



H2020 5GASP Project

Grant No. 101016448

D6.1 Initial report on building NetApps Community & defining a certification process

Abstract. Building a NetApps community is paramount for the 5GASP Project. First, by spreading the word about NetApps and helping the community to understand what the project is about; second, by conveying the necessary development background knowledge; and third, by attracting both SMEs' and large companies' interest to become members of the NetApps community for utilising the consortium's interconnected testbed facilities. This document provides an overview of building the 5GASP NetApps community. Specifically, we introduce and describe in detail our appropriate online platforms for SMEs to support businesses and foster NetApp development by designing two complementary portals, namely the (i) NetAppStore for businesses and the (ii) NetAppCommunity for developers. Moreover, we discuss the organisation and delivery of community engagement events, including educational webinars and workshops related to 5GASP NetApps. Finally, this deliverable also outlines our plans for kicking off the current work packages task related to 5GASP certification processes and our plans for future community engagement events.

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Disclaimer

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Executive Summary

This deliverable report is the first one in a series of three deliverable reports scheduled for M13 (current document), M23 (interim report) and M36 (final report), respectively. The present report sets the foundation for the future ones, which shall provide updates according to the progress of WP6 tasks and milestones, the running of community events, and maintenance activities for the portals that support SMEs and other developers engaging with 5GASP NetApp development and/or other activities and events. Also, the present deliverable presents the plan for defining the 5GASP Certification (5GASP-C) process.

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List of Acronyms

CI/CD	Continuous Integration - Continuous Delivery
FAQ	Frequently Asked Questions
MoSCoW	A prioritisation method used for software requirements analysis (M - Must have S - Should have C - Could have W - Won't have)
SME	Small and Mid-size Enterprise
5GASP-C	5GASP Certification

1 Introduction

WP6 sets the following objectives: (i) to build and facilitate a community of SMEs that will design, implement and test their NetApps in the context of the 5GASP project; (ii) to provide an appropriate online platform for Small and Mid-size Enterprises (SMEs); (iii) to provide a certification process for the SMEs that test their NetApps in the 5GASP provided facilities; and (iv) to organise promotional events for collaborations.

At the time of authoring this report, 5GASP has started to address or sets a plan for addressing the above objectives. Specifically, the current deliverable serves two main purposes. The first one is to present *the design of our two complementary portals*, namely, (i) NetAppStore¹ and (ii) NetAppCommunity². The former portals will support the development and business aspects, respectively. The NetAppStore portal is aimed to help innovative business solutions, whereas the NetAppCommunity portal aims to support NetApp developers, Network Functions and Network Services. It also includes a developers forum with 5GASP technical documentation on architecture and testbed sites, tutorials and user guides for developers, network operators and verticals.

The second purpose of this document regards *the promotion of the 5GASP NetAppLab initiative* through community engagement events such as educational webinars targeting the engagement of future developers, as well as Hackathons and demonstrations. Such community engagement events ensure varied opportunities and formats to address the current COVID-19 circumstances and restrictions regarding on-site live events. Specifically, we present our conducted 2021 educational webinars with links to videos produced by 5GASP partners and made publicly available online on the YouTube platform. In addition, we also give the details of our first and second NetApp Lab Events, with links to recorded YouTube video playlists and event analytics as well as participant feedback details.

Finally, the document outlines the future steps plan for WP6, including outlining our future-defined approach towards the certification process of 5GASP NetApps (Task 6.3 starting M13). Moreover, we brief our plan details for future community engagement events during 2022 and 2023.

1.1 Document structure

The rest of this document is structured as follows. Section 2 describes 5GASP platforms, including NetApp Community Portal and NetApp Store Portal. Section 3 contains details about community engagement events for showcasing NetApp and 5GASP technologies. Finally, Section 4 outlines our plans and conclusions from this deliverable, including plans for the recently initiated Task 6.3 about the certification process for SMEs, as well as our plans for future community engagement events.

¹ Note that MS6.2 regarding a beta version of NetAppStore is set for M15 and that here we outline a plan of design prior to meeting with the milestone.

² NetAppCommunity beta version is up and running in compliance to milestone commitment MS6.1 [M6]. The beta version of the portal is publicly available online here: <https://community.5gasp.eu/>.

2 5GASP Platforms

This section presents the beta versions of two complementary portals developed within WP6, namely, the (i) NetAppCommunity portal and the (ii) NetAppStore portal. To explain the portals development, we overview the requirements specification (functional, non-functional, requirements to the content), sitemap, and design of each portal.

2.1 NetAppCommunity Portal

The NetAppCommunity portal [1] aims to support NetApps, Network Functions, and Network Services developers. It provides users with a developers' forum, technical documentation, user guides, and other related information for developers, operators, verticals, etc.

2.1.1 Requirements Specification

The main objective of the NetAppCommunity portal is to support the Community of NetApp developers and users with relevant information in the field of 5G with a specific focus on NetApps' development and certification as well as to provide the Community members with useful information like announcements of events (conferences, workshops, webinars, etc.), news, and blog posts. This objective allows the formulation of the requirements for the content as defined in Table 1.

Table 1. Requirements for the content.

Page Name	Page Content	Page Visibility
NetAppCommunity (Home page)	Includes three sections: 1. Events (events announcements) 2. News (Community and project news) 3. Blog (blog posts)	Visible to all visitors
About	Description of the Community and 5GASP project mission	Visible to all visitors
NetAppCommunity Members	A list of companies and academic partners registered as the Community members	Visible to all visitors
5GASP Project	Brief information about the 5GASP Project with the links to the project resources (the project website, 5GASP portal and NetAppStore portal)	Visible to all visitors
Knowledge Center	The collection of paper abstracts, materials, definitions, etc.	Visible to all visitors
Certification Guidelines	Description of the NetApp certification application process	Visible to all visitors
NetApp Cases Studies	Information on three use-cases: Automotive, PPDR and Cross Vertical	Visible to all visitors
5GASP Documentation	The 5GASP deliverables that can be of interest for the Community members and visitors of the portal (methodology for NetApps design, development and testing, architecture, model entities specification and design, market research report, etc.)	Visible to all visitors

FAQ	A collection of frequently asked questions and their answers	Visible to all visitors
Developers' Forum	A forum for NetApps developers and users	Visible to all visitors
Public Repository of Experiments	Description of NetApps that are under development and validation on the 5GASP infrastructure	Visible to all visitors
Multimedia	Gallery of videos created by 5GASP experts and the Community pictures	Visible to all visitors
Login	Login page that includes: <ul style="list-style-type: none"> • Field "Username or E-mail", • Field "Password", • Checkbox "Keep me signed in" • Button "Login", • Button "Register", • Link to "Password Reset" page 	Visible to all visitors
Register	Register page that includes fields for the following information: <ul style="list-style-type: none"> • Company information ("Company Name", "Company Website", "Country"); • Company representative information ("First Name", "Last Name", "Position", "E-mail Address"); • Signing-in details ("Username", "Password", "Confirm Password") 	Visible to all visitors
Password Reset	Includes a field for a username or email	Visible to all visitors
My Account	Includes: <ul style="list-style-type: none"> • Field "Username", • Field "First Name", • Field "Last Name", • Field "E-mail Address", • Field "Password", • Button "Update Account" 	Available after login
Edit Profile	Includes: <ul style="list-style-type: none"> • Field "Company Name", • Field "Company Website", • Field "Country", • Field "First Name", • Field "Last Name", • Field "Position", • Button "Update Profile", • Button "Cancel" 	Available after login

According to the portal purpose and logic, there are three roles of the portal users: an unregistered user, a registered user, and an admin. An unregistered user can only browse pages with open content, according to Table 1. After registration, the user can also create their company's profile and communicate with other registered users in the Developers' Forum. The portal admin manages the content and administrates the Developers' Forum. Possible use cases are shown as a UML diagram in Fig. 1.

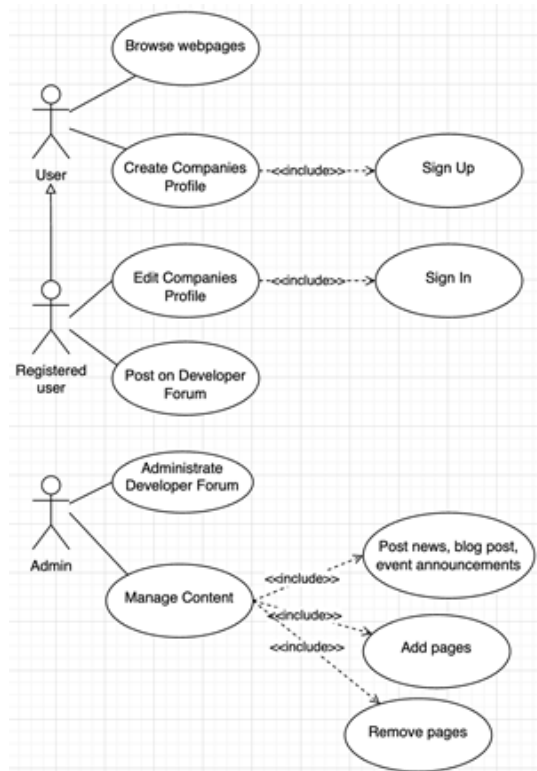


Figure 1. Use Case diagram.

The functional requirements (Table 2) are defined according to the Use Case diagram. They suppose the priority scale is defined according to the MoSCoW analysis [2].

Table 2. Functional requirements.

Name	Description	Priority
FR01	Visualization of textual and graphical content	MUST (Mandatory)
FR02	Navigation with menu	MUST (Mandatory)
FR03	Content management	SHOULD (Of high priority)
FR04	Forum management	SHOULD (Of high priority)
FR05	User management	COULD (Preferred but not necessary)
FR06	Media management	WOULD (Can be postponed and suggested for future execution)

The non-functional requirements specify the quality attributes of the NetAppCommunity portal, including graphical design and security matters. These requirements are defined in Table 3.

