Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale

WP7 Dissemination, Communication and Exploitation

D7.7 Update of the collaboration plan with definition of common objectives and activities including milestones

http://textarossa.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme, EuroHPC JU, grant agreement No 956831

TEXTAROSSA

Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale

Grant Agreement No.: 956831

Deliverable: D7.7 Update of collaboration plan with definition of common objectives and activities including milestones

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Please see http://textarossa.eu for more information on the TEXTAROSSA project.

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The content of this document is the result of extensive discussions within the TEXTAROSSA © Consortium as a whole.

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List of Acronyms

Acronym	Definition
HPC	High-Performance-Computing
DoW	Description of Work
GA	Grant Agreement
CGP	Complementary Grants Project
CA	Collaboration Agreement
PO	Project Officer
CPCB	Cross-Project Collaboration Board
PO	Project Officer

Executive Summary

This deliverable is an update of deliverable D7.6 that presented a Collaboration Plan and relative objectives envisaged to build an effective collaboration network with other EU research projects and the main HPC European competence centres. In this deliverable, the activities implemented during the first half of the project to implement the proposed plan are reported and analysed to verify the plan's effectiveness and provide adjustments, if needed.

The reported activity concerns task T7.3: “Networking with EU HPC landscape and Centres of Excellence” and task T7.5: “Common task for complementary grants”, as they are strictly related in some respects. It must be noted that this is an internal TEXTAROSSA Collaboration Plan that includes but is not limited to the Collaboration Plan that has been defined together with the complementary grants.

The deliverable was due at M 18, but it has been delayed by a few months, because collaboration activities required more time than expected for the initial setup. However, thanks to this additional time, more significant updates have been provided regarding, for instance participation in events such as HiPEAC 2023 and EuroHPC Summit Week, collaboration workshop in the context of EuroHPC 19 complementary grants projects, and presentation of TEXTAROSSA in both European and industrial context.

1 Introduction

Establishing an effective collaboration between TEXTAROSSA and companion EuroHPC initiatives is crucial for paving the way toward a European research and innovation ecosystem in the HPC area. As introduced in D7.6, we identified three aims for establishing an effective collaboration activity.

- **A1: Collaboration with complementary grants,** actively participating in the collaboration activity implemented in the context of complementary grants projects.
- **A2: External Networking**, establishing contacts, and implementing specific actions for collaborating with the main actors of the European HPC landscape, such as Centres of Excellence, innovation, and technology transfer bodies such as industry associations, competency centres, and the forthcoming European Digital Innovation Hubs; this task is also related to the exploitation activity in selecting the appropriate industrial venue to improve the TEXTAROSSA results in uptake
- **A3: Internal Activity**, focused on preparing material tailored to the specific objectives and selecting roles for implementing and monitoring networking activity; this task is strictly related to dissemination activity in producing presentations, flyers, and organizing events.

The corresponding Collaboration Plan, summarized in Figure 1, is based on the strategy of iteratively refining objectives by way of a periodic exchange with representatives of complementary grants (A1), aiming at disseminating and exploiting results in the external network (A2) by way of materials produced by the internal activity (A3). The plan updates and activity and results obtained so far in TEXTAROSSA, are reported in the following sections.

