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Project Full Title:	**Open virtual neighbourhood network to connect intelligent buildings and smart objects**
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Deliverable D3.1

High-available VICINITY server deployment

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[1] ***Deliverable Type:***
R: Document, report (excluding the periodic and final reports)
DEM: Demonstrator, pilot, prototype, plan designs
DEC: Websites, patents filing, press & media actions, videos, etc.
OTHER: Software, technical diagram, etc.

[2] ***Dissemination level:***
PU: Public, fully open, e.g. web
CO: Confidential, restricted under conditions set out in Model Grant Agreement
CI: Classified, information as referred to in Commission Decision 2001/844/EC.

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Executive Summary

The present document is the deliverable D3.1 "High-available VICINITY server deployment" of the VICINITY [1] project. It has been finished in time reach to MS4 without delay. Regarding the architecture of the VICINITY project [2], the VICINITY Communication Server is a component of the VICINITY cloud (Figure 1). It handles the delivery of VICINITY control and user plain messages according to the authorisation rules of the VICINITY Neighbourhood database [3].

The messages are exchanged in the VICINITY P2P network of connected VICINITY Agents [4] via the VICINITY Open Gateway API [5] in a VICINITY Node (Figure 2). The key results are:

- selection of the hybrid model of the P2P network;
- selection of the XMPP communication protocol (RFC 6120) for P2P communication;
- selection of the OpenFire as Java-based implementation of XMPP;
- definition of the P2P network model using XMPP;
- integration of VICINITY Neighbourhood Manger and VICINITY Open Gateway API;
- deployment of VICINITY Communication Server in a high-availability platform;
- development test of P2P using testing devices and value-added services.

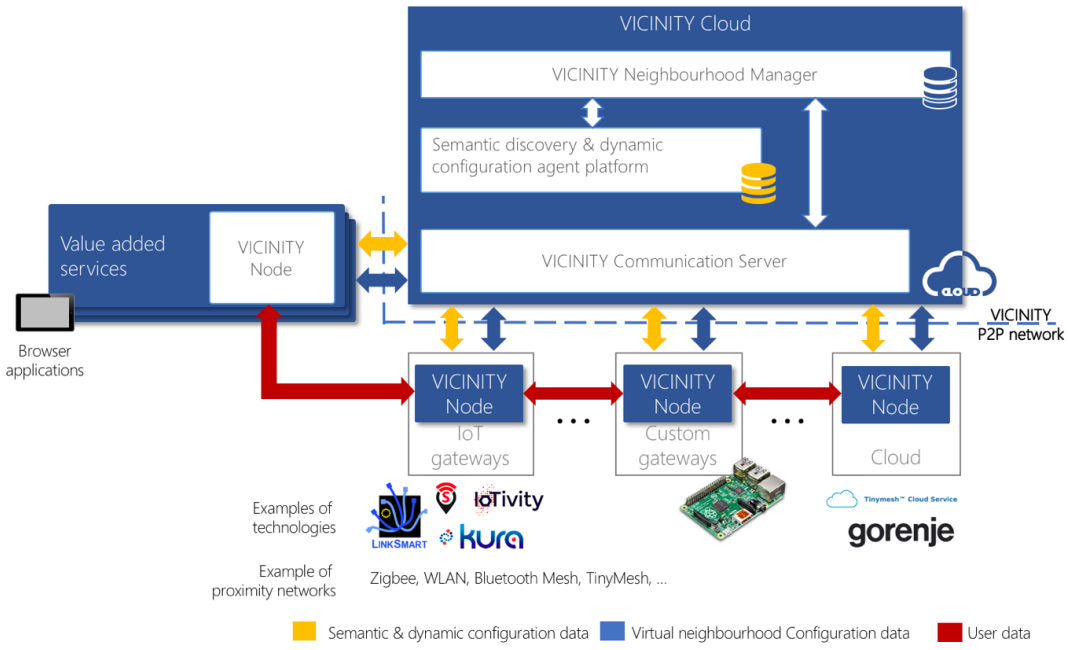

Figure 1 VICINITY Over-all architecture

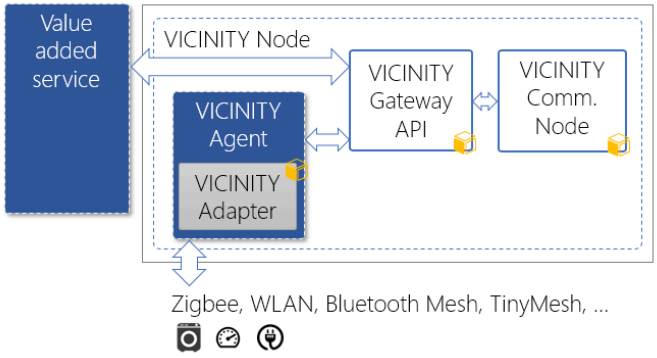

Figure 2 VICINITY Node architecture

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List of Definitions & Abbreviations

Abbreviation	Definition
API	Application Programming Interface
DG RTD	Directorate-General for Research and Innovation
EC	European Commission
EU	European Union
P2P	Peer-to-peer
REST	Representational state transfer
WP	Work package
XMPP	Extensible Mark-up and Presence Protocol

1. Introduction

This deliverable describes deployment of VICINITY Communication server which facilitates user and control plane of the VICINITY Platform. The deployment is described in the following VICINITY Communication Server repository: https://github.com/vicinityh2020/vicinity-communication-server. VICINITY Communication server services are deployed on commserver.bavenir.eu:5222.

