



H2020 5GASP Project

Grant No. 101016448

D7.6.3 Annual Dissemination Report

Abstract. This document is a report of the dissemination activities being carried out during the 3rd year of the project. It summarizes the project dissemination achievements, including participation in industry fora and standardisation activities, academic events, publishing scientific papers, press releases, dissemination through social media, and other activities.

Document properties

Document number	D7.6.3
Document title	Annual Dissemination Report
Document responsible	Yevgeniya Sulema (BLB)
Document editor	Yevgeniya Sulema, Roman Odarchenko (BLB)
Editorial team	BLB, ITAV, VMware
Target dissemination level	PU
Status of the document	
Version	1.0

Document history

Revision	Date	Issued by	Description
0.1	February 15, 2024	BLB	Initial ToC
0.2	February 22, 2024	BLB	Updated ToC, sections 1, 2, 3
0.3	February 29, 2024	BLB	Updated ToC, sections 4, 6, 7, 8, 9, 10
0.4	March 6, 2024	UoP	Section 5
0.5	March 8, 2024	ININ	Section 5
0.6	March 20, 2024	BLB	Section 11
0.7	March 25, 2024	BLB	Version ready for review
0.8	March 26, 2024	VMware	Reviewed version
0.9	March 27, 2024	BLB	Updated version after review
1.0	March 28, 2024	BLB	Final version

Disclaimer

This document has been produced in the context of the 5GASP Project. The research leading to these results has received funding from the European Community's H2020 Programme under grant agreement number 101016448.

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Executive Summary

This report presents a summary of the progress made in disseminating, standardizing, and assessing the impact during the third year of the 5GASP project. It demonstrates the final status and results of all the activities carried out by the consortium within the context of WP7.

The consortium members participated in industry events such as EuCNC 2023 conference, ITS European Congress, IEEE World Forum on Internet of Things, French annual ITS congress (51th), industry fora and standardization activities as well as organized two 5GASP Network Applications Community webinars.

Social media channels, along with the project website and community portal, were utilized to support dissemination activities. The 5GASP project deliverables, events, blogs, webinars, and videos were used as a source of content for social media and websites.

Scientific dissemination during the third year of the project included the organization of a scientific workshop and the publishing of 3 journals papers and 12 research papers.

To present the project to a broader audience, the 5GASP partners during the third year prepared three press releases, curated the project social media channels and webpages and achieved the following results: the Network Applications Community portal – 18K page views, X (formerly Twitter) – 114 followers, LinkedIn – 271 followers, YouTube – more than 3K views. This all shows a marked increase in engagement as compared to the results reported in the previous deliverable.

Finally, all the targeted public deliverables were submitted and made available and also updated on the project website. These dissemination activities have helped to reach a large number of people from academia, industry, civil society, and the general media.

List of authors

Company	Name	Contribution
BLB	Yevgeniya Sulema, Roman Odarchenko	Sections 1, 2, 3, 4, 6, 7, 8, 9, 10, 11
ININ	Rudolf Susnik	Section 5
UoP	Kostis Trantzas	Section 5
VMware	Miguel Ponce de Leon	Sections 1, 2, 6

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List of Acronyms

3GPP – The 3rd Generation Partnership Project
5G – Fifth Generation Cellular Networks
5GPPP – 5G Infrastructure Public Private Partnership
6G – Sixth Generation Cellular Networks
API – Application Programming Interface
DevOps – Development (Dev) and IT Operations (Ops)
ETSI – European Telecommunications Standards Institute
EU – European Union
EuCNC – European Conference on Networks and Communications
GST – Generic Slice Template
ICT41 – Horizon 2020 Call - H2020-ICT-41-2020

IEEE – Institute of Electrical and Electronics Engineers
ISO – International Standardisation Organisation
ITU – International Telecommunication Union
KPI – Key Performance Indicators
MANO – Management and Orchestration
mMTC – massive Machine Type Communications
NaaS – Network as-a-Service
NSaaS – Network Slice-as-a-Service
NFV – Network Function Virtualization
OSM – Open Source MANO
PoCs – Proof of Concepts
PPDR – Public Protection & Disaster Relief
SDG – Software Development Group
SME – Small and Medium Enterprise
URLLC – Ultra Reliable and Low Latency Communications
VITAL-5G – Horizon 2020 project “Vertical Innovations in Transport And Logistics over 5G experimentation facilities”
WG – Working Group
WP – Work Package
XaaS – Anything-as-a-Service

1. Introduction

1.1. Objective of this document

This report outlines the dissemination efforts carried out in the third year of the project within WP7. These efforts encompass various channels:

- Academic dissemination through the presentation of new scientific findings in journal papers and conferences.
- Distribution to industrial partners via business networks and professional communities.
- Reaching a broader audience through the project website, social media platforms, the Network Applications Community portal, and public events.

The document evaluates the effectiveness of the dissemination strategy implemented during the third year and draws conclusions based on the outcomes achieved.

1.2 Organisation of this document

The rest of the document is organized as follows:

Section 2 provides the review of the dissemination strategy of the project and its adaptation for the third year;

Section 3 describes the results of academic dissemination presented in journal papers, conference papers and invited talks, keynote speeches, etc.;

Section 4 presents dissemination events;

Section 5 discusses industry fora and standardisation activities, including 5GPPP related activities, the NetworkEurope SME WG, ETSI OSL SDG contributions;

Section 6 presents open-source software;

Section 7 describes the ways of the dissemination through social media;

Section 8 presents the project website updates;

Section 9 presents the Network Applications Community portal updates;

Section 10 provides information of the new press releases;

Section 11 summarizes the dissemination activities being fulfilled during the third year of the project implementation.

2. Dissemination Strategy

Given the significant impact anticipated in the Network Applications domain, the 5GASP consortium prioritizes substantial efforts toward exploiting and disseminating project outcomes. The aim of dissemination activities is to enhance the visibility of the 5GASP project by spreading its results across various domains. The primary target audience includes industrial verticals such as Automotive (V2X), PPDR, and others, as well as industry stakeholders, SMEs, software developers, MNOs, research institutes, and academia.

2.1. Review of the 3rd project year dissemination strategy

The purpose of this section is to assess all dissemination strategy objectives for the third year of the project and adjust the implementation plan accordingly.

2.1.1. Objectives

All partners actively participated in dissemination activities. One of primary platforms for reaching the largest audience is through the Network Applications Community, which is dedicated to promoting and hosting community engagement events. The project's website is regularly updated and utilized for dissemination purposes. An updated dissemination and exploitation plan has ensured the utilization of 5GASP project results among key stakeholders.

To establish the 5GASP project as the leading initiative for Europe's competitiveness in the Network Applications sector the main directions of dissemination include:

- Internal dissemination;
- Focused dissemination;
- Extended dissemination.

So, the main objectives for the third project year can be listed as follows:

- **Network Applications Lab promotion.** The 5G Network Applications Lab seeks to assist startups, SMEs, developers, and researchers in designing and delivering valuable 5G products and services, capitalizing on the inherent capabilities of 5G technology. Concurrently, 5GASP actively promotes the 5G Network Applications Lab accelerator, aiming to empower SMEs, startups, and individuals to develop, test, and validate 5G-based Network Applications across various business verticals. This initiative will also play a pivotal role in fostering a community of developers and vertical end-users centered around the 5GASP Platform, thereby enhancing the potential to create successful commercial products or services.
- **New Network Applications Community members engagement.** This task retains its utmost significance and can be accomplished through direct communication with SMEs, startups, industrial software vendors, and operators engaged in Software Networks. Key methods for disseminating this information includes presentations and discussions during the regular consultancy services offered by the project's industrial and SME partners, as well as workshops and conferences. Additionally, we will directly target members of ICT-41 projects who we have identified as potentially more interested in participating.

- **Dissemination to the broad research community.** The primary objective of this initiative is to raise awareness and generate interest in the 5GASP open platform, its DevOps practices, testing innovations, the Network Applications Community, and the Network Applications Store. This goal will be pursued through participation in prominent conferences, as well as by publishing project results in the most relevant journals in the field. Additionally, 5GASP plans to host at least one scientific workshop next year and will actively contribute to other workshops organized by the 5GPPP community and ICT41 projects in particular.
- **Industry influence.** The project strives to guarantee the extensive dissemination of its public outcomes to stakeholders across EU Member States and Associated Countries. Additionally, 5GASP seeks to advocate for the incorporation of its architecture's key interfaces into pertinent standards bodies and groups. This endeavor aims to ease the technology's adoption by market players beyond those directly engaged in the consortium.

2.1.2. Implementation plan review

Table 1 summarizes the targets of the project for different dissemination and communication activities, as well as the objectives reached so far.

