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Executive Summary

This document is deliverable D8.3.2 of the CloudLightning project, a Research and Innovation Action project supported by the European Union Horizon 2020 programme under Grant Agreement Number 643946. Full information on this project, including the contents of this deliverable, is available online at (<http://www.cloudlightning.eu>).

The purpose of this document is:

- to report on actions taken and impact achieved with regard to concertation and orchestration activities in Y2,
- to update the initial concertation plan (D8.3.1) produced in January 2015 and
- to outline concertation strategy for Y3.

The report is organised as follows. Part 1 provides an overview of the overall progress of Task 8.3 in Y2, as well as detailed descriptions of all concertation actions taken by the Consortium members from M13 to M24. Part 2 presents the plan for the future concertation actions to be held throughout Y3.

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1 Introduction

The objective of Task 8.3 is to ensure that the project’s activities are well orchestrated with similar initiatives worldwide and to encompass specific activities in connection with other EU projects.

CloudLightning is an active participant in the NATRES and Inter-cloud Challenges, Expectations and Issues clusters. As part of these clusters, in Y2 the project contributed to three publications and participated in three cluster working group meetings.

In Y1 and Y2, CloudLightning held a number of concertation activities with other EU projects including CACTOS, HARNESS, MO-BIZZ, MODAClouds, and DICE. Other related projects were invited to write guest blogs for the CloudLightning website and present at CloudLightning meetings or related events. Concertation actions are planned with the new Horizon 2020 RECAP project.

The CloudLightning External Advisory Board was formed in M12 and the first meeting was held in M14. Separately, CloudLightning emailed 30 funding and standardisation organisations to build awareness of CloudLightning and to seek opportunities for knowledge sharing.

Table 1 below summarises the KPIs achieved at M12 and M24 in relation to the end of the project targets.

Table 1. Concertation KPIs

KPIs	M12 January 2016	M24 January 2017	M36 (target) January 2018
Concertation Publications (cluster participation and position papers)	2	6	2
Concertation Presentations and Meeting (direct knowledge sharing with EU projects)	6	14	12
Presentations to national stakeholders	5	10	32
Briefing papers	2	4	6
Participation in standardisation activities	0	0	2
Formal briefing events	0	0	4
Informal stakeholder meetings	0	0	10
External Advisory Board meetings	1	1	4

2 Concertation Activities

This section presents the concertation and orchestration activities executed in the second year of the project. Concertation activities are divided into Concertation Publications, Concertation Meetings and Concertation Presentations, Presentations to National Stakeholders, Briefing Papers and Other Concertation Activities that do not fall under any of the categories.

2.1 Concertation Publications

CloudLightning actively collaborates with the participants of two relevant EU clusters: Novel approaches and technologies for Cloud resource and service management (NATRES) and Inter-cloud Challenges, Expectations and Issues. In Y2 CloudLightning contributed to a NATRES whitepaper, the NATRES annual report and the Inter-cloud Challenges, Expectations and Issues Research Roadmap position paper update. A special issue of *Scalable Computing: Practice and Experience on New Approaches for Infrastructure Services* was published in M23.

Table 2. Concertation Publications

1	Type	NATRES White Paper
	Title	Novel approaches and technologies for Cloud resource and service management (NATRES) White Paper
	Date	16/04/2016
	Authors	D. Petcu (IeAT), L.Lopez (ATOS), F. Javier Nieto (ATOS), I. Mavroidis (FORTH ICS), R. Bruschi (CNIT), Z. Zhao (University of Amsterdam), C.Vassilakis (UBITECH), P.Gouvas (UBITECH), I.Matranga (Engineering Ingegneria Informatica SpA), D.Pavia (Engineering Ingegneria Informatica SpA), A.Edmonds (Zürich University of Applied Sciences), T. M.Bohnert (Zürich University of Applied Sciences), M.Fazio (University of Messina), P.Leitner (University of Zurich), E.Salant (IBM Research), D. Vladušić (XLAB), R. Prodan (University of Innsbruck), S. Georgoulas (University of Surrey).
	Publication references	https://eucloudclusters.files.wordpress.com/2015/05/white-paper.pdf
2	Type	NATRES Annual Report
	Title	Novel approaches and technologies for Cloud resource and service management (NATRES) Annual Report
	Date	01/08/2016
	Authors	D. Petcu (IeAT)
	Publication references	https://eucloudclusters.files.wordpress.com/2015/05/report-natres.pdf
3	Type	Inter-cloud Challenges, Expectations and Issues Position Paper
	Title	Inter-cloud Challenges, Expectations and Issues - Research Roadmap Update
	Date	10/10/2016

