

HORIZON2020 FRAMEWORK PROGRAMME

TOPIC EUK-03-2016

“Federated Cloud resource brokerage for mobile cloud services”



D7.4

Communication plan and activities

Project acronym: BASMATI

Project full title: *Cloud Brokerage Across Borders for Mobile Users and Applications*

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Editor:	Patrizio Dazzi	ISTI-CNR
Author(s):	Patrizio Dazzi	ISTI-CNR
	Konstantinos Tserpes	ICCS-NTUA
Authorized by	Patrizio Dazzi	CNR
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BASMATI Glossary

Term/Acronym	Definition
Mobile cloud services	Online services offered by cloud resources to support mobile apps. The backend of the mobile apps.
CP	Cloud Provider. The actor that provides the cloud infrastructure/resources, such as VMs
CSP	Cloud Service Provider. The actor that provides cloud services on top of a rent infrastructure from a CP
Cloudlet	Limited capacity infrastructures with virtualization capabilities, often used to support a limited amount of users or perform a limited set of operations on behalf of the central cloud infrastructure that hosts the complete application
Edge resources	Resources aimed to operate specialized functionality, located at the "edge" of the network infrastructure, thus, closer to the end users. Examples are (clusters of) RaspberryPis or cloudlets
BUDaMaF	BASMATI Unified Data Management Framework
KE	Knowledge Extractor
DM	Decision Maker
RB	Resource Broker
MVD	Mobile Virtual Desktop
DASFEST	An 3-day long music festival taking place in Karlsruhe, Germany every July
ACE	Amenesik Cloud Engine. The cloud service deployment tool through which actual federation is achieved
BEAM	BASMATI Enhanced Application Model. An extension of the TOSCA specification
ASP	Application Service Provider. A Federation user that rents resource services in order to provide an Application services to End-users
Brokering	The matchmaking support provided by BASMATI platform to decide about the best cloud resources to exploit for the execution of the back-end of BASMATI applications. This activity regards the placement of the services or data on computational resources and storages belonging to the cloud data centre and the cloudlets within the federation.
End user	A user who benefits the various application and infrastructure services provided by the Cloud. Within BASMATI, the most typical example is exploiting the Cloud federation via a mobile device (possibly a laptop) using specialized apps or a web browser.
Offloading	The ability of BASMATI platform supporting the runtime placement of the components composing the front-end of BASMATI applications on edge resources available nearby the end user. This activity takes place both when edge and mobiles exchange one each other their own workload or when such devices transfer some workload to the clouds or cloudlets. In BASMATI we often distinguish Front-end offloading, related to the mobile part of application, from Back-end offloading, concerning the server side of applications. The latter roughly translates to the known concept of Cloudbursting.

QoE	Quality of experience. It is a measure of a customer's experiences with a service. It may be related to some aspects of the QoS and QoP, but can also take into account other metrics.
Service handover	Service handover refers to the activity of transferring an active service between two computational resources (e.g. Cloudlets) with minimal or no disruption on the availability of the service. Ideally, service handover is transparent with respect to the user.
Situational Awareness	The ability of the BASMATI platform to recognise the "situation" characterising the actual combined status of users, applications and resources, aimed at achieving an effective and efficient management of applications and resources.

Executive Summary

Dissemination and communication are a key pillar for maximizing the impact of the project. Both of them, indeed, related to the same activities for different targeted audiences. These activities, together with training, standardization and exploitation, conform the strategy for ensuring the sustainability of project results.

Within this deliverable, the communication plan is depicted at the beginning, followed with a summary of all the activities performed, ending with a set of Key Performance Indicators (KPIs) used to measure the results of the performed activities and as a reference for the future.

Basic strategy can be considered as a mean for creating awareness around the project, letting different stakeholders know about BASMATI, its research goals and results, as well as to attract and engage them with the final objective of creating a community of interest around the project.



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1 Introduction

1.1 About this deliverable

This deliverable details the communication plan and activities that have been carried out during the project lifetime.

Based on a comparison between what was planned and what was actually executed, key performance indicators were measured and strengths and weaknesses of BASMATI communication strategy were identified. During the second period of the project, the communication strategy was updated to address the weaknesses previously identified as well as to foster the strengths. This results in an increased interest of stakeholders, attracted by BASMATI's messages.

1.2 Relationship to other deliverables

This report is related to the following list of deliverables:

- D7.2: "Market analysis and business potentials"
- D7.3: "Exploitation plan"
- D7.5: "Training plan and activities"
- D7.6: "Standardization plan and activities"

The Market Analysis (D7.2) deliverable is the one that has driven the identification process of high business value items; whereas the exploitation plan (D7.3) is aimed at defining a sustainability plan for the project. Both those deliverables have been a fundamental support to target audience and tailor the dissemination and communication activity. The training activities (D7.5) contributed to the communication plan of the project and as such the activities reported in that deliverable are also summarized here. Standardization activity has been a chance of dissemination and communication of the BASMATI approach, ideas, concept and project, this is why this deliverable briefly summarizes the contribution given by standardization to the communication and dissemination activities of BASMATI.

1.3 Document structure

The document is structured as follows:

- Section 2, presents the initially depicted communication strategy for the project.
- Section 3, describes in detail the communication material that was created for the project;
- Section 4, presents the performed dissemination activities, including among other scientific publications to conferences as well as participation to events, conferences, workshops;

- Section 5, refers to the digital channels used to communicate BASMATI approach and results, such as official web site and social channels, DAS FEST app;
- Section 6, describes the project's liaison activities;
- Section 7, compares planned against actual work by considering the key performance indicators defined in [1];
- Section 8, reports some future planned actions;
- Finally, Section 9 provides some concluding remarks.

2 Communication Plan

According to what was presented in D7.2, BASMATI has identified a set of initial stakeholders who to transmit the scientific and technological results achieved during the project lifetime. The following table containing the stakeholders and the benefits that BASMATI can bring to them, extracted from D7.2, and some tentative messages is showed below:

Stakeholder	Potential benefit	Message
End users	End users can benefit of the transnational Cloud federation proposed by BASMATI, benefiting of accessing to their data anywhere, anytime	BASMATI will allow access to data anywhere, anytime
Application providers	BASMATI platform improves the QoS of mobile application in crowded scenarios driving the most efficient exploitation of resources what will improve providers' offering	BASMATI can improve efficiency
Cloud service providers	BASMATI proposed federated Cloud will support providers on cost savings related to their overspending on unused resources and expanding their geographic footprints	BASMATI can increase operational savings
Research communities	BASMATI aims to provide novel methods for analysis and defining mobility and behavioural patterns in the Mobile Cloud computing arena that can be of interest of other researchers	BASMATI provides innovative research results
Open Source communities	BASMATI makes uses of OS technologies and is planning to release its results under an OS licensing scheme. It is expected to foster the OSS adoption and increase community know-how in the Mobile Cloud computing arena	BASMATI can foster OSS adoption
Standardization bodies	The project will make use of well-known standards and market standards to ensure the interoperability of project results. Furthermore, BASMATI will perform a close follow up of standards and standardization bodies in order to identify any gap and/or potential contribution	BASMATI can enhance existent standards

BASMATI's objectives are:

- Raise awareness about the project objective and goals in order to serve as a framework for discussion for different stakeholders.
- Align all WP7 activities to maximize the impact of project results aiming to ensure their sustainability.
- Promote OSS usage and adoption through industry.
- Promote project results in research communities.
- Leverage European cloud market.

Several activities have been already identified for a proper project communication, and have been performed, as reported in the following sections.

3 Communication Material

The selected material has been chosen based on the potential impact it may have in the targeted audience.

3.1 Who is who

BASMATI has produced a “who-is-who” booklet listing all the people involved in the project, their short CVs, the associated commitments¹. This booklet has been distributed in the public events reported in Section 3.

3.2 Factsheet and Flyer

BASMATI consortium produced a factsheet and a flyer to ease the communication and dissemination of the concepts underpinning the BASMATI project. These items have been distributed in the events listed in Section 3.

The factsheet (Consortium, 2016) has been printed using A4 paper with a portrait alignment, single sheet with two pages, in the first page has been reported the logo of the project, a brief summarization of the main ideas of the project, and the general characteristics, such as the title, the EU coordinator, the project consortium, the duration, the total cost, etc. The first page also provides information about the context in which the project has been conceived, as well as its main challenges.



Cloud computing and mobile applications are key drivers for innovation. However, mobile device limitations still hinder today's mobile applications from reaching their full potential. The joint South-Korean and EU Horizon 2020 project BASMATI develops an integrated brokerage platform targeting federated clouds that supports the dynamic needs of mobile applications and users since 1st of June 2016.