Table 1. Project lifetime targets and current number of dissemination activities

Category	KPI	Target	Current status
Standardization and industry fora	Standards and industry groups impacted	3GPP, ETSI	Achieved (see Section 5 and D7.6.2 [1])
Open source software	Number of open source releases published	2	Achieved (see Section 6)
Industrial dissemination	Participation in industry events	MWC, EuCNC and at least two others	Achieved (EuCNC 2021, 2022, 2023; ITS European Congress, IEEE World Forum on Internet of Things, French annual (51th) ITS congress)
	Organization and attendance of 5GASP Network Applications community webinars	6	Achieved – 6 (see Section 4)
	5GPPP activities	Participation in the 5G Automotive WG of the 5G-PPP and in 5G PPP SME WG	Achieved (see Section 5 and D7.6.2 [1])

Scientific dissemination	Organization of scientific events and attendance	Two scientific workshops with 20+ attendants	Achieved – 4 workshops (see Section 3 and D7.6.2 [1])
	Number of publications	More than 20	Achieved – 37 (see Section 3)
Communication to the general public	Number of press-releases	6	Achieved – 8 (see Section 10)
	Web site visits outside the consortium	More than 75% of the visits coming outside the consortium	Achieved (see Section 8)
	Social media channels used	X, LinkedIn, YouTube	Achieved (see Section 7)
	Blog posts	20+	Achieved – 40 (see Section 9)

As shown in Table 1, at the final stage of the project all the objectives related to the number of dissemination activities have been achieved and even exceeded. The number of dissemination activities related to international journals and conference papers has reached 37 contributions. Regarding the number of keynotes and panels together with the participation in 5G events, dissemination has already reached the number of 39. The targeted number of workshops in major IEEE conferences has been reached (4).

Finally, all the targeted public deliverables were submitted and made available and also updated on the project website. These dissemination activities have helped to reach a large number of people from academia, industry, civil society, media, etc. In particular, 1900 people from the scientific community, 380 people from industry, 230 people from civil society, 720 people from the general public and 450 people from other sectors. In total, 3680 people have been reached with the 5GASP dissemination activities.

Thus, the developed dissemination strategy of the project was fully implemented and target KPIs have been met.

3. Academic Dissemination Results

As part of the dissemination plan, dissemination to the research community is being achieved through the publication means.

3.1. Scientific Publications

5GASP partners have been targeting high impact journals in the field. The journal publications are presented in Table 2 (the reference number is continuous; the papers J01-J03 were presented in D7.6.2 [1]) and the book chapter is shown in Table 3.

Table 2. 5GASP Journal Publications

Reference Number	Reference
J04	Pratchaya Jaisudthi, Xenofon Vasilakos, Shadi Moazzeni, Reza Nejabati, Dimitra Simeonidou "On the Learning Transferability of Multi-Objective Reinforcement Learning-based VNF Profilers" in IEEE Transactions on Network and Service Management
J05	Rafael Direito, Daniel Gomes, Joao Alegria, Daniel Corujo, Diogo Gomes NetOr: A Microservice Oriented Inter-Domain Vertical Service Orchestrator for 5G Networks, Journal of Internet Services and Applications (JISA), 2023
J06	Juan Marcelo Parra-Ullauri, Hari Madhukumara, Adrian-Cristian Nicolaescu, Xunzheng Zhang, Anderson Bravalheri, Rasheed Hussaina, Xenofon Vasilakosa, Reza Nejabatia, Dimitra Simeonidou. kubeFlow: A Privacy-Preserving Framework for Kubernetes-Based Federated Learning in Cloud-Edge Environments. Future Generation Computer Systems, 2024.

Table 3. Book Chapter Publication

Reference Number	Reference
B01	Odarchenko, R., Shapira, E. (2023). Ecosystem for the Development and Testing of Emerging Network Applications in 5G and Beyond Environment. In: Klymash, M., Luntovskyy, A., Beshley, M., Melnyk, I., Schill, A. (eds) Emerging Networking in the Digital Transformation Age. TCSET 2022. Lecture Notes in Electrical Engineering, vol 965. Springer, Cham. https://doi.org/10.1007/978-3-031-24963-1_8

5GASP partners have published eleven conference papers. The full list of conference papers, either published or accepted, is given in Table 4 (the reference number is continuous; the papers C01-C18 were presented in D7.6.2 [1]).

Table 4. 5GASP Conference Publications

Reference Number	Reference
C19	Daniel Gomes, Rafael Direito, Diogo Gomes, Rui Aguiar A Zero-Touch and NFV-Based Full-Mesh VPNaaS Solution – Demo, 2023 IEEE International Conference on Network Softwarization (Netsoft23)
C20	Rafael Direito, Diogo Gomes Towards a Fully-Fledged Validation of 5G NetApps, 2023 IEEE International Conference on Network Softwarization (Netsoft23)
C21	Juan Marcelo Parra Ullauri, Xunzheng Zhang, Anderson C Bravalheri, Reza Nejabati, Dimitra Simeonidou Federated Hyperparameter Optimisation with Flower and Optuna, ACM SIGAPP Symposium on Applied Computing proceedings 2023
C22	Juan Marcelo Parra Ullauri, Luis F. Gonzalez, Anderson C Bravalheri, Rasheed Hussain, Xenofon Vasilakos, Ivan Vidal, Francisco Valera, Reza Nejabati, Dimitra Simeonidou Privacy Preservation in Kubernetes-based Federated Learning: A Networking Approach, IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS) proceedings 2023
C23	PJaisudthi P, Moazzeni S, Vasilakos X, Nejabati R, Simeonidou D. i-Profiler: Towards Multi-Objective Autonomous VNF Profiling with Reinforcement Learning. In IEEE INFOCOM ICCN 2023. 2023
C24	Roman Odarchenko, Azamat Imanbayev, Alla Pinchuk Development of the testbed for testing Deep learning based IDS system for 5G network, CEUR, Modern Machine Learning Technologies and Data Science Workshop (MOMLET& DS), 2023
C25	Pratchaya Jaisudthi, Shadi Moazzeni, Xenofon Vasilakos, Reza Nejabati, Dimitra Simeonidou Machine Learning-based Multi-Objective Online Profiling of VNFs for 6G Network Dynamics, 2023 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)
C26	Shadi Moazzeni, Xenofon Vasilakos, Pratchaya Jaisudthi, Reza Nejabati and Dimitra Simeonidou On the Learning Transferability of Multi-Objective Reinforcement Learning-based VNF Profilers, 2023 IEEE Global Communications Conference: Next-Generation Networking and Internet
C27	Roman Odarchenko, Maksym Riabenko, Maryna Ivanova, Al-Mudhafar Akil Abdulhussein M. AI-based QoE-to-QoS mapping for next generation mobile networks, 12th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IEEE IDAACS), 2023
C28	Rafael Direito, Dário Matos, Daniel Gomes, Diogo Gomes, Rui Aguiar. A Monitoring System to Measure the Impact of a Network Application in a 5G Network. Zenodo, 2023, https://zenodo.org/record/8354820
C29	Amin Emami, Hilary Frank, Wenhao He, Anderson Bravalheri, Adrian-Cristian Nicolaescu, Haiyuan Li, Hamid Falaki, Shuangyi Yan, Reza Nejabati, and Dimitra Simeonidou. Multi-RAT enhanced Private Wireless Networks with Intent-Based Network Management Automation. IEEE ICC 2024 Next-Generation Networking & Internet Symposium.

C30	Jorge Gallego-Madrid, Ana Hermosilla, Luis Bernal-Escobedo, Rodrigo Asensio, Anthony Pogo-Medina, Julio S Diez-Revenga, Ramon Sanchez-Iborra, Antonio Skarmeta. Virtual On-board Unit Migration in a Multi-access Smart-Campus 5G Architecture. IEEE Future Networks World Forum 2023, Symposium on future networks for connected and automated mobility.
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3.2. The European 5G Annual Journal 2023

The European 5G Annual Journal 2023 with 5GASP contribution has been released and is available for download [2].

The paper presented by 5GASP has the title “5G Application & Services experimentation and certification Platform” (Figure 1). It presents the 5GASP architecture and provides its description.

5G PPP PHASE 3, PART 6: INNOVATIONS FOR VERTICALS WITH THIRD PARTY SERVICES

The nine projects³⁷ from H2020-ICT-41-2020: 5G innovations for verticals with third-party services started in January 2021.

³⁷ <https://5g-ppp.eu/5g-ppp-phase-3-6-projects/>

5GASP

5G Application & Services experimentation and certification Platform

Coordinated by Diogo Nuno Pereira Gomes (ITAv)
January 2021-December 2023
Website: www.5gasp.eu/
Twitter: @5gasp

Objectives

Mobile communication technologies have been evolving unprecedentedly fast with 5G.

This fast pace requires stable testing and validation environments for developing 5G applications and services. In this scope, project 5GASP provides tools and testbeds for SMEs developing, testing, and certifying 5G applications and services, moving from concepts to prototypes and eventually products. However, industrial verticals have diverse needs, considering the cases of Automotive and Public Protection and Disaster Relief (PPDR), requiring different levels of support in realising prototypes.

