



# D36.151

## D3.15a Service Development Facilities (Release 1)

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## Abbreviations and definitions

Abbreviation	Definition
API	Application Programming Interface
IDE	Integrated Development Environment
OS	Operating System
SDK	Service Development KIT
UI	User Interface
UML	Unified Modeling Language
USDL	Unified Service Description Language
WS	Web Service
WSDL	Web Service Description Language

## Executive Summary

This deliverable gives an overview on the current state of the service developer facilities. In close cooperation with SP4 a sandbox environment is being developed and featured with functionalities to support service developers during their developments with the MOBiNET platform. A service developer should be able to use the sandbox to test its service without really connect to the MOBiNET central facilities. Requirements for the test environment are summarized. Furthermore developers are supported with tutorials to enable an easy introduction into application development for MOBiNET.

# 1. Introduction

## 1.1. Document Purpose and Scope

MOBiNET as a full an operational system (beyond the implementation in the actual project) is aiming to reduce the effort of service providers to deploy their services. The key intention is to lower the threshold of the corresponding investment to make deployment more ad hoc and rather a minor risk. The purpose of the SDK and, in the scope of this deliverable, particularly the Service developer facilities are aiming to support this goal.

Workpackage 3.6 is concerned to enable the developer user to develop, deploy, and operate services in MOBiNET. That also targets in a mid-term perspective to migrate existing services (link to WP2.3). Furthermore task 3.6.1 will enable developer's access to MOBiAGENT, so the developer is offered a front end for MOBiAGENT and can use the MOBiAGENT's environment (API).

The activities regarding the Service developer facilities flank the activities regarding the Service developers KIT (SDK, see D36.141). In contrast to the guidelines, handbooks and software packages in the SDK, the Service developer facilities are providing working environments that help service providers to build, test and deploy services.

SDK and Service developer facilities combined should close the technical gap between the MOBiNET platform (SW and hardware) and the usage orientated service providers, letting service providers efficiently deploy services into MOBiNET. In the scope of the project the SDK/Service developer facilities are used by the service development in SP2.

This deliverable is dedicated to task 3.6.2 "service developer facilities". The aim of this task is to provide (initial) requirements for SP4 to determine and provide a test environment. Furthermore, this task addresses a sandbox as a test bed for serviced. This sandbox will run services in an isolated environment, to enable testing and assessment in terms of compliance to MOBiNET standards

The developments described in this document are tightly related to the activities in SP4. The main commissioning and operations are located in SP4 as well as the testing environments. However, it is not in scope of SP4 to directly interact with service providers and their testing. This leaves a gap between such technical facilities and the usage oriented service providers. There are certain tools necessary to enable service provider to access and use them in helpful and coordinated way. This is the functional and technical challenge of the corresponding task to provide Service developer facilities to close this gap.

## 1.2. Intended Audience

The targeted audience of this deliverable are the MOBiNET service developers in SP2 and the SP4 platform hosting authorities. The Service Development Facilities are providing a test and commissioning environment that helps the service developer to test and maintain his services even before the commissioning and deployment procedure on the platform itself. As result every new component can be pretested before being uploaded onto the commissioning environment. .

## 2. Service developer facilities

### 2.1. What are service developer facilities

The SDK of MOBiNET is tightly bound to the architecture, since it provides the developer access and usage to the components of the MOBiCENTRE. The current state of the architecture is shown in Figure 1 and is the basis for this document. The architecture is still under development and future changes will also affect the content described by this document.