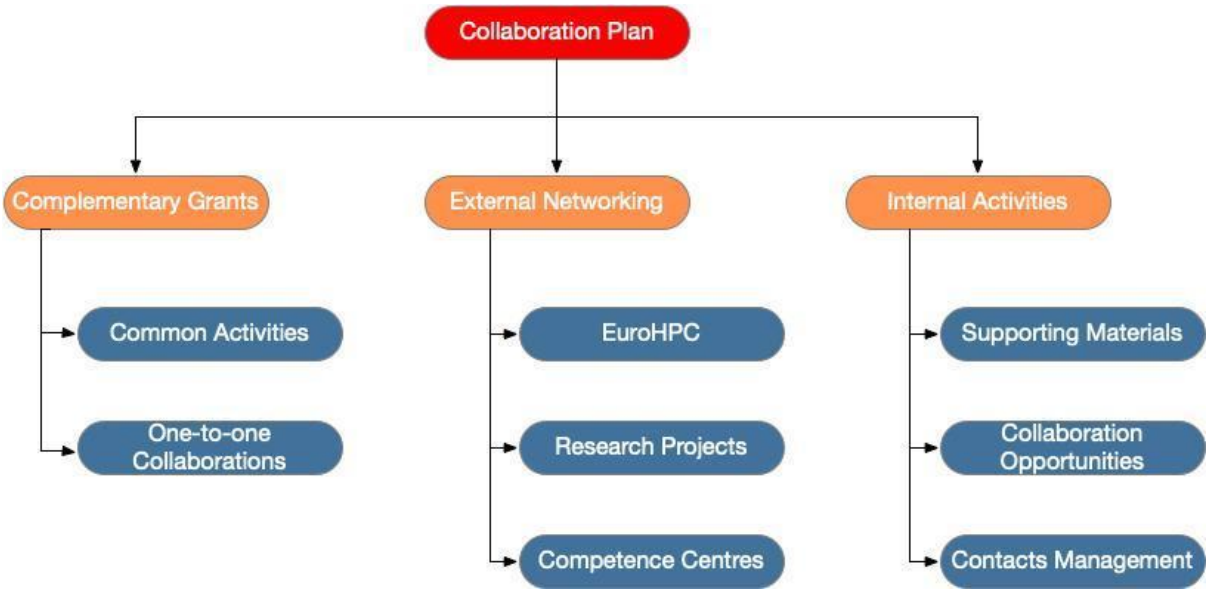

Figure 1: Collaboration Plan

2 Collaboration with Complementary Beneficiaries

A specific task (Task 7.5: Common task for complementary grants) has been introduced in the TEXTAROSSA DoW to organise all efforts to establish synergies and collaboration with complementary grants projects (see Table 1) listed under Article 2 of the Grant Agreement (GA)[1]. All the complementary grants projects (CGP) must identify common objectives and define a shared collaboration strategy to implement them.

The involved project coordinators soon started sharing information about the main topics addressed in the projects, selecting technical contact points in the activity between more similar projects, and collecting suggestions on general collaboration actions, such as joint meetings, shared participation in events, and a unified website.

The first objective and the main achievement was to formally regulate this collaboration through a Collaboration Agreement (CA) signed by all the participants in March 2022[2]. The purpose of the CA, as reported in "Article 2" is to coordinate the work, create synergy in the mutual activities, implement the provisions of the respective Complementary Grant Agreements, Implement and update Collaborations Plans and jointly decide upon commonly shared dissemination and upcoming activities. TEXTAROSSA collaboration plan is being updated according to these joint activities, as reported in the next sections.

Table 1: List of Complementary Grant project

Complementary Grants projects	Specific Connections with TEXTAROSSA
956213 (SPARCITY)	Contact through coordinator
955776 (RED-SEA)	Common beneficiaries (INFN, ATOS)
955701 (TIME-X)	Contact through coordinator
956748 (ADMIRE)	Common beneficiaries (CINI, BSC, E4, INRIA, PSNC)
955606 (DEEP-SEA)	Common beneficiaries (BSC, ATOS, Fraunhofer)
956702 (eProcessor)	Common beneficiaries (BSC) Contact also via UNIBO, La Sapienza
956201 (DComEX)	Contact through coordinator
955811 (IO-SEA)	Common beneficiaries (ATOS)
955513 (MAELSTROM)	Common beneficiaries (E4)

2.1 Objectives and plan

Objectives of the Collaboration Plan were introduced and discussed in D7.6 and are summarised in Table 2. No major update has been needed as they fully comply with the ones discussed and agreed with the complementary projects.

[1] Grant Agreement Number 956831 - TEXTAROSSA - H2020-JTI-EuroHPC-2019-1

[2] Collaboration Agreement EuroHPC-01-2019, Final version 08 March 2022.

Table 2: Collaboration with Complementary Beneficiaries objectives

Main Objectives	
A1-Obj1	Jointly addressing cross-cutting issues
A1-Obj2	Sharing results and best practices as relevant
A1-Obj3	Participating in benchmarking exercises of products across projects
A1-Obj4	Working towards joint publication, dissemination, and exploitation of results
A1-Obj5	Actively contributing to the definition of the overall EuroHPC-JU strategy and road mapping, following common objectives

Collaboration activity to pursue these objectives was planned, also defining clear milestones for the beginning of the project and suggesting potential ones, depending on the discussion with CGP. In the next section, we discuss the proposed milestone with respect to the activity done and provide information about their accomplishment.

2.2 Activity Report

Initial milestones were reached in the first months of the projects, as reported in D7.6, and are summarised in Table 3. Concerning the others, a more detailed discussion is provided.