Given this context, 5GASP targets shortening the idea-to-market process through the creation of a fully automated, self-service testbed fostering the rapid development and testing of innovative Network Applications built under the 5G NFV-based reference architecture. Leveraging existing physical infrastructures, 5GASP focuses on automated and innovative

experimental test operations across several countries and domains, providing support tools for Virtual Network Function (VNF) Continuous Integration and Continuous Deployment (CI/CD) in a secure & trusted environment for companies capitalising on 5G. 5GASP targets the creation of an Open-Source Software (OSS) repository and a VNF marketplace targeting SMEs with OSS examples and building blocks, as well as incubating a community of NetApp developers supported by tools and services enabling an early validation and/or 5G NetApp certification.

Major results and innovations

5GASP has already achieved several milestones, either through contributions to the standardisation of the Network Application concept, software tools to assist testbeds and experimenters, or NetApp examples created by the project SME's:

- Network Application requirements and 5GASP's approach at 5G PPP Software Network WG³⁸
- Complete OSS platform for onboarding, deployment and testing Network Applications over 5G infrastructure (Openslice)³⁹
- Interdomain Network Orchestrator (NetOr) [2] • Virtual On-Board Unit provisioning NetApp (vOBU)

³⁸ <https://5g-ppp.eu/wp-content/uploads/2022/10/Software-Network-WG-Network-Applications-2022.pdf>

³⁹ <https://www.innovera.eu/resultbykeyword/5gasp>



Figure 1. The 5GASP paper in the European 5G Annual Journal 2023

3.3. 5GASP scientific event

From September 7 to 9, 2023, Roman Odarchenko (BLB) participated as a co-organizer of the Workshop "Beyond 5G and 6G Networks Technologies and Security" during the IEEE IDAACS 2023 conference, which was held in Dortmund, Germany (Figure 2).



Figure 2. Workshop "Beyond 5G and 6G Networks Technologies and Security"

This workshop covered the innovative technologies that were studied in various research projects and standardised by 3GPP in Rel 16 and Rel 17. The special session encouraged the submission of papers studying the current status of beyond 5G and 6G networks research and commercial deployment of 5G networks in order to assess how this relates to the current 6G vision. The evaluation of the current solutions and/or deployment for features such as 5G eMBB, URLLC (Ultra Reliable and Low Latency Communications) and mMTC (massive Machine Type Communications) was considered as well. Also, security and privacy aspects were covered. The intent was papers should be accessible and provide a reality check for a wider audience. Whilst wireless industry technologists were expected to take a keen interest, papers and views from a wider perspective of verticals like Automotive, Touristic Sector, Smart cities, Healthcare and Industry 4.0, which are currently being analysed in the 5G domain were invited. The workshop was organised and technically co-sponsored by one of the flagship projects in Phase III of the H2020/ 5GPPP initiative – 5GASP.

Finally, this workshop became a center for discussing advanced technologies and security issues in 5G and 6G networks, sparking intensive exchanges of ideas and developments among industry experts. Events of this kind are essential for the community of scientists and professionals to promote the development and implementation of advanced network technologies. The agenda of the workshop is available at [3].

3.4. Presentations, keynote speeches, invited talks

5GASP partners have participated in at least twenty different events, so far. A selection of the most relevant presentation and talks is also available on the project website at [4]. The full list of the events, where partners participated, is given in Table 5 (the reference number is continuous; the papers E01-E16 were presented in D7.6.2 [1]).

Table 5. 5GASP Events

#	Event title	Event type	Presenter/Responsible Person	Dissemination Role	Dates	Location
E17	Analysys Mason Telecom Summit	Conference	Cristian Patachia	Signage and presentation of 5GASP	5-7.10.2022	London, UK
E18	European Cyber Security Challenge Finals and Conference	Conference	Cristian Patachia	Signage and presentation of 5GASP	13-16.09.2022	Vienna, AT
E19	IEEE ICC 2023 PR-2: SELF-ORGANIZING, SELF-MANAGING (AI-DRIVEN) AUTONOMOUS 6G NETWORKS	Conference / Industrial Forum & Exhibition	Xenofon Vasilakos	Invited Talk on "Network Applications as an enabler for AI-driven Autonomous networking"	29.06.2023	Rome, Italy
E20	EENA Conference 2023	Conference & Exhibition	Janez Sterle	Exhibition booth	19-21.04.2023	Ljubljana, Slovenia
E21	Modern Machine Learning Technologies Workshop	Conference	Roman Odarchenko	Paper presentation	2-3.06.2023	Online
E22	Prospects for the use of 6G in/for the aerospace industry	Workshop	Roman Odarchenko	Keynote speech	12.04.2023	Online
E23	Siresp Tech Days	Workshop	Janez Sterle	Presentation of PPDR projects (incl. 5GASP) and Panel Discussion	31.5-2.06.2023	Lisbon, Portugal
E24	EuCNC 2023	Conference / Industrial / Exhibition	Marius Iordache, Catalin Brezeanu	Signage and presentation of 5GASP in third party booth	6-9.06.2023	Gothenburg, Sweden
E25	IEEE IDAACS 2023	Conference	Roman Odarchenko	Chair/Paper presentation	7-9.09.2023	Dormund, Germany
E26	ITS European Congress - Session 68 "Creating New ITS Services and Applications Enabled by 5G"	Industrial conference (5G-specific session co-organized with other 5G EU projects related to ITS)	Thierry Ernst	Workshop - session co-organizer and session participant	22-24.05.2023	Lisbon, Portugal
E27	ISO TC204 plenary meeting and working groups meeting	Standardization (Automotive, PPDR and ITS/Mobility verticals)	Thierry Ernst	Participation in edition of standards related to telecommunication technologies, including the	15-19.05.2023	San Antonio, USA (remote participation)

				integration of 5G and the underlying technology-agnostic transmission of data/services		
E28	ISO TC204 plenary meeting and working groups meeting	Standardization (Automotive, PPDR and ITS/Mobility verticals)	Thierry Ernst	Participation in edition of standards related to telecommunication technologies, including the integration of 5G and the underlying technology-agnostic transmission of data/services	23-27.10.2023	Singapore (remote participation)
E29	ETSI TC ITS plenary meeting and working groups meeting	Standardization (Automotive, PPDR and ITS/Mobility verticals)	Thierry Ernst	Analysis of standards related to telecommunication technologies, including the integration of 5G and the underlying technology-agnostic transmission of data/services	Spring & Fall 2023	Sophia-Antipolis, France (remote participation)
E30	Path to the digitization of the economy and local communities	Workshop & Exhibition	Janez Sterle	Exhibition booth	26.09.2023	Ljubljana, Slovenia
E31	IEEE World Forum on Internet of Things (Industry Forum section)	Conference	Rudolf Sušnik	Presentation "Empowering PPDR applications and services"	12-27.10.2023	Aveiro, Portugal
E32	French annual ITS congress (51th)	Conference & Exhibition	Thierry Ernst	Presentation / Session F2 "Connectivity & Intelligent Transports" - Presentation entitled "Services ITS Coopératifs: quelle(s) technologie(s) radio pour un déploiement durable ?"	23-24.01.2024	Paris, France
E33	ISO TC204 plenary meeting and working groups meeting	Standardization (Automotive, PPDR and ITS/Mobility verticals)	Thierry Ernst	Participation in edition of standards related to telecommunication technologies,	8-12.04.2024	Oslo, Norway

				including the integration of 5G and the underlying technology-agnostic transmission of data/services		
E34	LINCS (scientific community bringing researchers from several French labs, including Nokia, Inria, IMTA)	Scientific workshop	Thierry Ernst	Presentation on C-ITS standards & technologies for connected & cooperative automated mobility	11.03.2022	Paris, France
E35	IEEE World Forum on Internet of Things - IoT vertical track on "transportation"	Conference	Thierry Ernst	Key-note presentation on C-ITS standards & technologies for connected & cooperative mobility services	3.11.2022	Yokohama, Japan (remote participation)
E36	DGA-INRIA research community (involving scientists from French Army and INRIA Research Institute)	Scientific workshop on 5G	Thierry Ernst	Presentation entitled "Les enjeux de la 5G pour les services de mobilité connectée et collaborative"	31.05.2022	Paris, France
E37	New cybersecurity challenges in 5G and future 6G networks	Conference	Roman Odarchenko	Keynote speech	29.12.2022	Tbilisi, Georgia (online)
E38	ISO TC204 plenary meeting and working groups meeting	Standardization (Automotive, PPDR and ITS/Mobility verticals)	Thierry Ernst	Participation in edition of standards related to telecommunication technologies, including the integration of 5G and the underlying technology-agnostic transmission of data/services	3-7.10.2022	Tampere, Finland (F2F participation)
E39	ITU Plenipotentiary Conference	Conference	Cristian Patachia, Marius Iordache, Ioan Constantin	Booth	26.09-14.10.2022	Bucharest, Romania

4. Dissemination Events

The 5GASP project has been presented in several large-scale events. In particular, during the reported period, EANTC presented the project (Figure 3) at the largest and most influential event for the connectivity ecosystem that is MWC'24 conference in Barcelona (February 26-29, 2024).



