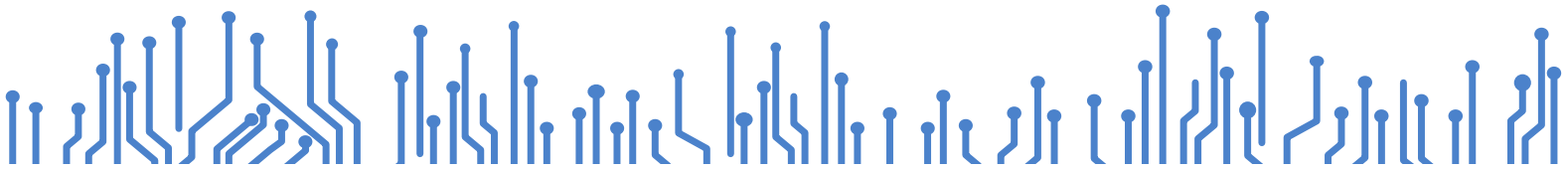
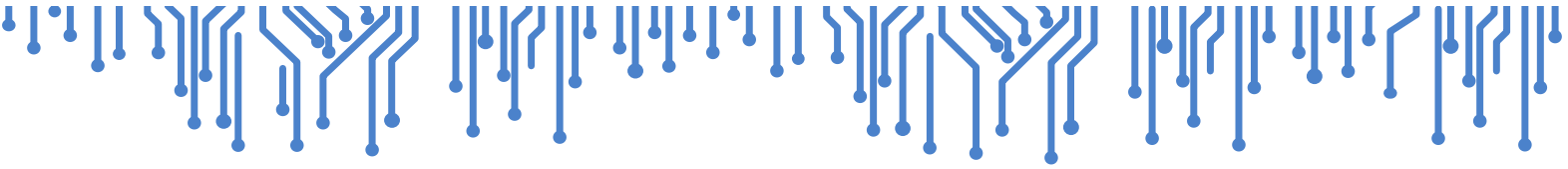
REliable Power and time-ConstraInts-aware Predictive management of heterogeneous Exascale systems



RECIPE

WP5 Dissemination and Exploitation

D5.2 RECIPE Dissemination Plan



http://www.recipe-project.eu

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
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Contents

Executive Summary

This report reports the plans to drive dissemination of the RECIPE project.

First, we identify the *stakeholders* for the project dissemination and communication. Then, we identify the means to reach each class of stakeholders.

We then outline the plans for internal and external dissemination, both at the project-wide and at the individual partner level, including a quantification of the goals to be reached by the end of the project.

Finally, we report on the initial dissemination actions, which include an invited paper and presentation at the SAMOS conference, the submission of a paper to DATE 2019, and the distribution of flyers to several recent conferences in Europe, as well as the preparation of a news item for the HiPEAC Newsletter.

1 Dissemination Plan

Disseminating the project results to relevant parties is crucial to obtain an effective exploitation of the project's outputs. To this end, we plan to increase the stakeholders' awareness of the project and the visibility of the project more broadly by using various tools. Each tool will be carefully selected to maximise the knowledge transfer to a specific group of relevant stakeholders, with a clear reference to the different target audiences the three Use Cases have.

1.1 Stakeholders

Stakeholder identification is critical to focus dissemination activities towards the right direction. During the proposal preparation and the first three months of the project, we have identified the following **stakeholder groups**. The following section will be periodically updated to take into account the evolution of the research scene in Europe and worldwide.

Project's consortium The project consortium includes the eight entities cooperating on the RECIPE project. They are mainly targeted by the *internal dissemination* activities (see Section 1.2 for details on the plans for internal dissemination).

Research and academic community The research and academic community relevant to the RECIPE project is identified primarily through a set of European initiatives.

Initiative	Focus area	Contacts
High Performance and Embedded Architecture and Compilation (HiPEAC)	Academic and industrial community in HPC hardware and compilers	BSC is a member of the HIPEAC consortium; most RECIPE key personnel are members of the network
Partnership for Advanced Computing in Europe (PRACE)	Research infrastructure and related activities	BSC, PSNC are members of PRACE
European Technology Platform for High Performance Computing (ETP4HPC)	Strategic agenda design for European supercomputing	BSC and UPV are members of the ETP
MyPreHealth: Predicting Episodic Disorders with Health Companions	Epylepsy	EPFL/CHUV
DeepHealth: Deep-Learning and HPC to Boost Biomedical Applications for Health	Biomedical Maching Learning	EPFL, UPV, BSC are members of the consortium
MANGO: exploring Manycore Architectures for Next-GeneratiOn HPC systems	Deeply Heterogeneous HPC architectures	EPFL, UPV, POLIMI, CERICT are members of the consortium

To expand beyond the European audience, we identify as a relevant dissemination target the participants to major international conferences in supercomputing, high performance computing, and parallel computing, as well as the readership of major academic journals in the field.

Due to the project focus on heterogeneous resources, we also expand the list of relevant conferences and journals to include primary venues in field programmable gate arrays, design automation of computer systems, and compiler techniques.

The two lists have been expanded, refined, and updated with respect to the initial identification of stakeholders performed as part of D5.1. As a consequences, the lists herebelow supercede those reported in D5.1.

Journal Title	**CORE Rank**[1]	SJR Class[2]
SoftwareX (Elsevier)	N/A[3]	3724 (Q1)
ACM Transactions on Computer Systems	A+	1438 (Q1)
IEEE Transactions on Parallel and Distributed Systems	A+	983 (Q1)
IEEE Transactions on Circuits and Systems I: Regular Papers	N/A	869 (Q1)
Future Generation Computer Systems	A	844 (Q1)
Journal of Parallel and Distributed Computing (Elsevier)	A+	502 (Q1)
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems	N/A	485 (Q2)
Distributed Computing (Springer)	A	446 (Q2)
International Journal of High Performance Computing and Networking	B	428 (Q2)
IEEE Micro	N/A	413 (Q2)
Journal of Supercomputing (Springer)	B	407 (Q2)
IEEE Computer	N/A	406 (Q2)
Parallel Computing (Elsevier)	A	351 (Q2)
International Journal of High Performance Computing Applications	B	348 (Q2)
ACM Transactions on Architecture and Code Optimization	A	302 (Q2)
Concurrency and Computation: Practice and Experience (Wiley)	A	282 (Q2)
International Journal of Parallel Programming (Springer)	A	244 (Q3)
Parallel Processing Letters	B	199 (Q3)
International Journal of Parallel, Emergent and Distributed Systems	B	174 (Q4)
International Journal of High Performance Systems Architecture	C	119 (Q4)

[1]Ranking according to the Australian CORE exercise 2010

[2]Ranking according to the Scimago SJR

[3]SoftwareX had its first issue published in September 2015, whereas the Australian rankings for journals was performed in 2010.