Table 3: First Milestones Reached

A1-Milestone 1	Defining an official communication channel among all the projects.	An email list has been established between the coordinators of projects[3].
A1-Milestone 2	Presenting each other projects as a starting point for further collaboration.	Mini-workshop organized on 25th May 2021
A1-Milestone 3	Identify point-to-point collaborations between projects' specific technical topics.	The project coordinators have elaborated a collaboration matrix between projects (Figure 2)
A1-Milestone 4	Establish a collaborative workspace to share information, presentations, documents, and other useful material for collaborating.	A "EUROHPC-2019-1-Projects" share point has been established and shared by ATOS to facilitate the exchange of files and documents[4]

[3] eurohpc19_coord@fz-juelich.dev

[4] https://atos365.sharepoint.com/sites/300000906

	ADMIRE	SparCity	DcoMEX	DEEP-SEA	eProcessor	IO-SEA	MAELSTROM	RED-SEA	Time-X	TEXTAROSSA
ADMIRE				X		X	X		X	X
SparCity			X	X	X					
DcoMEX		x			x		x		x	x
DEEP-SEA					X	X	X	X	X	
eProcessor		X	x					x		X
IO-SEA	X			X			X	X		
MAELSTROM	X		x	X		X		x?	X	X
RED-SEA				X	x	X				
Time-X			x	X			X			
TEXTAROSSA			x		X		X			

Figure 2: Updated Collaboration Matrix between CPGs

- **A1-Milestone 5:** Prepare and agree on a Collaboration Agreement to be signed by the end of December 2021.

As we already introduced, the CA was signed on March 2022. Regarding the original schedule, the delay occurred mainly due to the need of sharing, discussing and signing among all the 61 partners in the CGP. However, the PO, Daniel Opalka was informed of the ongoing process and agreed on the schedule.

The CA is structured in 10 articles defining the general collaboration frameworks such as Definitions (Article 1), Purpose and relationship with Consortium Agreement (Article 2), Miscellaneous (Article 8), Applicable Law and Settlement of dispute (Article 9), Entry into Force, Term, Termination, Withdrawal (Article 10) and ruling the collaboration activity in terms of:

- Article 3: Management and Collaboration Aspects
- Article 4: No Warranties & Limitation of Liability
- Article 5: Confidentiality
- Articles 6 and 7: Access to Reports and Results

Following the formal signature of the CA, several collaboration actions have also been undertaken concerning some of the milestones we proposed in D7.6.

- **A1- Milestone 6:** *"Create (and participate) in common boards and advisory structures to decide on collaboration and synchronization of activities, including on management of outcomes, common approaches towards standardization, SME involvement, links with regulatory and policy activities, and commonly shared dissemination and awareness raising activities"* as stated in the GA.

Article 3 of the CA states that "The Parties will establish a Cross-Project Collaboration Board (CPCB). It will be composed of one representative of the Coordinator of each on-going EUROHPC-01-2019 Project ("CPCB member") ". The CPCB has been set up to have a different chair for each 6-months slot. The first chair, for the period 01/04/2022-30/09/2022, was Peter Dueben from ECMWF MAELSTROM coordinator, while for the second one was Massimo Celino from ENEA, the TEXTAROSSA coordinator. The scope of the CPCB is organising collaboration sessions and discussing all the joint activities. The next CPCB is scheduled for April

11th 2023. The CPCB meeting on June 6—7, 2023, will be organized by TEXTAROSSA partners in Torino (Italy).

- **A1-Potential Milestone 7:** Invite other project representatives inside each project advisory board.
- **A1-Potential Milestone 8:** Provide guest presentations at the General Assemblies of the different projects.

So far, including other project representatives in each project board has not been pursued as the main action. Also, more than inviting guest presentations at the project GA the collaboration activity has focused on identifying shared topics and creating working groups that could effectively share knowledge and objective. So, Milestone 7 and 8 remain potential, interesting suggestions that would not dramatically increase the collaboration results.
Indeed, the collaboration is currently well structured at two different levels:

- project coordinators share general project knowledge and organise joint activities in the CPCB;
- technical working groups share and integrate involved project technologies and results in specific Work Streams.

The Work Streams currently active are:

- I/O traces and performance analysis, led by Philippe Deniel (IO-SEA) and André Brinkmann (ADMIRE)
- Malleability, led by Ahmad Tarraf (ADMIRE) and Jesus Carretero Perez (ADMIRE)
- Optimisation cycles, led by Alexander Geiss (DEEP-SEA)
- Codesign, led by Hans-Christian Hoppe (DEEP-SEA) –
- Benchmarking, led by Yannik Müller (DEEP-SEA)) – Fabrizio Magugliani (E4)

TEXTAROSSA is involved in I/O traces with INFN partner, Codesign activity with E4 (Fabrizio Magugliani) and INFN (Alessandro Lonardo), and Benchmarking with E4 (Fabrizio Magugliani).

