profile button saves the info and redirects the user to the organization profile page. For the avatar there's no update profile button. It seems to be saved by default. Selecting the organization option from the left menu we can see that the avatar has been updated.

  The last option on the edit profile page is to cancel account. If we are logged in as a user (using the session of the user) we can end up cancelling the user account instead of the organization.

- Delete an organization
For this we created a new user and a new organization, to test the different behavior when using a user or an organization session.

Now that we have our organization, go to the edit organization profile and try to remove it from the cancel account option. When using the organization session, the available option is destroy organization. Clicking on that option asks twice for confirmation, and after that we successfully deleted the organization. When using the user session, the available option is cancel account. If we proceed, what happens is that the user account is cancelled instead of the organization.

- Add new member with roles

We created two new users and an organization. From the organization session we can add new members from the Add link on the members column. Doing that shows a window where we can add the new user. Typing the name on the Users field shows the available users that match that name as we type it. Once found, we select it.

If we don’t assign an initial role to the user, this won’t be added to the organization, but there’s no notification or error message warning about this. So we need to add at least an initial role. For our organization we only have the Owner role available, so we just select that role for the new member. Also, we’ve seen no way to add new roles inside an organization.

The members’ list now shows our new member on the organization. Here we can change the user roles. If we try to remove the current role without assigning another, the system asks if we want to remove the user as a contact. If we do so, the user is removed from the organization. When the user has no organizations and tries to browse others, the list is empty. The user will not see any other organization until it is a member of one.

- Assign roles to members

We can manage the roles of the members of the organization from the members list. Here we can assign or remove roles from the available members of the organization. But, depending on the session used, though the available roles will be the same, the assignment will be stored separately, and the choices made using the organization session will not affect the choices made with the user session.

- Change role of the user and try to access Cloud, Store and Mashup

We assigned the different roles available for Cloud, Store and Mashup to different users and tried to access those services. After using the services with users with different roles, we were unable to detect any visible difference on the choices and actions available for the users using those services, regardless of the role used.
4.5.5.3  

Applications

- Add an application

We can add an application to a user or an organization. Here we will test adding to a user. For this we first login with our user and then select the "Register Application" or "Register" options from the applications column on the user’s home. Next, we need to fill the application details:

Name: My Test App  
Description: Test Application for the user  
URL: http://130.206.126.38/  
Callback URL: http://130.206.126.38/login

For this test, we used an application running on one of our instances on the FIWARE Cloud.

After filling the form, we click next. Now we can select an image as the application logo. As with other actions that allow us to set a logo, the preview image overlaps the browse button. As with the organizations, we can select an image and then crop it to use as our application logo.

Once the logo is set we can manage the roles available for the application. Here we have the default roles: Provider and Purchaser. We’ll use the default values for now and manage the roles later.

After clicking on the finish button, we are now on our application info page that shows the previously entered data plus the OAuth2 Credentials for our application. These credentials will be used later to configure the application to authenticate users via OAuth2 against the FIWARE Account portal. We can also see that the list of authorized users for the application already shows the user that has registered the application with the provider role already assigned.

- Manage roles for the application

To test the role management for the application, we have to go to the application profile page. Here we can see the list of currently authorized users. The Add button allows us to authorize new users, so we’ll do that.
Now we can search for the users that we want to add and assign them one or more of the available roles. For our test we just add a new user with the Purchaser role. Once added, we can see the user on the list of authorized users with the assigned role.

If we remove the roles from a user, we are asked if we want to remove the contact. If we confirm this, the user disappears from the list, but reloading the application profile page, the user still appears on the list, though with no selected roles. Also, there seems to be no way to remove a user from the authorized list.

- **Create new roles and permissions for the application**

  To add a new role for our application, we need to go to the edit profile page for the application. Here we find the section to manage the roles and permissions for the application. Here we can see the permissions assigned to the default roles.

  We add a new role to limit the access to a private section of our application. First we need to click on the New role link, which allow us to enter the name for our new role. We call it private and save it.

  Now we can assign the permissions to the new role. To limit the access to our private section of the application, we need to create a new permission. To do that, we click on the New permission link and fill the form. First, we can fill the name and description of the permission. Then we need to set the HTTP actions and resources of our application that this permission will manage. On our test we will limit the GET action on the /private section of our application. Once created, the new permission appears on the list of permissions available for our role and we can assign the new permission to our role.

  When creating the new permission, we also have the option to use an advanced rule using XACML, but there is no documentation for this. We can also delete permissions by clicking on the X icon on the right of the name. This will ask to confirm that we want to delete the permission. After confirming the action, the permission is gone.

  As with the permissions, we can also delete the roles that we created. Again, we are asked for confirmation. And this deletes the role.

  If we try to create a role with the same name that another role, we receive a warning that the name is already taken.

- **Use the OAuth credentials and use the documentation to authenticate on the app**

  We checked the available documentation and found that the best source for OAuth2 documentation is the videos available on FIWARE Academy.
First, we need to get the OAuth2 credentials for the application. This can be found on the application profile page by clicking on the OAuth2 Credentials link. This shows the Client ID and Client Secret for our application. For this test we will be using the oauth-example-client available on https://github.com/giing/oauth2-example-client. On this client, we have to edit the config.js file to add the credentials:

```javascript
var config = {};

config.idmURL = 'https://account.lab.fi-ware.org';
config.client_id = '1382';
config.client_secret = 'bc8abd71d84f966ddf400e6cc2e497ebb171755fc34370cc2d833e0828b1a8c2833a892fc81eff9d0c7efcad291dfcd1711dbfaecbf608d45c0734b9134becc8';
config.callbackURL = 'http://130.206.126.38/login';

module.exports = config;
```

Here we've set the client_id, client_secret and callbackURL variables to the values configured for our application. After that, we need to start our application. First we must install any missing nodejs dependencies with

```bash
npm install
```

and then we should be able to start the application with

```bash
sudo node server.js
```

We are using `sudo` because we are using a regular user account on the server, but we need to bind the application to port 80, and that requires you to start the server as root. Once the application works, we can switch to a more permanent solution by using apache + passenger to serve the nodejs application. Once started, we can access the url and be greeted by the application root page.

From the application, we click on the Log in button and we are redirected to the sign in page of FIWARE Labs (https://account.lab.fi-ware.org/users/sign_in). Here we can see that the system has recognized that the request is for our application.
Being the first time that this user has tried to use this application, we need to authorize it to access our user data.

We accept that the application will be able to access our public information. Once confirmed, the account portal redirects the user to the callback url previously configured, returning the user to the application, which shows that the user has been successfully authenticated.

Now the application can read the user data. If we go back to our application profile page, we can see that the new user has been added to the authorized list and has no role by default. If we try to revoke the authorization, we find that currently there is no option available to do so. The user has no information about the application available on its profile, and the available options on the application profile only allow adding new users to the authorized list. This is a serious issue.

The last option we have on our application is to logout. That redirects the user to the root page of the application. If we keep the session opened on account.lab.fi-ware.org, the application will be able to log on us to the system automatically.

If we try to login with a user that we already have on the application authorized list but the user has not explicitly allowed the application to access its data, we’ll get the application request for authorization as any other user. This also does not show up on the user or the application pages, and the user cannot revoke this authorization with the current interface.
5 Enablers testing executions

5.1 Orion Context Broker

5.1.1 Documentation

Orion Context Broker documentation is probably the most up to date GEri we’ve worked with in FIWARE. During the period we’ve been testing it, the documentation has been updated several times according to the new implementations. Orion User and Programmers Guide (https://forge.fiware.org/plugins/mediawiki/wiki/FIWARE/index.php/Publish/Subscribe_Broker_-_Orion_Context_Broker_-_User_and_Programmers_Guide) followed step by step provides a really good support to understand what the GEri does and how it works. The release system also worked good, older versions and operations are compatible with the new releases.

5.1.2 Local Installation

Reference distribution is CentOS 6.3. We’ve been able to install Orion from packages in CentOS 6.3 and CentOS 6.5 following the documentation. Also, we could install Orion in Ubuntu 14.04 from sources.

Problems faced:

- CentOS 6.3 running locally in a machine with low Space resources (5Gb). Mongodb, one of the components used by Orion, was unable to load. It needs more space resources.

5.1.3 FIWARE Lab Installation

Installation in FIWARE Labs was divided in four different scenarios: new Base image instance, new dedicated Orion GE instance, new instance using chef recipes and new instance using blueprints templates.

New Base image instance

Orion installation from packages in CentOS 6.3 and CentOS 6.5 base images following the documentation was successful. Also, we could install Orion in Ubuntu 14.04 from sources in the cloud baseimage.
New dedicated Orion GE instance

Image tested: orion-psb-image-R3.4. It’s an Orion dedicated image based in CentOS 6.3. Once deployed, Orion is ready to be used.

Using Chef Recipes

CentOS 6.3: mongodb crashed during the installation as reported in HELP-701.
CentOS 6.5: installation succeeds.
Ubuntu 14.04: installation failed (Ubuntu is not the reference distribution so it’s not supported).

Using Blueprints templates

During the tests, Orion blueprints were under maintenance several times. In the end, there were two Orion templates in the Blueprints catalogue that we were able to test:

- “orion”, template with Orion 0.13.0 running on CentOS 6.5. Deployed successfully.
- “orion-cluster” template, deploys 3 VMs on CentOS 6.5 and an old Orion version (0.9.1) deployed successfully.

5.2 IDAS

5.2.1 Documentation

User and programmers Guide (http://forge.fiware.org/plugins/mediawiki/wiki/FIWARE/index.php/Backend_Device_Management__User_and_Programmers_Guide) couldn’t be followed as the installation couldn’t be completed (same for Unit testing plan - http://forge.fiware.eu/plugins/mediawiki/wiki/FIWARE/index.php/Backend_Device_Management__Unit_Testing_Plan_and_Report). We’ve reported several errors (see Local Installation below) and after that we were suggested to use a cloud image called “eidas-sbc-img” that is unreachable.