Authors	B. Di Martino (Second University of Naples), M.Biancani (Interoute SpA), J.Aznar (I2CAT), D.Gallico (Interoute SpA), A.J.Ferrer (ATOS), K.Djemame (University of Leeds), E.Di Nitto (Politecnico di Milano), G.Kecskemeti (MTA SZTAKI), Z.Zhao (University of Amsterdam), F.D'Andria (ATOS), R.Woitsch (BOC), K.Kritikos (FORTH), P.Deussen (Fraunhofer), P.Massonet (CETIC), M.Villari (UNIME), J.Costa (AALTO), E.Kowalczyk (ORANGE), J. Morrison (UCC)
Publication references	https://drive.google.com/open?id=0B4hHTKjZDMXGeW5UUmJkcFIPR1k
4 Type	Scalable Computing: Practice and Experience - Special Issue
Title	Special Issue on New Approaches for Infrastructure Services in Scalable Computing: Practice and Experience
Date	01/12/2016
Authors	D. Petcu (IeAT), V. Casola (UNINA), A. De Benedictis (UNINA), M. Rak (UNINA), U. Villano (UniSannio), S. Meyer (UCC), J. Morrison (UCC), D. Kimovski (UIBK), N.Saurabh (UIBK), Vlado Stankovski (UniLJ), R. Prodan (UIBK), G. Iuhasz (UVT), D. Pop (UVT), I. Dragan (IeAT), T. F. Fortis (IeAT), M. Neagul (IeAT)
Publication references	http://www.scpe.org/index.php/scpe/issue/view/134

2.2 Concertation Meetings

The project participates in the above-mentioned cluster activities, both formally (EC conferences and face-to-face meetings) and informally (monthly telcos and discussions). In Y2 the CloudLightning partners attended four cluster meetings organized as parts of the EC conferences in Belgium and Spain.

Table 3. Concertation Meetings

1	Event	NATRES working group meeting, CloudScape 2016
	Meeting Date	08/03/2016
	Location	Brussels, Belgium
	Participating Projects	AppHub, ARCADIA, BEACON, CloudLightning, CloudSpaces, ClouT, CloudWave, DICE, ENTICE, iKaaS, INPUT, IOStack, Mikangelo, Mobile Cloud Networking, Mo-bizz, MODAClouds, MUSA, RAPID, SPECS, SWITCH
	Consortium	D.Petcu (IeAT), A.Gourinovitch (DCU)
2	Event	NATRES working group meeting, Netfutures 2016
	Meeting Date	19/04/2016
	Location	Brussels, Belgium
	Participating Projects	AppHub, ARCADIA, BEACON, CloudLightning, CloudSpaces, ClouT, CloudWave, DICE, ENTICE, iKaaS, INPUT, IOStack, Mikangelo, Mobile Cloud Networking, Mo-bizz, MODAClouds, MUSA, RAPID, SPECS, SWITCH
	Consortium	D.Petcu (IeAT)
3	Event	Inter-cloud Challenges, Expectations and Issues working group meeting, Netfutures 2016

