# D1.2 Periodic Report (06 Months)
# Version 1.0

## Document Information

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# Change Log

| Version | Description of Change |
|---------|----------------------|
| V1.0 | Initial version sent to the European Commission based on 0.8 internal. |
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# Table of Contents

# 1  Publishable Summary

The objective of the RETHINK big Project is to bring together the key European hardware, networking, and system architects with the key producers and consumers of Big Data to identify the industry coordination points that will maximize European competitiveness in the processing and analysis of Big Data over the next 10 years. Specifically, RETHINK big will deliver a strategic roadmap for how technology advancements in hardware and networking can be exploited for the purpose of data analytics while also taking into consideration advancements in applications, algorithms and systems.

In this project, we will not carry out actual research on Hardware optimizations for Big Data, but rather survey the landscape of opportunities and propose a strategic roadmap from that landscape. The outcome of the project will be a series of detailed (mentioning specific technologies), realistic (considering our 10-year timeline), verifiable (including target metrics) and coordinated technology development recommendations that would be in the best interest of European Big Data companies to undertake in concert as a matter of competitive advantage.

Practically speaking, the roadmap will be produced as a result of area specific and cross-functional working groups meetings and congresses. We will initially identify and evaluate the existing competencies across European Big Data application domains and technology providers in Europe and then identify the key European stakeholders, or the established and up-and-coming institutions that possess or are developing the technologies, processes or services that map to these competencies. From these stakeholder institutions, we will select technology and business experts that will chart the technological advancements, their respective challenges and the potential business opportunities that they present. These experts will not only share an interest in defining a credible roadmap, but also hold the decision-making power within their respective institutions (and collectively) to implement that roadmap.

At the highest level, this project will identify and evaluate the existing competencies across European Big Data Hardware and Networking technology sectors and application domains and prioritize the complementary interests and the shared opportunities that allow all key industrial stakeholder companies to unlock the highest return on their respective investments; it will result in a roadmap that would be irrational not to follow.

## 1.1  Motivation and goals

In future decades, the ability to process and analyze Big Data will have a greater and greater impact on the European Union's productivity and competitiveness. Big Data describes a massive volume of both structured and unstructured data that is too large to be processed using traditional database and software techniques. It is often seen as the **"oil of the 21th century"**; it is estimated that by the year 2020 there will be 35 zettabytes of data. As Big Data analytics is an important part of the modern ICT society, many European companies rely on it to describe consumer behavior by real-time figures, and to use that information as a guideline for business decisions, effectively reducing risk and increasing profit. Businesses and public institutions are currently being challenged to unlock the potential for the most added-value by making use of Big Data.

Offering the right information extracted from Big Data, to the right people, is fast become the key to competitive advantage.

- The objective of the RETHINK big Project is to bring together the key European hardware, networking, and system architects with the key producers and consumers of Big Data to identify the industry coordination points that will maximize European competitiveness in the processing and analysis of Big Data over the next 10 years. Specifically, RETHINK big will deliver a strategic roadmap for how technology advancements in hardware and networking can be exploited for the purpose of data analytics while also taking into consideration advancements in applications, algorithms and systems. The resulting report will be used as a direct reference for technology innovation in Europe.
- In a multi-phase approach, the project will identify critical stakeholders in Europe in the area of hardware and networking support for Big Data, engage top stakeholder technical experts with access to decision makers, organize these experts in working groups in applications, hardware, and networking, consider opportunities for cross-functional co-design across working groups and synthesize the working group findings into a strategic roadmap defined as a series of detailed, realistic, verifiable and coordinated technology development undertakings that would be in the best interest of EU Big Data companies to undertake in concert as a matter of competitive advantage.

As an indirect outcome, it is hoped that the roadmap will facilitate the coordination between the Big Data ecosystem and public authorities (EU and the Member States) responsible for Big Data research and dissemination programs. It will foster joint initiatives among the main stakeholders in the area of research and innovation programs and RETHINK big members.

The majority of the investigation and analysis will be performed in well-focused, well-prepared surveys and meetings in which the Working Groups play the central role. The Working Groups are composed of 2 tiers of participation. Tier 1 comprises the Project Partners which includes some of the major players in hardware, networking and software support in addition to European Big Data practitioners. The Partners will be directly responsible for the acquiring, discussing and synthesizing input from key industrial and academic players or stakeholders from Tier 2 into the roadmap. Tier 2 is comprised of the representatives of the stakeholders in the outcome of the project; these are Big Data practitioners and technology providers who will directly benefit from a clear roadmap for advancements in technology support for Big Data in Europe.

Technology roadmapping is a critical activity for a global economy when a near-future technology investment decision is not entirely straightforward, meaning that it is not clear which alternative to pursue and how quickly the technology is needed / will be available or when there is a need to coordinate the development of multiple related technologies. Each of these ideas is relevant in the case of Big Data. The RETHINK big Roadmap must define *which* technical capabilities the European ICT industry needs to develop in order to stay on top of Moore's Law and other trends, as well as defining *when* each of these capacities will be needed.

For this reason, the RETHINK big Project will only be deemed successful having achieved the following outcomes:

- A roadmap that is detailed (mentioning specific technologies), realistic (considering our 10-year timeline), verifiable (including target metrics);
- A roadmap that includes coordinated technology development recommendations that would be in the best interest of European Big Data companies to undertake in concert as a matter of competitive advantage;
- A roadmap that takes into consideration the known Hardware and Networking challenges of performance and scalability, bandwidth and latency limitations, energy efficiency, reliability, and security;
- A roadmap that takes into consideration the known Big Data-related challenges of variety, velocity, volume and veracity;
- A roadmap that accounts for other key enabling technologies from non-Big Data industry and research that might bring disruptive solutions into Big Data;
- A roadmap that facilitates the creation of new international standards, as required;
- A Big Data Technology Ecosystem that includes the key European hardware, networking, and system architects, the key European producers and consumers of Big Data that cooperates with key European existing initiatives in the area of Big Data, HPC, and ICT in Europe, such as the NESSI, the European Data Forum, The European Technology Platform for High Performance Computing and the like…

It is only through this successful roadmap that we can achieve a world-class, globally competitive, European Big Data Technology value chain that provides the key industry decision makers with a mutually beneficial strategy for the long term development for Big Data in Europe.

## *1.2 Technical work performed and main results*

In the first 6 months of the RETHINK big Project, the RETHINK big Project Team focused on setting up the project internally, identifying the Key Stakeholder Companies based on European Competencies and bringing together the representatives of these companies for the first Working Group Meeting.

From a Management perspective, the RETHINK big Coordinator (BSC) under WP1 spent the first 6 months putting in place the tools and procedures required for strong communication within the Project Team. This work included releasing the Project Portal and SVN for internal document exchange and project-related news in addition to creating distribution lists, document templates and a Quality Plan. At the same time, the Management team organized the Kick-off meeting held on 19 March 2014 in conjunction with the EDF in Athens, Greece which was briefly attended by Ms. Marta Nagy-Rothengass, head of "Data Value Chain" in DG CONNECT.

In addition, the Dissemination Team led by UPM focused on establishing strong online project presence. Based on the tasks outlined by WP2, this team worked to launch a preliminary version of the www.rethinkbig-project.eu, LinkedIn Group and Twitter feed which was announced at the EDF. The team then followed up with additional releases of more detailed content on the website in the months following the Kick-off Meeting. Moreover, the team released both a Press Release coinciding with the Kick-off and subsequently a newsletter highlighting the project motivation, goals and Project Kick-off meeting.