5.2.2 Local Installation

For this purpose and according the requirements specified in the Installation and Administration Guide, we’ve used a CentOS 5 image with 1GB of RAM and 40 GB HDD, but during the installation we’ve run into several errors that will be described below in brief:
Avoid using fixed GID and UID numbers for group and user creation (IOT-48): Some of the sections of the installation guide instruct us to create some system groups and users. The commands used to create this groups and users use fixed values for the GID and UID numbers. Depending on the system where we are trying to install the platform, we may find that those values are already in use by other groups and users.

Unless it is strictly needed for the platform to have this groups and users with those specific GID and UID values, it is better to let the OS assign those values automatically from the available pool. If the platform needs to have those groups and users with the values specified on the installation guide, it must be clearly stated in the document and instruct the user to resolve any conflict before proceeding.

Minimum system requirements (IOT-49): Under the Requirements section of the installation guide it is stated:

The instructions below were tested on the following environment, it may or may not be the same on other configurations.

It should be clearly stated what are the minimum system requirements for the platform. If the specifications shown on the document for the testing environment are the minimum required to install the platform, please state that in the document.

Specify the user who must execute the commands (IOT-39): There is no specific information about what user must execute the commands needed during the platform install process. Some sections of the installation guide have references to using "su -" or "sudo" while others don't have any information regarding the user that must execute the commands. As the majority of the commands should be run by root, it is better to specify this information at the beginning of the guide with something like:

Unless otherwise stated all commands must be run as root.

Then, specify the user to run the commands only when it is not root.

Add ksh as a dependency (IOT-47): Some of the scripts used by the platform use ksh as the shell to run them, but the installation guide does not have this as a dependency for the platform. Most modern distributions use bash as the default shell and may not install ksh by default. Add ksh as a dependency and instruct the user to install it if it's not already installed.

Specify mongodb version (IOT-43): It is not clearly stated on the installation guide if the user needs to install a specific mongodb version. The only reference to a mongodb version is in the code example to extract the contents of the downloaded tgz.

If the platform needs a specific version of mongodb, please state that information on the guide. If there is no need for a specific version, instruct the user to download the latest (stable) version available.
**Missing command in mongodb install steps (IOT-42):** There is a command missing from the steps used on the installation guide to install mongodb. The guide states the following commands:

```
cp mongo-x86_64-2.0.2.tgz /home/mongodb
tar xzf mongo-x86_64-2.0.2.tgz
```

There's a missing "cd /home/mongodb" command before executing the tar command. Without this command, the tgz will be extracted to the current directory instead of the mongodb user home.

**Fix monit download link (IOT-45):** The current download link for the monit rpm package on the installation guide is a link to a rpmfind.net search. There is information on the monit home page wiki (https://mmonit.com/wiki/Monit/Installation) on how to install monit for several distributions, including CentOS. For CentOS, the link is http://pkgs.repoforge.org/monit/

**Specify monit version (IOT-44):** It is not clearly stated on the installation guide if the user needs to install a specific monit version. The only reference to a monit version is in the code example to install the needed rpm package.

If the platform needs a specific version of monit, please state that information on the guide. If there is no need for a specific version, instruct the user to download the latest (stable) version available.

**Check for missing dependencies using yum (IOT-41):** Some of the platform packages have some dependencies that need to be installed before installing the package. For rpm based systems, it is possible to check if a package has unmet dependencies using yum:

```
yum install my-local-rpm-package.rpm
```

This will check if there is any missing dependency needed and present a list of the packages required to meet the needs of the package the user is trying to install.
Missing download info on the installation guide for platform packages (IOT-20): The installation guide does not have download links or the needed information from where to download the required packages. Some sections even instruct us to just "scp" the required package from a remote (unknown and unavailable) server.

The Download section of this GE Catalogue page (http://catalogue.fi-ware.org/enablers/downloads-45) has a link to download the IDAS - Core Binaries from https://forge.fi-ware.org/frs/?group_id=7, which leads to a list of all the packages from all the projects on forge.fi-ware.org.

Searching through this list we can find the links to the required packages here:

https://forge.fi-ware.org/frs/download.php/1119/neoidas-monitorbd-1.0-canis.release.rhel5.5.x86_64.rpm
https://forge.fi-ware.org/frs/download.php/1115/neoidas-bd-1.0-canis.release.rhel5.5.x86_64.rpm
https://forge.fi-ware.org/frs/download.php/1118/neoidas-gw-1.0-canis.debug.rhel5.5.x86_64.rpm
https://forge.fi-ware.org/frs/download.php/1117/neoidas-fe-1.0-canis.release.rhel5.5.x86_64.rpm
https://forge.fi-ware.org/frs/download.php/1120/neoidas-rest-1.0-canis.release.rhel5.5.x86_64.rpm
https://forge.fi-ware.org/frs/download.php/1122/iotagent-3.3.3.tar.gz
https://forge.fi-ware.org/frs/download.php/1233/etsim2magent-3.3.3.tar.gz

This information should be available on the installation guide.

Fix formatting of code examples on the installation guide (IOT-40): Most of the code examples used on the installation guide for showing the commands and content of the files have some formatting issues.

- Some lines have been merged into one single line, leading to errors on some of the scripts or commands.
- There are some strange characters on some of the lines (?) (maybe from copy & paste?)
- Also, try to use the “&lt;pre&gt;” tag for all command examples.

Explain the meaning of the variables that need to be set (IOT-46): some of the components of the platform need some environment variables set before installing the required package. There is no
explanation of what are these variables and what may need to be modified in order to install the platform. These variables can be found for:

- `neoidas-monitbd`
- `neoidas-bd`
- `neoidas-fe`
- `neoidas-be`

**Add mongodb configuration information (IOT-31):** There is no information on the installation guide of the required configuration for the mongodb server. From the examples of the variables found on the `neoidas-monitbd` and `neoidas-bd` sections it can be deduced that the platform may need a specific mongodb configuration prior to install (from the examples, a replica set configuration). This is not explained on the guide and should be. If the platform can be installed with just a single mongodb node, then add the necessary information to the guide for the user to be able to install and configure it. Also, if a mongodb replica set is a requirement for the platform, provide instructions on how to install this configuration.

**Fix the method used to load environment variables (IOT-32):** The installation guide has instructions on the sections for `neoidas-monitbd` and `neoidas-bd` to create a script with some export statements to load some environment variables, then instructs the user to execute that script in order to load those variables into the current environment.

When using bash as shell (the default on most modern distributions), executing the export statement on a script loads the variables on the environment of the subshell spawned to run the script and not on the environment of the current shell. To load the variables on the environment of the current shell, use the "." command (source command):

```
. environment-variables.sh
```

**Fix errors on neoidas-monitbd rpm package (IOT-29):** The neoidas-monitbd rpm package currently available has some errors that need to be fixed:

- Set the user and group of files during package creation: The files on the package have the group set to "cvs", which may not exist when installing the package, raising the following error:
Future Internet Core Platform

This can be fixed when building the rpm package by using the %attr and %defattr directives on the %files section of the package spec file. Instead the group is modified afterwards on the package post install script.

If this user must exist, state on the installation guide the necessary commands to create it.

- Set the execution bit of scripts during package creation: Some of the scripts installed by the package do not have the execution bit enabled when installed, so they cannot be executed. One of them is used on the package post install script, thus failing with the following error:

```
-ksh: line 1: /home/mongodb/scripts/stamongod.sh: cannot execute [Permission denied]
```

This can be fixed when building the rpm package by using the %attr directive on the %files section of the package spec file.

**Fix errors on neoidas-bd rpm package (IOT-30):** The neoidas-bd rpm package currently available has some errors that need to be fixed:

- Set the user and group of files during package creation: The files on the package have the group set to "idas" and the user set to "manager", which may not exist when installing the package, raising the following error:

```
warning: group idas does not exist - using root
warning: user manager does not exist - using root
```

This can be fixed when building the rpm package by using the %attr and %defattr directives on the %files section of the package spec file. If the user and group must exist, state on the installation guide the necessary commands to create them.
**Notify init with telinit (IOT-38):** In some sections of the installation guide the user is instructed to modify /etc/inittab and notify init to reload the changes with the command:

```
init q
```

Although this command may work, the proper command to notify init to reload changes on /etc/inittab is:

```
telinit q
```

**Add list of package dependencies to neoidas-gw (IOT-34):** The section of the installation guide for the neoidas-gw package does not have a list of the needed packages that need to be installed as a dependency for neoidas-gw. Add the list of the needed packages to the document and instruct the user to install them before installing the neoidas-gw package. On our test we found that we needed to install these two packages:

- bzip2-libs
- libicu

Do not add the content of the require field of the spec file as the dependencies list. Add the packages that fulfil those dependencies instead.

**Redundant and incomplete monit install information (IOT-35):** The installation guide has instruction to install monit on several of the sections, as this is a requirement for most of them. This information is repeated on different sections and some of them are incomplete. As this is used by several components of the platform, it is better to add the needed information in one place of the document and then add references to it on the appropriate sections when needed.

**Inconsistent methods to configure monit (IOT-37):** The methods used on the installation guide to configure monit differ from component to component. Some of the components have a specific configuration file for monit, starting a specific instance of monit for that component, while others use default /etc/monit.conf configuration file. Try to use the same method on all components.
Missing information to automate monit start for DCA-IDAS SE (IOT-21): There is no information on the installation guide on how to automate the start of the frontend and backend components of DCA-IDAS SE using monit. Following the method used for previous components, this could be done by adding to /etc/inittab the following lines:

```bash
mfe:2345:respawn:su - mongodb -c "monit -v -l -c 
/export/open/IDAS_FE/conf/monitIDAS.conf -d 10 -p
/export/open/IDAS_FE/run/monit.pid"
mbf:2345:respawn:su - mongodb -c "monit -v -l -c
/export/open/IDAS_BE/conf/monitIDAS.conf -d 10 -p
/export/open/IDAS_BE/run/monit.pid"
```

Missing download links for Java rpm package (IOT-36): The installation guide does not provide download links or information from where to download the required java package for the DCA-IDAS ADMIN REST API component. Add the link to the java download page: http://www.java.com/en/download/linux_manual.jsp?locale=en from that page, download the required package (32 or 64 bit).