AT A GLANCE

Project title:
BASMATI: Cloud Brokerage Across Borders for Mobile Users and Applications

Project coordinator:
Prof. Dr. Theodor Varvagiannis, Institute of Communications and Computer Systems

Partners from:

- Institute of Communications and Computer Systems (Greece)
- CNR-Istituto Nazionale delle Ricerche (Italy)
- CAS Software AG (Germany)
- Atee Spain SA (Spain)
- Amerisank Surf (France)
- Electronics and Telecommunications Research Institute (Korea)
- InsuGRID (Korea)
- Seoul National University (Korea)

Duration: 01.06.2016-31.05.2018
Total cost: 3,000,000 €
EC Contribution: 1,500,000 €
Programme: EUK-09-2016

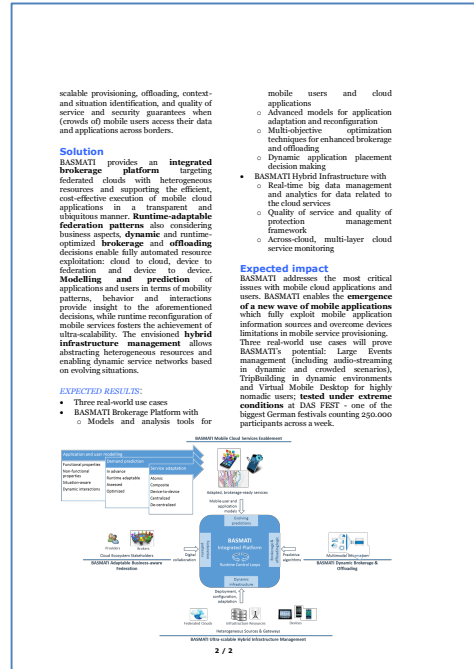
Further information:
<http://www.basmati.cloud>

Context and motivation

Several studies highlight the penetration and wide use of mobile devices, sensors and virtual entities. In this context cloud environments are increasingly considered as the enabling technology for a broad set of scenarios and applications. As a matter of fact, mobile devices are becoming more and more powerful and sophisticated, enabling rich-multimedia service provisioning and accessing at the same time various information sources (e.g. GPS), however **resource constraints still hinder today's mobile applications** from reaching their full potential.

Challenge

The current technological and social landscape calls for a shift towards the introduction of a hybrid computing paradigm, following the rise and limitations of mobile applications. BASMATI aims at providing a **complete ecosystem** that integrates cloud federation with mobile devices. It enhances mobile applications via a **seamless usage of cloud platforms and of mobile devices** for overcoming mobile devices limitations and supporting the management of services and data. Thus, BASMATI addresses challenges related to resource heterogeneity, ultra-



scalable provisioning, offloading, context- and situation identification, and quality of service and security guarantees when (crowds of) mobile users access their data and applications across borders.

Solution

BASMATI provides an **integrated brokerage platform** bringing federated clouds with heterogeneous resources and supporting the efficient, cost-effective execution of mobile cloud applications in a transparent and ubiquitous manner. **Runtime-adaptable federation patterns** also considering business aspects, **dynamic and runtime-optimized brokerage and offloading** decisions enable fully automated resource exploitation: cloud to cloud, device to federation and device to device.

Modelling and prediction of applications and users in terms of mobility patterns, behavior and interactions provide insight to the aforementioned decisions, while runtime reconfiguration of mobile services fosters the achievement of ultra-scalability. The envisioned **hybrid infrastructure management** allows abstracting heterogeneous resources and enabling dynamic service networks based on evolving situations.

EXPECTED RESULTS:

- Three real-world use cases
- BASMATI Brokerage Platform with
 - Models and analysis tools for mobile users and cloud applications
 - Advanced models for application adaptation and reconfiguration
 - Multi-objective optimization techniques for enhanced brokerage and offloading
 - Dynamic application placement decision making
 - BASMATI Hybrid Infrastructure with
 - Real-time big data management and analytics for data related to the cloud-services
 - Quality of service and quality of protection management framework
 - Across-cloud, multi-layer cloud service monitoring

Expected impact

BASMATI addresses the most critical issues with mobile cloud applications and users. BASMATI enables the **emergence of a new wave of mobile applications** which fully exploit mobile application information sources and overcome devices limitations in mobile service provisioning. Three real-world use cases will prove BASMATI's potential: Large Events management (including audio-streaming in dynamic and crowded scenarios), Tripholding in dynamic environments and Virtual Mobile Desktop for highly nomadic users, **tested under extreme conditions** at DAS FEST - one of the biggest German festivals counting 250,000 participants across a week.

BASMATI Mobile Cloud Service Framework

BASMATI Virtualized Digital Infrastructure Management

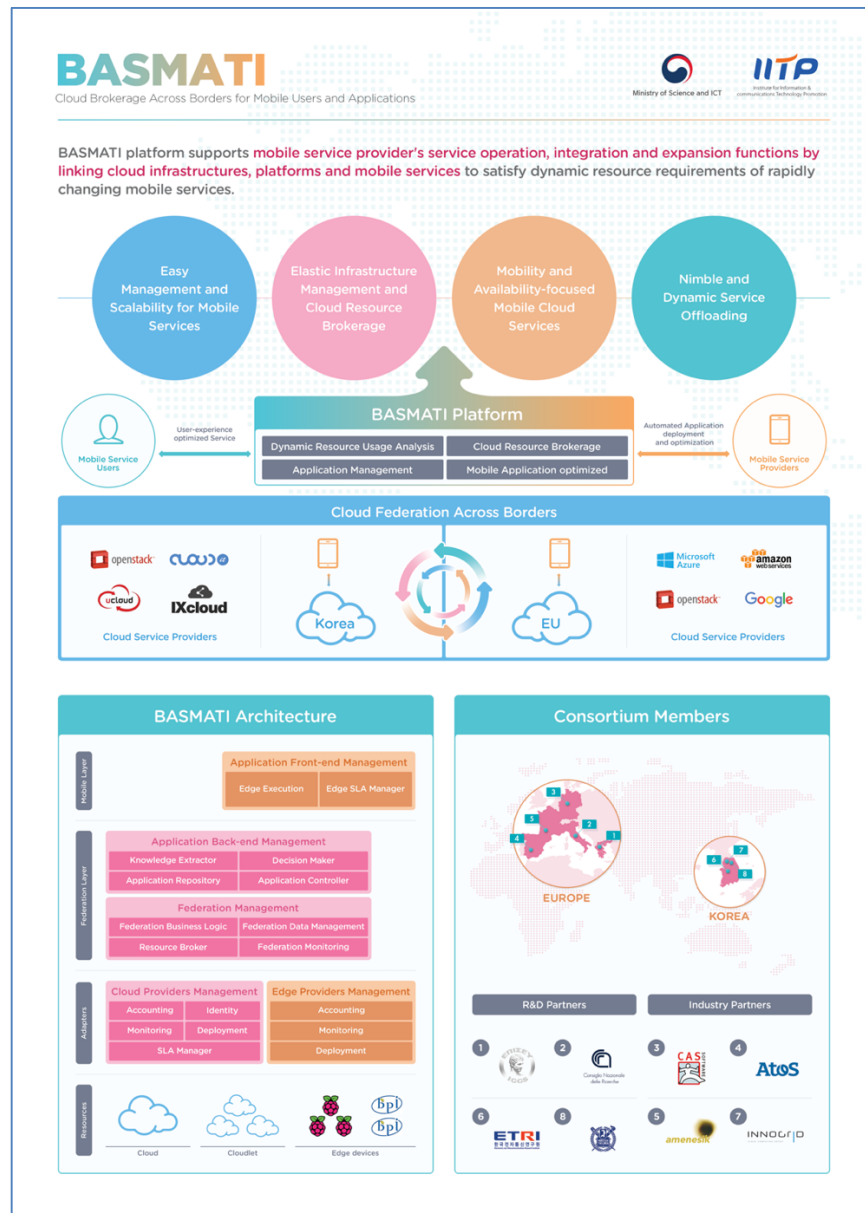
2 / 2

¹ all the consortium members listed in the “who is who” explicitly agreed to share their professional information

BASMATI Factsheet

In the second page of the fact sheet are reported the envisioned solutions delivered by the projects, the expected impacts it will have and a picture reporting the concepts underpinning the project. This document has been ready and started circulating from the very beginning of the project.

At the end of 2017 has been released a new communication item, the **flyer**, aimed at showing the main achievement of the project, obtained so far. It has been presented for the first time on November 2017 in Seoul. The flyer has been printed on A4 paper on two sides. The front side has a very limited amount of text, presenting the aspect characterizing the BASMATI project in a more endearing way. It reports information about the platform and architecture along a world map showing the partners of the consortium.



The second page of the flyer describes the visions of the project (Enablement of Mobile Cloud Services, Adaptable Business-aware Federation, Dynamic Brokerage and Offloading, Ultra-scalable Hybrid Infrastructure) and the three use cases: Mobile Virtual Desktop Infrastructure, Large Event (targeting DAS FEST), TripBuilder.

VISIONS

Enabement of Mobile Cloud Services

Modelling of applications and users in terms of their mobility patterns and behavior, applications, functional and non-functional properties, interactions between service components, and contextual aspects.

Adaptable Business-aware Federation

Enabling the development of different federation patterns taking into consideration business aspects as well during the compilation of the federation decisions.

Dynamic Brokerage and Offloading

Fully automated and efficient exploitation of resources at any-time based on offloading decisions according to different schemas.

