D4.1 ASSESSMENT PLAN

OCTOBER 2024

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DELIVERABLE INFORMATION	
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Document type	Deliverable
Document code	D4.1
Document name	Assessment Plan
Work Package / Task	WP4
Dissemination Level	Public
Status	Draft
Delivery Date (GA)	31 October 2024
Actual Delivery Date	13 November 2024

DELIVERABLE HISTORY

Date	Version	Author	Summary of main changes
13/11/2024	1.0	ININ, all	Final version v1.0

Co-funded by the European Union

Funded by the European Union.

The project is supported by the Smart Networks and Services Joint Undertaking and its members.

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List of Acronyms

3GPP	3rd Generation Partnership Project
5G	The fifth generation of wireless cellular technology
5GC	5G Core network
5G NR	5G New Radio
5G SA	5G Stand Alone
5G MEC	5G Mobile Edge Computing
5G NSA	5G Non-Stand Alone
5QI	5G QoS Identifier
6G	The sixth generation of wireless cellular technology
AAU	Active Antenna Unit
AES	Advanced Encryption Standard
AKA	Authentication Key Agreement
AMF	Access and Mobility Management Function
API	Application Programming Interface
APN	Access Point Name
AUSF	Authentication Server Function
BBU	Base Band Unit
BSS	Business Support System
BW	Bandwidth
CCTV	Closed Circuit Television
CMAS	Commercial Mobile Alert Service
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
CPRI	Common Public Radio Interface
CPU	Central processing unit

DL	Download
ECIES	Elliptic Curve Integrated Encryption Scheme
EDGE	Enhanced Data rates for GSM Evolution
EIR	Equipment Identity Register
eMBB	enhanced Mobile Broadband
ETSI	European Telecommunications Standards Institute
ETWS	Earthquake and Tsunami Warning System
FDD	Frequency Division Duplex
gNB	next generation Node B
GPRS	General Packet Radio Service
GTP-U	GPRS Tunnelling Protocol - User data tunneling
GW	Gateway
HDD	Hard Disk Drive
HSPA	High Speed Packet Access
ICT	Information and Communications Technology
IMSI	International Mobile Subscriber Identity
IoT	Internet of Things
ITU	International Telecommunication Union
L2	Layer 2 (referring to ISO OSI model)
LTE	Long Term Evolution
LTE-A	Long Term Evolution – Advanced
MAE	Mobile Automation Engine
MANO	Management and Orchestration
MIMO	Multiple Input, Multiple Output
mMTC	massive Machine Type Communication
NFVI	Network Function Virtualization Infrastructure
NG	Next Generation
NGAP	Next Generation Application Protocol
NPN	Non-Public Network
NRF	Network Repository Function
NSSF	Network Slice Selection Function
OSS	Operations Support System
OSM	Open Source MANO
PNI-NPN	Public Network Integrated Non-Public Network
PO	Project Objective
PoC	Proof of Concept
PPDR	Public Protection and Disaster Recovery
pRRU	pico RRU
QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
RAID	Redundant Array of Inexpensive Disks
RAM	Random Access Memory
RAN	Radio Access Network
RRH	Remote Radio Head
RRU	Remote Radio Unit
SBS	Small Base Station
SCS	Sub-Carrier Spacing
SDO	Standards Development/Developing Organization
SIM	Subscriber Identity Module
SLA	Service Level Agreement

SMF	Session Management Function
SUPI	Subscription Permanent Identifier
TAI	Tracking Area Identity
TRL	Technology Readiness Level
TDD	Time Division Duplex
UDM	Unified Data Management
UL	Upload
UPF	User Plane Function
USIM	Universal Subscriber Identity Module
VPN	Virtual Private Network
WP	Work Package
XR	eXtended Reality

1. EXECUTIVE SUMMARY

This deliverable describes the overall assessment plan for the project EXIGENCE. Since the plan will be updated with more details as the development of the architecture and different components evolve, it may be also seen as an initial assessment plan, delivering requested results expected by the Grant Agreement in this phase of the project.