Missing download links for Tomcat 7 package (IOT-24): The installation guide does not provide download links or information from where to download the required tomcat package for the DCA-IDAS ADMIN REST API component. Add the link to the Tomcat download page: http://tomcat.apache.org/download-70.cgi from that page, download the required package.

Add execution permission to /etc/init.d/tomcat (IOT-27): The commands used on the installation guide to create and install the /etc/init.d/tomcat script are missing the step to add the execution bit to the script in order for this to be executable. Add the following command to the steps:

```bash
chmod +x /etc/init.d/tomcat
```

Fix extraction instructions for iotAgent and etsim2mAgent (IOT-25): The installation instructions for these two components on the installation guide state that extracting those packages create the needed directories on /export. Instead, those are created on the current directory. The packages should be extracted on /export or the created directories moved to /export after extraction.
Missing info on entityPatterns.conf field separator (IOT-23): The example found on the installation guide for the entityPatterns.conf configuration file show two columns separated by spaces. It is not stated on the document if the separator between the pattern and the identifier should be a tab character or spaces. If this is important for the file to be correctly parsed, it should be stated on the document.

Platform architecture (IOT-28): It is not stated on the installation guide whether all the platform components must be installed on the same server or if they could be on different servers. Please, describe the architecture of the platform.

Do not use /etc/inittab to start scripts (IOT-22): There are several components on the installation guide that add lines to /etc/inittab in order to start some services. This is not recommended. It's better to use the system facilities to manage services instead of adding lines to /etc/inittab. Also, if the OS uses upstart instead of system-V, as later versions of CentOS do, they will ignore the lines added to /etc/inittab.

Add instructions to install the platform components from source (IOT-26): The current version of the installation guide only contains instructions on how to install the components using rpm packages. Adding instructions on how to install the platform components from source will help install it on other distributions other than CentOS/RHEL.

5.2.3 FIWARE Lab Installation

New Base image instance

IDAS requires a CentOS 5.8 image which is not available between FIWARE Labs images, and also requires a minimum of 1024 Mb of RAM and 30 Gb of HDD that is not available in any of the available flavours.

New dedicated instance

Currently there is no image available as "Centos65-eidas" as specified in the FIWARE Catalogue.

Using Chef Recipes

Not available.
Using Blueprints templates
Not available.

5.3 Access Control

5.3.1 Documentation
This enabler provides a wide guide on how to deploy an Access Control implementation. Unlike other enablers, it was needed to spend more time to deeply understand how this Enabler works and to get used with the certificates and configuration for a real environment. There were some fixes for the documentation reported in JIRA that will be updated in the new documentation release. Access Control also provides a Unit Testing Plan for our implementation.

The user and programmers Guide explains all the APIs and actions to manage the PAP and PDP among others. It could have been easier to understand if the examples have used the IdM Enabler available in FIWARE and not, for example, the one from GCP from Deutsche Telekom IdM used in one of the actions explanation (i.e. how values from XACML matches, et cetera). For a good understanding, we strongly recommend to check the courses available in http://edu.fi-ware.org/ before starting.

FIWARE Access Control Course provides very good information on how to understand the environment where Access Control fits, how it interacts with IdM and provides different options on how to implement the module with the main resources (i.e. PEP Proxy, IdM, and Access Control among others).

Last but not least, a real example Application and/or image showing this flow and messages between IdM, PEP and Access Control would be really useful in order to understand better the scenario.

5.3.2 Local Installation
The Access Control local installation has been done using an Ubuntu 14.04 distribution. Following the Installation and Administration Guide provides enough information to be able to make a successful installation. All the steps should be done carefully and paying attention to all the commands executed. For inexperienced users, the deployment could be a bit tough, and we suggested providing more brief information in some of the steps (all reported in JIRA).
5.3.3 FIWARE Lab Installation

Like other enablers, we’ve analysed four different scenarios: new Base image instance, new dedicated Orion GE instance, new instance using chef recipes and new instance using blueprints templates.

**New Base image instance**

The behaviour of the deployed Enabler in an Ubuntu 14.04 baseimage was the same as in local environment.

**New dedicated instance**

Documentation specified that there were a cloud image available for testing purposes, accesscontrol-gei-tha-3.3.3-1, but after several tries we couldn’t have access to it, as we reported in JIRA SEC-32.

**Using Chef Recipes**

Not available.

**Using Blueprints templates**

Not available.

5.4 IDM

5.4.1 Documentation

Taking into account the information available at [http://edu.fi-ware.org](http://edu.fi-ware.org) courses, the documentation is almost complete (the last chapter, “Authorizing access to protected resources”, is missing). We’ve really missed this chapter to integrate our application.

We also missed more information about the PEP Proxy. There were several ways to integrate IdM with Access Control and PEP Proxy, but there were not any clear guidelines.

More specific information regarding the documentation can be found in the chapter “Account Portal” described below.
5.4.2 Local Installation

Reference distribution is Ubuntu 12.04. We’ve been able to install IDM in Ubuntu 12.04 following the documentation and in 14.04 with few changes, but just in a testing environment. The guide doesn’t provide enough information to deploy the Enabler for production mode. For that, we had to implement several changes and go through different configurations that are not explained.

5.4.3 FIWARE Lab Installation

The four different scenarios for this purpose were: new Base image instance, new dedicated Orion GE instance, new instance using chef recipes and new instance using blueprints templates.

New Base image instance

The behaviour of the deployed Enabler in a Ubuntu 12.04 baseimage was the same as in local environment.

New dedicated instance

Not available as an image to deploy, but the same FIWARE Labs uses it at http://account.lab.fi-ware.org

Using Chef Recipes

Not available.

Using Blueprints templates

Not available.

5.5 NEC IoT Broker

5.5.1 Documentation

Because the NEC IoT Broker could not be installed or deployed, we could not test the examples provided in the Users and Programmers Guide. There are two official links for the installation guide

and


None of them correspond with the instructions detailed in the README.md file provided in the source code so, the documentation probably is out-dated.

5.5.2 Local Installation

Since the installation process uses files allocated in scm.ops4j.org and it no longer exists, it is impossible to accomplish the local installation. This issue was reported on October 29 and no solution is yet provided.

5.5.3 FIWARE Lab Installation

We could not deploy the IoT broker in the Cloud Portal because an unspecified error occurs each time we tried to launch it.
5.6 Kurento

The first phase of the Stream Oriented GE – Kurento – comprised its installation and configuration. The tests were divided in multiple segments that comprehend the multiple scenarios, in which each was followed the installation guide and configuration, or other sources of information, provided by the FIWARE Lab and catalogue pages.

5.6.1 Documentation

The installation guide is present in the Kurento Documentation and Downloads catalogue page (http://catalogue.fi-ware.org/enablers/stream-oriented-kurento). The documentation section provides guides for the installation and administration that is complete and updated, allowing the user to, in a fast and simple way, install and deploy the Kurento Media Server. The user and programmer guide is also complete and update. In this section there is a detail description of the API, allowing the easy development of applications that use Kurento.

In addition to the documentation section, there are also multiple examples, with the respective description and code that use the features present in Kurento, as an example samples for one-to-one or one-to-many real-time media streaming.
5.6.2 Local Installation

The first installation was on a local machine, with the following configuration: Ubuntu 14.04 (32bits), memory 4 GB and 100 GB of HDD. It follows the guide described in the previous section. The list below presents the result and notes of the tests for running the guide.

**Installation and configuration**

The installation of the Kurento Media Server (KMS) is correct and there are no major faults in the guide or documentation, all the procedures that need to be performed are present. Regarding the configuration, the information concerning the changes, which need to be performed for NAT scenarios deployment, are also present.

However, there should exist a more detailed document for the configuration file, concerning all the modules that can be used. Another drawback of the installation is being limited to Linux Ubuntu and there are not distributions for other platforms, at the present moment.

**Sanity check procedures**

For the sanity checks, installation of multiple examples is required. These examples comprehend web application to perform end-to-end testing. All the procedures need for the installation and deploy of the examples are present. The feedback of the sanity check procedures is given from the log of the Web Server and the Kurento Media Server.

In a general way, the installation of the Kurento Media Server is easy and fast. The configuration to deal with authentication, NAT and TURN relating problems is simple. Overall the process runs well.

5.6.3 FIWARE Lab Installation

The second installation was on a VM machine, with the following configuration: Ubuntu1404_x64 image and m1.small flavour. Due to the fact that this installation was very similar to the previous one no major problem has been found.

The third installation was on a VM machine, based on a following image kurento-image-R5.0.4 and m1.small flavour. There should not be any installation. The presented image, after deployment, should have all the components ready for use. There should be an image with a stable version and an image with the current version of the Kurento.

In the FIWARE Lab, the present image had all the components install and deployed, including the samples to test the end-to-end connectivity. The present image has the latest version in accordance with all the documentation.
5.7 EspR4FastData

5.7.1 Documentation

The installation guide is present in the Esp4fastData Documentation and Downloads catalogue page (http://catalogue.fi-ware.org/enablers/gateway-data-handling-ge-espr4fastdata/documentation). The documentation section provides a guide for the installation and administration that is complete and updated, allowing the user to, in a fast and simple way, install and deploy the Espr4FastData GE. The user and programmer guide is also complete and updated.

In addition to the documentation section, there is also a quick start tutorial scenario.

The tutorial scenario is well documented and includes a sanity check procedure to check if the install process went well.

5.7.2 Local Installation

At first we had some troubles with the local install because of the version of the GE provided in the catalogue and documentation page. The install process when well but the sanity check procedure and the system test did not give good results. This was due to an outdated version that we reported: http://jira.fi-ware.org/browse/HELP-1405. After fixing the problem, (the good version was uploaded) the installation procedure went according the tutorial.

5.7.3 FIWARE Lab Installation

No major problem where found once the good version of the GE was uploaded.

