

H2020 5GASP Project

Grant No. 101016448

D7.6.2 Annual Dissemination Report

Abstract. This document is a report of the dissemination activities that took place during the 2^{nd} year of the project. It summarizes the project dissemination achievements, including participation in the conferences, publishing scientific papers, activities in social media.

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Disclaimer

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Executive Summary

This report provides a summary of the outcomes to date towards dissemination, standardization and impact assessment during the second year of the project. It also provides an opportunity for the project partners to review their exploitation planning and refine their strategic intentions for exploiting the project outcomes.

Industrial Communication and Dissemination activities continued supporting all the necessary social media channels along with the project and community websites. Content for social media and the websites has come from the deliverables as well as 5GASP events, blogs from partners and video content.

The consortium members participated in industry events such as EuCNC 2022 conference, industry fora and standardization activities (ECSO WG1 – Standardization, Certification and Supply Chain Management, Camaro project, EU Standardization Booster) as well as organized one 5GASP NetAppCommunity webinar and in-person NetAppLab Event in Bucharest, Romania.

Scientific dissemination during the 2nd year of the project included the organization of two scientific workshops and the publishing of eleven research papers.

To present the project to a broader audience, the 5GASP partners during the second year prepared two press releases and updated a leaflet, worked on the project social media channels and webpages and achieved the following results: the NetAppCommunity portal – 3778 page views, Twitter – 92 followers, LinkedIn – 224 followers, YouTube – more than 3000 views.

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, 1600 people from the scientific community, 280 people from the industry, 150 people from civil society, 600 people from the general public and 350 people from other sectors. In total, 2980 people have been reached by the 5GASP dissemination activities.

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Table of Contents

	DOCUMENT HISTORY	
	ECUTIVE SUMMARY	
LIS	ST OF AUTHORS	3
LIS	ST OF FIGURES	5
LIS	ST OF TABLES	5
LIS	ST OF ACRONYMS	5
1.	INTRODUCTION	7
	1.1. OBJECTIVE OF THIS DOCUMENT	7
	1.2 Organisation of this document	7
2.	DISSEMINATION STRATEGY	8
	2.1. REVIEW OF THE 2ND PROJECT YEAR DISSEMINATION STRATEGY	8
	2.1.1. Objectives	8
	2.1.2. IMPLEMENTATION PLAN REVIEW	
	2.1.3. CONCLUSIONS	
	2.2. DEVELOPMENT OF THE 3RD PROJECT YEAR DISSEMINATION STRATEGY	
	2.2.1. OBJECTIVES	_
3.		
	3.1. SCIENTIFIC PUBLICATIONS	
	3.1.1. JOURNAL ARTICLES AND MAGAZINES	
	3.1.2. CONFERENCE PAPERS	
	3.2. 5GASP SCIENTIFIC WORKSHOPS	
	3.2.1. EUCNC 2022	
	3.3. PRESENTATIONS, KEYNOTE SPEECHES, INVITED TALKS	
4.	DISSEMINATION EVENTS	
	INDUSTRIAL FORA RELATED ACTIVITIES	
5.		_
	5.1. ECSO WG1 - STANDARDISATION, CERTIFICATION AND SUPPLY CHAIN MANAGEMENT	
	5.2. 5GPPP RELATED ACTIVITIES	
_		
6.	DISSEMINATION IN THE SOCIAL MEDIA	
7.		
	7.1. WEBSITE UPDATES	
	7.2. Website Updated Statistics	
8.		
9.	PRESS RELEASES	32
10	LEAFLET UPDATES	33
11	. CONCLUSIONS	35
RE	FERENCES	35



List of Figures

Figure 1. The 5G NetApp Lab Launch Event	18
Figure 2. ITU Plenipotentiary Conference 2022	19
Figure 3. Orange's 5G Lab	19
Figure 4. LinkedIn profile	21
Figure 5. Twitter profile	22
Figure 6. 5GASP profile on YouTube	22
Figure 7. 5GASP YouTube channel statistics (last 90 days period)	23
Figure 8. 5GASP Website - Unique Users Evolution during 2022	27
Figure 9. 2022 Visits Duration	27
Figure 10. 2022 Top 10 Traffic-Originating Countries	27
Figure 11. 2022 Most Visited Pages	28
Figure 12. Blog posts webpage on the Community Portal	29
Figure 13. Knowledge Center webpage on the Community Portal	30
Figure 14. Certification Guidelines webpage on the Community Portal	30
Figure 15. Multimedia webpage on the Community Portal	31
Figure 16. Metrics of the Community Portal: December 2022	31
Figure 17. Metrics of the Community Portal: November 2021	32
Figure 18. Press Release #3	32
Figure 19. Press Release #4	33
Figure 20. The Project's leaflet	34
List of Tables	
Table 1. Project lifetime targets and current number of dissemination activities	9
Table 2. Project planning targets of dissemination activities for the second year	
Table 3. 5GASP Journal Publications	12
Table 4. Target Journal Publications	13
Table 5. 5GASP Conference Publications	14
Table 6. 5GASP Events	17
Table 7. The list of 5GASP videos	24

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



ICT41 - Horizon 2020 Call - H2020-ICT-41-2020

IEEE – Institute of Electrical and Electronics Engineers

ISO – International Standartisation Organisation

ITU – International Telecommunication Union

KPI – Key Performance Indicators

MANO – Management and Orchestration

MNO – Mobile Network Operator

mMTC – massive Machine Type Communications

MWC - Mobile World Congress

NFV – Network Function Virtualization

NFV MANO - Network Function Virtualization MANO

OSM - Open Source MANO

ORO – Orange Romania

PPDR - Public Protection & Disaster Relief

Q&A – Questions and Answers

SDO – Standards Development Organisation

SEO – Search Engine Optimization

SME – Small and Medium Enterprise

URLLC – Ultra Reliable and Low Latency Communications

V2X - Vehicle-to-everything

VITAL-5G – Horizon 2020 project "**V**ertical Innovations in **T**ransport **A**nd **L**ogistics over 5G experimentation facilities"

WP - Work Package



1. Introduction

1.1. Objective of this document

This deliverable describes the dissemination activities undertaken within WP7 in the second year of the project. These activities include:

- Academic dissemination through presenting new scientific results in journal papers and at conferences;
- Dissemination to the industrial partners through business networks and professional communities;
- Dissemination to the wider audience at the project website, social media, the NetAppCommunity portal, the NetApp Community events, and NetApp Lab programme.