Conference Title	CORE Rank[4]	GGS Rank[5]
Intl Conf on High Performance Computer Architectures (HPCA)	A+	1
Supercomputing (SC)	A	1
Principles and Practice of Parallel Programming	A	1
Design Automation Conference (DAC)	A	1
Intl Conf on High Performance Distributed Computing (HPDC)	A	2
Intl Conf on Supercomputing (ICS)	A	2
Intl Conf on Parallel Architectures and Compiler Techniques (PACT)	A	2
International Conference on Parallel Processing	A	2
IEEE Cluster	A	2
Intl Parallel and Distributed Processing Symposium (IPDPS)	A	2
European Conference on Parallel Processing (EuroPar)	A	2
ESWeek (CASES, CODES+ISSS)	A	2
Design Automation and Test in Europe (DATE)	B	2
Field Programmable Logic (FPL)	N/A	2
Intl Conf on High Performance Computing (HiPC)	A	3
Computing Frontiers	B	3
Intl Conf on Parallel and Distributed Computing Applications and Technologies (PDCAT)	B	3
Intl Conf on High Performance Computing and Simulation (HPCS)	B	3
Parallel Computing (ParCo)	C	3
High Performance Computing and Communications (HPCC)	B	WiP
European MPI Users Group Conference (EuroMPI)	C	WiP
Computational Science and Engineering (CSE)	C	WiP
Euromicro Parallel and Distributed Processing (PDP)	C	WiP
ISC High Performance Computing	C	WiP

Supercomputing Centre Personnel and Users Administrators and technical leaders of supercomputing centres as well as HPC users (scientists and application developers) are a primary target of the dissemination activities.

In many cases, administrators and technical leaders of supercomputing centres and HPC application developers attend the same range of conference identified for the academic community. Also, participation to the ETP4HPC and PRACE activities through BSC, UPV, and PSNC will help to further enforce the dissemination towards these stakeholders. As a further measure, partners will leverage their own contacts with other supercomputing centres. For example, POLIMI is in contact with the Italian HPC centre, CINECA, and the Czech HPC centre, IT4i, through the ANTAREX project.

Students Education is a key component of ensuring adoption of new technologies. Any new technology is only as easy to adopt as there is an available group of competent users and developers. Thus, specific measures will be designed to target graduate and undergraduate student audiences.

[4]Ranking according to the Australian CORE exercise 2018
[5]Rank according to the Italian-Spanish GII-GRIN-SCIE exercise 2018

Specifically, for graduate students exposure is foreseen through Master's thesis proposals focused on the extension or application of project technologies, as well as presentation of specific project technologies as part of courses. For example, at POLIMI it is expected that the programming model will be presented within the Master-level course on "Code Optimization and Transformation".

Industry While RECIPE is an advanced research project, contact with industrial sector is necessary to pave the way for future exploitation, in particular for the industrialisation and adoption of the project technologies.

In general, industrial stakeholders are target of dissemination through the Use Case-specific flyers and briefs, and will be contacted through individual channels of the UC partners, as well as through industrial fairs and exhibitions, and, where appropriate, through research-oriented conferences that have a significant industrial participation, such as HiPEAC, SC, DAC, DATE. Additional channels are highlighted for each Use Case in the rest of this paragraph.

UC1 Oil & Gas companies. BSC will reach these stakeholders by participating in HPC conferences such as Supercomputing, and through informal meetings with practitioners of such domain that are involved in HPC initiatives like the HPC advisory council or EC activities like the HPC for Energy project that was led by BSC.

UC2/Weather Forecast UC2 mostly deals with renewable energy sources, wind energy in particular. Since PSNC is able to model accurately weather and any physical phenomena related to wind, to plan and predict energy production, the obvious industry/companies to target are:

- Distribution System Operators;
- Companies involved in building (to find the best location for a wind farm) and/or running wind farms (to predict and optimise energy production).

The same application may be used in the photovoltaic industry - detailed weather prediction supports planning and prediction of solar energy production. Additionally, PSNC will reach stakeholders by participating to HPC conferences, such as Supercomputing series.

UC2/Water Management For the water management application, the target industries are those using water sources, such as:

- Managers of hydro and thermo electrical power plants;
- Agrarian consortia.

In this scenario, IBTS his identifying a location to host a real setup of the UC technologies, which will enable to address directly a set of 2-4 possible customers within the project timeframe.

Additional project-wide industry stakeholders are *FPGA tool vendors* and other companies in the area of digital electronics and accelerator programming tools, since in RECIPE we expect to improve the computational efficiency of this application using these type of devices. Vendors such as Xilinx, Cadence, and Maxeler typically attend events organised by the HiPEAC Network of Excellence, and will be targeted through poster exhibition, talks and tutorial at different

progress levels in the project. During HiPEAC 2019, we will aim for a poster presentation and distribution of flyers; for 2020, we will aim at a technical presentation; further plans will be made by the consortium based on the response at HiPEAC 2019 and exposed in the next dissemination plan. Furthermore, participation to industrial events and exhibitions and organisation of special-interest workshops, to which industrial stakeholders will be invited, is foreseen by RECIPE partners involved in the technology development.

Hospital staff As a specific stakeholder group for *UC3 Biomedical machine learning*, the hospital staff (primarily at CHUV) is a key dissemination target. As for many applications involving patients, a good understanding of the benefits provided is critical to allow the hospital staff to invest the significant amount of resources and effort necessary to implement them.

To this end, CHUV RECIPE personnel will have monthly meetings with clinicians specialising in epylepsy, which will be used to keep them up to date with project results.

Public Bodies Land reclamation authorities and irrigation authorities are key stakeholders for the portion of UC2 dealing specifically with water management.

The weather forecasting application part of UC2 may be used to model and predict air quality over countries, districts and cities. Local/municipal government should therefore be targeted.

Public bodies will be reached through the Use Case specific brief and flyer. Contacts with local authorities, both at the municipal level and at inter-municipal authority level has been already started through dedicated meetings.

Public Interest Groups and Associations Associations and foundations linked to epileptic patients (e.g. Epilepsy foundation) are a key stakeholder for *UC3 Biomedical machine learning*.

Flyers will be used for dissemination to the patients at CHUV. Furthermore, representatives of several relevant associations attend periodic informational meetings organised by CHUV. RECIPE information will be included, when significant UC3 milestones are reached, in such meetings.

1.2 Internal Dissemination

Internal dissemination activities are directed at the project's consortium. These include a suite of private tools:

- the main project collaboration tool based on Phabricator;
- a repository of relevant documents ownCloud;
- a collaborative document editing based on Collabora;
- a `git` repository to collaborate on dissemination materials like papers and deliverables;
- several background services, e.g. LDAP for user authentication, real-time chat daemons, etc.

All these tools are open-source and consequently free of licensing charges. The software is internally hosted on Politecnico di Milano's servers, adequately protected against unauthorised accesses. To decrease the risk of data loss, the backup of the overall database and files is periodically performed on a dedicated storage unit located in a different building with respect to the data centre facility.

Internal periodical meetings ensure effective and smooth circulation of information, knowledge and documentation among the partners. These tools will then, ultimately, improve the cooperation among the project's partners, thus positively impacting on the success of the project as a whole.

1.3 External Dissemination

External dissemination activities are instead directed at the other target audiences listed above, and they aim at ensuring the visibility of the RECIPE project and at raising awareness of its results. Given the diversity of the audiences, the tools adopted will be carefully selected to maximise the chances of transferring the knowledge and the results of the project to them.

In particular, the **project website** is designed to suit the different stakeholder groups. Beyond describing the project, there will be a section dedicated to publications (this will be of interest mainly to the research and academic community), news about the project with special reference to the three use cases (of interest to hospital staff, industry, and the general public), events and public deliverables, as well as the project poster and flyers.