Figure 3. EANTC team at MWC'24 conference

The ICT-41 PlugFest is a satellite event of the IEEE-WFIoT (12-27 October 2023), and took place on the 23rd and 24th of October 2023 in Aveiro, Portugal (Figure 4). The event took place in the Campus of the University of Aveiro and in Altice Labs. A plugtest is an event based on a certain technical standard where the designers of electronic equipment or software test the interoperability of their products or designs with those of other manufacturers. It could be literally plugging company A's cable into company B's socket, or a more elaborate test resembling a realistic scenario. 5GASP project was a co-organizer of this event.

On the 23rd of October, developers from ICT-41 groundbreaking projects converged for a plug fest, marking a significant milestone in our collective journey towards innovative network applications.

Key highlights from the event:

1. **Uniting forces:** Developers from ICT-41 projects have come together to participate in a collaborative plug fest at WFIoT'23. This synergy promises to amplify the impact of each project, fostering a collective environment of shared learning and innovation.
2. **Validation of deployment:** The primary focus of the event was to validate the deployment of network applications across projects. Through meticulous testing and collaboration, developers worked hand-in-hand to ensure seamless interoperability and integration, setting the stage for a new era of interconnected technologies.



Figure 4. The ICT-41 PlugFest

3. **Diverse expertise:** With each project bringing its unique set of skills and perspectives, the plug fest showcased the incredible diversity and depth of expertise within the ICT-41 community. From edge computing to 5G security, the collaborative effort spanned a spectrum of cutting-edge technologies.
4. **Knowledge exchange:** Beyond the technical aspects, this gathering was also a forum for knowledge exchange. Developers had the opportunity to share insights, best practices, and lessons learned, fostering a collaborative spirit that will undoubtedly propel all the projects to new heights.
5. **WFIoT'23 impact:** The WFIoT'23 plug fest served as a testament to the vibrant ecosystem of innovation that defines our community. The event not only showcases the current state of ICT-41 projects but also lays the groundwork for future collaborations and advancements in the rapidly evolving landscape.

Besides these large-scale events and as the continuation of the series of educational webinars organized during the first and the second years (1st 5GASP Educational Webinar, 2nd 5GASP Educational Webinar, 3rd 5GASP Educational Webinar), the following webinars were organized during the third year:

- Webinar "Automotive and Mobility",
- Webinar "5G Applications for PPDR",
- 5G innovations for verticals – contributions on testing and certification.

Thus, the total number of webinars organized by the 5GASP project is six. All the webinars are available through the project website [5] and YouTube channel [6].

5. Industrial Fora Related Activities

5.1. 5GPPP related activities

ININ has represented 5GASP in the 5G-PPP TMV WG and 5G-PPP SME WG. Within TMV working group, 5GASP project goals and objectives were presented and disseminated. As a result of an active dissemination of related 5GASP's challenges and outcomes, the project has been referenced in the white paper "KPIs Measurement Tools, From KPI definition to KPI validation enablement", issued in March 2023. In particular, the 5GASP has been referenced due to contributions related to KPIs matter.

Similarly, ININ has been representing 5GASP in the SME WG by regularly attending meetings and reporting/disseminating on 5GASP activities whenever applicable. Following specific actions have taken place with ININ contribution and certain involvement of 5GASP:

- Contribution to the SME brochure entitled "European SME Expertise in 5G and Beyond" by publishing the company's profile in the brochure issued for year 2023 [7] and year 2024 [8].
- Contribution to the "Find your SME" web page [9] at NetworldEurope [10] by regularly updating its profile.
- Participation in "SNS WG CONSULTATION 2023" survey.

5.2. ETSI OSL SDG Contributions

5GASP is actively participating and contributing to ETSI OSL Software Development Group (SDG). Partners UoP, ITAV, are chairing and have various roles in the group which has in scope various proof of concepts (PoCs) within ETSI related to Network as a Service and Application exposure. 5GASP bring to ETSI OSL OpenSlice, a solution that is heavily used in the project as the service and application orchestrator as well as exposing applications to external stakeholders. Following the Anything-as-a-Service (XaaS) paradigm, strong attention has been drawn to the Network Slice-as-a-Service (NSaaS) model and in general Network as-a-Service (NaaS). NaaS is more of a business-oriented concept than a technological one, allowing on one side to automatically map service demands from a customer to functionality, topology, policies, and parameters of a network slice, as well as to provide component-based and auto-configured network functionalities for operators to design and launch network services in a more convenient manner. Examples of NaaS models include the Generic Slice Template (GST) as defined by GSMA or the recent efforts of the Open Gateway initiative.

In the context of 5GASP project, OpenSlice supports a multi-site CI/CD DevOps cycle for Network Applications enabled by reproducible network service deployments. For this purpose, OpenSlice supports multiple NFVOs. Also, Service Test models as well as Product models are introduced to enable a network application marketplace.

5.3. The NetworldEurope SME Working Group

ININ is actively participating in the NetworldEurope SME Working Group. The objective of this WG is to promote the skills and expertise of SMEs in the telecommunications domain, especially towards larger companies and research organisations, and on supporting the engagement of SMEs in collaborative projects and cooperation with those players, via networking and exchange of information amongst SME representatives. The main goal is to ensure industrial leadership for Europe in 5G and 6G. It is to be achieved through both fostering Europe's technology sovereignty in 6G and boosting 5G deployment in Europe.

6. Open source software

The 5GASP software available in open access is published on the 5GASP GitHub repository [11].

It includes 14 items (Figure 5) including:

- NetworkAppControl-MiniAPI
- NEF_emulator
- 5GASP Certification Entity
- 5gasp-helm
- 5GASP CLI
- Introduction and Usage of the 5GinFIRE Healthcheck service (HCS)
- Considerations for Testing 5GASP's Network Applications

In particular, the 5GASP Certification Entity calculates the certificate grade and creates a certificate for a testing; the Helm chart for 5GASP Netapp-7's MiniAPI deploys and instantiates the MiniAPI pod connected to the MEC Handover prediction application, for testing purposes.

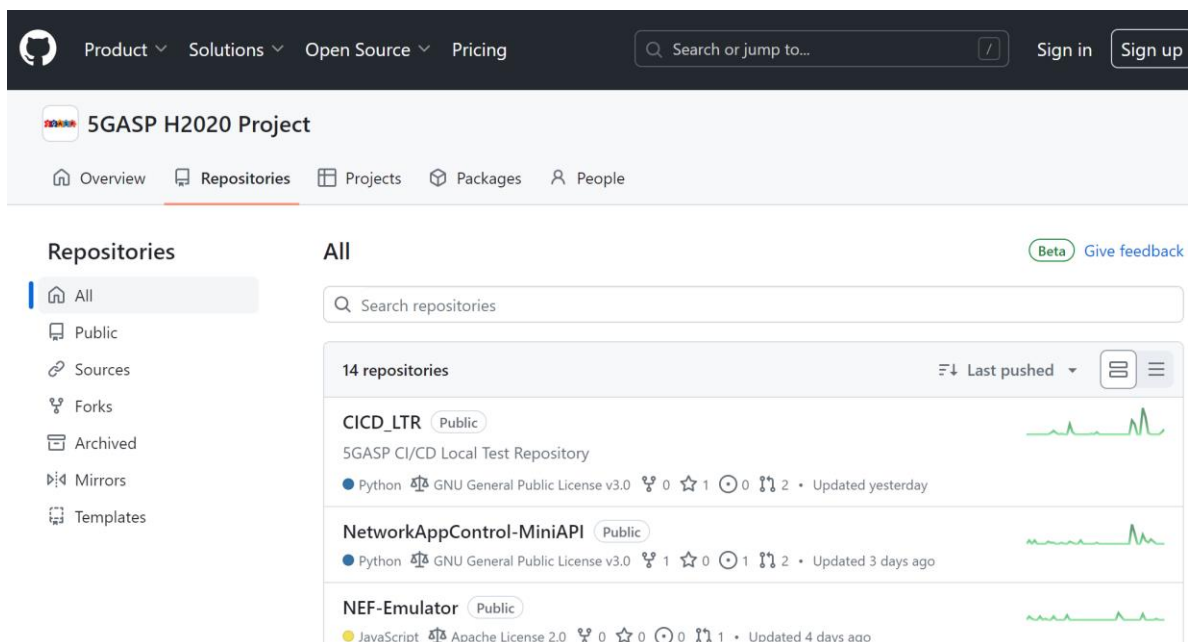


Figure 5. The 5GASP project on GitHub

7. Dissemination in the Social Media

The project is using LinkedIn [12] as a key tool for dissemination in social media. The possibility to share posts and news with longer extension than on X makes LinkedIn an attractive social network to share the project progress with a higher level of detail. The release of new project deliverables, news articles related to project meetings and the participation in different events are continuously announced through this platform. 5GASP is present on LinkedIn under the name of “5GASP: 5G Application & Services experimentation and certification Platform”. 5GASP profile visitors come from different professional sectors, showing the project impact on different fields. 5GASP LinkedIn profile page is shown in Figure 6.