Table 3. Non-functional requirements.

Name	Description	Priority
NR01	HTTPS protocol	MUST (Mandatory)
NR02	A password to include at least 8 characters and at least one capital letter, one lowercase letter, one digit	SHOULD (Of high priority)
NR03	5GASP project logo on all pages	MUST (Mandatory)
NR04	UX to use neutral colours	SHOULD (Of high priority)
NR05	Each page to include both textual information and graphics.	COULD (Preferred but not necessary)
NR06	Search by keywords or tags	COULD (Preferred but not necessary)

2.1.2 Design, content and development details

The NetAppCommunity portal is designed following the defined requirements. The site map is shown in Figure 2.

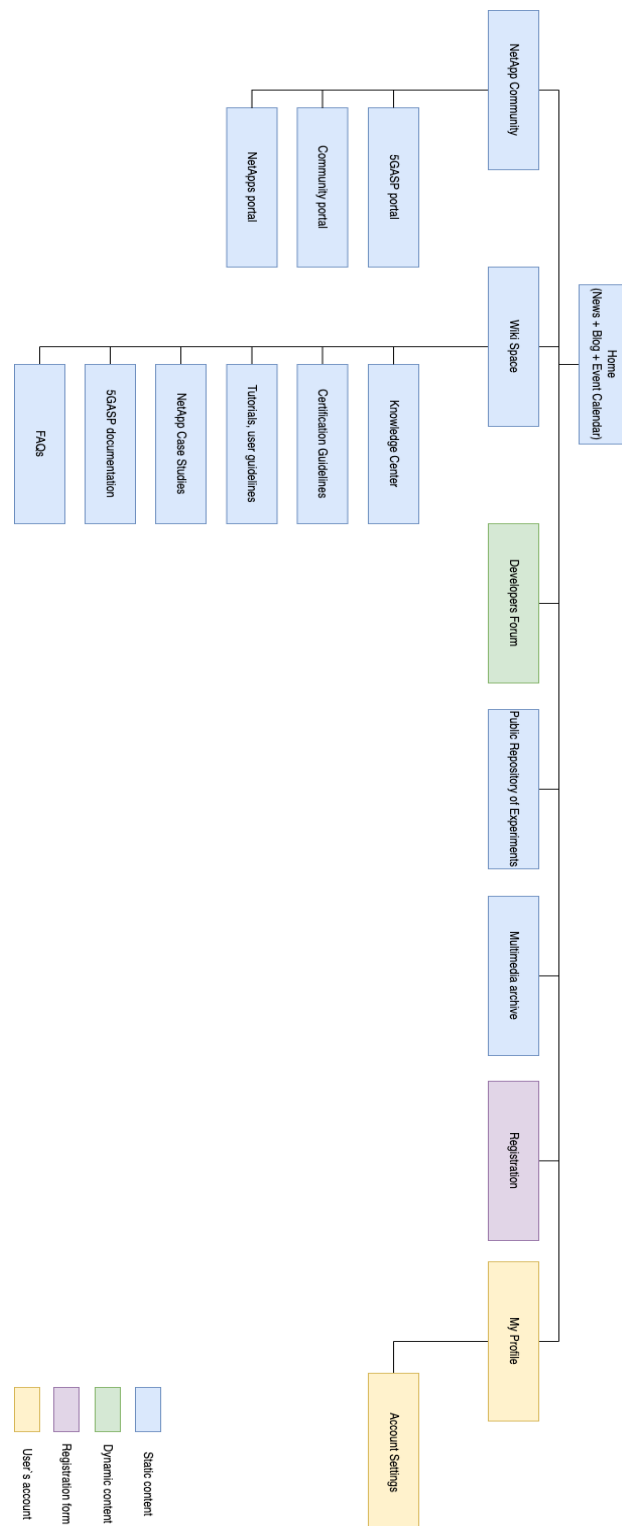


Figure 2. The site map for the NetAppCommunity portal.

The portal includes pages of three types:

1. Pages with "static" content (content is to be updated by the portal admin).
2. Pages with "dynamic" content (content is to be updated according to users' entries).
3. Page with forms.
4. User's account pages.

The portal's graphical design is shown in Figure 3.



Figure 3. The main page with 5GASP logo and graphical content.

Thus, the developed beta-version satisfies the requirements of the NetAppCommunity development at the first iteration. The next iteration will be focused on the maturity of the content and polishing of the graphical design.

2.2 NetAppStore Portal

NetAppStore portal, which is one of 5GASP innovative solutions for business, provides operational information collected automatically during the NetApps' independent testing on the 5GASP platform.

2.2.1 Requirement Specification

The NetAppStore portal can be roughly divided into three areas:

1. Upper menu.
2. Sort menu and a Search field.
3. Content.

The "Upper menu" section contains a roadmap by which users can go to the resources they are interested in, as well as functionality for authorising and registering new users. This is described in Table 4.

Table 4. Requirements for the "Upper menu".

Menu element	Content	Visibility
NetAppStore	Home page	Visible to all visitors
About	Redirect to: 5GASP portal	Visible to all visitors
NetApp	Redirect to: Community portal	Visible to all visitors
Community		
Certification	Redirect to: Community portal	Visible to all visitors
Guidelines	Certification Guidelines	
Register With	Redirect to: Community portal	Visible to all visitors
Search	Registration	
SmeSList	Unavailable	Visible to all visitors

ProductList	Redirect to: portal with products	Visible to all visitors
Certification	To be added	Visible to all visitors
ProcessResults		
Add apps	Redirect to: portal for NetApps	Visible to all visitors
Edit Panel	Redirect to: portal for NetApps	Visible to all visitors
Registration	Register window that includes fields for the following information:	Visible to all visitors
	<ul style="list-style-type: none"> – Label "Please, fill all necessary fields below" – Optional field "Name" – Optional field "SurName" – Required field "E-Mail" – Required field "Password" – Required field "Confirmation of password" – Button "Cancel" – Button "Save" 	
Sign In	Sign window that allows users to sign in via filling next fields:	Visible to all visitors
	<ul style="list-style-type: none"> – Label "Welcome" – Required field "Email" – Required field "Password" <ul style="list-style-type: none"> o Button "Visibility" – Button "Cancel" – Button "Enter" 	

The "Sort menu + Search field" section contains additional options for filtering and changing the display of page content, as well as a search field that is used to search for the desired NetApp by its title. This is described in Table 5.

Table 5. Requirements for the "Sort menu + Search field".

Elements	Content	Visibility
Elements	This menu contains options for displaying a fixed number of NetApp cards:	Visible to all visitors
	<ul style="list-style-type: none"> – Option "Show 6 elements" – Option "Show 12 elements" – Option "Show 18 elements" 	
Details	This menu contains options for filtering NetApp cards:	Visible to all visitors
	<ul style="list-style-type: none"> – Option "Best rating" – Option "A lot of projects first" – Option "Latest project" – Option "New on platform first" 	
Price	This menu contains options for filtering NetApp cards:	Visible to all visitors
	<ul style="list-style-type: none"> – Option "From lower to higher" – Option "From higher to lower" 	
Updates	This menu contains options for filtering NetApp cards:	Visible to all visitors
	<ul style="list-style-type: none"> – Option "From earlier to older" – Option "From older to earlier" 	
Search field	This field is needed to quickly search NetApp by name.	Visible to all visitors

The Content section contains NetApps card views. This is described in Table 6.

Table 6. Requirements for the "Content".

Element	Content	Visibility
---------	---------	------------

NetApp card

All NetApp cards will contain the Visible to all visitors
next info:

- Header:
 - o NetApp title
- Content:
 - o Image (logo) of NetApp
 - o NetApp description
 - o Label "Price:"
 - o NetApp price;
 - o Label "Version:"
 - o NetApp version
 - o Label "Experimental:"
 - o NetApp status
 - o Button "Preview" (redirect to portal with NetApps)
- Footer:
 - o Calendar Icon;
 - o Label "Last update:"
 - o Date from NetApp

An UML diagram was compiled to display possible options for using this platform, shown in Figure 4.

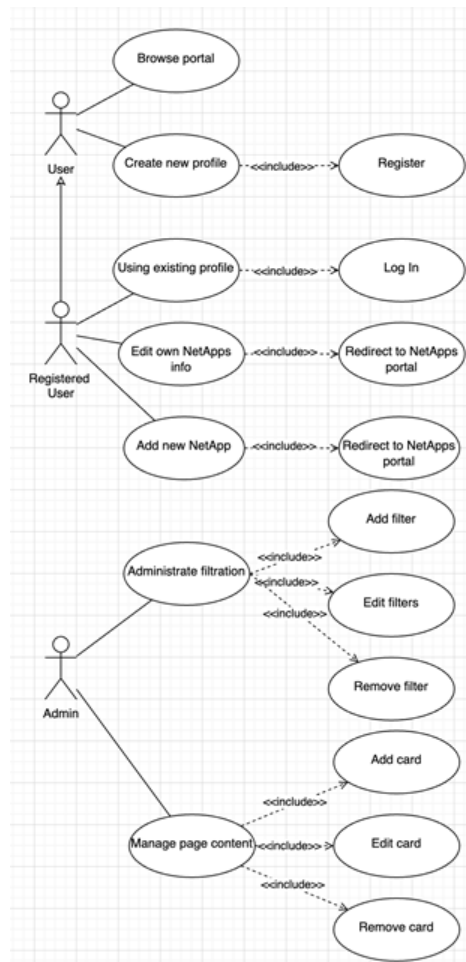


Figure 4. Use Case diagram.