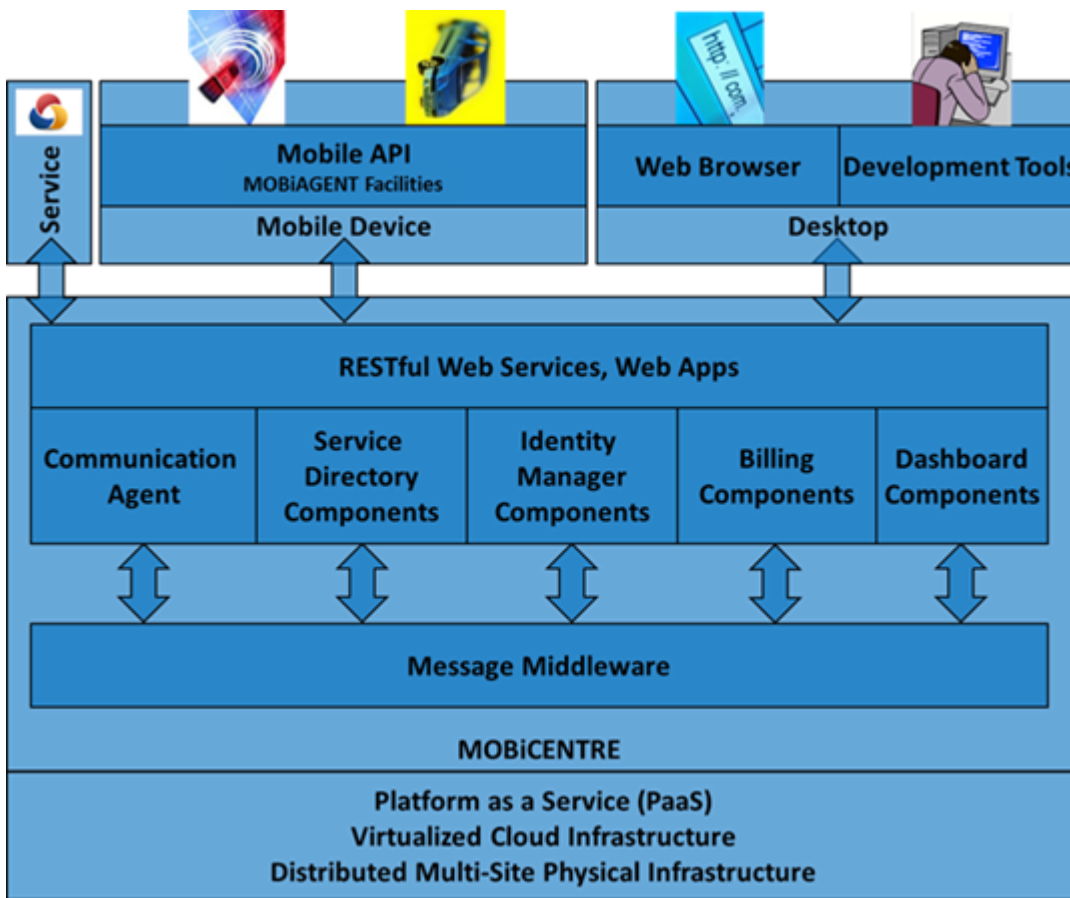


Figure 1: Main architecture of MOBiNET service platform

Sp4 provides the test environment in a cloud operate the MOBiCENTRE as shown in Figure 2. This test environment consists of several virtual machines to run the MOBiCENTER to provide flexibility and scalability. This fully equipped environment is called production environment PROD ENV. There will be several reduced stages of this environment to support different stages of development. The most basic environment for development is the sandbox environment called DEV ENV. Figure 2 shows this dependency between the different environments and their intended usage in different sub-projects. For more details see deliverable D41.1b.

