



MIDIH

MANUFACTURING · INDUSTRY
DIGITAL · INNOVATION · HUBS



Grant Agreement No. 767498
Innovation Action Project
H2020-FOF-12-2017

D3.5

DIH Collaboration Platform

v1

**WP3 - Network of Competence Centers and pan-EU
DIHs in CPS/IOT**

Version: 1.0.

Due Date: 30 June 2018

Delivery Date: 30 June 2018

Type: Other

Dissemination Level: PU

Lead partner: ENGINEERING

Authors: Contribution from all Partners

Internal reviewers: Susanne Kuehrer

Disclaimer

This document contains material, which is the copyright of certain MIDIH consortium parties, and may not be reproduced or copied without permission.

The commercial use of any information contained in this document may require a license from the proprietor of that information.

Neither the MIDIH consortium as a whole, nor a certain part of the MIDIH consortium, warrant that the information contained in this document is capable of use, nor that use of the information is free from risk, accepting no liability for loss or damage suffered by any person using this information.



MIDIH has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 767498.

Version Control:

Version	Date	Author	Author's Organization	Changes
0.1	19/06/2018	ENG	Angelo Marguglio	TOC and first draft
0.2	22/06/2018	ENG	Angelo Marguglio	Updated TOC and contents
0.5	24/06/2018	ENG	Angelo Marguglio	Updated Section 3
0.8	24/06/2018	ENG	Angelo Marguglio	Updated Annex A
0.9	26/06/2018	ENG	Angelo Marguglio	Pre-final version
1.0	30/06/2018	EITD	Susanne Kuehrer	Final review, submission to EC

Annexes:

N°	File Name	Title
1	Annex A	Factsheet for DIH Collaboration Platform

Contributors:

Contributor	Partner
Angelo Marguglio	ENGINEERING
Contribution from all partners in the task	integrated by Engineering

Deliverable Title: DIH Collaboration Platform v1

Deliverable Number D.3.5

Keywords: DIHIWARE, Collaboration Platform, Online Portal

Executive Summary:

The **DIHIWARE Platform** constitutes the collaboration platform developed within the scope of the MIDIH projects, by integrating the following four main subsystems:

- **Collaboration Portal (PORTAL):** This is the main subsystem, offering tools for social activity, collaboration and much more. Most of common community members will access only to this module.
- **Identity Manager (IDM):** This is the subsystem in charge of centralizing user authentication, defining their roles and granting their access while using the other applications. Administrators can use it to set specific roles or permissions, while common operations (e.g. registration of a new portal user) can be executed on the PORTAL, since the PORTAL and IDM integration will assure that the newly created user on the PORTAL will be automatically propagated to the IDM and registered with the permissions following the policies defined.
- **Market Place (MKPL):** This is the subsystem dealing with the creation of the company offers by means of products catalogue. The PORTAL and MKPL integration allows a *buyer* to view a list of products and to interact with them. A *seller* can use, instead, the MKPL to add new products into the catalogue.
- **Knowledge Base (KBNODE):** This is the subsystem that supports the portal universal search, grounded on semantic technologies and providing a set of services fully integrated with the PORTAL.

The overall Platform will be distributed using **Docker containers technology**, chosen as it is an easy way to assembly and deploy complex services architectures.

The entire Platform can be deployed on a **Linux Operating System** with limited resources (8 core, 16 GB RAM, 400 GB, 1 IP address) using Docker and Docker-compose, since a **docker-compose.yml** file and some instructions are provided to simplify the deployment and the system start/stop.

Table of Contents

Table of Contents	6
List of Figures	7
List of Tables.....	7
1 Introduction	8
2 Architecture of the DIH Collaboration Platform	9
3 DIH Collaboration Platform.....	9
3.1 Collaboration Portal	9
3.1.1 Background components	10
3.1.2 Foreground components	10
3.2 Identity Manager.....	11
3.2.1 Background components	11
3.2.2 Foreground components	12
3.3 Market Place	13
3.3.1 Background components	13
3.3.2 Foreground components	13
3.4 Knowledge Base	14
3.4.1 Background components	14
3.4.2 Foreground components	14
4 Conclusions	14
5 References.....	15
List of Acronyms and Abbreviations	16
Annex A. Factsheet for DIH Collaboration Platform	17
1 DIHIWARE Platform.....	17
1.1 INTRODUCTION	17
1.2 FUNCTIONAL DESCRIPTION.....	17
1.2.1 Overview	17
1.2.2 Architecture and Specification.....	17
1.3 MANUALS.....	20
1.3.1 Installation	20
1.3.2 Configuration	21

1.3.3	Usage.....	25
1.3.4	Licensing.....	25

List of Figures

Figure 1 – DIH Collaboration Platform Overview.....	9
Figure 2 – OPENNESS - IDM Interaction.....	12
Figure 3 – Market Place Business API Architecture	13
Figure 4 – IDM - MKPL interaction.....	14
Figure 5 – Architecture Details	18

List of Tables

Table 1 – Third Party licenses	25
--------------------------------------	----

1 Introduction

D3.5 describes the DIH Collaboration Platform developed in the scope of the MIDIH project that fosters the collaboration among a network of CCs and pan-EU or Regional DIHs, using modern IT solutions and methodologies developed in previous innovation initiatives.