The description of the functional requirements (Table 7. Functional requirements. Table 7) was defined in accordance with the UML diagram shown in Figure 10.

Table 7. Functional requirements.

Name	Description	Priority
FR01	Visualization of textual and graphical content	MUST (Mandatory)
FR02	Navigation with menu	MUST (Mandatory)
FR03	NetApps management	WOULD (Can be postponed and suggested for future execution)
FR04	User management	WOULD (Can be postponed and suggested for future execution)
FR05	Filtration management	COULD (Preferred but not necessary)
FR06	Content management	COULD (Preferred but not necessary)

The non-functional requirements are defined in Table 8.

Table 8. Non-functional requirements.

Name	Description	Priority
NR01	HTTPS protocol	MUST (Mandatory)
NR02	A password to include at least 8 characters and at least one capital letter, one lowercase letter, one digit	SHOULD (Of high priority)
NR03	5GASP project logo on all pages	MUST (Mandatory)
NR04	UX to use neutral colours	SHOULD (Of high priority)
NR05	Each NetApp to include both textual information and graphics	COULD (Preferred but not necessary)
NR06	Search by NetApp title	COULD (Preferred but not necessary)

2.2.2 Design, content and development details

The NetAppStore portal is designed in accordance with the defined requirements. The site map is shown in Figure 5. The portal includes pages of three types:

1. "Static" elements (content is to be updated by the portal admin).
2. "Dynamic" elements (content is to be updated according to users' entries).
3. Windows with form.

The portal graphical design is shown in Figure 6.

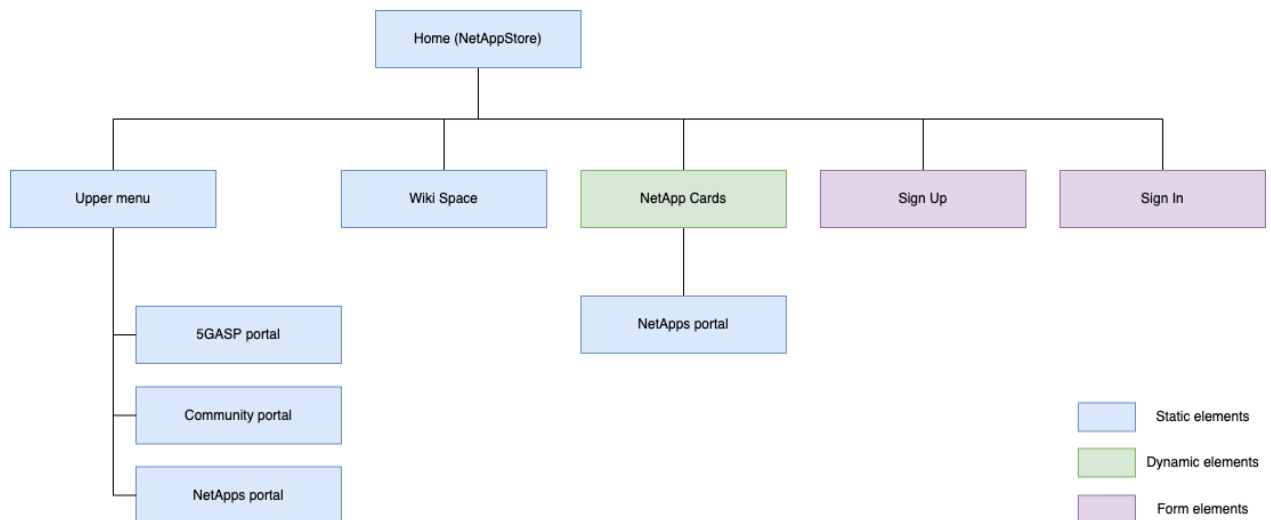


Figure 5. The site map.

When a user first enters the site, he will be able to view all available NetApps, as shown in Figure 6. Also, the user will be able to use the roadmap to navigate to the resources of interest and a variety of filters and/or search fields to change the order of displaying content.

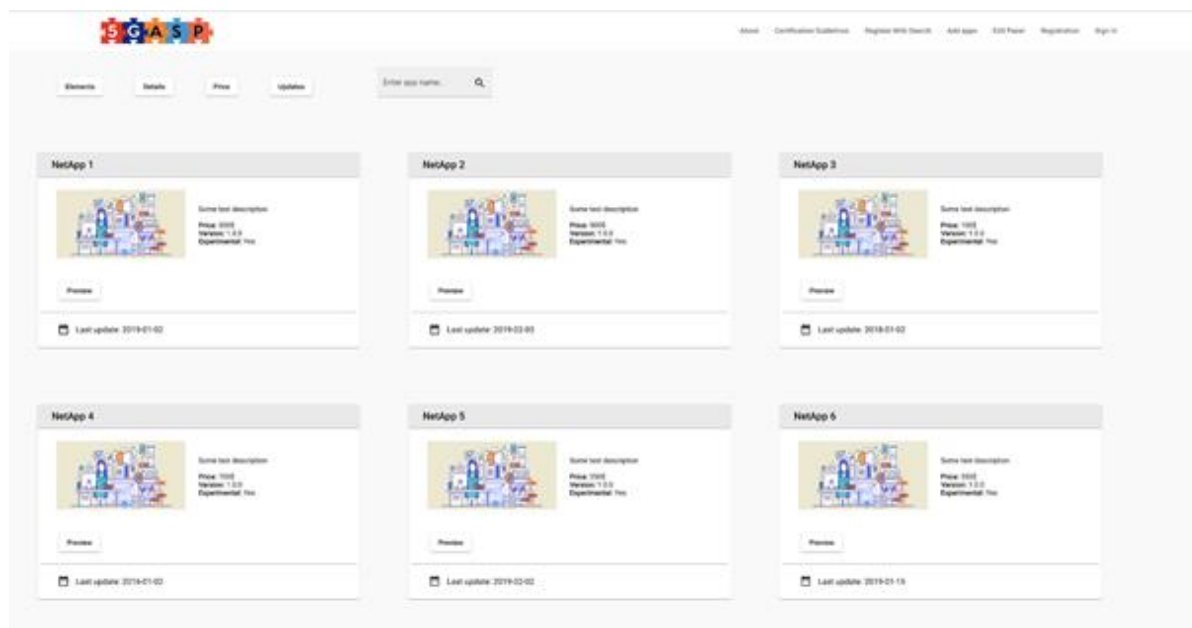


Figure 6. The main page with 5GASP logo and graphical content.

When the user selects any NetApp, the latter will have a distinctive highlight, as shown in Figure 7. For each NetApp, at least the following fields will be available:

- Title
- Description
- Image (logo or similar)
- Price
- Version
- Is it in experimental mode
- Link for more details
- Last update date

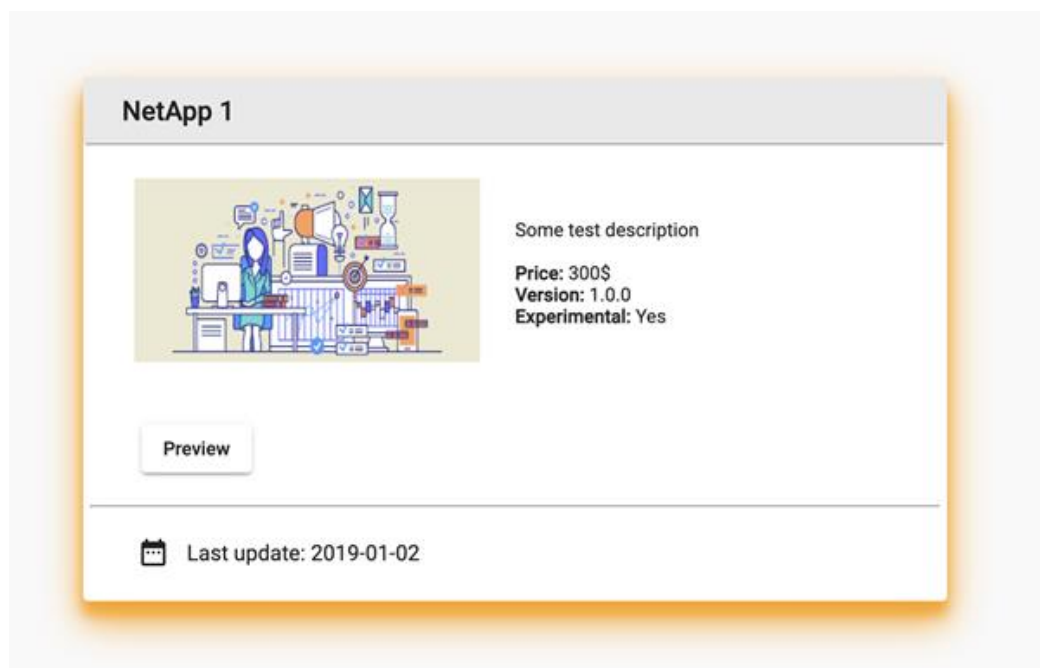


Figure 7. Selected card for "NetApp 1".

Thus, the beta version under development satisfies the requirements of the NetAppStore development at the first iteration. The current version of the portal has been developed to display test NetApps and filter them. At the next iteration, it is planned to finalise the design of the portal, as well as to transfer of all test functionality to a higher level.

3 Community Engagement Events

The Community Engagement Events are an important part of the 5GASP Project, supporting the dissemination efforts regarding the 5GASP platforms and certification process and a close engagement with NetApps developers such as SMEs, startups, teams of students and researchers, as well as specialists from bigger companies who can leverage the 5G technology and 5GASP platforms. Through the events, we are addressing current and potential future developers of NetApps that can benefit from the project developments [13]. In addition, we promote topics related to 5G in general and to 5GASP, in particular, to inspire, encourage and support technical specialists to build on 5G.