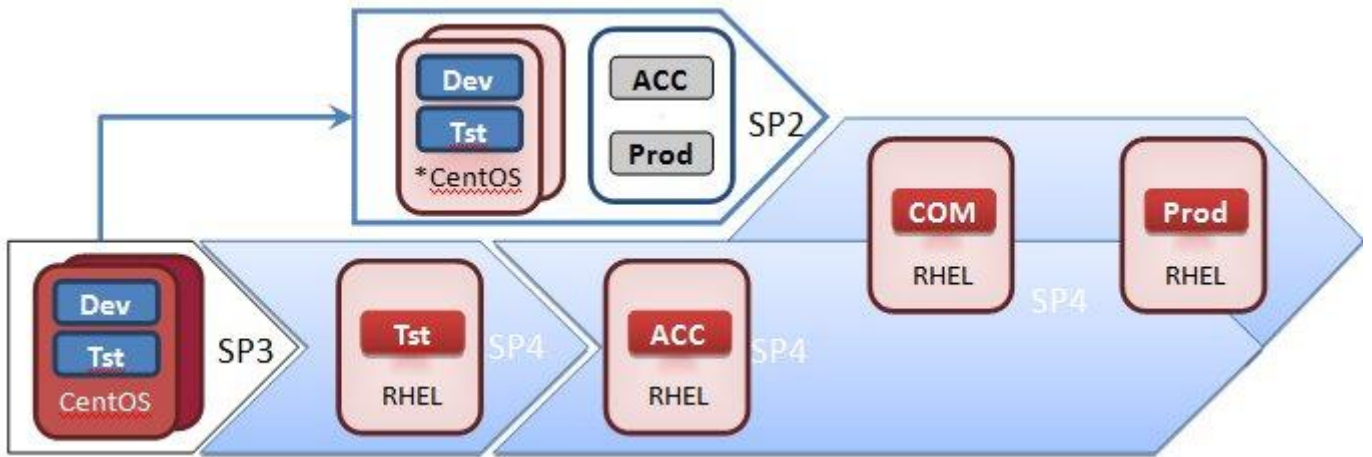


Figure 2: Transition process from SP2 and SP3 to production

## 2.2. Requirements of the serviced developer facilities

Key requirements for the service developer facilities are summaries in the following table. The preliminary requirements were collected from a selected number of service providers from SP2. The preliminary requirements are not fully comprehensive since the service providers have no first hand experiences yet and it is difficult for them to provide precise requirements.

The requirements will be regularly updated after service developers are able to test the service developer facilities.

Table 1: List of requirements for the virtual machine

Identifier	Description
DF.1	The DEV ENV must be fully operational on a user local device and need no further connection to components outside the test environment (i.e. the Virtual Machine of MOBiCENTRE).
DF.2	Ensure that license agreements of deployed components and their respective dependencies are met.
DF.3	All developed core components must be available to the developer.
DF.4	Development environment on the developer computer must be able to access the MOBiCENTRE without additional hardware.
DF.5	Development environment on the developer computer must have functionalities to access the sandboxed MOBiCENTRE without additional hardware.
DF.6	The sandboxed MOBiCENTRE must provide a local service directory or a mockup.



DF.7	The sandboxed MOBiCENTRE should provide a local communication agent or a mockup.
DF.8	The sandboxed MOBiCENTRE should provide a local identity manager or a mockup.
DF.9	The sandboxed MOBiCENTRE should provide local billing components or a mockup.
DF.10	The sandboxed MOBiCENTRE should provide local dashboard components or a mockup.
DF.11	The resulting virtual machine should be usable by a possible wide range of virtualization solutions (e.g., Oracle VirtualBox, VmWARE) or at least an product must be used, which allows free distribution.

### 2.3. Sandbox clone for pre-testing and validation of services

The sandbox environment is a stripped down version of the production environment with a very basic MOBiCENTRE and test data to enable local development without necessarily having access to the real MOBiCENTRE. This sandbox environment is a virtual machine, which runs a simulated computer including the local and stripped down MOBiCENTRE. For virtualization the product Oracle VirtualBox is used to simulate the virtual computer. It also will contain some test stubs with dummy test data in order to be an integrated part of the complete service development tool kit (SDK).