The Platform is intended to be an IT integrated platform to support both the “Access to” and “Collaborate with” services of the MIDIH ecosystem, easing the understanding and the adoption of digital innovations in the manufacturing sector. The sharing of the latest **knowledge, expertise and technology** will be realized by improved connections among organizations and users that constitute the inter value chain of the considered ecosystem.

D3.1 – “Specification and Design of DIH one-stop-shop Marketplace 1” has defined the way how the DIH Collaboration Platform will act as a facility intended to support knowledge sharing and technology transfer, based on human to human interaction, communication and technology information. The aim of this platform is to support Manufacturing Industries (especially SMEs) and Technology Innovators/Solution Providers (IT start-ups/web entrepreneurs) in accessing locally the services provided by regional CCs and European DIHs in order to support and speed up the digitalization of their products/services/supply chains.

D3.5 is divided in two main parts involving the main document and one annex. The main document involves an introduction to present an overview of the proposed solution. The annex part includes the information related to the development and deployment requirements of the MIDIH components involved in the first release of the DIH Collaboration Platform.

2 Architecture of the DIH Collaboration Platform

The MIDIH Collaboration Platform is grounded upon four main subsystems, delivering an integrated framework where each component provides a specific function, even interacting with the other ones. The high-level decomposition is shown in Figure 1:

- **Collaboration Portal (PORTAL)**
- **Identity Manager (IDM)**
- **Market Place (MKPL)**
- **Knowledge Base (KBNODE)**

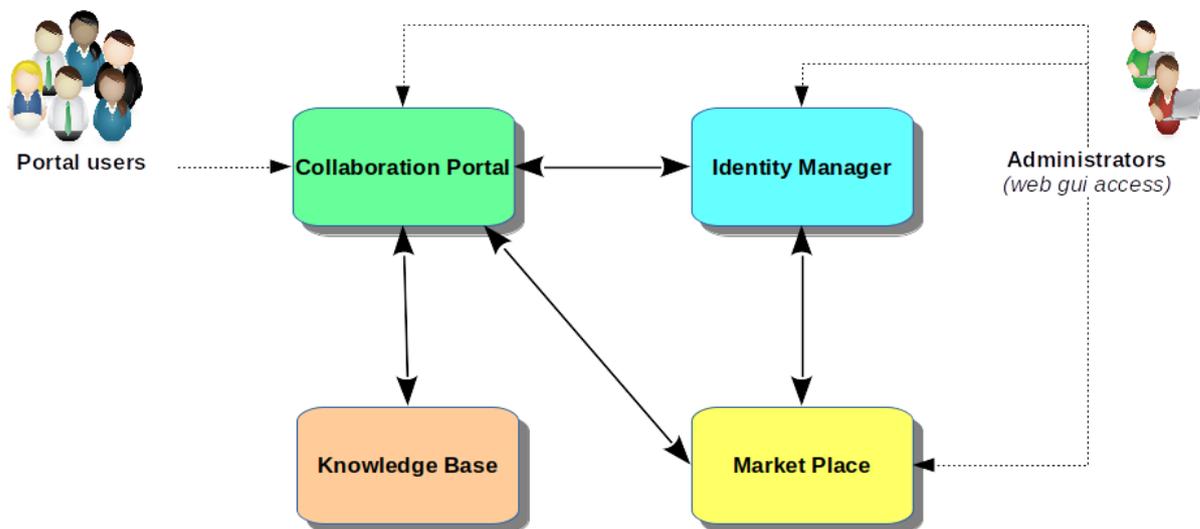


Figure 1 – DIH Collaboration Platform Overview

3 DIH Collaboration Platform

3.1 Collaboration Portal

The **Collaboration Portal (PORTAL)** is the main subsystem, offering tools for social activity, collaboration and much more. Most of common community members will access only to this module to exploit tools and services enabling an efficient collaboration network, based on a powerful knowledge hub able to link Users, Processes and Resources.

The suite of integrated and interconnected solutions of the platform aims to support efficiency, visibility and collaboration processes. The MIDIH Collaboration Platform, in fact, enables and supports the development, integration and delivery of knowledge sharing and collaboration services based on social networking, collective intelligence, collaboration, sharing, transparency and self- empowerment.

3.1.1 Background components

The DIHIWARE Platform is grounded on two main Open Source pillars: Liferay and OPENNESS.