It is worth reminding that Work Streams have been worked out from an initial phase where relevant common topics among the projects were identified and collected in a collaboration matrix (Figure 2). This matrix was discussed and updated during the collaboration meetings and can be used as a guide for establishing future point-to-point collaboration. Shared topics relevant for TEXTAROSSA are:

- Sparse data sets and workloads (SparCity, DCoMEX).
- Bioinformatics workloads (SparCity, eProcessor, DEEP-SEA, DcomEX).
- Power capping/management/modelling (SparCity, DEEP-SEA).
- Programming Models (SparCity, DEEP-SEA).

Beyond this, point-to-point collaborations between TEXTAROSSA and other projects are already in place. Daniele Gregori (E4) is collaborating with MAELSTROM (and EXAFOAM, not a CGP) to use their application basically on Nvidia Hopper. Pasqua D'Ambra (CNR) is investigating collaboration with TIME-X.

- **A1-Potential Milestone 9:** Prepare a joint newsletter to update on the progress of the different projects.

This milestone has not been pursued due to the complexity of organising the activity among all CGPs. A joint website that could be managed more dynamically is under preparation, as explained in Milestone-12.

- **A1- Milestone 10:** Organise joint sessions in specific events, for example, a Birds of a Feather Session at the Supercomputing conference, HiPEAC, ISC.

A full-day workshop was organised jointly by all the CGP:

- "EuroHPC JU Projects Shaping Europe's HPC Landscape" workshop on January 17th at HiPEAC 2023[5] in Toulouse.

The workshop consisted of a keynote address giving a concise overview of the projects (Figure 3) and a series of in-depth technical talks, with ample opportunity for Q&A with the audience.

Figure 3: Slides from the Keynote talk from Hans-Christian Hoppe at the EuroHpc Workshop at HiPEAC 2023

TEXTAROSSA contributed with the talk "The TEXTAROSSA Approach to Thermal Control of Future HOC Stems held by Federico Terraneo (Politecnico di Milano) (Figure 4).

Figure 4: Front page of the TEXTAROSSA presentation in the EuroHpc Workshop at HiPEAC

[5] https://www.hipeac.net/2023/toulouse/#/program/sessions/8014/

Joint participation at ISC 2023[6], in Hamburg on 21-25 May, has been already scheduled. As the projects cannot receive funding for their own booth at ISC 2023, they will join the EuroHPC booth («European Research Village»). A workshop has been also proposed with the title "European Research and Development on Key Topics for Future HPC and Exascale" Short Title: "European Path to Exascale".
A proposal for a "Workshop on Tools for Data Locality, Power and Performance" has been also submitted to EURO-PAR 2023[7].

- **A1-Potential Milestone 11:** Organise joint workshops between the CGPs.

These are mini-conferences with one talk for each project to present and discuss updates on each project's progress. They are a continuation of the mini-workshop in Milestone2.

Joint meetings organised among the CGPs are:

- "First EuroHPC19 Workshop to Seed and Foster Collaborations Across Europe" organised in Madrid on 19-20 September 2022 at the Universidad Carlos III de Madrid (UC3M)[8]. The workshop objective was to understand how the different projects cover certain topics of EuroHPC and structure the working groups on these topics[9] [10] (Figure 5).
- Collaboration Workshop in Luxembourg on November 7th 2023[11](Figure 6).

TEXTAROSSA will organise the next Collaboration Workshop scheduled on 6-7 June 2023 at the University of Turin premises, hosted by Prof. Marco Aldinucci. [12]

Figure 5: First EuroHPC19 Workshop in Madrid

[6] https://www.isc-hpc.com/
[7] https://2023.euro-par.org/
[8] https://www.dropbox.com/s/t7jal8itb8njn3o/2022_EuroHPC_Madrid_Workshop-2.pdf?dl=0
[9]https://docs.google.com/presentation/d/10zSWwhTlgQPQUTnhZa6Hbv8zHuiABtqvAg2yQq-Ai6U/edit#slide=id.gd730e63dc3_18_13
[10] https://fz-juelich.sciebo.de/s/5S9Jzub4DTRQNML?path=%2F20220919_Madrid-WS
[11] https://fz-juelich.sciebo.de/s/5S9Jzub4DTRQNML?path=%2F20221107_Global-Review
[12] https://alpha.di.unito.it/eurohpc-meeting-2023/

Figure 6: Front page of the overview presentation at the Collaboration Workshop in Luxembourg

- **A1-Potential Milestone 12:** Include references to the other CGPs in each project website or create a joint website with regard to the project and everyday events and dissemination material.