Every developer must be able to get his own dedicated copy of the development environment. For that purpose it is a hard condition, that licences allow free copying of the prepared development environment. As a result components of the MOBiCENTER should be either open source software or own developments, which can be duplicated without licensing issues. As an example the virtualizing software Oracle VirtualBox in the used version is licensed by the GNU General Public Licence V2 (GPL 2).

Figure 3 shows the context of the MOBiCENTRE. The hosting environment in this picture is provided by SP4 and for the service developer facilities realized as the sandbox environment. Furthermore, you can see "App" in this picture. Primary target of the service developer facilities is to support developing those applications, which need access to the (sandboxed) MOBiCENTRE. Because of that reason the sandboxed MOBiCENTRE will provide the same functionalities in a basic way, which are also provided by the production MOBiCENTRE. These provided services can be extracted from Figure 1 and are named as:

- Communication Agent
- Service Directory
- Identity Manager
- Billing

- Dashboard

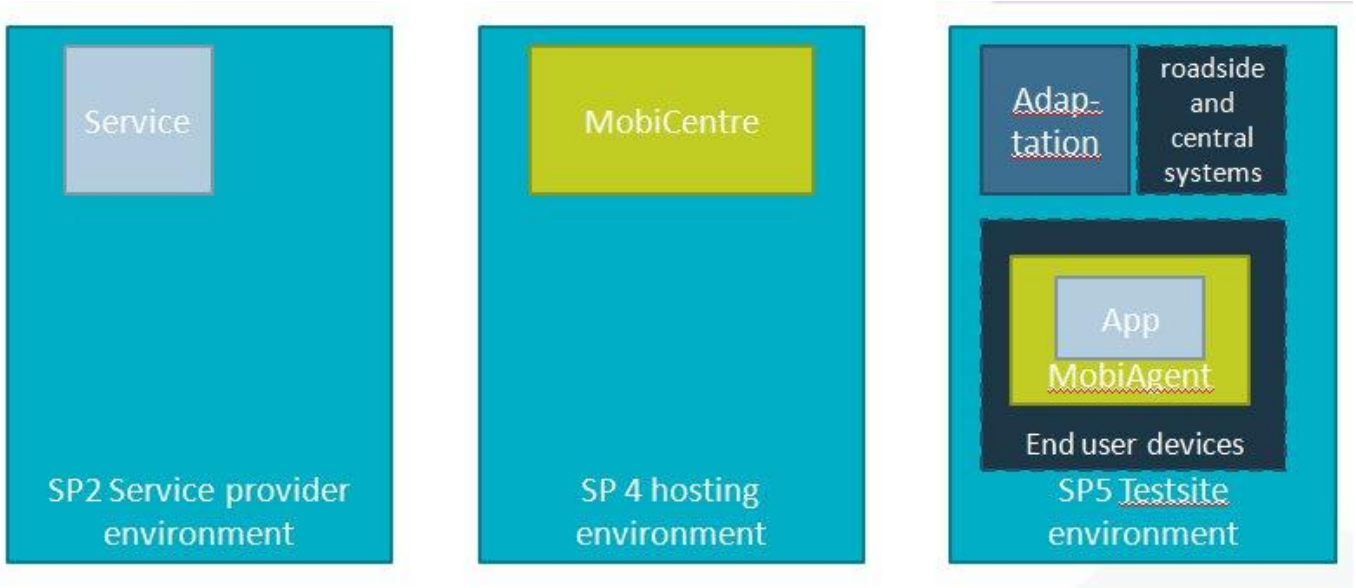


Figure 3: MOBiCENTRE and hosting environment

However, these components are currently in development in SP3 and therefore not yet (completely) available. In accordance to the appropriate work packages deployment in the (sandbox) environment will be coordinated, to give developers access to these functionalities as early as possible.

Figure 4 shows the virtual computer with the prepared sandbox environment with the login screen of the installed operation system Cent OS, which is a publicly available version of Red Hat Enterprise Linux. Usage of such a Linux system is a strong requirement because of licensing issues mentioned before.

