D6.3.3

SPECIFIC ENABLERS - FINAL RELEASE

June 2015

ABSTRACT

This document describes the final release of Enablers for the FIcontent platforms. Thereby, this document covers all Specific Enablers, made available during the course of the FIcontent project, regardless whether they are part of the final release, in order to provide a complete overview.

This document is a deliverable of the FI-CONTENT 2 integrated project supported by the European Commission under its FP7 research funding programme, and contributes to the FI-PPP (Future Internet Public Private Partnership) initiative.

DISCLAIMER

DELIVERABLE DETAILS

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EXECUTIVE SUMMARY

This document describes the final release of Enablers within Phase 2 of the FIcontent project, which delivers a core set of platforms building upon FIWARE and XiFi capabilities as part of the FI-PPP programme. In order to address the comments from the reviewers, we improved this document over the predecessor D6.3.2. Therefore, we report about all FIcontent SEs (even those not part of the final release, e.g. due to discontinuation). The Enablers detailed in this document cover the whole course of the project to provide a complete overview about the achieved results in terms of available software building blocks and their alignment with the overall objective of the FI-PPP (i.e. modular, reusable components).

The Enablers of the Social Connected TV Platform offer advanced capabilities to enhance connected TV services, to enable new interactions with sound in distributed media, to orchestrate additional content from disparate sources with recommendations according to interests, to unlock connectivity between TVs and a variety of devices, such as set top boxes, phones and tablets as well as provide a structured set of APIs for programme related interactive TV applications.

The Enablers of the Smart City Platform are opening up new possibilities in applications delivering new forms of content to users across such wide areas as cities, Themeparks and expo parks. The Smart City Platform includes local information aggregation services, provides points of interest (POIs) and recommendations based on collaboration and meta data. Finally, the app generator uniquely allows effortlessly bringing together Enablers in deployable mobile apps.

The Enablers of the Pervasive Games Platform target video game services by providing augmented reality tracking and 3D internet with Internet of Things capabilities. Importantly, this platform includes a series of Reality Mixer techniques advancing the state of the art in seamless integration of audio, visual and physical digital content with the real-world. The game platform delivers support for developer to build connected applications including virtual characters, POIs, matchmaking, leaderboards, and game synchronization.

The common Enablers among the FIcontent platforms share their technology across use case scenarios. They were identified to cover a larger area of interest and thereby are of potential interest for users of more than one domain. Finally, they are good candidates for the promotion towards FIWARE as new GEs or additional functionality of existing one.

In this document, we provide the following information for each SE: status, release cycle, relations of the Specific Enabler, deviations from the planned use of Generic Enablers, and relevant resources.

The final selection of Specific Enablers (Release 08/15) target all the deployment on FIC2Lab. Thus, they are available at the FIWARE Media & Content Lab and offered in particular to Phase-III participants.

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ABBREVIATIONS

AR	Augmented Reality
CG	Computer Graphics
API	Application Programming Interface
SE	Specific Enabler
GE	Generic Enabler
FAQ	Frequently Answered Questions
XML3D	Three Dimensional Extensible Markup Language
POI	Point of Interest
DB	Database
HbbTV	Hybrid Broadcast Broadband TV
HTML	Hyper-Text Markup Language
SOAP	Simple Object Access Protocol
REST	Representational State Transfer
SEO	Search Engine Optimization
NLP	Natural Language Processing
SME	Small to Medium Enterprise
UGC	User-Generated Content
RTS	Real-Time Strategy
VoD	Video on Demand
WebGL	Web Graphics Language
GPU	Graphics Processing Unit
FI-PPP	Future Internet – Public Private Partnership
GPS	Global Positioning System

1 - INTRODUCTION

The FIcontent platforms are a collection of tools and techniques, designed to enable the creation of applications on mobile and web-enabled devices. This technical portfolio takes advantage of established tools and frameworks, of specific technical contributions (FIcontent Enablers), and generic Future Internet technology (FIWARE Generic Enablers).

This deliverable mainly consists of the final release of the Enablers for the FIcontent platforms, which is a further integrated delivery of a core set of platforms building upon FIWARE and XiFi capabilities as part of the FI-PPP programme. Moreover, we provide this additional document with a brief description of the Specific Enablers (SEs) per platform as well as the common Specific Enablers used by multiple platforms.

In order to address the comments from the reviewers, we improved this document over the predecessor D6.3.2. Therefore, we report about all FIcontent SEs (even those not part of the final release, e.g. due to discontinuation).

1.1 - Information for each Specific Enabler

We provide the following information per SE. This addresses in particular recommendations 1, 2, 3, and 5 of the latest review report.

1.1.1 - Status

According to the recommendation 2 and recommendation 5 of the latest review report, all Specific Enablers either target the deployment on FIC2Lab or being discontinued in order to concentrate efforts. Most promising Enablers were handed-over to FIWARE if applicable. Thus, each SE belongs under one of the following states:

- "Discontinued." -- all activities regarding such SEs were stopped
- "Pending for FIC2Lab." -- some minor issues block such SEs to make their way to FIC2Lab
- "Deployed on FIC2Lab." -- such SEs are offered via FIC2Lab
- "Promoted to FIWARE." -- such SEs make their way to FIWARE (as contribution to an existing GE or as new GE)

The release cycle indicates the releases containing the Specific Enabler. According to our experimentation cycles we performed an initial release (09/13), an intermediate release (06/14) and a final release (08/15). Moreover, we condensed our releases with additional intermediate releases (10/14, 12/14, 04/15) to better fit the agile development approach of the technical teams. Finally, we cover the project's extension period with those additional releases and thereby incorporated the feedback and requests of Phase-III participant.

1.1.2 - Relations of the Specific Enabler

- Applications taking advantage of this SE
- Generic Enablers used by this SE

1.1.3 - Deviations from the planned use of Generic Enablers

On one hand, we experienced the discontinuation of FIWARE Generic Enablers. If a Specific Enabler relied on such GEs, the SE owners provide an assessment of the impact due to the discontinuation in order to address recommendation 3.

On the other hand, commitments for the integration of Generic Enabler may not be met in general and are subsequently justified.

Finally, SE owners may explain why their Enablers do not take advantage of general FI-PPP technology (i.e. FIWARE Generic Enablers).

1.1.4 - Relevant Resources

- technical documentation
- installation guide
- demo application

1.2 - Summary of Specific Enablers

This document contains the following list of FIcontent Enablers with final release status indicated.

Specific Enabler	Owner	Final release
3D-Map Tiles SE	DFKI	X
ARTool SE	DNET	X
App Generator SE	EBIZ	X
Asset Storage SE	DFKI	X
Audio Fingerprinting SE (deprecated)	IAIS	
Audio Mining SE	IAIS	X
Augmented Reality - Fast Feature Tracking SE	ETHZ, BLRK, DFKI	X
Augmented Reality - Marker Tracking SE (deprecated)	DFKI	
Content Atmosphere SE (deprecated)	TRDF	
Content Enrichment SE	FOKUS	X
Content Optimisation SE	IAIS	X
Content Sharing SE (deprecated)	TCF	
Content Similarity SE (deprecated)	TRDF	
Context Aware Recommendation SE	LCI	X
Flexible and Adaptive Text To Speech SE	MIVOQ	X
Fusion Engine SE	UPVLC, PRO	X
Game Synchronization SE	ETHZ	X
Geospatial - POI Interface SE	ETHZ	X
Geospatial - POI Matchmaking SE (deprecated)	GOBO	
HbbTV Application Toolkit SE	IRT, FOKUS	X
Leaderboard SE	ETHZ	X
Local Information SE (deprecated)	ORANGE	

Networked Virtual Character SE (deprecated)	DFKI, DRZ	
Open City Database SE	FOKUS	X
OpenDataSoft SE	ODS	X
POI Storage SE (deprecated)	DFKI	
POIProxy SE	PRO	X
Reality Mixer - Augmented Audio SE	ETHZ, BLRK	X
Reality Mixer - Camera Artifact Rendering SE	ETHZ, DFKI	X
Reality Mixer - Reflection Mapping SE	ETHZ, DFKI, BLRK	X
Recommendation Services SE (deprecated)	ORANGE	
Recommendation as a Service SE (deprecated)	FOKUS	
SLAMflex SE	DNET	X
Second-Screen Framework SE	IRT	X
Social Network SE	PIX	X
TV Application Layer SE	ULANC	X
Unusual Database-Event Detection SE	ETHZ	X
Virtual/Mixed Reality SE (deprecated)	ORANGE	
Visual Agent Design SE (deprecated)	ETHZ	

Please be aware about the fact that this document is generated from the FIcontent Wiki [1]. Thus, the document may sometimes still refer to the FIcontent Wiki. All information in this document are also available online. We suggest to use the online version [2] for an advanced reading experience.

2 - SPECIFIC ENABLERS RELEVANT TO SOCIAL CONNECTED TV

The Enablers of the Social Connected TV Platform offer advanced capabilities for enhancing connected TV services, enabling new interactions with sound in distributed media, orchestrating additional content from disparate sources with recommendations according to interests, unlocking connectivity between TVs and a variety of devices, such as set top boxes, phones and tablets as well as providing a structured set of APIs for programme-related interactive TV applications.

2.1 - Audio Mining

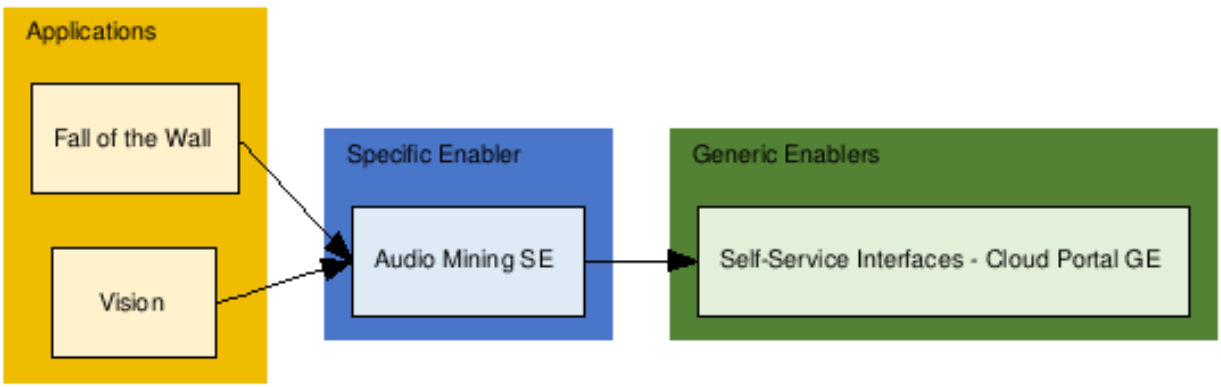
Audio Mining analyses German or English-language audio/video files (e.g. content from a TV news show) and returns textual information suitable for indexing (e.g. for search engines). Audio Mining performs speech and speaker segmentation as well as speech recognition in order to render speech into text. The SE delivers segments, speaker identification, characteristic keywords and additional metadata in XML and JSON. Finally, the SE builds an index for multimedia search.

2.1.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

2.1.2 - Relations of the Specific Enabler



2.1.3 - Deviations from the planned use of Generic Enablers

For securing our Audio Mining SE we used IDM-GCP GE owned by Deutsche Telekom for authentication of users of our SE. In January we found out that this GE is no longer included in FIWARE Catalogue and that the support of the GE is no longer provided. We re-factored our SE to no longer use IDM-GCP GE and decided that we do not need to use an identity manager.