A joint CGP website is almost ready to go online. The structure has been discussed and implemented and will include:

- A homepage presenting the objectives of the EuroHPC19 projects and how they fit into the EuroHPC strategy (Figure 7).
- A map of Europe with countries participating in EuroHPC19 projects highlighted.
- One or two pages with each single project presentation with a link to the actual project webpage.
- A blog-style list of specific collaboration events and activities.
- An events page.
- A publications page.
- An aggregator page which will feed from the various social media
- Contact & legal information

The draft was discussed in the last CPCB meeting and is currently circulated in the mailing list. The most appealing name for the EuroHPC19 project is under discussion, too. One proposal is “2021 Exascale Projects”.

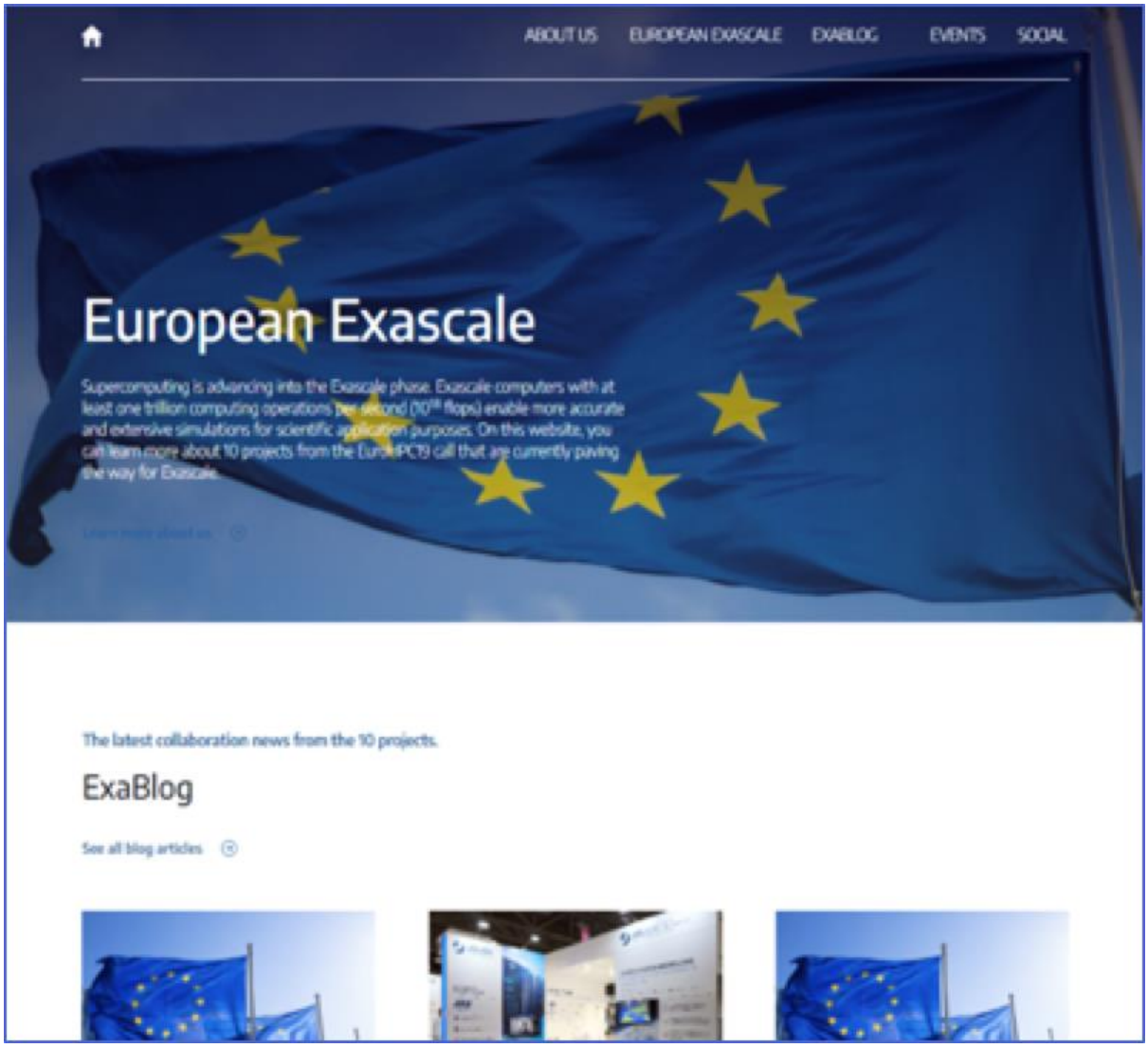

Figure 7: First page of the joint website

3 External Networking

The External Networking activities in the TEXTAROSSA projects aim to enable the consortium to reach early adopters and engage critical stakeholders to facilitate impact and large-scale uptake, and are the main focus of "Task 7.3: Networking with EU HPC landscape and Centres of Excellence". Activities comprise attending and presenting TEXTAROSSA at critical events throughout the project to broaden the visibility of the solutions developed in the project and to establish links with external stakeholders, therefore are strongly related to the general Dissemination task. Partners will also establish contacts with the leading EU organization in the context of HPC and HPDA/AI. The TEXTAROSSA partners, and more importantly, the people directly involved in TEXTAROSSA have already several links with the most important and influential networks in Europe.

3.1 Objectives and plan

We already identified the main objectives as discussed in D7.6 and summarised in Table 4.

Table 4: External Networking activity objectives

Main Objectives	