As the project progress towards its research and innovation goals, the project website will be enriched with videos that will explain, in lay terms, the nature of the project and its goals (for the non-technical audience who wants to grasp the importance of the RECIPE project in their everyday life), as well as with three **freely downloadable flyers specific for the three use cases** (see Appendix).

The website is described fully in Deliverable 5.1.

Project partners will participate in relevant conferences, workshops, PhD forums, special sessions and trade events to transfer the knowledge about the project to the **international scientific community**. This will ensure the high visibility of RECIPE partners' work and it will foster a two-way communication with **relevant stakeholders** that can help cross-dissemination, enhance the research outputs and, ultimately, form the basis for collaborations in future cutting-edge projects.

In addition to this, project's results will be submitted for publication in relevant journals. The submission of **papers jointly written** by various project's partners is especially encouraged.

The target is to achieve **5 journal publications, 15 papers at international conferences** and to plan a **book** collecting the main results of the project. We monitor the state of this key goal in section 3.1.

Curricula of relevant graduate courses will be updated with the project's results.

Three **research briefings** summarising the main results of the project, with special reference to the three use cases, will be created and provided to industrial customers of BSC and PSNC,

public bodies partners of IBTS, and CHUV hospital staff respectively. These are intended to provide an overview of the impact of the project, thus supporting the exploitation of its results. These briefings will be sent to the target audiences at the end of the project and they will be also provided at workshops that will be specifically organised to inform them of the project's results.

These **workshops will be aimed at engaging the stakeholders** in a two-way discussion on the project's aims and sustainability.

1.4 Individual Dissemination Plans

1.4.1 Politecnico di Milano (POLIMI)

POLIMI leads the dissemination and communication activities. As such, it has set up the website, social media account, and project communication and collaboration tools. Furthermore, POLIMI edited and presented an invited paper to the SAMOS 2019 conference, and organised the SAMOS Special Session on European Projects. POLIMI also contributed to a paper on the outcomes of Task 1.1, which is currently under review at DATE 2019, and submitted a paper to Euromicro PDP, currently under review.

POLIMI further disseminated information about RECIPE through the flyers, at the Euromicro Digital Systems Design (DSD 2018) conference and at the Italian Workshop on Embedded Systems (IWES 2018).

POLIMI plans to further disseminate project awareness through several channels, including presentations and posters at HiPEAC 2019, DATE 2019, Euromicro DSD 2019.

POLIMI is also preparing a journal submission on its open source software toolchain, which is developed as part of both the RECIPE and MANGO projects.

1.4.2 Universitat Politécnica de Valencia (UPV)

Dissemination actions done so far include the help on building the Advisory Board and arranging a meeting with Dave Mayhew in Valencia (AB member).

In the future, UPV plans on attending the HiPEAC Conference, and its related workshops, in January in Valencia (Spain) and on using social media to communicate their work within the project. In particular, in the first semester 2019 when RECIPE hardware prototype will be available, UPV will record short TV interviews that will then be linked to the RECIPE twitter and facebook accounts. These short videos will also be uploaded on the UPV website.

1.4.3 Centro Regionale Information Communication Technology scrl (CeRICT)

CeRICT aims at presenting at least one contribution per year (in the form of technical paper, presentation, session chairing, or invited talk) in one or some of the following events:

- Design Automation and Test in Europe (DATE) conference (next edition: Firenze, March 25-29, 2019)
- High Performance and Embedded Architecture and Compilation (HiPEAC) conference (next edition: Valencia, January 21-23, 2019)
- Field-Programmable Logic and Applications (FPL) conference (next edition: September 2019)
- ISC High Performance (next edition: Frankfurt, June 16-20, 2019)

For all the above events, the targeted audience will mostly include research groups from academia as well as representatives of the relevant industry sectors (computing technologies, digital electronics, programming tools).

CeRICT plans to perform the following dissemination and communication actions:

- setting up a dedicated website for advertising the compute platform and programming toolchain developed during the project
- using the organisational website as well as social media for focused communication activities
- issuing a *call for ideas* for the use of the developed compute platform to be disseminated through relevant mailing lists (e.g. the HiPEAC network mailing list).

The architectural exploration carried out by CeRICT is advertised within the MSc programme in Computer Engineering (*Laurea Magistrale in Ingegneria Informatica*) at the University of Naples Federico II, a member of the CeRICT consortium. In particular, the Advanced Computer Architecture and GPU Programming course, held by prof. Cilardo, adopts the compute platform currently under development in RECIPE as a case study of a many-core architecture. Various assignments and bachelor/master theses are based on specific aspects investigated by CeRICT in RECIPE, particularly concerning the manycore accelerator architecture and the related programming tools.

1.4.4 École Polytechnique Fédèrale de Lausanne (EPFL)

Paper submission and attendance to the following top-notch conferences in the field of computer engineering and architecture, and electronic design automation:

Design Automation and Test in Europe (DATE) academic audience mainly - Scope: various aspects of embedded engineering and electronic design automation

Design Automation Conference (DAC) academic & industry audience - Scope: conference for design and automation of electronic systems

IEEE International Parallel & Distributed Processing Symposium (IPDPS) academic audience mainly - Scope: parallel and distributed architectures, applications, software

Embedded Systems Week (ESWEEK) academic audience mainly - Scope: All aspects of embedded systems and software

We also plan the submission of publications to the following journals:

IEEE Transactions on Computers monthly frequency, scope: computer organisation and architectures, digital devices and operating systems

IEEE Micro bi-monthly journal, scope: all aspects of computer science

IEEE Trans. on Computer-Aided Design monthly - design, analysis and use of computer-aided design of integrated circuits and systems

IEEE Trans. on Circuits and Systems I monthly - theory, analysis, CAD, and practical implementation of circuits.

IEEE Computer monthly - all aspects of computer science

EPFL will disseminate the project results and any other achievement via the webpage of its laboratory[6]. We will also use the webpage and social accounts of the RECIPE project.

The research undertaken during the RECIPE project will be part of the PhD thesis of the students hired by the project. Therefore, it will be used as part of PhD thesis.

1.4.5 Barcelona Supercomputing Center (BSC)

BSC has disseminated RECIPE's work through informal meetings with other researchers within BSC. In particular, the group has discussed the scope and objectives of RECIPE with BSC researchers leading the H2020 LEGATO and Montblanc 2020 projects. They have not published anything yet because BSC technical innovations are conducted mainly in WP3 which is scheduled to start in M7.

BSC is planning on attending the following conferences:

- HIPEAC Conference in January 2019
- DATE Conference in March 2019
- DAC Conference in June 2019, whose audience is a mix of academic and industrial audiences

BSC plans to upload on its website a publication concerning the innovative use of statistical tools to derive the worst-case execution of HPC applications that will be carried out in the context of RECIPE. BSC will then publicise such publication on Twitter and LinkedIn to increase its visibility and impact.

On the academic side, BSC expects that the RECIPE's work will be part of two PhD theses from BSC/UPC. It also intends to use its contacts with UPC to disseminate the outputs of RECIPE to master students.