2.1.4 - Relevant Resources

- Technical documentation of Audio Mining SE [3]
- Developer guide of Audio Mining SE [4]
- Installation guide of Audio Mining SE [5]
- Demo application of Audio Mining SE [6]

2.2 - Content Optimisation

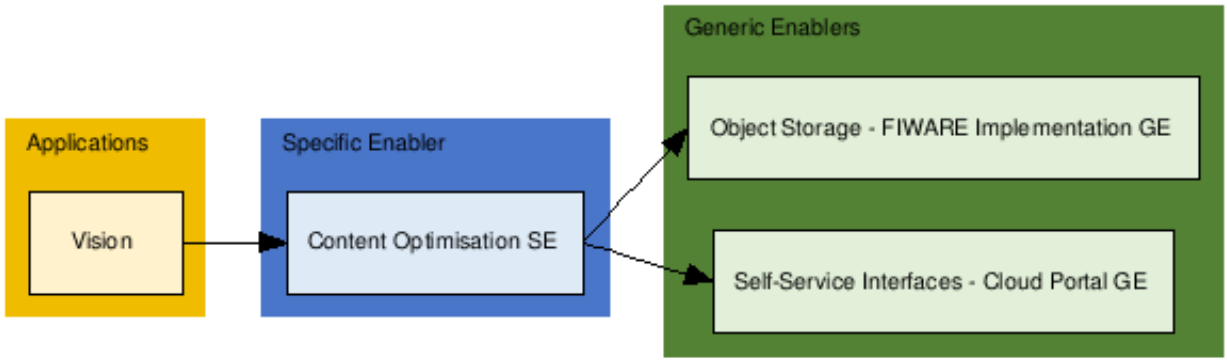
Content Optimisation processes incoming textual content (e.g. from the Audio Mining SE) and extracts characteristic keywords. Subsequently, semantic enrichment based on natural language processing (NLP) is performed to connect the transcripts and keywords with additional, contextual information. The SE integrates and harmonises additional content from diverse sources. The software is intended for SMEs wanting to build second screen applications (e.g. for TV documentaries), but can also be used for various other purposes.

2.2.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

2.2.2 - Relations of the Specific Enabler



2.2.3 - Deviations from the planned use of Generic Enablers

For offering additional language support of our Content Optimisation SE we used the Semantic Annotation GE. In January we found out that this GE is no longer included in FIWARE Catalogue and that the support of the GE is no longer guaranteed. We re-factored our SE to no longer use Semantic Annotation GE. Since there is no other GE offering the same or a similar functionality we could not choose an alternative from FIWARE catalogue. The service of our SE will therefore be restricted to support German and British English.

For securing our Content Optimisation SE we used IDM-GCP GE owned by Deutsche Telekom for authentication of users of our SE. In January we found out that this GE is no longer included in FIWARE Catalogue and that the support of the GE is no longer provided. We re-factored our SE to no longer use IDM-GCP GE and decided that we do not need to use an identity manager.

2.2.4 - Relevant Resources

- Technical documentation of Content Optimisation SE [7]
- Developer guide of Content Optimisation SE [8]
- Installation guide of Content Optimisation SE [9]
- Demo application of Content Optimisation SE [10]

2.3 - Audio Fingerprinting

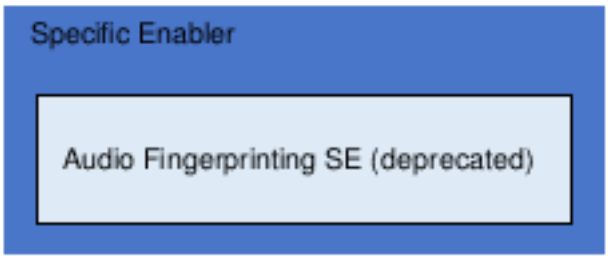
The Audio Fingerprinting SE consists of an indexing component (adding/removing media to/from a fingerprint database) and a matching component (testing unknown fingerprints against a database). Furthermore, a mobile SDK/software library for Android and iOS is available, which can be linked into a mobile application. It takes care of recording the audio signal, calculating an acoustic fingerprint (while also encrypting the data), sending the fingerprint to a server and passing the results back to the application. The algorithm works independently of the spoken language and is robust towards regular background noises and distortions. Synchronisation will work for compressed data and in lively living rooms. It was also successfully tested during presentations with larger crowds and over laptop speakers. Furthermore, the algorithm can be tuned to trade off speed against accuracy.

2.3.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X				

2.3.2 - Relations of the Specific Enabler



2.3.3 - Deviations from the planned use of Generic Enablers

None.

2.3.4 - Relevant Resources

n/a

2.4 - Second-Screen Framework

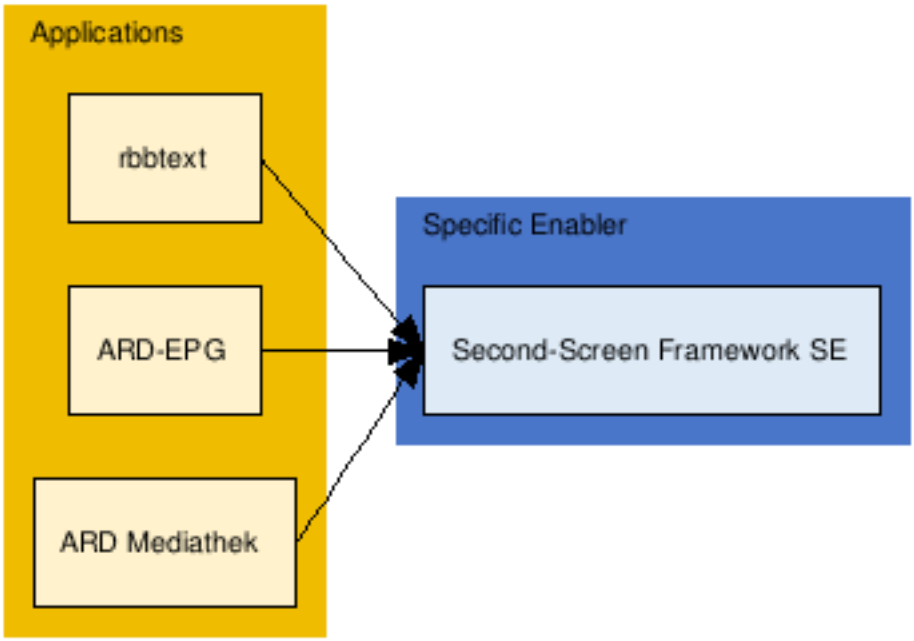
The Second Screen Framework (SSF) provides web applications that are running on a TV with all the crucial functionalities to establish a persistent bi-directional communication path to a web application running in the browser of any second-screen device. This includes the possibility to launch applications from a TV to a second screen.

2.4.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

2.4.2 - Relations of the Specific Enabler



2.4.3 - Deviations from the planned use of Generic Enablers

For being able to better personalise SCTV services for individual users, the IRT analysed different Identity Management solutions for their suitability in FIcontent earlier in the project. A main criterion was the technical feasibility to deploy the IDM's frontend on a TV (specifically on HbbTV devices operated with a remote control).

The developers and owners of the FIWARE Generic Enabler "Identity Management Digital Self (IDM-DS)", NSN (now Nokia), offered their support and extended the GE to support HbbTV accordingly. In a joint effort between IRT and NSN, a proof-of-concept application using the IDM-DS GE and the Second Screen Framework SE was implemented and further integration activities were planned. In Sep 2014, we were informed that the GE IDM-DS was removed from the FIWARE catalogue. The remaining IDM GE "KeyRock" does not fulfill the above-mentioned requirements. While Nokia continues to provide some basic support on a voluntary basis, this results in the fact that for HbbTV applications in WP2, no official IDM GE can be used as originally foreseen.

2.4.4 - Relevant Resources

- Technical documentation of Second-Screen Framework SE [11]
- Developer guide of Second-Screen Framework SE [12]
- Installation guide of Second-Screen Framework SE [13]
- Demo application of Second-Screen Framework SE [14]

2.5 - HbbTV Application Toolkit

Due to the lack of tools for content creators and developers, developing HbbTV applications can be demanding, time-consuming and expensive. The HbbTV Application Toolkit SE provides a powerful

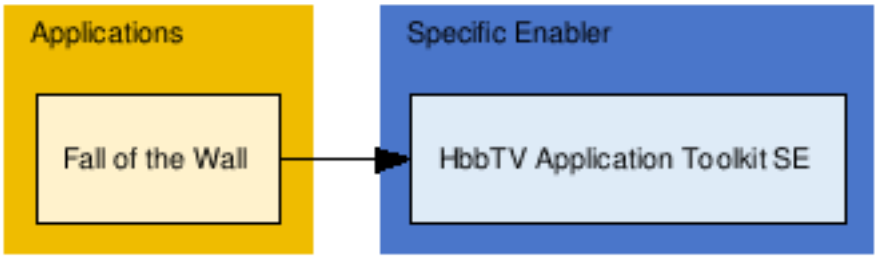
tool set enabling broadcasters, program editors and TV app developers to quickly and easily create HbbTV-compliant TV apps.

2.5.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
			X	X	X

2.5.2 - Relations of the Specific Enabler



2.5.3 - Deviations from the planned use of Generic Enablers

None.

2.5.4 - Relevant Resources

- Technical documentation of HbbTV Application Toolkit SE [15]
- Developer guide of HbbTV Application Toolkit SE [16]
- Installation guide of HbbTV Application Toolkit SE [17]
- Demo application of HbbTV Application Toolkit SE [18]

2.6 - TV Application Layer

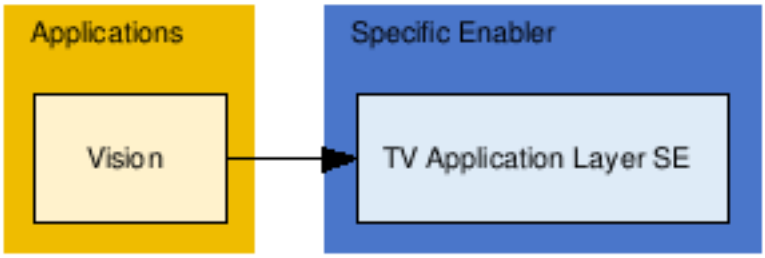
TAL was developed internally within the BBC as a way of vastly simplifying TV application development whilst increasing the reach of BBC TV applications such as iPlayer. Today all of the BBC's HTML-based TV applications (such as BBC News and BBC Sport) are built using TAL.

2.6.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

2.6.2 - Relations of the Specific Enabler



2.6.3 - Deviations from the planned use of Generic Enablers

We evaluated DCRM for supporting the TV Application Layer SE and the Cross-Device Resume Play scenario. A DCRM-based virtual infrastructure may be used to ensure high availability by hosting user session activity data as well as related application logic to enable seamless cross-device functionality. The requirements were to provide versatility in terms of scaling the infrastructure to handle periods of high user demand, to migrate virtual appliances to handle user requests and data, and to make sure that users' quality of experience is maintained throughout the system.

The GE provides well-written documentation and easy to find. There are sufficient training materials in general though they can be updated more frequently and the installation process can be further documented. A few issues that prevent the adoption of the DCRM GE in our current development and experiments include:

- The service hosting GE does not provide persistent performance required for TAL SE and hosting the user activity data. Specifically, the network latency is unpredictable and unmanageable.
- We have little control over hosted services in regards to where the data resides (important for licensing issues). For instance, according to the UK Data Protection Act, the user data (i.e., the user activity data gathered for the cross-device resume play scenario should not be transferred outside the UK without adequate protection and additional user agreement.