A2-Obj1	Align with **EuroHPC initiatives** and the open architecture European strategy by participating in main European HPC networking events, such as EuroHPC Summit week, Teratec forum, and HiPEAC.
A2-Obj2	Establish solid links with the **European Centre of Excellence** to discuss with a wide range of application **domain users** and improve the co-design approach.
A2-Obj3	Enlarge the network with **industries** starting with the already established links, in the context and collaboration with the project exploitation activity.
A2-Obj4	Participate in **events** organized by public administration sponsoring research in either **Energy or HPC-related domains** or organize side events to large networking conferences: to lobby for the adoption of state-of-the-art HW and SW solutions to increase productivity and adopt cleaner energy solutions.
A2-Obj5	**Standardization Bodies**: Investigate the possibility of participating and collaborating in standardization bodies and working groups close to TEXTAROSSA's technological development core.

3.2 Activity Report

To reach these goals, collaboration activities will be strictly connected with the dissemination and exploitation roadmap, focusing specifically on collaboration opportunities, and will be supported by internal activities. The corresponding milestones are easily related to the objectives.

- **A2- Milestone 1**: Establish links with the European Centre of Excellence, starting with, but not limited to, The European Centres of Excellence (CoEs) for High-Performance Computing (HPC)[13].

TEXTAROSSA is included in the ETP4HPC Handbook of European HPC Projects[14]. TEXTAROSSA also participated in European events such as HiPEAC (see next milestones) and the EuroHPC Summit Week held in Gothenburg Sweden, on 20-23 March 2023. Among other networking activities, Prof. Marco Aldinucci presented TEXTAROSSA results and collaboration with different EuroHPC projects (Figure 8).

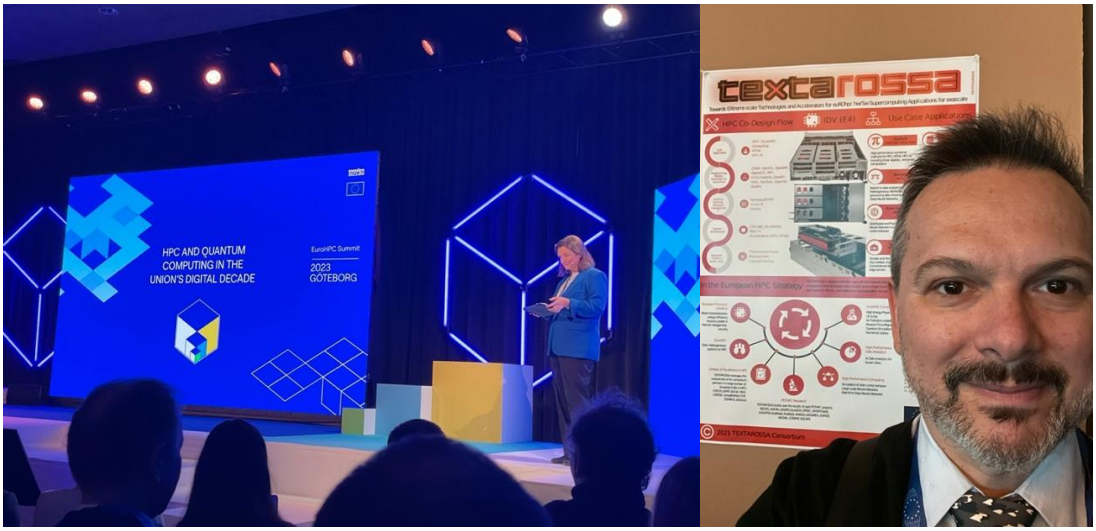

Figure 8: Marco Aldinucci (CINI-UNITO) at EuroHPC summit week 2023.