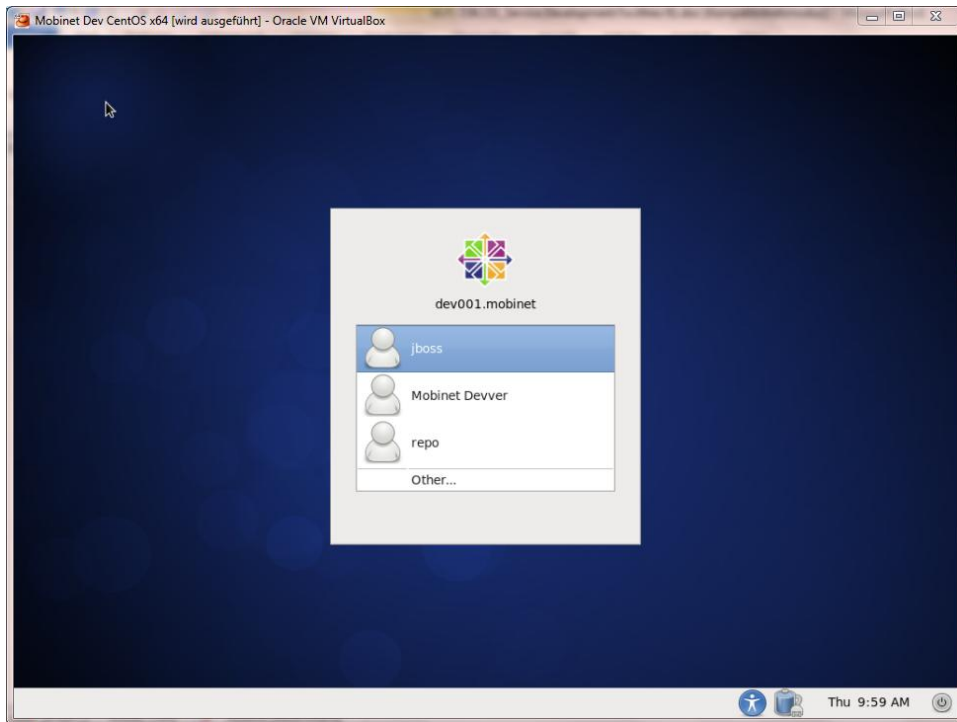


Figure 4: Virtual computer with login screen of the sandbox environment

Figure 5 shows the desktop of the computer with running applications.