The work of WP3 Applications Challenges, WP4 Key Enabling Technologies and WP5 Strategy and Roadmapping focused primarily on identifying the key European Competencies in Big Data and using these competencies as a starting point determining a list of target key stakeholders (in the form of experts) in hardware, networking and algorithms for the processing of big data and culminated in an initial working group meeting at the Universidad Politécnica de Madrid (UPM) on 18 and 19 September 2014. The objectives were to identify challenges across European big-data sectors and to develop a shared language to discuss these and to identify key strategists within each organization. Nearly seventy experts participated in a structured brainstorming session to facilitate communication across sector, disciplinary and cultural boundaries. Participants were asked to provide concrete, practical and measurable examples which were real rather than hypothetical, and to communicate them in objective, rather than subjective, language. The results from the lively, engaged debates are currently being analyzed with the results of a pre-meeting survey in order to provide a high level assessment of the most common perceived Big Data problems, particularly in industry.

Finally, the RETHINK big Project engaged as a project with the most important projects and organization in the current Big Data Ecosystem. RETHINK big submitted a position paper in response to the public consultation for the SRIA sponsored by the EC and Big Data Value and were subsequently invited to the NESSI Summit. We collaborated with associated Big Data projects BIG and BYTE to consider an initial Key Stakeholder Platform Strategy and were subsequently invited to a meeting sponsored by the soon to be named Big Data cPPP at Commission Headquarters in Luxembourg.

# 2 P1 Objectives, progress and achievements during the period

## 2.1 6 Months progress and achievements in detail

### 2.1.1 WP1 Coordination and Management

See Management Section.

### 2.1.2 WP2 Dissemination and Ecosystem Ties

During the first six months of the project, the main objectives of WP2 were to build awareness of the project objectives and potential impact in the relevant industrial, research and academic communities, to disseminate project objectives and engage in a conversation with the relevant communities and to the public at large, to coordinate project participation in EC clustering and concentration activities related to Big Data and to build a community of key stakeholders and decision makers in Big Data development in Europe.

#### 2.1.2.1 Dissemination Plan Target Metrics and Progress-to-date

The table below summarizes the target metrics for the project by which dissemination success may be measured on an annual basis as well as over the course of the project. These metrics were determined via discussions within the consortium as well as a comparison with projects of similar size and scope.

The numbers achieved to date show good progress toward targets for Period 1 in most areas. The most notable needed area for improvement is in the number of critical expert stakeholders representatives engaged on the online platforms (Twitter and LinkedIn) as well as the individually and community targeted tweets and LinkedIn discussion items. The representatives and targeted discussion items have the potential for indicating community trends that are not evident in the literature to date, in particular the available literature available on company roadmaps. Progress for each of the targets is described in detail in the sections to follow.

| TASK | DISSEMINATION TYPE | TARGET (TOTAL) | ADDITIONAL DETAILS | DISSEMINATION METRICS - ACHIEVED P1 |
|---|---|---|---|---|
| T2.1 Public website | News Items | 24 | Based on one entry per month | 6 |
| T2.1 Public website | Public Website | 3.000 | Total number of unique visitors | 1.087 |
| T2.2 Online Community | LinlkedIn Group | 130 | Number of members. Over duration of project | 132 |
| T2.2 Online Community | Twitter Account | 1.000 | Number of Tweets. Over duration of project. | 211 |
| T2.2 Online Community | Twitter Account | 275 | Number of Followers. Over duration of project. | 156 |
| T2.4 EC Factsheet | Project Factsheet or flyer | 1.000 | Number of prints. An EC Fact Sheet / Flyer that consists primarily of a project publishable summary suitable for web publishing. | 200 |
| T2.4 Newsletter | Project Newlsetter | 75 | Number of Suscribers.Subsequent Newsletters and Flyers that will be available for hand-out at relevant events and Congresses. Published bi-anual (every 6 Months). Number of Suscribers. | 17 |
| T2.4 Newsletter | Project Newlsetter | 2.000 | Number of prints. Public Newsletters distributed in Congresses, Workshops and Related Events. | 750 |
| T2.4 Newsletter | Project Newlsetter | 4 | Published Newsletters. Published bi-anual (every 6 Months). Number of issues. | 1 |
| T2.4 Press | Project Press Releases | 2 | Over duration of project, based on one PR after project start and one PR near project completion | 1 |
| T2.4 Press | Media clippings | 10 | Press articles that name the project and its impact. Over duration of project. | 2 |
| T2.5 Concentration Activities | Events attended | 30 | Presence at EC clustering and concertation activities in the area of Big Data. Over duration of project. | 11 |
| T2.5 Concentration Activities | Related Publications | 15 | Number of appearances. Presence at publications/newsletters of other projects/organizations/events/networks/associations in the area of Big Data. Over duration of project. | 3 |
| Task 2.6 Preparation Final European / International Conference | Final International Conference | 200 | Number of attendees. High-visibility congress in conjunction with the European Commission at which we will formally announce the roadmap as well as discuss the steps required for implementing the roadmap | 0 |
| Task 2.7 Project video public showcase | Video Showcase. | 1 | An interactive showcase or short video that explains the project outcomes and the final roadmap to an "interested" but not necessarily specialist audience (to be available on the Public Website). Number of videos | 0 |

**Table 1 - RETHINK Dissemination Metrics to date**

### 2.1.2.2  Task 2.1 Establishing and maintaining the Public Website (UPM, BSC)

As leader of this task UPM, initiated work on the initial design of the project Public Website prior to the project's official start with the goal of having an initial page and social media tools in place in time for the Kick-off Event on 19 Mar 2014 as well as to be able to announce the Website and tools at the co-located EDF.  UPM enlisted BSC's expertise in web design as well as infrastructure in order to achieve this goal. Together, the partners procured the required equipment, set-up the webserver, defining the layout and design of the website (including blog, RSS feed, social media links and interactive calendar of events), coordinated the collection and review of the initial content.  Initial requirements for the website are included in the associated deliverable description.  In addition, this task includes maintaining the complete content of the website.

The website content includes a synopsis of the project, a description of the partners and working groups involved and a press corner with news, events, press releases and the project logo. In addition, anyone who is interested can subscribe to the project newsletter through the website.  It also includes a complete list of project-related events, publications and presentations as well as links to papers for download, where applicable.  The RETHINK big roadmap will be made available on the website.

**Figure 2 - RETHINK big public website homepage**

Finally, the website will provide direct access to all public deliverables once they have been approved by the EC. More detailed information regarding the Public Website can be found in the deliverable D2.1 Public Website and online community.

Since the launch of the project website, the RETHINK big Public website has received a total of **2050** visits, of which **1087** were unique visitors. The page which received the most clicks is the homepage, followed by information about the Google Summer of Code event and the RETHINK big newsletter. The average session duration is four minutes.