2.6.4 - Relevant Resources

- Technical documentation of TV Application Layer SE [19]
- Developer guide of TV Application Layer SE [20]
- Installation guide of TV Application Layer SE [21]
- Demo application of TV Application Layer SE [22]

2.7 - Content Similarity

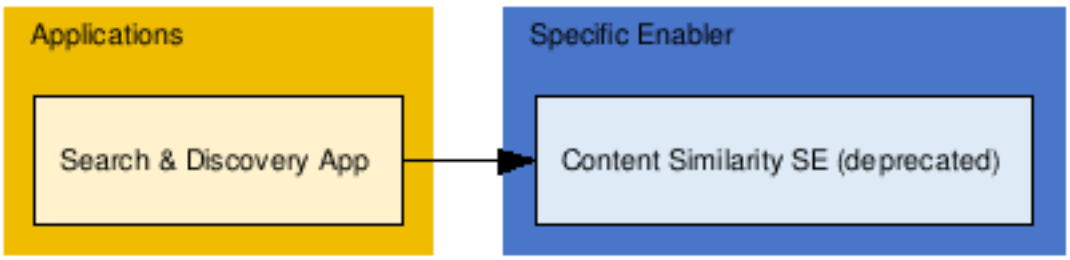
Content Similarity enabler is a software solution to provide content-to-content recommendations based only on content metadata. The object is to offer a solution that allows a list of similar movies to be obtained from an initial movie request. The technology is based on a Technicolor algorithm that computes distances between movies. The target customers for this solution are content providers and cinema Information providers in order to offer VOD discovery services.

2.7.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X			

2.7.2 - Relations of the Specific Enabler



2.7.3 - Deviations from the planned use of Generic Enablers

None.

2.7.4 - Relevant Resources

n/a

2.8 - Content Atmosphere

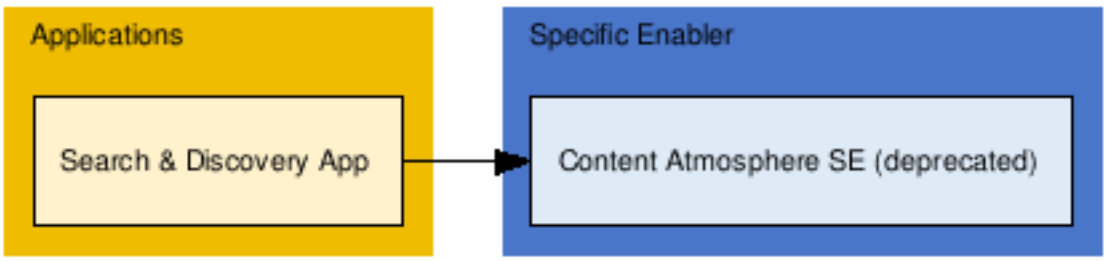
The Content Atmosphere SE will allow to discovering new content thanks to ambient movie's mood. The movie atmosphere can be described with 2 dimensions, the arousal one (calming to exciting) and the valence one (dark to positive). The similarity between content can be computed thanks to these values. It relies on machine learning algorithms to compute (arousal, valence) values. It uses a supervised learning technique called Support Vector Regression Machine (also known as SVR machine) to compute these values.

2.8.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15

2.8.2 - Relations of the Specific Enabler



2.8.3 - Deviations from the planned use of Generic Enablers

None.

2.8.4 - Relevant Resources

n/a

3 - SPECIFIC ENABLERS RELEVANT TO SMART CITY SERVICES

The Enablers of the Smart City Platform are opening up new possibilities in applications delivering new forms of content to users across such wide areas as cities, Themeparks and expo parks. The Smart City Platform includes local information aggregation services, provides points of interest (POIs) and recommendations based on collaboration and meta data. Finally, the app generator uniquely allows effortlessly bringing together Enablers in deployable mobile apps.

3.1 - Open City Database

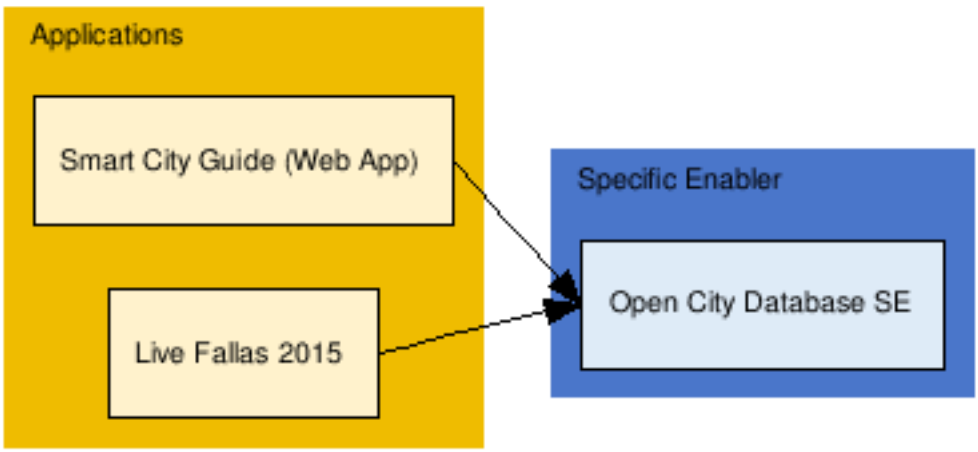
The Open City Database (OCDB) SE is an open source database management system for smart city-related data (e.g. Points of Interest, Open City data and related media from various sources). Besides its database functionality, the OCDB provides a comprehensive API to create, modify and request data sets for integration with smart city guide apps or any other application or service that takes advantage of open city data.

3.1.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

3.1.2 - Relations of the Specific Enabler



3.1.3 - Deviations from the planned use of Generic Enablers

The POI Data Provider (POI-DP) GE introduces an odd REST dialect, e.g. it uses for each HTTP verb a different resource API path where the semantics are put into the resource names (POST /add_poi, POST /update_poi, DELETE /delete_poi). The correct or at least usual way (REST compliant) would be to have a resource /pois and then for posting a new poi do a POST /pois, update with POST /pois/a-poi-uuid or to delete a poi DELETE /pois/a-poi-uuid.

The POI-DP GE specifies a return format with no capability for ordering and the API provides no capability for pagination. The returned data set is a map with uuid as keys making the handling of long result sets hard on the client application side.

Even though the POI-DP GE format seems to be extensible through its "components" approach, there is no out-of-the-box support for social interactions on POIs (likes, ratings, comments, check-ins) that would justify the use of the POI-DP GE for the purposes of the OCDB SE.

The provided implementation of the POI GE is released under Apache 2.0 which is great, but neither the chosen language (PHP) nor the code quality could justify the usage of the POI-DP GE as a basis for the OCDB SE.

In POI-DP GE authentication is out of scope of its specifications. Introducing a specification for read and write accesses without any means of authentication ruled out the POI-DP GE as a basis for the OCDB SE completely. The OCDB comes with a token based access control and is extensible to allow for full control of read and write access permissions on data row level. Introducing this functionality on top of the POI-DP GE would lead into a re-write of the POI-DP GE reference implementation.

3.1.4 - Relevant Resources

- Technical documentation of Open City Database SE [23]
- Developer guide of Open City Database SE [24]
- Installation guide of Open City Database SE [25]
- Demo application of Open City Database SE [26]

3.2 - Recommendation as a Service

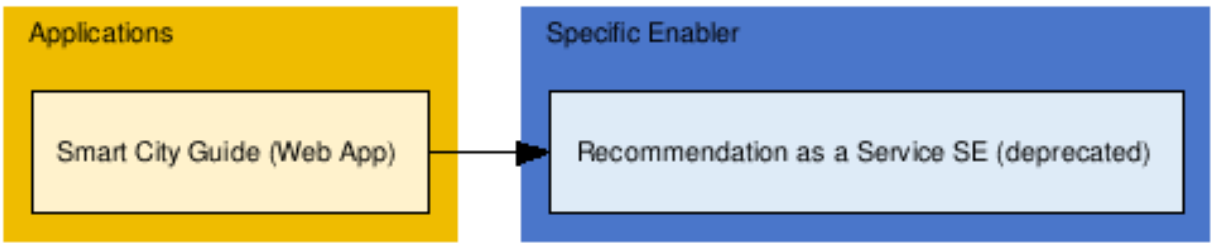
The Recommendations as a Service (RaaS) SE provides the ability to create a professional recommendation engine with just a few mouse clicks and no programming skills. This SE can maintain your item and user data and will host your recommendation engine as a service in the cloud or on your own server infrastructure. Thereby, decision makers can choose whether to use ratings, likes, check-ins or implicit feedback, such as clicks or consumption time. In addition, they can adjust the way the personalization works by selecting from a wide range of well-explained algorithms.

3.2.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X	X	

3.2.2 - Relations of the Specific Enabler



3.2.3 - Deviations from the planned use of Generic Enablers

None.

3.2.4 - Relevant Resources

n/a

3.3 - OpenDataSoft

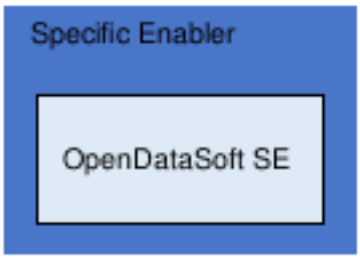
The ODS SE has been specifically designed for non-technical business users to share, publish and reuse structured data in order to create interactive data visualizations and to feed external applications with data via a rich set of REST APIs.

3.3.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
		X	X	X	X

3.3.2 - Relations of the Specific Enabler



3.3.3 - Deviations from the planned use of Generic Enablers

The OpenDataSoft SE has been introduced as a new enabler when OpenDataSoft joined the consortium end of year 1. This SE was already existing before the project and OpenDataSoft didn't find any opportunity to include GEs in the implementations done during the course of the project. However, some potential of integration has already been identified and might be studied later, namely in the area of 3D dataviz and dashboards building.

3.3.4 - Relevant Resources

- Technical documentation of OpenDataSoft SE [27]
- Developer guide of OpenDataSoft SE [28]
- Installation guide of OpenDataSoft SE [28]
- Demo application of OpenDataSoft SE [29]

3.4 - POIProxy

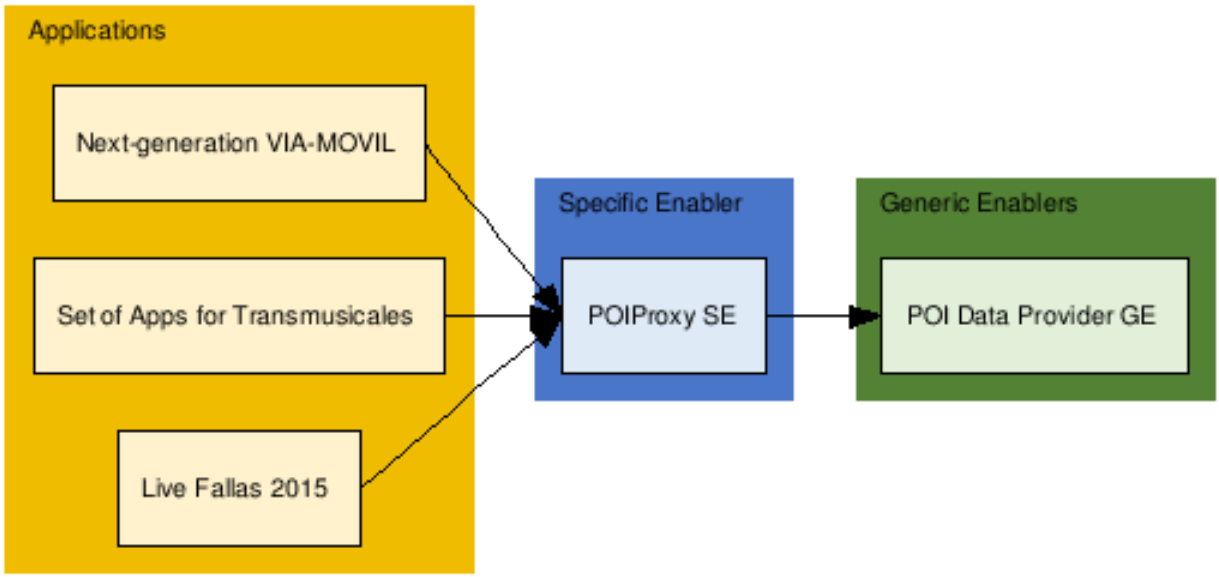
The POIProxy SE is a service to retrieve Points of Interest from almost any public remote service that exposes geolocated data through a REST API or static files.Some examples of the kind of services that POIProxy can interact with: Open data portals (static files, OData APIs, REST APIs...), social networks (Flickr, Panoramio, Instagram, 500px, Twitter, Facebook, Foursquare...), event services (LastFM, Nvivo, SongKick, Meetup, Eventbrite, ...), and other services, including real time services (Wikilocation, Geonames, OpenWeatherMap, CityBikes, ...)