5.8 MrCoAP

5.8.1 Documentation

The installation guide is present in the MrCoAP Documentation and Downloads catalogue page (http://catalogue.fi-ware.org/enablers/protocol-adapter-mr-coap). The documentation section provides a guide for the installation and administration that is complete and updated, allowing the user to, in a fast and simple way, install and deploy the MrCoAP GE. The user and programmer guide is also complete and updated.
The tutorial scenario is well documented and includes a sanity check procedure to check if the install process went well.

### 5.8.2 Local Installation

At some point, the download link of the GE was outdated. But it was quickly resolved after signalling the error. Following the installation guide to setup the prerequisite and using the automatic bash installer that comes with the GE it is very easy to install it.

### 5.8.3 FIWARE Lab Installation

No major problem where once we had a stable ssh connection.
6 Friendly testing developer examples

6.1 How to get already created mashups and widgets and inspect their source code in order to improve users new functionalities

The tutorial describes how to get already created mashups and widgets and inspect their source code in order to improve them and provide users with new functionalities.

Through this tutorial the user will see all needed steps to do so. In this case, the tutorial describes how to improve Multimedia Viewer Pack so that it can play audio resources.

6.1.1 Architecture

The target widget has a structure like the one in the following image:

![Image of widget structure]

**Figure 6.1: Structure of the target widget**

It is composed of a main html file, “index.html”, with uses CSS, JS and other resources, distributed in the folders you can see in the figure.

In order to test the wiring process, we also propose a very simple connection architecture example you can see in the following image:

![Image of simple connection architecture]
Figure 6.2: Connection architecture of the widget example

6.1.2 Generated documentation

We generated a document, called “How to improve an already created widget”, that explains, step by step with code snippets, how to modify a widget in order to add some functionality inside it. Moreover, a video tutorial that explains all goals step by step has been done, too.

Documents can be checked at: https://www.dropbox.com/sh/opl3kykaozrywn/AAAAADYy4jY5YG4rzJSiNjspAUta?dl=0

6.2 Data analysis with Cosmos and MapReduce

The goal of the tutorial created is showing how to analyse data using FIWARE BigData Generic Enabler, Cosmos. With this tutorial, the user will be able to learn to:

- Add data to Cosmos.
- Query locally the files uploaded.
- Code a custom MapReduce program.
- Execute MapReduce programs in Cosmos to analyse data.
- Exploit the data in a frontend application.

6.2.1 Architecture

The proposed architecture for the tutorial involves a Linux Virtual Machine created on FIWARE Lab Cloud Portal, the generic instance of Cosmos and WireCloud. In the tutorial we explain that the virtual machine is used in order to query Cosmos remotely through remote Hive and later on we explain and provide the full code to make the reader able to develop his or her own MapReduce job. Finally, we show the reader examples on how to exploit that data on a frontend application, in this case using WireCloud widgets, given an API that he or she should develop.
6.2.2 Generated Documentation

All the generated documentation has been written in a document called Data Analysis with Cosmos and MapReduce.docx. We also provide with the document all the code files explained on it, so it is easier for the readers to analyse and modify what is needed for their own examples. We did not find the need for updating the official documentation as the process explained in the tutorial is complementary to it and we took as base the documentation provided in FIWARE Catalogue.

Documentation can be checked at:

https://www.dropbox.com/sh/k6f3x62suvr3wmd/AAD50XodqDHFGOkujlbvNx2ea?dl=0

6.3 How to publish datasets in different formats to the FIWARE Store and how to get access to private datasets that can be acquired

The goal of the created tutorials is to detail how to add datasets in different formats to the FIWARE Lab Data portal and publish them to the FIWARE Store. Moreover, the tutorial also explains how to request access, in the FIWARE Lab Data, to a private dataset that can be acquired in the FIWARE Store. After following the tutorial the user should be able to:

- Add a new dataset to FIWARE Lab Data (CKAN) in CSV, XML and JSON.
- Publish a dataset the user owns in the Lab Data to the FIWARE Store.
- From the FIWARE Data Lab request access to a private dataset that can be acquired in the FIWARE Store.

In the current FIWARE Lab Data (CKAN) implementation when a user clicks in a private dataset (that can be acquired in the FIWARE Store), as shown in Figure 6.3, is displayed a message like the one in Figure 6.4.

![PRIVATE] Madrid Transport Evolution
Evolution of Madrid Transport

CSV

Figure 6.3: CKAN acquirable private dataset before the “Get Access” button

To improve the usability of the FIWARE Lab Data when acquiring a private dataset a button, to request access to the dataset, was implemented. This button improves the usability by forwarding the user to
the dataset in the Store when clicked, as a replacement for the user having to click the link within the blue message dialog (Figure 6.4). Additionally, the error message “Unauthorized to read package” is also hidden from the user.

![Figure 6.4: Current message when trying to access private dataset](image)

An example of a private dataset that can be acquired in the Store after the implementation of the “Get Access” button is shown in Figure 6.5. The button is only shown for private datasets that can be acquired in the FIWARE Store. The button is not shown for datasets owned by the user or already acquired.

![Figure 6.5: CKAN acquirable private dataset with “Get Access” button](image)

### 6.3.1 Architecture

The FIWARE Lab Data Portal uses CKAN as the platform to provide Datasets that can be used in FIWARE applications. CKAN can be customized by using extensions. These extensions can provide additional features, extend existing core functionalities.

The CKAN in the FIWARE Lab Data Portal uses several extensions to integrate it with other FIWARE components and to adapt CKAN to the specific FIWARE requirements. The main extensions used by the CKAN in FIWARE including a brief description are listed below:

- **ckanext-privatedatasets**: modifies the default behaviour for private datasets. Allows a user to create private datasets only visible to certain users and provides an API to access private datasets. By default CKAN only allows the owner to access private datasets.
- **ckanext-storepublisher**: allows to publish datasets in the FIWARE Store as offerings.
- ckanext-datastore_restful: provides a fully Restful API to access the data contained in the DataStore.
- ckanext-oauth2: adds oAuth2 support.
- ckanext-FIWARE_header: replaces the default CKAN header with one customized for FIWARE, similar to the header used in other FIWARE Portals.

For the “Get Access” button implementation we opted for a modification of the ckanext-privatedatasets extension. This choice was based on the fact that this extension modifies the behaviour of the private datasets in CKAN and the “Get Access” button depends on this customized behaviour. Thus, an implementation as an independent extension would not be the most correct choice.

The forked version of ckanext-privatedatasets extension that includes the implementation of the “Get Access” button can be found at the following GitHub repository: https://github.com/pgalves/ckanext-privatedatasets.

6.3.2 Generated Documentation

We generated a document detailing the different steps needed to add a new dataset in different formats to FIWARE Lab Data and then how to publish this dataset to the FIWARE Store, which can be found at the following GitHub repository: https://github.com/pgalves/ckanext-privatedatasets/tree/master/docs. A Video tutorial detailing the steps to add new datasets was also created that can be found at the following link:

https://www.youtube.com/watch?v=tTZZr4HmDGE&list=UUQvLeLVdgdXtfiooPZemWpg&spfreload=10

6.4 Orion Context Broker + IoT

The main goal of this developer example is to show how data gathered from Internet of Things networks can be published in CKAN using Orion Context Broker. The user publishing contents should be authenticated using IDM (KeyRock) and using the roles assigned in IDM, Access Control module controls the users permissions (authorization) to complete the publishing action. The publication of IoT data is done in Orion and using Cygnus CKAN subscribed to Orion, the data is pushed to CKAN.

In order to achieve these goals, two scenarios have been covered:

- Manual Publishing to CKAN: in this scenario, using a web application, the user can create new context entities and update the values to them. These entities are created as CKAN resources and the values for these entities are stored in CKAN resources, including all values updates (history).
- Sensors publishing to CKAN: In this scenario sensors data from Santander Smart City Sound Level Meters are published in CKAN.
6.4.1 Architecture

The basic architecture for this application is:

![FIWARE ChanChan global architecture](image)

**Figure 6.6: FIWARE ChanChan global architecture**

The user has created an account in IDM (idm.server), and the admin user in IDM has added the “Publisher” role to her, so she can publish contents in CKAN. The sensors data is gathered using FIWARE Lab Orion context broker, and manual publication and sensors publication is done to CKAN.

The details of the architecture are in the next graph:
In order to install all the platform a vagrant image has been created including the download, install, deploy, configuration and integration of all the components.

Also, some specific development has been done like implementing the communication between KeyRock and KeyPass.

All components are Open Source, so any developer can download the platform and use it, including the ChanChan application. The developer just needs an account in CKAN and in FIWARE Labs to test all and understand how all the architecture work together.

6.4.2 Generated Documentation

The entire project is available in GitHub in the ChanChan repository:

https://github.com/Bitergia/FIWARE-chanchan
In this project:

- All source code from ChanChan app is included.
- All vagrant scripts to create the full ChanChan platform are included.
- There is a wiki with information about the install process and how to use the platform as a base system to start developing with. Also, in the wiki the basic information to understand the main interactions is also included.
- A presentation of the full project is included in “doc” directory, including the architecture diagrams.
- A video tutorial of the app is also included.
- Install process of the platform and the application is also documented in the source code main README file.

6.5 Kurento + CEP

In this section there is a description of an example develop using the CEP and Kurento, which are described in the sections 4.6.3 and 4.6.5 of this document, respectively. For a brief description of the example, is used a Kurento filter that detects ZBar codes and trigger events. These events are given to the CEP, which processes them and returns feedback for the end user.

6.5.1 Architecture

The architecture of the example uses a modular design and is based on Kurento and CEP architectures. The Figure 6.8 illustrates in detail the modules used and the communication channels between them.
The architecture is composed by the following modules:

- **Client Browser**: this module represents the end user browsers, which are capable to support WebRTC communications.
- **Web Server Application (WSA)**: this module represents a web server that implements a sample application of Kurento. It can communicate using websockets and rest interfaces.
- **Kurento Media Server (KMS)**: this module represents the Kurento Media Server that is responsible for web real-time communication.
- **CEP Event Processing**: this module represents the Complex Event Processing (CEP) that is responsible for processing events originated by the web sample application.