Over the next reporting period, project partners will be looking at ways to optimize the content and make it as engaging as possible, in order to attract more visitors and facilitate interaction with stakeholders and the general public. Moreover, we will consider employing additional search optimization techniques to ensure that the website can be found more easily.
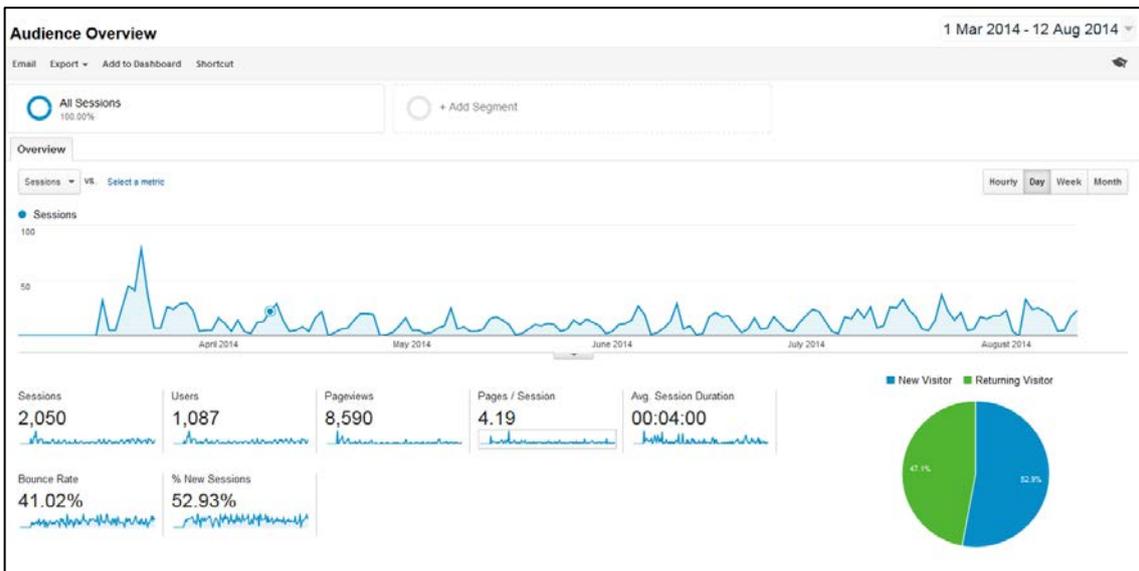
**Figure 3 - Web Visits to date**

### 2.1.2.3 Task 2.2 Establishing the online community (PARSTREAM, UPM)

In this task, we want to take an innovative approach to developing a community of experts and interested parties by establishing the appropriate incentives for ongoing participation. As there are already a number of platforms for engaging specific communities already in use by our target members, the General Assembly selected the subset that they felt would best serve our needs as a project, namely, LinkedIn and Twitter, These tools were selected based on their widespread use by the public as well as current project team members. As a follow-up action, ParStream sponsored a Face-to-Face meeting with UPM and BSC at BSC in Barcelona. The emphasis of the meeting was to determine whom to target via each of the selected platforms as well as to establish high level processes to ensure adequate moderation of the discussions held on each of them. ParSteam, UPM and BSC also used the meeting to clarify the various roles and responsibilities for the Twitter (UPM / ParStream), LinkedIn (UPM) and various aspects of the website (BSC).

As a result of this meeting, we have set up interactive channels to allow stakeholders and followers to participate actively in topics relating to big data. The main channels are a Twitter account and a LinkedIn group; a Facebook group was initially planned, but after careful consideration of the dissemination strategy at the outset of the project, we decided to focus more on LinkedIn and Twitter account, hence avoid overlapping content and target our efforts where they would be most effective. The Coordinator has created a distribution list for social media content rethinkbig-socialmedia@bsc.es, to which all core team members can send suggestions for social media posts, in order to create a "pool" of content. Shortcuts to all RETHINK big social media accounts are provided on the public website and the Twitter feed is automatically updated on the project home page. In order to facilitate participation in Twitter by all project partners, we have provided a list of relevant hashtags via the project portal, in the social media section. This will hopefully help Twitter users find our tweets more easily and allow the RETHINK big Twitter feed to participate in general conversations about key topics.

The main objectives of the Twitter account are, first, to position RETHINK big as a source of credible, valuable information, providing a stream of useful and relevant

content such as related articles and publications, events and conferences. The second main objective is to allow the project to connect with similar projects and related communities, holding conversat ions which will help the project gain different viewpoints and unite different groups. The account has been active since 20 February; at the time of writing there are 156 followers, the account has tweeted 211 times and has been listed 25 times. We have been retweeted 156 times, mentioned 46



**Figure 3 – Twitter Account**

times and "favourited" 91 times, and we have been pleased to note an increase in the number of retweets, especially by accounts with a significant number of followers such as @mycordis (7,097 followers at time of writing) and @prismtech (17,135 followers at time of writing).
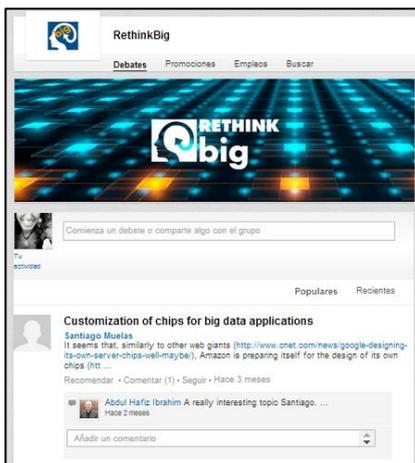


**Figure 4 – LinkedIn Profile**

In response to feedback from the project officer, we have re-evaluated the approach to Twitter and are working to adopt a new approach by targeting our engagement to specific members of the stakeholder community.

We have also set up a LinkedIn group to promote debate and discussion among professionals. LinkedIn debates must include interesting articles about Big Data as the starting point for discussion and opinion, but always taking a position from the perspective of the project. Each Work Package 2 participant (and all WPLs) will define an internal conversation "watcher" to begin the conversations and check for spammers.

The RETHINK big LinkedIn group currently has 134 members and has hosted 23 discussions on key topics such as the value of big data, data centers, the customization of chips and the Internet of Things.
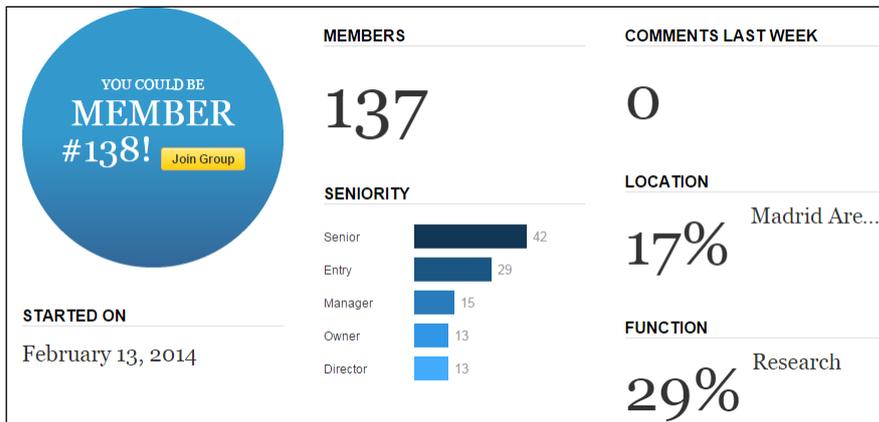
**Figure 5 – LinkedIn Statistics**

### 2.1.2.4  Task 2.3 Survey of European Big Data competencies and Expert selection (UPM, UniMan, PARSTREAM)

In this task, UPM, UniMan, PARSTREAM supplied an initial set of European Big Data competencies as the starting point for selecting a group of technology and business experts representing the most critical Big Data application domains and technology providers in Europe. BSC worked to define selection criteria for the individual experts and all Consortium members were asked to send their suggestions. ParStream being one of the few non-research organizations in the project focused on including industry expertise while UPM provided close links to research and industry organizations including NESSI, Big Project and BSC engaged the ETP4HPC. At the same time, BSC solicited the participation of projects and individuals alike based on key recommendations from the European Commission.

The outcome of this activity will be the <u>D2.2 Report on European Big Data Competencies and Expert Selection</u> in which we define the competencies and describe our criteria and process for selecting the experts. To the extent possible, we are working to provide this list of experts as an open data resource according to the suggested data structure https://joinup.eceuropa.eu/asset/all.