1.4.6 Poznan Supercomputing and Networking Center (PSNC)

PSNC is disseminating RECIPE's results at the HiPEAC 2019 Conference in Valencia (Spain) and through Supercomputing conference series. Moreover, social media will be used, organi-

[6] http://esl.epfl.ch

sational website in particular, to share major RECIPE related news with the community and stakeholders.

Additionally, PSNC is planning to liaise with H2020 VECMA project and to propose Use Case 2 as an external application.

1.4.7 IBT Solutions S.r.l. (IBTS)

IBTS focus is to improve the awareness on IBTS design capabilities among the partners and towards perspective customers.

IBTS plans to create a specific section of its Web portal to advertise on this new product under development and its relation with the RECIPE project. Moreover, IBTS will cooperate with the rest of the partners to write joint papers to be presented at conferences and workshops. The plan for the future is to keep on using the website as the main vehicle for external public dissemination, while cooperating with the partners of the use case where IBTS is involved to write papers for conferences and magazines.

For the sake of moving from the creation of awareness in the direction to create a real business, we are planning to design a commercial brief showing in a more detailed manner the full range of opportunities offered by the system we are developing, and to perform an initial study on the possible stakeholders in the Lombardy Region. We plan to identify a location capable to host a real setup and to create a "story" around it to be presented directly to a set of 2-4 possible customers, within the project timeframe. Such experience and the feedback we plan to collect will constitute the cornerstone to refine the dissemination material that will be adopted for the commercial exploitation of the project output after the project timeframe. We will also analyse the possibility to present such material in specific fairs and exhibitions organised in Italy and/or in locations suggested by the RECIPE partners.

The presence during public events will be taken into account when the platform under development will be mature enough. The creation of product flyers is also foreseen at the end of the first year, and specific contacts are already in progress with a local water management public body to join an info-day (within the project timeframe) where the benefits of the infrastructure under development are explained to a wide not-purely technical audience.

1.4.8 Centre Hospitalier Universitaire Vaudois

CHUV will disseminate its results at conferences on wearable devices for neurological diseases. In particular, the Second International Congress on Mobile Devices and Seizure Detection in Epilepsy event will take place in Lausanne Switzerland next year 6-7 September 2019. Philippe Ryvlin of CHUV will be one of the co-chairs.

In general, the audience addressed by CHUV is academic, industrial as well as some association of epileptic patients (or relatives).

Professor Ryvlin, as academic professor, plans to talk about the project in courses for future clinicians.

2 Communication Plan

RECIPE partners believe communication activities are pivotal to make interested parties and the general public aware of the project, of its importance and of its impact on people's life. To this end, the communication plan lays out in detail how the Consortium intends to capitalise on various opportunities to make the RECIPE project known.

We plan to write **articles for the general public** interested in topics linked to the project and to publish them on journals that can reach a wide audience (e.g. The Conversation, Mondo Digitale). We will also prepare brief descriptions on crucial aspects of the research to be published on the various **newsletters** of the partners' organisations (e.g. Politecnico of Milano's newsletter that reaches mainly the general public and public organisations). When important milestones will be reached, we will prepare **press releases** and get in contact with the local press, capitalising on the experience of the partners.

In addition to this, we will create **short explanatory videos (and related podcasts)** for the general public to be uploaded on YouTube and on the various consortium's websites as well as on the project's website. The videos will also be circulated via the social media **Twitter and Facebook accounts** that will be set up to share news about the project and about upcoming events, and to connect with relevant stakeholders.

Public participation in the project will also be achieved via the participation of RECIPE partners to events such as the **European Researchers' Nights and local events for science communication**. The RECIPE consortium will also look into more **artistic communication projects** such as photo exhibitions, FEAT and VERTIGO.

3 Report on Dissemination & Communication Activities

3.1 Scientific Papers

In the early months of the project, Prof. William Fornaciari (PC, Politecnico di Milano) participated to the SAMOS conference presenting an invited paper [1], jointly written by the consortium partners.

Furthermore, one paper describing the challenges in deeply heterogeneous HPC drawn from the activities of T1.1 has been submitted to DATE 2019, and is currently under review. A third paper has been submitted by POLIMI to Euromicro PDP, and is currently under review.

Type of Publication	Goal	Published	Submitted
Journal	5	0	
Conference	15	1	2
Book	1	0	0

3.2 Other Dissemination Activities

In the early months of the project, Giovanni Agosta (PTM, Politecnico di Milano) organised a Special Session on European funded projects at the SAMOS conference.

Project flyers were distributed at the following events:

- Euromicro Conference on Digital Systems Design (DSD 2018);
- Italian Workshop on Embedded Systems (IWES 2018).

A short press release has been sent to the HiPEAC Newsletter, and will be published in issue 56.

Also, POLIMI and IBTS held an initial meeting with Consorzio Muzza, which manages the water basin of the Muzza channel, covering parts of the provinces of Milan and Lodi in central Lombardy, to discuss the possibility to install IBTS devices as part of an experiment for water level data collection for Use Case 2.

Finally, UPV arranged a meeting with advisory board member Dave Mayhew in Valencia, presenting him the project key features.

3.3 Website and Social Media Report

3.3.1 Website Analytics

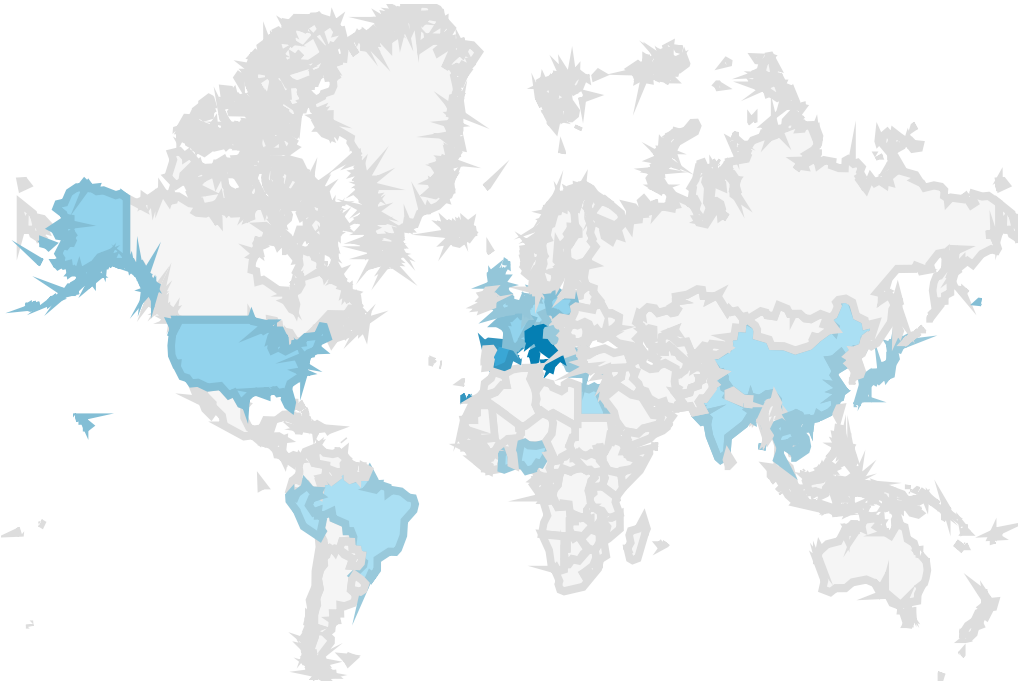
RECIPE website is pivotal in communicating and disseminating project results to different audiences. The following pictures provide: 1) the statistics of users and the geographical information in Figure 1; 2) operating system and browser utilisation in Figure 2; 3) the views per page.