3.4.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
		X	X	X	X

3.4.2 - Relations of the Specific Enabler



3.4.3 - Deviations from the planned use of Generic Enablers

None.

3.4.4 - Relevant Resources

- Technical documentation of POIProxy SE [30]
- Developer guide of POIProxy SE [31]
- Installation guide of POIProxy SE [32]
- Demo application of POIProxy SE [33]

3.5 - Fusion Engine

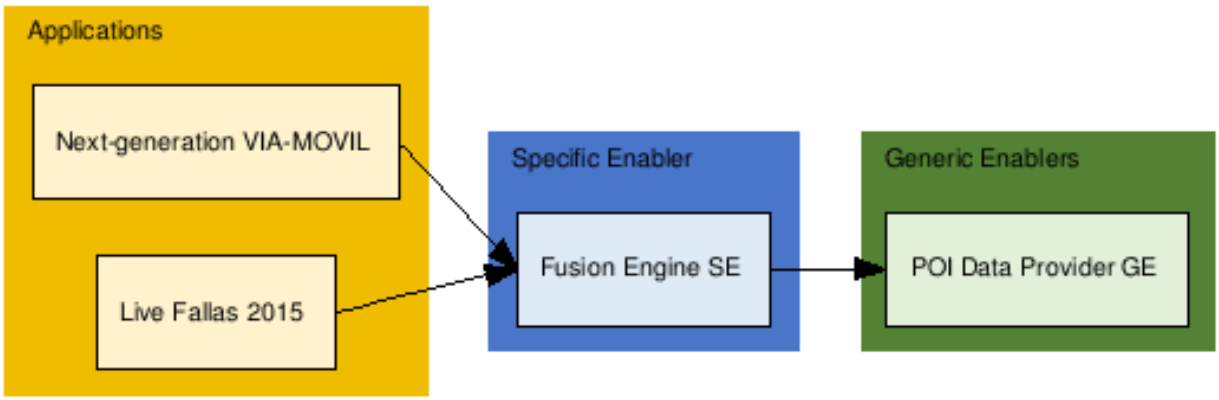
The Fusion Engine (FE) merges Points of Interest (POIs) from various data sources. The main objective is to build Open City Databases (OCDs) with different POIs obtained from different data sources (OSM, DBPedia, etc.). Duplicate POIs will be removed. Categories of POIs can be set up in order to merge and retrieve only specific POIs. The FE Specific Enabler is implemented as a backend service - interaction is with administrator only, rather than with users.

3.5.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
			X	X	X

3.5.2 - Relations of the Specific Enabler



3.5.3 - Deviations from the planned use of Generic Enablers

None.

3.5.4 - Relevant Resources

- Technical documentation of Fusion Engine SE [34]
- Developer guide of Fusion Engine SE [35]
- Installation guide of Fusion Engine SE [36]
- Demo application of Fusion Engine SE [37]

3.6 - App Generator

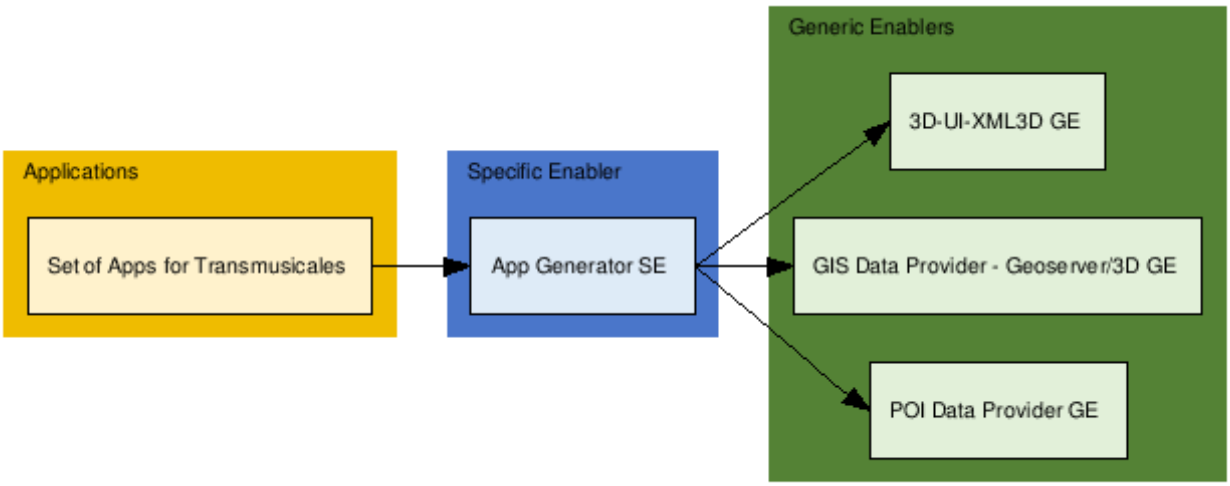
This service enables the deployment of a complete application ecosystem on-the-fly: custom mobile apps with content (app name, icons, data), custom web-apps and backends. For example: the editor of a city guide application can now develop a web-app, backend and mobile apps and then simply apply this template to other cities. Using this SE, deploying a new city is a matter of minutes: provide new data, images and text, and the Generator takes care of the rest, deploying your web-app instances, creating your datasets and readying your new mobile apps for deployment.

3.6.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X	X	X

3.6.2 - Relations of the Specific Enabler



3.6.3 - Deviations from the planned use of Generic Enablers

None.

3.6.4 - Relevant Resources

- Technical documentation of App Generator SE [38]
- Developer guide of App Generator SE [39]
- Installation guide of App Generator SE [40]
- Demo application of App Generator SE [41]

3.7 - Context Aware Recommendation

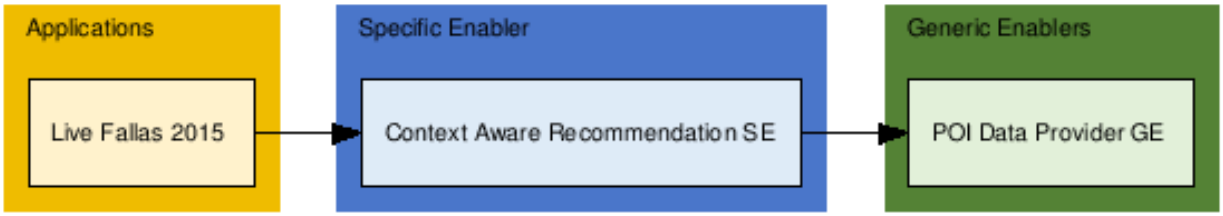
This Specific Enabler consists of two server modules - an Activity and Context Recognition server module, which uses gathered contextual and sensory data for classification of user activity and context, and a Recommendation Matrix Preparation server module. Additionally, we provide a demo Android application for collection of contextual/sensory data and presentation of POI recommendation results.

3.7.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
		X	X	X	X

3.7.2 - Relations of the Specific Enabler



3.7.3 - Deviations from the planned use of Generic Enablers

The plan was that the Context Aware Recommendation (CAR) SE might use the Publish/Subscribe Context Broker GE - Orion from M24 for realization of standardized interface for gathering contextual data and reporting changes in context sources and sensory data streams. Because of the heavy load during preparation of the SE for the FIC2Lab, we have a delay in implementation of the NGSI9/10 REST API interfaces and related handlers in the Activity and Context Recognition module of our SE. Nonetheless, our plan is to enable our SE to utilize the Publish/Subscribe Context Broker GE - Orion through NGSI9/10 REST APIs allowing developers to combine the CAR SE with as much contextual and sensory data sources as possible. We will update the open source GitHub repository of our SE with this new functionality when implementation of the NGSI9/10 REST API handlers is finished and tested.

3.7.4 - Relevant Resources

- Technical documentation of Context Aware Recommendation SE [42]
- Developer guide of Context Aware Recommendation SE [43]
- Installation guide of Context Aware Recommendation SE [44]
- Demo application of Context Aware Recommendation SE [45]

3.8 - Recommendation Services

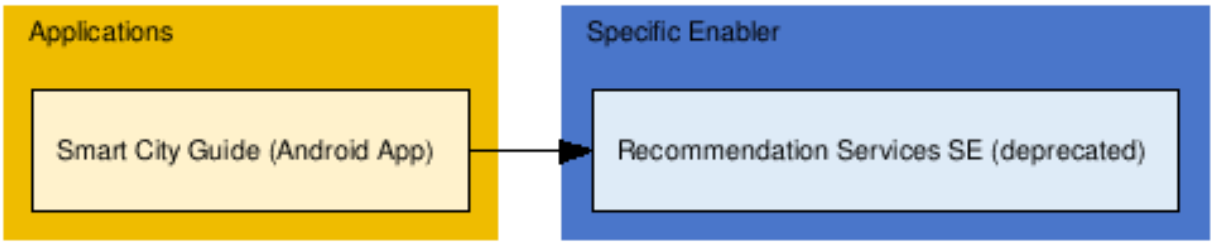
The Specific Enabler “Recommendation Services” is based on REPERIO product, which is a generic recommendation engine providing both content based (meta-data descriptions of items) and collaborative (logs usage) recommendations. REPERIO can make contextual or personalized recommendations on products (items) to users. To make recommendations, rank predictions or similarities predictions, REPERIO relies on four types of data: logs, preferences, characteristics and relations. Recommendations supplied by REPERIO are a new way to browse items and/or users, in addition to a search engine.

3.8.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X					

3.8.2 - Relations of the Specific Enabler



3.8.3 - Deviations from the planned use of Generic Enablers

None.

3.8.4 - Relevant Resources

n/a

3.9 - Local Information

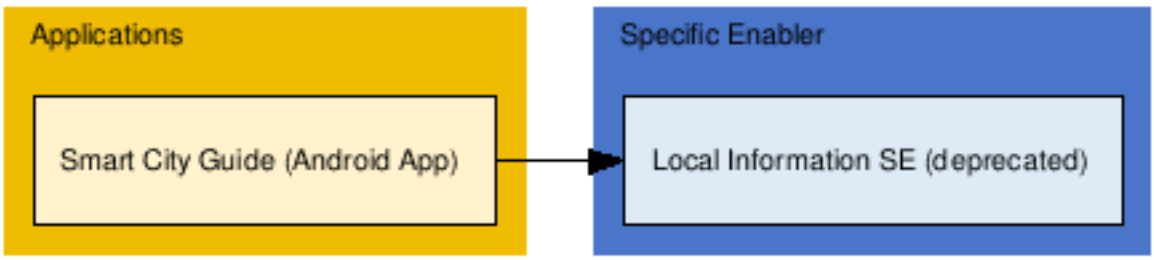
The Local Information SE allows to access local content aggregated from multiple sources (open data, web sites, etc.), enriched with UGC and recommendations. The main functionalities are POI (Point Of Interest) collecting, POI formatting, POI storage, Web services to access data. The Local Information SE will not be open to developers in Phase 3.

3.9.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X					

3.9.2 - Relations of the Specific Enabler



3.9.3 - Deviations from the planned use of Generic Enablers

None.