Ultra-scalable Hybrid Infrastructure

Facilitate the development of a dynamic infrastructure consisting of heterogeneous resources. Deployment and configuration patterns will be dynamic according to the emerging requirements of applications and users.

USE CASES

Mobile Virtual Desktop Infrastructure

Mobile Virtual Desktop Infrastructure service provides virtual desktops to users as a service in the cloud environment and enables users to access their virtual desktop anywhere and anytime.

MVDI can exploit BASMATI to enhance the QoS associated with the VDI services. In particular, this use case exploits the cross-border brokerage ability of BASMATI to relocate the VDI services from Korea to EU, by exploring the tradeoff cost/performance. This approach provides users with a more stable and high-quality VDI service regardless of their location.

Large Event (DAS FEST)

Large event is any event with thousands of visitors with mobile devices such as festivals, football matches, and Olympic Games. We will implement BASMATI in DAS FEST festival which is held in Germany.

BASMATI is able to seamlessly exploit both cloud resources and mobile devices. BASMATI will determine the assignment of the necessary resources, in the context of a highly dynamic and ephemeral network. BASMATI also take care of QoS of the services provided (especially in terms of latency) by means of the advanced offloading and application re-configuration techniques.

TripBuilder

TripBuilder is a mobile service helping tourists to build their own personalized sightseeing tour of a city. TripBuilder exploits publicly available sources (Linked Open Data) to build a knowledge base and infer user interests.

Tripbuilder represents a typical application for people travelling "across regional borders" and the BASMATI Cloud federation can help in relocating the services to different cloud providers. Since TripBuilder explicitly leverages the "wisdom of the crowd" models, it is highly relevant to react whenever a large number of people concentrates in a specific area.

CONTACT POINTS : Youngwoo Jung, (yjungw@etri.re.kr) / Konstantinos Tsierpes, (tsierpes@mail.ntua.gr)

3.3 Press Release

The press release of the project has been created at the beginning of the project to announce the BASMATI Vision of the project and to report press about the main objectives of BASMATI.



BASMATI - Cloud Brokerage Across Borders for Mobile Users and Applications

Cloud Computing and mobile applications are key drivers for innovation. However mobile device limitations still hinder today's mobile applications from reaching their full potential. The joint South-Korean and EU Horizon 2020 project BASMATI develops an integrated brokerage platform targeting federated clouds that supports the dynamic needs of mobile applications and users since 1st of June 2016.

Clouds and mobile applications have been strengthening industry competitiveness and economic growth. The current technological and social landscape calls for a shift towards the introduction of a hybrid computing paradigm, following the rise and limitations of mobile applications. BASMATI aims at providing a complete ecosystem that integrates cloud federation with mobile devices, while addressing challenges related to resource heterogeneity, ultra-scalable provisioning, offloading, context- and situation identification, quality of service and security guarantees, targeting (crowds of) users accessing their data and applications across borders. BASMATI will provide an integrated brokerage platform targeting federated clouds with heterogeneous resources and supporting the efficient, cost-effective execution of mobile cloud applications in a transparent and ubiquitous manner. Runtime-adaptable federation patterns also considering business aspects, dynamic and runtime-optimized brokerage and offloading decisions will enable fully automated resource exploitation: cloud to cloud, device to federation and device to device. Modelling and prediction of applications and users in terms of mobility patterns, behavior and interactions will provide insight to the aforementioned decisions, while runtime reconfiguration of mobile services will foster the achievement of ultra-scalability. The envisioned hybrid infrastructure management will allow abstracting heterogeneous resources and enabling dynamic service networks based on evolving situations. BASMATI will be evaluated against three real-world use cases: Large Events management (including audio-streaming in dynamic and crowded scenarios), TripBuilding in dynamic environments and Virtual Mobile Desktop for highly nomadic users, which will be provided by BASMATI platform and validated during a 2018 international large event (Das Fest) counting 250.000 participants across a week.

It has been published (either in its exact form or with some adaptations, depending on the actual needs of the publisher) using different channels, including both local and international magazines, including:

- ERCIM News
- ISTI News
- Korean National Newspapers

3.4 Local Newspaper press for BASMATI at DAS FEST

BASMATI consortium members participated to the press conference of DAS FEST (DAS FEST) 2018. During the conference the BASMATI project, and its role in DAS FEST has been presented to media.

Countdown für das große Open-Air-Spektakel in Karlsruhe

„Das Fest“ steht vor seiner 34. Auflage / Organisatoren stellen Neuerungen vor: Bergwacht, grüner Touch und zusätzliche Ampeln

Von Winfried Heck



Karlsruhe – „Fest“-Chef Martin Wacker gibt sich völlig tiefenentspannt. „Gestern hatten wir einen Testlauf von dem, was am Wochenende auch passieren könnte.“ Beim Vor-„Fest“ ging am Dienstag ziemlich unvermittelt ein Platzregen nieder und die Crew konnte schon mal üben, was in solchen Fällen zu tun ist.

Auch bei der 34. Auflage des Karlsruher Open-Air-Spektakels „Das Fest“ wird nichts dem Zufall überlassen. Jahr für Jahr geht es vielmehr darum, noch ein Stückchen besser zu werden. Dieses Jahr ist erstmals die Bergwacht am Start und wird das DRK mit Personal und Material unterstützen. Vor allem in unwegsamem Gelände, das es in der 17 Hektar großen Günther-Klotz-Anlage durchaus gibt, erhofft sich Holger Schuhknecht von der DRK-Stadtbereichsleiter eine noch bessere Notfallversorgung. Die Bergwacht am Mount Klotz ist auch für Wa-

Die Bühne ist bereit: Hier werden ab Freitag namhafte Bands auftreten und bis zu 250 000 Besucher in die Günther-Klotz-Anlage locken.

Fotos: win

werden. Mit dem Partner Yellow Map ist man zudem den Bewegungsmustern der Besucher auf der Spur. Wohin strömen die Leute am Ende eines Konzerts, wenn es regnet oder die Sonne zu heiß brennt? Im Rahmen eines EU-Forschungsprojekts und in Zusammenarbeit mit koreanischen Forschern werden hierzu anonymisiert die Positionsdaten von Smartphones erfasst und analysiert. „Wir wissen nur, wo gerade ein Handy ist, nicht dessen Nummer oder sonstige Daten“, verweist Richard Wacker von der Karlsruhe Firma Rock Shop, die gemeinsam mit „Das Fest“ groß gewordene ist und auch schon Papst-Messen beschallt durfte. „Es beklagen sich inzwischen schon Leute aus der Weststadt, dass sie abends auf ihren Balkon keine Fest-Musik mehr zu hören bekommen“, schmunzelt Wacker über eher kuriose Beschwerden der Anwohner. Die echten Beschwerden gehen hingegen beständig zurück. „Wir wissen durchaus, dass hier in der Nachbarschaft Menschen leben, die abends bei offenem Fenster schlafen wollen.“ Reichlich Musik gab es beim „Vorfest“ natürlich auch schon. Mehr als 20 000 Besucher wurden bis Dienstagabend bei den Auftritten der zumeist regionalen Bands gezählt, an den drei „Fest“-Tagen sollen es dann wieder rund 250 000 werden.

Karlsruhe in „Das Fest“-Stimmung

Ab heute geht es in der Klotze mit Mando Dia, Marteria und Simple Minds rund

Am besten mit Rad oder Bahn

Die Fest-Aussenseiter empfehlen sich vornehmlich mit dem Rad oder mit der Bahn. Entmacht ist die Fest-Eventkarte auch KVV-Ticket. Im Westen und im Osten des Geländes gibt es bewachte BGV-Stellplätze für die Drahtesel. Zudem kann man sein Rad vom ADRC coahren lassen, auch ein Kurant Check ist möglich. Für die E-Biker wird zudem eine E-Bike-Station der Stadtwerte Karlsruhe eingerichtet.

„Zu feiern gibt es für „Das Fest“-Gäste immer etwas. Für junge wie alte Musikfans, Sportbegeisterte, Kulturbegeisterte, für Kinder und Familien. Wer Tickets hat, bekommt bis Sonntag für nur 30 Euro um die Haupttribüne am Hügel mit Mando Dia, Marteria und Simple Minds ein Line-Up serviert das Hipflapper erleben, bedient wie Rockfans. Feiern kann bei Süddeutschlands größtem Familienfestival in der Günther-Klotz-Anlage auch, wer spontan und ohne Ticket kommt. 70 Prozent der Angebote kosten keinen Cent. Im Kinder- und Kulturbereich stehen Varieté, Tanz, Theater, Comedy und Zirkus am dem Programm. Die als Coblenzinger gehandelte Fußbühne ist längst keiner mehr Recht lassen sich dort regionale und europäische Künstler entdecken, die Großes machen, aber noch nicht zu den ganz Großen gehören. Im Sparta-Sportpark rund um die Europahalle stehen beim Fest-Cup die Starter ohne Besten, am trocken gelegten Modellboote produzieren die Karlsruher Club-Boats. Bunt bestickt ist die Infomobile (Kart-Wolf-Weg) und

Stadtparkausstellungen, die heute ab 15 Uhr über den Eingang Klotz Krupp seinen Platz finden. Wer in den Zugängen nicht lange warten will, bringt nur die Nitrogen (dynamischer Solenostschutz und biogen) in einem DINA4-großen Stoffbeutel mit, der auch schnell kontrollieren lässt. Festgelegt mit Rückpack müssen durch poröse T-Schleusen. Wie immer gibt es für das sonntägliche Klassikerfest noch Restkarten – ab acht Uhr an der Dickkassie Europahalle. Da nicht mehr dem üblichen Ticket nichts im Wapp – außer Theatertickets für Tee oder Kaffee, die erstmals draußen bieten müssen. „Das Fest und Innovation gehen zusammen“, unterstrich am Mittwoch Martin Wacker, Geschäftsführer der Event City & der Medien. Neu sind etwa die Solar-Leuchten entlang der Wilhelm-Bau-Strasse, die auch bei Stromausfall ihren Dienst erledigen.