### 2.1.2.5  Task 2.4 EC Factsheet, Press Releases and other media (THALES, UPM)

In this task, our goal is to organize a media campaign in conjunction with the European Commission. As leader of the task and with the collaboration of UPM and BSC, THALES began by creating the <u>D2.3 EC Fact Sheet / Flyer</u> in time to present the project and its goals to the public at the EDF (with which the project kick-off meeting was collocated) to approximately 400 attendees. Subsequently, UPM used this first document as a starting point for the content of the initial project <u>Press Release (D2.4)</u> with the help of THALES and BSC to announce the start of the project. In addition, THALES authored and delivered the first newsletter of the project with the partners' contribution. THALES subsequently printed the newsletter and organized distribution at relevant events, including the following:



**Figure 6 - Factsheet**

- ESWC, Crete, Greece, 100 copies
- NESSI Summit, Brussels, 50 copies
- SHPCloud 2014: International Workshop on Extreme Scale Data Cloud Computing Architectures, Beijing China, 50 copies.
- SIGMOD 2014 (distributed by EPFL)

Finally, THALES also published the following article with the RETHINK big consortium:

- Lortal, G., Gouguenheim, C., Faure, D., Laudy, C., RETHINK big Consortium Dissemination Lead, « RETHINK big Collaborative Support Action » In EU Project Networking Session at ESWC 2014 (European Semantic Web Conference), Crete, 2014.

To help achieve greater publicity following this late start, the team submitted an article describing RETHINK big to the HiPEAC (European Network of Excellence on High Performance and Embedded Architecture and Compilation) newsletter *HiPEAC info* (issue 39) and plans to submit an article focusing on simulator results in a future newsletter.



**Figure 7 - RETHINK big in HiPEAC Info 39**

### 2.1.2.6 Task 2.5 Clustering and concertation activities (UniMan, UPM)

In this task, we work to coordinate with the EC to contribute to and participate in focused concertation actions, themed seminars or special interest groups in the domain of Big Data. As an active member in NESSI with strong ties to BIG Project, UPM has taken the lead in ensuring that RETHINK big has been included in all Big Data-related events organized by both organizations as well as the soon to be announced BDVA and cPPP for Big Data. In April 2014, RETHINK big (authored by Work Package Leaders, UniMan, TUB, UPM and BSC) sent a Project-level response to the SRIA put forth by Big Data Value and subsequently participated in the NESSI Summit in May 2014. RETHINK big also participated in a Big Project-sponsored sustaining group along with the BYTE Project throughout the summer 2014 and as a result has been included in EC discussions on the Big Data Stakeholder Platform Meeting in Luxemburg on 24 Sep 2014.

### 2.1.2.7 Task 2.6 Preparation Final Conference m24 (UPM, THALES)

Preparation for this task will begin in P2.

### 2.1.2.8 Task 2.7 Project video public showcase (THALES, UPM)

This task begins in m21.

### 2.1.2.9 Task 2.8 Project dissemination progress tracking (UPM, BSC)

In this task, we will ensure that dissemination progress is in sync with the plan of record at the management-led Monthly General Assembly Teleconferences. To date, BSC has worked with UPM to determine a set of target metrics for all tasks in this Work Package in the *Dissemination Report (a section of the Project Report)* which can be found in the Disseminations section of this report. The target metrics will be compared against actual numbers in the M06 and all subsequent reports. UPM tracks progress for dissemination activities in the monthly GA teleconferences as well as the Work Package Leader meetings.

## 2.1.3 WP3 Application Challenges

### 2.1.3.1 Tasks 3.1, 3.2, 3.3 and 3.4 Application Challenges Working Groups

In the first 6 months of the Project, WG Leaders BSC (3.1), ParStream (3.2), CWI (3.3), and IMR (3.4) focused their efforts on finding the appropriate mix of experts for the Applications Working Groups which are broken down in the Description of Work by "task":

- Task 3.1 = WG3.1 Fundamental Sciences and Engineering Applications (BSC, UPM, CWI, UniMan)
- Task 3.2 = WG3.2 Business, Finance and Information Marketplaces (PARSTREAM, IMR, UPM)
- Task 3.3 = WG3.3Life Sciences (CWI, UniMan, UPM, EPFL)
- Task 3.4 = WG3.4 Future Internet and Social Networking (IMR, BSC, TUB, UPM)

In parallel, the Work Package Leaders (BSC, UPM, UniMan, TUB) met on a bi-weekly (once every 2 weeks) basis in order to evaluate the balance of expertise, industry/academia and national representation in order to ensure a broad group in place for the first Working Group Meeting held on 18 and 19 Sep 2014. In addition, and as per the Description of Work, each of the Project Partners offered its own contribution of internal expertise, by nominating an expert to each Working Group to which it had been assigned Person Months (with some minor exceptions). Finally, all Partners provided input to a one of 2 surveys related to Big Data and Applications or Technologies, respectively as well as a follow-up survey in preparation for the event WG Meeting.

### 2.1.3.2 Task 3.5 WP3 Coordination (UniMan) m1-m24

Near the outset of the project, the WP3 and WP4 Leaders UniMan and TUB, respectively, worked closely with WP2 Leader UPM and WP5 Leader BSC to identify application domain experts and decision makers from industrial and academic stakeholders and invite them to participate in four Working Groups. These Working Groups met once prior to each Synthesis Workshop. As stipulated in the DoW, the first WP3 and WP4 Face-to-Face WG Meetings were co-located in order to hold a cross-functional session to discuss and assess the impact of cross-cutting issues such as

energy efficiency, reliability, security and performance in addition to evaluating opportunities for co-development. WPLs coordinated with WP4 and WP5 Leaders to define the appropriate templates in the form of an Applications and Technologies survey in addition to a more strategy-focused follow-up survey in order to maintain a consistent approach at the first WG Meeting. At time of writing, the WG Leaders are collecting and synthesizing the information for their specific domain group from the meeting while WP Leaders UniMan and TUB are synthesizing the key points across the working groups as well as raising any critical issues to the General Assembly.

## 2.1.4 WP4 Enabling Technologies

### 2.1.4.1 Task 4.1, 4.2, 4.3 and 4.4 Enabling Technologies Working Groups

In the first 6 months of the Project, WG Leaders ARM (4.1), THALES (4.2), ALBLF (4.3), and CWI (4.4) focused their efforts on finding the appropriate mix of experts for the Technologies Working Groups which are broken down in the Description of Work by "task":

- Task 4.1 = WG4.1 Conventional and unconventional HW Architectures, Process Technology (<u>ARM</u>, BSC, EPFL, No Rack, UPM, UniMan, CWI)
- Task 4.2 = WG4.2 Distributed Architectures, Devices and Sensors, Memory and Storage Systems (<u>THALES</u>, BSC, EPFL, No Rack, UPM, UniMan, CWI, PARSTREAM)
- Task 4.3 = WG4.3 Networks (<u>ALBLF</u>, TUB, THALES, BSC, UniMan)
- Task 4.4 = WG4.4 Frameworks, SW Models, Algorithms and Data Structures, and Visualization (<u>CWI</u>, TUB, EPFL, UniMan, PARSTREAM, IMR, UPM)

### 2.1.4.2 Task 4.5 Coordination (TUB)

Near the outset of the project, the WP3 and WP4 Leaders UniMan and TUB, respectively, worked closely with WP2 Leader UPM and WP5 Leader BSC to identify and invite application domain experts and decision makers from industrial and academic stakeholders to participate in four Working Groups that met once Face-to-Face prior to each Synthesis Workshop. As stipulated in the DoW, the first WP3 and WP4 Face-to-Face WG Meetings were co-located in order to hold a cross-functional session to discuss and assess the impact of cross-cutting issues such as energy efficiency, reliability, security and performance in addition to evaluating opportunities for co-development. WPLs coordinated with WP4 and WP5 Leaders to define the appropriate templates in the form of an Applications and Technologies survey in addition to a more strategy-focused follow-up survey in order to maintain a consistent approach at the first WG Meeting. At time of writing, the WG Leaders are collecting and synthesizing the information for their specific domain group from the meeting while WP Leaders UniMan and TUB are synthesizing the key points across the working groups as well as raising any critical issues to the General Assembly.