At the start of the application, the client browser connects to the WSA, using for communication web sockets and trading messages in JSON format. This step allows the establishment of a communication channel between the client and the server.
When the client wants to begin a real-time communication, the WSA is used as an intermediary to create a communication channel with KMS. After the channel is set up, the media streaming communication, between the client and the media server, is based in the WebRTC schema.

At the same time that the client is performing a stream communication with the media server, there is a daemon present in the KMS, which is gathering information and sending it to CEP, using a Representational State Transfer (REST) interface and messages in JSON format. The CEP then processes the information that was receive and provides feedback to the client, using the WSA as an intermediary.

6.5.2 Generated Documentation

This application provides an example to how to integrate the Kurento with CEP. The main goal is to use the real-time communication samples, from the Kurento, to create events, which can be processed by the CEP, generating some feedback for the end user. Given that Kurento was a filter that detects and reads ZBar codes, it is possible to develop an application that allows the user showing a code bar that will trigger an event, similar to the cash registration machines of the supermarkets.

The example is a ZBar code analyser that from the values given, in the format of bar codes, presents results to the end user. The end user shows barcodes to the Webcam with values, which are identified and decoded by the Kurento. These values are then used by the CEP that, for a time window, calculates the number of view, sum and average of the values. The results are then send to the end user as feedback.

This is a basic example showing how is possible to use image filters, provided from Kurento, to analyse and then process events and created from image collection. In the future, with more different filters it is possible to develop more advance analysis mechanism that are capable of processing other type of data, identification and processing events generated from car plates or face recognition.

The installation and the configuration detailed in this section are for a deployment in local machines in your own premises and could be easily adapted for a deployment in the FIWARE Cloud.

The entire project is available in GitHub in the following repository: [https://github.com/pgalves/BarCodeApp](https://github.com/pgalves/BarCodeApp). The project on the repository contain:

- All the documentation, on how to install, configure, deploy and run the application.
- The Kurento WebServer application source code.
- The CEP project file for the application.
- The scripts for collect and parse information from Kurento logs files.
6.6 IoT + Wirecloud

In this section a description of a sample application developed using the IoT and Wirecloud modules is presented. The application consists of two widgets, one that accepts user inputs that represent the id of a sensor, and another that requests sensor data from this device resorting to the IoT GE’s. After receiving the sensor’s data, the widget presents it onscreen.

6.6.1 Architecture

The architecture of the sample application uses a modular design and is based on the Wirecloud and IoT GEs. The Figure 6.9 illustrates in detail the modules used and the communication channels between them.

The architecture is comprised by the following modules:

- **Wirecloud**: this module represents the web interface of the Wirecloud GE and its corresponding widgets.
- **IoT Broker**: this module represents a communications broker which handles all the requests from the widgets and returns the data from the devices registered on the IoT Configuration Manager.
- **IoT Configuration Manager**: this module handles the registration and de-registration of the available devices and their information.

At the start of the application, the client browser connects to the Wirecloud platform and logs-in with the user credentials. In the Wirecloud platform, the user has two available widgets. One widget allows the user to input the name of the device to be queried, and the other widget’s task is to present the device’s information.

The user fills in the form with the device name for which he wishes to get the data. The name of the device is passed to the second widget using the wireframe architecture. The second widget then performs a REST GET request to the IoT Broker GE using NGSI10 enquiring about this particular device. In its turn the IoT Broker queries the IoT Configuration Manager GE through NGSI9 to check if the device exists and to get the requested data. The IoT Configuration Manager returns a XML response with the device object, which contains several data. Afterwards, the IoT Broker forwards this XML document to the Widget to be presented on the Wirecloud platform.

In our particular case, since there are unsolved and impeding bugs on the IoT Broker GE related to XML verification and validation, we bypassed the Broker GE and queried the IoT Configuration Manager directly. We did this in order to get access to the device’s information. This way, the application performs as expected and the outputs correspond to the manuals.

### 6.6.2 Generated Documentation

This application provides an example of how to integrate the IoT GEs with Wirecloud. The main goal is to use the Wirecloud widget paradigm to present sensor device data in a user friendly interface, which is modular and has many possibilities for expandability. This gives us the possibility to interact and retrieve information on many types of devices with many types of sensors and information gathering mechanisms. In turn this results in an easier way to visualize and manipulate the data from the devices unlocking many possible real-world applications.

The installation and the configuration detailed in this section are for a deployment in local machines in your own premises and could be easily adapted for a deployment in the FIWARE Cloud.

The entire project is available in GitHub in the following repository: [https://github.com/PedroBorges9/FIWARE-Wirecloud-IoT-DeviceData](https://github.com/PedroBorges9/FIWARE-Wirecloud-IoT-DeviceData). The project on the repository contains:

- All the documentation, on how to install, configure, deploy and run the application.
- The Wirecloud data retrieval widgets application source code.
6.7 3D-UI-XML3D/WebTundra

The goal of the tutorial is showing how XML3D integrates with the HTML DOM and the utilities it provides. With this tutorial, the user will learn to:

- Create an XML3D scene.
- Add your own objects to a canvas scene using XML3D.
- Modify the scene through the HTML DOM and using events.

The application developed to cover the previous points is a very simple 3D Arkanoid. The original idea was to combine and XML3D application with WebTundra synchronisation server. The problem we found was that there was no explanation in the official documentation about how to make custom Tundra scenes (named tXML files) which was reported on testing phase.

6.7.1 Architecture

The proposed architecture for the tutorial involves a Linux machine, which can be a local one. In the tutorial we also point that the reader is able to create a Virtual Machine in the FIWARE Lab Cloud Portal service. The application architecture does not need any other resource since it is completely based on frontend code.

6.7.2 Generated Documentation

All the generated documentation has been written in a document called Using XML3D in an HTML application.docx. In this file we documented all the process of creating a custom scene and manipulating it through JavaScript and events. Since the official documentation does not provide clear and direct example on how to export custom models from modelling applications, we also added a section on how to export from Blender to XML3D format. All the scene, model and logic code has been provided to the reader so he or she can follow it and modify it as needed.

In general, the official documentation of the Advanced Web UI Architecture chapter has a dispersed documentation and a lack of concrete explanation on how the different GEs can interact together. We think more tutorials on specific examples of interactions between GEs of the chapter can be useful for the official documentation.

Documentation can be checked at: https://www.dropbox.com/sh/tiai28frd9susdl/AACbkfeS3M176gtJOnKYTEr1a?dl=0
6.8 IoT Discovery

Throughout the tutorial the user will learn how to use the IoT Discovery GEi. The tutorial is focused in two main areas, the sensor2web API and the NGSI-9 API. The tutorial also describes how to install the GEi. Specifically with the sensor2web API, the user will be able to:

- Register an IoT description for resources, services and entities.
- Update an IoT description for resources, services and entities.
- Retrieve the IoT description of a resource, a service or an entity from its identifier.
- Use patterns to search services, entities or resources.
- Do queries using SPARQL for retrieve IoT descriptions.
- Locate a description of a resource or entity from a map.

All the operations related to sensor2web will be performed using the web interface and directly using the API. Furthermore the user will be able to use the NGSI-9 API to:

- Register a new context entity.
- Discover the availability of context entities in different ways.

6.8.1 Architecture

The architecture needed to accomplish the tutorial is really simple. On the one hand, it only has the IoT Discovery GEi as backend service and, on the other hand, we use the web browser to interact with the enabler through the web interface, and a RESTClient extension installed in the browser to use the API directly.

6.8.2 Generated Documentation

We generated a document that explains how to use IoT Discovery GEi. In order to allow to the user accomplish the objectives of the tutorial, it also provides a step-by-step examples with all the code that is needed. Moreover, a video tutorial that explains all goals step by step has been done too.

Documentation can be checked at:
https://www.dropbox.com/sh/9866kez72uw1rpq/AAB5QCYjSHbU-4dK1hm2CFhba?dl=0
6.9 CEP

Throughout the tutorial the user will learn how to use the CEP GE implemented by IBM Proactive Technology Online (aka Proton). If the user follows this tutorial, he will be able to install the enabler and manage a complex event system performing actions like:

- Define event classes and events
- Define different contexts.
- Define events processing agents that will detect predefined situations and will generate derived events.
- Declare a producer in order to get inputs.
- Declare a consumer in order to provide outputs.

6.9.1 Architecture

In the backend we need Apache Tomcat installed with the Authoring Tool deployed, we also need an instance of the standalone version of Proton. Finally, we use two REST services that act as consumer and producer. In the following figure, we can see the defined architecture for this example.

Figure 6.10 CEP for IoT architecture
6.9.2 Generated Documentation

We generated a document, which explains how to use the CEP GEi. In order to allow the user to accomplish the objectives of the tutorial, it also provides a step-by-step example with several screenshots and captures. This example consists in generating an alert if the temperature exceeds a specific value. We have done it using a REST service as producer and another as consumer.

Documentation can be checked at:

https://www.dropbox.com/sh/9y2m4nd637eear0/AABXPkDYAVSCHC9tAVmUJKgma?dl=0
7 Follow up with the resolution of issues

This section makes a resume of work accomplished by the friendly testers team. It will cover the periods between 7 October 2014 and 9 December 2015 (approx. 90 days). We will see in a first part the number of issues created and how many have been marked as resolved. The first part will also show how the issues are distributed between the different FIWARE components. In a second part we will see the resolution status and average resolution time of the issues. Finally in a last part we will see what kind of issues were marked as resolved but are not really yet.

7.1 Created and resolved issues

Since the friendly tester teams have been reporting issues on FIWARE project a large its number have not stopped growing. We have to note that the values represented in the below figures include not only the friendly tester issues but all issues reported on the mailing lists (FIWARE-lab-help [at] lists.fi-ware [dot] org, FIWARE-tech-help [a] lists.fi-ware [dot] org, etc.).

As said before, due to the complexity of the cloud portal, most of the issues created concern this part (48%). In second place comes the tech part (General enablers installation and usage) with 25 % of the issues created.