In particular, **Liferay**¹ has been selected since it is a widely used Open Source and state-of-the-art Content Management System. Liferay Portal is a free and open source enterprise portal software product written in Java. Liferay includes a built-in web content management system allowing users to build websites and portals as an assembly of themes, pages, portlets/gadgets and a common navigation.

The second background component exploited to develop the MIDIH Collaboration Platform is **OPENNESS**², an asset developed and managed by the ENGINEERING R&D Department. This Open Source platform is able to support the collaboration among different stakeholders, such as DIH, competence centres, technology providers (SMEs), manufacturing industries (SMEs), business consultants, funding agencies, venture capitalists. In the scope of the MIDIH Collaboration Platform, the “*Access to*” and “*Collaborate with*” services defined in D3.1 – “Specification and Design of DIH one-stop-shop Marketplace 1” have been implemented by collaborative business processes supported by this specific IT tool.

OPENNESS (OPEN Networked Enterprise Social Software) represents a platform fully developed using open source technologies, and leveraging principles related to Open Innovation, Collective Intelligence, Enterprise Social Software. The platform enables the development, integration and delivery of services and collaborative environments based on models of social networking and collective intelligence and provides in SaaS mode (Software-as-a-Service) features and services such as management and development of the community, knowledge management and collective experience and applications, enabling collaborative working and social analytics.

3.1.2 Foreground components

The final aim of any collaborative platform is to support knowledge sharing in a multi-actor scenario. To this extend, the developed MIDIH Collaboration Platform involves primitives for human socio-business main activities and collaboration, including idea management, open innovation and cross-enterprise social networks. In particular the DIHIWARE Collaboration Platform aims to realize a one-stop-shop for industrial partners to access technology, knowledge and market and to enable collaborative processes.

As further described in D3.1 – “Specification and Design of DIH one-stop-shop Marketplace 1”, the main services that will be offered can be divided into two main categories: the “*Access to*” services will enable users gather information about skills, technological and business matters (Competencies, Technology, Industrial Experiments, Knowledge, Market), while the “*Collaborate with*” services will enable dynamic interactions and collaborative creative

¹ <http://www.liferay.com/>

² <http://openness.eng.it/>

processes among users (Open Innovation and Social Networking). These services will be complemented by cross functionalities supporting the general mode of operation, such as Searching Functionalities, Multi-lingual support, Guide for content creation, Workflow monitoring and support.

The services portfolio offered by the MIDIH ecosystem will be refined during the project in order to provide additional features. For the first platform release, the attention has been focused on the following subset of functionalities: collection of experimental and didactic facilities, workflow monitoring and support, guide for content creation, multilingual support, collection of latest news, KPIs and statistics overview, funding through private investors.

A particularly interesting new MIDIH-specific developments, already presented in the first release of the Platform, is the integration of services intended to monitor and support workflows and business processes: modelling and execution of B2B workflows can be talked to constantly monitor the interaction between users, in order to boost the platform adoption and business achievement by partners. On top of this framework, the definition of KPIs will make it possible to measure and assess relevant parameters, i.e. number of visits, percentage of visits concluded with a business etc.

3.2 Identity Manager

The **Identity Manager** (IDM) is the subsystem in charge of centralizing user authentication, defining their roles and granting their access while using the other applications. Administrators can use it to set specific roles or permissions, while common operations (e.g. registration of a new portal user) can be executed on the PORTAL, since the PORTAL and IDM integration will assure that the newly created user on the PORTAL will be automatically propagated to the IDM and registered with the permissions following the policies defined.

3.2.1 Background components

The FIWARE³ Catalogue provides an enhanced OpenStack-based cloud environment plus a rich set of open standard APIs and OSS components that enables to the full adoption of Future Internet technologies such as Internet of Things, Big Data Analytics, Service Marketplaces, Advanced multi-media, User Interaction, and Privacy and Security Management. It aims at the creation of a sustainable ecosystem of Cloud-ready generic components – aka Generic Enablers (GE) – that may be used as the foundational building blocks of Future Internet solutions in any area, effectively supporting the new wave of digitalization of EU industry and society.

The **Identity Management – KeyRock** is the FIWARE Generic Enabler, that covers a number of aspects involving users' access to networks, services and applications, including secure and private authentication from users to devices, networks and services, authorization & trust management, user profile management, privacy-preserving disposition of personal data, Single

³ <https://www.fiware.org>

Sign-On (SSO) to service domains and Identity Federation towards applications. The Identity Manager is the central component that provides a bridge between IdM systems at connectivity-level and application-level. For end users, the IdM provides a convenient solution for registering with applications since it gives them a means to re-use attributes like address, email or others, thus allowing an easy and convenient management of profile information.