## 2.1.5 WP5 Roadmap and Recommendations

In this task, we have prepared the templates to be used for the analysis performed in the Working Group Meetings and Synthesis Workshops. Moreover, we will provide the team with the analytical tools required to identify the internal and external factors that are favorable and unfavorable to achieving our high level objective.

In order to ensure a uniform approach, analysis-related templates will focus on the WHO, WHAT, by WHEN, WHERE, WHY and HOW MUCH aspects. This will also force authors to keep recommendations clear and concrete.

### 2.1.5.1 T5.2 Preparation Post-mortem Synthesis Workshop 1 m9 (BSC, All)

In this task we will prepare, facilitate and document the first Synthesis Workshop as well as assign and track authorship for each of the versions of the Roadmap. Post-mortem implies that the ideas and general synthesis that results from meeting will be reviewed and revised at great length requiring at least a nominal participation from all of the Partners. The outcome of this task is the first version of the Roadmap v1 (m12).

The Synthesis Workshop serves as the follow-on to the initial Working Group Meetings, in which each WG will meet to perform an initial strategic analysis to determine the Critical Success Factors for each area of focus for the European Community in addition to performing a gap analysis to determine the best path to success. Armed with this area-specific analysis, WG Leaders will meet to perform the same analysis cross-functionally (bringing along one of their External Expert counterparts) at the Synthesis Workshop.

WP5 together with WP3 and WP4 as described above focused primarily on identifying the key European Competencies in Big Data and using these competencies as a starting point determining a list of target key stakeholders (in the form of experts) in hardware, networking and algorithms for the processing of big data and culminated in an initial working group meeting at the UPM on 18 and 19 September 2014. The objectives were to identify challenges across European big-data sectors, to develop a shared language to discuss these and to identify key strategists within each organization.

Prior to the meeting, participants were asked to complete a survey on challenges in the field of big data; the highest-ranking results were then used as the basis for the brainstorming sessions. The meeting itself attracted an impressive turnout of 69 participants from 49 organizations, 38 of whom were external experts identified by the project as being able to offer a valuable contribution to the debate. The balance between sectors represented by participants was firmly in line with the project's objectives, with 19% coming from academic backgrounds or research institutions, 16% from small and medium enterprises (SMEs) and 12% from large companies, as well as 2% from projects. A total of 14 countries were represented.

On the first day, following a keynote presentation by John Goodacre of ARM Ltd. and Anastasia Ailamaki of the École Polytechnique Fédérale de Lausanne (EPFL), participants were split into small groups, each representing a different sector. Their task was to identify and evaluate a) challenges across European big-data application domains and b) technological advancements, prioritizing those which demonstrated most potential for improving big-data processing over the next five years.

With such a mix of participants, the potential for miscommunication was high, and the meeting therefore sought to establish a common language to describe the challenges facing Europe in terms of processing big data. To this end, a structured brainstorming method was used to facilitate communication across sector, disciplinary and cultural boundaries, while the discussions in small groups were intended to make everyone feel comfortable in sharing their perspective. Participants were asked to provide concrete,

practical and measurable examples which were real rather than hypothetical, and to communicate them in objective, rather than subjective, language. The results from the lively, engaged debates which ensued were then shared in the plenary session at the end of the day.

Once these issues had been identified by groups of participants working in similar areas, on the second day hardware and software representatives were brought together in groups, with the aim of establishing a common language to help understand the benefits and trade-offs of applying various technological solutions to these challenges. Participants were asked to prioritize some of the key problems facing Europe identified by the survey, before considering how Europe should respond to these issues and the timeframe required to do so. Once again, each small group presented its findings to the full assembly.

### 2.1.5.2 T5.2 Preparation Post-mortem Synthesis Workshop 2 m19 (BSC, All)

This task has not yet started.

## *2.2 Project planning*

### 2.2.1 Deliverables

The following table shows the Deliverables due to the first six months of the project:

| Del. no. [1] | Deliverable name | Version Submitted to EC | WP no. | Lead bene-ficiary | Owner | Internal Reviewer | Delivery date[4] | Actual / Forecast date | Achiev ed Yes/No | Comments | Posted to Public Website |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D2.1 | Public Website and online community | 1.0 | 2 | UPM | Ernestina Menasalvas (UPM) | David Faure (THALES) | 1 | 1 | Y | NONE | N |
| D2.3 | EC Fact Sheet / Flyer | 1.0 | 2 | THALES | David Faure (THALES) | Gina Alioto (BSC) | 1 | 1 | Y | NONE | N |
| D2.4 | Initial Press Release(s) / Report | 1.0 | 2 | THALES | David Faure (THALES) | Gina Alioto (BSC) | 1 | 1 | Y | NONE | N |
| D5.1 | Roadmap Templates | 1.0 | 5 | BSC | Gina Alioto (BSC) | Philippe Rigaux (IMR) | 2 | 8 | Y | To be delivered due to resource unavailability (working on preparations for the first WG Meeting) | N |
| D1.1 | Project Management Procedures and Communication Tools | 1.0 | 1 | BSC | Emma Torrella (BSC) | Stefan Manegold (CWI) | 4 | 4 | Y | NONE | N |

| D1.2 | Period 1 (M06) Project Report including: Technical, Management, Financial (partial - effort) Report. | 1.0 | 1 | BSC | Emma Torrella (BSC) | Mikel Lujan (UniMan) | 6 | 8 | Y | Delivered 2 months late due to resource unavailability (working on preparations for the first WG Meeting | N |

**Table 2 – 6M Project Deliverables**

## 2.2.2 Milestones

The following table shows the Milestones due to the first six months of the project:

| MS No. | Milestone Name | Work Packages Involved | Lead bene-ficiary | Delivery date from Annex I [1] | Means of Verification | Comments |
|---|---|---|---|---|---|---|
| M1 | Kick-off / Internal and External Communication Tools / Templates and Training Complete | WP1 | BSC | 2 | Successful Completion of Kick-off Meeting (and associated Training), D1.1, D2.1, D2.3, D5.1 | All of the deliverables required for the successful achievement of this milestone have been completed. |

**Table 3 – 6M Project Milestones**

# 3 Project Management

Work Package 1, consisting of the Coordination and Project Management of the Project, is the responsibility of the Project Manager and the Technical Manager; however, it also includes the active participation of all project Partners through the General Assembly which is integral to the successful management of the project.

In the first six months of the project, WP1 focused on further defining the Management Plan and (technical) Project Plan described in the Description of Work and executing on this plan in order to drive the project forward. This work largely consisted of setting up the organizational structure of the project and determining the most effective internal communication strategy for the project partners, establishing the appropriate quality assurance procedures, implementing the tools required for tracking project progress and tracking the project progress itself. As these structures, strategies and procedures were defined and documented in the following places:

The Communication Strategy and Tools are described in detail in the D1.1 Project Management Tools Document; however, a brief overview of the strategy and associated tools is included below in Section 3.1 below.

## 3.1 Task 1.1 Internal communication strategy and tools definition (BSC)

### 3.1.1 Management organizational structure

At the outset of the project, WP1 implemented the management structure of the project as defined in the Description of Work. At its first official meeting (held on 18 March 2014), the General Assembly reviewed the rules and procedures which had been detailed in the Consortium Agreement (CA) and formalized basic requirements for internal communication summarized in the internal communication strategy described below.

### 3.1.2 Contact list and distribution lists

The primary communication channel for the project is email. For this reason, the first communication-related tool set-up for the project consists of several Distribution Lists which facilitate the routing of information requests to the appropriate individuals and groups. The Project Manager updates these lists on a regular basis and posts the most up-to-date information to the Project Portal in the form of a sortable project Contact List. This Contact List also includes the key contact coordinates for all Partners.