By the end of the friendly testing we can see a considerable reduction in the amount of issues created as the curve of the Figure 7.1 reduces its increase speed.
This chart shows the number of issues created vs. the number of issues resolved in the last 90 days. We can see in the previous figure that from mid-October to 4 November 2014 (20 days) about 500 issues were created. This corresponds with the beginning of the tests realized by friendly tester’s team as they were reporting issues found on all FIWARE components. The pace slows down then ~ 400 issues were created in 50 days.

The table below shows the data used to create the graph. More than 50% of the issues were created in the first 5 weeks of the friendly tester tests.

<table>
<thead>
<tr>
<th>Period</th>
<th>Created</th>
<th>Resolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 41, 2014</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Week 42, 2014</td>
<td>69</td>
<td>0</td>
</tr>
<tr>
<td>Week 43, 2014</td>
<td>152</td>
<td>267</td>
</tr>
</tbody>
</table>
As said before, a large amount of issues were created during the friendly testing phase 1. Those issues are mostly divided into two big components (FIWARE-lab-help and FIWARE-tech-help), but they are not the only one in which new issues was created. The following figure gives details about the different issues that were created in the Jira Support project.

<table>
<thead>
<tr>
<th>Week</th>
<th>New Issues</th>
<th>Resolved Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 44, 2014</td>
<td>187</td>
<td>111</td>
</tr>
<tr>
<td>Week 45, 2014</td>
<td>146</td>
<td>90</td>
</tr>
<tr>
<td>Week 46, 2014</td>
<td>58</td>
<td>115</td>
</tr>
<tr>
<td>Week 47, 2014</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>Week 48, 2014</td>
<td>38</td>
<td>60</td>
</tr>
<tr>
<td>Week 49, 2014</td>
<td>59</td>
<td>30</td>
</tr>
<tr>
<td>Week 50, 2014</td>
<td>39</td>
<td>45</td>
</tr>
<tr>
<td>Week 51, 2014</td>
<td>56</td>
<td>66</td>
</tr>
<tr>
<td>Week 52, 2014</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Week 1, 2015</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Week 2, 2015</td>
<td>30</td>
<td>29</td>
</tr>
</tbody>
</table>
A detailed content can be shown in the Table 7.2, which gives detailed of all the issues that were created during this period of time. Take into consideration that not all the issues were created by the friendly testers but almost all of them are responsible of this team. Over the 90 days 561 issues that represent 70% were created in the FIWARE-lab-help component. In this case the component makes reference to the different email list from which the issue was reported to the Jira.

The large amount of issues is due to the complexity of the components, which involves Cloud, Data, Mashups, Help&Info, accounts and store portal. We have analysed the issues that the friendly testers have reported in order to create the Figure 7.3. More than half of the issues are distributed between the Cloud Portal and Mashups/Wirecloud (27%+25%). We have also seen some general issues in the FIWARE Lab that does not concern any portal in particular and design issues also.

Table 7.2: issue repartition by component data
<table>
<thead>
<tr>
<th>Component</th>
<th>Issues</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIWARE-LAB-HELP</td>
<td>561</td>
<td>48%</td>
</tr>
<tr>
<td>FIWARE-TECH-HELP</td>
<td>297</td>
<td>25%</td>
</tr>
<tr>
<td>No component</td>
<td>207</td>
<td>18%</td>
</tr>
<tr>
<td>FIWARE-GENERAL-HELP</td>
<td>39</td>
<td>3%</td>
</tr>
<tr>
<td>FIWARE-SPEAKERS-REQ</td>
<td>14</td>
<td>1%</td>
</tr>
<tr>
<td>FIWARE-FEEDBACK</td>
<td>10</td>
<td>0%</td>
</tr>
<tr>
<td>FIWARE-COLLABORATION-REQ</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>FIWARE-OPEN-DATA-REQ</td>
<td>5</td>
<td>0%</td>
</tr>
<tr>
<td>FIWARE-SMART-CITIES-REQ</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>FIWARE-OPS-HELP</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>FIWARE-MUNDUS-REQ</td>
<td>3</td>
<td>0%</td>
</tr>
</tbody>
</table>

Figure 7.3: FIWARE Lab issues by friendly testers.
Unlike the issues of the General, Design and Cloud, where all of them was reported; the rest of components have still issues unresolved that should be closed in the next weeks. We can see in the Figure 7.4 the relation of unresolved issues per components.

![Unresolved issues/GE](image)

**Figure 7.4: Unresolved FIWARE Lab issues per GE.**

The table below shows the data gathered and used to construct the previous two charts.

**Table 7.3: FIWARE lab issues data**

<table>
<thead>
<tr>
<th>FIWARE Lab Components</th>
<th>Issues</th>
<th>% Issues</th>
<th>Unresolved Issues</th>
<th>% Unresolved Issues / GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud</td>
<td>60</td>
<td>26,67</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>data</td>
<td>17</td>
<td>7,56</td>
<td>4</td>
<td>23,53</td>
</tr>
<tr>
<td>store</td>
<td>36</td>
<td>16</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Mashup/Wirecloud</td>
<td>56</td>
<td>24,89</td>
<td>17</td>
<td>30,36</td>
</tr>
<tr>
<td>Account</td>
<td>16</td>
<td>7,11</td>
<td>2</td>
<td>12,5</td>
</tr>
<tr>
<td>Design</td>
<td>9</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>General</td>
<td>31</td>
<td>13,78</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
As for the FIWARE-tech-help the friendly testers have tested those GE:

- Kurento
- IDAS
- IoT Broker
- IoT Discovery
- Orion Context Broker
- Espr4FastData
- MR CoAP

Those tests have led to the creation of 64 issues found by friendly testers. The figure below shows the repartition of the issues count.

![% Issues](image)

**Figure 7.5: FIWARE Tech Lab issues by friendly testers**

Some of the issues are still unresolved as the chart below shows the % of unresolved issues per GE.
As a total, we see that 26% of the issues reported are still not resolved. The table below shows the numbers that were used to build the charts.

Table 7.4: FIWARE Tech Lab issues data

<table>
<thead>
<tr>
<th>Generic Enablers</th>
<th>Issues</th>
<th>% Issues</th>
<th>Unresolved Issues</th>
<th>% Unresolved Issues / GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orion Context Broker</td>
<td>4</td>
<td>6,25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>MR CoAP</td>
<td>2</td>
<td>3,125</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>Kurento</td>
<td>1</td>
<td>1,5625</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IoT Discovery</td>
<td>7</td>
<td>10,9375</td>
<td>3</td>
<td>42,86</td>
</tr>
<tr>
<td>IoT Broker</td>
<td>6</td>
<td>9,375</td>
<td>4</td>
<td>66,67</td>
</tr>
</tbody>
</table>
7.2 Issue resolution and time

Over the 90 days proximally 70% of the issues have been marked as resolved (done). Due to the complexity of the issues and the increase of the number of them, the average resolution time of an issue has nearly doubled going from 20-30 days to 50 days.

Those numbers are not always representative of the resolution delay of an issue. Indeed, it is only an average time given by Jira charts. Many of the tasks where resolved quickly (marked as answered) but they are only marked as resolved later.
Due to the complexity of the issues and the increase of their numbers, the average resolution time of an issue has nearly doubled going from 20-30 days to 50 days as the figures 18 shows us.

This chart shows the average number of days issues were unresolved for on a given day over the past 90 days.

<table>
<thead>
<tr>
<th>Period</th>
<th>Issues Unresolved</th>
<th>Total Age</th>
<th>Avg. Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 42, 2014</td>
<td>247</td>
<td>5421</td>
<td>21</td>
</tr>
<tr>
<td>Week 43, 2014</td>
<td>314</td>
<td>7054</td>
<td>22</td>
</tr>
<tr>
<td>Week 44, 2014</td>
<td>198</td>
<td>2499</td>
<td>12</td>
</tr>
</tbody>
</table>
## 7.3 Unresolved issues marked resolved

While doing the follow up, we could find some issues marked as resolved that are not. We proceeded to take all the issues in the HELP project that were marked as resolved from the 90 past days in order to replay all the user scenarios which have led to an error and check if the error still exists. We found some of them that are not. Here are some issues marked as resolved but are not resolved:

- [http://jira.fi-ware.org/browse/HELP-390](http://jira.fi-ware.org/browse/HELP-390): Key file with unknown name
- [http://jira.fi-ware.org/browse/HELP-446](http://jira.fi-ware.org/browse/HELP-446): Removing a member
- [http://jira.fi-ware.org/browse/HELP-516](http://jira.fi-ware.org/browse/HELP-516): no credentials to access VM over VNC
- [http://jira.fi-ware.org/browse/HELP-700](http://jira.fi-ware.org/browse/HELP-700): message": "Flavours' disk is too small for requested image”, "code": 400
- [http://jira.FIWARE.org/browse/HELP-759](http://jira.FIWARE.org/browse/HELP-759): JSON storage. This error was dealt with in comment section.
Some of the times the developer’s team could not reproduce some of the errors. This is because of the user hardware and software configuration. While reproducing an issue, the same OS and Browsers have to be the same mentioned in the issues.

i.e.: http://jira.fi-ware.org/browse/HELP-390 The issue is only reproducible if we use Browser: Safari 7.1 OS: Mac OS X 10.9.5.

The Browsers can behave in different manners to the same JavaScript/CSS Code.
8 Conclusions

In this deliverable we presented the results of our work regarding the friendly testing activities over FIWARE Lab and the more important Generic Enablers reference implementations (GEri). This activity that is name Quality Assurance (QA) will allow us to improve in time the performance and user experience of the FIWARE Lab and their Generic Enablers.

The following points have been provided:

1. Test Cases definition for all the Generic Enablers and Portals involved in this process.
2. Way of working in the Quality Assurance process, including the activity of the coordinators and friendly testers.
3. Result of the execution of the Test Cases associated to FIWARE Portals, including a resume of the different issues that was found by the friendly testers.
4. Result of the execution of the Test Cases associated to the most important GEris in FIWARE, including a resume of the different issues that was found by the friendly testers.
5. Result of the applications examples developed by friendly tester and the different problems that they found using the GEris.
6. Analysis of the issues in time created by friendly testers and the situation in which they are after the finalization of this activity.