This assessment plan highlights the project management technique of EXIGENCE that decreases wait times and streamlines the interaction points between the different work packages. Even though the evaluation of different individual components is done within the respective work package (WP) responsible for them, this assessment plan defines validation criteria and suggests concrete dates and suitable methods and techniques for validating these components in the overall project execution context. This avoids delays in delivery by decoupling the specific WP output from the delivery of components from other WPs.

The core of this document is an assessment and timeline table that defines how the different components (output of the individual WPs) will be assessed and to which concrete project objective will they be mapped to.

2. INTRODUCTION

This document presents an (initial) assessment plan of the EXIGENCE project, aimed at safeguarding the achievement of the defined project objectives in spite of the separation in partly independently and partly in parallel running technology development tasks in different work packages (WP).

To increase project execution efficiency, EXIGENCE has been designed to avoid stop-and-wait situations, which would occur in a strictly cascaded work execution plan, resulting in considerable delays in achieving project goals. In EXIGENCE, work on metrics and measurements in WP2 and on potential optimization and incentivization methods in WP3 starts earlier than the delivery of the first requirement documents or architecture drafts from WP1. The philosophy of project management in EXIGENCE is based on the high confidence in all project partners and, in particular, in the integrity of individual work package work streams. For that reason, each work package and each task are generally responsible for the correctness, soundness, completeness and high quality of its deliverables and results. The quality control of individual components, algorithms, methods and subsystems is, in principle, delegated to the task/work package respectively producing them. Since the overall project objectives were carefully decomposed into sub-objectives, the sum of which achieves the project objectives by construction, ideally, the overall project objectives should be achieved by simply following the project execution plan and integrating all results as components in the overall system.

However, in the current ICT practice, simply assuming such an ideal situation would be quite weak. Instead, EXIGENCE opts for an additional layer of quality control at the integration level. Indeed, given the uncertainty related to, on the one hand, the radically new technological ideas pursued in the project and, on the hand, the complexity of the technological problem at hand, in practice, additional quality management means are required. This task is pursued in WP4, task T4.1. The role of this task is to make sure that the delivered components, when put together, meet the overall project objectives. This is achieved by continuous assessment of the dependencies between the external interfaces of the delivered individual components or the specifications thereof (i.e., their respective input expectations and output capabilities) in the sense of conformity (to the architecture), compatibility (syntax and semantics, i.e., in terms of formats and meaning), seamless integration, timing, accuracy, platform executability, and other requirements, which become more and more refined as the specifications and technological means mature during the respective task execution.

More concretely and depending on the nature and needs of the components, the T4.1 will use typical state of the art methods such as analytical assessment, expert reviews, proof of concept (PoC) or validation in the available testbeds. The results of such assessment runs will be fed back to the concerned work packages, such that corrective measures can be implemented in case of observed divergence, insufficiencies or impracticability.

The plan at hand will be refined, and the actual assessment will only start later in the project lifecycle.

2.1 STRUCTURE OF THE DELIVERABLE

Next to the Executive summary, Introduction, Conclusions and References, the document is divided into 2 main sections: Assessment Plan and Timeline, and Testbeds.

Section *Assessment Plan and Timeline* lists WP2 and WP3 components that will be assessed within the T4.1 task activities. Assessment will be divided into preliminary and final assessment, for each part of the assessment, criteria are introduced. In general, the table answers the questions on how and when the assessment will be performed.

Section *Testbeds* describes lab environments available for the Exigence experimentation and related (physical) assessments, i.e., ITAV testbed located in Aveiro, Portugal, and ININ's testbed located in Ljubljana, Slovenia.

3. ASSESSMENT PLAN AND TIMELINE

Table 1 introduces an (initial) assessment plan by providing overview of required assessment activities for every component delivered from WP2 and WP3 against the specifications from WP1, general best practice criteria and project objectives. Notably, the components will be first assessed in the sense of the following criteria:

- **Soundness**: the component is required, and it fulfils requirements coming from functional architecture (defined in WP1, although also influenced by related work in WP2 and WP3) without ambiguity or uncertainty. In that sense, requirements and consequently assessment outputs should be able to provide and prove validity and correctness of, e.g., understanding the component purpose, its variables, dependencies to other components/models, understanding of the underlying model (if applicable), key constraints of the component, etc.
- **Completeness**: the component or a group of the latter is sufficient, i.e., there are no gaps also by functional architecture requirements and towards objectives, requested functionalities and behaviours of the component are realized as per the requirements and specifications, including response to violations.
- **Compatibility**: a group of components integrated as per WP1 requirements is oxymoron-free, e.g., running one does not break the other, etc. The check is to see whether the components can work within the same system and, in particular, whether the component under assessment is able to inter-work/interface with all components that it is required to work/interface with, all under the condition of the same set of constraints (i.e., to avoid building multiple independent systems).