3.9.4 - Relevant Resources

n/a

3.10 - Virtual/Mixed Reality

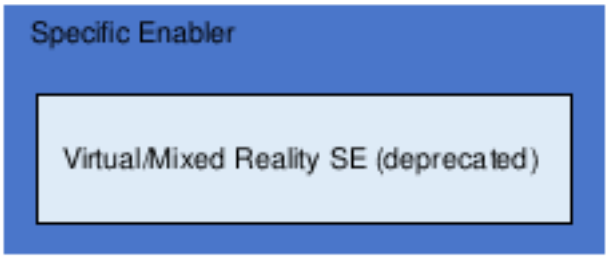
Mixed reality combines the real world with virtual objects, characters and information. The Virtual/Mixed Reality SE is the core component of a mixed reality service, managing a large number of geo-localized moving objects in real-time, with a distributed architecture allowing almost unlimited scalability. This SE provides neighboring moving objects (either real or virtual) according to the user's position. The position can be computed either using antennas or cameras with AR marker databases or in case of markerless image tracking, natural marker databases.

3.10.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15

3.10.2 - Relations of the Specific Enabler



3.10.3 - Deviations from the planned use of Generic Enablers

None.

3.10.4 - Relevant Resources

n/a

4 - SPECIFIC ENABLERS RELEVANT TO PERVASIVE GAMING

The Enablers of the Pervasive Games Platform target video game services by providing augmented reality tracking and 3D internet with Internet of Things capabilities. Importantly, this platform includes a series of Reality Mixer techniques advancing the state of the art in seamless integration of audio, visual and physical digital content with the real-world. The game platform delivers support for developer to build connected applications including virtual characters, POIs, matchmaking, leaderboards, and game synchronization.

4.1 - Leaderboard

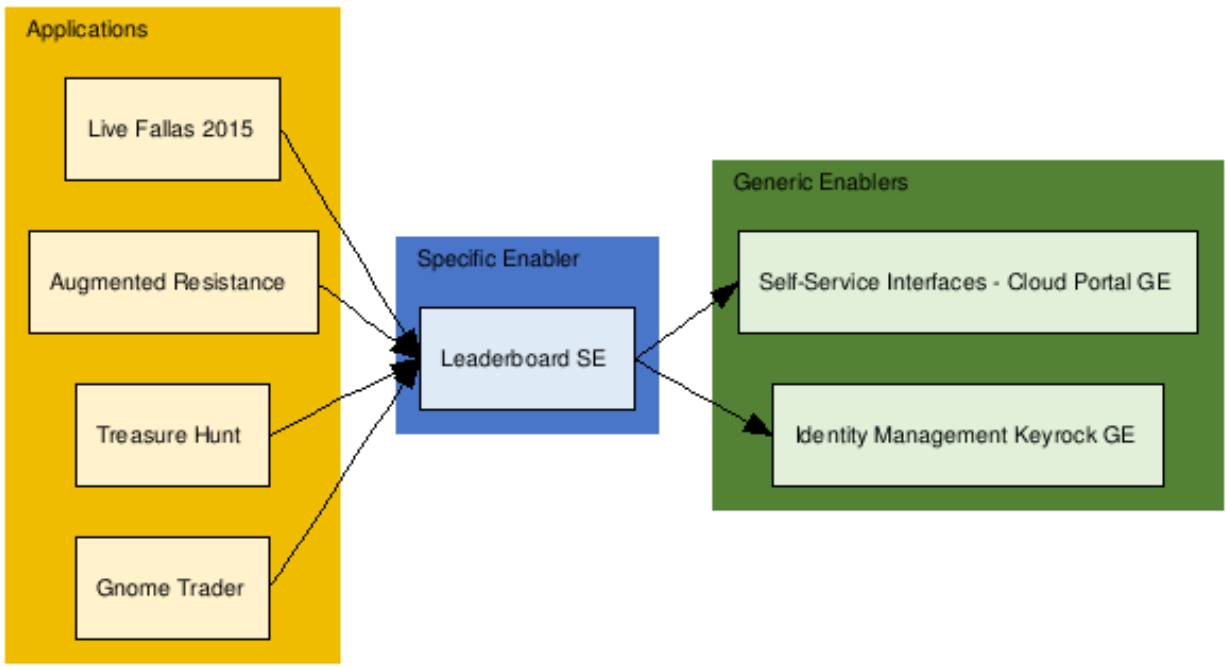
The Leaderboard SE provides for the storage of high scores and the retrieval of high scores as a sorted list. In addition, it can connect to the Social Network Enabler and automatically post a message when a player breaks the high score.

4.1.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

4.1.2 - Relations of the Specific Enabler



4.1.3 - Deviations from the planned use of Generic Enablers

The Object Storage GE is not used as a highscore list can potentially contain thousands of entries. These are sorted on the server to return e.g. only the top 20 entries. This is not possible with the Object Storage GE and there would be unnecessary overhead transmitting all entries and sorting them on the client.

4.1.4 - Relevant Resources

- Technical documentation of Leaderboard SE [46]
- Developer guide of Leaderboard SE [47]
- Installation guide of Leaderboard SE [48]
- Demo application of Leaderboard SE [49]

4.2 - Unusual Database-Event Detection

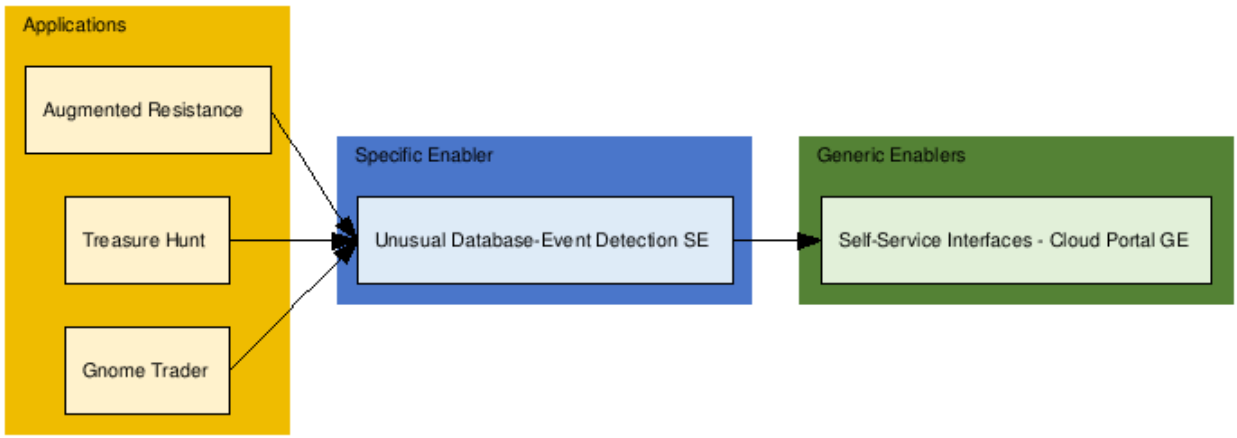
The main functionality that the Unusual Database-Event Detection SE provides is a monitoring service of a database. It regularly checks database values. If any value is out of an expected range, an email alert is sent.

4.2.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

4.2.2 - Relations of the Specific Enabler



4.2.3 - Deviations from the planned use of Generic Enablers

The Complex Event Processing GE is closely related and could be used by forwarding every single new entry to the GE. This would require changing the code of the game and need yet another server. We decided to include the simple minimum and maximum checks directly in the SE that also provides monitoring of the database and does not require any changes in the game.

4.2.4 - Relevant Resources

- Technical documentation of Unusual Database-Event Detection SE [50]
- Developer guide of Unusual Database-Event Detection SE [51]
- Installation guide of Unusual Database-Event Detection SE [52]
- Demo application of Unusual Database-Event Detection SE [53]

4.3 - Reality Mixer - Reflection Mapping

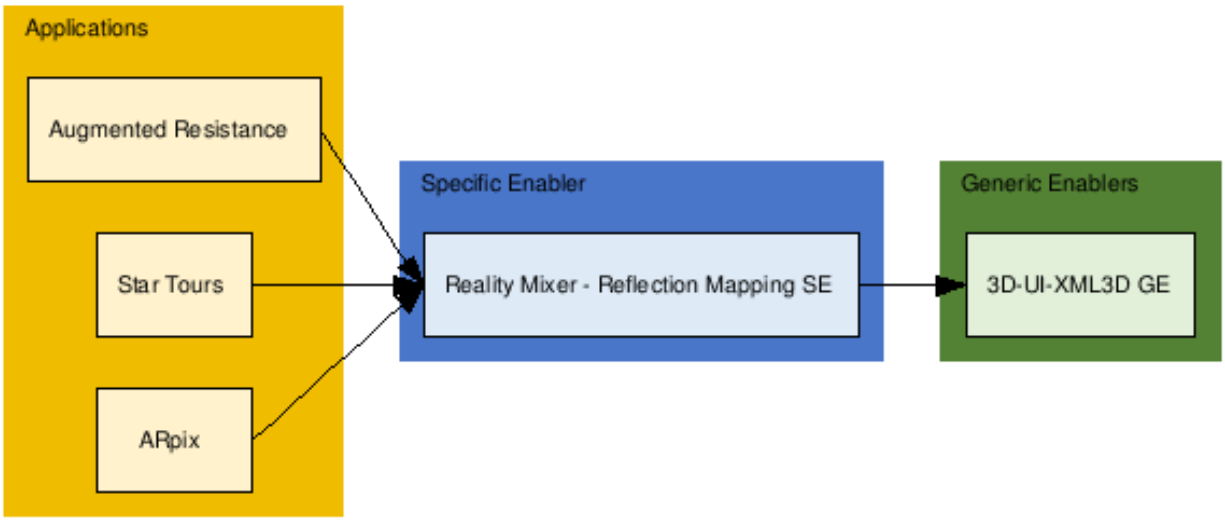
All visually-oriented SEs of the Reality Mixer group measure camera properties and adapt the virtual objects to fit to the camera image background visually. The Reflection Mapping SE utilizes a light probe to extract a sphere map from the camera image, which contains the environmental lighting conditions. This sphere map will be used to apply an appropriate lighting model to rendered virtual objects. Thus, the additional virtual objects are incorporated into the resulting image in a very seamless fashion leading to a more realistic experience of mixed reality applications.

4.3.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

4.3.2 - Relations of the Specific Enabler



4.3.3 - Deviations from the planned use of Generic Enablers

None.

4.3.4 - Relevant Resources

- Technical documentation of Reality Mixer - Reflection Mapping SE [54]
- Developer guide of Reality Mixer - Reflection Mapping SE [55]
- Installation guide of Reality Mixer - Reflection Mapping SE [55]
- Demo application of Reality Mixer - Reflection Mapping SE [56]

4.4 - Reality Mixer - Camera Artifact Rendering

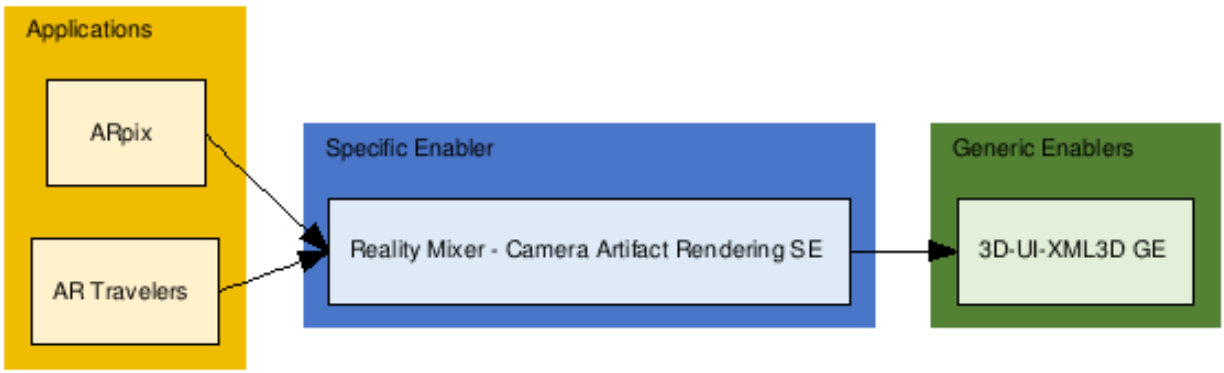
All visually-oriented SEs of the Reality Mixer group measure camera properties and adapt the virtual objects to fit to the camera image background visually. This client-side code modifies the virtual rendered content to match the camera image more closely in an AR context to provide more realistic appearance.