An initial requirement specification for QA has been provided. We defined a Test Suite in order to test the FIWARE portals and GEri in order to detect as many as possible each bugs and issues that the normal user could find in a normal use of those components. In particular we have provided and initial specification of those Test Suite in order to reproduce afterward without any problems. We have also described our general approach and associated problems related to the access to those components together with any misunderstanding in the documentation provided by those components, specifically the GEs.

Besides, we define a set of example applications using different GE in order to test that the documentation provided by them all consistent and they can be used integrated with other GE. Those examples try to demonstrate the enablers’ integration ability and how to improve documentation, tutorials and guidelines. In general, we have found the FIWARE project as a huge supporter for research and development of Internet based technologies and applications, allowing developers to advance very quickly in prototyping and bringing their ideas to reality. We think that following the development path we have seen during our collaboration; the platform has potential to bring greater impact in services development and maintenance thanks to its broad goals and traversal tools.

Regarding the first objective, many bugs have been detected thanks to the Test Suite that we have defined (see section 7 for details) and they have been incorporated to the enablers tracking systems defined thanks to the procedure that have been defined in this document (see section 3 for details). This fact provides very valuable information for the enablers’ teams that can use this information to improve
both enablers’ code and documentation. As a continuation of this activity, we would like to make a follow-up activity on these issues in order to assure that all the raised issues are fixed and solved.

Regarding the second objective, several and very interesting examples have been developed covering the most used FIWARE GEs. These examples show the ability of integration of them and the ease of use of them. The generated code and documentation have good quality and fulfil the expectations. These examples are a good starting point and a very valuable documentation for other developments and applications to be implemented in the future. We have to remember that the activities arose by friendly testing was limited in time and resources and the examples that was developed in that time give us a detailed information about the capacity of the FIWARE in order to provide faster integrated solution that ever without little effort by developers.

In general terms, the friendly testing activity has reported a very positive feedback and it has been very useful and valuable for Generic Enablers’ teams and we encourage continuing this activity during the continuation of the project.
Table 9.1: Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>CEP</td>
<td>Complex Event Processing</td>
</tr>
<tr>
<td>CKAN</td>
<td>Comprehensive Knowledge Archive Network</td>
</tr>
<tr>
<td>FEMTO-ST</td>
<td>Université de Franche-Comté</td>
</tr>
<tr>
<td>GE</td>
<td>Generic Enabler</td>
</tr>
<tr>
<td>GErí</td>
<td>Generic Enabler reference implementation</td>
</tr>
<tr>
<td>GID</td>
<td>Group ID</td>
</tr>
<tr>
<td>HDD</td>
<td>Hard Disk Drive</td>
</tr>
<tr>
<td>HTTP</td>
<td>Hipertext Transfer Protocol</td>
</tr>
<tr>
<td>IDM</td>
<td>Identity Manager Generic Enabler</td>
</tr>
<tr>
<td>IOT</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>KMS</td>
<td>Kurento Media Server</td>
</tr>
<tr>
<td>NAT</td>
<td>Network Address Translation</td>
</tr>
<tr>
<td>OneSource</td>
<td>One Source Consultoria Informática, Lda.</td>
</tr>
<tr>
<td>OS</td>
<td>Operative System</td>
</tr>
<tr>
<td>PAP</td>
<td>Policy Access Point</td>
</tr>
<tr>
<td>PDP</td>
<td>Policy Decision Point</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>RAM</td>
<td>Random Access Memory</td>
</tr>
<tr>
<td>REST</td>
<td>Representational State Transfer</td>
</tr>
<tr>
<td>REST</td>
<td>Representational State Transfer</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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</tr>
<tr>
<td>RTP</td>
<td>Real-time Transport Protocol</td>
</tr>
<tr>
<td>SCIM</td>
<td>System for Cross-domain Identity Management</td>
</tr>
<tr>
<td>TURN</td>
<td>Traversal Using Relays around NAT</td>
</tr>
<tr>
<td>tXML</td>
<td>Tiny XML</td>
</tr>
<tr>
<td>UID</td>
<td>User ID</td>
</tr>
<tr>
<td>ULPGC</td>
<td>Universidad de Las Palmas de Gran Canaria</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
</tr>
<tr>
<td>VM</td>
<td>Virtual Machine</td>
</tr>
<tr>
<td>WSA</td>
<td>Web Server Application</td>
</tr>
<tr>
<td>XACML</td>
<td>eXtensible Access Control Markup Language</td>
</tr>
<tr>
<td>XML</td>
<td>eXtensible Markup Language</td>
</tr>
</tbody>
</table>
Annex A: Summary of all reported issues:

The following table presents a summary of all reported issues with the corresponding issue identification on Jira.