The 5GASP Project includes a series of online webinars, a program dedicated to NetApp developers, the NetAppLab program, and events, to ensure varied opportunities and formats that can be adapted as best as possible to the global health situation.

3.1 2021 Educational webinars

As a first effort to support education and ensure a baseline of understanding for people joining the 5GASP community, we created a series of short videos explaining the basic concepts in the 5G ecosystem.

The videos aim to be a clean-slate approach towards the basic concepts, using simple terms to explain the technology. They are aimed at an audience with general technical knowledge, such as students, developers, tech entrepreneurs and experts in other various technical domains.

The videos are published on the 5GASP YouTube account, in a dedicated playlist³. We have referenced them in the promotion materials of the webinars we have organised and will keep doing so for all future events. We also promote snippets of knowledge on our social media accounts, aiming to raise awareness and draw people to watch the full videos.

The views of the videos in the playlist have so far gathered 539 views (as of January 24th 2022) and cover the following topics:

- About 5G [4]
- What is the NetApp [5]
- Software defined networking [6]
- Network function virtualisation [7]
- OSM (Open Source MANO) [8]
- Network Function Virtualization MANO (NFV MANO) [9]
- Jenkins [10]
- How to write a NetApp descriptor [11]
- What is Openslice [12]

To adapt to the COVID-19 pandemic and as a continued effort for community building, we organise a series of online events that offer information about the 5GASP Project and the 5G technology in general. In addition, we address current technical researchers, students, developers and tech

³ Playlist available online via 5GASP YouTube account:

<https://www.youtube.com/watch?v=LG2p4wvFgl4&list=PLviCCfHpC15E7nLQoDarMs6wMMCMhikO8>.

entrepreneurs that will thus understand more about the 5G benefits and can grow to become developers of NetApps in the future.

The first two webinars we held in the fall of 2021, gathered a total of 444 participant registrations. We use Eventbrite as the main platform to promote and gather event registrations. As of November 15th, the Eventbrite 5GASP profile has 53 followers.

3.2 First Community Event (1st NetApp Lab Event)



Figure 8. First Community Event introductory slide.

Entitled **5G - Technology updates & opportunities**, the first webinar we organised was focused on the main concepts and knowledge necessary to understand 5G development. It went through the main concepts needed to work in the 5G space and offered participants the opportunity to ask questions to clarify any question marks they may have had.

The event took place on October 13th, online, via Zoom webinar and the Eventbrite live page. The full event recording is available in the dedicated YouTube playlist:

https://www.youtube.com/watch?v=UcQeDJHHot8&list=PLviCCfHpC15ESO486m1byUb6OoZq_t4he

The event was mainly presented via the Eventbrite public page and was promoted on all 5GASP channels, as well as partners' channels.

<https://www.eventbrite.com/e/5g-technology-updates-opportunities-tickets-174198210537>

The agenda included a presentation on the 5GASP Project delivered by Diogo Gomes, 5GASP Project Coordinator, Instituto de Telecomunicações Portugal. Marius Iordache, 5G Technical Manager at Orange Romania presented the major developments of the 5G technology and an overview of the commercial market - expected use cases and coverage developments. Further on, Dr. Christos Tranoris, Senior Researcher at the Electrical and Computer Engineering Department of University of Patras presented the NetApp concept and implementation and representatives of the University of Bristol - Dr. Syed Ali, Research Fellow at the Smart Internet Lab and Navdeep Uniyal, Senior Research Associate at the High Performance Networks Research Group, Smart Internet Lab - talked about Software Defined Networking (SDN) & Network Function Virtualization (NFV).

The event also included external guest specialist Eduardo Sousa, Software Engineer - OSM at Canonical who presented MANO - NFV Management and Network Orchestration. Kostis Trantzas - Researcher and PhD candidate at the Electrical and Computer Engineering Department of University of Patras

presented details about Open Slice and Vesselin Arnaudov, Director, Advanced Development Center at VMware talked about Continuous Integration/ Continuous Delivery (CI/CD) tools.

Concluding the event, Dr. Roman Odarchenko, Senior Researcher at Bundleslab KFT presented the 5GASP Community and encouraged participants to register and join the conversations.

Event analytics:

This first event gathered 259 registrations with a peak of simultaneous online viewers of 110 attendees. The public event page has reached 1323 views. The YouTube recordings are an important amplification channel and opportunity to review concepts for the attendees, having gathered 286 views by January 24th 2022.

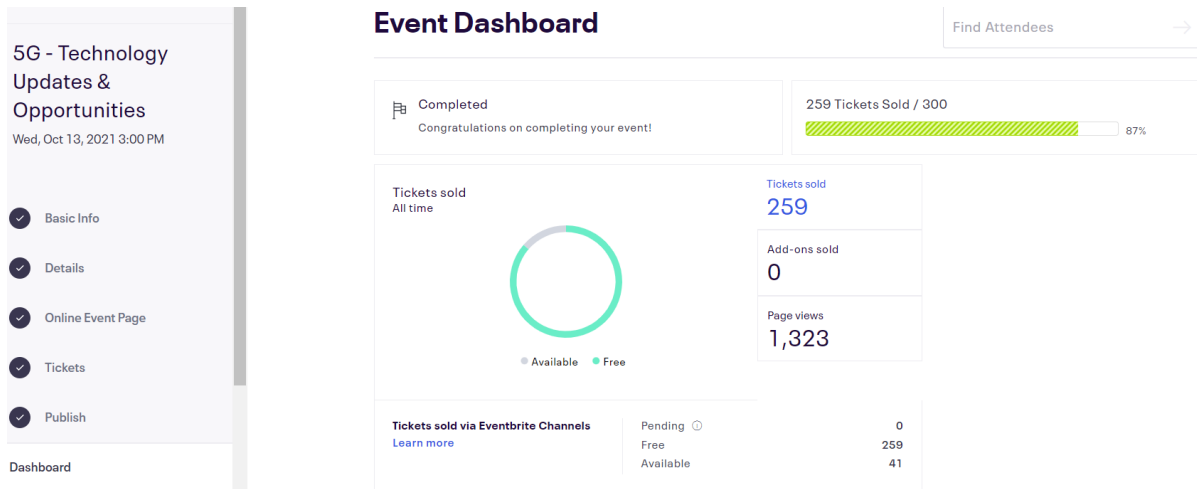


Figure 9. Main Eventbrite analytics numbers.

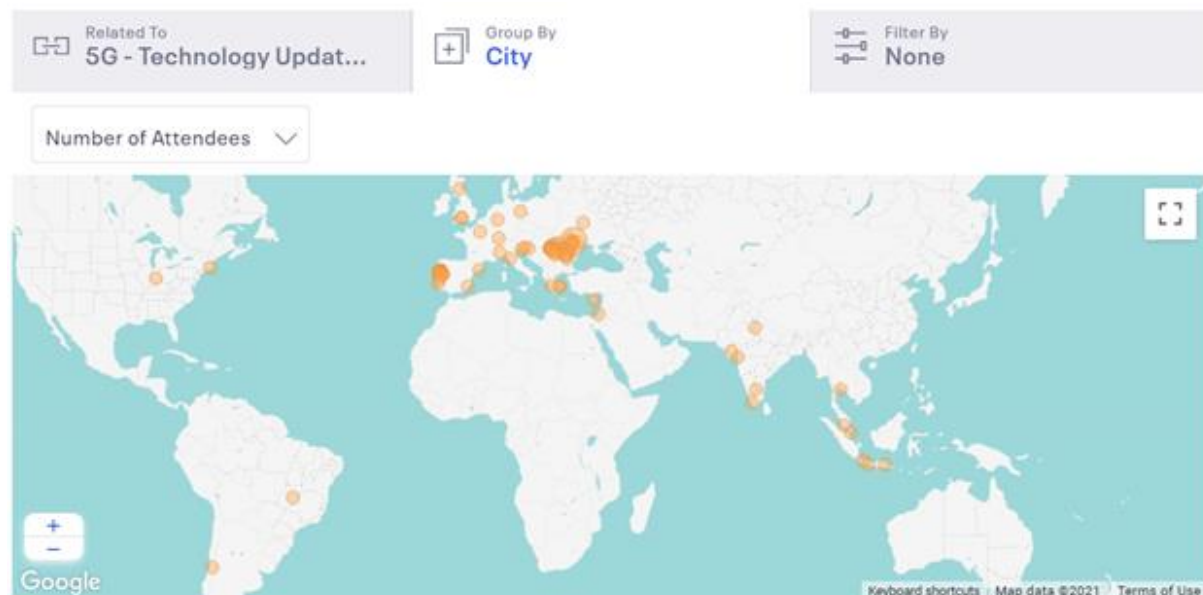


Figure 10. The geographical spread of Eventbrite registrations.

In the period of October 1st to October 22nd, the main activity on the 5GASP Twitter and LinkedIn channels was dedicated to promoting the 1st webinar. The tweets gathered a total of 3000 impressions, 60 likes, 33 retweets and generated 27 link clicks for the main posts. On LinkedIn, the posts gathered a total of 3075 impressions and 99 post reactions. The 5GASP LinkedIn page got a total of 111 page views and 49 unique page visitors. More information on this can be found in D7.6.1.

Feedback from participants

After the event, we sent out a feedback form to all event registered participants. The event was well appreciated, having received between 7 and 10 scores on the further recommendation scale. All feedback received from the 5 participants who completed the form can be viewed in the following figure.

Feedback form filled in by 5 participants.