Und „Das Fest“ fungiert als Testfeld. Profis setzen der Karlsruher Rockshop und die auslandschick (Bekannt) bei der aktuellen Ausgabe unter dem Slogan „More an, less noise“ auf moderne Beschallungstechnik, die dem Publikum überall Musikspas, den Anwohnern weniger Lärm verspricht. Mit der mobilen Fest-App alles im Blick haben nicht nur Besucher, sondern auch deren Entwickler Yellow Map. App-Banner können das EU-Forschungsprojekt BASMATI live unterstützen und ihre Lautwege zur Messung von Besucherflüssen, tracken lassen. Anonym, versteht sich. – „Hil-

Ampeln zeigen Weg zum „Fest“

KARLSRUHE: Neue Sicherheitskonzepte werden beim Open Air mit erwarteten 250 000 Besuchern erprobt

Von Winfried Heck

„Fest“-Chef Martin Wacker gibt sich tiefenentspannt. „Gestern hatten wir einen Testlauf von dem, was am Wochenende auch passieren könnte.“ Beim „Vor-Fest“ war am Dienstag unvermittelt ein Platzregen nieder und die „Fest“-Crew konnte schon mal üben, was in solchen Fällen zu tun ist.

Auch bei der 34. Auflage des Karlsruher Open-Air-Spektakels „Das Fest“ wird nichts dem Zufall überlassen. Jahr für Jahr geht es vielmehr darum, noch ein Stückchen besser zu werden. Dieses Jahr ist erstmals die Bergwacht mit Personal und Material unterstützen. Vor allem in unwegsamem Gelände, das es in der 17 Hektar großen Günther-Klotz-Anlage durchaus gibt, erhofft sich Holger Schuhknecht von der DRK-Stadtbereichsleiter eine noch bessere Notfallversorgung. Die Bergwacht am Mount Klotz ist auch für Wacker eine sinnvolle Ergänzung.

Es mag seltsam klingen, doch auch die Verringerung der Lärmbelastung spielt bei dem Spektakel eine große Rolle. So wird die Beschallungstechnik seit Jahren verfeinert, inzwischen sorgen „gerichtete“ Lautsprecher dafür, dass die Musik nur dort in voller Lautstärke ankommt, wo sie auch gehört werden soll. „Auch in diesem Jahr sind viele Experten unseres Lieblingsherstellers auf dem Gelände, um das „Fest“ als Testfeld für neue, noch bessere Beschallungssysteme zu nutzen“, bestätigt Gerd Grub von der Karlsruher Firma Rock Shop, die gemeinsam mit „Das Fest“ groß gewordene ist und auch schon Papst-Messen beschallt durfte. „Es beklagen sich inzwischen schon Leute aus der Weststadt, dass sie abends auf ihren Balkon keine Fest-Musik mehr zu hören bekommen“, schmunzelt Wacker über eher kuriose Beschwerden der Anwohner. Die echten Beschwerden gehen hingegen beständig zurück. „Wir wissen durchaus, dass hier in der Nachbarschaft Menschen leben, die abends bei offenem Fenster schlafen wollen.“ Reichlich Musik gab es beim „Vorfest“ natürlich auch schon. Mehr als 20 000 Besucher wurden bis Dienstagabend bei den Auftritten der zumeist regionalen Bands gezählt, an den drei „Fest“-Tagen sollen es dann wieder rund 250 000 werden.

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4 Reporting dissemination activities

This section summarizes the dissemination activities that have been performed by the BASMATI partners. BASMATI dissemination activities are split into the following categories:

- Scientific publications to conference proceedings
- Participation in events, conferences, workshops
- Other dissemination activities

4.1 Scientific Publications to journal and conferences

Type	Title	Venue or Journal	Authors	Year
Journal	Text Classification Using the N-Gram Graph Representation Model over High Frequency Data Streams	Frontiers in Applied Mathematics and Statistics	Violos, John, Konstantinos Tserpes, Iraklis Varlamis, and Theodora Varvarigou.	2018
Conference	User Behavior and Application Modeling in Decentralized Edge Cloud Infrastructures	Economics of Grids, Clouds, Systems, and Services 2017. Lecture Notes in Computer Science.	Violos, John, Vinicius Monteiro de Lira, Patrizio Dazzi, Jörn Altmann, Baseem Al-Athwari, Antonia Schwichtenberg, Young-Woo Jung, Theodora Varvarigou, and Konstantinos Tserpes	2017
Conference	BASMATI: Cloud Brokerage Across Borders for Mobile Users and Applications	Advances in Service-Oriented and Cloud Computing Communications in Computer and Information Science	Carlini, Emanuele, Massimo Coppola, Patrizio Dazzi, Konstantinos Tserpes, John Violos, Young-Woo Jung, Ganis Zulfa Santoso, et al.	2017
Conference	BASMATI: An Architecture for Managing Cloud and Edge Resources for Mobile Users	Economics of Grids, Clouds, Systems, and Services 2017. Lecture Notes in Computer Science	Altmann, J., Al-Athwari, B., Carlini, E., Coppola, M., Dazzi, P., Ferrer, A.J., Haile, N., Jung, Y.-W., Marshall, J., Pages, E., Psomakelis, E., Santoso, G.Z., Tserpes, K., Violos, J.	2017

Conference	Dynamic Resource Selection in Cloud Service Broker	International Conference on High Performance Computing Simulation (HPCS) 2017	Santoso, G. Z., Y. W. Jung, S. W. Seok, E. Carlini, P. Dazzi, J. Altmann, J. Violos, and J. Marshall	2017
Conference	BUDaMaF - Data Management in Cloud Federations	CLOSER 2018	Evangelos Psomakelis, Konstantinos Tserpes, Dimosthenis Anagnostopoulos, Theodora A. Varvarigou	2018
Conference	Enabling Business-Preference-Based Scheduling of Cloud Computing Resources	Economics of Grids, Clouds, Systems, and Services 2016. Lecture Notes in Computer Science	Jörn Altmann et al.	2016
Conference	Design of Multiple Clouds based Virtual Desktop Infrastructure Architecture for Service Mobility	UBICOMM 2016	Dongjae Kang et al.	2016
Conference	BASMATI-A Brokerage Architecture on Federated Clouds for Mobile Applications	CGW 2016	Jörn Altmann et al.	2016



Conference	Effect of homophily on network formation	Communications in Nonlinear Science and Numerical Simulation, Netherland	Kibae Kim et al.	2016
Conference	Optimal resource placement of Nested Virtualization System by using Performance Degradation Analysis	JCCI 2017	Sunwook Kim et al.	2017
Conference	Design of Application Controller for BASMATI platform	2017 Spring KIPS Conference	Songwoo Sok et al	2017
Conference	Study of Real-time Monitoring System Applicable to Heterogeneous Cloud Service Brokerage	2017 Spring KIPS Conference	Baul Kim et al.	2017
Conference	Load balancing for minimizing the average response time of get operations in distributed key-value stores	ICNSC 2017	Jörn Altmann et al.	2017



Conference	Efficient Nested Cloud System Configuration using Performance Analysis	12 th FutureTech 2017	Sunwook Kim et al.	2017
Journal	Evaluating Investments in Portability and Interoperability between Software Service Platforms	Future Generation Computer Systems	Netsanet Haile et al.	2017
Conference	Runtime Adaptive Resource Selection in Cloud Service Brokerage	SerCo 2017 – HPCS	Ganis Zulfa Santoso et al.	2017
Conference	QoS Guarantees for Network Bandwidth in Private Clouds	Cloud Forward 2016	Anastasi et al.	2016
Conference	A Holistic Approach for High-level Programming of Next-generation Data-intensive Applications Targeting Distributed Heterogeneous Computing Environment	Cloud Forward 2016	Carlini et al.	2016

Conference	Self-optimising Decentralised Service Placement in Heterogeneous Cloud Federation,	IEEE SASO 2016	Carlini et al.	2016
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4.2 Participation and organization of events, conferences and workshops

Many BASMATI partners are actively involved in the organization of scientific conferences and workshop. Most of the partners also have experience in the organization of dissemination events.

4.2.1 Organization of Dissemination Events

BASMATI partners organized events for the dissemination of BASMATI vision and approach.