1.1. Context within VICINITY

The D3.1 High-available VICINITY server deployment is part of WP 3 Server implementation work package (Figure 3). The D3.1 is from the 3 main deliverables D1.5 VICINITY technical requirements specification, D1.6 VICINITY architecture design and D2.1 Analysis of Standardisation Context and Recommendations for Standards Involvement from which VICINITY functional, non-function requirements, design decision and standard followed has been implemented.

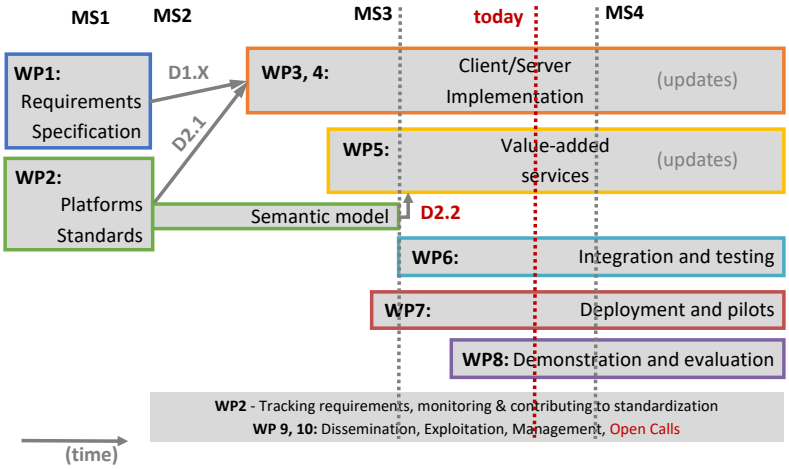

Figure 3 VICINITY Work package structure

The VICINITY Communication server [D3.1 High-available VICINITY server deployment] is integrated with VICINITY Neighbourhood Manager [D3.2 Web-based VICINITY Neighbourhood manager] (user interface towards neighbourhood), Open Interoperability Gateway API (semantic interface towards P2P network) [D3.4 Open Interoperability Gateway API] and Semantic platform (Storing semantic descriptions of IoT Objects) [D3.5 Semantic discovery and dynamic configuration services], thus the communication server documentation assumes prior knowledge about these components as well.

1.2. Objectives in Work Package 3 and Task 3.1

The VICINITY Communication Server is delivered under Task 3.1 of Work Package 3. The VICINITY Communication Server services are indirectly accessible through integrated VICINITY Neighbourhood Manager and VICINITY Open Gateway API as well to support fulfilment of the following VICINITY Project objectives:

- Objective 3.1 open gateway of semantic interoperability connected to the internet;

- Objective 3.2 web-based Neighbourhood Manager connected to the internet;
- Objective 3.3 advanced trust, security and privacy assuring mechanism implemented.

2. VICINITY Communication Server

The D3.1 High-available VICINITY server deployment defines following key achievements to meet objectives defined in 1.2:

- selection of the hybrid model of the P2P network and selection of industrial standard XMPP communication protocol (RFC 6120);
- selection of the OpenFire as Java-based implementation of XMPP, good development community and REST API plugins enables to configure P2P network from VICINITY Neighbourhood Manager;
- definition of the P2P network model using XMPP share rosters approach (https://github.com/vicinityh2020/vicinity-communication-server/wiki/VICINITY-Communication-Server-modus-operandi);
- integration of VICINITY Neighbourhood Manger (https://github.com/vicinityh2020/vicinity-neighbourhood-manager/tree/master/vicinityManager/server/services/commServer) through REST API plugin and VICINITY Open Gateway API through Smack Java XMPP client library (https://www.igniterealtime.org/projects/smack/index.jsp);
- deployment (accessible under: commserver.bavenir.eu:5222) and configuration of VICINITY Communication Server in VICINITY High-availability platform.

The VICINITY Communication Server installation and configuration guide is described in https://github.com/vicinityh2020/vicinity-communication-server.

3. Conclusions

This deliverable discussed the details of installation, configuration[1] and operation principles[2] of VICINITY Communication Server. In the following phase of the project, the deployed VICINITY Communication Server will be used:

- to facilitate message exchange between integrated infrastructures and value-added services based on authorization rules in integration, lab testing and pilot site setup.
- to facilitate communication for integrated infrastructures and value-added services for VICINITY Open call projects.

The VICINITY Communication Server will be maintained and upgraded according to bug fixes and relevant requests raised during integration, testing and validating phase of the VICINITY Project.

[1] https://github.com/vicinityh2020/vicinity-communication-server/blob/master/README.md
[2] https://github.com/vicinityh2020/vicinity-communication-server/wiki/VICINITY-Communication-Server-modus-operandi

References

[1] http://www.vicinity-h2020.eu

[2] D1.6 VICINITY Architectural Design

[3] D3.2 Web-based VICINITY Neighbourhood Manager

[4] D3.4 Open Interoperability Gateway API

[5] D3.5 Semantic discovery and dynamic configuration services