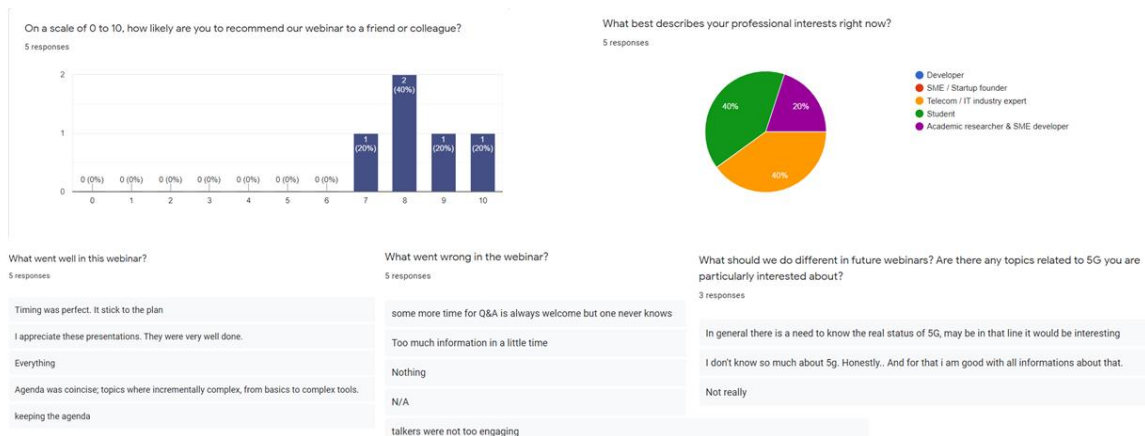


Figure 11. Feedback for the 1st webinar from participants via online feedback form.

3.3 Second Community Event (2nd NetApp Lab Event)



Figure 12. Second Community Event introductory slide.

Entitled **5G - Support for next-generation applications**, the second webinar presented more details about the 5GASP platform that is under development, offered a case study into one of the NetApps that is included in the 5GASP Project. The event also facilitated a discussion panel on the status of 5G – both from a technological and from a commercial network expansion and applications perspective as well.

The event took place on November 10th, online, via Zoom webinar and the Eventbrite live page. The full event recording is available in the dedicated YouTube playlist: <https://www.youtube.com/watch?v=3Lx3NZz5ajg&list=PLviCCfHpC15FIYWso3UoSpHN1uut94UQt>

The event was mainly presented via the Eventbrite public page and was promoted on all 5GASP channels, as well as partners' channels. <https://www.eventbrite.com/e/5g-support-for-next-generation-applications-tickets-190337012127>

The event was moderated by Diogo Gomes, 5GASP Project Coordinator, Instituto de Telecomunicações Portugal. After a short welcome from the moderator, Dr. Christos Tranoris, Senior Researcher at the Electrical and Computer Engineering Department of University of Patras, presented in depth the 5GASP Architecture. Further, Jorge Gallego-Madrid, Researcher at the University of

Murcia and Odin Solutions, presented a case-study for the Virtual On-Board Unit Provisioning NetApp for the Automotive vertical NetApp.

As a highlight of the event agenda for the more general public, the event featured a discussion panel on The Status of 5G, presenting different views on the technology and commercial developments. As a special guest, Dr. Alexandros Kaloxylos, Executive Director at the 5G Infrastructure Association presented his views on the 5G and 6G development. The panel also included representatives of the industry - Cristian Paţachia, Development & Innovation Manager, Orange Romania and Sven van der Meer, Lead Architect, Distributed Systems at VMware- and was balanced by the academic perspective of moderator Diogo Gomes, 5GASP Project Coordinator, Instituto de Telecomunicações Portugal.

Further, Dr. Roman Odarchenko, Senior Researcher at Bundleslab KFT presented the 5GASP Community and encouraged participants to register and join the conversations. The event concluded with a session of Q&A with all speakers.

Event analytics:

The second 5GASP webinar gathered 185 registrations with a peak of simultaneous online viewers of 85 attendees. The public event page has reached 1101 views and the recording on YouTube has 38 views as of January 24th2022.

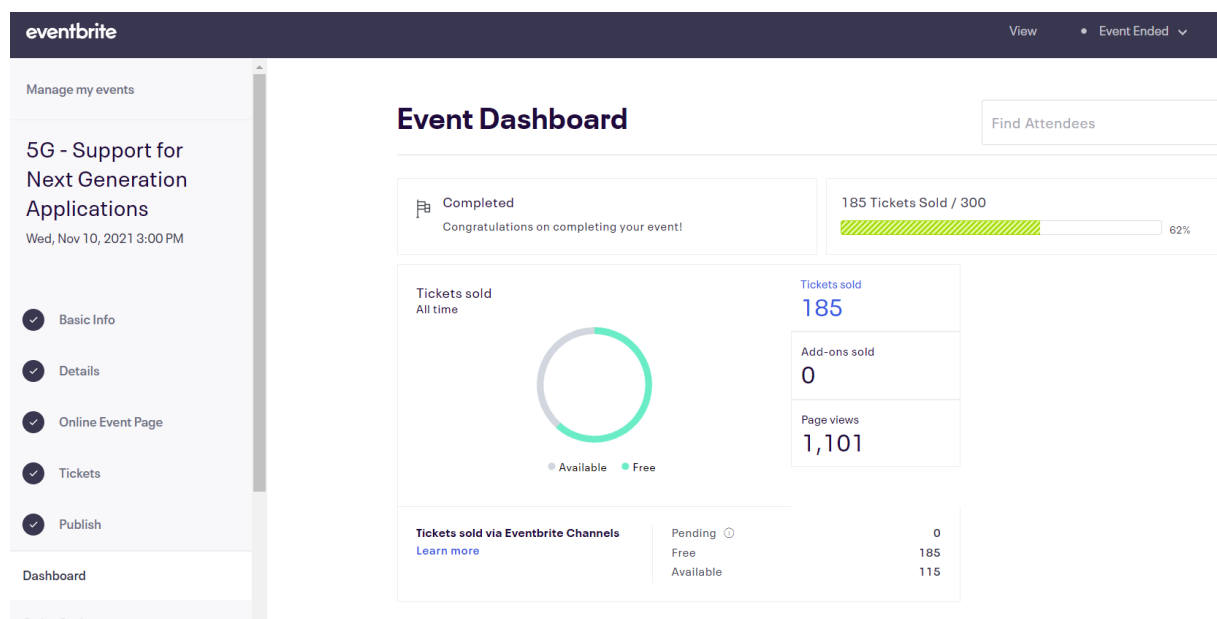


Figure 13. Main Eventbrite analytics numbers.

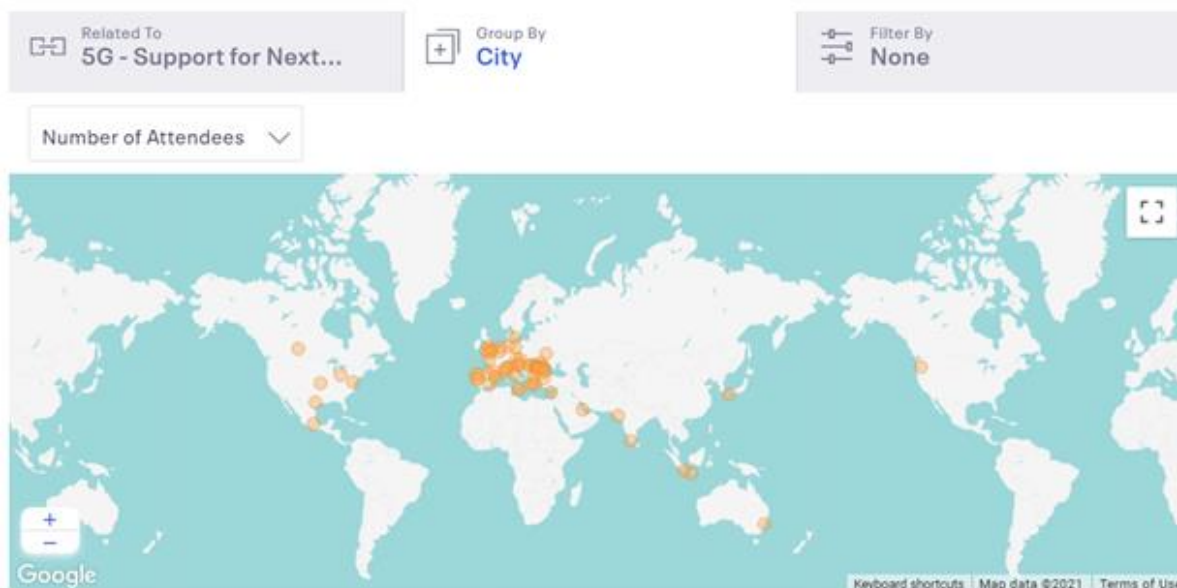


Figure 14. Geographical spread of Eventbrite registrations.

In the period of November 1st to November 12th, the main activity on the 5GASP Twitter and LinkedIn channels was dedicated to promoting the 2nd webinar. The tweets gathered a total of 2900 impressions, 70 likes, 28 retweets and generated 21 link clicks for the main posts. On LinkedIn, the posts gathered a total of 1837 impressions and 99 post reactions. The 5GASP LinkedIn page got a total of 54 page views and 24 unique page visitors. More information on this can be found in D7.6.1.

Feedback from participants

After the event, we sent out a feedback form to all event registered participants. The event has received scores of 6, 7 and 9 on the recommendation scale. All feedback received from the 3 participants who completed the form can be viewed in the following figure.

Feedback form filled in by 3 participants.