4.4.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

4.4.2 - Relations of the Specific Enabler



4.4.3 - Deviations from the planned use of Generic Enablers

None.

4.4.4 - Relevant Resources

- Technical documentation of Reality Mixer - Camera Artifact Rendering SE [57]
- Developer guide of Reality Mixer - Camera Artifact Rendering SE [58]
- Installation guide of Reality Mixer - Camera Artifact Rendering SE [58]
- Demo application of Reality Mixer - Camera Artifact Rendering SE [59]

4.5 - Reality Mixer - Augmented Audio

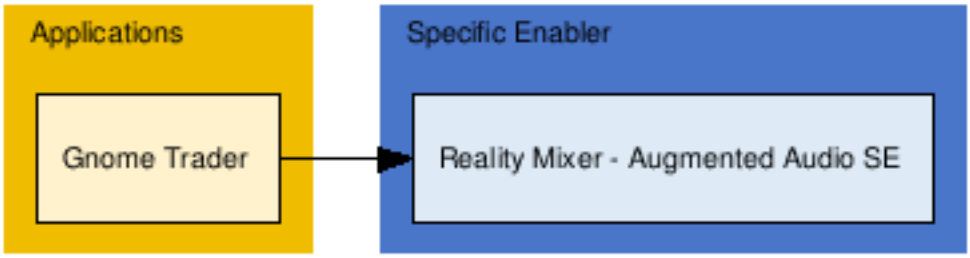
This aurally oriented enabler of the Reality Mixer group measure sensor location properties and adapt the virtual sound sources to the audio environment. The Augmented Audio enabler makes use of the POI interface enabler to provide correctly located spatial sounds. Thus, the addition of audio incorporated into the physical environment in a very seamless fashion leads to a more realistic sound experience for mixed reality applications.

4.5.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

4.5.2 - Relations of the Specific Enabler



4.5.3 - Deviations from the planned use of Generic Enablers

This enabler optionally relies on POI Interface to assist with the spatial augmented audio service it provides. POI Interface in turn uses the POI Data Provider GE for geolocated persistent audio sources. This enabler also optionally uses TwoBigEars' 3Dception middleware for 3D binaural spatial audio rendering.

4.5.4 - Relevant Resources

For installation guide below, please see installation note at the foot of the linked developer guide.

- Technical documentation of Reality Mixer - Augmented Audio SE [60]
- Developer guide of Reality Mixer - Augmented Audio SE [61]
- Installation guide of Reality Mixer - Augmented Audio SE [62]
- Demo application of Reality Mixer - Augmented Audio SE [63]

4.6 - Game Synchronization

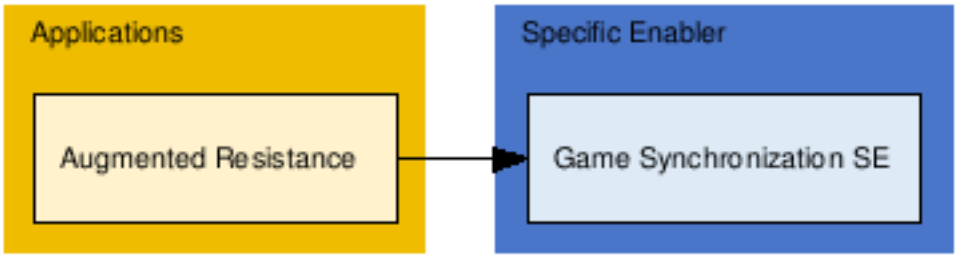
The Game Synchronization SE provides functionality to synchronise the game world using the RTS (Real-Time Strategy) Lockstep mechanism. Provides an efficient way to synchronize many objects by sending their actions instead of streaming their positions.

4.6.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

4.6.2 - Relations of the Specific Enabler



4.6.3 - Deviations from the planned use of Generic Enablers

The Game Synchronization SE does not use any GE, because the current Synchronization GE from the FIWARE catalogue is focusing on centralized server-based solutions, while the latency requirements for many games demand a more distributed approach. Therefore, the Game Synchronization SE is a standalone piece of software providing peer-to-peer game synchronization (lock-step model). However, it does use Unity3D (including the Unity-provided meta-server), which is one of the two foundations of the Pervasive Games Platform.

4.6.4 - Relevant Resources

- Technical documentation of Game Synchronization SE [64]
- Developer guide of Game Synchronization SE [65]
- Installation guide of Game Synchronization SE [66]
- Demo application of Game Synchronization SE [67]

4.7 - Augmented Reality - Fast Feature Tracking

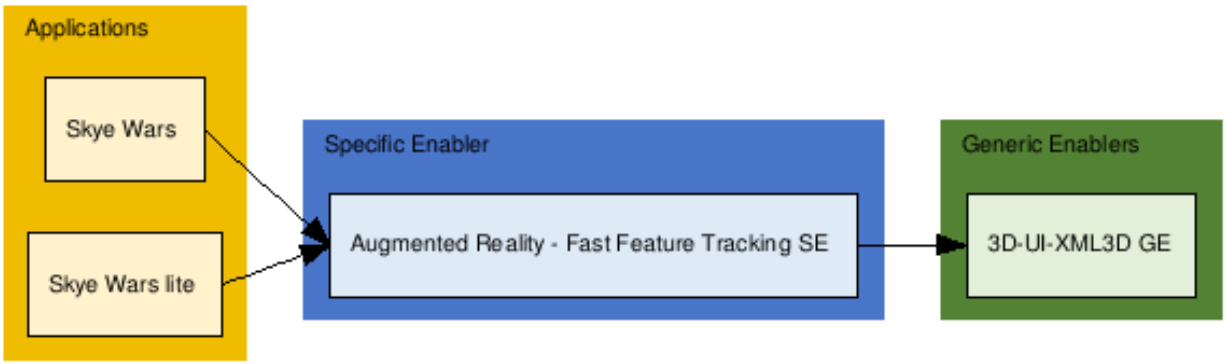
All specific enablers of the Augmented Reality (AR) group provide various tracking methods to enable AR applications. The Fast Feature Tracking SE learns targets by colour and then matches the centre of a colour area (for example a coloured football or road sign) in the camera image to retrieve the relative camera pose information. This extends an application with the capabilities to apply the matching transformation to 3D-scene content and render them onto respective targets.

4.7.1 - Status

Pending for FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

4.7.2 - Relations of the Specific Enabler



4.7.3 - Deviations from the planned use of Generic Enablers

None.

4.7.4 - Relevant Resources

- Technical documentation of Augmented Reality - Fast Feature Tracking SE [68]
- Developer guide of Augmented Reality - Fast Feature Tracking SE [69]
- Demo application of Augmented Reality - Fast Feature Tracking SE [70]

4.8 - Augmented Reality - Marker Tracking

All SEs of the Augmented Reality group provide various tracking methods to enable augmented reality (AR) applications. The Marker Tracking SE utilises AR markers to retrieve camera pose information through Xflow. This extends XML3D with the capabilities to apply the matching transformation to 3D scene content and render them onto respective markers in a web-based environment. The Marker Tracking SE follows the declarative approach of XML3D and is real-time capable.

4.8.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X		

4.8.2 - Relations of the Specific Enabler

4.8.3 - Deviations from the planned use of Generic Enablers

None.

4.8.4 - Relevant Resources

- Technical documentation of Augmented Reality - Marker Tracking SE (deprecated) [71]

4.9 - Geospatial - POI Matchmaking

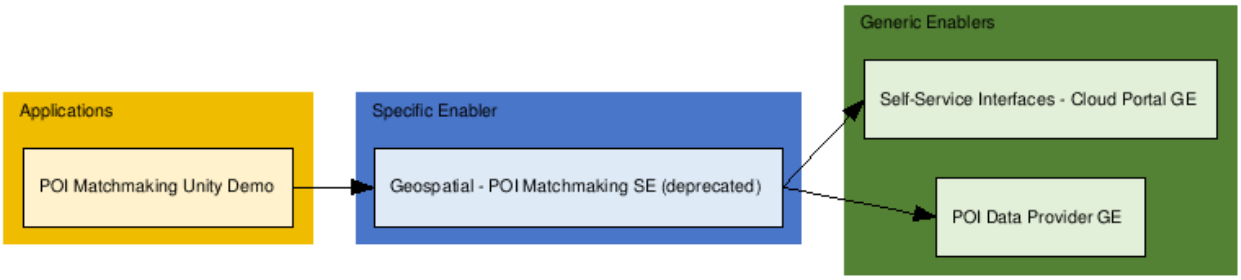
The POI Matchmaking SE is an extension of the functionality of the Spatial Matchmaking SE (this was originally in the 09/13 release but is now no longer available). This enabler allows any number of players to group together based on their latitude and longitude value, or their spatial proximity to a point of interest. These points of interest are taken from the POI-DP GE by FIWARE.

4.9.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	

4.9.2 - Relations of the Specific Enabler



4.9.3 - Deviations from the planned use of Generic Enablers

None.

4.9.4 - Relevant Resources

- Technical documentation of Geospatial - POI Matchmaking SE (deprecated) [72]
- Developer guide of Geospatial - POI Matchmaking SE (deprecated) [73]

4.10 - Geospatial - POI Interface

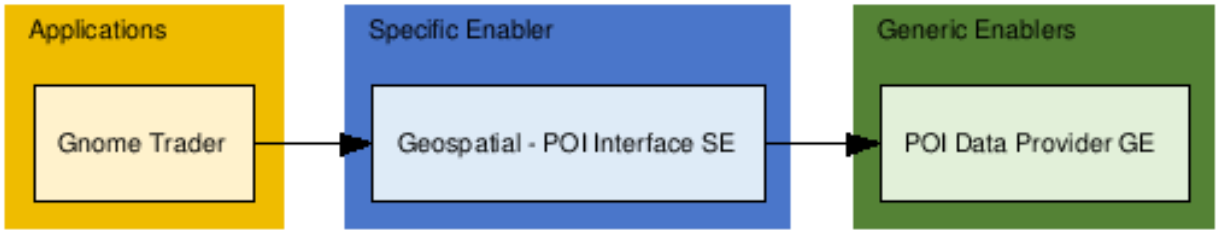
The POI Interface SE implements an interface to the POI Data Provider GE or POI Storage SE APIs for Unity3d. It provides access to all the POI Data Provider GE methods and wraps the POI data structures into C# objects.

4.10.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X	X	X

4.10.2 - Relations of the Specific Enabler



4.10.3 - Deviations from the planned use of Generic Enablers

None.