Final assessment will run against fulfilment of Project Objectives (PO):

- **Project Objective 1 – PO1**: Conception, design and prototype implementation of a system, to be validated at TRL 4, capable of reliably assessing energy consumption / carbon footprint equivalents (CO2e) of the use phase of an ICT service execution / provisioning over all involved domains, potentially of different tenants.
- **Project Objective 2 – PO2**: Exploration, adaptation and conception of novel, incentive-compatible energy consumption / carbon footprint optimization mechanisms, for both service providers and service users, resulting in the following end-to-end service level improvements:
    - reduction of energy consumption / carbon footprint by factor of 3 for relatively simple use cases (e.g., video streaming, i.e., eMBB/best effort transport service with typical, low-SLA compute endpoint in a data centre),
    - reduction of energy consumption / carbon footprint by factor of 5 for use cases with strict guarantees (e.g., PNI-NPN2 with both transport and compute services guaranteed at a high SLA),
    - bringing CO2e to zero for some realistic deployment options of the considered use cases.

- **Project Objective 3 – PO3**: Transformation of the obtained insights into requirements and suitable solutions for the most important, typical ICT domains and systems, to be brought into various Standard Development Organizations (SDOs) in charge, in particular:
    - requirements for 6G systems in the 3GPP, specifically 3GPP SA1,
    - requirements and suitable solutions for interfaces, APIs and modules into ETSI.

This final assessment against POs will be done in the sense of the relevance of the actual component to that PO only. This means that the achievement of the POs per se is of course not verifiable within the work package of the project promising these POs, but will need to be verified in the final project review by external experts.

The assessment against certain criteria and/or PO will be performed utilizing one of the following specific assessment methods aimed for assessing different components, as presented in the Table 1:

- **Method I** – interface definitions check: check (e.g., expert reviews, formal checks) whether the component interfaces (input, output) are compliant to all relevant specifications (known from the considered systems and technology domains) necessary to meet the WP1 functional architecture requirements.
- **Method II** – requirements cross check: check (e.g., analysis, semi-automated testing with test vectors, synthetic tests, Postman API tests) whether the component is compliant to all relevant requirements and architectural aspects (syntax, semantics, extra-functional properties like timing, accuracy, resolution, etc.), primarily focusing on interactions among various components (e.g., input/output relations) considering not only reference points, while also implementations at later stages (e.g., timing, connectivity/channel formats, underlying protocols, etc.). The method also includes identification of gaps, redundancies and, potentially, new requirements not yet covered by relevant SDOs, thus making them candidates for further standardization process.
- **Method III** – testbed assessment: the component is integrated (including underlying system components and other related components necessary for showing functionality of the component of interest) and assessed as a system within the lab environment (e.g., PoC, dynamic testing approach) in the senses of, e.g., feasibility, ease of integration, error-free execution, general interface compatibility, smooth interworking, result achievement. The Method III is not limited to physical/software components only, as it may also serve for assessment of (theoretical) models, metrics, etc., however, certain physical/software (experimental) devices integrated into the testbed environment would be required in the latter case.

Table 1: Assessment plan and the timeline

component	WP	Preliminary assessment of the components			Final assessment of the components against Project Objectives		
		Soundness	Completeness	Compatibility	PO1	PO2	PO3
Energy consumption and CO2e footprint metrics	2	M19 Method I, II,	M19 Method I, II	M19 Method I, II	M27 Method II, III	N.A.	M27 Method II
Selected energy efficiency metrics	2	M19 Method I, II,	M19 Method I, II	M19 Method I, II	M27 Method II, III	N.A.	M27 Method II
Energy consumption and energy efficiency measurement methods, tools and prototypes	2	M19 Method I, II; M27 Method III	M19 Method II	M19 Method I, II; M27 Method III	M27 Method II, III	M27 Method II	M27 Method II
Methods for collecting, storing, and exchanging data on energy consumption	2	M19 Method II	M19 Method II	M27 Method II	M27 Method II	M27 Method II	M27 Method II
Data exchange interfaces	2	M19 Method I	M19 Method I	M27 Method I	M27 Method I	M27 Method I	M27 Method II