The data below show how the engagement with RECIPE project gained through the website use has increased drastically since the last report. The majority of users is from Italy and Spain, which suggests that the consortium has been active in communicating and disseminating the project in its own countries. More should be done to increase the awareness of the project in the other European countries RECIPE partners are currently operating in, and outside Europe. One way we intend to reach this goal is by differentiating more clearly the content of the website so as to tailor it more precisely on the interests of the relevant audiences.

3.3.2 Social Media Analytics

RECIPE social media accounts allow to reach stakeholders with news and interactions. They act as outlets for the news items which also appear on the website, and provide a way to interact with and obtain the support of other institutional accounts, such as those of the consortium partners, and those managed by the European Union entities.

RECIPE Facebook account targets a mixed audience, primarily with photographs, infographics, and news items. In the last months, the project's page has gained new views and new followers. As for the views, for instance, the latest one regarding RECIPE press release has been read



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Map Overlay

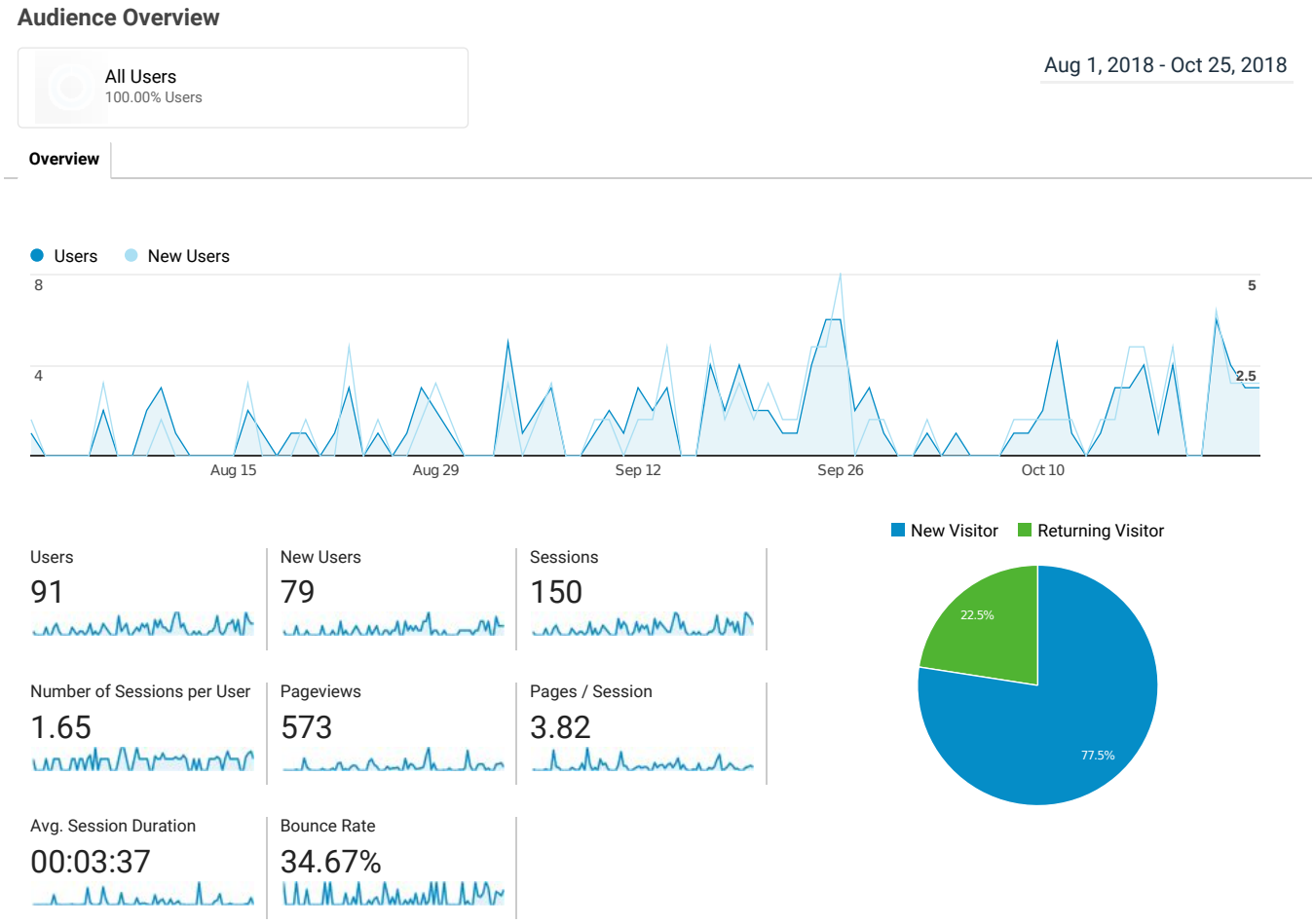
Summary

Aug 1, 2018 - Oct 25, 2018

	Country	Acquisition			Behavior			Conversions		
		Users	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
		91 % of Total: 100.00% (91)	79 % of Total: 100.00% (79)	150 % of Total: 100.00% (150)	34.67% Avg for View: 34.67% (0.00%)	3.82 Avg for View: 3.82 (0.00%)	00:03:37 Avg for View: 00:03:37 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	$0.00 % of Total: 0.00% ($0.00)
1.	Italy	29 (31.87%)	23 (29.11%)	70 (46.67%)	22.86%	4.91	00:06:31	0.00%	0 (0.00%)	$0.00 (0.00%)
2.	Spain	20 (21.98%)	16 (20.25%)	31 (20.67%)	35.48%	3.32	00:01:09	0.00%	0 (0.00%)	$0.00 (0.00%)
3.	France	5 (5.49%)	5 (6.33%)	5 (3.33%)	60.00%	3.20	00:02:32	0.00%	0 (0.00%)	$0.00 (0.00%)
4.	Poland	5 (5.49%)	5 (6.33%)	8 (5.33%)	37.50%	2.50	00:00:14	0.00%	0 (0.00%)	$0.00 (0.00%)
5.	United States	5 (5.49%)	5 (6.33%)	6 (4.00%)	83.33%	1.17	00:00:01	0.00%	0 (0.00%)	$0.00 (0.00%)
6.	Belgium	4 (4.40%)	3 (3.80%)	5 (3.33%)	60.00%	2.60	00:01:06	0.00%	0 (0.00%)	$0.00 (0.00%)
7.	Switzerland	2 (2.20%)	2 (2.53%)	2 (1.33%)	100.00%	1.00	00:00:00	0.00%	0 (0.00%)	$0.00 (0.00%)
8.	Germany	2 (2.20%)	2 (2.53%)	2 (1.33%)	50.00%	2.00	00:00:13	0.00%	0 (0.00%)	$0.00 (0.00%)
9.	United Kingdom	2 (2.20%)	1 (1.27%)	3 (2.00%)	0.00%	4.00	00:04:15	0.00%	0 (0.00%)	$0.00 (0.00%)
10.	Greece	2 (2.20%)	2 (2.53%)	2 (1.33%)	0.00%	3.00	00:01:49	0.00%	0 (0.00%)	$0.00 (0.00%)

Rows 1 - 10 of 24

Figure 1: Website Users Analytics: geographic distribution



	Browser	Users	% Users
1.	Chrome	52	57.14%
2.	Firefox	20	21.98%
3.	Safari	7	7.69%
4.	Edge	5	5.49%
5.	Android Webview	2	2.20%
6.	Opera	2	2.20%
7.	(not set)	1	1.10%
8.	Internet Explorer	1	1.10%
9.	Safari (in-app)	1	1.10%

© 2018 Google

Figure 2: Website Users Analytics: browsers and OS used

around 300 times, which is definitely more than what happened with the early news on the page. Facebook has now 14 likes. We plan to raise this number by promoting more news linked to the project in the future and by sharing more information, photos and videos linked to the technology currently developed by the partners.