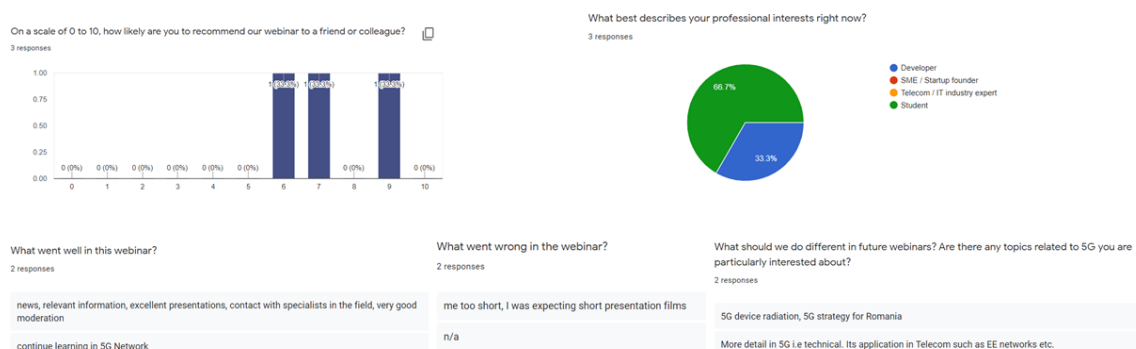


Figure 15. Feedback for the 2nd webinar from participants via online feedback form.

4 Future Steps & Conclusions

In what follows, we first brief our plan highlights for WP6 future activities. This includes an outline plan of "Task 6.3 - Certification process for SMEs", which has just been kicked off in M13 (i.e., January 2022). Also, we summarise our plans for future follow-up community engagement events after the success of those conducted in 2021 and presented in Section 3. Last, we highlight the main points from the deliverable about the community portals and the community engagement events so far.

4.1 Future Steps

4.1.1 5GASP Certification Process

The Project has created an initial instance of the certification strategy [4]. The document explains the technical coverage, the process, logistical and administrative aspects of the certification. Specifically, it outlines the interaction with NetApp vendors and the various steps that are mandated or recommended to initiate, progress, and complete a certification cycle. The document includes a specific focus on the intended automated, CI/CD nature of the 5GASP Certification (5GASP-C) pipeline; its goal is to provide continuous quality assurance for the NetApp community, growing the test scope, strengthening the technical goals, and expanding the number of NetApps covered.

The descriptions in D2.2 will be adapted in WP6 with a focus to educate the NetApp community, lowering the barriers for participation in the 5GASP-C certification pipeline. Generally, we aim to provide sample documentation paired with a very lean process, making it specifically easy for SMEs and startup vendors of NetApps to join the certification pipeline. The outcome of each certification run needs to be beneficial for the NetApp vendors to entice them to participate. Thus, we will focus on tests that will help NetApp vendors to increase the interoperability and improve the performance of their NetApps efficiently. With these measures we aim to grow the NetApp community around 5GASP quickly.

The entire 5GASP-C process is defined in D2.2 with three involved parties - NetApp Applicant, Authorized Testbed, and Certification Authority. We expect that each party, namely the "NetApp Applicant", the "Authorised Testbed" and the "Certification Authority", would pose a different focus and the related activities. To make it easier to follow by the different parties, some use cases are defined in Table 9.

Table 9. 5GASP Certification Use Case.

Use Case	Trigger Party	Responsible Party	Workflow
Certification Request	NetApp Applicant	Certification Authority	Section 4.1.1.1
Certification Testing	NetApp Applicant	Authorised Testbed	Section 4.1.1.2
Certification Issuing	Authorised Testbed	Certification Authority	Section 4.1.1.3

Certification Debugging	Authorised Testbed Certification Authority	NetApp Applicant	Section 4.1.1.4
Certification Arbitrating	Authorised Testbed NetApp Applicant	Certification Authority	Section 4.1.1.5
Re-certification	NetApp Applicant	Authorised Testbed Certification Authority	Section 4.1.1.6

4.1.1.1 Certification Request

NetApp Applicant should initial the certification process when his NetApp would like to be certificated by 5GASP-C. The applicant would be allowed to select one or multiple 5GASP testbeds to validated his NetApp. After the certification process, one certificate would be issued online, and the applicant will have the opportunity to showcase his product on 5GASP NetAppStore public marketplace portal.

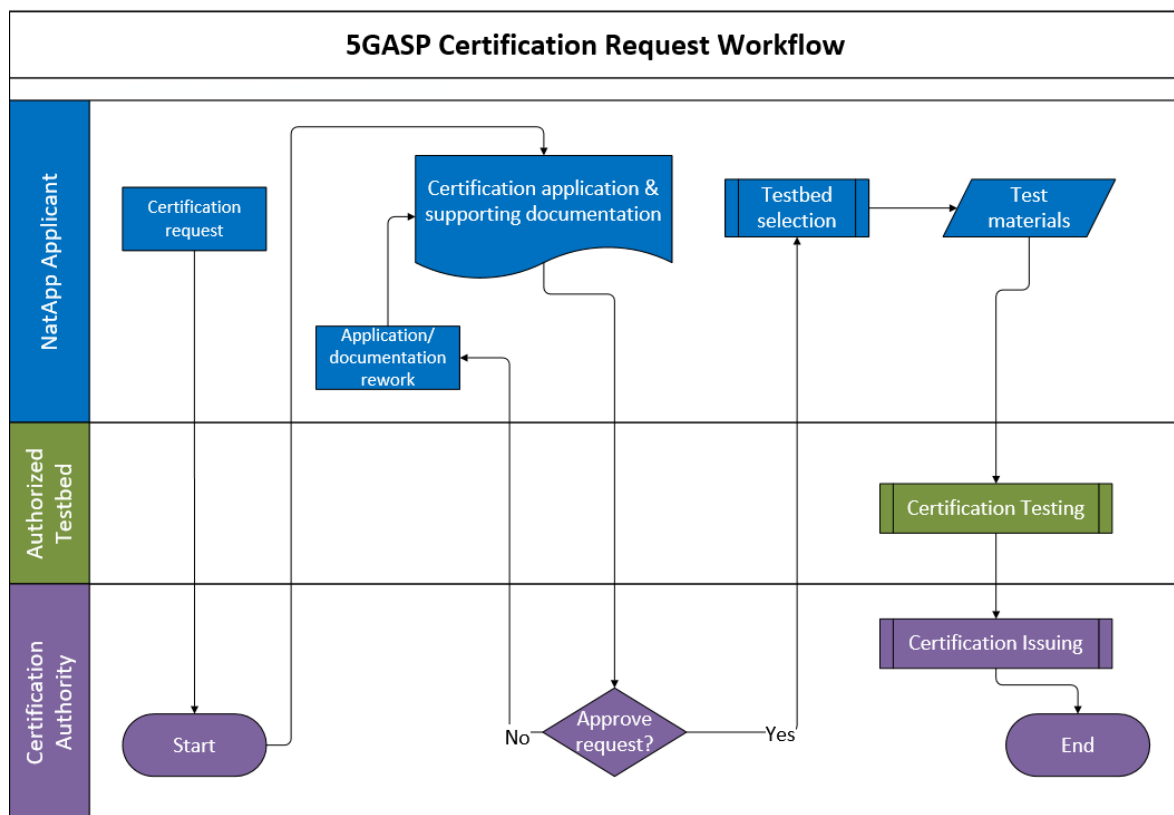


Figure 16. Certification Request Workflow

4.1.1.2 Certification Testing

Authorised Testbed should start the test and validation process after NetApp Applicant submits the test materials and the supporting documentation. The testbed should share with the applicant the testing steps, results, reports when needed, and has to share the logs when an issue happens.

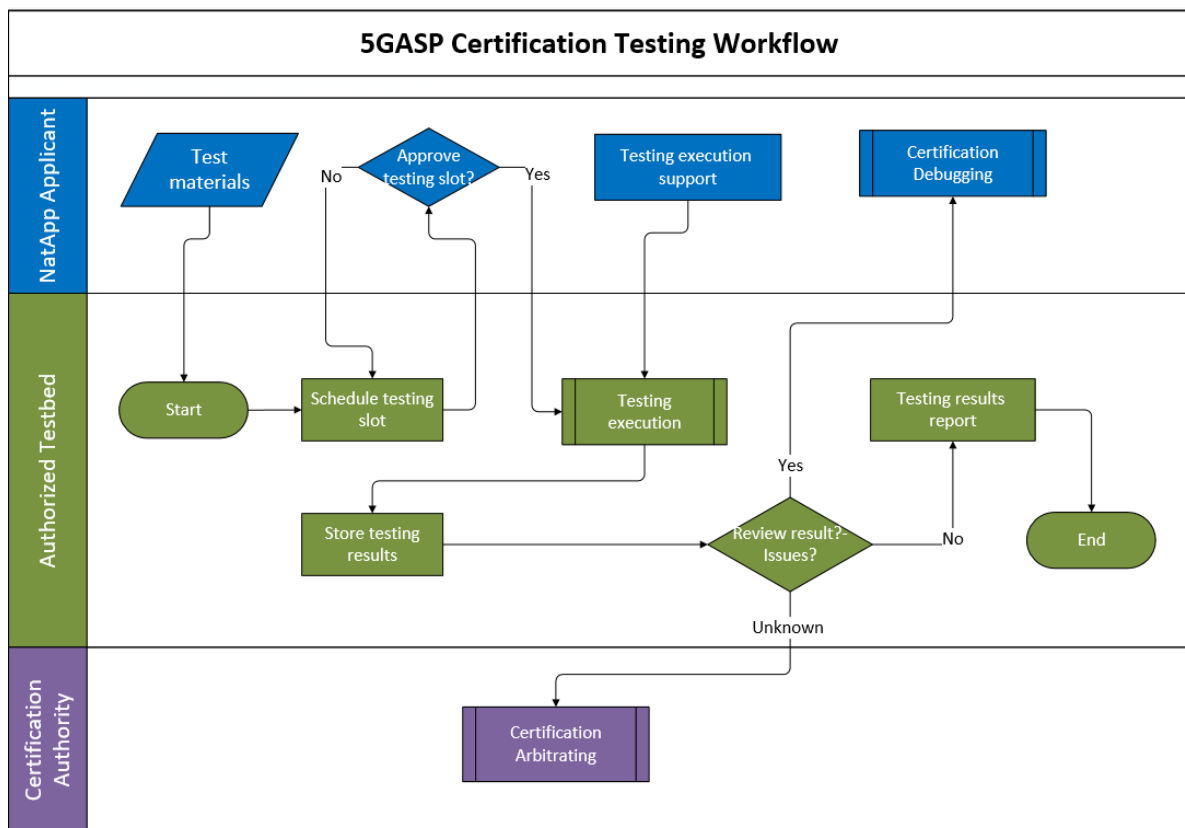


Figure 17. Certification Testing Workflow

4.1.1.3 Certification Issuing

Certification Authority should issue a certificate according to the approved testing report. The authority would authenticate the certificate with the 5GASP official logo and then publish it on the 5GASP NetAppStore public marketplace portal.