This document analysed the dissemination strategy and its implementation plan during the second year. And based on the achieved results, the updated version of the strategy was proposed for its implementation during the third year of the project.

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, in particular, NetAppCommunity events;

Section 5 discusses industry for aand standardisation activities (ECSO WG1 - Standardisation, Certification and Supply Chain Management, Camaro project, EU Standardisation Booster);

Section 6 describes the ways of the dissemination through social media and networking platforms;

Section 7 presents the project website updates;

Section 8 presents the NetAppCommunity portal updates;

Section 9 provides information of the new press releases;

Section 10 provides information of the project leaflets;

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



2. Dissemination Strategy

Due to the high potential impact that 5GASP aims to achieve in the NetApps domain, the consortium devotes major efforts on project results' exploitation and dissemination. The goal of dissemination activity is to promote the visibility of 5GASP project, disseminating its results into multiple domains. The main target audience contains verticals (V2X, PPDR and others), industry, SMEs, software developers, MNOs, research institutes, academia etc.

This section determines two main stages of the dissemination activity:

- Review of the second year dissemination strategy;
- Development of the dissemination strategy for the third year.

2.1. Review of the 2nd project year dissemination strategy

This section aims to review all the objectives for the dissemination strategy for the second project year and implementation plan accordingly.

2.1.1. Objectives

All the partners were involved in the dissemination activities, including through the NetAppCommunity, dedicated to promoting and hosting community engagement events. The project's website was updated periodically and used for dissemination. Also, more conventional approaches, such as targeted mailings, participation in seminars, webinars, etc., were applied as well. A dissemination and exploitation plan was successfully elaborated to ensure the use of the results of the 5GASP project among the most pre-eminent players.

The main objectives for the second project year were listed as it follows:

- New NetApp Community members engagement. To build a real community among the project partners and other stakeholders such as new companies, academia, etc. The full list of Community members is available at [1]. This number of members was achieved through the direct communication with SMEs, startups, industrial software vendors and operators working in Software Networks. Main instruments to apply to this type of dissemination were presentations/discussions during regular consultancy services of the project's industrial and SME partners, workshops and conferences. Also the first NetApp Lab Event was organized in Bucharest, Romania.
- Dissemination to the broad research community. During this type of activity 5GASP aimed to inform and stimulate interest on 5GASP open platform, its DevOps, testing innovations and the NetAppStore. This was achieved through the participation in leading conferences, publishing of the project results in the most relevant journals in the area, etc. 5GASP also implemented a comprehensive dissemination strategy towards the scientific community with the organization of two scientific workshops ("NetApps for Verticals" on EuCNC 2022 and "NetApps into Beyond 5G and 6G Networks" on IEEE International Mediterranean Conference on Communications and Networking) during the second year.
- Industry influence. In this case, project ensured the widespread dissemination of public results of the project to the stakeholders in the EU Member States and the Associated Countries.



2.1.2. Implementation plan review

A table summarizing the targets of the project for different dissemination and communication activities, as well as the objectives reached so far, is given below.

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

Category	КРІ	Target	Current status
Standardization and industry fora	Standards and industry groups impacted	3GPP, ETSI	Achieved (see Section 5)
Open source software	Number of open source releases published	2	Achieved
Industrial dissemination	Participation in industry events	MWC, EuCNC and at least two others	Partially achieved (EuCNC 2021, 2022)
	Organization and attendance of 5GASP NetApp community webinars	6	Partially achieved – 3 (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)
Scientific dissemination	Organization of scientific events and attendance	Two scientific workshops with 20+ attendants	Achieved – 3 workshops (see sub- Section 3.3)
	Number of publications	More than 20	Achieved – 21 (see sub- Section 3.1)
Communication to the general public	Number of press- releases	6	Partially achieved – 4 (see Section 9)
	Web site visits outside the consortium	More than 75% of the visits coming outside the consortium	Achieved (see Section 7)
	Social media channels used	Twitter, LinkedIn, YouTube	Achieved (see Section 6)
	Blog posts	20+	Partially achieved – 17 (see Section 8)



As shown in Table 1, at the current stage of the project not all the objectives related to the number of the dissemination activities have been achieved. The number of dissemination activities related to international journals and conference papers has reached 21 contributions. Regarding the number of keynotes and panels together with the participation in 5G events, dissemination has already reached the number of 15. The targeted number of workshops in major IEEE conferences has been reached (3), and during the next year project plans to organize at least one more scientific workshop on a major conference. Partners are still working on open software development. Communication to the general public is ongoing.

Finally, all the targeted public deliverables were submitted and made available and also updated in the project website. These dissemination activities have helped to reach a large number of people from academia, industry, civil society, media, etc. In particular, 1600 people from the scientific community, 280 people from the industry, 150 people from the civil society, 600 people from the general public and 350 people from others sectors. In total, 2980 people have been reached with the 5GASP dissemination activities.

2.1.3. Conclusions

According to the results of the second year, it has to be mentioned that the developed dissemination strategy of the project was almost fully implemented and target KPIs have been met, but in any case, the new objectives and implementation plan have to be developed for the third year. Some lessons learned in the first and second years have to be taken into account and new dissemination channels and methods can be applied. Thus, we aim to focus more on NetApp community activities engagement, industrial dissemination, standardization activities and open-source releases.

2.2. Development of the 3rd project year dissemination strategy

This section aims to identify new objectives for the dissemination strategy for the third project year and implementation plan accordingly.

2.2.1. Objectives

It is obviously, that all the partners will be involved in the dissemination activities mainly through the NetAppCommunity dedicated to promoting and hosting of community engagement events. Of course, the project's website, together shall be updated periodically and used for dissemination. A dissemination and exploitation plan will be updated with the purpose of ensuring the use of the results of the 5GASP project among the most pre-eminent players.