Figure 3 reports some numbers showing how, only in the last 28 days, the engagement with the page has increased.

RECIPE Twitter account targets an audience which is more technical than the Facebook one, mostly by leveraging the sharing news of major accounts followed by academics, students, and industry players.

To this end, RECIPE Twitter account has already 24 followers, a number that increased importantly from the last report. We plan on increasing such number and on improving the engagement of interested audiences with the account by getting in contact with stakeholders now better identified. This will increase the awareness of the project among interested parties.

Figure 4 highlights the number of impressions learned in the last 3 months.

4 Data Management Plan

Data Management Plans (DMPs) are introduced in the Horizon 2020 Work Programmes:

> A further new element in Horizon 2020 is the use of Data Management Plans (DMPs) detailing what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved. The use of a Data Management Plan is required for projects participating in the Open Research Data Pilot. Other projects are invited to submit a Data Management Plan if relevant for their planned research.

The purpose of the Data Management Plan (DMP) is to provide an analysis of the main elements of the data management policy that will be used by the applicants with regard to all the datasets that will be generated by the project. The DMP is not a fixed document, but evolves during the lifespan of the project.

In the case of RECIPE, specific care needs to be put to ensure correct management of data within Use Case 3, which employs personal data from patients to drive its machine learning application.

4.1 Private Data Management Policies

The Project Coordinator is the physical person responsible for the RECIPE project and for approving other users access to the project.

Users are physical persons participating in the project. Membership of users to RECIPE project is authorised by Project Coordinator and the entire consortium is aware of that list, since any modification is discussed during the weekly telcos.