3.2.2 Foreground components

The MIDIH Collaboration Platform implementation is based on different Open Source components, which need to be integrated and harmonised. For granting a unique access point, the IdM component has been used and customized in order to fulfil the following two main requirements:

- sharing and aligning user information between OPENNESS and IDM;
- defining an optimized **GUI**



Figure 2 – OPENNESS - IDM Interaction

ENGINEERING has integrated, using the APIs provided by IDM, the secure login functionality in the MIDIH Collaborative Platform. With simple steps OPENNESS (OPNS) admin activates and configures the correct integration with FIWARE IdM in Control Panel, setting up client ID, client Secret, Oauth authentication Url and other parameters. In particular:

1. A new user is created in OPNS platform (or user signs-in through OPNS) with its default role;
2. OPNS propagates the user to the IdM user base through IdM open APIs;
3. IdM registers a new user on internal DB for accesses in all the registered applications and specifying default application roles when managed by IdM.

OPNS represents the master for information, supports the collaboration among the different stakeholders of a DIH enabling the creation of User Generated Contents, while, on the other side, KeyRock provides a bridge between IdM system at connectivity-level and application-level and authorizing foreign services to access personal data stored in a secure environment. A custom GUI has been developed, in order to make it easier for users to login and the new theme has been integrated within the IDM.

3.3 Market Place

The **Market Place** (MKPL) is the subsystem dealing with the creation of the company offers by means of products catalogue. This subsystem allows the monetization of different kind of assets (both digital and physical) during the whole service life cycle, from offering creation to its charging, accounting and revenue settlement and sharing. Concretely, it includes the catalogue management, ordering management, inventory management, usage management, billing, customer, and party APIs. The PORTAL and MKPL integration allows a *buyer* to view a list of products and to interact with them. A *seller* can use, instead, the MKPL to add new products into the catalogue.

3.3.1 Background components

The functionality of the Marketplace module integrated into the MIDIH Collaboration Platform is implemented using the *FIWARE/TMForum Business API Ecosystem GE*⁴, which is the result of the collaboration between FIWARE and the TMForum. In this regard, the Business API Ecosystem GE is a joint component made up by integrating the FIWARE Business Framework with a set of standard APIs (and its reference implementations) provided by the TMForum in its TMF API ecosystem. Business API Ecosystem GE provides sellers the means for managing, publishing, and generating revenue of their products, apps, data, and services.

The APIs of this component are designed to enable repeatable and flexible integration among operations and management systems, making it easier to create, build and operate complex innovative services.

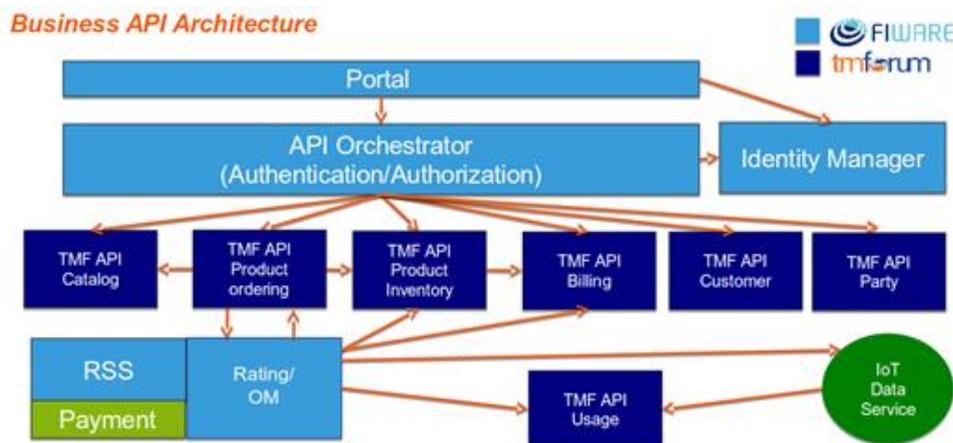


Figure 3 – Market Place Business API Architecture

3.3.2 Foreground components

Integration from OPNS to MKPL contributes to align systems information. To share and align information between OPNS and MKPL, REST services for integration have been used; they are exposed by the MKPL (API Orchestrator) to properly support interaction between the two platforms.

⁴ <https://catalogue-server.fiware.org/enablers/business-api-ecosystem-biz-ecosystem-ri>



Figure 4 – IDM - MKPL interaction

OPNS uses/calls REST API of MKPL to internalize products as resources. User accesses OPNS through his credentials; from OPNS, any user is able to access the MKPL with a pre-defined role (buyer). The integration between OPNS and MKPL has requested also to adapt the graphical interfaces of the background component; in particular, main OPNS colors have been identified and the MKPL graphic interface (theme) has been modified, adapting it to the OPNS colors to the graphical structure (alignment of the relative color classes), in order to provide the user with a continuity in the Look&Feel during the entire navigation.

3.4 Knowledge Base

The **Knowledge Base** (KBNODE) is the subsystem that supports the portal universal search, grounded on semantic technologies and providing a set of services fully integrated with the PORTAL. This subsystem enables advanced search functionalities by using a graph representation of information based on ontologies. It also provides on-the-fly suggestions during the query formulation.