**Figure 8 - Contact and Distribution Lists**

### 3.1.3 Meetings

Another important tool for maintaining strong communication between the partners has been holding monthly teleconferences to evaluate progress against project plans, ensure high quality implementation of the project, to identify major problems and co-ordinate project-related interactions among the WP Leaders.

There is a standing agenda that is the template for each meeting and ensure that each Partner is aware of what will be discussed from meeting to meeting. This agenda is flexible to accommodate the two distinct goals of: 1) discussing general and high level project progress toward the plan of record and assign actions; and 2) sharing status on individual tasks and results as well as discussing relevant issues in greater detail.
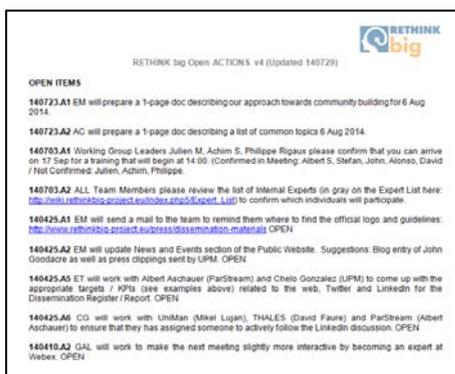


**Figure 9 - Action Item List**

The Project Manager works with the Technical Manager to procure agenda items, chair the meetings, assign action items and provide the minutes. Action items are assigned unique identifier including the meeting date and number (i.e. 140328.A2) so that they can be easily tracked from meeting to meeting in order to ensure prompt resolution. The Project Manager provides these actions in a list, Action Item List, and uploads it in the Project Portal to ensure the partners involved can also track them and update the status. The RETHINK big Team held 6 General Assembly teleconferences in the first 6 months of the Project.

When the discussion of complex strategic issues are threatened by meeting time constraints, team members are actioned to hold additional meetings and / or create a technical discussion via email or bilateral conferences until they have resolved the issue.

The project is organized in five Work Packages and each of this is broken down into different Tasks and subsequently each Task has been assigned a leader. In order to ensure the performance of every task is implemented correctly the Coordinator organizes Work Package Leaders (WPL) teleconferences to discuss the progress of each task and to plan the preparation of WP deliverables. From the beginning of the Project, Coordinator has held four WPL teleconferences.

A part from holding monthly teleconferences, there has been two Face-to-Face meetings, consisting of one or several days of detailed technical discussions. These meetings, specifically, a Kick-off Meeting held in March 2014 and the Dissemination Strategy Meeting in April 2014 facilitated tight collaboration among the project participants ensuring that the project has progressed according to the plan of record. In particular, the April Face-to-face Meetings held in Barcelona focused on the collaboration necessary to define and refine the Dissemination Strategy among the WP2 (WP2 Dissemination and Ecosystems Ties) to break down the most effective dissemination channels (press, social media, wiki, events, etc.) to create a community of stakeholders and to build awareness of the project objectives.

The following table lists all of the meetings held during this reporting period:

| DATE | MEETING | DURATION | LOCATION |
|---|---|---|---|
| 07-03-14 | Teleconference | | |
| 18-03-14 | Kick-off Meeting | 2-days | Athens, Greece |
| 10-04-14 | Teleconference | | |
| 25-04-14 | Face-to-Face Meeting WP2 | 1-day | Barcelona, Spain |
| 07-05-14 | Teleconference | | |
| 26-05-14 | Teleconference WPLs | | |
| 29-05-14 | Teleconference WPLs | | |
| 03-06-14 | Teleconference WPLs | | |
| 05-06-14 | Teleconference | | |
| 03-07-14 | Teleconference | | |
| 04-08-14 | Teleconference WPLs | | |
| 28-08-14 | Teleconference | | |

**Table 4 - Project Meetings**

### 3.1.4 Project Portal as a communication tool



**Figure 10: Project Portal Home**

Perhaps the communication tool used most by the Project Team has been the Project Portal. The Project Portal is a wiki-based secure intranet that was created to facilitate the exchange of critical project documentation, events and news. It provides a structured central document repository for meeting minutes and presentations, deliverable drafts, dissemination material drafts, project-internal documentation and other relevant information including links to relevant articles, blogs, papers and events, paying special attention to European Commission Big Data Initiatives. The Quick Links Section of the portal is largely maintained by the Project Manager; however the Portal also allows Projects Team members, which have been provided with a username and password, to update the content and upload the latest versions of the deliverables. It allows having a controlled shared repository of latest versions of critical documentation.

The RETHINK big Project Portal may be accessed with username and password from the RETHINK big Public Website (see Project Portal button) and at the link: http://www.rethinkbig-project.eu/.

## 3.2 Task 1.2 Establishing quality assurance procedures (BSC)

In addition to being a critical communication tool, the Project Portal also serves an important function with respect to quality assurance. Instead of being buried in a lengthy document for download, links to quality procedures and templates feature prominently throughout the site and are accessible from various locations or pages.

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There is a Quick Link that provides direct access to all critical information regarding deliverables including the deliverable schedule, author and reviewer assignments as well as templates, and simple deliverable review and approval guidelines. There is also a direct link from the Home page reminding each participant to the contractual Acknowledgement text for publications and dissemination.

In the first months of the project, WP1 proposed to the General Assembly a Quality Assurance process to ensure that each deliverable would be reviewed against a well-defined set of criteria. The project team has established a list of the Main Authors and Review Owners for every Deliverable for the duration of the project. The Main Author generates the Deliverable using a standard Deliverable template to ensure a homogeneous structure and appearance. S/He then passes the Deliverable on to the internal Reviewer. The Reviewer provides comments in a standardized Deliverable Review Form that includes the complete list of criteria. The Main Author revises the Deliverable and sends it to the General Assembly for a final approval before sending it to the European Commission. The Deliverables List (including Main Author and Reviewer) as well as the Review Form and templates are all posted to the Project Portal.

## 3.3  Task 1.3 Technical and financial progress tracking (BSC)

The regular General Assembly / WPLs Meetings described in the previous section are the most important part of the two-tiered reporting process established in order to monitor project progress. The General Assembly meets via teleconference on a regular basis in order to review progress toward critical project deliverables and milestones, to assess risk and to assign actions. Additionally, each Partner delivers an annual report, which includes a summary of the effort dedicated to each work package, a detailed list of the non-human resource expenses incurred to date and a summary of the technical work completed to date as well as a brief explanation for any deviations from the Description of Work.  This information is compiled and then shared by the Project Manager with the General Assembly to ensure that effort spending at the Partner level is in sync with the technical work performed to date.  The Project Plan and the reporting process as well as the content and format of all associated reports have been documented on the Project Portal. The Project Manager sends templates and provides assessment to the Partners in every step of the process.

## 3.4  Task 1.4 Legal and financial management of contract (BSC)

During the first six months of the project, there were no changes / subsequent modifications to the EC Grant Agreement or to the Consortium Agreement. The Coordinator received the pre-financing and forwarded it to the other beneficiaries in compliance with the provisions of the Grant Agreement and the Consortium Agreement. Details regarding the use of the resources will be provided in Section 5 regarding Use of the Resources.