- SerCO 2017 @ HPCS: Special session organized in the context of the 2017 International Conference on High Performance Computing and Simulation, focused on BASMATI topics, jointly organized by CNR and NTUA and participated by several members of the BASMATI consortium. As a follow-up of the event has been organized a journal special issue of the Future Generation Computer Systems, focused on the same topics.

CALL FOR PAPERS & PARTICIPATION

As part of The International Conference on High Performance Computing & Simulation (HPCS 2017)
<http://hpcs2017.cis.edu.info> or <http://cis.edu.us/rp/hpcs17>

July 17 – July 21, 2017
Genoa, Italy

Submission Deadline: **April 15, 2017 - Extended**

Submissions could be for full papers, short papers, poster papers, or posters

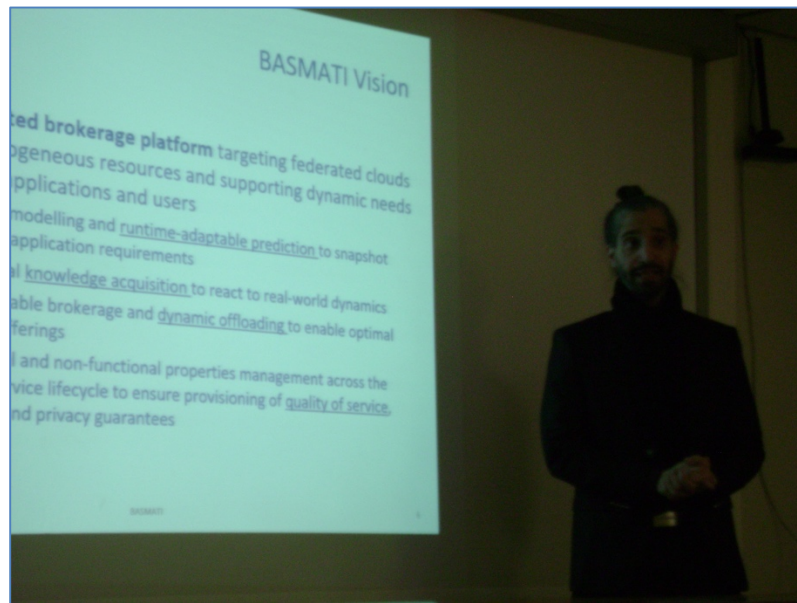
SCOPE AND OBJECTIVES
Since its establishment as a software design style, Service Oriented Architectures have taken the ICT world by storm. The Lego pieces logic thrived through Cloud Computing and it is now considered the standard approach in practically every application framework. The keyword for this success is adaptivity: Service Oriented Architectures are implemented through a wide range of technologies and tools leading to numerous combinations that meet the application requirements in the desired way.

But there is a specific combination of application characteristics and requirements that seemingly put SOAs to the test: data-intensive tasks coupled with performance and temporal requirements. The challenge is justified because SOAs are simply not meant to deal with shifting large data volumes between nodes. And unfortunately this is a common problem nowadays; IoT and big data applications are simply two general application categories that come with exactly those characteristics and -more often than not- with the said temporal requirements. To a certain extent the problem is mitigated through the increase of the SOA infrastructures' computing and storage node density while "stretching" them at the same time. Edge and fog computing as well as lambda services are emerging trends that validate the concept.

This special session invites research communities from a diverse set of scientific areas such as cloud, distributed, parallel and high-performance computing to publish their work and share opinions about applications, challenges and viable solutions to the potential new systems emerging from the need to deal with data intensive application tasks within a SOA framework.

BASMATI – SerCo Call for papers

- Dissemination activity in NCSR Demokritos Institute of Informatics and Telecommunications, where has been presented, by NTUA, the BASMATI project, its objectives, and its main technical solutions.



BASMATI dissemination at Demokritos IIT

- Dissemination at LabDay, an annual event that take place in the deanery of NTUA in which all ECCE research labs disseminate and demonstrate their research disciplines and the research projects involved. In LabDay BASMATI members presented the project communication material and informed more than 80 students and stakeholders about the Basmati project.



BASMATI dissemination at LabDay 2018

4.2.2 Presentations given at other events

Besides the aforementioned organization of dissemination events, BASMATI project has been also presented in existing events, including conferences, workshop and meetings.

- Talk at 2016 Korea-EU Coordinated calls - R&D Conference - H2020 ICT Calls Tech Day
- Invited Speech at 2016 Joint Workshop of Cloud Computing
- Talk at the EC Inter-Cloud cluster meeting at CloudForward 2016 conference
- Exhibition at IC3 2017 - INNOGRID CLOUD COMPUTING CONFERENCE
- F2F meeting at ParCo conference 2017
- Talk at 2017 EU Project Track at the ESOC Conference
- Talk at 2017 Korea-EU Coordinated calls - R&D Conference - H2020 ICT Calls Tech Day

4.3 Other dissemination activities

Beyond the ones listed above, BASMATI also performed other kinds of dissemination activities. Such activities fall under two main chapters:

4.3.1 Dissemination in training activities (More details can be found in D7.5)

BASMATI concepts, approaches and results have been disseminated in the context of two workshops organized in Athens.

- The 1st workshop was organized in Athens, on the 17th of May 2018 from Konstantinos Tserpes (project coordinator - ICCS) and Patrizio Dazzi (scientific coordinator - CNR). The topic was related to the resource allocation question. The subject was: “Smart Brokering Solutions for Clouds and Cloudlets”
- The 2nd workshop was organized in Athens, on the 9th of June 2018 from Konstantinos Tserpes (project coordinator - ICCS) and Jörn Altmann (SNU) in the frame of the International Conference on Open Source Software (OSS 2018). The topic was related to the business incentives behind cloud federations. The subject was: “Cloud Federation Economics”.

4.3.2 Dissemination in standardization events (More details can be found in D7.6)

BASMATI consortium actively participate to standardization bodies. Deliverable D7.6 reports all the detailed description of all the activities conducted in the context of standardization for the BASMATI concepts and approaches, including all the meetings in which the BASMATI vision, and its requirements in terms of standardization has been introduced. In particular, in November 2017 meeting, has been presented as a contribution in ITU-T (International Telecommunication Unit, Telecommunication Standardisation Sector) SG13 (Study group 3) Q17 session, by Konstantinos Tserpes (ICCS/NTUA) and Young-Woo Jung (ETRI) an Introduction of Resource Brokerage related Requirements in BASMATI jointly developed by ICCS/NTUA , ETRI, ISTI/CNR

5 Digital communication activities

To ensure a proper online presence of BASMATI, a website was set up and accounts on different social networks were created.

5.1 Website

At the very beginning of the BASMATI project has been reserved the basmati.cloud domain and developed a website. The website is continuously being maintained, to provide up to date information about the project.

The website has been designed to communicate to a broad audience the main objectives of the BASMATI project, the partners composing the consortium, a general overview of the project, the press material and the news and the events that are related to BASMATI.

To this end, the website has been organized in five main pages:

- The Homepage (<http://www.basmati.cloud>) aimed at presenting the general perspective on the project, its foci, the proposed solutions and the expected results and the envisioned impact.

- A page (<http://www.basmati.cloud/consortium>) devoted to show and briefly describe the partners composing the project consortium, including their role in the project.

The screenshot displays the 'Consortium' page of the BASMATI project. It features a navigation bar with links for HOME, CONSORTIUM, PROJECT OVERVIEW, PRESS MATERIAL, and NEWS & EVENTS. Below the navigation is a header image showing a person in a suit. The main content area is titled 'Consortium' and lists eight partners, each with a brief description and a link to their website. A map of Europe and Korea is also visible, highlighting the geographical distribution of the partners. The right sidebar contains 'RECENT NEWS' and 'GET IN TOUCH' sections.

