ICT 7: Advanced cloud infrastructures and services

ICT 8: Boosting public sector productivity and innovation through cloud computing services

Jorge GASOS – DG CONNECT
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FP7 ICT Work Programmes

WP 2007-2008 (Call 1): Service and Software Architectures, Infrastructures and Engineering: €120 million

WP 2009-2010 (Call 5): Internet of Services, Software and Virtualisation: €110 million

WP 2011-2012 (Call 8): Cloud Computing, Internet of Services and Advanced Software Engineering: €70.0 million

WP 2013 (Call 10): Software Engineering, Services and Cloud Computing: €41.5 million

Total investment in the software, services and cloud computing area: €341.5 million + part of Future Internet PPP
Call 10
- Many running projects "in the cloud"
Research and innovation:

• High performance heterogeneous cloud infrastructures
• Federated cloud networking
• Dynamic configuration, automated provisioning and orchestration of cloud resources
• Automated discovery and composition of services (cloud of public services)
• Cloud security

66 M €; small and large projects; R&I
ICT-enabled public sector innovation: addressed in H2020 under the Industrial Leadership and Societal Challenges programmes

LEIT: ICT-7 Advanced Cloud Infrastructures and Services
- Automated discovery and composition of services

SC6 News forms of innovation
- Innovation in the public sector by using emerging ICT technologies
- ICT-enabled open government
- Innovative mobile e-government applications for SMEs
Innovation platforms for trusted cloud systems

- Open source software for innovative and trusted cloud-based services

5 M €; small projects; Innovation

Coordination and support actions

- Reference models for SLAs in the cloud. Legal, economic and societal factors
- Collaboration among research projects

2 M €; CSA
ICT 8: PCP - PPI

Preparation proposals
CP-CSA for PCP

Choice between possible constellations for joint procurement

Consortia of public bodies
P1->P5

Management/Coordination joint PCP
CSA part

CP part

Dissemination PCP

Preparing joint PCP

EU-Funding
100% for CSA part: Networking and Coordination activities
50% for CP part: Joint research activities, Joint PCP tendering (R&D Services)

Product Idea
Solution Design
Prototype
First Test-Products

Commercial End-Products

Supplier A, B, C, D, E or X

Phase 4
Commercialisation of products/services
(commercial development)

Commercial Tendering

Public Procurement for commercial roll-out
Pre-commercial procurement for public sector cloud computing services (PCP)

- common requirements and terms of reference for future procurement of cloud computing services

9 M €; large projects; PCP

Public procurement of innovative cloud computing solutions (PPI)

- organizing joint procurement of innovative cloud services by public authorities

13 M €; large projects; PPI
Building on work undertaken by the project C4E: www.cloudforeurope.eu

Cloud for Europe supports public sector cloud use as collaboration between public authorities and industry. The project identifies obstacles, finds innovative solutions and builds trust in European cloud computing.

Cloud for Europe uses pre-commercial procurement as an instrument for public sector innovation. The pre-commercial procurement identifies innovative solutions for cloud services that best fit public sector needs, but also provides better information to public procurers about the potential of cloud
Policy context: Cloud Computing Strategy


- The strategy is designed to stimulate the uptake of cloud computing across the economy

- Three key actions:
  - Mapping cloud relevant standards
  - Fair and safe contracts and SLAs
  - European Cloud Partnership
Further Information

Digital Agenda – Cloud Computing

European Cloud Computing Strategy

Sources:
Cloud Computing Expert Group (December 2012)
NESSI ETP Position Papers

11
Number of presentations

- 13 presentations:
  - 5 projects
  - 8 profiles
Project idea

NOW: 451 RESEARCH – PHILIP INGLESANT

NEXT: CSIT – GAVIN MCWILLIAMS
Philip Inglesant
EU Analyst

451 Research, London
philip.inglesant@451research.com
The 451 Group

- Unique combination of research, analysis & data
- Published syndicated research on emerging markets
- Daily qualitative & quantitative insight
- Analyst advisory, support
- Global events
- Go-to-market support
451 has research practices including Cloud, Data Centres, Eco-Efficient IT
Dedicated European research practice area
451 leads Impact work packages: exploitation, dissemination, sustainability, standardisation
Partners in over 6 major EU projects since 2007
Dr. Inglesant has specialisations in Cloud and Future Internet
Led Innovation work packages of Co-ordination and Support Action in Future Internet
The Challenge: Coping with the complexity of Cloud deployment and execution