# 4  Explanation of the Use of Resources

## 4.1  Planned vs. Actual Effort Spent by Work Package

The following table compares the planned work vs. the actual work performed (effort) over the duration of the project.

| PARTNER | WP1 | | WP2 | | WP3 | | WP4 | | WP5 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Planned | Actual | Planned | Actual | Planned | Actual | Planned | Actual | Planned | Actual | Planned | Actual |
| | 6M | 6M | 6M | 6M | 6M | 6M | 6M | 6M | 6M | 6M | 6M | 6M |
| 1 BSC | 3,00 | 3,80 | 1,75 | 2,28 | 1,50 | 1,30 | 1,50 | 0,60 | 6,50 | 4,80 | 14,25 | 12,78 |
| 2 TUB | 0,00 | 0,00 | 0,00 | 0,00 | 1,00 | 0,50 | 4,75 | 1,50 | 0,50 | 0,00 | 6,25 | 2,00 |
| 3 EPFL | 0,00 | 0,00 | 0,00 | 0,00 | 0,50 | 0,00 | 1,00 | 0,00 | 0,50 | 0,00 | 2,00 | 0,00 |
| 4 CWI | 0,00 | 0,00 | 0,00 | 0,00 | 1,50 | 1,34 | 2,00 | 1,10 | 0,50 | 0,00 | 4,00 | 2,44 |
| 5 UniMan | 0,00 | 0,00 | 0,50 | 0,25 | 4,75 | 4,00 | 1,50 | 1,00 | 0,50 | 0,25 | 7,25 | 5,50 |
| 6 UPM | 0,00 | 0,00 | 3,50 | 3,00 | 2,00 | 0,50 | 1,00 | 0,50 | 0,50 | 0,00 | 7,00 | 4,00 |
| 7 ARM | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 1,00 | 1,10 | 0,50 | 0,00 | 1,50 | 1,10 |
| 8 PARSTREAM | 0,00 | 0,00 | 0,75 | 1,00 | 1,00 | 0,50 | 1,00 | 0,50 | 0,50 | 0,00 | 3,25 | 2,00 |
| 9 IMR | 0,00 | 0,00 | 0,00 | 0,00 | 1,50 | 1,16 | 1,00 | 0,68 | 0,50 | 0,00 | 3,00 | 1,84 |
| 10 No Rack | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 1,00 | 0,00 | 0,50 | 0,75 | 1,50 | 0,75 |
| 11 THALES | 0,00 | 0,00 | 1,50 | 0,10 | 0,00 | 0,00 | 1,50 | 0,04 | 0,50 | 0,00 | 3,50 | 0,14 |
| 12 ALBLF | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 1,00 | 1,40 | 0,50 | 0,00 | 1,50 | 1,40 |
| TOTAL | 3,00 | 3,80 | 8,00 | 6,63 | 13,75 | 9,30 | 18,25 | 8,42 | 12,00 | 5,80 | 55,00 | 33,95 |

**Table 5 – 6M Project PM Status Table (by Work Package)**

In general, the usage of resources generally is lower than planned. The main reason is the slow ramp-up at start as well as in the first 6 months of the RETHINK big Project, the RETHINK big Project Team focused on planning and setting up the project internal which implies a lower spent of PMs. For this reason, BSC, as a coordinator, has spent the efforts almost according to the plan but the rest of the partners have had less involvement. EPFL has been involved in the project this first six months of the Project, but the spent resources have been paid with own funds.

# Annex 1 – Dissemination Register

| REF | PERIOD | Type of activities - | Main leader - Presenter | Title | Date | PLACE | Type of audience | Addressed countries | Size of Audience | LINK |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M01-M06 | 100 copies of RETHINK big Newsletter | David Faures (THALES) | RETHINK big Newsletter | 25-29 May-2014 | 11th ESWC (Crete, GREECE) | Scientific Community, Industry | Europe | 400 | http://2014.eswc-conferences.org/ |
| 2 | M01-M06 | 50 copies of RETHINK big Newsletter | David Faure (THALES) | RETHINK big Newsletter | 04-08 Aug - 2014 | SPH Cloud International Workshop on Extreme Scale Data Cloud Computing Architectures 2014, (Beijing, CHINA) | Scientific Community, Industry | World | 30 | http://www.scienceengineering.org/ase/conference/2014/bigdata/beijing/website/ |
| 3 | M01-M06 | 100 copies of RETHINK big Newsletter | David Faure (THALES) | RETHINK big Newsletter | 24-29 Sep - 2014 | BDSE2014 (Big Data Science and Engineering), Tsinghua University, Beijing, China | Scientific Community, Industry | World | 300 | http://www.swinflow.org/confs/bdse2014/index.htm |
| 4 | M01-M06 | 50 copies of RETHINK big Newsletter | Gina Alioto (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Newsletter | 27-may-14 | Nessi Summit 2014 (Brussels) | Scientific Community, Industry, | Europe | 80 | http://www.nessi-europe.com/?Page=nessi_summit_2014 |
| 5 | M01-M06 | 100 copies of RETHINK big Newsletter | David Faure (THALES) | RETHINK big Newsletter | 08-10 Oct 2014 | IEEE CloudNet 2014 (Luxembourg) | Scientific Community, Industry, | Europe | 100 | http://www.ieee-cloudnet.org/index.html |
| 6 | M01-M06 | 100 copies of RETHINK big Newsletter | Dimitra Tsaoussis (EPFL) | RETHINK big Newsletter | 22-27 June - 2014 | 2014 ACM SIGMOD/PODS Conference (Utah, USA) | Scientific Community, Industry, | Europe | 500 | http://www.sigmod2014.org/ |
| 7 | M01-M06 | 170 copies of RETHINK big Newsletter | David Faure (THALES) | RETHINK big Newsletter | 8-10 Oct-2014 | HiPEAC Computing Systems Week CSW 2014 (Athens, GREECE) | Scientific Community, Industry, | Europe | 400 | http://www.hipeac.net/csw/2014/athens |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | M01-M06 | 90 copies of RETHINK big Newsletter | Emma Torrella (BSC) | RETHINK big Newsletter | 18-19 Sep-14 | RETHINK big Working Group Meeting (Madrid, SPAIN) | Scientific Community, Industry, | Europe | 80 | http://www.rethinkbig-project.eu/press/events/rethink-big-working-group-meeting |
| 9 | M01-M06 | 100 copies of RETHINK big Newsletter | Ernestina Menasalvas and Consuelo González (UPM) | RETHINK big Newsletter | 15-19 Sep-14 | ECML/PKDD 2014- The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Database (Nancy, FRANCE) | Scientific Community, Industry, | Europe | 100 | http://www.ecmlpkdd2014.org/ |
| 10 | M01-M06 | 200 copies of RETHINK big Flyer | Adrian Cristal, Gina Alioto (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Project Stand | 19-20 Mar-2014 | EDF 2014 - European Data Forum 2014 (Athens, GREECE) | Scientific Community, Industry | Europe | 500 | http://2014.data-forum.eu/news/save-date-european-data-forum-2014-takes-place-19-20-march-2014-athens-greece |
| 11 | M01-M06 | Press Release | Nuria Masdeu (BSC) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 18-mar-14 | RETHINK big Website | Civil Society | World | NA | http://www.rethinkbig-project.eu/press/news/rethink-big-gathers-key-stakeholders-maximize-european-competitiveness-big-data |
| 12 | M01-M06 | Press Release | John Goodacre (ARM) | Thinking about the challenges and future for Big Data? | 18-mar-14 | ARM Connected Community | Civil Society | World | NA | http://community.arm.com/people/johngoodacre/blog |
| 13 | M01-M06 | Press Release | Ernestina Menasalvas (UPM) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 19-mar-14 | Canal UPM - News Section | Civil Society | World | NA | http://www.upm.es/institucional/UPM/CanalUPM/NoticiasPortada/Contenido/d8103bb7ac4d4410VgnVCM10000009c7648aRCRD |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14 | M01-M06 | Press Release | Nuria Masdeu (BSC) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 09-april-2014 | BSC News | Civil Society | World | NA | http://www.bsc.es/about-bsc/press/bsc-in-the-media/proyecto-rethink-big-una-hoja-de-ruta-para-el-liderazgo-europeo-en |
| 15 | M01-M06 | Press Release | Albert Aschauer (ParStream) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 10-apr-14 | ParStream Website News Section | Civil Society | World | NA | https://www.parstream.com/news/media-coverage/ |
| 16 | M01-M06 | Press Release | Stefan Manegold (CWI) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 17-apr-2014 | CWI Website News Section | Civil Society | World | NA | https://www.cwi.nl/news/2014/cwi-researchers-in-european-rethink-big-project |
| 17 | M01-M06 | Press Release | Alonso Silva (ALBLF) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 2-apr-2014 | Alcaltel Lucent Newsletter | Industry, Scientific Community | World | NA | http://www.alcatel-lucent.com/press |
| 18 | M01-M06 | Press Release | Dimitra Tsaoussis Melissargos (EPFL) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 09-may-14 | Data-Intensive Applications And Systems Laboratory Website - EPFL | Civil Society | World | NA | http://blogs.epfl.ch/dias-news |
| 19 | M01-M06 | Press Release | David Faure (THALES) | RETHINK big gathers key Stakeholders to maximize European competitiveness in the Big Data revolution | 15-may-14 | Thales Information Fusion and Analytics Wiki | Thales Community | World | 65.000 | Internal. Not accessible |
| 20 | M01-M06 | Media Clipping | Ernestina Menasalvas (UPM) | Hacia el liderazgo europeo en 'big data' | 18-mar-14 | Euroxpress | Civil Society | Europe | NA | http://www.euroxpress.es/index.php/noticias/2014/3/18/hacia-el-liderazgo-europeo-en-big-data/ |