Consortium

- Institute Of Communications And Computer Systems (GR)**
www.grid.ece.ntua.gr
The Institute of Communication and Computer Systems-ICCS (www.iccs.gr) is a research organization associated with the School of Electrical and Computer Engineering of the National Technical University of Athens (NTUA). It has about 40 laboratories and research units presently active which are established by the implementation of several structural programmes including National and European Programs.
The participating lab of ICCS in BASMATI is the Distributed, Knowledge and Media Systems Group-DKMS (www.grid.ece.ntua.gr). The research focus of this group is mainly on:
 - Distributed Computing**, dealing with topics such as Service Oriented Architectures, Cloud Computing, Big Data, Internet of Services and Things, Data Privacy, Application Modelling and Analysis and Quality of Service in Service Provisioning Systems.
 - Knowledge, Media & Digital Art**, dealing with topics such as Knowledge Representation and Domain Modelling, Artificial Intelligence and Decision Support Systems, Social Analytics, Crowdsourcing and Gamification.
- Consiglio Nazionale Delle Ricerche (IT)**
www.cnr.it
The "Consiglio Nazionale delle Ricerche" (CNR) is the largest public research organisation in Italy and a top level R&D performer in Europe, being the fourth beneficiary of the EU FP7. CNR participates to BASMATI by means of its largest institute involved in ICT, the "Istituto di Scienza e Tecnologia dell'Informazione" (ISTI, <http://isti.cnr.it>) located in Pisa. ISTI is committed to producing scientific excellence and to playing an active role in technology transfer. The domain of competence covers Information Science, related technologies and a wide range of applications. The research group of ISTI involved in BASMATI is the HPC Lab. CNR will be the scientific leader of the project in collaboration with ETRI. The HPC Lab (<http://hpc.isti.cnr.it>) at ISTI conducts research in various areas of High Performance Computing, including Cloud Computing, Cloud Federations, Large-scale Data Analysis, Efficient Machine Learning, Information Extraction and Semantic Enrichment, Web Search.
- CAS Software AG (DE)**
www.cas.de
Founded in 1986, CAS Software has become the German, market-leading innovator for Customer Relationship Management (CRM) solutions for small and medium-sized enterprises (SMEs) and is the leading expert for anything relationship management (xRM) in Europe. CAS Smart Development Center is a business unit of CAS Software and develops the company's next generation cloud platform CAS Oper; an expandable, modular Platform-as-a-Service (PaaS) solution, hosting Software-as-a-Service (SaaS) solutions. The business unit YellowMap is an expert in the field of map-based visualization and develops technology covering the whole stack and functionality of location-based service applications and capable of being applied in consumer as well as corporate applications – web-based and mobile.
In BASMATI, CAS Group brings in its expertise in cloud brokerage and in map-based visualization (mobile and web) of various kinds of data. Another central contribution will be the use case and evaluation of BASMATI on a large festival in Karlsruhe called DAS FEST. YellowMap is the official app partner of DAS FEST.
- Atos Spain SA (ES)**
www.atos.net
Atos SE (Societas europeae) is an international information technology services company with 2012 annual revenue of EUR 8.8 billion and 77,100 employees in 52 countries. Serving a global client base, it delivers IT services in 3 domains, Consulting & Technology Services, Systems Integration and Managed Service & SPO, and transactional services through Worldline. With its deep technology expertise and industry knowledge, it works with clients across the following market sectors: Manufacturing, Retail & Services; Public sector, Healthcare & Transports; Financial Services; Telco, Media & Utilities. Atos is focused on business technology that powers progress and helps organizations to create the firm of the future. It is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is quoted on the NYSE Euronext Paris market. Atos operates under the brands Atos, Atos Consulting & Technology Services, Worldline and Atos WorldGrid.
- Amenesik Sarl (FR)**
www.amenesik.com
Amenesik is a young start-up founded in November 2014 and provides open source, cross cloud, vendor agnostic cloud management technology and solutions for modern day enterprise cloud applications. In the BASMATI project, Amenesik Sarl will bring its expertise and technology; the ACCORDS PLATFORM, to be used as a Cloud Application Description, Provisioning and Monitoring Platform.
- Electronics And Telecommunications Research Institute (KR)**
www.etri.re.kr
ETRI (Electronics and Telecommunications Research Institute, since 1976) is a government-funded research institute in Daejeon Science Town, Korea. As of 2015, ETRI has about 2,600 employees where about 1,800 of them are researchers.
ETRI makes contribution to the nation's economic and social development through research, development and distribution of industrial core technologies.
The technical portfolio includes:
 - Internet technology,
 - Software/Security technology,
 - Telecommunication/Broadcasting technology,
 - Convergence technology,
 - Digital contents technology, and
 - Components and material technology.
- InnoGRID (KR)**
www.innogrid.com
Innogrid started in earnest cloud computing research and development in 2009 and succeeded in developing Innogrid's own IaaS solutions (Cloudit) in 2011. Innogrid won the GS(Good Software) certification and were selected as pilot carrier to verify stability of cloud computing technology for Ministry of Science, ICT and Future Planning in 2014. And Innogrid's Cloudit was selected as the outstanding procurement software by Korean Procurement Agency in 2015. This means that Innogrid has grown to be a trusted company with both technology and supply reliability.
Innogrid has plan to start various business based on cloud through strong partnership with leading company in Big Data, IoT, and FinTech industries. And Innogrid will take Internet Data Center over in 2015 to integrate the value chain rearward and forward in cloud industry and jump up to be a cloud integrator. ETRI (Electronics and Telecommunications Research Institute, since 1976) is a government-funded research institute in Daejeon Science Town, Korea. As of 2015, ETRI has about 2,600 employees where about 1,800 of them are researchers.
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 - Telecommunication/Broadcasting technology,
 - Convergence technology,
 - Digital contents technology, and
 - Components and material technology.
- Seoul National University (KR)**
www.temep.snu.ac.kr
As Korea's and Asia's leading research university, Seoul National University (SNU) is committed to sciences, engineering & technology, social sciences, and humanities. The IT Services Economics Group of SNU is a strong and innovative research group within the Technology Management, Economics, and Policy Program, which belongs to the College of Engineering at Seoul National University. The research of the group centres on the interdisciplinary aspects of Internet technologies, economics, and sociology. The group develops new architectures and technologies, which allow economically efficient resource allocation based on economic and sociological models.

RECENT NEWS

- BASMATI Mass Event Application in Karlsruhe 1. August 2018
- 2nd BASMATI Workshop 8. Juni 2018
- BASMATI Training Workshop 16. Mai 2018
- Research & Innovation Day 2017-21. Februar 2018
- BASMATI on DAS FEST 2017 2. August 2017

GET IN TOUCH

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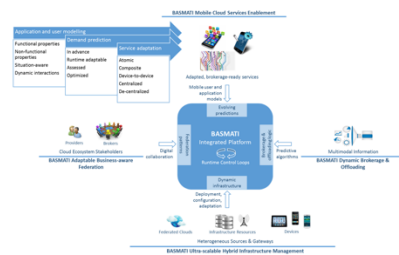
BASMATI consortium

- A section aimed at describing the project overview (<http://www.basmati.cloud/project-overview>), with a subsection reporting a presentation of the three project use cases (<http://www.basmati.cloud/project-overview/use-cases>).



Project Overview

Clouds and mobile applications have been two key drivers for innovation in the last decade, strengthening industry competitiveness and economic growth. The current technological and social landscape calls for a shift towards the introduction of a hybrid computing paradigm, following the rise and limitations of mobile applications. BASMATI aims at providing a complete ecosystem that integrates cloud federation with mobile devices, while addressing challenges related to resource heterogeneity, ultra-scalable provisioning, offloading, context- and situation identification, quality of service and security guarantees, targeting (crowds of) users accessing their data and applications across borders.



BASMATI will provide an integrated brokerage platform targeting federated clouds with heterogeneous resources and supporting the efficient, cost-effective execution of mobile cloud applications in a transparent and ubiquitous manner. Runtime-adaptable federation patterns also considering business aspects, dynamic and runtime-optimized brokerage and offloading decisions will enable fully automated resource exploitation: cloud to cloud, device to federation and device to device. Modelling and prediction of applications and users in terms of mobility patterns, behavior and interactions will provide insight to the aforementioned decisions, while runtime reconfiguration of mobile services will foster the achievement of ultra-scalability. The envisioned hybrid infrastructure management will allow abstracting heterogeneous resources and enabling dynamic service networks based on evolving situations. BASMATI will be evaluated against three real-world use cases: Large Events management (including audio-streaming in dynamic and crowded scenarios), TripBuilding in dynamic environments and Virtual Mobile Desktop for highly nomadic users, which will be provided by BASMATI platform and validated during a 2018 international large event (Das Fest) counting 250.000 participants across a week.



BASMATI Has Received Funding From The European Union's Horizon 2020 Research And Innovation Programme Under Grant Agreement No. 723131 And From ICT R&D Program Of Korean Ministry Of Science, ICT And Future Planning No. R0115-16-0001.

GET IN TOUCH



RECENT NEWS

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- BASMATI on DAS FEST 2017 2. August 2017

HOME CONSORTIUM PROJECT OVERVIEW PRESS MATERIAL NEWS & EVENTS

Use Cases

1. Large Events

Large events, with thousands of visitors and their mobile devices, such as festivals, football matches, Olympic Games and the like, nowadays create both offline and online communities. In fact these online communities give shape to a second event – the virtual counterpart – and represent one of the most significant motivating factors for subsequent activity on social media. The willingness to share, contribute and interact on both sides, though this can be restrained to such things as related to the event. Hence, most participants belong to only one of the communities but with increasing significance more and more belong to both. In the context of BASMATI, we propose the creation of a virtual storage and computation layer, called the **Virtual Event**, which realizes and makes available a shared storage, computation, and network platform to any on-site device as an ad-hoc micro cloud. This approach will enable the realization of contextualized collective applications, whose purposes include entertainment, business and social support. For example, users can read and contribute to a live event guide, create complex mosaics using mobile devices displays, have access to emergency support and localization services.