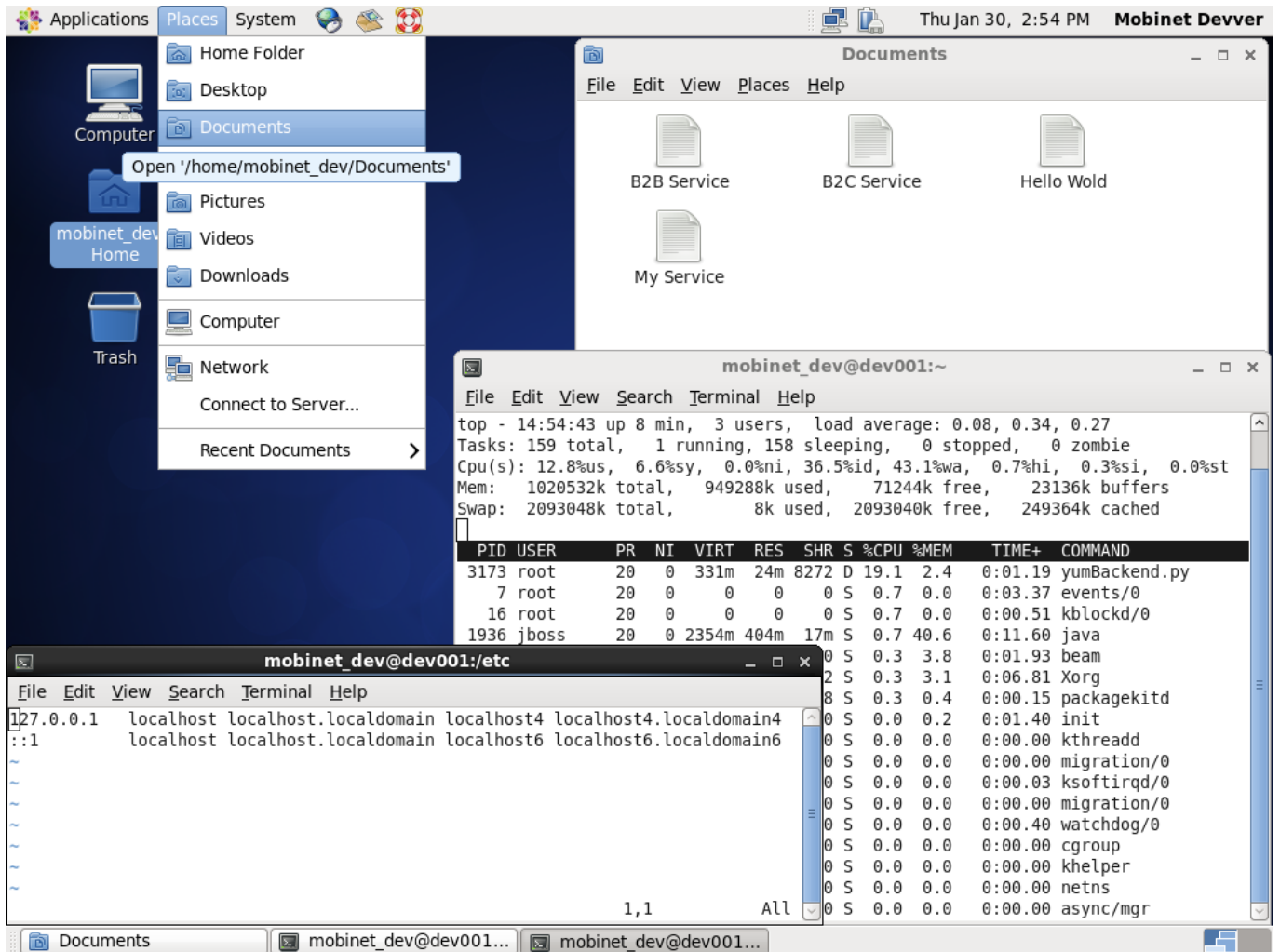


Figure 5: Sandboxed virtual computer with running applications

## 2.4. Tutorials

Further aspects of the service development facilities are documentation and tutorials to enable developers an easy beginning with development of MOBiNET applications. For that purpose the service development facilities cover tutorials which will be released and updated during the development phase.

First release of the service development KIT as realized in task 3.6.1 is built on an Eclipse based integrated development environment (IDE). The features of the IDE are described in D36.141. The current version can be downloaded from the project server together with basic explanations. An example of the GUI of the IDE is indicated in Figure 6, Figure 7 and Figure 8