| 21 | M01-M06 | Media Clipping | Ernestina Menasalvas (UPM) | Rethink Big o cómo liderar el 'big data' desde Europa | 19-mar-14 | TicBeat | Civil Society | Europe | NA | http://bigdata.ticbeat.com/rethink-big-como-liderar-el-big-data-desde-europa/ |
| 22 | M01-M06 | Publication | Osman Unsal (BSC) | FP7 RETHINK big Project: Roadmap for European Technologies in Hardware and Networking for Big Data | July 2014 | HiPEAC Newsletter Info N.39 | Scientific Community, Industry | Europe | NA | http://www.hipeac.net/system/files/HIPEACinfo39.pdf |
| 23 | M01-M06 | Conference | Adrian Cristal (BSC) | RETHINK big Project Overview: Presentation of the Project | 19-20 Mar-2014 | EDF 2014 - European Data Forum 2014 (Athens, GREECE) | Scientific Community, Industry | Europe | 500 | http://2014.data-forum.eu/news/save-date-european-data-forum-2014-takes-place-19-20-march-2014-athens-greece |
| 24 | M01-M06 | Conference | Adrian Cristal, Gina Alioto (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Project Stand | 19-20 Mar-2014 | EDF 2014 - European Data Forum 2014 (Athens, GREECE) | Scientific Community, Industry | Europe | 500 | http://2014.data-forum.eu/news/save-date-european-data-forum-2014-takes-place-19-20-march-2014-athens-greece |
| 25 | M01-M06 | Conference | David Faures (THALES) | RETHINK big: Collaborative and Support Action | 25-29 May-2014 | 11th ESWC (Crete, GREECE) | Scientific Community, Industry | Europe | 400 | http://2014.eswc-conferences.org/ |
| 26 | M01-M06 | Conference | Gaelle Lortal (THALES) | RETHINK big: Collaborative and Support Action | 27-may-14 | EU Project Networking Session at ESWC 2014 (Brussels, BELGUIM) | Scientific Community, Industry | Europe | 28 | http://2014.eswc-conferences.org/program/eu-project-networking |
| 27 | M01-M06 | Events | Mateo Valero (BSC) | RETHINK big Project Overview: Presentation of the Project | 22-jul-14 | Rector UPM visits BSC (Barcelona, SPAIN) | Scientific Community and Academia | Spain | 30 | NA |

| 28 | M01-M06 | Conference | Marcus Leigh and Volker Markl (TUB) | M4: A Visualization-Oriented Time Series Data Aggregation **(Best Paper Award)** | 30-aug/06-sept-2014 | VLDB2014 Very Large Data Bases, (Hangzhou, CHINA) | Scientific Community, Industry | World | 800 | http://www.vldb.org/2014/ |
|----|---------|------------|--------------------------------------|-----------------------------------------------------------------------------------|---------------------|--------------------------------------------------|-------------------------------|-------|-----|---------------------------|
| 29 | M01-M06 | cPPP Event | Adrian Cristal and Gina Alioto (BSC) | RETHINK big Project Overview: Presentation of the Project | 24-sep-14 | Community Building and Big Data Value Stakeholder Platform (Luxembourg) | Scientific Community, Industry | Europe | 20 | http://www.bigdatavalue.eu/ |
| 30 | M01-M06 | Workshop | Adrian Cristal and Gina Alioto (BSC) | NA | 25-sep-14 | Forecasting the Future of IoT, Cloud, and business opportunities (Brussels, BELGUIM) | Scientific Community, Industry | Europe | 60 | http://www.cvent.com/events/forecasting-the-future-of-iot-and-cloud-eu-consulting/event-summary-1fbd42ccbdcc4b26a6c0c2bd1fbd5288.aspx |
| 31 | M01-M06 | cPPP Event | Eugene Griffiths (BSC) | RETHINK big Signature for Data PPP | 13-oct-14 | Data PPP Signature Event | Scientific Community, Industry | Europe | 120 | http://www.bigdatavalue.eu/index.php/7-pages/64-big-data-public-private-partnership-signature |
| 32 | M01-M06 | cPPP Event | Adrian Cristal (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Project Overview: Presentation of the Project | 30-sep-14 | Big Data Project Final Event Workshop (Heidelberg, GERMANY) | Scientific Community, Industry | Europe | 30-40 | http://big-project.eu/finalevent |
| 33 | M01-M06 | Events | Adrian Cristal (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Project Overview: Presentation of the Project | 30-sep-14 | ISC Big Data Meeting (Heidelberg, GERMANY) | Industry, Scientific Community | Europe | 30 | http://www.isc-events.com/bigdata14/ |
| 34 | M01-M06 | Workshop | Osman Unsal (BSC), Christos Kotsedilis (UniMan) | RETHINK big coordinated the Workshop: "Hardware, Networking and Security for Big Data and Data Centers" | 8-10 Oct-2014 | HiPEAC Computing Systems Week CSW 2014 (Athens, GREECE) | Scientific Community, Industry and Academia | Europe | 40-50 | http://www.hipeac.net/csw/2014/athens |

# Annex 2 – cPPP related activites

| PERIOD | Main leader - Presenter | What has been done | Date | Name of the Event | Type of audience | Addressed countries | Size of Audience | LINK |
|---|---|---|---|---|---|---|---|---|
| M01-M06 | Adrian Cristal and Gina Alioto (BSC) | RETHINK big Project Overview: Presentation of the Project | 24-sep-14 | Community Building and Big Data Value Stakeholder Platform (Luxembourg) | Scientific Community, Industry | Europe | 20 | http://www.bigdatavalue.eu/ |
| M01-M06 | Eugene Griffiths (BSC) | RETHINK big Signature for Data PPP | 13-oct-14 | Data PPP Signature Event | Scientific Community, Industry | Europe | 120 | http://www.bigdatavalue.eu/index.php/7-pages/64-big-data-public-private-partnership-signature |
| M01-M06 | Adrian Cristal (BSC) and Ernestina Menasalvas (UPM) | RETHINK big Project Overview: Presentation of the Project | 30-sep-14 | Big Data Project Final Event Workshop (Heidelberg, GERMANY) | Scientific Community, Industry | Europe | 30-40 | http://big-project.eu/finalevent |