4.10.4 - Relevant Resources

- Technical documentation of Geospatial - POI Interface SE [74]
- Developer guide of Geospatial - POI Interface SE [75]
- Installation guide of Geospatial - POI Interface SE [76]
- Demo application of Geospatial - POI Interface SE [77]

4.11 - Networked Virtual Character

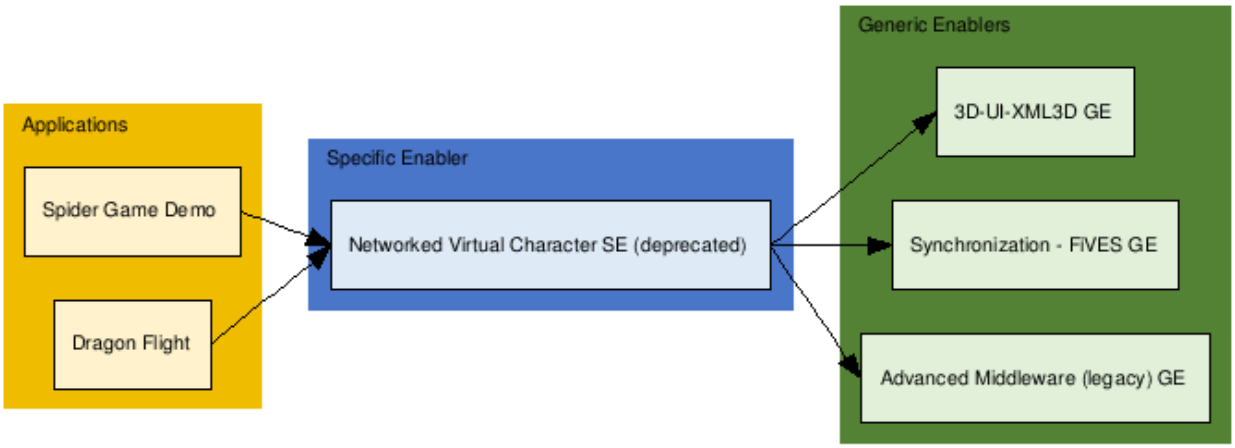
The animation of virtual characters is a usual task in game development. Regardless of the way how to animate the virtual character, it is desirable to synchronize the sequence of motions across multiple clients. Therefore, the Networked Virtual Character (NVC) SE is provided as a plugin to the Synchronization GE and thereby extends its synchronization capabilities to virtual characters while supporting a variety of cross-platform clients.

4.11.1 - Status

Promoted to FIWARE.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X		

4.11.2 - Relations of the Specific Enabler



4.11.3 - Deviations from the planned use of Generic Enablers

The Virtual Character GE of FIWARE is not applicable since its focus is on the playback and blending of pre-edited animation sequences. In contrast, the NVC SE supports real-time synchronization of motion-captured or physically-simulated character animations. Moreover, the Virtual Character GE is not compatible with the 3D-UI-XML3D GE and considered to be discontinued too.

4.11.4 - Relevant Resources

- Technical documentation of Networked Virtual Character SE (deprecated) [78]

4.12 - Visual Agent Design

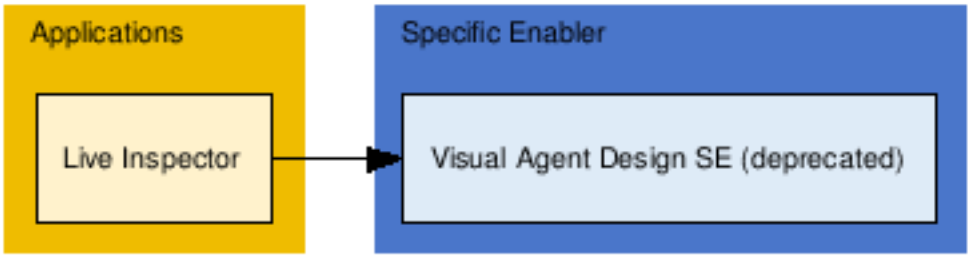
This SE provides the building blocks to visually design the behaviour of agents in Unity 3D. These agents will typically be physical robots. This SE also allows to inspect their behaviour in real time through augmented reality.

4.12.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
		X	X	X	

4.12.2 - Relations of the Specific Enabler



4.12.3 - Deviations from the planned use of Generic Enablers

At the time of planning the Visual Agent Design SE, we envisioned to use the following GEs:

- Object Storage, to allow user save their creation in the cloud
- Identity Management Keyrock, in conjunction with Object Storage, to have a cloud-based account
- Configuration Management, to manage augmented reality setups with multiple devices in a single room

However, as the development load to integrate these proved bigger than planned, and as the year-1 review focused on evaluation, we rather directed forces to thoroughly evaluate the added benefit of Augmented Reality in the context of Programming Education using the Visual Agent Design. This lead to a publication in ITiCSE 2015, a very competitive conference, and to the abandon of the GE integration.

The Visual Agent Design SE does not use any GE. For that reason, and as suggested by the reviewer after 1st year review, we decided not to provide it on FIC2Lab.

4.12.4 - Relevant Resources

- Technical documentation of Visual Agent Design SE (deprecated) [79]
- Developer guide of Visual Agent Design SE (deprecated) [80]

4.13 - ARTool

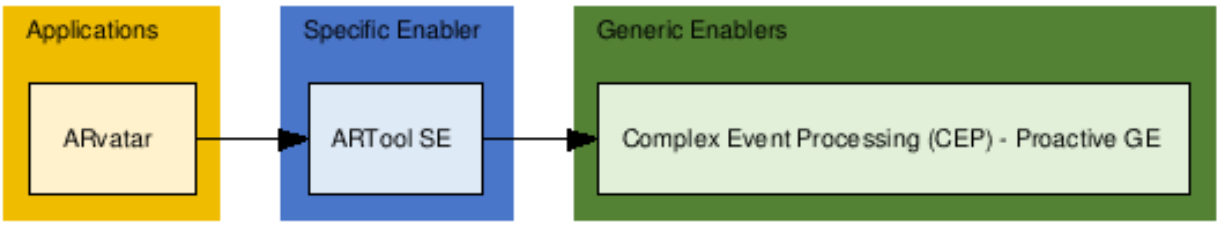
The ARTool platform enables the simple and fast creation of AR applications using a user-friendly design platform (ARTool Creator), and the subsequent deployment of these applications through the ARTool Deploy platform.

4.13.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

4.13.2 - Relations of the Specific Enabler



4.13.3 - Deviations from the planned use of Generic Enablers

None.

4.13.4 - Relevant Resources

- Technical documentation of ARTool SE [81]
- Developer guide of ARTool SE [82]
- Installation guide of ARTool SE [83]
- Demo application of ARTool SE [84]

4.14 - SLAMflex

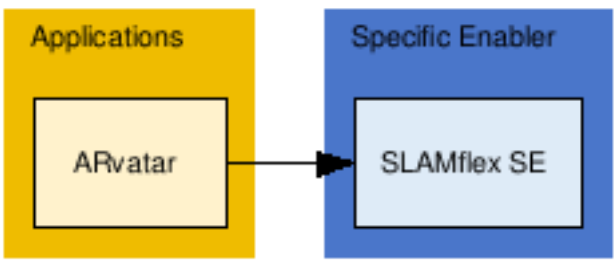
SLAMflex provides detection and tracking of dominant planes for smartphone devices. This plane can then be used to show AR content relative to the plane orientation. The detection of plane is performed in the field of view of the smartphone camera. In subsequent frames it is tracked. The interface returns the plane position and orientation.

4.14.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

4.14.2 - Relations of the Specific Enabler



4.14.3 - Deviations from the planned use of Generic Enablers

This SE relies on CEP GE indirectly when used in combination with ARTool SE. This SE is effectively native library for Android and iOS performing local video stream analysis and providing information to the ARTool, which then in turn utilizes CEP GE.

4.14.4 - Relevant Resources

- Technical documentation of SLAMflex SE [85]
- Developer guide of SLAMflex SE [86]
- Installation guide of SLAMflex SE [87]
- Demo application of SLAMflex SE [88]

4.15 - Flexible and Adaptive Text To Speech

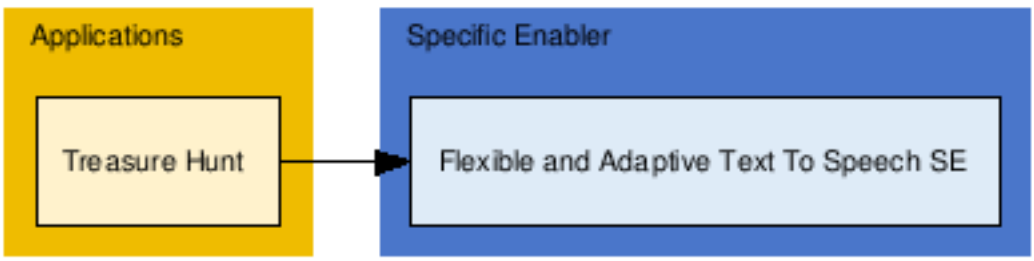
The Flexible and Adaptive Text To Speech (FA-TTS) SE is a Text To Speech server that enables simple and fast creation of synthetic speech based on a text input. The technology used allows the manipulation of various acoustic and linguistic parameters in order to obtain the synthetic voice that is most suitable for a specific situation. Pitch/rhythm modifications and a vocal tract scaler can be used to generate more expressive speech.

4.15.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

4.15.2 - Relations of the Specific Enabler



4.15.3 - Deviations from the planned use of Generic Enablers

Flexible and Adaptive Text-To-Speech SE does not make direct use of any GE. However, the SE provides an unprotected REST API, so a PEP proxy GE, such as PEP SteelSkin GE or PEP Wilma GE should always be used in conjunction with Flexible and Adaptive Text-To-Speech SE, in order to enforce authentication. The REST API is simple and can be easily protected using both PEP SteelSkin GE (with the rest plugin) and PEP Wilma GE, without any change. For this reason no action have been taken to force one solution or another and the decision is left to the service provider, i.e. who deploys Flexible and Adaptive Text-To-Speech SE on its own systems.

4.15.4 - Relevant Resources

- Technical documentation of Flexible and Adaptive Text To Speech SE [89]
- Developer guide of Flexible and Adaptive Text To Speech SE [90]
- Installation guide of Flexible and Adaptive Text To Speech SE [91]
- Demo application of Flexible and Adaptive Text To Speech SE [92]

5 - COMMON SPECIFIC ENABLERS RELEVANT ACROSS PLATFORMS

The common Enablers among the FIcontent platforms share their technology across use case scenarios. They were identified to cover a larger area of interest and thereby are of potential interest for users of more than one domain. Finally, they are good candidates for the promotion towards FIWARE as new GEs or additional functionality of existing one.

5.1 - 3D-Map Tiles

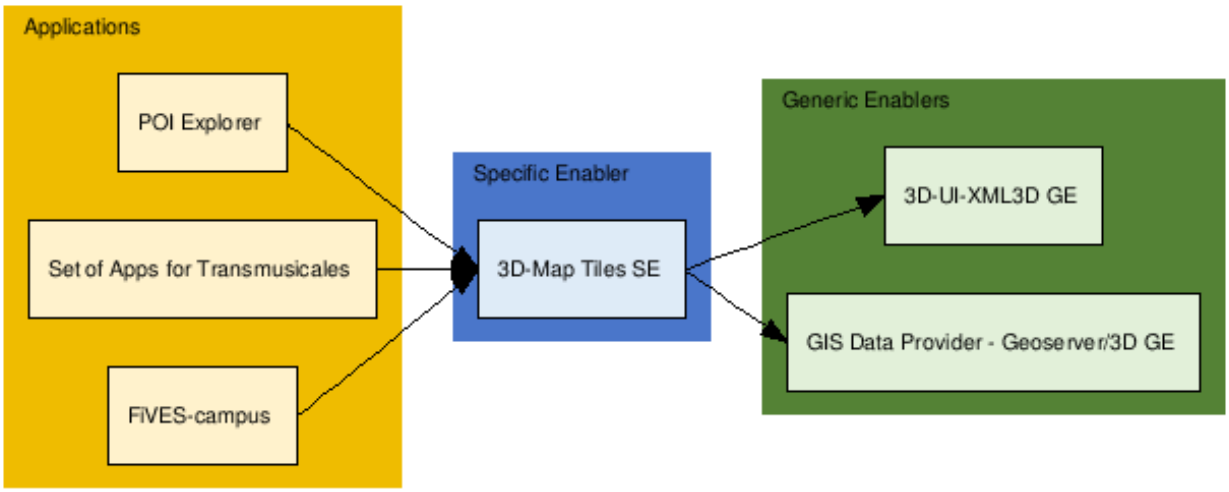
The 3D-Map Tiles SE supplies OSM-style map tiles - however, these tiles are a 3D representation of the physical geometry of locations in contrast to the image tiles of Open Street Map. The 3D-Map Tiles SE also supports various backend data providers and offers various kinds of tiles, such as projected OSM-tiles and laser-scanned elevation data with textures. The 3D-Map Tiles SE incorporates the GIS-DP GE from FIWARE.