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLD-10 HELP-442</td>
<td>[UI] Deleting a Keypair</td>
</tr>
<tr>
<td>CLD-11 HELP-443</td>
<td>[UI] Creating new Security Group</td>
</tr>
<tr>
<td>CLD-12 HELP-445</td>
<td>[UI] Fields in rules for security group</td>
</tr>
<tr>
<td>CLD-13 HELP-444</td>
<td>[UI] Adding new rule for Security Group</td>
</tr>
<tr>
<td>CLD-14 HELP-446</td>
<td>[UI] Removing a member</td>
</tr>
<tr>
<td>CLD-15 HELP-463</td>
<td>[UI] Incorrect warning message</td>
</tr>
<tr>
<td>CLD-16 HELP-458</td>
<td>[FIWARE-Lab] Terminating a instance</td>
</tr>
<tr>
<td>CLD-17 HELP-459</td>
<td>[FIWARE-Lab] Removing multiple Groups</td>
</tr>
<tr>
<td>CLD-18 HELP-460</td>
<td>[FIWARE-Lab] Error removing a security group</td>
</tr>
<tr>
<td>CLD-19 HELP-461</td>
<td>[FIWARE-Lab] Associating an IP to instance</td>
</tr>
<tr>
<td>CLD-20 HELP-465</td>
<td>[UI] Information message for removing Security Group</td>
</tr>
<tr>
<td>CLD-21 HELP-467</td>
<td>[UI] Creating duplicated rules</td>
</tr>
<tr>
<td>CLD-34 HELP-521</td>
<td>Cloud: Error &quot;No nw_info cache associated with image&quot; after successfully launch instance</td>
</tr>
<tr>
<td>Issue</td>
<td>Description</td>
</tr>
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<td>-------</td>
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</tr>
<tr>
<td>CLD-37 HELP-396</td>
<td>Cloud: Halted instance shows Power State as &quot;RUNNING&quot;</td>
</tr>
<tr>
<td>CLD-39 HELP-393 HELP-994</td>
<td>Interface user feedback lackingCloud: Instance Password</td>
</tr>
<tr>
<td>CLD-40 HELP-392</td>
<td>Add Security Group placeholder text</td>
</tr>
<tr>
<td>CLD-41 HELP-391</td>
<td>Modal loading screens without cancel</td>
</tr>
<tr>
<td>CLD-42 HELP-390</td>
<td>Key file with Unknown name</td>
</tr>
<tr>
<td>CLD-43 HELP-389</td>
<td>Rules creation UI/UX mismatch</td>
</tr>
<tr>
<td>CLD-48 HELP-698</td>
<td>Labs: missing hint or info for minimum password length on sign up</td>
</tr>
<tr>
<td>CLD-49 HELP-699</td>
<td>Cloud: Images - UI suggestion, include back button when presenting Image Details.</td>
</tr>
<tr>
<td>CLD-5 HELP-489</td>
<td>Cloud: Context menu shows actions, not executed or not available, when right clicking over Images</td>
</tr>
<tr>
<td>CLD-7 HELP-440</td>
<td>[UI] Wrong summary description</td>
</tr>
<tr>
<td>CLD-8 HELP-441</td>
<td>[UI] Missing button in image description</td>
</tr>
<tr>
<td>CLD-9 HELP-439</td>
<td>[UI] Keypair at creating machine</td>
</tr>
<tr>
<td>CP-13 HELP-488</td>
<td>Cloud: Description when Importing Keypair is not correct, is the same as Creating new Keypair</td>
</tr>
<tr>
<td>CP-17 HELP-700</td>
<td>Cloud: Create Instance - only instance flavours adapted to the image to deploy should be listed</td>
</tr>
<tr>
<td>CP-18 HELP-395</td>
<td>Cloud: Unable to delete snapshots</td>
</tr>
<tr>
<td>DATA-10 HELP-487</td>
<td>[Kurento GE] There should be more images of Kurento</td>
</tr>
<tr>
<td>DATA-8 HELP-428</td>
<td>CEP GE: Unexpected result/error on Unit Test 7, Case 1, Step 5</td>
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<tr>
<td>DATA-8 HELP-518</td>
<td>CEP GE: Unexpected result/error on Unit Test 7, Case 1, Step 5</td>
</tr>
<tr>
<td>HELP-1037</td>
<td>CEP GE: Create instances tab in CEP Catalogue has no references to the CEP blueprint template</td>
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<tr>
<td>HELP-1102</td>
<td>CEP GE: Clicking on a field with double quotes strings clears field (Web development UI)</td>
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<tr>
<td>HELP-1105</td>
<td>CEP GE: Error saving a definition, containing spaces in name, to file</td>
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<tr>
<td>HELP-1128</td>
<td>CEP GE: Event Attributes section collapsed by default in EPAs-Derivation tab (Web Devel UI)</td>
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<tr>
<td>HELP-1167</td>
<td>Italian/English mixed message when closing window of SCORM based webinar course</td>
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<tr>
<td>HELP-377</td>
<td>Cloud: Unable to connect to a Virtual Machine Display</td>
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<tr>
<td>HELP-388</td>
<td>Catalogue image names</td>
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<td>HELP-394</td>
<td>Certificate error</td>
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<tr>
<td>HELP-399</td>
<td>Catalogue: No links to download Complex Event Processing (CEP) - IBM Proactive Technology Online</td>
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<td>HELP-403</td>
<td>CEP GE: error running sample</td>
</tr>
<tr>
<td>HELP-406</td>
<td>[UI] Incorrect Ordering Name</td>
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<tr>
<td>HELP-412</td>
<td>CEP GE: Not clear the purpose of &quot;definitions-repository&quot; parameter in ProtonAdmin.properties file</td>
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<tr>
<td>HELP-413</td>
<td>CEP GE: Default input/output ports for ProtonOnWebServer doesn't match ports in documentation</td>
</tr>
<tr>
<td>HELP-414</td>
<td>CEP GE: Non empty definition file loaded by default when starting an instance of the Proton engine</td>
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<tr>
<td>HELP-417</td>
<td>CEP GE: Missing Draw EPN Button on the Proton Development Web UI</td>
</tr>
<tr>
<td>HELP-419</td>
<td>CEP GE: Links to Proton User Guide and Programmers guide point to different versions in the FIWARE Wiki and other places</td>
</tr>
<tr>
<td>HELP-421</td>
<td>CEP GE: Issues running Unit Test 1</td>
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<tr>
<td>HELP-424</td>
<td>CEP GE: Unit test 2 - No project named &quot;sample&quot;</td>
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<tr>
<td>HELP-425</td>
<td>CEP GE: Unit test 3, 4, 5, and 6 - No project named &quot;sample&quot;</td>
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<tr>
<td>HELP-430</td>
<td>CEP GE: Error on Unit Test 7, Case 2 - Export to external repository</td>
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<tr>
<td>HELP-431</td>
<td>CEP GE: Error testing Unit Test 7, Case 2, Step 2 - Call on REST API</td>
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<tr>
<td>HELP-464</td>
<td>CEP GE: Unit Test 6 - Missing &quot;Draw EPN&quot; button on Web UI</td>
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<tr>
<td>HELP-469</td>
<td>Cloud: UI Blueprint Templates Clone</td>
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<td>HELP-470</td>
<td>Cloud: Blueprint Clone 503 Error</td>
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<td>HELP-471</td>
<td>Cloud: UI Deleting Multiple Blueprint Templates</td>
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<tr>
<td>HELP-474</td>
<td>Cloud: UI Security Create Keypair behaviour</td>
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<tr>
<td>HELP-486</td>
<td>[Kurento GE] Deploying a dedicated GE instance based on an image</td>
</tr>
<tr>
<td>HELP-492</td>
<td>Cloud: Launched image stays with Status: BUILD, Task: spawning, Power State: NO STATE</td>
</tr>
<tr>
<td>HELP-493</td>
<td>Cloud: Launched image stays with Status: BUILD, Task: spawning, Power State: NO STATE</td>
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<tr>
<td>HELP-502</td>
<td>Cloud: Unable to connect to instance via SSH (instance: cad6bcc4-36ec-4d00-86b7-29a5edd58697)</td>
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<tr>
<td>HELP-704</td>
<td>Cloud: Error launching instance based on cep-r3.3.3-img image (Mexico region)</td>
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<tr>
<td>HELP-757</td>
<td>[Kurento GE] Trying to install some applications</td>
</tr>
<tr>
<td>HELP-758</td>
<td>GE: Interface designer</td>
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<tr>
<td>HELP-760</td>
<td>POI Data Provider</td>
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<td>HELP-770</td>
<td>CEP GE: Unable to consume/produce events from/to JMS queue.</td>
</tr>
<tr>
<td>HELP-772</td>
<td>Labs Blueprint: Empty dialog when clicking in a item in the Blueprint template catalog (Zurich region)</td>
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<tr>
<td>HELP-806</td>
<td>Cloud: Unable to access CEP GE Proton Development Web UI when launching instance from blueprint template named &quot;cep&quot;</td>
</tr>
<tr>
<td>HELP-807</td>
<td>CEP GE: Reference to different CEP GE versions in documentation/labs.</td>
</tr>
<tr>
<td>HELP-913</td>
<td>Mexico-Cloud: unsuitable Flavour sizes</td>
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<tr>
<td>HELP-920</td>
<td>Mexico-Cloud: Image operations</td>
</tr>
<tr>
<td>HELP-913</td>
<td>Mexico-Cloud: unsuitable Flavour sizes</td>
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<tr>
<td>HELP-920</td>
<td>Mexico-Cloud: Image operations</td>
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<td>HELP-921</td>
<td>Mexico-Cloud: keypair download Safari</td>
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<td>HELP-931</td>
<td>Web interface</td>
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<td>HELP-934</td>
<td>Mexico-Cloud: Security group rules</td>
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<td>HELP-935</td>
<td>Slow network</td>
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<tr>
<td>HELP-936</td>
<td>PiraeusN number of IPs</td>
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<td>HELP-938</td>
<td>Cloud: UI glitches while inspecting blueprint template</td>
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<tr>
<td>HELP-939</td>
<td>GIS Data Provider - Installation instructions</td>
</tr>
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<td>HELP-940</td>
<td>GIS Data Provider running</td>
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<td>HELP-941</td>
<td>[Kurento Lab] Problem trying to deploy test application</td>
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<tr>
<td>HELP-942</td>
<td>[Kurento Lab] Error deploying a Kurento example</td>
</tr>
<tr>
<td>HELP-943</td>
<td>[Kurento Lab] The service of kurento doesn't allow the &quot;status&quot;</td>
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<td>HELP-944</td>
<td>[Kurento Doc] Wrong link in Kurento examples</td>
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<td>CEP GE: Proton Development Web UI - &quot;Show required only&quot; button hides mandatory columns in Temporal Contexts</td>
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<td>HELP-962</td>
<td>[Kurento Tutorial] Uncorrected video guide</td>
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<td>HELP-963</td>
<td>[Cloud Lab] Blueprint Template Creation</td>
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<tr>
<td>HELP-965</td>
<td>CEP GE: Improvement, show date/time format and time units in Proton development Web UI - Temporal Contexts</td>
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<tr>
<td>HELP-967</td>
<td>[Cloud Lab] The UI resize not working properly</td>
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<td>HELP-968</td>
<td>CEP GE: Clicking on &quot;Edit&quot; button in Temporal Contexts - &quot;Relative Time Terminator&quot; section has no effect</td>
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<td>HELP-970</td>
<td>PiraeusN Cloud: Import Keypair</td>
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<td>HELP-971</td>
<td>Cloud: UI Keypairs multiple selection odd behaviour</td>
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<tr>
<td>HELP-972</td>
<td>NITOS-UTH Cloud: No available networks</td>
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<tr>
<td>HELP-974</td>
<td>Cloud: Blueprint Launch Instance</td>
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<tr>
<td>HELP-975</td>
<td>Zurich Cloud: Cannot create instance with available network</td>
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<tr>
<td>HELP-976</td>
<td>Cloud: Images UI feedback</td>
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<tr>
<td>HELP-977</td>
<td>PiraeusN Cloud: Multiple Volumes in an instance</td>
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<tr>
<td>HELP-978</td>
<td>PiraeusU Cloud: Security groups port mapping</td>
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<tr>
<td>HELP-979</td>
<td>PiraeusN Cloud: SSH</td>
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<tr>
<td>HELP-980</td>
<td>Cloud: Fast clicking side-menus breaks UI</td>
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<td>HELP-981</td>
<td>PiraeusN Cloud: Import Keypair</td>
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<tr>
<td>HELP-982</td>
<td>PiraeusN Cloud: Launch multiple Snapshots</td>
</tr>
<tr>
<td>HELP-983</td>
<td>Store: Offerings are not being deleted</td>
</tr>
<tr>
<td>HELP-984</td>
<td>Store: UI Create New Offering English</td>
</tr>
<tr>
<td>HELP-985</td>
<td>Account: UI (Delete) Destroy an Organization</td>
</tr>
<tr>
<td>HELP-986</td>
<td>Cloud: UI Delete Instance Snapshot</td>
</tr>
<tr>
<td>HELP-987</td>
<td>Cloud: UI SUGGESTION File Upload Progress</td>
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<tr>
<td>HELP-988</td>
<td>Cloud: Storage Container Stored File Size</td>
</tr>
<tr>
<td>Help Code</td>
<td>Issue Description</td>
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<tr>
<td>HELP-989</td>
<td>Cloud: UI Containers Large File Upload Problem</td>
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<td>HELP-990</td>
<td>Cloud: UI File Upload messages</td>
</tr>
<tr>
<td>HELP-991</td>
<td>Cloud: Allocate IP to Project Error</td>
</tr>
<tr>
<td>HELP-992</td>
<td>Documentation: Disparity between the Cloud Instances help video and the actual webpage UI</td>
</tr>
<tr>
<td>HELP-993</td>
<td>Documentation: Disparity between the Cloud Blueprints help video and the actual webpage UI</td>
</tr>
<tr>
<td>HELP-994</td>
<td>Cloud: Instance Password</td>
</tr>
<tr>
<td>HELP-996</td>
<td>[Kurento] There isn’t much information about chef recipes</td>
</tr>
<tr>
<td>WEB-19 HELP-420</td>
<td>GIS Data Provider installation</td>
</tr>
<tr>
<td>WEB-20 HELP-418</td>
<td>Tundra SDK installation</td>
</tr>
<tr>
<td>HELP-1024</td>
<td>[FIWARE-lab-help] [Account Portal] Trying to delete an organization could lead to cancel the user account</td>
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<tr>
<td>HELP-713</td>
<td>[FIWARE-tech-help] [Chp - Security][Identity Management] Missing domain configuration instructions</td>
</tr>
<tr>
<td>HELP-847</td>
<td>[FIWARE-tech-help] [Chp - Security][Identity Management] Link to outdated version of the installation guide</td>
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<tr>
<td>SEC-42</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Specify the user who must execute the commands</td>
</tr>
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<td>SEC-43</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Update package list before installing new packages</td>
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<td>Issue</td>
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<td>SEC-44</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Fix database.yml example filename</td>
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<td>SEC-45</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Provide a list of dependencies</td>
</tr>
<tr>
<td>SEC-41</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Provide instructions to install passenger</td>
</tr>
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<td>SEC-35</td>
<td>CLONE - [FIWARE-tech-help] [Chp - Security][Identity Management] Incomplete/obsolete instructions for deploying with Capistrano</td>
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