3.4.1 Background components

The OPENNESS platform includes several search and retrieval features to help a user quickly find information, or just to browse through content, people, and teams.

Universal Search manages interactive search by inserting filters on the search bar. The users can search for specific words by simply entering the search terms to see content containing all the specified words in any order. They can find resources by person, title and content, and benefit from suggestions shown in real-time in the search box when typing the query. Furthermore, it also shows a set of tips to enrich the query that take into account the user's activities in the community.

3.4.2 Foreground components

No specific developments have been realized in the scope of the MIDIH project.

4 Conclusions

We presented in this D3.5 deliverable the main components of the MIDIH Collaboration Platform that have been identified as building blocks across the different DIH/CC. The main outcome is represented by the DIHIWARE Platform, further described in the annex.

After the first experimentations in the identified early adopters (STRAT and IMR), a second piloting phase will be extended to all the other DIHs/CCs, part of the MIDIH Consortium.

During the second period of the project the MIDIH Collaboration Platform will be extended with further features and a new validation phase will be set up.

5 References

N/A

List of Acronyms and Abbreviations

Acronym	Meaning
API	Application Program Interface
CC	Competence Centre
DB	Database
DBMS	Database Management System
DIH	Digital Innovation Hub
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
GE	Generic Enabler
GUI	Graphic User Interface
HTTP	Hypertext Transfer Protocol
IDM	Identity Manager
IP	Internet Protocol
KBNODE	Knowledge Base Node
KPI	Key Performance Indicator
MKPL	Marketplace
OPENNESS/OPNS	OPEN Networked Enterprise Social Software
OSS	Open Source Software
RAM	Random Access Memory
REST	REpresentational State Transfer
SaaS	Software-as-a-Service
SME	Small and Medium Enterprise
SMTP	Simple Mail Transfer Protocol
SSH	Secure Shell
SSO	Single Sign-On

Annex A. Factsheet for DIH Collaboration Platform

1 DIHIWARE Platform

1.1 INTRODUCTION

The following document will present the main technical details to access, download and execute the MIDIH Collaboration Platform, in order to enable a full evaluation of the main outcome represented by the **DIHIWARE Platform**.

1.2 FUNCTIONAL DESCRIPTION

1.2.1 Overview

The DIHIWARE Platform is intended to be an IT integrated platform to support both the “Access to” and “Collaborate with” services of a network of CCs and pan-EU or Regional DIHs. The services available through the Platform will enable any business to **access the latest knowledge, expertise and technology** for testing and experimenting with digital innovations relevant to its products, processes or business models. Services will also **provide connections** with investors, facilitate access to financing for digital transformations, and help connecting users and suppliers of digital innovations across the value chain. These services are of particular relevance to **companies which currently have a relatively low level of digitisation** and which do not have the resources or personnel to address the digitisation challenge (for instance SMEs).

The DIHIWARE Platform is grounded upon four main subsystems, delivering an integrated framework where each component provides a specific function, even interacting with the other ones. The main pillars of the DIHIWARE Platform are the following:

- **Collaboration Portal (PORTAL)**
- **Identity Manager (IDM)**
- **Market Place (MKPL)**
- **Knowledge Base (KBNODE)**

1.2.2 Architecture and Specification

All previous subsystems have been implemented using **Docker**⁵. Docker technology has been chosen as it is an easy way to assembly complex and pre-configured services architectures and it allows their deployment on multiple different environments with a high success probability.

The following Figure 5 shows a more detailed view about the subsystems introduced in previous section.