Meeting Date	19/04/2016
Location	Brussels, Belgium
Participating Projects	CloudSocket, BEACON, SSICLOPS, ENTICE, CYCLONE, CLOUDLIGHTNING, AppHub, SWITCH, ASCETiC, ModaClouds, PaaSage, SeaClouds, mOSAIC
Consortium	D.Petcu (IeAT)
4 Event	Inter-cloud Challenges, Expectations and Issues working group meeting, CloudForward 2016
Meeting Date	18/10/2016
Location	Madrid, Spain
Participating Projects	CloudSocket, BEACON, SSICLOPS, ENTICE, CYCLONE, CLOUDLIGHTNING, AppHub, SWITCH, ASCETiC, ModaClouds, PaaSage, SeaClouds, mOSAIC
Consortium	Gabriel Castane (UCC)

2.3 Concertation Presentations

All relevant projects are invited to present at the meetings and events organised by CloudLightning. In Y2 two projects (CACTOS and DICE) presented their achievements at the National Conference on Cloud Computing and Commerce (NC4 2016) hosted in DCU. In M23 CACTOS and PROTECTIVE consortium members gave invited talks at the Data Centres in Ireland workshop in DCU.

Table 4. Concertation Presentations

1 Event	The National Conference on Cloud Computing and Commerce (NC4 2016)
Type	Presentation
Place	Dublin, Ireland
Organiser	DCU
Dates	12/04/2016
Title of presentation	CACTOS Prediction Toolkit - Optimisation aware simulation
Presenter	Sergej Svorobej (DCU)
Project	CACTOS
2 Event	The National Conference on Cloud Computing and Commerce (NC4 2016)
Type	Presentation
Place	Dublin, Ireland
Organiser	DCU
Dates	12/04/2016
Title of presentation	Developing Data-Intensive Cloud Applications with Iterative Quality Enhancements (DICE)

	Presenter	Ioan Dragan (IeAT)
	Project	DICE
3	Event	Data Centres in Ireland Workshop
	Type	Presentation
	Place	Dublin, Ireland
	Organiser	DCU
	Dates	09/12/2016
	Title of presentation	CACTOS - Context-Aware Cloud Topology Optimisation and Simulation
	Presenter	Paul Liston (DCU)
	Project	CACTOS
4	Event	Data Centres in Ireland Workshop
	Type	Presentation
	Place	Dublin, Ireland
	Organiser	DCU
	Dates	09/12/2016
	Title of presentation	PROTECTIVE
	Presenter	Brian Lee (IeAT)
	Project	PROTECTIVE

2.4 Presentations to National Stakeholders

DCU and UCC regularly reported on the progress of the project to the Irish Centre for Cloud Computing and Commerce (IC4) Steering Committee at the periodic steering committee meetings. The steering committee members represent a minimum of 5 stakeholder groups identified in D8.3.1 (see

Table 5) including the Irish government agencies responsible for domestic enterprise development and foreign direct investment. In the second year of the project the IC4 steering committee meetings were held five times on the following dates:

- March 9, 2016
- July 7, 2016
- September 8, 2016
- November 11, 2016
- January 5, 2017

Table 5. IC4 Steering Committee Members

Name	Company	Stakeholder Group
Aidan Gallagher	Inishtech	Independent Software Vendors
Anne Sinnott	Dublin City University	Higher Education Institution
Brian Lee	Athlone Institute of Technology / PROTECTIVE	Scholarly Authors, Project Consortia
Gerry Murray	Independent Cloud Consultant	Independent Software Vendors
Joe Butler	Intel	Application Developers, Hardware Manufacturer
John Power	Ostia Solutions	Independent Software Vendors
Ken Finnegan	IDA Ireland	Funding Bodies
Liam English	Bluematrix	Independent Software Vendors
Martin Hussey	Enterprise Ireland	Funding Bodies
Michael Meagher	Microsoft	Application Developers, Cloud Service Providers
Sean Baker	Investor/Non-Executive Director	Venture Capital. Independent Software Vendors
Tim Roche	University College Cork TTO	Higher Education Institution

2.5 Briefing Papers

As reported in D8.1.2. Exploitation Progress Report, four briefing papers were published on the website in Y1 and 2:

Table 6. Briefing Papers

1	Title	Global HPC Market
	Authors	T. Lynn (DCU), D. Kenny (DCU), A. Gourinovitch (DCU)
	Date of publication	28/10/2015
2	Title	3D Image Rendering
	Authors	T. Lynn (DCU), D. Kenny (DCU), A. Gourinovitch (DCU), A. Persehais (DCU), G.Tierney (DCU), M.Duignam (DCU), S.Keenan (DCU)
	Date of publication	24/12/2015
3	Title	Overview Of The HPC Market For Genome Sequencing
	Authors	T. Lynn (DCU), A. Gourinovitch (DCU)
	Date of publication	27/04/2016
4	Title	Drivers and Barriers to Using High Performance Computing in the Cloud
	Authors	T. Lynn (DCU), A. Gourinovitch (DCU), D. Kenny (UCC), X. Liang (DCU)
	Date of publication	16/09/2016

2.6 Informal Stakeholder Meetings



CloudLightning is engaging with a wide range of stakeholders informally. Collecting this data has been difficult due to the informal nature of the engagements.

2.7 External Advisory Board

The CloudLightning External Advisory Board, initially comprised 12 members, was created to provide guidance on scientific and strategic matters. In Y2 four additional members joined the EAB:

- Prof. John Mooney (Pepperdine University),
- Prof. Hiroshi Nakamura (University of Tokyo),
- Josh Simons (VMWare) and
- Andrew Johnson (Amazon Web Services).

Table 7. EAB members, as of M24.

#	Name	Company	Sector	Industry	Country
1	Prof Dan Marinescu	University of Central Florida	Academia	HPC	US
2	Prof Mary Wheeler	University of Texas at Austin	Academia	HPC/Oil and Gas	US
3	Prof Jesus Carretero	Universidad Carlos III de Madrid	Academia	Computer Science	Spain
4	Prof Dieter Kranzmüller	Ludwig Maximilians Universität	Academia	Computer Science	Germany
5	Michaela Blott	Xilinx	Private	HPC/FPGA	Ireland
6	Aidan Gallagher	Rendicity	Private	Ray Tracing	Ireland
7	Brian Boyle	HEANet	Public	HPC	Ireland
8	Ronan Dalton	IBM	Private	HPC/Cloud Service Provider	UK
9	Victor Gonzalez	Next Limit Technologies	Private	Ray Tracing	Spain
10	Robert Jenkins	CloudSigma	Private	Cloud Service Provider	Switzerland
11	Alison Kennedy	STFC Hartree Centre	Public	HPC	UK
12	Denis Condon	Microsoft	Private	Cloud Service Provider	Ireland
13	Prof Hiroshi Nakamura	University of Tokyo	Academia	HPC	Japan
14	Prof John Mooney	Pepperdine University	Academia	MIS	US
15	Josh Simons	VMWare	Private	Cloud Service Provider	US
16	Andrew Jones	Amazon Web Services	Private	Cloud Service Provider	UK

The first EAB meeting was held on 30 March 2016 and attended by the following members: Prof. Dan Marinescu, Prof. Jesus Carretero, Prof. Dieter Kranzmüller, Prof. Hiroshi Nakamura, Mr.

Aidan Gallagher, Mr. Brian Boyle and Mr. Ronan Dalton. Feedback from the EAB highlighted the importance of developing quantitative measures and benchmarks to evaluate the project's objectives and the need to prioritise aspects of the research due to the project's overall complexity and ambition. These should be reflected in the risk management plan.

The second meeting is scheduled for 10 February 2017. Two more meetings will be held before the end of the project – one following the completion of simulation research and one on completion of the project.