Green service orchestrator component	3	M19 Method II	M19 Method I	M19 Method I	M27 Method II	M27 Method II	M29 Method II
Runtime service coordination methods	3	M19 Method II	M19 Method II	M19 Method II	M27 Method II	M27 Method II	M29 Method II
User incentivization component	3	M27 Method II	M27 Method I	M27 Method I	N.A.	N.A.	M29 Method II
Common interfaces and protocols for resource selection and control	3	M19 Method I	M19 Method I	M19 Method I	M27 Method I	M27 Method II	M29 Method II

4. TESTBEDS

Assessment activities rely on methods and tools featured for the assessment purposes, as well as testbeds where certain activities take place. Below, this section describes main two testbed facilities primarily enabling "testbed" assessment (e.g., see Method III within the Assessment *plan and timeline* above) activities within the EXIGENCE project. Out of the two testbeds available, one is located in Aveiro/Portugal at ITAV and the other in Ljubljana/Slovenia at ININ.

Multiple tools are envisioned for assessment activities, some of them already available within the testbeds are described accordingly. However, in general, the focus of the (initial) assessment planning was not on identification of specific tools, but rather on identifying general tools/methods which will support methodologies introduced in the *Assessment plan and timeline*. For those purposes, assessment activities are planned to rely on methods such as expert reviews, formal inspections, synthetic tests, unit testing, integration testing, black-box testing, white-box testing, data flow testing, etc.

3.1 ITAV INFRASTRUCTURE AT AVEIRO, PORTUGAL

The Portuguese facility features a platform that exploits a rich set of capabilities and characteristics that go beyond the mere aggregation of equipment. The overall infrastructure features both research and commercial graded solutions and open labs to provide a real-life city-wide environment for developing, integrating, and testing novel solutions for 5G and beyond technologies. The infrastructure is geographically distributed across the city area as shown in Figure 1, and encompasses various indoor and outdoor 5G NR deployments supported with different 5G Core and Edge Computing solutions. Besides enabling wireless communications, the deployment incorporates connected devices (e.g., CCTV cameras, user equipment, and IoT devices) which can be leveraged for the validation of 5G technologies. The sites covered by the infrastructure include seaport and railway areas, which makes it suitable for exploring Localization and Transportation use cases; industrial areas that could be leveraged for Industry 4.0 scenarios; city wide smart lampposts and fibre deployments that could be explored for PPDR use cases as well as to extend the reachability of the current resources towards other nearby verticals, notably care facilities for eHealth scenarios.

An overview of the facility resources, use cases and targeted functionalities enhancements is provided in Figure 2. The heterogeneity of resources, with different technological readiness and customization levels falling into the domain of different organizations create an ideal environment for multi-domain, multi-technology solution development allowing to evolve all the way from concept to prototype to end-of-line validation.