To establish the 5GASP project as the leading initiative for Europe's competitiveness in the NetApp sector, as it was for the first and second years, the next main directions will be followed:

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

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



- **NetApp Lab promotion.** 5G NetApp Lab aims to support startups, SMEs, developers and researchers that wish to design and deliver valuable 5G products and services, leveraging the native 5G technology capabilities. And 5GASP targets to promote actively the 5G NetApp Lab accelerator, with the aim to enable SMEs, start-ups and individuals to develop, test and validate 5G-based NetApps for various business verticals. This direction will also be a comprehensive part of creation of a community of developers and vertical end-users around the 5GASP Platform, which will help to maximize the potential to create successful commercial products or services.
- New NetApp Community members engagement. This task remains one of the most important and may be achieved through the direct communication with SMEs, startups, industrial software vendors and operators working in Software Networks. Main instruments to apply this type of dissemination will be presentations/discussions during regular consultancy services of the project's industrial and SME partners, workshops and conferences. We will also target more directly members of ICT-41 projects which we identified as potentially more interested in participating.
- **Dissemination to the broad research community.** The main aim of this activity is to inform and stimulate interest on 5GASP open platform, its DevOps, testing innovations, the NetApp Community and the NetAppStore. This will be achieved through the participation in the leading conferences, publishing of the project results in the most relevant journals in the area, etc. Next year 5GASP is planning to organize at least one scientific workshop and also will be an active contributor to other workshops organized by the 5GPPP community and ICT41 projects in particular.
- Industry influence. In this case, project aims to ensure the widespread dissemination
 of public results of the project to the stakeholders in the EU Member States and the
 Associated Countries. 5GASP also aims to promote the key interfaces of its
 architecture into the relevant standards bodies and groups, in order to facilitate the
 use of the technology to stimulate its adoption by other market players beyond those
 involved in the consortium.

2.2.2. Implementation plan

To achieve the goals of the third project year dissemination strategy the next plan should be implemented.

A table summarizing the targets of the project for different dissemination and communication activities, as well as the objectives reached so far, is given below.

Table 2. Project planning targets of dissemination activities for the second year

Category	КРІ	Target	
Standardization	Standards and industry	2CDD ETCI	
and industry fora	groups impacted	3GPP, ETSI	
Open source	Number of open source	2	
software	releases published	2	
Industrial	Verticals related groups	V2X, PPDR	
dissemination	impacted	VZX, PPDR	
	Participation in industry	EuCNC 2023	
	events		



	Organization and attendance of 5GASP NetApp community webinars	3
	5GPPP activities	Participation in the ICT41 joint initiatives
Scientific	Organisation of scientific	One scientific workshops with 20+
dissemination	events and attendance	attendants
	Number of publications	More than 5
Communication to	Number of press-releases	2
the general public	Web site visits outside the	More than 75% of the visits coming
	consortium	outside the consortium
	Social media channels used	Twitter, LinkedIn, YouTube
	Blog posts	5+

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

3.1.1. Journal Articles and Magazines

5GASP partners have been targeting high impact journals and magazines in the field. The following journal publication (see Table 3 and [2]) are associated with the results in 5GASP projects.

Table 3. 5GASP Journal Publications

Reference	Reference
Number	
J01	M. Volk and J. Sterle, "5G Experimentation for Public Safety: Technologies, Facilities and Use Cases," in IEEE Access, vol. 9, pp. 41184-41217, 2021, doi: 10.1109/ACCESS.2021.3064405
J02	R.Odarchenko, G. Labadze. "Links between 5G PPP Projects: The road from the past to the future', <i>Scientific and practical cyber security journal</i> , 2021.
J03	J. Gallego-Madrid, R.Sanchez-Iborra, A. F. Skarmeta, "From Network Functions to NetApps: The 5GASP Methodology." CMC-COMPUTERS MATERIALS & CONTINUA 71.2 (2022)

5GASP is also planning the submission for several target journals, identified as being particularly suitable for possible publications (Table 4).



Table 4. Target Journal Publications

Topic	Journal	Link
Communi-	IEEE Transactions	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=
cations,	on Computers	12
Virtualizatio	IEEE	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=
n	Communications	35
	Magazine	
	Journal of	https://www.journals.elsevier.com/journal-of-network-and-
	Network and	computer-applications
	Computer	
	Applications	
	International	https://www.journals.elsevier.com/computer-networks
	Journal of	
	Computer and	
	Telecommunicati	
	ons Networking	
	Journal of Cloud	https://journalofcloudcomputing.springeropen.com/
	Computing	
	Journal of	https://www.springer.com/journal/10922
	Network and	
	Systems	
	Management	
Software	IEEE Transaction	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=
Engineering		32
	Engineering	
	<u>-</u>	https://www.journals.elsevier.com/journal-of-systems-and-
	and Software	software
		https://dl.acm.org/journal/tosem
	on Software	
	Engineering and	
	Methodology	
	(TOSEM)	
	· ·	https://www.springer.com/journal/10664
	Software	
	Engineering	
	(EMSE)	
_		https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=
	Transport Systems	4149681
tion System		
		https://www.tandfonline.com/loi/gits20
	Intelligent	
	Transportation	
	Systems:	
	Technology,	
	Planning, and	
	Operations	



IEEE Transactions	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=
on Vehicular	25
Technology	
International	https://www.inderscience.com/jhome.php?jcode=ijvas
Journal of Vehicle	
Autonomous	
Systems	

3.1.2. Conference papers

5GASP partners have published eighteen conference papers, so far. A selection of the most relevant conference papers is also available on our public website at the page [2]. The full list of conference papers, either published or accepted so far, is given below.