2.8 Other Concertation Activities

2.8.1 Funding Agencies, International Standardisation Bodies and Policy Making Organisations

In M19 the project emailed the following foundations, policy making organisations and international standardisation bodies to introduce the project and seek opportunities for knowledge transfer and collaboration:

- Centre for Life
- Spanish Foundation for Science and Technology
- Wellcome Trust
- Gulbenkian Institute of Science
- Robert Bosch Stiftung
- Norwegian Academy of Science and Letters
- Volkswagen Foundation
- Riksbankens Jubileumsfond
- Bill & Melinda Gates Foundation
- Network of European Foundations for Innovative Cooperation
- The Global Alliance for Genomics and Health (GA4GH)
- NAFEMS High Performance Computing Working Group
- OASIS
- OpenStack
- Open Grid Forum (OGF)
- Distributed Management Task Force (DMTF)
- ISO/IEC JTC 1/SC 38 Cloud Computing and Distributed Platforms
- European Telecommunications Standards Institute (ETSI)
- e-Infrastructure Regulatory Group
- European Science Foundation

- Digital Europe
- European CIO Association
- European Association of Research and Technology Organisations
- Geant
- IHE-Europe
- MedTech Europe
- EuropaBio
- European Council for and Energy Efficient Economy
- Oil and Gas UK
- Norwegian Oil and Gas Association
- Danish Export Association Oil and Gas Technology Group.

2.8.2 Guest Blogs

CloudLightning accepts guest blog posts on topics relevant to HPC and cloud computing from industry influencers or academic researchers. Aside from that, as part of collaboration with CloudWatch Hub, CloudLightning supports other participating projects by sharing their news or publishing announcements. As of today, six guest blogs and two concertation announcements have been published on the website. CloudLightning is confident that it can continue to source guest contributors on a regular basis for the remainder of the project.

Table 8. Other Concertation Activities

1	Type	Guest Blog Post
	Title	ExTASY – A Flexible Approach to Biomolecular Simulation
	Date	13/07/2016
	Author	Iain Bethune
	Project/Institution	ExTASY (Extensible Toolkit for Advanced Sampling and analysis)
	Web link	http://cloudlightning.eu/blog/extasy-a-flexible-and-scalable-approach-to-biomolecular-simulation/
2	Type	Guest Blog Post
	Title	Effervescent Clouds: Nimble Computing Infrastructure
	Date	20/07/2016
	Author	Daniel Reed
	Project/Institution	University of Iowa
	Web link	http://cloudlightning.eu/blog/effervescent-clouds-nimble-computing-infrastructure/
3	Type	Guest Blog Post
	Title	Automating Cloud HPC Resource Management With CloudyCluster

	Date	26/07/2016
	Author	Boyd Wilson
	Project/Institution	CloudyCluster
	Web link	http://cloudlightning.eu/blog/automating-cloud-hpc-resource-management-with-cloudycluster
4	Type	Guest Blog Post
	Title	High Performance Computing in the Cloud
	Date	30/07/2016
	Author	Peter Coffee
	Project/Institution	Salesforce
	Web link	http://cloudlightning.eu/blog/hpc-in-the-cloud
5	Type	Big Data Analytics & Multi-cloud Event Promotion
	Title	Big Data Analytics & Multi-cloud Event
	Date	09/11/2016
	Author	MCloudDaaS / EIT Digital
	Project/Institution	MCloudDaaS
	Web link	http://cloudlightning.eu/blog/big-data-analytics-multi-cloud/
6	Type	HNSciCloud PCP Tender Results Announcement Ceremony
	Title	HNSciCloud PCP Tender Results Announcement Ceremony
	Date	1/11/2016
	Author	HNSciCloud
	Project/Institution	HNSciCloud
	Web link	http://cloudlightning.eu/blog/hnscicloud-pcp-tender/
7	Type	Guest Blog Post
	Title	Research and Innovation Management and Online S3
	Date	05/12/2016
	Author	Katharina Fellnhofer
	Project/Institution	Online S3, Research and Innovation Management GmbH
	Web link	http://cloudlightning.eu/blog/online-s3/
8	Type	Guest Blog Post
	Title	Containers Have The Potential To Take Scientific HPC To The Cloud
	Date	13/01/2017
	Author	Carlos Eduardo Arango Gutierrez



Project/Institution	Universidad del Valle
Web link	http://cloudlightning.eu/blog/containers-hpc-cloud/



3 Action Plan for Year 3

To reach the Concertation KPIs set for M36 (see Table 1), the following actions are planned for Y3:

3.1 Concertation Publications

The target for concertation publications has been exceeded. The project will continue its ongoing collaboration with the relevant H2020 and FP7 projects and clusters and will contribute to new publications, if appropriate.