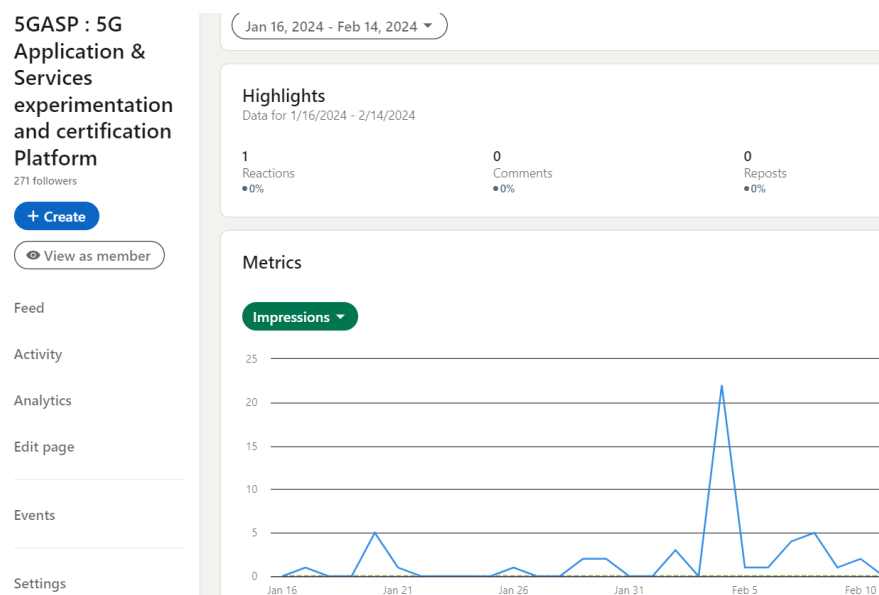


Figure 6. LinkedIn profile

X (former Twitter) is another social media tool used to promote the 5GASP work, milestones and achievements. The project is using X [13] as a key tool for dissemination in social media. Not only news related to the project or published on the website, but also the main activities related to Network Applications Community are continuously shared through this platform. The current number of tweets, followers and links on twitter are also observed in the following Figure 7.



Figure 7. 5GASP profile on X

A YouTube channel [6] has been used to capture presentations from e.g. industry forum demonstrations, workshops, and test-bed trials. Also, 5GASP YouTube is a source of educational videos, created by the partners and educational webinars of 5GASP NetApp Community. Figure 8 presents the project profile.

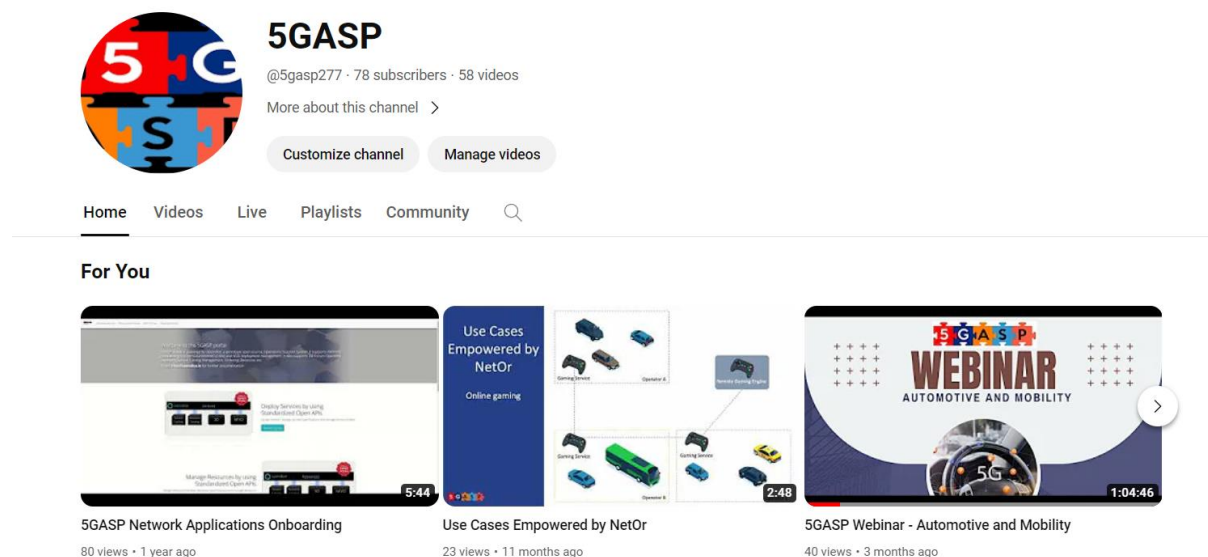
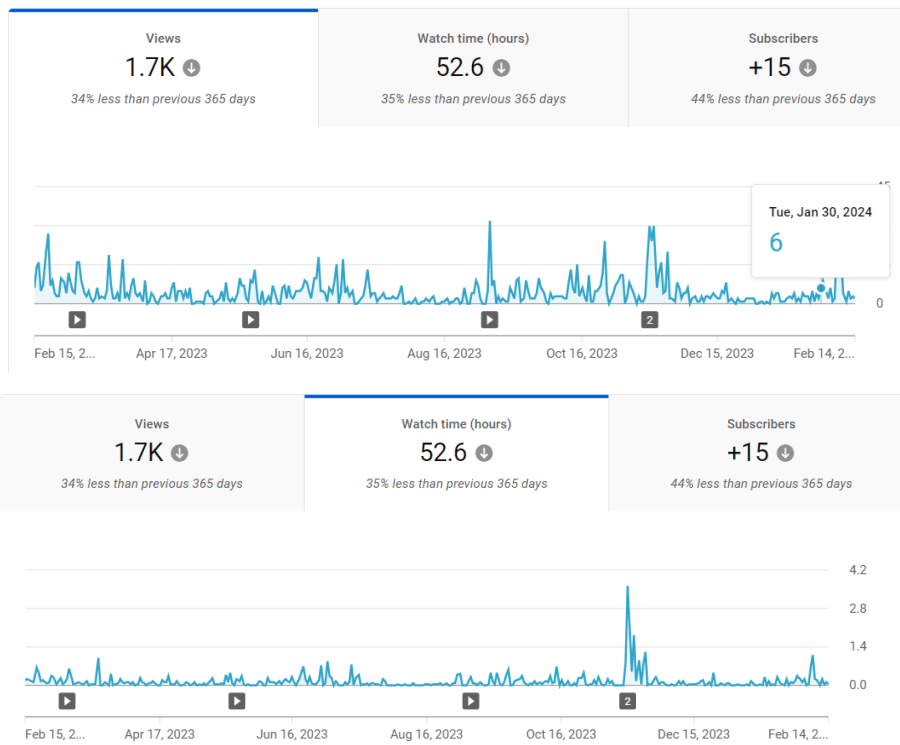


Figure 8. 5GASP profile on YouTube

The channel statistics is shown on Figure 9.

Your channel got 1,667 views in the last 365 days



Your top content in this period






	Content		Average view duration	Views
1	 NFV MANO Sep 15, 2021		1:39 (48.3%)	437
2	 MANO - NFV Management and Network Orchestration Oct 22, 2021		1:37 (13.7%)	234
3	 Build your VNF from scratch Jan 12, 2022		1:38 (30.1%)	113
4	 Introducing OSM Primitives and Juju Charms Feb 6, 2022		3:16 (30.7%)	76
5	 5GASP Network Applications Onboarding Jan 17, 2023		1:01 (18.0%)	68

Figure 9. 5GASP YouTube channel statistics (last 90 days period)

There are several playlists on 5GASP YouTube channel as listed in Table 6.