Table 5. 5GASP Conference Publications

Reference Number	Reference
C01	Cristian Patachia-Sultanoiu et. All, "Advanced 5G Architectures for FutureNetApps and Verticals", in IEEE BlackSeaComm, 2021
C02	Andreea Bonea et. All, "Automated onboarding, testing and validation for NetApps and Verticals", in International Symposium on Signals, Circuits and Systems, 2021
C03	M.Nedelcu, V.Niţu, T.Petrescu," Evaluation of electromagnetic field exposure in indoor spaces where there are located base stations with distributed antenna system", EEE International Black Sea Conference on Communications and Networking, Bucharest, Romania, 2021
C04	M. Nedelcu, V. Niţu and T. Petrescu, "Evaluation of electromagnetic field exposure in indoor spaces where there are located base stations with distributed antenna system," 2021 International Symposium on Signals, Circuits and Systems (ISSCS), 2021, pp. 1-6.
C05	J Gallego-Madrid, A. Hermosilla, A. F. Skarmeta, "5GASP: Security and Trust in NetApp Deployment and Operation", 2021 Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit): Workshop 8 - From 5G to 6G Automated and Intelligent SecuriTy: FAST
C06	K.Trantzas, C.Tranoris, S.Denazis, R.Direito, D.Gomes, J.Gallego-Madrid, A. Hermosilla, A.F. Skarmeta, "An automated CI/CD process for testing and deployment of Network Applications over 5G infrastructure", IEEE International Mediterranean Conference on Communications and Networking (MeditCom2021)
C07	Gallego-Madrid, R.Sanchez-Iborra, A. F. Skarmeta," Security and Trust in the Integration of Network Functions within the 5G Architecture: The 5GASP Project", The 5th International Symposium on Mobile Internet Security 2021.
C08	X. Vasilakos, M. Bunyakitanon, R. Nejabati and D. Simeonidou, "Towards Low-latent & Load-balanced VNF Placement with Hierarchical Reinforcement Learning," 2021 IEEE International Mediterranean Conference on Communications and Networking (MeditCom), 2021, pp. 162-167.



C09	M. Bunyakitanon, X. Vasilakos, R. Nejabati and D. Simeonidou, "HELICON: Orchestrating low-latent & load-balanced Virtual Network Functions," ICC 2022 - IEEE International Conference on Communications, 2022, pp. 353-358
C10	R. Direito, D. Gomes and R. L. Aguiar, "Towards a Fully Automated System for Testing and Validating NetApps," 2022 IEEE 8th International Conference on Network Softwarization (NetSoft), 2022, pp. 231-233.
C11	R. Direito, D. Gomes, K. Trantzas and C. Tranoris, "5GASP's approach to the onboarding, deployment and validation of 5G NetApps," 2022 IEEE International Mediterranean Conference on Communications and Networking (MeditCom), 2022, pp. 78-81
C12	K.Trantzas et al., "Implementing a holistic approach to facilitate the onboarding, deployment and validation of NetApps," 2022 IEEE International Mediterranean Conference on Communications and Networking (MeditCom), 2022, pp. 261-267
C13	Hermosilla, Ana, Gallego-Madrid, Jorge, Martinez-Julia, Pedro, Kafle, Ved, Trantzas, Kostis, Tranoris, Christos, Direito, Rafael, Gomes, Diogo, Ortiz, Jordi, Denazis, Spyros, & Skarmeta, Antonio. (2022, October 18). "Deployment of 5G Network Applications over Multidomain and Dynamic Platforms."
C14	Gallego-Madrid, Jorge, Hermosilla, Ana, & Skarmeta, Antonio. (2022, October 18). Dynamic Deployment and Testing of Virtual On-board Units in 5G. https://doi.org/10.5281/zenodo.7221666
C15	Xenofon Vasilakos, Sharday Olowu, Reza NejabatiandDimitra Simeonidou. "Towards an intelligent 6G architecture: the case of jointly Optimised handover and Orchestration", WWRF47, 2022, Bristol. (Accepted)
C16	Navdeep Uniyal, Juan Parra-Ullauri, Anderson Bravalheri, Sharday Olowu, Xenofon Vasilakos, Reza Nejabati, Dimitra Simeonidou, "On the design of a native," 47th World Wireless Forum meeting (WWRF47), Bristol, United Kingdom, 21-23 June, 2022. (Accepted)
C17	Joao Alegria, Rafael Direito, Daniel Gomes, Daniel Corujo, Diogo Gomes, "NetOr: An Inter-domain Vertical Service Orchestrator for 5G Networks", 2022 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN) - Mobislice Workshop (Accepted)
C18	Jorge Gallego-Madrid, Luis Bernal-Escobedo, Rodrigo Asensio, Ana Hermosilla, Alejandro Molina Zarca, Jordi Ortiz, Ramon Sanchez-Iborra, "GAIA 5G: A Multi-Access Smart-Campus Architecture", 2022 GIoTS Global IoT Summit (Dublin, Ireland, 20-23 June, 2022) (Accepted)

3.2. 5GASP scientific workshops

3.2.1. EUCNC 2022

On 8 June 2022 was hold joint workshop "NetApps for Verticals" on EuCNC 2022. The duration of the workshop was 1h 30m. The session was focused on discussing how NetApp



empowers the verticals on-boarding on 5G and reinforce the fact that 5G is a platform and not a pipe and targeted to:

- highlight experiences and lessons learned with NetApp development and its Lifecycle management
- investigate how Standards include related information to realize the NetApps vision
- understanding of all related stakeholders
- investigate cross-industry cooperation opportunities
- discuss on common models and APIs
- promote the innovative services and new business models introduced by the NetApp concept and their evolution towards 6G The proposed session will upon the success of the series of past relevant EuCNC Special Sessions and Workshops, and it aimed to provide useful inputs along the above-mentioned directions.

The agenda of the workshop is available at [3].

3.2.2. IEEE International Mediterranean Conference on Communications and

Networking

On 5 September 2022 was hold joint workshop "NetApps into Beyond 5G and 6G Networks" on IEEE International Mediterranean Conference on Communications and Networking.

The duration of the workshop was a full day, consisted of 4 sessions. The sessions included i) presentations highlighting aspects of the NetApps and respective open experimental network platforms, ii) presentations from NetApp stakeholders, iii) presentations from SDOs, and key organisations and iv) Interactive session panels with Q&As from the Session Chair, speakers and the Audience.

Specifically for Session I and II, the aim was to exchange ideas on the topics through discussions between the speakers and the audience. Speakers made a position statement (7min) and then a Q&A interactive panel followed.

To empower the discussion across the participants and the panel, the workshop structure allocated dedicated slots for Q&A (30min each). Through these sessions, we targeted to capture the take of the community on the level of interaction and trust that NetApp should support, the way services are provided to verticals, how NetApp simplifies the implementation and deployment of vertical systems at large scale etc.

Finally, there were presented 9 highly-qualified research papers related to the 5G NetApps. The agenda of the workshop is available at [4]. Published papers in the nearest future should be accessible and provide a reality check for a wider audience.

3.3. Presentations, keynote speeches, invited talks

5GASP partners have participated in fifteen different events, so far. A selection of the most relevant presentation and talks is also available on our public website at [5]. The full list of the events, where partners already participated so far, is given below.