3.2 Concertation Presentations and Meetings

The CloudLightning consortium members will aim to attend concertation meetings and events as notified by the Commission, DG Connect and others. Cluster projects and other relevant projects will be invited to attend and present at the National Conference on Cloud Computing and Commerce 2017 (NC4 2017) in April. In addition, DCU will organise a joint workshop on simulation with the H2020-RECAP project (Reliable Capacity Provisioning and Enhanced Remediation for Distributed Cloud Applications) on April 11 and 12, 2017. The original target for this activity has already been exceeded.

3.3 Presentations to National Stakeholders

All consortium members will be encouraged to brief their national stakeholders in Y3 including EC National Contact Points. The project will continue to be presented to Irish national stakeholders at six IC4 Steering Committee meetings in Y3. This target will be met.

3.4 Briefing Paper

At least three more market briefings will be released in Y3 of the project:

- The HPC Market for Oil and Gas Exploration – Executive Briefing (M30)
- The HPC Opportunity for Hyperscale Data Centers – Executive Briefing (M33)

- The Market for Cloud Simulation Platforms (M36) – Executive Briefing (M36)

It is anticipated that the target for Briefing Papers will be exceeded.

3.5 Participation in Standardisation Activities

As the exploitable IP will be ready for release in Y3 (M25 onwards), the main focus for Concertation for this period will be the engagement with international standardisation organisations on cloud and high performance computing and related areas. CloudLightning has a number of contributions it plans to make to the open source community, including OASIS and TOSCA. As such, consortium members will be engaging with various standards bodies to brief them on the project and ensure CloudLightning adherence to standards.

An updated newsletter will be sent to funding agencies, international standardisation bodies and policy making organisations. We anticipate meeting targets for this KPI.

3.6 Formal Briefing Event

Four formal briefing events will be held from M30 to M36 targeting the three primary use cases and hyperscale cloud service providers. These are dependent on technical outputs and results. We anticipate meeting this target.

3.7 Informal Stakeholder Meetings

CloudLightning is engaging with a wide range of stakeholders informally. Collecting this data has been difficult due to the informal nature of the engagements. A concentrated effort will be made in Y3 to document informal engagement with stakeholders from all communities and to ensure appropriate evidence is available to meet these targets.

3.8 External Advisory Board

The second External Advisory Board meeting is scheduled for 10 February 2017. Two additional meetings will be held in Y3. The first will be held at M30 to brief the EAB on the simulation



results. A final meeting will be held in the end of Y3 (January 2018) to evaluate the project's performance and results.



4 Conclusion

This document reported on key activities that the CloudLightning consortium executed with regard to collaboration with relevant initiatives and projects in Y2. It also outlines a set of activities for Y3, however these are subject to alteration if new and greater opportunities for concertation and collaboration arise. As can be seen from Table 9, CloudLightning expects to meet or exceed all concertation targets.

Table 9. Concertation Target Expectations

KPIs	M24 January	M36 (target) January 2018	Expectations
Concertation Publications (cluster participation and position papers)	6	2	EXCEED
Concertation Presentations and Meeting / Direct knowledge sharing with EU projects	14	12	EXCEED
Presentations to national stakeholders	10	32	MEET
Briefing papers	4	6	EXCEED
Participation in standardisation activities	0	2	MEET
Formal briefing events	0	4	MEET
Informal stakeholder meetings	0	10	MEET
External Advisory Board meetings	1	4	MEET