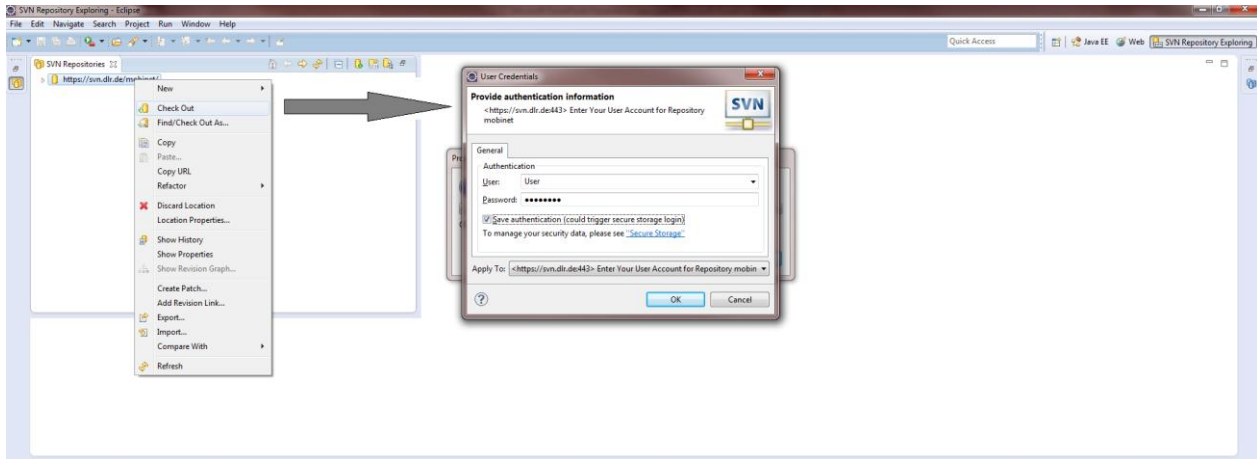


Figure 6: Example of user interface of integrated developer environment (IDE)

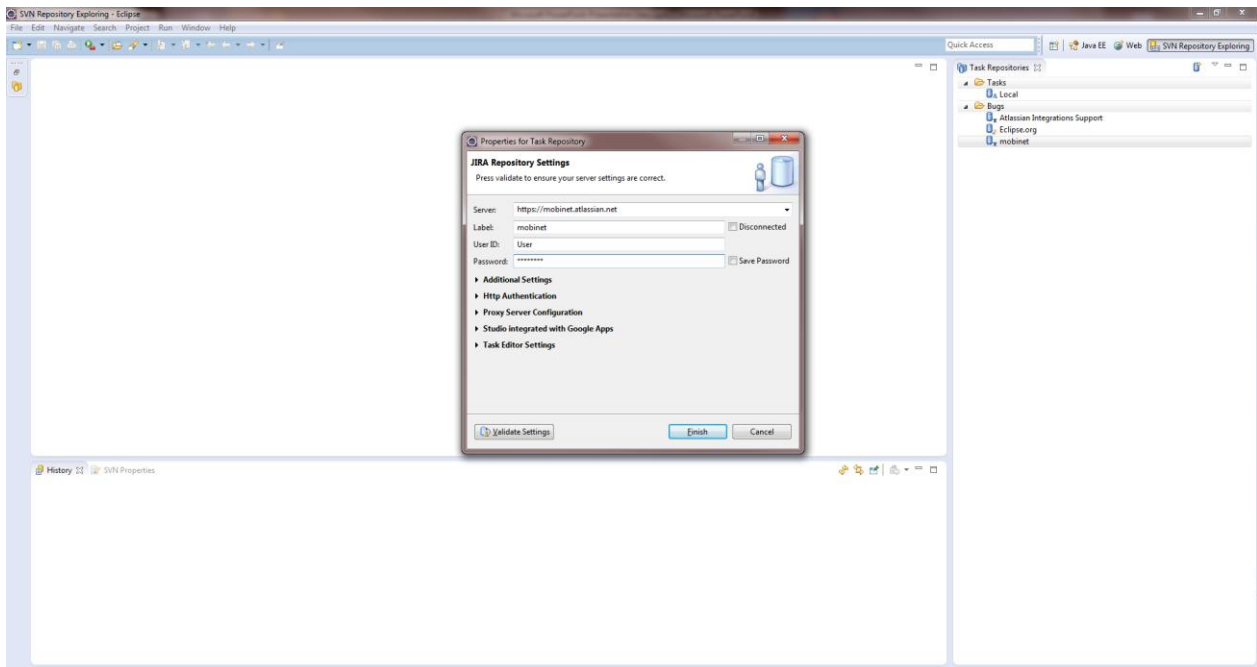


Figure 7: JIRA integration in the integrated development environment (IDE)