Table 6. 5GASP Events

#	Event title	Event type	Presenter/Responsible Person	Dissemination Role	Dates	Location
E1	PCSITS 2021	Conference	Roman Odarchenko (BLB)	Keynote speech	15/4/2021	Kyiv, Ukraine (online)
E2	ISCTS 2021	Conference	Roman Odarchenko (BLB)	Keynote speech	16/4/2021	Tbilisi, Georgia + online
E3	IEEE Meditcom	Conference	UnivBris	Paper presentation	8/9/2021	Athens, Greece
E4	IEEE Meditcom	Conference	UoPatras	Paper presentation	8/9/2021	Athens, Greece
E5	VITEL, 36th Workshop on Telecommunications	Workshop	Janez Sterle (ININ)	Paper presentation	18/05/2021	Brdo pri Kranju, Slovenia (online)
E6	5G4CAM WG Meeting	Conference	Antonio Skarmeta (OdinS)	Keynote speech	14/03/2022	Online
E7	ICC'22 NGNI-1: QoE and Network Systems	Conference	Xenofon Vasilakos (UnivBris)	Paper presentation	17/05/2022	Online
E8	WWRF 2022	Conference	Navdeep Uniyal (UnivBris)	Paper presentation	21/06/2022	Bristol, UK
E9	WWRF 2022	Conference	Xenofon Vasilakos (UnivBris)	Paper presentation	22/06/2023	Bristol, UK
E10	IEEE Meditcom 2022 - WS2. NetApps in Beyond 5G and 6G Networks	Conference	Christos Tranoris (UoPatras)	Chair	5/9/2022	Athens, Greece
FTT	IEEE Meditcom 2022 - Demo Session	Conference	Christos Tranoris (UoPatras)	Chair	6/9/2022	Athens, Greece
	IEEE Meditcom 2022 - Demo Session		Kostis Trantzas (UoPatras)	Paper presentation	6/9/2022	Athens, Greece
E13	IEEE Meditcom 2022 - Main Track	Conference	Kostis Trantzas (UoPatras)	Paper presentation	7/9/2022	Athens, Greece
E14	VITEL, 37th Workshop on Telecommunications	Workshop	Janez Sterle (ININ)	Paper presentation	17/5/2022	Brdo pri Kranju, Slovenia (online)
E15	Broadway - Forest Fire Pilot Ljubljana	Workshop	Janez Sterle (ININ)	Supporting organization of the event and participation in the field trial	7-9/6/2022	Ljubljana, Slovenia
E16	"O futuro das Telecomunicações"	Seminar	Diogo Gomes (ITAv)	Key Note	12/10/2022	Braga, Portugal



4. Dissemination Events

Part of the NetApp Lab activities, 5GASP has organized in 2022 the 3rd Educational Webinar and a hybrid event, in Bucharest and broadcasted online, The 5G NetApp Lab Launch Event.

Entitled Building NetApps in the 5G Ecosystem, the 3rd online webinar, presented details on the progress of the 5GASP platforms and certification process, an extensive case-study for building a PPDR NetApp and hosted a discussion panel on what it takes to build 5G NetApps, which included representatives of SMEs, 5G-PPP Software Networking Group, as well as VITAL-5G, another Horizon 2020 project. The event had 100 registrations and was also published as a recording on YouTube, where it gathered 122 views by November 15th. *For more detailed information, please check D6.2.*

The 5G NetApp Lab Launch Event (Figure 1), hosted by ORO in Bucharest and livestreamed, focused on promoting the program towards potential NetApp developers that would further engage with the project. The agenda included presentations of the 5GASP main project activities, as well as pitches on the NetApps developed in the project to serve as inspiration and encouragement for current and potential NetApp developers. It also involved a local SME which presented its NetApp under development, as well as representatives of the VITAL-5G project. The event had 48 online registrations and 27 persons attending in-person. The recording published on YouTube gathered 492 views by November 2022. For more detailed information, please check D6.2 [6].





Figure 1. The 5G NetApp Lab Launch Event

The 5GASP Project was presented during the ITU Plenipotentiary Conference 2022 (Figure 2), held in Bucharest (both on stage and to visitors of the Orange dedicated booth).







Figure 2. ITU Plenipotentiary Conference 2022

5GASP is also disseminated through various delegation visits that take place in Orange's 5G Lab, with guests such as ITU's Secretary General, Mr. Houlin Zhao or members of the French Chamber of Commerce (Figure 3).

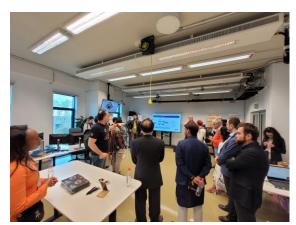




Figure 3. Orange's 5G Lab

5. Industrial Fora Related Activities

5.1. ECSO WG1 - Standardisation, Certification and Supply Chain Management

The objective of this WG is to support the roll-out of EU ICT security certification schemes, standard and legislative recommendations, and ensure the establishment of trusted and resilient supply chains in Europe.

• Current Works:

- Composition approach across EU schemes
- o Guidelines for the certification of secure systems and analysis of the associated risk management.
- Identify the challenges for SMEs in using certification schemes and define guidelines / best practices (survey)
- Address the challenges for a trusted supply chain and management of the risks.



- Analysis for consistency of the legislative framework and Cybersecurity Act and potential market impact.
- Analysis of the Cyber Resilience Act proposal
- Collaboration with ENISA, EC, European SDOs and other relevant stakeholder with feedback

In that sense OdinS has been involved in considering possible impact of different activities in the certification of security components, and how they are affected by:

- Composition approach across EU schemes: Challenges on how to reuse certification information from the same and from different schemes.
- KPIs and Metrics of Certification Schemes to measure their effectiveness and efficiency: working in the survey to provide feedback to ENISA on the suitability of the metrics
- ECSO's Task Force on Cloud Security Data Spaces (CSDS) working in the Position Paper on the European Cybersecurity Certification Scheme for Cloud Services (EUCS)
- Labelling cybersecurity certification and possible feedback on technical specification of the label

5.2. 5GPPP related activities

OdinS is representing 5GASP in the 5G4CAM WG of the 5GPPP where all CAM related projects are presents and where a biweekly audio is scheduled to exchanges experiences and work on common white papers. 5GASP has been active in this activity and already provided a presentation of the main results and possible synergies.