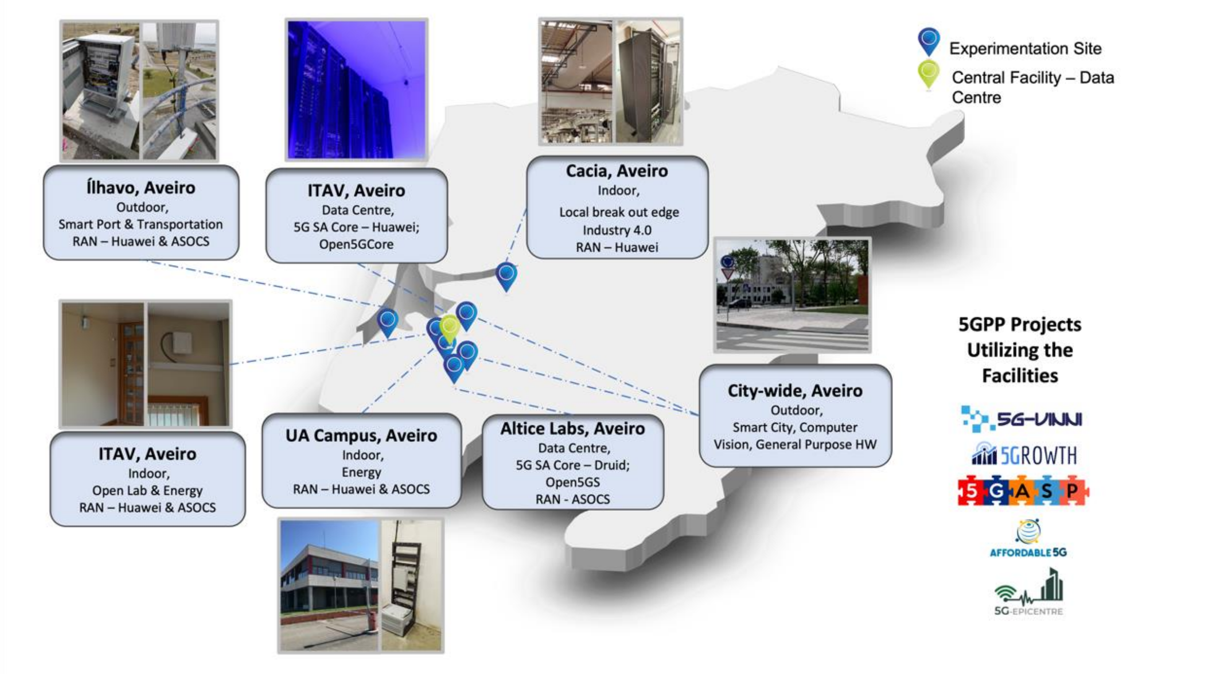

Figure 1: ITAV facility geographical distribution.

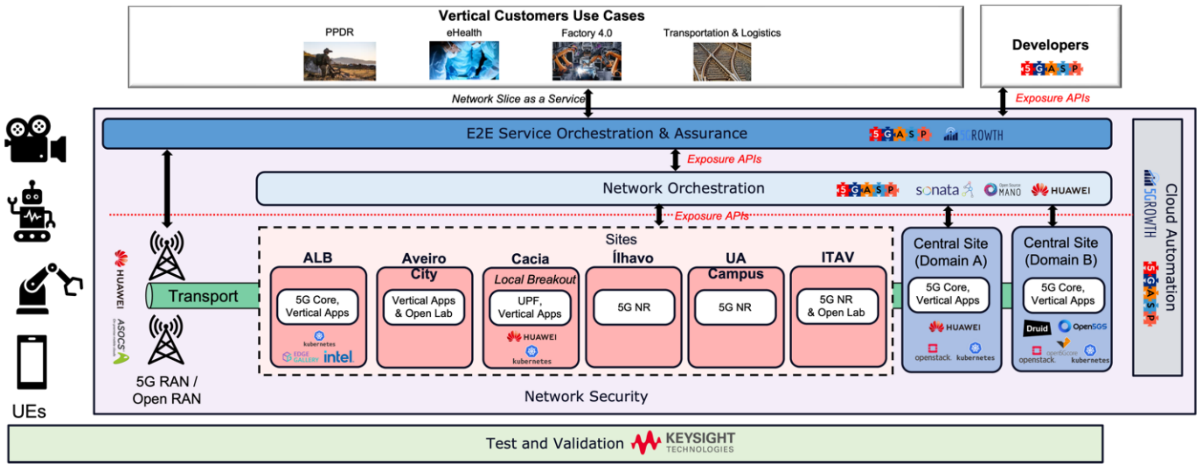

Figure 2: Portuguese facility architectural components.

3.1.1 KEY FEATURES

ITAV testbed provides following key features:

- **Radio Infrastructure:** The 5G RAN infrastructure brings different 5G NR deployments configured in the frequency band n78 with TDD transmission and center frequency 3790 MHz and bandwidth of 20 MHz as summarised in Table 2.