5.1.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X	X	X

5.1.2 - Relations of the Specific Enabler



5.1.3 - Deviations from the planned use of Generic Enablers

None.

5.1.4 - Relevant Resources

- Technical documentation of 3D-Map Tiles SE [93]
- Developer guide of 3D-Map Tiles SE [94]
- Installation guide of 3D-Map Tiles SE [95]
- Demo application of 3D-Map Tiles SE [96]

5.2 - Content Enrichment

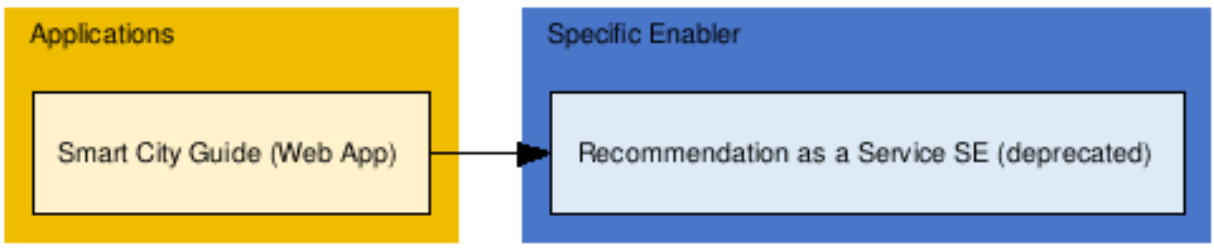
Content Enrichment provides functions to create, distribute and play interactive video content across platforms and devices by making video objects clickable. It also provides interfaces to incorporate Web 2.0 capabilities and community functionalities. The enabler acts as a common building block for future video and multimedia infrastructures. It allows seamless, platform-independent and convenient enrichment of any type of video content using any type of device for a variety of application cases.

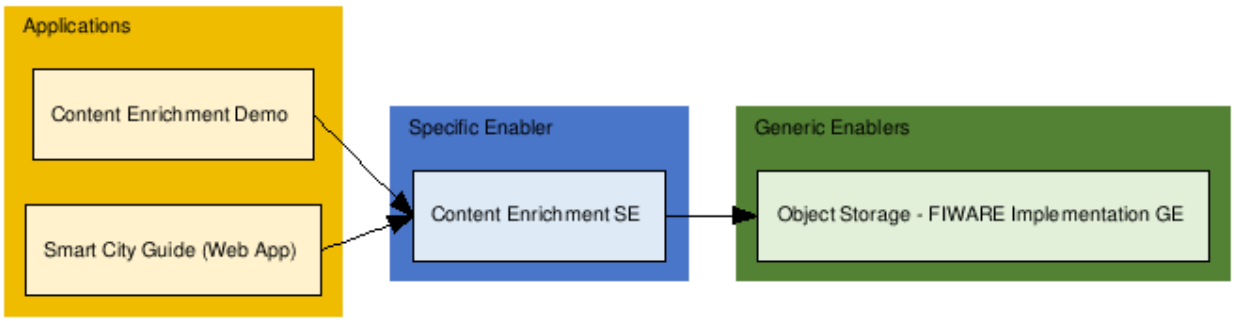
5.2.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

5.2.2 - Relations of the Specific Enabler





5.2.3 - Deviations from the planned use of Generic Enablers

None.

5.2.4 - Relevant Resources

- Technical documentation of Content Enrichment SE [97]
- Developer guide of Content Enrichment SE [98]
- Installation guide of Content Enrichment SE [99]
- Demo application of Content Enrichment SE [100]

5.3 - Content Sharing

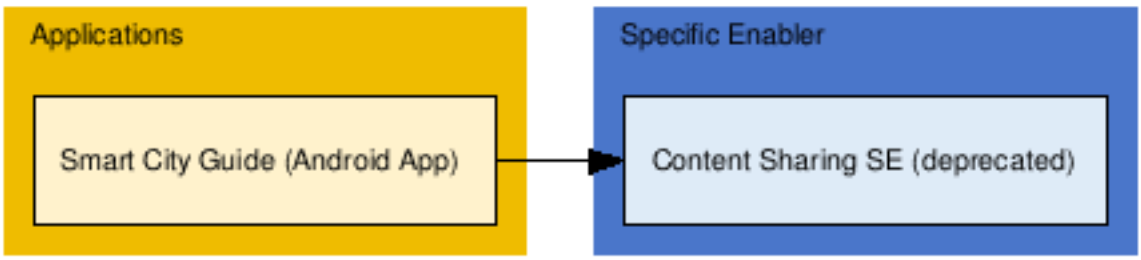
The main functionality of the Content Sharing SE consists of a transparent content synchronization with regards to underlying network connectivity (infra, ad hoc). This allows for instance the synchronization of feeds containing linked content such as comments on images, or images related to one another. The Content Sharing SE provides mainly the ability to share content in infrastructure-less situations. This is useful to transfer data directly between users or to a server. As an example, downloaded content can directly be shared with other users without requiring additional infrastructure. For mobile devices the service is designed with power efficiency and possible connectivity disruptions in mind.

5.3.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X		

5.3.2 - Relations of the Specific Enabler



5.3.3 - Deviations from the planned use of Generic Enablers

At the time of planning the use of the following GEs was envisioned:

- Object Storage
- Location (discontinued)
- Identity Management Keyrock
- AccessControl (discontinued)
- POI Data Provider

5.3.4 - Relevant Resources

n/a

5.4 - POI Storage

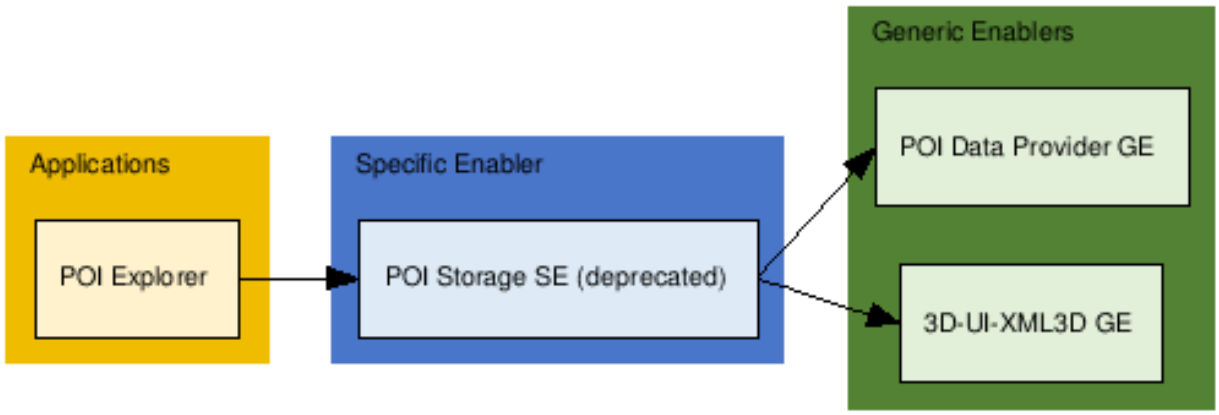
The POI Storage SE provides a flexible, lightweight webservice to store POI-related data. Furthermore, it is a GE-compliant implementation of the POI-DP GE from FIWARE and amends the use of this GE with additional features, such as storing and retrieving of custom data components and easy import of sample data (e.g. geonames.org, other POI-DP instances, etc.).

5.4.1 - Status

Discontinued.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
	X	X	X		

5.4.2 - Relations of the Specific Enabler



5.4.3 - Deviations from the planned use of Generic Enablers

None.

5.4.4 - Relevant Resources

- Technical documentation of POI Storage SE (deprecated) [101]

5.5 - Social Network

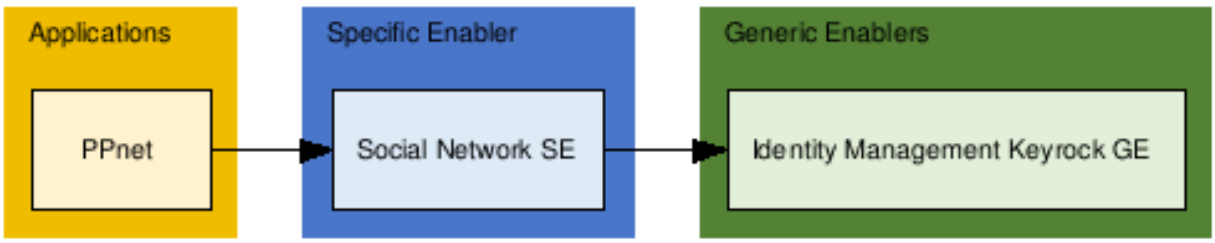
The Social Network SE Core (or SNE) is a REST Service with a Web interface that gives end users the possibility of communicating with each other. Unlike monolithic infrastructures (such as Facebook), the SNE provides not only full autonomy of user data but also provides the possibility of running SNE as a federated service.

5.5.1 - Status

Deployed on FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
X	X	X	X	X	X

5.5.2 - Relations of the Specific Enabler



5.5.3 - Deviations from the planned use of Generic Enablers

None.

5.5.4 - Relevant Resources

- Technical documentation of Social Network SE [102]
- Developer guide of Social Network SE [103]
- Installation guide of Social Network SE [104]
- Demo application of Social Network SE [105]

5.6 - Asset Storage

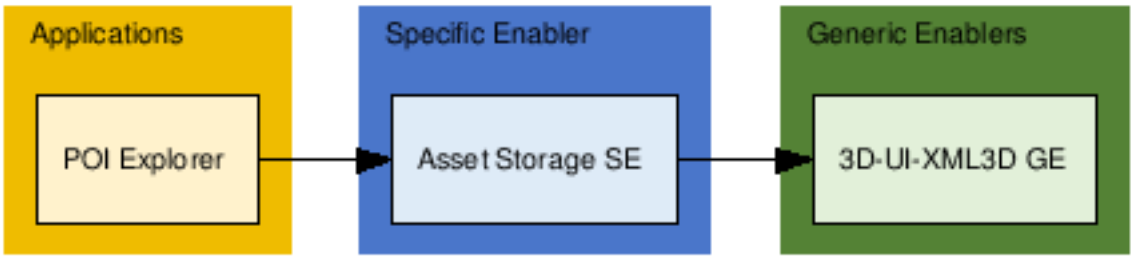
The Asset Storage SE is a system for storage and conversion of polygonal 3D models. It offers a REST interface to add and retrieve models, where HTTP content negotiation is used to determine the input and output format(s). Its current primary use is to import 3D models into its own storage format, and export them to something usable on the web (i.e. compatible with the 3D-UI-XML3D GE).

5.6.1 - Status

Pending for FIC2Lab.

Release 09/13	Release 06/14	Release 10/14	Release 12/14	Release 04/15	Release 08/15
				X	X

5.6.2 - Relations of the Specific Enabler



5.6.3 - Deviations from the planned use of Generic Enablers

None.

5.6.4 - Relevant Resources

- Technical documentation of Asset Storage SE [106]
- Developer guide of Asset Storage SE [107]

6 - CONCLUSION

In this document, we have presented an overview of all Specific Enablers worked on in the course of the FIcontent project. We showed the relations of each enabler indicating their relevance to FIcontent application as well as their alignment with the overall objective of FI-PPP to take advantage of FIWARE Generic Enablers.

The final selection of Specific Enablers (Release 08/15) targets the deployment on FIC2Lab. Thus, they are available at the FIWARE Media & Content Lab [108] and offered in particular to Phase-III participants.

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