ININ is representing 5GASP in the TMV and SME 5G-PPP WGs. TMV is more active group with biweekly calls. The objective is to exchange testing and measurement practices and other 5G KPI related activities. As part of the process, 5GASP project goals and objectives were presented and disseminated between the WG stakeholders to find possible synergies.

The main SME WG objective is in supporting European SME participation in the EU R&D projects and to improve its visibility. As such meetings are not periodic and are organized based on the needs of the SME community (typically 3-4 times per year) where relevant discussion takes place, related to preparation of new SME brochure, participation at EuCNC events etc.

5.3. Contributions to CAMARA

DriveU is an active partner in the CAMARA project – The Telco Global API Alliance [7], an open-source project headed by The Linux Foundation, and by GSMA. CAMARA is developing an open, global, and accessible API with access to operator capabilities, allowing applications to run consistently between telco networks.

DriveU is representing 5GASP in the activities and showcased the usage of the 5G APIs using DT 5G SA test network network while the DriveU app (NetApp) was deployed according to the manual 5GASP procedures.



5.4. Participation is the new EU Standardisation Booster

In order to increase the impact in the Standardisation area 5GASP partners started communication with the Project Manager and Vice Coordinator of the HSbooster.eu project, a newly launched EC-funded initiative. HSbooster.eu will provide a tailor-made online platform and resources for standardisation experts in Europe to advise 1,000 Horizon Europe and H2020 projects on how best their research results can lead to the revision or creation of standards.

5GASP aims at receiving expert support to help to increase the impact and exploitation of project results by contributing to the creation or revision of standards, as part of the EU Strategy on Standardisation.

5GASP aims to submit an application to Open Calls for Horizon Europe and H2020 Projects. Our project can rely on a wide spectrum of Standardisation Experts categorised under multiple domains under Sustainable digitalisation and 5G, in order to be coupled and assisted by the right professional and to receive the necessary support to break into the Standards arena in the most effective way.

Project partners identified several areas under the umbrella of Sustainable digitalization and other related areas.

6. Dissemination in the Social Media

The project is using LinkedIn [8] as a key tool for dissemination in social media. The possibility to share posts and news with longer extension than on Twitter 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 on the Figure 4.

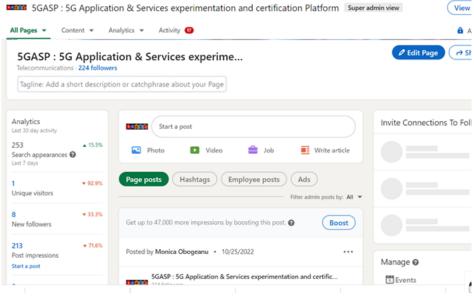


Figure 4. LinkedIn profile



Twitter is another social media tool used to promote the 5GASP work, milestones and achievements. The project is using Twitter [9] 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 NetApp Community are continuously shared through this platform. The current number of tweets, followers and links on twitter are also observed in the following Figure 5.



Figure 5. Twitter profile

A YouTube channel [10] has been used to capture presentations from e.g. industry forum demonstrations, workshops, and test-bed trials. Also, 5GASP YouTube is a source of the educational videos, created by the partners and educational webinars of 5GASP NetApp Community. Figure 6 presents the project profile.

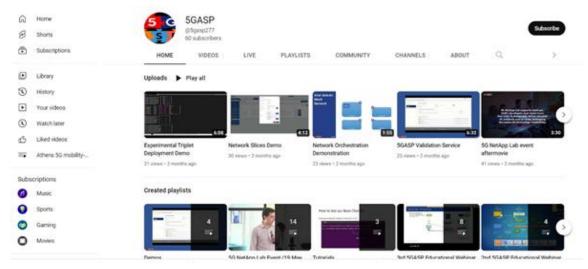


Figure 6. 5GASP profile on YouTube



The channel statistics is shown on Figure 7.

Your channel got 2,341 views in the last 365 days



Your channel got 2,341 views in the last 365 days



Your top content in this period

Content	Average view duration	Views
1 NFV MANO Sep 15, 2021	1:41 (49.5%)	504
2 MANO - NFV Management and Network Orchestration Oct 22, 2021	1:57 (16.6%)	323
3 5G NetApp Lab - part 1 May 30, 2022	2:24 (3.7%)	122
Introducing OSM Primitives and Juju Charms Feb 6, 2022	2:05 (19.6%)	94
NetApp 3: Efficient MEC handover May 30, 2022	1:12 (20.4%)	85

Figure 7. 5GASP YouTube channel statistics (last 90 days period)



There are several playlists on 5GASP YouTube channel as listed in Table 7.

Table 7. The list of 5GASP videos

#	Video title			
Playlist "5GASP educational videos"				
1	About 5G			
2	What is the NetApp			
3	Software defined networking			
4	Network function virtualisation			
5	OSM			
6	NFV MANO			
7	Jenkins			
8	How to write the NetApp descriptor			
9	Openslice			
	Playlist "The 1st 5GASP educational webinar"			
10	Intro - About 5GASP project			
11	5G - Major developments & commercial market overview			
12	What is a NetApp?			
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			
	Playlist "The 2 nd 5GASP educational webinar"			
19	The 5GASP architecture			
20	NetApp Case Study: Virtual On-Board Unit Provisioning NetApp for Automotive			



21	The Status of 5G - discussion panel			
22	Get involved further - the 5GASP NetApp Community			
Playlist "The 3 rd 5GASP educational webinar"				
23	NetApp case study: 5G isolated operation for public safety			
24	5GASP NetApps 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			
Tutorials				
31	Introducing OSM Primitives and Juju Charms			
32	Automating Day-1 and Day-2 VNF Operations with OSM Primitives			
33	How to test your VNFs with The Robot Framework			
	NetApp Lab Event			
34	5G NetApp Lab - part 1			
35	NetApp 1: Neo.Bus			
36	NetApp 2: 5G isolated operation for public safety			
37	NetApp 3: Efficient MEC handover			
38	NetApp 4: Enabling autonomous vehicles deployment through teleoperation			
39	NetApp 5: Virtual on-board provisioning NetApp & NetApp 6: Multi-domain migration NetApp			
40	NetApp Certification			
41	NetApp: Fire detection and ground assistance using drones (Fidegad)			
42	NetApp: Virtual roadside unit NetApp & NetApp: Cooperative central ITS station NetApp			



43	Privacy analyzer and its transformation to a NetApp within 5GASP	
44	An example of Vertical Specific NetApp: On board data collection & interfacing for NAVROM vessel	
45	Vital 5G: about the project	
46	Event conclusions	
Demos		
47	5GASP Validation Service	
48	Network Orchestration Demonstration	
49	Network Slices Demo	
50	Experimental Triplet Deployment Demo	

7. Project website updates

7.1. Website Updates

Content of the project's website [11] 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.