TEXTAROSSA partners CNR and ENEA were involved the in EoCoE (Energy Oriented Center of Excellence) projects, EoCoE-I and EoCoE-II, providing strong and consolidated interaction with CoEs in the energy context.

- **A2- Milestone 2:** Enforce and enlarge the network with industries already established by the consortium partners.

On January 17th, E4 Chief Scientific Officer, Daniele Gregori, during the HiPEAC international conference, held in Toulouse from 16 to 17 January 2023, gave a speech during the Industrial Session entitled "E4 Computer engineering Expertise and Involvement in European Projects" (Figure 9). This was an opportunity to illustrate TEXTAROSSA project to an industrial audience.

Prof. Marco Aldinucci (CINI-UNITO) also presented TEXTAROSSA results and collaboration among different EuroHPC projects in industrial events:

- Dell Technologies – Advanced Computing Workshop 2023: HPC and Beyond, in Bologna on 23 February 2023 (Figure 10).
- Kick-off of CENTAI, the novel company focusing on AI for finance participated by Intesa-SanPaolo bank, at Intesa-SanPaolo headquarters, Torino, Italy, Mar, 2023 (Figure 11).

[13] https://www.hpccoe.eu/eu-hpc-centres-of-excellence2/
[14] https://etp4hpc-handbook.online/

Figure 9: Daniele Gregori (E4) presenting TEXTAROSSA during the Industrial Session at Hipeac 2023

Figure 10: Marco Aldinucci (CINI-UNITO) presenting TEXTAROSSA during the Dell Advanced Computing Workshop 2023: HPC and Beyond

Figure 11: Marco Aldinucci (CINI-UNITO) presenting TEXTAROSSA at the kick-off of CENTAI

Further presentations towards industrial audience are already planned including:

- Session on Mathematical Software for Computational and Data Science at Extreme Scales, within the First Thematic Conference on Emerging Technologies in Computational Science for Industry, Sustainability and Innovation (Taormina 29 maggio-1 giugno 2023)[15]
- Minisymposium on Sparse Linear Solvers for Computational Science at Extreme Scales, within the 10th International Congress on Industrial and Applied Mathematics (Tokyo, 20-26 agosto 2023)[16]

- **A2- Milestone 3**: Participate in public administration and networking events to sponsor TEXTAROSSA objectives.

During HiPEAC 2023, E4 organised a workshop called "RISC-V: The cornerstone ISA for the next generation of HPC infrastructures" that gave the opportunity to explore issues related to the use of RISC-V International in the HPC filed with researcher from major European universities and selected companies. Federico Rossi, from the team of Prof. Sergio Saponara (CINI-UNIPI) gave the speech "RISC-V Hardware and Lightweight ISA extension for Posit arithmetic" demonstrating the developments in posit arithmetic the team is implementing in their lab and using in TEXTAROSSA.

Figure 12: Daniele Gregori (E4) and Federico Rossi (CINI-UNIPI) at the RISC-V workshop in HiPEAC 2023

E4 also hosted in their booth at HiPEAC 2023 the TEXTAROSSA poster (Figure 13:).

[15] https://m2p2023.cimne.com/event/area/78cbaddc-4df0-11ed-9b3c-000c29ddfc0c
[16] https://iciam2023.org/registered_data?id=00911

Figure 13: Prof. Marco Aldinucci (CINI-UNITO) and Prof. Massimo Torquati (CINI-UNIPI) at HiPEAC2023

- **A2- Milestone 4**: Participate in standardization bodies and technology working groups.

TEXTAROSSA is working to organize activity on this point to bring technological interests and results from the project in technology working groups. So far, the main action is participating in the EuroHPC workstream (see 2.2) and selecting the TEXTAROSSA technology that can bring advancement in current standardization effort.

4 Internal Activity

To collaborate with complementary beneficiaries and external networking, we selected several internal activities to be included as supporting actions in the Collaboration Plan. The main objectives that guide this activity are summarized in Table 5.

Table 5: Internal Collaboration activity objectives

Main Objectives	
A3-Obj1	Provide support for an effective networking activity in the general context of main EU stakeholders (e.g., projects, organizations, industry)
A3-Obj2	Finding collaboration opportunities regarding events, standardization involvement, and exploitation actions (i.e., dissemination and exploitation actions in the collaboration context)
A3-Obj3	Involve all the partners of the TEXTAROSSA consortium in the Networking activities, taking into account their specific roles in the project and their competencies

As we already discussed in D7.6, internal collaboration is strictly related to the Dissemination and Exploitation activity (WP7) and is mostly an iterative process where the action results need to be continuously monitored and updated starting from an initial milestone. We therefore report the activity that has been done so far.