⁵ <https://www.docker.com/>

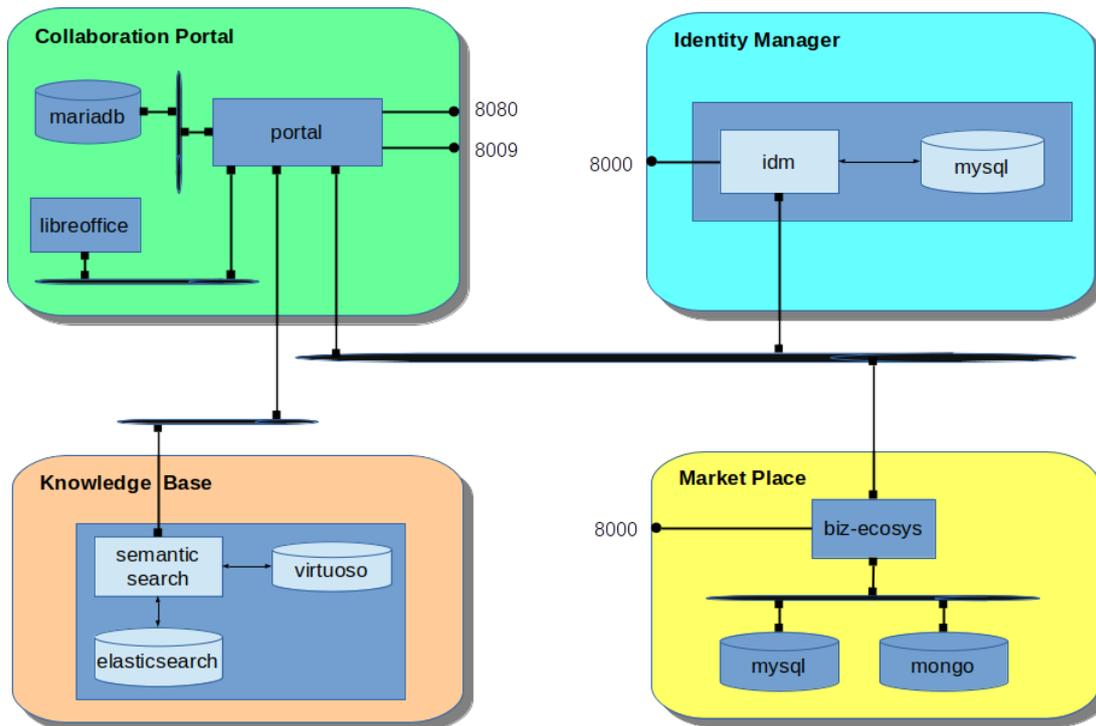


Figure 5 – Architecture Details

As a general criterion, the interconnection between containers has been realized by means of the docker subnets, whose access is restricted only to the needed communications, avoiding exposing a container to other ones not requiring its services.

PORTAL, IDM and MKPL expose to the docker host only the necessary ports to permit normal user and/or administrators to access to their services. These ports - internal to each container - must be published ("mapped") to available and reachable docker host ports to make services accessible from the outside. In particular, as further described in the following sections, the 8080 port of the PORTAL and the 8000 ports of both IDM and MKPL allow direct access via HTTP to the WEB interfaces of the corresponding containers. Alternatively, to the 8080 port, the port 8009 gives the possibility, if necessary, to reach the PORTAL efficiently using a reverse proxy through the AJP protocol.

1.2.2.1 HW/SW Prerequisite

The entire DIHIWARE Platform can be hosted in a Docker environment installed on a Linux Operating System running preferably on a bare metal server (even if virtualized HW can be used as well but with reduced performance).

The minimum **hardware** requirements are the following:

- **Core [num]:** 8+
- **RAM [GB]:** 16+
- **Storage [GB]:** 400+

The preferred **software** versions (those ones the system have been developed and tested on) are the following:

- **Operating System:** Linux CentOS 7
- **Docker client/server:** version 18.03.1-ce
- **Docker-compose:** version 1.21.2

The main **network** requirements for the DIHIWARE Platform are:

- SSH or local console access for system administrators
- To reach the platform components there are the following alternatives:
 - 1 DNS name (or 1 static IP address) and 3 externally accessible http ports (PORTAL, IDM, MKPL)
 - 3 DNS names (PORTAL, IDM, MKPL) and a Reverse Proxy that routes the calls to the corresponding service
- An administrator mail account and an SMTP server for sending users registration emails

1.2.2.2 MIDIH Specific developments

The main functions of the MIDIH Collaboration Portal have been decomposed in the following Docker containers and configurations (even if in the future releases the decomposition could change):

- **Docker containers**
 - *portal*: this container implements the core PORTAL application and the related data documents that are persisted in a specific docker volume.
 - *mariadb*: this container implements the DBMS storage, namely MariaDB⁶, used by the portal container to store its data and configurations; this container make use of docker volumes for ensure data persistence.
 - *libreoffice*: this container implements a headless LibreOffice⁷ service used by the *portal* container to convert documents (e.g. from .doc to .pdf).
 - *idm*: this container implements the original FIWARE IdM component⁸ – with few start-up modifications needed to integrate it with other subsystems – and it includes also its own MySQL DBMS; this container make use of docker volumes for ensure data persistence.
 - *mkpl*: this container implements the original FIWARE biz-ecosystem⁹ with few start-up modifications needed to integrate it with other sub-systems; it makes use of bind mounts for ensure configurations persistence, as the original does.