  An indoor site is deployed within the university campus, where ITAV is located, and consists of two antennas (pRRU 5961). It includes a BBU 5900 and a RHuB 5963 that makes connection between the BBU and the antennas. An outdoor site, 6 km away from the university campus, is composed of three outdoor antennas (AAU 5649) placed on top of a tower and covering three different sectors. The AAUs are connected to a BBU 5900 which in turn is connected to the 5GC through a public L2 service.

In addition to the fixed sites, a portable site can also be deployed using a BBU 5900 and an RHUB 5963, connected to a pRRU 5961 antenna. This setup is compatible with an open-source core, allowing for flexible and rapid deployment in various locations. The portable site offers a cost-effective solution for temporary or mobile connectivity needs, with the ability to integrate seamlessly into existing network infrastructures.

Table 2: Radio frequency configurations.

Parameter	Value
DL Center Frequency	3790 MHz
Bandwidth	20 MHz
DL Frequency Start	3780 MHz
DL Frequency End	3800 MHz

- **Core Network**: The two 5G SA cores listed below are available for use, depending on the specific characteristics and requirements of the use case:
    - Open5GS, Free5GCore and OAI, an open source 5G SA cores, supporting all major core components and followings 3GPP Release 17.
    - Huawei 5G SA Core has some R17 functionalities and the following functions available: AMF, SMF, AUSF, NSSF, NRF, UDM, and UPF. This core supports custom network slices providing performance based on use case requirements, it also supports dynamic network slicing, being able to change network slice performance in run time without disrupting end device communication.

- **Cloud, Edge Computing Resources**: The site provides an edge computing capability, where latency-sensitive applications, such as XR can be deployed to take advantage of low latency conditions and improved bandwidth efficiency.

- **Control, Management, and Orchestration Platforms**: The different resources (e.g., RAN, Core, Edge, Cloud) are managed and operated by different solutions. On one hand, the commercial-graded 5G infrastructure (i.e., 5GC, 5G NR and 5G MEC) is monitored by means of a Huawei eSight platform as well as a Mobile Automation Engine (MAE) solution. The MANO role, currently played by OSM, is responsible for receiving requests from other systems (e.g., service orchestration, OSS/BSS, portals) and orderly executing them on top of the available NFVI.

- **Security Architecture**: The facility features a security architecture following the best security practices and recommended security mechanisms, including physical access control, firewalls, and separate VPNs where the management and service planes are isolated. The connectivity to external sites is currently secured through encrypted VPNs with adequate access and integrity controls. In deployments where external entities are at play, the various third-party security policies from associated entities must be resolved alongside the existing internal policies so that the enforcement maintains compliance. In terms of 5G access networks, SIMs are programmed and managed by the relevant partner and a combination of APN and TAI are used for UL CL.

3.2 ININ INFRASTRUCTURE AT LJUBLJANA, SLOVENIA

INTERNET INSTITUTE's testbed is built with 5G SA Non-Public Network (NPN) as a central capability of the testbed. It is located at ININ's lab in Ljubljana and can be seen as a campus network deployed at a single location. However, due to its portability, it can be also deployed at any remote location, which will be elaborated in more details later.

The testbed infrastructure integrates following components (see Figure 3)Figure 3: Slovenian facility architectural components.:

- 5G SA NPN network,
- RAN/gNb components,
- core network components,
- edge capabilities,
- far-edge capabilities,
- IoT device,
- set of software-based and hardware measurement, monitoring and testing tools.