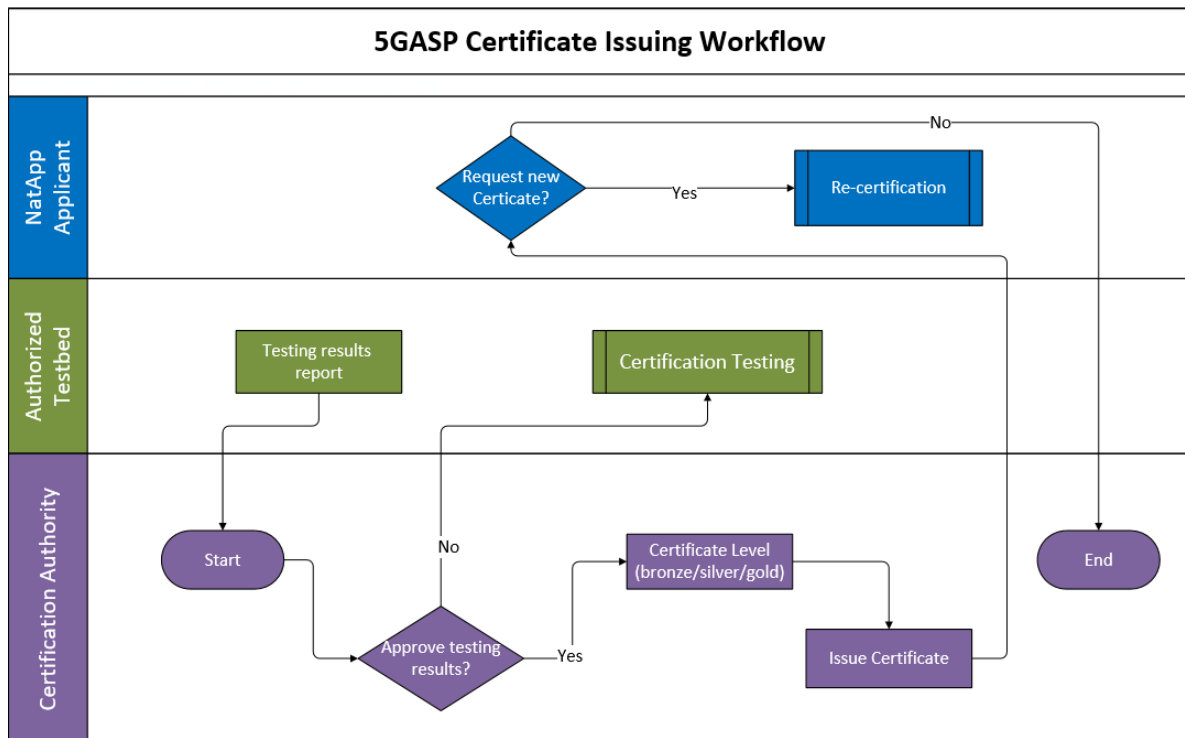


Figure 18. Certificate Issuing Workflow

4.1.1.4 Certification Debugging

NetApp Applicant should start to do the debugging when NetApp issues are reported in any one of the below cases.

- Authorised Testbed reports NetApp issues during the use case Certification Testing.
- Certification Authority reports NetApp issues during the use case Certification Arbitrating.

The test materials and the supporting documentation would be updated within a new version after the issues are fixed, and then the new testing run would be started by the selected testbed.

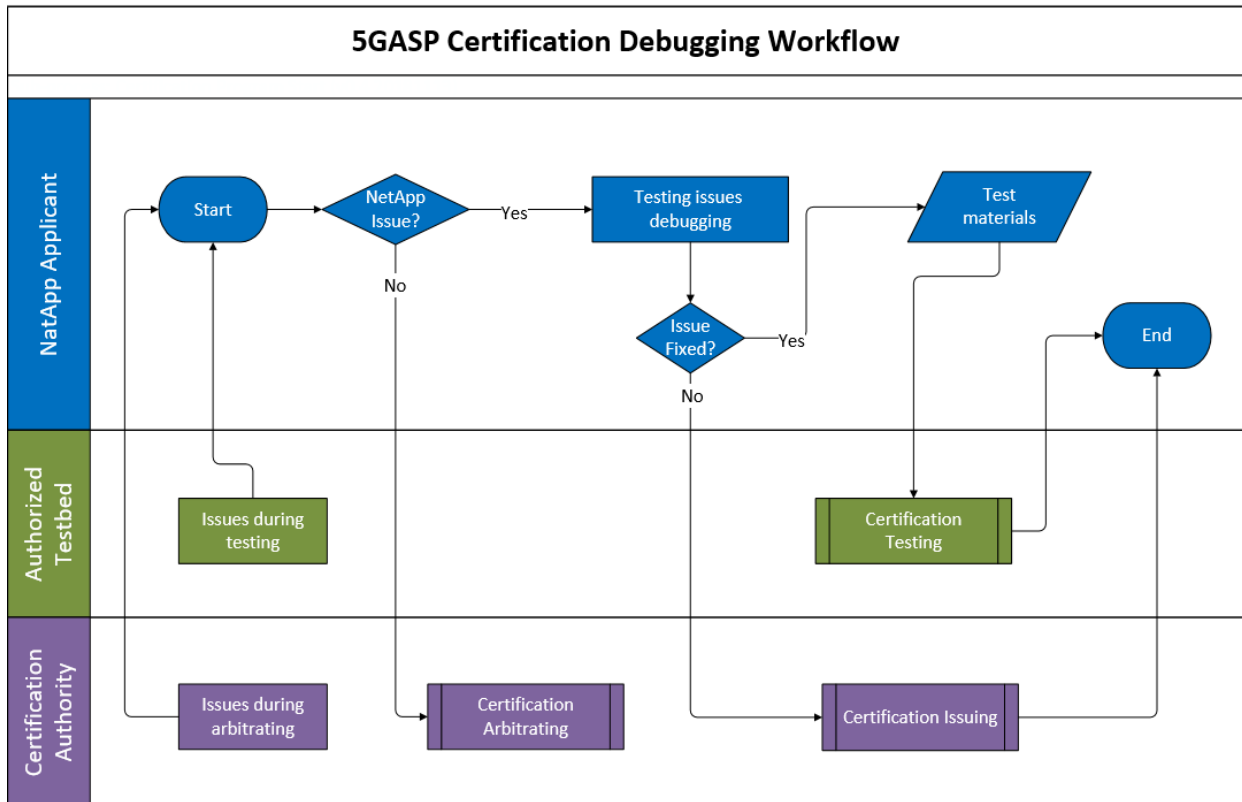


Figure 19. Certification Debugging Workflow

4.1.1.5 Certification Arbitrating

Certification Authority should arbitrate the issues no matter the arbitration request is from NetApp Applicant or Authorized Testbed. The authority has to make the decision in one of the below arbitration results.

- NetApp issue: NetApp Applicant should start the NetApp debugging.
- Testbed issue: Authorized Testbed should start the testbed optimisation.
- No issue: it is not an issue that would impact the certification.

The arbitration results would be officially published on the 5GASP-C platform for both NetApp Applicant and Authorized Testbed