- **A3-Milestone 1**: Reserve a dedicated folder in the TEXTAROSSA SharePoint to collect all the valuable material for collaboration issues.

A dedicated subdirectory has been created in the General folder of the project Sharepoint, to collect all information and dissemination material needed for collaboration[17]. It is worth noticing that usual dissemination and exploitation material can also be used in the collaboration context but to avoid replication, it will be maintained in the respective dedicated space.

- **A3-Milestone 2:** When needed, and depending on the specific needs, prepare material (presentation, documents, etc.) for enabling internal and external collaboration actions.

Standard dissemination material such as project presentation and poster are used for presenting the project also in collaboration meetings and events. Starting from the official dissemination material, project presentation has been tailored to meet the goals of specific events. For instance, highlighting the possible collaboration topics in the presentation for the First Collaboration meeting organised Madrid (section 2.2) or providing project information to be included in the presentation for the Collaboration Session requested by the EuroHPC JU, held on November 7th, 2022 (Figure 11).

[17] _EuroHPC19_collaborations

Figure 11: Slide from the General Session in Luxembourgh

- **A3-Milestone 3:** Define a Collaboration Task table where each partner in the consortium provides information on the collaboration opportunities and actions undertaken in the context of TEXTAROSSA, ranging from technical collaboration with other research projects to the organization of joint workshops and participation in standardization bodies.

The table has been prepared and shared in the consortium to allow each partner to provide needed information. It is built both considering CGPs activity and external networking, and is continuously updated during the projects. Table 6 reports the information available so far, discussed and updated during the next General Assembly in April.

Table 6: Collaboration Task Table

Partner	Collaboration ongoing & planned
CINI-UNITO	• EuroHPC ACROSS Testing of Streamflow on industrial use cases • EuroHPC ADMIRE Coordination language for I/O (CAPIO) • EuroHPC EUPEX Testing StreamFlow and CAPIO on ARM Pilot • EuroHPC EUPilot Distributed streaming at the edge and & FL on RISC-V • EUMaster4HPC Community building
CINI-POLIMI	• EuroHPC EUPEX Run-time management of resources and Dynamic Code Versioning (Lib VC compiler) • EuroHPC EUPilot Run-time management of resources at node (BBQ) and system level (SLURM)

	• EUMaster4HPC Hosting a Master degree program on HPC, starting in fall 2022 • APROPOS Training network on approximate computing • Possible synergies with projects working on EPI and RISC-V, ACROSS, ADMIRE
CINI-UNIPI	• EPI2 Integrating Posit and Secure solutions with EPAC RISC-V IPs (RISC-V Vec, STX) • The EUPilot AI& video IPs compliant with RISC-V VEC and MLS via oneDNN and/or 0NNX DACEML • AERO Secure accelerators for the European Cloud • EUmaster4HPC Advanced learning subjects & additional activities (schools and workshops) • Possible synergies of Textarossa with E-Processor and ADMIRE
E4	• Maelstrom and Exafoam interested to test the IDV-E and IDV-A platforms to run their Machine Learning codes for Maelstrom and OpenFoam for Exafoam.
PSNC	Identifying collaboration on the following topics: ○ Mixed precision ○ Performance analysis ○ Energy efficiency ○ Power & thermal models
INFN	Identifying collaboration on the following topics: ○ Porting and benchmarking of partner's applications on the APEIRON framework ○ Realtime/high throughput analytics on data streams ○ Machine learning (on FPGAs) ○ Scalable reconfigurable systems ○ CGRA ○ In-network computing ○ Low-latency interconnects
CNR	○ EuroHPC-TIMEX Collaboration on numerical algorithmic advances in multigrid methods for parallel in time integration methods ○ EuroHPC-ADMIRE Collaboration on experimenting malleability tools in multigrid sparse solvers at extreme scales for efficient dealing of coarse-level grids.

5 Conclusion

A lot of collaboration activities are ongoing and promise to provide valuable results. From the technical perspective, collaboration with other projects, mostly EU funded, allow knowledge sharing and technology integration. From the dissemination one, collaboration with industries and participation to EuroHPC initiatives and CoE allows spreading knowledge of TEXTAROSSA and its results in a wide audience with effective follow up. One weakness, so far, is missing participation in standardization bodies but we are working to find suitable venue for this, if any. However, we think that active collaboration and effective dissemination of project results can pave the way toward this.

As the project progresses, new technological advancements and a greater awareness of the project's global vision will certainly bring new life to collaborative activities, which in turn will provide inspiration for new achievements.