Table 6. The list of 5GASP videos

#	Video title
<i>Playlist “5GASP educational videos”</i>	
1	About 5G
2	What is the Network Applications
3	Software defined networking
4	Network function virtualisation
5	OSM
6	NFV MANO
7	Jenkins
8	How to write the Network Applications descriptor
9	Openslice
<i>Playlist “The 1st 5GASP educational webinar”</i>	
10	Intro - About 5GASP project
11	5G - Major developments & commercial market overview
12	What is a Network Applications?
13	Software defined networking (SDN)
14	Network function virtualization (NFV)
15	MANO – NFV Management and Network Orchestration
16	About Openslice
17	Continuous Integration Continuous Delivery (CI-CD)
18	Get Involved Further – the 5GASP community
<i>Playlist “The 2nd 5GASP educational webinar”</i>	
19	The 5GASP architecture
20	Network Applications Case Study: Virtual On-Board Unit Provisioning NetApp for Automotive
21	The Status of 5G - discussion panel

22	Get involved further - the 5GASP Network Applications Community
Playlist “The 3rd 5GASP educational webinar”	
23	Network Applications case study: 5G isolated operation for public safety
24	5GASP Network Applications certification process
25	Panel discussion - Nokia's presentation
26	Panel discussion - Nextworks' presentation
27	Panel discussion - Neobility's presentation
28	Panel discussion - Interact's presentation
29	Panel discussion
30	5GASP Community - Support and Resources for NetApp developers
Playlist “The 4th 5GASP educational webinar”	
31	5GASP Webinar - Automotive and Mobility
32	5GASP Webinar - 5G Applications for PPDR
Tutorials	
33	Introducing OSM Primitives and Juju Charms
34	Automating Day-1 and Day-2 VNF Operations with OSM Primitives
35	How to test your VNFs with The Robot Framework
36	5GASP Network Applications Onboarding
37	5GASP CLI Tutorial
38	How to manage your VNF with an Helm Chart-based Execution Environment
NetApp Lab Event	
39	5G Network Applications Lab - part 1
40	Network Application 1: Neo.Bus
41	Network Application 2: 5G isolated operation for public safety
42	Network Application 3: Efficient MEC handover
43	Network Application 4: Enabling autonomous vehicles deployment through teleoperation

44	Network Application 5: Virtual on-board provisioning NetApp & NetApp 6: Multi-domain migration NetApp
44	Network Applications Certification
45	Network Applications: Fire detection and ground assistance using drones (Fidegad)
46	Network Applications: Virtual roadside unit NetApp & NetApp: Cooperative central ITS station NetApp
47	Privacy analyzer and its transformation to a Network Application within 5GASP
48	An example of Vertical Specific NetApp: On board data collection & interfacing for NAVROM vessel
49	Vital 5G: about the project
50	Event conclusions
Demos	
51	5GASP Validation Service
52	Network Orchestration Demonstration
53	Network Slices Demo
54	Experimental Triplet Deployment Demo
55	Use Cases Empowered by NetOr
56	Deployment of Network Application for 5GMETA users through the 5G IANA Platform - 5GMETA & 5G IANA
57	Quality Monitor Network Application (5G-INDUCE) deployment in port facilities
2023 IEEE WFloT Plugfest	
58	2023 IEEE WFloT Plugfest 5GASP Presentation
59	2023 IEEE WFloT Plugfest Panel Discussion - "Network Application Synergy: Lessons Learned"
60	2023 IEEE WFloT Plugfest 5G EPICENTRE Presentation
61	2023 IEEE WFloT Plugfest 5G IANA Presentation
62	2023 IEEE WFloT Plugfest 5GMETA Presentation
63	2023 IEEE WFloT Plugfest VITAL 5G Presentation
64	Demonstrations on a Media Services Network Application - 5GASP & 5G EPICENTRE

8. Project website updates

Content of the project's website [4] has been renewed periodically. Updates mainly focused on the project's press releases, news, deliverables, and publications to keep the 5G community informed of the project's progress. No major structural changes were necessary during this time period. To evaluate the engagement of the community, one of the most important KPIs to evaluate is the number of unique visitors to our website. In 2022, 5GASP's website had, on average, 645 monthly unique users. In 2023, this value increased to 755, resulting in an increase of around 17%. This proves that 5GASP is becoming more widespread in the 5G Community, thus having more engagement from its members. Figure 10 shows the monthly evolution of unique members during the third year.

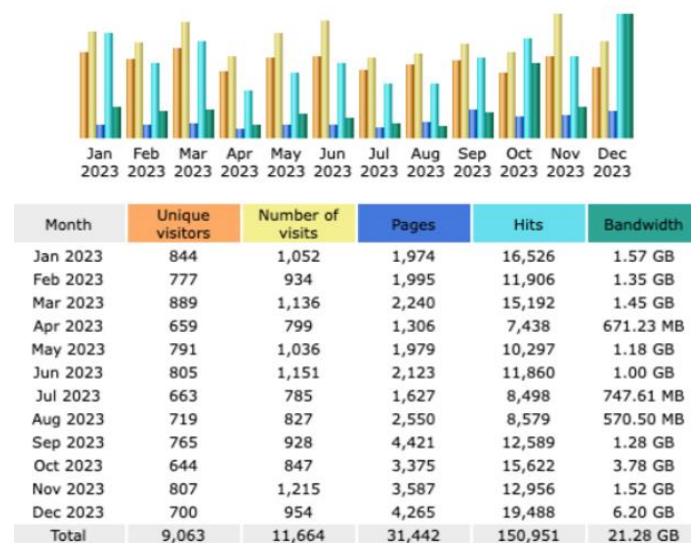


Figure 10. The project website statistics

It is also important to evaluate the origin of the users who visit our website. By looking at Figure 11, which showcases the top 10 traffic-originating countries, it is possible to notice a large number of European countries, around 80%, which is consistent with 5GASP's dissemination updated approach.

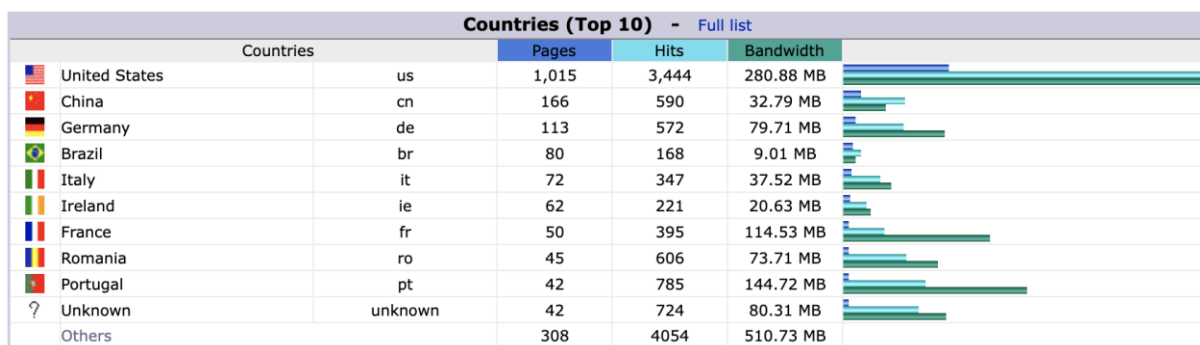


Figure 11. Top 10 traffic-originating countries

9. Network Applications Community Portal updates

During the third year of the project the Network Applications Community portal [14] was used for strengthening the community and dissemination of the project outcomes.

One of the important activities for dissemination is the preparation and posting of various materials which can attract more visitors to the portal. In particular, since the last reporting in D7.6.2 [1], 20 new blog posts were published on the portal (Figure 12). All partners participated in this activity. The topics of the blog posts concern different aspects of Network Applications development and use.

- Taking the Wheel from Afar: Unleashing the Potential of Remote AV Control with 5GASP
- NetOps and 5G integration through NFV
- Automated Certification
- Automated Security Scanning of 5G CNFs within 5GASP
- Advancements in Telecommunications: The Evolution of Test Beds for Network Experimentation
- Showcasing the migration of Virtual On-board Units through the 5GASP platform in GAIA 5G