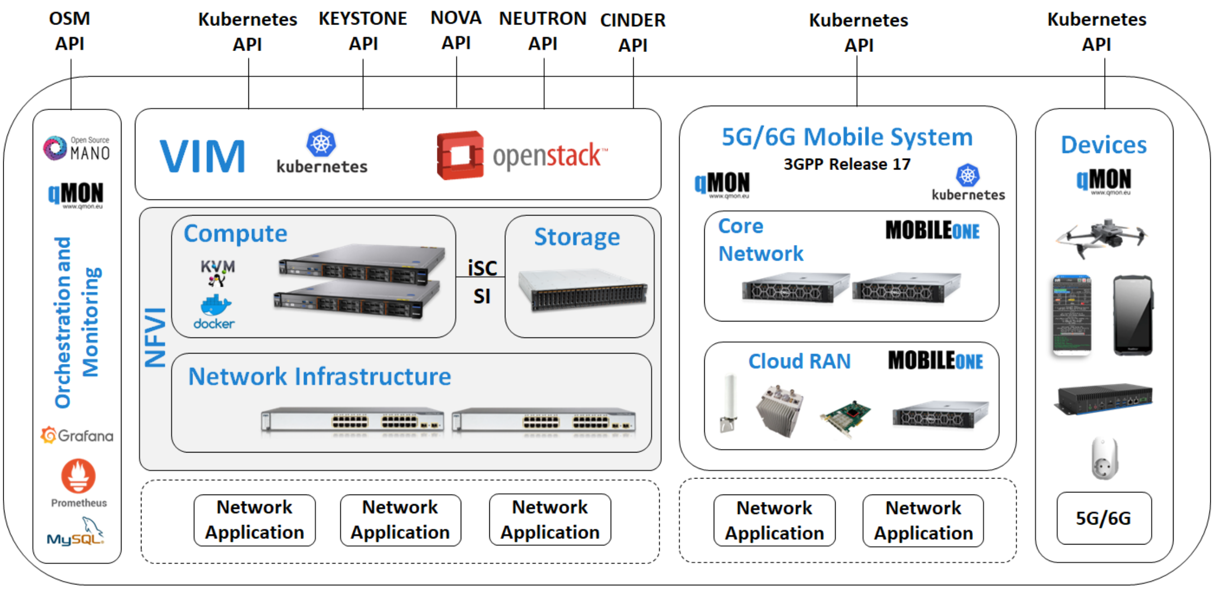

Figure 3: Slovenian facility architectural components.

The description provided in this deliverable focuses on what is available in the testbed at time being, however, during the development of the project, several Exigence outcomes are expected to be integrated into the testbed (mainly as software deployed to cloud continuum environment), being testing/measurement tools or deliveries that requires testing/assessment.

3.2.1 5G SA NPN NETWORK

5G SA NPN/Private network setup for Exigence project supports eMBB and mMTC network services. It is customized to provide high-performance and reliable connectivity services, supporting the most demanding use cases such as critical infrastructures.

Table 3: Specification of gNb component available at ININ Ljubljana testbed.

gNb components	Features supported up to the 3GPP release 17
5G NR BBU	All 5G FDD and TDD bands (sub-6G Bands)
	Slicing eMBB, mMTC, with QoS Flows (3GPP 5QI)
	NG interface (NGAP and GTP-U) to 5GC
	XnAP gNb-gNb
	Up to QAM 256 DL UP to QAM 256 UL
	DATA SCS: 15 and 30 KHz SBS SCS: 15 and 30 KHz
5G NR RRU, frequency band N77	up to 2 W per port
	Up to 100 MHz BW
	4x4 MIMO

The network facility, i.e., ININ's product named MobileONE [1], is built up as a portable, in-a-box node that integrates 5G RAN and 5G Core Network capabilities (up to 3GPP Release 17 specifications). It provides an antenna, radio unit (RRH 4x4 100MHz 33dBm) and a NFVI environment (x86 based Network Appliance; see 3.2.2 for more details) running 5G RAN and 5G core network functions (both provided in the cloud-native way) on a single Kubernetes instance. The NFVI environment is positioned as an edge server, thus enabling deploying user applications as well.

Besides container-based deployment of 5G RAN and core network functions, Kubernetes platform supports deployment of MANO-compliant orchestration and other cloud-native mechanisms (e.g., self-healing, scaling etc.). Deployed system also supports slicing features that allows us to allocate dedicated network resources and parameters for different types of traffic and IoT devices.

The MobileONE product has been first designed and developed for the critical-communications verticals within the ICT-42 project Int5Gent [2], and then further customized for critical infrastructure within 5G-Loginnov (customization focused on industrial applications in a seaport) [3] and 6Green (exploring energy efficient network operations towards 6G) [4].

Table 3 and Table 4 summarize technical specifications of the 5G network which will be deployed for the Exigence project needs.

Table 4: Specification of core network component available at ININ Ljubljana testbed.