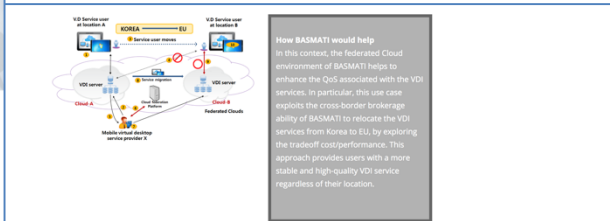
Challenges and Scenarios
In the context of a large event, every device and their associated user is handled as an isolated node and the enabling technical services depend heavily upon the available connectivity to the network, the service provider and their account. Currently, it is not possible to mirror real world phenomena with thousands of people performing and interacting together, singing, dancing and celebrating as a crowd and contributing to the social experience of all. Creating the virtual and online equivalent of this kind of ad-hoc community is currently very inefficient with conventional communication, computation and storage technologies. The quality of the connection between the two communities is not as extensive as it could be due to purely technical reasons. Each individual contribution has to pass through a centralized infrastructure and, if shared or requested, redelivered to the devices. This requires each device to have strong connectivity to the mobile network and a shared workspace is missing. This creates numerous secondary issues, latency for the individual, with people being excluded when losing mobile connectivity and consequently many services that rely upon shared data cannot be effectively provided. Moreover digital information exchange between infrastructure and visitors is difficult to establish in crowded areas.

How BASMATI would help
With the creation of the **Virtual Event**, mobile devices on-site the event / festival represent a shared decentralized and dynamic information space, by acting as virtual service provisioning platform. To that end, the brokerage platform of BASMATI that, by means of the BASMATI hybrid infrastructure, is able to seamlessly exploit both cloud resources and mobile devices, will determine the assignment of the necessary resources in the context of a highly dynamic and ephemeral network. The BASMATI platform also takes care of QoS of the services provided (especially in terms of latency) by means of the advanced offloading and application reconfiguration techniques. The **Virtual Event** use case also benefits of the BASMATI advanced tools for user modeling and situational knowledge acquisition for deciding in a proactive way where and when allocate computational and storage resources.

2. Mobile Virtual Desktop

Recently, many companies and government organizations have begun to exploit smart work environments by exploiting Virtual Desktop Infrastructure (VDI) services in order to reduce the cost of the management and static hardware infrastructure. A VDI service may include company-specific business applications with high level security, software to handle various document formats, and even favourite personal applications. A VDI usually runs remote desktop operating systems and applications inside Virtual Machines (VM) that are hosted in the Cloud. VDI provides virtual desktops to users as a service in the cloud environment and enables the users to access their virtual desktop anywhere and anytime. A common VDI system is composed by three core entities: (i) the VDI client, such as a thin clients, a zero clients or a PC clients, (ii) the VDI server in which user's virtual desktop are executed and stored, and (iii) the VDI manager that orchestrates the overall virtual desktop system.

Challenges and Scenarios
VDI services are often used by employees during business travel. Let us consider the case in which a Korean employee has a business trip to an European country, but still prefers to use their national VDI service to continuously perform business work, to access to specific data or to enjoy favourite personal applications. In such conditions (i.e. cross bordering), the QoS enforcement of the VDI service is very challenging, due to the interactive nature of the application coupled with the degraded response time and performance caused by long distance data transfer. In this context, an advanced brokerage platform is needed to support the mobile virtual desktop on top of a federated Cloud environment in order to enhance the degraded QoS of VDI service when the user moves to another place, e.g. border-across movement. In this scenario, mobile VDI services can be freely transferred among federated Cloud, and adapting their behaviour in terms according to the users location. This approach allows the user to receive a more stable and effective VDI service anywhere regardless of their location.



How BASMATI would help
In this context, the federated Cloud environment of BASMATI helps to enhance the QoS associated with the VDI services. In particular, this use case exploits the cross-border brokerage ability of BASMATI to relocate the VDI services from Korea to EU, by exploring the tradeoff cost/performance. This approach provides users with a more stable and high-quality VDI service regardless of their location.

3. TripBuilder

TripBuilder is a mobile service helping tourists to build their own personalized sightseeing tour of a city that they don't know. Given a targeted touristic area, the time available for the visit, and the tourist's profile, TripBuilder provides its users with a time-budgeted tour that maximizes a tourist's interests and takes into account both the time needed to enjoy the attractions and the time required to move from one Point of Interest (PoI) to the next one. For the sightseeing tour generation TripBuilder exploits publicly available sources (Linked Open Data) to build a knowledge base and infer user interests. The sources currently exploited include Wikipedia, Flickr and Google Maps. The sightseeing tour generation relies on Clouds allowing to harness the required computing power whenever the service needs to update its knowledge bases, or when a large number of users from different countries congregate in a same area.

Challenges and Scenarios

TripBuilder leverages established technologies for parallel computing (Apache Spark, Storm). Providing service to end-users requires generating two logically separate knowledge bases (KB), the area-KB and the user-KB, as well as solving a rather heavy computational tasks in terms of the KBs and of the user query (optimal tours are obtained by an approximated algorithm for the actual NP-hard problem). The computation associated with the area-KB is network and memory intensive, and possibly computation intensive. It is a typical batch mode task for each target area. The user-KB can be trivial (manually specified preferences), or it can be pre-computed from user-provided information. From example, the user-KB can be obtained from static sources like user's Flickr pictures, or from the context of the user, or by considering a combination of the two. The computation of user-KB may happen either on the mobile device itself or by offloading to the BASMATI Cloud infrastructure (in general independent from the TripBuilder services), allowing for a flexible tradeoff between performance and privacy protection. The final tour generation is compute intensive and also has near real time constraints. TripBuilder presents several challenges when supporting a large number of areas from one or more servers (compute and storage scalability), a very large number of users planning their trips in the same city (server scalability, server replication and dynamic load behaviour) and users moving to different cities, thus requiring service handover and load balance across different servers (monitoring and short-term performance prediction, situation-aware resource brokering). Different geo-location and legal constraints can also affect the brokering and application placement choices.

How BASMATI would help
BASMATI features improve TripBuilder's back-end computations. TripBuilder represents a typical application for people travelling "across regional borders" and the BASMATI Cloud federation helps in relocating the services to different cloud providers. Since TripBuilder explicitly leverages the "wisdom of the crowd" models, it is highly relevant to react whenever a large number of people concentrates in a specific area. In this context the QoS capabilities of BASMATI can orchestrate the offloading process to the cloud infrastructure as well as merge the flow of information about POI coming from the multitude of local devices with the information already presented in the cloud backend. In addition, BASMATI helps in configuring touristic and business tours according to the changing of conditions in the context of the users, thanks to the flexible relocation model of services and the ability to scale the trajectories reconfiguration.

BASMATI Has Received Funding From The European Union's Horizon 2020 Research And Innovation Programme Under Grant Agreement No. 773231 And From ICT R&D Program Of Korean Ministry Of Science, ICT And Future Planning No. R015-16-0005.

RECENT NEWS

- BASMATI Mass Event Application in Karlsruhe 1. August 2018
- 2nd BASMATI Workshop 8. Juni 2018
- BASMATI Training Workshop 16. Mai 2018
- Research & Innovation Day 2017 21. Februar 2018
- BASMATI on DAS FEST 2017 2. August 2017

GET IN TOUCH

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BASMATI Use cases

- A section listing the press material (<http://www.basmati.cloud/press-material>) that has been shown at the beginning of this report
- A last section with up-to-date information about the news of the project and the events that are related to BASMATI (<http://www.basmati.cloud/category/news>).

BASMATI News and Events

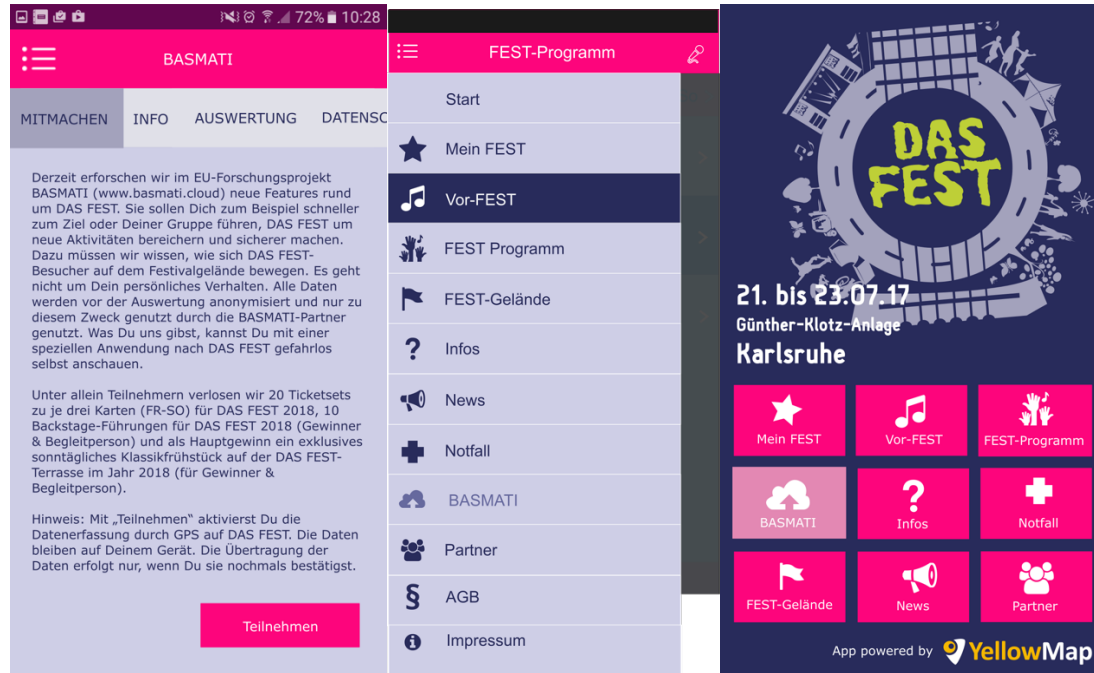
5.2 Social networks

BASMATI consortium created pages and accounts on the most important social networks, to ensure a proper presence, enhance the communication of its key concepts, foster the dissemination of the BASMATI approach. There exist BASMATI pages in Twitter, Facebook and LinkedIn.