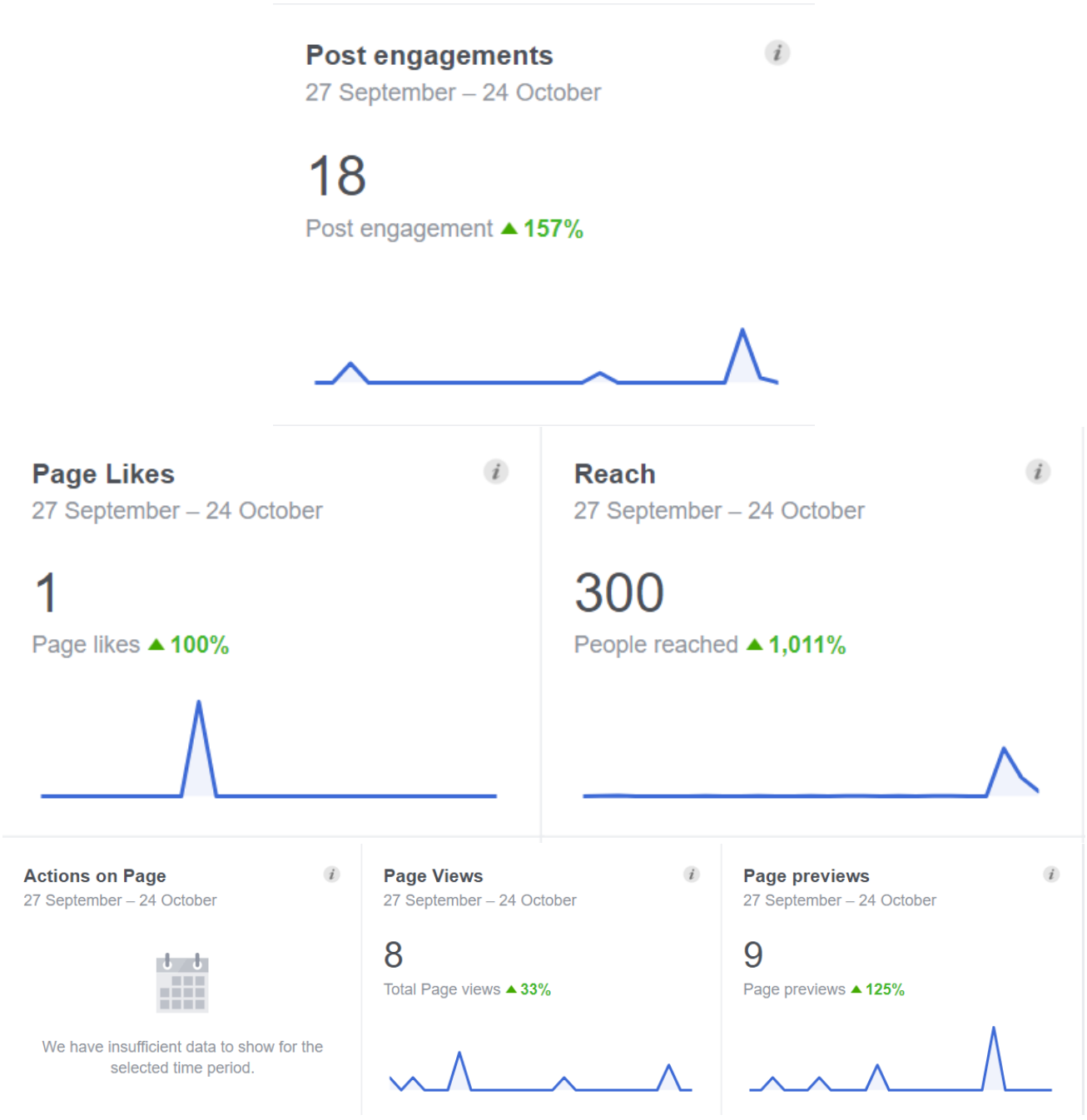


Figure 3: Facebook engagement

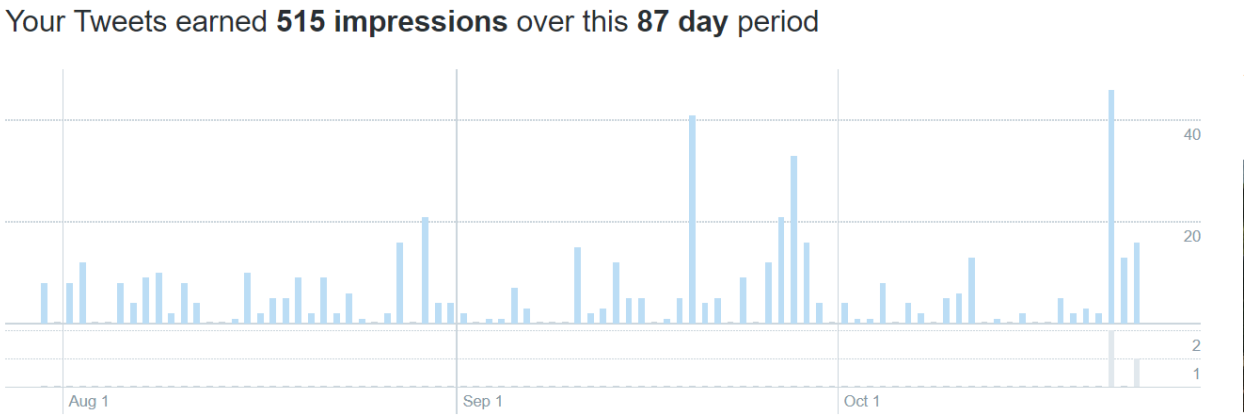


Figure 4: Twitter impressions

4.1.1 Project Data Sharing Platforms

Phabricator is a suite of web-based collaboration tools. The instance of Phabricator used for RECIPE is self-hosted at POLIMI, the coordinating entity, and connected to file storage and versioning solutions, also self-hosted on the same physical machine (which is not virtualised). In particular, we employ ownCloud, a self-hosted Dropbox-like solution for private file storage. It is used in the project as a repository to store files related to the project (e.g., reports, publications, dissemination materials). We use a free version of ownCloud as the repository server. It is an open platform which can be accessed through a web interface or a sync client (available for desktop and mobile platforms). Members of the RECIPE Consortium can access the repository files using accounts, previously created by a system administrator. Furthermore, we employ Git, a version-control system supporting collaboration on both the RECIPE software and shared documents provided in (primarily) plain text or markup formats. Access to the three platforms is granted by the coordinator, and is technically managed via username/password authentication, or via public key authentication.

The project website is hosted on a different (virtualised) machine, since it holds only public documents. All the machines are placed in a server room secured by elecromechanical locks controlled by access cards. Only POLIMI system administrators have access to this room.

4.1.2 Storage and Access Policies

Data generated or used by the project are held in facilities under the control of individual partners, and are shared (when such sharing is authorised by the Project Coordinator based on the policies set in the Consortium Agreement) with other partners only through the project OwnCloud and Git platforms.

In particular, data employed for Use Case 3 are kept at CHUV facilities in Switzerland, and will not be stored in the project facilities nor otherwise moved outside Switzerland. A synthetic data set with compatible statistical properties will be generated for the purpose of testing the scale-up of the Use Case 3 application on the RECIPE hardware infrastructure, which will be installed at UPV and CERICT facilities.

Such hardware infrastructure is dedicated to the project, and will be accessible to other consortium partners (only) through public key authentication and/or password based SSH/SFTP access.

RECIPE will also leverage a hardware prototype developed within the context of the MANGO H2020 FET-HPC project, which will be also installed at UPV and CERICT after the end of the MANGO project itself. Since the MANGO prototype will be accessible also to partners of the MANGO consortium which are not partners of RECIPE, only non-confidential data will be transferred to and elaborated on the MANGO prototype.

Any transfer of data between RECIPE storage facilities will take place through encrypted and authenticated channels (SFTP/SCP) only.

4.2 Data Management Plan Template

For each generated dataset, the following metadata will be produced. Open datasets will be listed on appropriate resources, such as OpenAIRE.

Number	Item	Description
1	Dataset reference and name	Identifier for the dataset to be produced (DOI)
2	Dataset description	Description of the data that will be generated or collected, its origin (in case it is collected), nature and scale and to whom it could be useful, and whether it underpins a scientific publication. Information on the existence (or not) of similar data and the possibilities for integration and reuse.
3	Standards and metadata	Reference to existing suitable standards of the discipline. If these do not exist, an outline on how and what metadata will be created.
4	Data sharing	Description of how data will be shared, including access procedures, embargo periods (if any), outlines of technical mechanisms for dissemination and necessary software and other tools for enabling reuse, and definition of whether access will be widely open or restricted to specific groups. Identification of the repository where data will be stored, if already existing and identified, indicating in particular the type of repository (institutional, standard repository for the discipline, etc.). In case the dataset cannot be shared, the reasons for this should be mentioned (e.g. ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related).
5	Archiving and preservation (including storage and backup)	Description of the procedures that will be put in place for long-term preservation of the data. Indication of how long the data should be preserved, what is its approximated end volume, what the associated costs are and how these are planned to be covered.

A Updated Dissemination Materials

A.1 Flyers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GA number: 801137
Duration: 2018-2021
RECIPE website:
http://www.recipe-project.eu/
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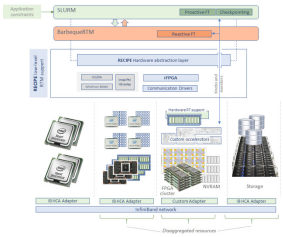
MILANO 1863

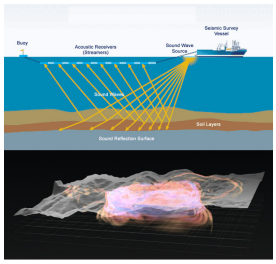


OBJECTIVES

RECIPE (REliable power and time-ConstraInts-aware Predictive management of heterogeneous Exascale systems) provides the tools needed to make the heterogeneous resources in future High Performance Computing (HPC) systems more robust and reliable.

The main goals are:

- 25% increase in energy efficiency
- 15% increase in mean to time failure
- Up to 25% improvement in energy-delay product
- Occurrence of fault executions reduced by 20% with recovery times compatible with real-time performance



GEOPHYSICAL EXPLORATION

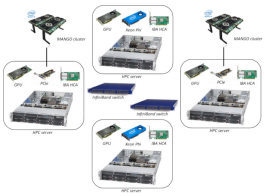
The most promising geophysical imaging tool nowadays is Full Waveform Inversion or FWI. Potentially, FWI can retrieve physical parameters for a whole 3D subsurface volume directly from the seismic data. However, the tool has its limitations, as are the necessity of specially acquired data (low-frequency, long-offset), good initial models and huge computational demands. In our tool, the FWI tool has inherited the efficient implementation of the algorithmically similar RTM and boosted its capabilities in order to turn this very costly imaging algorithm into a commodity.

PROBLEM and METHODOLOGY

RECIPE provides a hierarchical runtime resource management infrastructure to optimise energy efficiency and minimise the occurrence of thermal hotspots. This preserves the time constraints imposed by the applications, and ensures reliability for both time-critical and throughput-oriented computation.

More powerful and less energy-hungry supercomputers are needed.

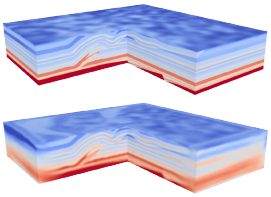
However, the supply needed to keep HPC centres running is about to exceed the capabilities of the power grid. We therefore need to exploit resource heterogeneity. RECIPE provides the tools to manage these heterogeneous resources in future HPC systems.



MORE THAN A RECIPE...

Our FWI tool incorporates novel preconditioning, data compression and workflow control ideas that make its approach unique and result in very high-resolution 3D subsurface models.

The resulting models are of very high quality even at deep sections, while the computing costs are not too different from those required for other high-end imaging applications (e.g. RTM). Together with accelerated kernels running on advanced HPC platforms, our tool is mature and ready to reduce uncertainty in seismic exploration surveys today.