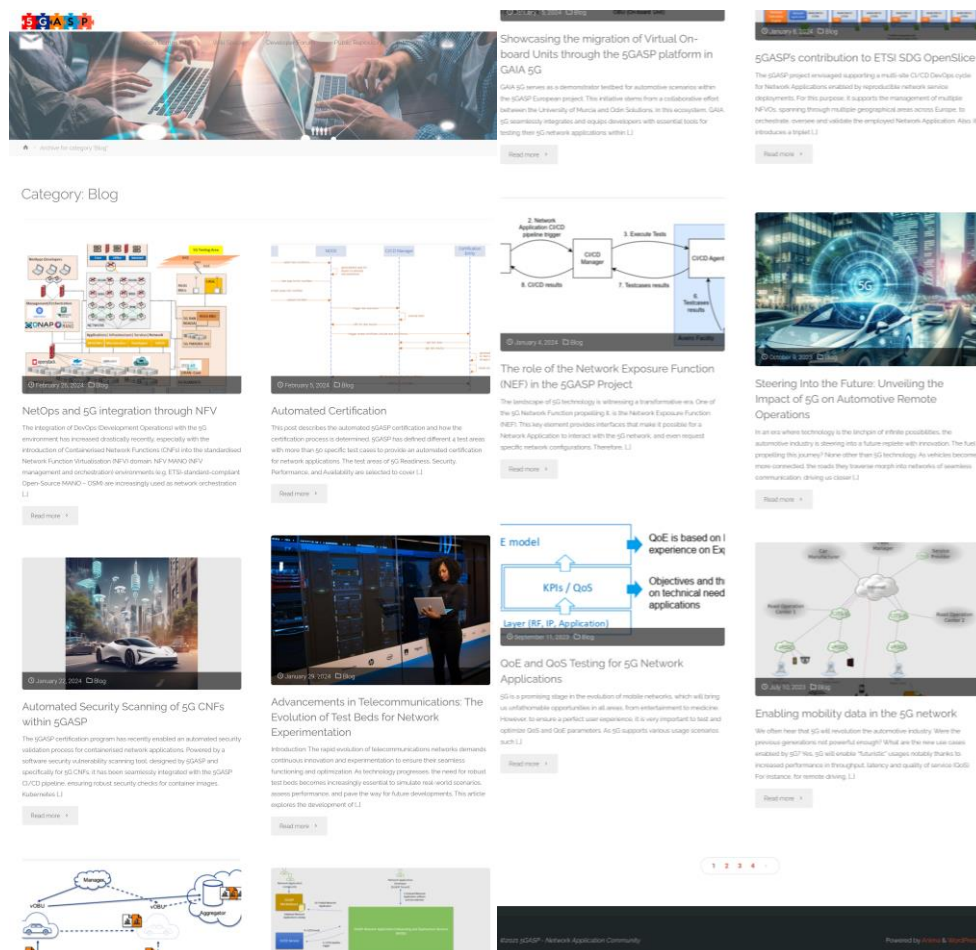


Figure 12. Blog posts webpage on the Community Portal

- 5GASP's contribution to ETSI SDG OpenSlice
- The role of the Network Exposure Function (NEF) in the 5GASP Project
- Steering Into the Future: Unveiling the Impact of 5G on Automotive Remote Operations
- QoE and QoS Testing for 5G Network Applications
- Enabling mobility data in the 5G network
- Accelerating 5G PPDR Slice Deployment with 5GASP: A Closer Look
- Testbed for beyond 5G networks
- PrivacyAnalyzer 5GASP Network Application
- Network Applications as an enabler for AI-driven Autonomous networking
- Assuring 5G PPDR slice in 5GASP environment
- 5GASP CLI for creating Testing Descriptors
- 5GASP Certificate Grades and Score Calculation
- On Community Engagement Events
- 5GASP Cloud Infrastructure reducing complexity in 5G supported vertical domains.

Thus, the total number of blog posts published by the end of March 2024 is 40.

The consortium actively worked on widening the scope of useful information accumulated on the Community portal. In particular, the consortium members worked on the new tutorials (Figure 13):

- Tutorials on how to Develop and Manage a Network Application:
 - Build your VNF from scratch
 - How to develop a Helm Chart
 - Juju Charms tutorial
 - Day-1 and Day-2 VNF operations
 - How to manage your VNF with an Helm Chart-based Execution Environment (EE) tutorial
 - From a Helm Chart to CNF tutorial
- Tutorials on how to Develop Network Application Tests
 - How to test your VNFs with the Robot Framework
 - 5GASP CLI for creating Testing Descriptors Tutorial
- Tutorials on Infrastructure Orchestration and Application Packaging
 - Kubernetes cluster deployment and OSM attachment
- Tutorials on how to Undergo 5GASP's Certification Process
 - 5GASP Certification Process
- Other Tutorials
 - NEF and how it can empower your applications



Tutorials

Tutorials on how to Develop and Manage a Network Application

Build your VNF from scratch

Basic Architecture OSM requirements Installing OSM Check the installation in the browser by accessing your host IP (by default user and password are admin). Adding a VIM account It is also possible to add the Vlm through the OSM GUI: What is a Virtual Deployment Unit (VDU) VDU is a ... [Continue reading](#)

Network Application Community - SGASP

Day-1 and Day-2 VNF Operations

Day-1 vs Day-2 Code Used This tutorial uses code from previous tutorials: Both are available here. Code modifications Basic structure The first step is to download the resources from the previous tutorials. Notice that you are recreating the content of mod/operator and mod/charms.osm. This is not entirely mandatory, but if ... [Continue reading](#)

Network Application Community - SGASP

How to develop a Helm Chart

This tutorial assumes that you have basic knowledge of Kubernetes and a working Kubernetes cluster. What is Helm? Helm is a package manager for Kubernetes that allows developers and operators to more easily package, configure, and deploy applications and services onto Kubernetes clusters. Helm is now an official Kubernetes project ... [Continue reading](#)

Network Application Community - SGASP

How to manage your VNF with an Helm Chart-based Execution Environment (EE) tutorial

Introduction to Execution Environments in OSM OSM's Execution Environments (EE) provide a runtime framework to run day-1 and day-2 primitives. These EE provide the means for NF-specific management code to run it into a dedicated helm chart, which is deployed into OSM's system cluster. From there, the EE interacts with ... [Continue reading](#)

Network Application Community - SGASP

Juju Charms tutorial

Software installation Installation of juju and charmcraft: Creation of the Charm structure After running these commands, you should have the following structure: Changing files Changing files to create a basic charm metadata.yaml You should replace the maintainer: config.yaml actions.yaml src/charm.py local-config.yaml Keep in mind that you should replace the hostname ... [Continue reading](#)

Network Application Community - SGASP

From a Helm Chart to CNF tutorial

What is a CNF? A Cloud-native Network Function (CNF) is a software-based network function designed to operate in cloud-native environments, such as Kubernetes clusters or container orchestration platforms. CNFs are a fundamental component of modern telecommunications and networking systems, enabling greater flexibility, scalability, and agility compared to traditional hardware-based network ... [Continue reading](#)

Network Application Community - SGASP

Tutorials on how to Develop Network Application Tests

How to test your VNFs with the Robot Framework

SGASP CLI for creating Testing Descriptors Tutorial

Figure 13. Knowledge Center webpage on the Community Portal

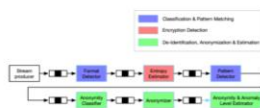
To provide the developers with information on the experiments, the portal offers the Public Repository of Experiment (Figure 14).

- Virtual On-Board Unit (VOBU) provisioning Network Application
- Virtual RoadSide Unit (vRSU) provisioning Network Application
- ITS station Network Application
- Multi-domain Migration Network Application
- Vehicle-to-Cloud (V2C) Real-Time Communication Network Application
- Remote Human Driving Network Application - Teleoperation for assisting vehicles in complex situations
- Efficient MEC handover Network Application

PrivacyAnalyzer is a software tool implemented by Modio catering for the identification of faulty or malicious behaviour either due to software bugs that lead to excessive Personal Identifiable Information (PII) leaks, or due to privacy leaks that might derive from the fact that a device has been hacked. In these scenarios, PII may be disseminated at any stage.

PrivacyAnalyser offers the following features:

- Within 5GASP, Modio's shall adapt the architecture of PrivacyAnalyzer in the context of the 5GASP architecture, so that its components are implemented as a chain of Virtual Network Functions (VNFs), in other words, as a Network Application deployed within the 5GASP platform.



- 5G Isolated Operation for Public Safety Network Application (5G IOPS Network Application)
- Vehicle Route Optimizer Network Application
- Fire detection and ground assistance using drones (FIDEGAD)

5 G A S P

To support the Network Application developers, the consortium supports the Developers' Forum which is the part of the Community Portal (Figure 15).

Topic	Replies	Views	Activity
🚩 Welcome to Discourse We want you to take part in the 5G Netapp Community, supporting your development and testing of Applications and Services.	4	283	Sep '21
What changes do I need to do to my code to port it for 5GASP? 5GASP	1	18	13d
Does this project has any whitepapers?	1	35	15d
Evolving an existant solution as Network Application Network Application Design and Development	0	12	22d
How to Perform Day-1 and Day-2 VNF Operations Network Application Design and Development	2	41	Jan 22
5G applications 5GASP	0	28	Jan 8
Security and Privacy in 5G 5GASP	0	25	Jan 8
Testbed performance 5GASP	0	25	Jan 8
5G testbed deployment 5GASP	0	28	Jan 8
UE-s in 5GASP CI/CD?	1	77	Dec '23

Figure 15. Multimedia webpage on the Community Portal

To analyze the interest of the broad community to the Community Portal, the metrics are measured in the Google Analytics tool. As the comparison of the metrics measured since September 2021 (Figure 16) shows, the number of the portal visitors has increased in 11.39 times, the number of pageview has raised in 11.18 times and the number of sessions has increased in 16.72 times.

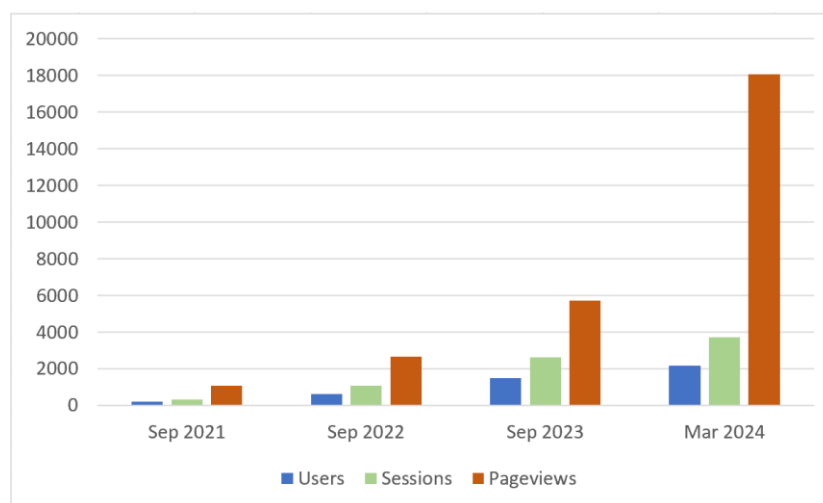


Figure 16. Dynamics of the Community Portal statistics

10. Press Releases

The preparation of the project press releases allows to support of the project dissemination activities. During the third year three new press releases have been published.