5.3 DAS FEST and DAS FEST App

BASMATI project approach, ideas and objectives have been communicated during the DAS FEST event in Karlsruhe, both in 2017 and 2018. Most of this communication process has taken place by means of the DAS FEST App that YellowMap provides to DAS FEST event.



The approach has been so successful that about 1500 users, both in 2017 and 2018, decided to participate to the BASMATI experiments conducted during the festival.

6 Collaboration/communication activities with Existing EU Projects/Initiatives

6.1 Participation in European Clusters



BASMATI contributes to European Clusters of Projects. BASMATI is participating in the European Future Cloud Cluster (formerly Inter-Cloud Cluster) (European Clusters of Projects - Future Cloud), which provides a discussion forum for different European research projects and initiatives regarding cloud challenges and issues. BASMATI contributed to the identification of the key research areas for Future Cloud.





Key research areas for the FutureCloud

6.2 Liaisons and collaboration with other research projects

BASMATI is currently collaborating with other research projects, in different ways, with different levels of involvement. In the following table are reported four EU projects with which BASMATI is discussing and/or collaborating mainly for research purposes.

	<p>BigClouT (BigClouT project) (Big data meeting Cloud and IoT for empowering the citizen cloud in smart cities). BigClouT offers an analytic mind to the city by creating distributed intelligence that can be implanted throughout the whole city network either for large or smaller urban areas.</p> <p><i>The collaboration with BASMATI is related to the potential exploitation of two BASMATI assets: (i) the brokering solutions and (ii) inter-cloud execution environment of BASMATI.</i></p>
	<p>MASTER (MASTER project) (Multiple ASpects TrajEctoRy management and analysis) is a project funded under the call H2020-MSCA-RISE-2017 with the objective of forming an international and inter-sectoral network of organisations working on a joint research programme to define new methods to build, manage and analyse multiple aspects semantic trajectories.</p> <p><i>The collaboration with BASMATI is related to the potential exploitation of the BASMATI approach for</i></p>

	<p><i>passively monitor people in an area, as BASMATI consortium performed in DAS FEST. Research results are already being shared mainly from BASMATI to MASTER.</i></p>
	<p>SoBigData (SoBigData Research Infrastructure) is the European Research Infrastructure for BigData and Social Mining. From data to knowledge, investigating stories ethically, paying attention to citizens' privacy. <i>In 2016 and 2017 SoBigData and BASMATI members participated to the respective plenary meetings to explore potential collaborations. So far is under evaluation the access to SoBigData transnational access for BASMATI members. This will allow the validation of the BASMATI models governing the Knowledge Extractor on the large set of dataset provided by the SoBigData infrastructure.</i></p>
	<p>BigDataGrapes (BigDataGrapes) Big Data to Enable Global Disruption of the Grapevine powered industries BigDataGrapes aims to help European companies in the wine and natural cosmetics industries become more competitive in the international markets. It specifically tries to help companies across the grapevine-powered value chain ride the big data wave, supporting business decisions with real time and cross-stream analysis of very large, diverse and multimodal data sources. <i>The collaboration with BASMATI is related to the potential exploitation of two BASMATI assets: (i) the representation of applications (ii) adaptive solutions for the flexible execution of applications using resources located in different places.</i></p>

7 Key performance indicators analysis

This section reports the positioning of BASMATI project with respect to the envisioned KPIs defined in the Project Proposal. As it can be noticed, most of the target KPIs indicated in the proposal have been successfully achieved, in some cases, outperforming the planned expectations.

Communication activity	KPIs	Achievements in BASMATI
<p>Inclusion of light content for non-specialized audience in the project website, blog, social media, as well as publishing “lighter” versions of project newsletters, leaflets, flyers, etc.</p>	<p>≥ 100 visitors in non-specialized area</p>	<p>BASMATI distributed its flyer and the other communication material. As illustrated in this deliverable there have been several occasions in which such material has been distributed. A rough estimation is that we almost doubled the threshold indicated in the KPI.</p>
<p>Exhibitions / workshops with free access, where visitors will have the possibility to realize in a lively way the BASMATI benefits. For example, visitors will have the opportunity to explore how the developed technologies support mobile services, and how EU and Korean research is making these companies more competitive, etc.</p>	<p>≥ 1 exhibitions/ workshops ≥ 50 non-specialized attendees</p>	<p>BASMATI achieved to be showcased in several events, as reported in this deliverable. Many of these events were public and open. The two training/dissemination workshops alone attracted the participation of more than 45 people. The attendance in presentations given in conferences and scientific workshops results in exceeding the anticipated target by far.</p>
<p>Training sessions in relevant events or online: BASMATI places emphasis on “educating” the general public about the need for additional advanced research to cover their requirements. Most people do not have ICT technology background, so new services seem to arise easily and “automagically” for them. BASMATI will devote due time and effort for ICT-related aspects and thus signalize the collaborative EU-Korean research.</p>	<p>≥ 1 online sessions ≥ 50 non-specialized attendees</p>	<p>In order to more actively engage the non-specialized attendees the online sessions were replaced by face-to-face workshops. The two workshops organized by ICCS have been attended a bit less than 50 non-specialized attendees. Additional details are reported in D7.5.</p>
<p>BASMATI recognition: BASMATI will elaborate on building its “image” to the external world. BASMATI will be made</p>	<p>≥ 50 responders identified</p>	<p>BASMATI logo has been designed with the support of the companies Involved in its consortium. In particular, the communication</p>

<p>identifiable, following marketing principles; BASMATI will be made a brand with a logo, a motto and design/template following its ubiquitous appearance. Harmonized design and templates will adorn the project website, flyers, reports, videos, presentations and any dissemination or communication activity.</p>	<p>BASMATI (from a questionnaire)</p>	<p>department of CAS developed the BASMATI logo, which has been used in every time it has been presented in public environments, either digital or physical ones. Even more, as reported in this deliverable, BASMATI has been publicized during the DAS FEST event, that is a festival participated by hundreds of thousands attendees. Both in 2016 and 2017 more than 1500 attendees participated to the BASMATI experiment.</p>
<p>BASMATI will come closer to local environments, rather than being an inaccessible initiative. Promotion of the BASMATI activities and benefits to the general public will be conducted in cooperation with local authorities (possible within the framework of citizens' training/educating), also covered by local media (e.g. broadcasters, papers, magazines).</p>	<p>≥ 1 local events ≥ 3 appearance to local media</p>	<p>BASMATI has been publicized in local newspapers and magazines, both in Europe and Korea. As indicated in the early part of this deliverable.</p>
<p>BASMATI will offer the opportunity to the general public for a free trial of part of the use cases (media use case), after having reached a predefined level of maturity.</p>	<p>≥ 5 "testers"</p>	<p>BASMATI has been presented and showcased in an online fashion in a few events. For instance, during the Joint EU-Korea event in Seoul 2017 the BASMATI consortium setup an hands-on session in which has been possible, for the attendees to play with the BASMATI technologies supporting the advanced brokering solutions developed in BASMATI.</p>
<p>BASMATI news will appear in blogs and websites offering technological news. Such sources have been already widespread among non-specialized audience,</p>	<p>≥ 200 reads</p>	<p>Since the very beginning of the project, BASMATI has an online presence, granted by its website and the most important social networks. Moreover, BASMATI has been</p>

focusing on technology news and trends.		publicized on online web magazines and news, such as ERCIM News, CNR news, ISTI news, etc.
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8 Future planned actions

BASMATI consortium already started some communication and dissemination activities that have not been performed during the time frame of the project but we plan to conduct or finalize after the end of the project.

OpenFog consortium (OpenFog Consortium). BASMATI consortium is in contact with the OpenFog initiative. The plan is to bring into that consortium the expertise, viewpoint, the perspective and the approach that has been consolidated by BASMATI. We are still in the process of defining the proper way to setup the collaboration.

Springer Book. We are in contact with Springer and we are evaluating the possibility to write a SpringerBriefs (SpringerBrief Books) book on BASMATI. The idea is to have a chapter for each major component developed in the context of the BASMATI project.

9 Conclusions

This Deliverable has provided information regarding the project's communication and dissemination activities. An overview of the related dissemination material and activities that were being used in order to disseminate the project's results was also presented.

In general words, and after two years of project, we can conclude that our communication and dissemination efforts are on track and most of the initial targets as defined in the dissemination strategy by the consortium have been met. Quite a good number of project presentations and publications as well as participation to large events made it possible for all the partners to properly disseminate BASMATI concepts.

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