⁶ <https://mariadb.org/>

⁷ <https://www.libreoffice.org/>

⁸ <https://github.com/ging/fiware-idm>

⁹ <https://github.com/FIWARE-TMForum/Business-API-Ecosystem>

- *mysql*: this container implements the relational DB storage used by the *mkpl* container and it make use of docker volumes for ensure data persistence.
- *mongo*: this container implements a NoSQL DB storage used by the *mkpl* container and it make use of docker volumes for ensure data persistence.
- *kbnode*: this container implements a custom search engine developed by ENGINEERING - based on Virtuoso¹⁰ and ElasticSearch¹¹ technologies - for semantic search related to the asset entries of the portal; this container make use of docker volumes for ensure data persistence.
- **Docker subnets**
 - *dbnet*: this subnet connects portal to its DBMS
 - *officenet*: this subnet connects PORTAL to its documents conversion system
 - *kbnet*: this subnet connects PORTAL to its KBNODE
 - *hostnet*: this subnet connects PORTAL, IDM and MKPL
 - *mkplnet*: this subnet connects MKPL to MySQL and mongo
 - *kbnet*: this subnet connects KBNODE to the PORTAL
- **Docker exposed ports**
 - *8080*: this is the internal HTTP port that have to be published (mapped to an externally accessible host port) to reach the portal web interface
 - *8009*: this is the AJP connector port that have to be published (mapped to an externally accessible host port) to reach the portal via a Reverse Proxy connection, if necessary
 - *8000*: this is the internal HTTP port that have to be published (mapped to an externally accessible host port) to reach the IDM management web interface
 - *8000*: this is the internal HTTP port that have to be published (mapped to an externally accessible host port) to reach the MKPL management web interface

1.3 MANUALS

1.3.1 Installation

All the docker customized images needed to run the DIHIWARE Platform, as well as the docker-compose.yml file needed to manage them, can be pulled from the following docker hub repository:

<https://hub.docker.com/u/midih/dashboard/>

¹⁰ <https://virtuoso.openlinksw.com/>

¹¹ <https://www.elastic.co/products/elasticsearch>

The platform security can be achieved:

- by configuring a Reverse Proxy as frontend for the web access to the application (PORTAL, IDM, MKPL) that accept only https connections (using a valid ssl certificate) and redirect them to the backend via http;
- by using strong passwords for the portal users as defined by internal password policy toolkit properties
- by limiting with suitable firewall rules the *ssh* administrative access to the docker host

1.3.2 Configuration

The **docker-compose.yml** file can be used to start the DIHIWARE Platform. In order to use it, it is necessary to set the following environment variables to reflect the docker host specific configuration.

```

$DIH_PORTAL_NAME = <portal_FQDN> | <portal_ipaddr:portal_port> | <host_ip:portal_port>
$PORTAL_WEB_PORT = <docker_published_portal_web_port>
$PORTAL_AJP_PORT = <docker_published_portal_ajp_port>

$DIH_IDM_NAME = <idm_FQDN> | <idm_ipaddr:idm_port> | <host_ip:idm_port>
$IDM_WEB_PORT = <docker_published_idm_web_port>

$DIH_MKPL_NAME = <mkpl_FQDN> | <mkpl_ipaddr:mkpl_port> | <host_ip:mkpl_port>
$MKPL_WEB_PORT = <docker_published_mkpl_web_port>
$MKPL_ADMIN_EMAIL = <mkpl_admin_email_address>
$MKPL_EMAIL_USER = <mkpl_admin_email_user>
$MKPL_EMAIL_PASSWD = <mkpl_admin_email_password>
$MKPL_EMAIL_SERVER = <mkpl_smtp_address>
$MKPL_EMAIL_SERVER_PORT = <mkpl_smtp_port>

```

The example content of the docker-compose.yml file is shown here below.

```

# docker-compose.yml
version: "2.3"
services:
#####
  portal:
    hostname: portal
    image: midih/dihportal:latest
    networks:
      hostnet:
    aliases:

```

```

                                - portal
dbnet:
  aliases:
    - portal
kbnet:
  aliases:
    - portal
officenet:
  aliases:
    - portal
ports:
  - "$PORTAL_WEB_PORT:8080"
  - "$PORTAL_AJP_PORT:8009"
environment:
  - PORTALNAME=$DIH_PORTAL_NAME
  - IDMNAME=$DIH_IDM_NAME
  - MKPLNAME=$DIH_MKPL_NAME
depends_on:
  - mariadb
  - kbnode
  - idm
volumes:
  - portal_data:/opt/liferay-portal-6.2.0-ce-ga1/data
mariadb:
  hostname: mariadb
  image: midih/dihmariadb:latest
  networks:
    dbnet:
      aliases:
        - mariadb
  volumes:
    - mariadb_data:/var/lib/mysql
  environment:
    - MYSQL_ROOT_PASSWORD=r00t
kbnode:
  hostname: kbnode
  image: midih/dihkbnode:latest
  networks:
    kbnet:
      aliases:
        - kbnode
  environment:
    - PORTALNAME=$DIH_PORTAL_NAME
  volumes:
    - elasticsearch_data:/opt/elasticsearch/data
    - virtuoso_data:/opt/virtuoso/var/lib/virtuoso/db
#####
office:
  hostname: office
  image: midih/dihoffice:latest