7.2. Website Updated Statistics

To evaluate the engagement of the 5G community, we may look at the number of unique visitors to our website. In 2021, 5GASP's website had, on average, 253 monthly unique users. In 2022, this value increased to 638, resulting in an increase of 252%. This proves that 5GASP is becoming more widespread in the 5G Community, thus having more engagement from its members. Figure 8 shows the monthly evolution of unique members until the end of November 2022.



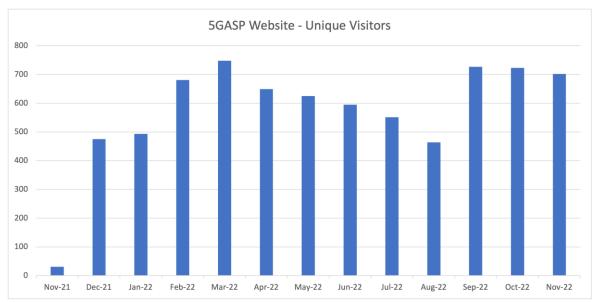


Figure 8. 5GASP Website - Unique Users Evolution during 2022

In 2022, our website had 8,512 unique visitors. Moreover, it is also important to reference that, after the summer vacation period, the 5GASP's website number of unique visitors has remained stable, with around 700 unique visitors per month. This is a trend we aim to maintain during 2023.

Regarding the navigation time, the average value is of 75 seconds, with around 95% of users only staying on the website for less than 2 minutes. This is troublesome, and thus the consortium will focus on implementing strategies to generate better user content, so we can retain the users on our website for a more prolonged period of time. Figure 9 showcases the visits duration statistics.

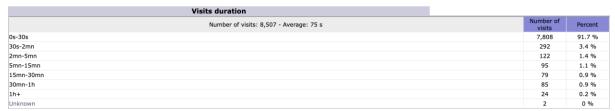


Figure 9. 2022 Visits Duration

It is also important to evaluate the origin of the users who visit our website. By comparing 2022 top 10 traffic-originating countries with the ones from 2021, it is possible to notice an increase in European countries, which is consistent with 5GASP's dissemination updated approach. Figure 10 showcases the top 10 traffic-originating countries.



Figure 10. 2022 Top 10 Traffic-Originating Countries



Lastly, Figure 11 showcases the top 10 pages of our website. We can see that, after the index page, the most visited page was the Deliverables one, being viewed 492 times throughout this year.

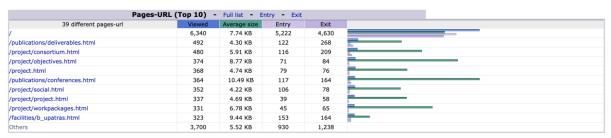


Figure 11. 2022 Most Visited Pages

8. NetAppCommunity Portal updates

The NetAppCommunity portal [12] has been developed in WP6. During the 2nd year of the project the portal was used for the community building and dissemination.

To attract more visitors, the consortium members prepared new materials for the Community portal. In particular, 11 new blog posts were published on the portal (Figure 12). The topics of the blog posts concern different aspects of NetApps development and use cases:

- "Automated Certification for NetApps" (EANTC)
- "PrivacyAnalyzer's transformation to a NetApp supporting 5GASP's vertical use cases" (Lamda)
- "Isolated Operations in 5G PPDR" (ININ)
- "Role of an intelligent NetApp to achieve the ZSM goals" (UNIVBRIS)
- "Using 5G to deliver connected and cooperative services for improved road safety and traffic efficiency" (YoGoKo)
- "BLB's role in the testing of the NetApps for Automotive and PPDR verticals" (BLB)
- "Autonomous vehicles teleoperation Is 5G the Solution?" (DriveU)
- "NeoBus integration in UrbanAir "UrbanBus"" (Neobility)
- "ITAv's Network Orchestrator NetOr" (ITAV)
- "5GASP's approach to the lifecycle of a NetApp (onboarding, deployment, and validation)" (UoP)
- "Some ideas and tips about NetApp specific tests" (Odins).



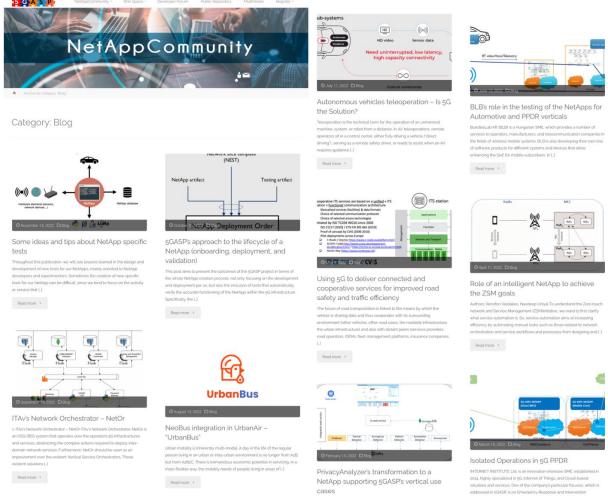


Figure 12. Blog posts webpage on the Community Portal

The new materials have been also published on the NetAppCommunity Knowledge Center where the consortium members accumulate research results, guidelines, tutorials and other useful information to share it with the broad audience. In particular, the Knowledge Center provides the portal visitors with the following guidelines and tutorials:

- 5GASP Certification Process
- Build your VNF from scratch
- Juju Charms tutorial
- Day-1 and Day-2 VNF operations
- How to test your VNFs with the Robot Framework.





Figure 13. Knowledge Center webpage on the Community Portal

To support certification process, a dedicated webpage "Certification Guidelines" is available on the portal (Figure 14).



Figure 14. Certification Guidelines webpage on the Community Portal



The "Multimedia" webpage (Figure 15) provides the portal users with the direct access to 29 educational videos of the 5GASP project.