The Press Release #6 [15] issued on April 1, 2023 has the title ‘5GASP Services Marketplace’. This press release presents basic information about the project’s Marketplace. The 5GASP Services Marketplace aims to support business around Network Applications, Network Functions, and Network Services. It provides a public registry of SMEs and their reusable products: Network Applications, Network Functions, and Network Services (Figure 17).


PRESS RELEASE
1 April 2023

5 G A S P

5G Application & Services experimentation and certification Platform
Funded under H2020-EU.2.1.1
Grant agreement ID: 101016448

5GASP Services Marketplace

Our vision for the 5GASP ecosystem is of an open market, where Developers, Verticals and Network Operators can meet and create added value. 5GASP already developed a portal (5GASP Services Marketplace) <https://portal.5gasp.eu/> where Network Applications Developers have the opportunity to showcase their products along with certifications on the supported software platforms (interoperability) and functionality (as assessed by a 3rd party certification entity).



This showcase portal is therefore more than a NetApp directory, it includes operational information provided by the 5GASP platform independently from NetApp developers and Network Operators. Such information is collected automatically from a pool of testbeds that run tests defined by various entities such as Developers of the Network Applications, Verticals surveying possible acquisitions/partnerships and Network Providers validating that they can support the Network Applications.

The 5GASP Services Marketplace aims to support business around Network Applications, Network Functions, and Network Services. It provides a public registry of SMEs and their reusable products: Network Applications, Network Functions, and Network Services. Any useful information and documentation for SMEs is available at this portal as well. The Network Applications Community (<https://community.5gasp.eu/>) supports developers' forum, technical documentation, user guides, and other related information for developers, operators, verticals, etc.

<https://5gasp.eu/> <https://twitter.com/5gasp> <https://www.linkedin.com/company/5gasp-5g-application-services-experimentation-and-certification-platform/?viewAsMemberof> 5gasp-contact@5g-ecpp.eu


5GASP PRESS RELEASE: 5G Application & Services experimentation and certification Platform
1 April 2023

Figure 17. Press Release #6

The Press Release #7 [16] issued on November 1, 2023 has the title ‘Exciting Collaboration Unveiled: ICT-41 Projects Join Forces for WFIoT'23 Plug Fest’. It presents The ICT-41 PlugFest, which was a satellite event of the IEEE-WFIoT (12-27 October 2023), and took place on the

23rd and 24th of October 2023 in Aveiro, Portugal. The event took place in the Campus of the University of Aveiro and in Altice Labs (Figure 18).

PRESS RELEASE
1 November 2023



5G Application & Services
experimentation and certification Platform
Funded under H2020-EU.2.1.1
Grant agreement ID: 101016448





Exciting Collaboration Unveiled: ICT-41 Projects Join Forces for WFIoT'23 Plug Fest

We are thrilled to share some exciting news from the world of ICT-41 projects at this year's WFIoT'23! The ICT-41 PlugFest is a satellite event of the IEEE-WFIoT (12-27 October 2023), and took place on the 23rd and 24th of October 2023 in Aveiro, Portugal. The event took place in the Campus of the University of Aveiro and in Altice Labs. A plugtest is an event based on a certain technical standard where the designers of electronic equipment or software test the interoperability of their products or designs with those of other manufacturers. It could be literally plugging company A's cable into company B's socket, or a more elaborate test resembling a realistic scenario.

On the 23rd of October, developers from ICT-41 groundbreaking projects converged for a plug fest, marking a significant milestone in our collective journey towards innovative network applications. Key highlights from the event:

- 1. Uniting forces:** Developers from ICT-41 projects have come together to participate in a collaborative plug fest at WFIoT'23. This synergy promises to amplify the impact of each project, fostering a collective environment of shared learning and innovation.
- 2. Validation of deployment:** The primary focus of the event was to validate the deployment of network applications across projects. Through meticulous testing and collaboration, developers worked hand-in-hand to ensure seamless interoperability and integration, setting the stage for a new era of interconnected technologies.
- 3. Diverse expertise:** With each project bringing its unique set of skills and perspectives, the plug fest showcased the incredible diversity and depth of expertise within the ICT-41 community. From edge computing to 5G security, the collaborative effort spanned a spectrum of cutting-edge technologies.
- 4. Knowledge exchange:** Beyond the technical aspects, this gathering was also a forum for knowledge exchange. Developers had the opportunity to share insights, best practices, and lessons learned, fostering a collaborative spirit that will undoubtedly propel all the projects to new heights.
- 5. WFIoT'23 impact:** The WFIoT'23 plug fest served as a testament to the vibrant ecosystem of innovation that defines our community. The event not only showcases the current state of ICT-41 projects but also lays the groundwork for future collaborations and advancements in the rapidly evolving landscape.

Stay tuned for more updates as we continue to navigate the exciting landscape of ICT-41 projects!

<https://5gasp.eu/><https://twitter.com/5gasp><https://www.linkedin.com/company/5gasp-5g-application-services-experimentation-and-certification-platform/?viewAsMember=true>5gasp-contact@5g-ppp.eu

5GASP PRESS RELEASE: 5G Application & Services experimentation and certification Platform
1 November 2023

Figure 18. Press Release #7

The Press Release #8 [17] issued on January 31, 2024 has the title 'Accelerating Innovation: 5GASP Project Testing Results Unveiled'. It presents that the 5GASP project has reached a significant milestone, and we are excited to share the impressive testing results that highlight the project's dedication to fostering rapid development and innovation within the 5G landscape (Figure 19).



Accelerating Innovation: 5GASP Project Testing Results Unveiled

We are thrilled to bring you the latest updates from the forefront of 5G innovation. The 5GASP project has reached a significant milestone, and we are excited to share the impressive testing results that highlight the project's dedication to fostering rapid development and innovation within the 5G landscape. On the final stages of the project key testing achievements were made:

▪ **Performance excellence:** The testing phase has demonstrated outstanding performance, showcasing the capabilities of the 5GASP testbeds. The results affirm 5GASP commitment to providing SMEs with a cutting-edge environment for the development and testing of 5G Network Applications.

▪ **Inter-vertical collaboration:** In line with 5GASP vision, the testing results underscore the success of enabling data exchange between different verticals. The seamless communication between domains, especially in mobility services like connected automobiles and Public Protection and Disaster Relief (PPDR), reflects the project's commitment to fostering interconnected innovation.

▪ **Automated testbed success:** The fully automated and self-service testbeds have proven to be a game-changer for SMEs. The testing phase demonstrated its efficiency in expediting the idea-to-market process, allowing for rapid development and testing of new and innovative 5G network applications.

▪ **Continuous integration and deployment:** The software support tools for Continuous Integration and Continuous Deployment (CI/CD) of Virtual Network Functions (VNFs) have played a crucial role in ensuring a secure and trusted environment. This not only streamlines the development process but also instills confidence in SMEs navigating the dynamic 5G market.

▪ **Open Source Software and VNF Marketplace:** The creation of an Open Source Software (OSS) repository and a VNF marketplace has laid the groundwork for collaboration and innovation. SMEs now have access to a wealth of OSS examples and building blocks, fostering a vibrant community within the 5G ecosystem.

▪ **Community Validation:** The incubation of a community of Network Application developers has shown promising results. With tools and services supporting early validation and certification, this community is poised to play a pivotal role in shaping the future of 5G products and services.

The 5GASP project remains committed to propelling SMEs towards success in the dynamic 5G landscape. Stay tuned for further developments and exciting opportunities as we continue to accelerate innovation.



<https://5gasp.eu/>



<https://twitter.com/5gasp>



<https://www.linkedin.com/company/5gasp-5g-application-services-experimentation-and-certification-platform/?viewAsMember=true>



5gasp-contact@5g-epp.eu

5GASP PRESS RELEASE: 5G Application & Services experimentation and certification Platform
31 January 2024

Figure 19. Press Release #8

The total number of press releases is nine. All the press releases are available at the project website [4] and disseminated through business network of the consortium members.

11. Conclusions

Dissemination activities covered the wide range of opportunities. The quantity of dissemination activities linked to international journals and conference papers has now reached 40 contributions. Partners are actively engaged in open software development, which is already accessible. Throughout the third year, 5GASP partners persisted in utilizing various dissemination channels, including blog posts, press releases, and webinars. All intended public deliverables were submitted and made accessible on the project website. These dissemination efforts have effectively reached a diverse audience encompassing academia, industry, civil society, and media outlets.

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