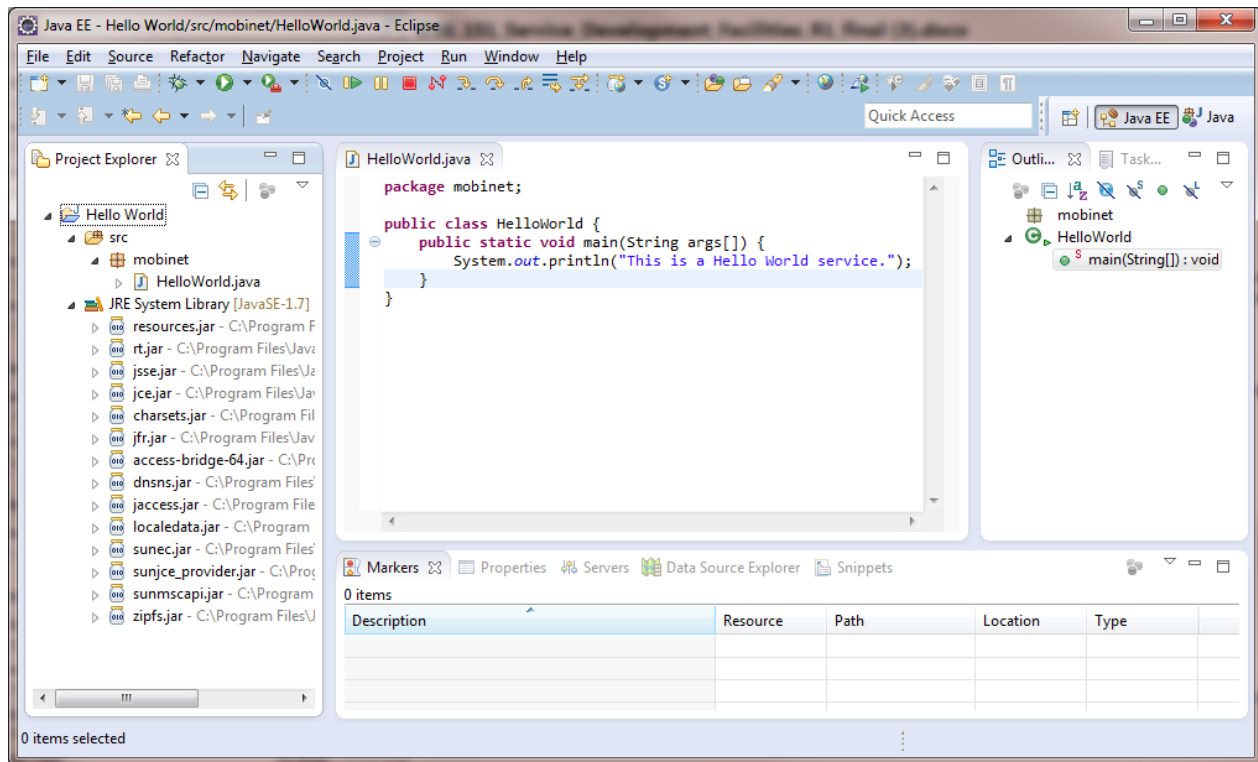


Figure 8: Coding editor of the integrated development environment (IDE)

For the next release a “Hello World” tutorial is in preparation, to explain how to start developing a simple application.

Following releases will contain further documentation and tutorials, how to get access to different functionalities during development and solve common issues, which can arise during development.

## 3. Summary

This deliverable gives an overview regarding the service developer facilities and their current state. In tight cooperation with SP4 a sandbox environment is developed and featured with functionalities to support developer users during their developments with MOBiNET applications. Furthermore developers are supported with tutorials to enable an easy introduction into application development for MOBiNET. Current state of functionalities is just very basic but will be improved during following releases.