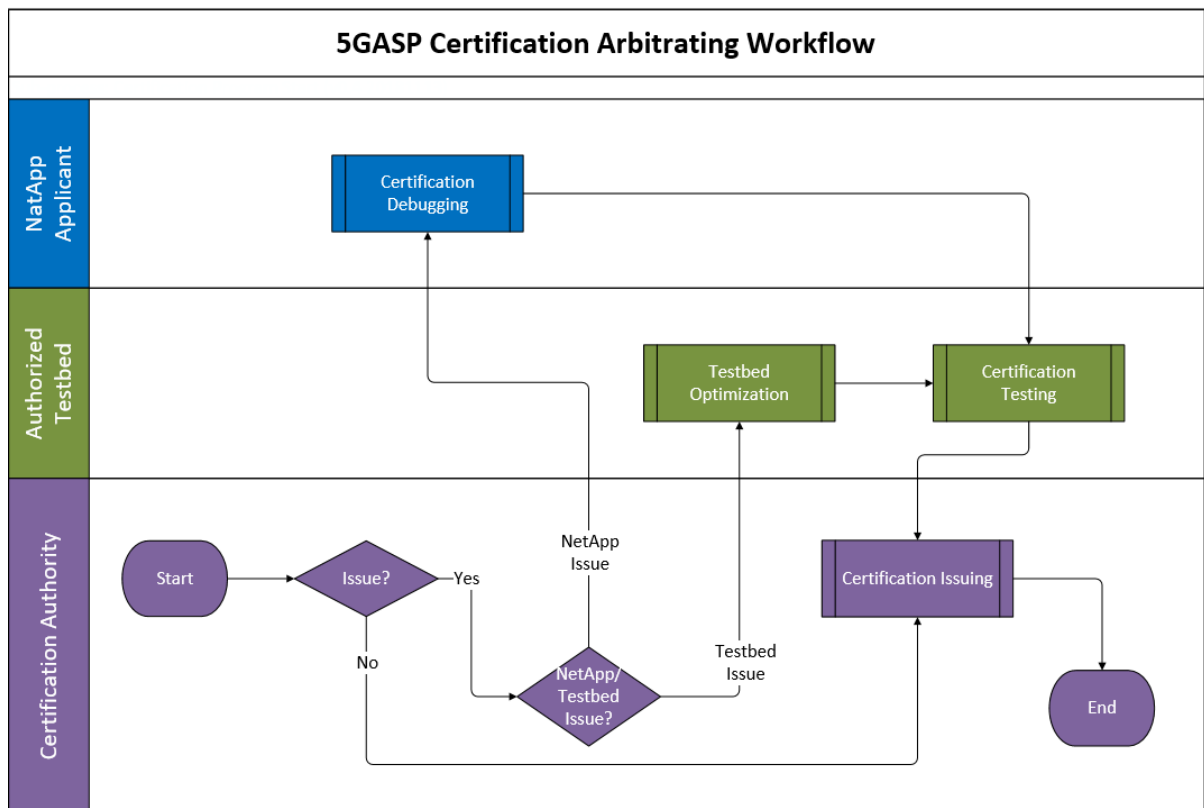


Figure 20. Certification Arbitrating Workflow

4.1.1.6 Re-certification

NetApp Applicant would initiate the re-certification process in any one of the below cases.

- There is no certificate after the previous certification; for example, the initial certification criteria are not fully reachable by the NetApp.
- There is a lower-level certificate, for example, the bronze certificate was issued, and then silver/gold certificate is expected with a new software version

In such a case, the fast track is necessary to skip or simplify some use case Certification Request steps.

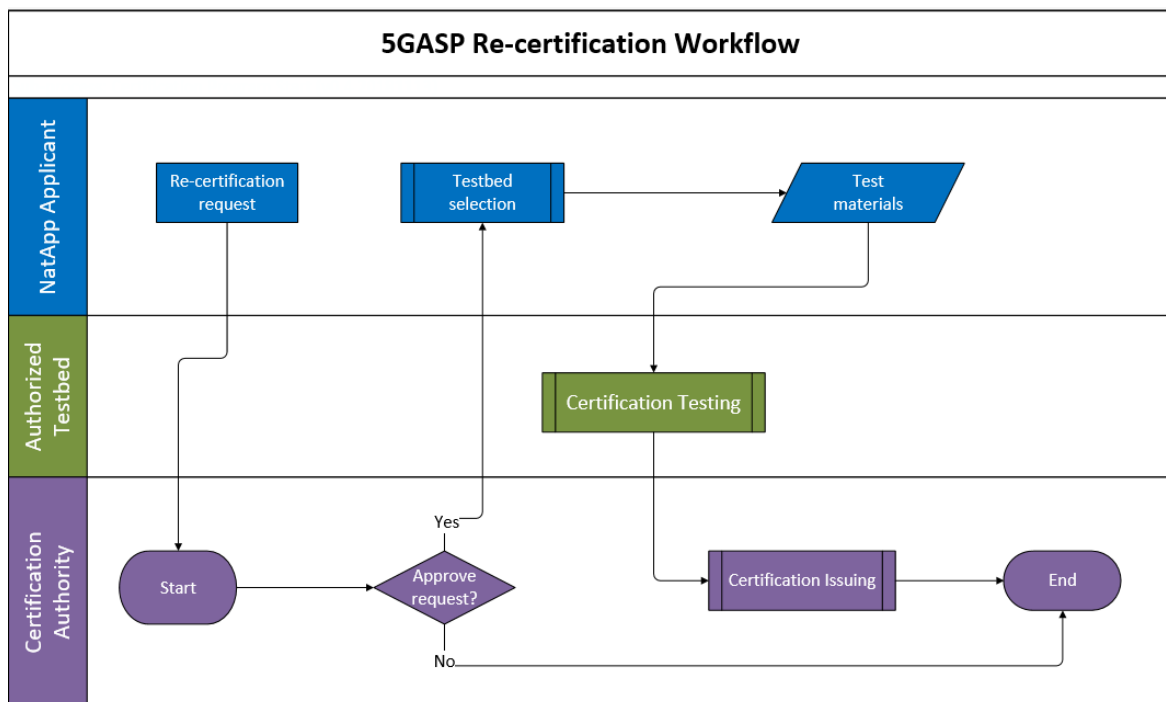


Figure 21. Re-certification Workflow

4.1.2 Future Events, Plans and Cross-project events

We will continue organising webinars [14] when we have relevant information to share with the community, on topics related to the development of the 5GASP platform, certification process and NetApps development.

5GASP 3rd online webinar - February 17th

We have scheduled the 3rd webinar to take place on February 17th, to cover the 5GASP certification process and a case study of the PPDR NetApp developed by ININ - 5G Isolated Operation for Public Safety NetApp (5G IOPS NetApp).

5GASP MS 6.5 - First NetAppLab event hosted by ORO in Bucharest

The first milestone event of the Project will take place in May 2022 in Bucharest, also marking the beginning of the NetAppLab program. Pending COVID-19 development, we aim to have a hybrid event, having at least one representative from each consortium partner physically present and to broadcast the presentations to a wide online audience.

A very important component of our 5GASP Community Events efforts is the NetAppLab program detailed hereunder.

5GASP NetAppLab program

The NetApp Lab program is a program we designed to support NetApp developers (startups, SMEs, academia teams) with know-how and access to the 5GASP platforms and resources. We have developed the high-level plan for the program, which includes a call for applications with a selection period, an initial program that will give the participants important information about the 5G technology, 5GASP resources and specific feedback and guidance to their NetApps, followed by continuous follow-up on progress and support for them to integrate their NetApps within the 5GASP ecosystem and go through the certification process.

The final demo of the NetAppLab applications will be done in the final community event - MS 6.6 Second NetAppLab event hosted by ITAV in Aveiro.

The high-level program timeline for the 5GASP NetAppLab program is:

1. Call for Applications (3 months)

During the Call for Applications, all program partners will promote the program towards their communities. The proposals will be submitted via an online application form.

2. Evaluation and Selection period (2 months)

To select the most fitted startups, the consortium will designate a selection committee. The members of the selection committee will review applications and, if necessary, it will organise follow-ups with applicants for further details.

The selection committee will also define beforehand a set of selection criteria, that will also be publicly communicated from the Call for Applications phase. At the end of the Evaluation and Selection period, the selected projects will be communicated publicly, as well as to all applicants.

3. NetApp Lab program (4 months)

The main NetApp Lab program will provide selected application developers with mentoring and support to develop their NetApps.

The main NetAppLab program types of activities will be **workshops** – series of 1-to-many events presenting basic concepts – both technical as well as product & business development-oriented; **mentoring sessions**, series 1-to-1 discussions, based on mentors' expertise and each team's specific needs for guidance or feedback; **pitching and demos**, events where the participants will present their NetApps and show demos of their products to varied audiences, to get feedback and new collaboration opportunities (ex. Investment, partners, clients etc.)

4. NetApp Lab continuous support & follow-up (9 months)

With the guidance provided in the program, developers are expected to continue the implementation of their NetApps, as well as integration in the 5GASP platform, to go through the 5GASP certification process. They will receive continued support and follow-up on progress.

5. NetApp Lab Demo Day

During the final 5GASP Community Event in Aveiro in 2023, the NetApp Lab participants will showcase their NetApps in the final NetApp Lab Demo Day event.

5GASP MS 6.6 - Second NetAppLab event hosted by ITAV in Aveiro

The final event will take place in October 2023 in Aveiro. Pending COVID-19 development, we aim to have a physical that will be boosted with online dissemination for increased impact.

The event will showcase NetAppLab applications' development, as well as other project results.

The current plan for community engagement events is the following (Figure 22 and Figure 23):

Activity	Q1			Q2			Q3			Q4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Webinar #3												
MS6.5 First NetAppLab event hosted by ORO												
NetAppLab - Call for Applications												
NetAppLab - Evaluation and Selection												
NetAppLab - Program												

Figure 22. 5GASP events plan for the year 2022.

Activity	Q1			Q2			Q3			Q4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NetAppLab - Continuous support & follow-up												
NetApp Lab - Demo Day												
MS6.6 Second NetAppLab event hosted by ITAV												

Figure 23. 5GASP events plan for the year 2023.

4.2 Summary of Conclusions

In this deliverable, we first presented in detail the design and development of the beta versions of two complementary portals: the (i) NetAppCommunity portal and the (ii) NetAppStore portals. Both portal descriptions contain detailed specification tables of requirements and a page design graph (i.e., a site map) with information about the content of pages, their content type (static, dynamic or other special types), and the portal page structure.

The deliverable also presents and discusses our community engagement events, including those committed as well as plans for those to come in the future. Such events are essential and increase our dissemination footprint regarding the 5GASP platforms and the future-defined certification process via the newly started task 6.3. In addition, those events aim to address current and potential future developers of NetApps, and according to online attendance reports and post-event video viewing numbers, the committed events were successful (see Sections 3.1, 3.2 and 3.3 detailed event analytics).

Finally, we note that the current document paves the way for future WP6 deliverables scheduled for M23 (interim report) and M36 (final report).

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