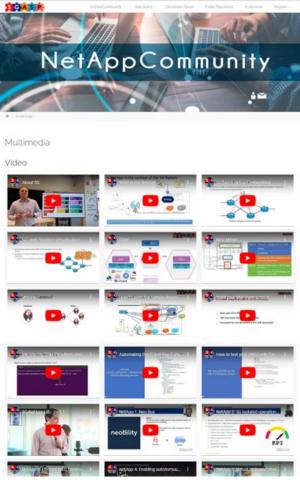


Figure 15. Multimedia webpage on the Community Portal

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 in December 2022 (Figure 16) and November 2021 (Figure 17) shows, the number of the portal visitors has increased in 5 times, the number of pageview has raised in 3.5 times and the number of sessions has increased in 4.8 times.

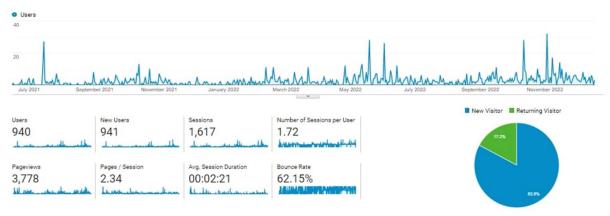


Figure 16. Metrics of the Community Portal: December 2022



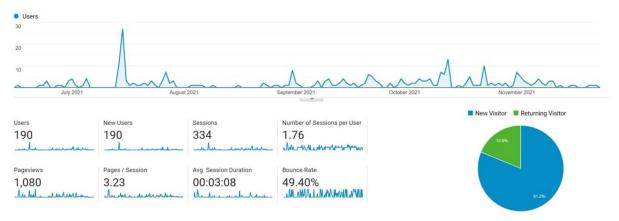


Figure 17. Metrics of the Community Portal: November 2021

For the next period, the consortium plans to continue working on new materials to share experience in the area of 5G and contribute into the Community building.

9. Press Releases

The preparation of the project press releases allows to support of the project dissemination activities. During the second year two press releases have been published.

The Press Release #3 [13] issued on March 1, 2022 has the title '5GASP Platforms Development'. This press release presents basic information about the project's platforms: NetApp Community Portal and NetApp Store. It defines the main objectives of 5GASP platforms development and their future usage. The press release also introduces the Community Engagement Events (Figure 18).



Figure 18. Press Release #3

The Press Release #4 [14] issued on June 13, 2022 has the title '5G NetApp Lab'. It presents the 5G NetApp Lab, which supports startups, SMEs, developers and researchers that wish to design and deliver valuable 5G products and services, leveraging the native 5G technology



capabilities. Special attention in this press release is given to the first 5G NetApp Lab Event took place on the 19th of May, 2022 (Figure 19).



5G NetApp Lab

5GASP strives to achieve a long-term goal: the development of a self-sustainable community of 5G researchers, developers, and vertical end-users that can disseminate knowledge about (i) how to develop NetApps, (ii) how to test them under close-to-real conditions; and (iii) how to certify their NetApps before the latter finally reach their targeted Network Operators and/or Vertical industry customers.

Our goal is indeed quite ambitious, but at the same time, it is *pragmatic* with respect to identifying, building, testing and validating a critical mass of technological components and optimal architecture designs, which can become blueprints for NetApp developers.

To support NetApp developers with their initiatives was launched the 5G NetApp Lab Accelerator

The 5G NetApp Lab accelerator is delivered by the Horizon 2020 <u>5GASP</u> project to enable SMEs, startups and individuals to develop, test and validate 5G-based NetApps for various business verticals and to create a community of developers and vertical end-users around the 5GASP Platform in order to maximize the potential to create successful commercial products or services.

5G NetApp Lab supports startups, SMEs, developers and researchers that wish to design and deliver valuable 5G products and services, leveraging the native 5G technology capabilities. Selected teams will get support from mentors with diverse expertise in designing, developing, testing & validating, and promoting 5G network solutions. Thus, they will get to:

- Test and validate your product in real-life scenarios and on real-life 5G testbeds;
- Integrate the latest tools and platforms that support continuous integration & delivery;
- Get feedback on improving your business model and value proposition for the end-users;
- · Gain visibility towards investors and social media.

Our first 5G NetApp Lab Event took place on the 19th of May, 2022. It gave the possibility to learn how the program and the 5GASP ecosystem can support NetApp developers. There were a lot of interesting presentations, NetApp developers' pitches, questions and other relevant and helpful information.

All the videos from the event are available on our YouTube channel.

Do not miss the opportunity to engage with the 5G NetApp Lab Accelerator and 5GASP project!

Apply now to participate in the program and join our NetApp Community!







experimentation-and-certificationplatform/?viewAsMember=true



5gasp-contact@5g-ppp.eu

5GASP PRESS RELEASE: 5G NetApp Lab 12 June 2022

Figure 19. Press Release #4

Both press releases are available at the project website and disseminated through business network of the consortium members.

10. Leaflet updates

According to the dissemination activities plan, the leaflet #1 has been prepared during the first year of the project, for supporting the project events (Figure 20). The leaflet is shared among project partners to be used for a better visual representation of the project, its consortium, the project objectives, vision, and tasks. The leaflet is available for download from the 5GASP website. Printed copies of this version have been made available at different



events in which the project has been participating. It is worth noting that partners are currently updating Leaflet #1 to include the most recent project updates and outcomes.



Figure 20. The Project's leaflet



11. Conclusions

Each activity area of WP7 has progressed well. Partners are working on open software development which is already available. The number of dissemination activities related to international journals and conference papers has reached 21 contributions. Regarding the number of keynotes and panels together with the participation in 5G events, dissemination has already reached the number of 15. 5GASP has already participated at EuCNC 2022 and is also planning to participate at EuCNC 2023 in different forms (conference papers, talks, joint workshop with ICT-41 projects).

During the second year 5GASP partners continued to use the next dissemination channels: blog posts, press releases, webinars. All the targeted public deliverables were submitted and made available in the project website. These dissemination activities have helped to reach a large number of people from academia, industry, civil society, media, etc. The project is broadly on target time to meet initial targets and in some areas as 5GASP moves towards use case delivery and demonstrations the greatest opportunities for engagement and dissemination lay ahead for this project.

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