```

```

networks:
  officenet:
    aliases:
      - office
#####
idm:
  hostname: idm
  image: midih/dihidm:latest
  networks:
    hostnet:
      aliases:
        - idm
  volumes:
    - idm_keystone:/keystone
    - idm_horizon:/horizon
    - idm_mysql_data:/data/mysql
  ports:
    - "$IDM_WEB_PORT:8000"
  environment:
    - PORTALNAME=$DIH_PORTAL_NAME
#####
mkplmysql:
  hostname: mkplmysql
  image: mysql:5.7.21
  networks:
    mkplnet:
      aliases:
        - mysql
  volumes:
    - mkpl_mysql_data:/var/lib/mysql
  environment:
    - MYSQL_ROOT_PASSWORD=r00t
mkplmongo:
  hostname: mkplmongo
  image: mongo:3.2
  networks:
    mkplnet:
      aliases:
        - mongo
  volumes:
    - mkpl_mongo_data:/data/db
    - mkpl_mongo_conf:/data/configdb
mkpl:
  hostname: mkpl
  image: midih/dihmkpl
  networks:
    hostnet:
      aliases:
        - mkpl
    mkplnet:

```

```

aliases:
  - mkpl

ports:
  - "$MKPL_WEB_PORT:8000"

depends_on:
  - mkplmysql
  - mkplmongo
  - idm

environment:
  - MKPLNAME=$DIH_MKPL_NAME
  - PORTALNAME=$DIH_PORTAL_NAME
  - IDMNAME=$DIH_IDM_NAME
  - MYSQL_HOST=mysql
  - MYSQL_ROOT_PASSWORD=r00t
  - ADMIN_EMAIL=$MKPL_ADMIN_EMAIL
  - EMAIL_USER=$MKPL_EMAIL_USER
  - EMAIL_PASSWD=$MKPL_EMAIL_PASSWD
  - EMAIL_SERVER=$MKPL_EMAIL_SERVER
  - EMAIL_SERVER_PORT=$MKPL_EMAIL_SERVER_PORT

volumes:
  - ./MKPLDATA/apis/war:/apis/wars-ext
  - ./MKPLDATA/conf/rss:/etc/default/rss
  - ./MKPLDATA/conf/charging:/business-ecosystem-charging-backend/src/user_settings
  - ./MKPLDATA/conf/proxy:/business-ecosystem-logic-proxy/etc
  - ./MKPLDATA/charging-bills:/business-ecosystem-charging-backend/src/media/bills
  - ./MKPLDATA/charging-assets:/business-ecosystem-charging-backend/src/media/assets
  - ./MKPLDATA/charging-plugins:/business-ecosystem-charging-backend/src/plugins
  - ./MKPLDATA/charging-inst-plugins:/business-ecosystem-charging-backend/src/wstore/asset_manager/resource_plugins/plugins
  - ./MKPLDATA/proxy-indexes:/business-ecosystem-logic-proxy/indexes
  - ./MKPLDATA/proxy-themes:/business-ecosystem-logic-proxy/themes
  - ./MKPLDATA/proxy-static:/business-ecosystem-logic-proxy/static
#####
volumes:
  mariadb_data:
  portal_data:
  virtuoso_data:
  elasticsearch_data:
  idm_keystone:
  idm_horizon:
  idm_mysql_data:
  mkpl_mysql_data:
  mkpl_mongo_data:
  mkpl_mongo_conf:

```

networks:
 hostnet:
 dbnet:
 kbnet:
 mkplnet:
 officenet:

1.3.3 Usage

The whole system can be started by using the command **docker-compose up -d** and stopped with the command **docker-compose down**.

A demo portal can be publicly accessed through the Internet, pointing your browser to the following address:

<http://demodihware.eng.it/>

The above mentioned portal contains only example content, to demonstrate the capabilities of the IT platform, without having a real community of organizations/users behind it or specific content from the DIH/CC involved in the MIDIH project. In any case the portal is protected by an identity manager, therefore to have a real access to its private spaces you might need to contact ENGINEERING to get a valid credentials peer.

1.3.4 Licensing

The DIHIWARE Platform will be licensed under an Open Source license schema, once the complete set of services and integrated third party's components will be detailed. For the time being, the following Table 1 contains the main information related to the identified third party's components needed to run the DIHIWARE Platform.

Table 1 – Third Party licenses

Docker CE	Apache License Version 2.0
LibreOffice	Mozilla Public License 2.0
FIWARE IDM	MIT License
FIWARE Biz Ecosystem	Affero GPL v3
Liferay framework (main licenses)	Apache License Version 1.1 and 2.0 BSD Style License Common Public License 1.0 MIT License Eclipse Public License Version 1.0
Tomcat	Apache License Version 2.0

MariaDB	GNU General Public License, version 2
MongoDB	Free Software Foundation's GNU AGPL v3.0
ElasticSearch	Elastic License Apache License Version 2.0
Virtuoso	GNU General Public License, Version 2