EULAG
Poznan Supercomputing and Networking Center (PSNC) applies HPC to predict the energy produced by renewable energy sources. For the existing wind turbines, the simulation provides a more detailed weather forecast to maximize the outcome of the power plant. It can also help in finding the most optimal localization of the wind turbines to maximize benefit from local topography and weather conditions.
PSNC simulations software uses HPC simulations to predict and forecast air quality in urban areas, modelling NOx, SOx, PM2.5 and PM10 concentrations in particular. The EULAG model allows different scales to be modeled, taking into account:
• Weather conditions, including forecasts;
• Different emission types: point, line, area, including vehicle types, emission based on land cover;
• Complex urban topography;
• Season differentiation
PSNC main goal is to ensure reliable, in-time and efficient air quality modeling and execution of energy production prediction in order to allow fine-grained optimization in future smart grids.
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RECIPE EU H2020 FETHPC PROJECT
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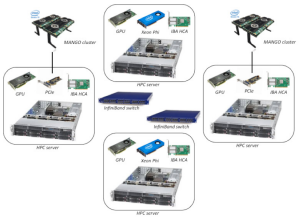

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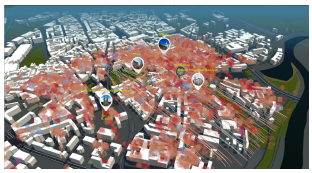
However, the supply needed to keep HPC centres running is about to exceed the capabilities of the power grid. We therefore need to exploit resource heterogeneity. RECIPE provides the tools to manage these heterogeneous resources in future HPC systems.

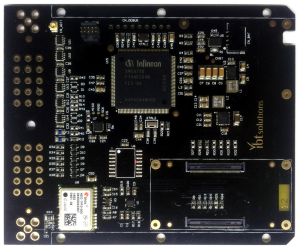
ENVIRONMENTAL MONITORING

Flood events are the most frequent and expensive manifestations of hydro-geological instability. Because of climate change, by 2050 the number of flood events is expected to double, with devastating effects on our ability to intervene and on our economy. Environmental monitoring is often extended with numerical weather prediction (NWP) models, which can be used to predict the occurrence and the range of the floods, and to optimize the behavior of power plants exploiting renewable energy sources (RES) such as wind turbines.

RECIPE aims at:

- Demonstrating the applicability of weather forecast in two application domain, i.e. water level prediction and RES;
- Showing that run-time resource management is of paramount importance to achieve reliabilty and to satisfy timing-related performance in a cost-effective manner.





H2Observer

IBTS designs a set of in-field deployable platforms and a dashboard application to keep the status of water basins under control. The long-term goal is not only to monitor the status of rivers and canals, but also to :

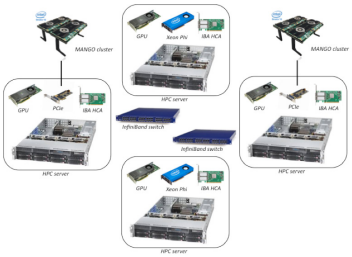
- Improve the reaction speed to critical conditions such as floods by exploiting weather forecasts;
- Make the application running on the server more reliable;
- Create a repository with historical data for analysis and forecast collected through a flexible, easily deployable and low-cost sensor station;
- Create a control dashboard for different end-users

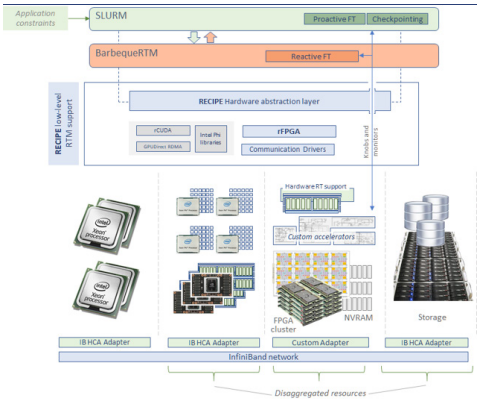
Interestingly, weather predictions are not merely used to enhance water level predictions, hence flooding. The data coming from the on-field sensors (water level, humidity, speed and direction of wind, etc.) can also be used to enhance the precision of weather predictions themselves, thus creating a very useful synergy.

RECIPE (REliable power and time-ConstraInts-aware Predictive management of heterogeneous Exascale systems) provides the tools needed to make the heterogeneous resources in future High Performance Computing (HPC) systems more robust and reliable.

Goals

- 25% increase in energy efficiency
- 15% increase in mean to time failure
- Up to 25% improvement in energy-delay product
- Occurrence of fault executions reduced by 20% with recovery times compatible with real-time performance
- Full exploitation of available resources under non-saturated conditions



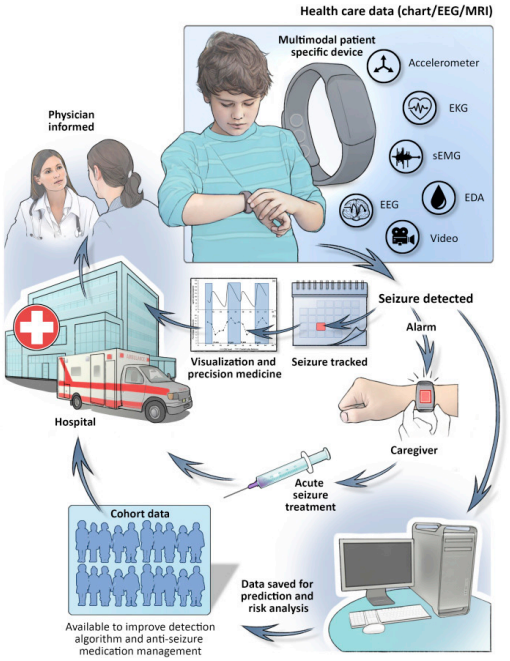


Methodology

RECIPE provides a hierarchical runtime resource management infrastructure to optimise energy efficiency and minimise the occurrence of thermal hotspots. This preserves the time constraints imposed by the applications, and ensures reliability for both time-critical and throughput-oriented computation.

Epilepsy and MHealth

Epileptic seizures induce a number of autonomic system changes that can be monitored via wearable electronics. However, the huge variation in seizures from one patient to another makes their detection very challenging and militates for individually setting algorithm.



Ulate-Campos et al., Seizure, 2016

Once stabilized, patients' wearable devices should access their own specific algorithm in due time to offer real-time seizure detection. To do so, **biomedical traces** obtained via a monitoring system are labelled as potential seizures, and **are sent to computing infrastructures with enough computational power** to execute the required machine-learning and deep learning algorithms needed **to detect whether the biomedical traces seem to correspond to an upcoming epileptic seizure.**

The main goal in this project is to develop the required software infrastructure to enable the deployment of the seizure detection algorithms in a prototype platform able to manage a large-scale population while meeting the real-time requirements of the application.

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Duration: 2018-2021

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References

[1] William Fornaciari, Giovanni Agosta, Carlo Brandolese, et al. Reliable power and time-constraints-aware predictive management of heterogeneous exascale systems. In *Proceedings of the 2018 International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation (SAMOS XVIII) (to appear)*, July 2018.