5G CN Component	Features supported up to the 3GPP release 17
Compact 5G core network	AMF, AUSF, SMF, UPF, UDM and 5G-EIR
	Encryption | AES, SNOW3G, ZUC
	Encrypted SUPI/IMSI registration (ECIES)
	USIM Auth | XOR, Milenage, TUAK 5G-AKA
	Slicing with QoS Flows (3GPP 5QI)
	Interfaces | NG (NGAP and GTP-U)
	Local CMAS and ETWS messages

3.2.2 EDGE CAPABILITIES

The Edge serves for 5G network software components and applications/functions required by the UCs deployed in the testbed. Technical characteristics of the Edge are:

- Dell PowerEdge r440,
- 20x CPU - Intel(R) Xeon(R) Silver 4210R CPU @2.40 GHz,
- 64 GB RAM,

- 500 GB disk w/ RAID,
- 2x 10 G,
- 2x 1 G,
- CPRI,
- Standalone Kubernetes cluster.

3.2.3 FAR-EDGE CAPABILITIES

Far-edge device available at Ljubljana testbed is an IoT Gateway (Figure 4), a product provided by ININ [5]. It serves two main goals:

- data processing function: the gateway provides Kubernetes environment, running on x86 industrial computer integrated into the gateway; it allows for deployment of cloud native application components, as well as, the gateway enables MANO-based network and service orchestration,
- gateway function: providing 5G connectivity for non-5G IoT devices (e.g., video-camera) through multiple non-5G input ports available at the gateway (serial, ethernet, wi-fi).

Figure 4: Far-edge device, i.e., IoT Gateway.

Some technical characteristics of the IoT gateway:

- 4x CPU (11th Gen Intel(R) Core(TM) i3-1115GRE @3.00GHz,
- RAM: 8 GB,
- HDD: 128 GB,
- Standalone Kubernetes cluster,
- 5G modem: Sierra Wireless EM EM9191 5G modem (based on Qualcomm SD55)
    - operational environment:
        - temperature range: -40°C to +60°C,
        - ingress protection: IP67+,
        - mobile technologies supported: GPRS, EDGE WCDMA, HSPA+, LTE, LTE-A, LTE-A Pro, 5G NSA and SA (Cat3 to Cat21),

- supported 5G NSA/SA bands: n1, n2, n3, n5, n7, n8, n12, n20, n25, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79.

3.2.4 IOT DEVICES

A video camera will be available at the testbed (the exact type of the video camera will be defined at a later stage).

Other IoT devices (either 5G-enabled or non-5G connected via IoT Gateway) can be also integrated upon request.

3.2.5 MEASUREMENT, MONITORING AND TESTING TOOLS

Primary measurement, monitoring and testing tools utilized at the testbed will be qMON tools [6], which will be upgraded by the achievements gained through the Exigence project development. As well, other Exigence outcomes addressing measurement, monitoring and testing tools may be deployed, according to the requirements of experimental/assessment scenarios. In case any other tools will be required to use, they may also be integrated into the testbed upon verifying whether the integration of the required software is feasible.

Hardware measurement tool already available at the testbed:

- NETIO [7]: are remotely controlled smart power sockets and outlets, while they also provide measurements. The latter are provided at following conditions:
  - default time resolution: 60 seconds,
  - resolution of measured unit:
    - 1 W,
    - 1 Wh,
    - 0,1 V,
    - 1 mA,
  - accuracy < 1 %.

For graphical representation of the measurement results and for creating various reports, Grafana and Tableu tools are also available.

5 CONCLUSIONS

The assessment plan provided in the document outlines minimum steps required to guarantee compatibility among multiple WPs' outcomes, i.e., components, and prove its soundness, completeness and compatibility against initial requirements defined by overall project objectives and/or by activities already performed within the Exigence project activities.

The idea behind this (initial) assessment plan is also to refine it accordingly during the project development, since actual assessment activities start later on. Thus, WP4/T4.1 assessment activities will provide preliminary technological assessment results in M19 and final technological assessment results in M27. Project month M19 and M27 are therefore recognized as milestones which time-wise guideline the assessment plan provided in D4.1.

By having assessment time plan and concrete steps defined, D4.1 in certain way guidelines synchronization of activities taking place in multiple parallel activities, i.e., primary focusing on WP2 and WP3 outcomes relevant at building Exigence ecosystem, thus helping at achieving specific and overall project objectives.

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