- Options for service delivery and service consumption are growing exponentially
- For SMEs in particular: new opportunities, new challenges
- Changed supplier-consumer relationships
- Organisations will struggle with negotiating and monitoring service agreements
- Possibilities for deployment change rapidly
The Proposal: Cloud Control Plane and Execution Toolkit

- *Best Execution Venue:* pioneered by 451 Research
- Logical separation between management policies and underlying implementation
- Builds on Trust – Risk – Eco – Cost model implemented in OPTIMIS project
- Allows exploration of innovative, dynamic pricing models
Project idea

NOW: CSIT – GAVIN MCWILLIAMS
NEXT: EUREVA – PHILIPPE MARTINEAU
LEIT ICT-7-2014 Advanced Cloud Infrastructures and Services

TUTIS: Environment for User-Centric Information Security

Gavin McWilliams
January 2014
Academic Centre of Excellence in Cyber Security Research
Cloud security:
Mechanisms, tools and techniques to increase **trust, security and transparency** of cloud infra and services, including **data integrity, localisation and confidentiality**, also when using **third party cloud resources**.

...an approach that can be implemented on multiple platforms.

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g.mcwilliams@qub.ac.uk
User Centric Info Security

Algorithms + Data Structures = Programs

func1( ) {
    struct tnode *top, *tree();
    char c, word[wsize];
    int i;
    i = top = 0;
    while (c = getchar())
        if (a <= c && c <= z || A <= c && c <= Z)
            if (i < wsize - 1)
                word[i++] = c;
            else
                if (i)
                    word[i++] = '\0';
                top = tree(top, word);
                i = 0;
    tprint(top);
}

func2( ) {
    struct tnode *top, *tree();
    char c, word[wsize];
    int i;
    i = top = 0;
    while (c = getchar())
        if (a <= c && c <= z || A <= c && c <= Z)
            if (i < wsize - 1)
                word[i++] = c;
            else
                if (i)
                    word[i++] = '\0';
                top = tree(top, word);
                i = 0;
    tprint(top);
}

func_three( ) {
    struct tnode *top, *tree();
    char c, word[wsize];
    int i;
    i = top = 0;
    while (c = getchar())
        if (a <= c && c <= z || A <= c && c <= Z)
            if (i < wsize - 1)
                word[i++] = c;
            else
                if (i)
                    word[i++] = '\0';
                top = tree(top, word);
                i = 0;
    tprint(top);
}

func_two( ) {
    struct tnode *top, *tree();
    char c, word[wsize];
    int i;
    i = top = 0;
    while (c = getchar())
        if (a <= c && c <= z || A <= c && c <= Z)
            if (i < wsize - 1)
                word[i++] = c;
            else
                if (i)
                    word[i++] = '\0';
                top = tree(top, word);
                i = 0;
    tprint(top);
}

main() {
    struct tnode *top, *tree();
    char c, word[wsize];
    int i;
    i = top = 0;
    while (c = getchar())
        if (a <= c && c <= z || A <= c && c <= Z)
            if (i < wsize - 1)
                word[i++] = c;
            else
                if (i)
                    word[i++] = '\0';
                top = tree(top, word);
                i = 0;
    tprint(top);
}
main
{
    struct tnode *top, *tree(
    ) ;
    char c, word[wsize] ;
    int i ;
    i = top = 0 ;
    while ( c=getchar() )
        if (´a´<=c && c<=´z´ ||
            ´A´<=c && c <= ´Z´ ) {
            if ( i<wsize-1) word[i++] = c;
        } else
            if (i) {
                word[i++] = ´\0´ ;
                top = tree(top, word) ;
                i = 0 ;
            }
    tprint(top) ;
}

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            ´A´<=c && c <= ´Z´ ) {
            if ( i<wsize-1) word[i++] = c;
        } else
            if (i) {
                word[i++] = ´\0´ ;
                top = tree(top, word) ;
                i = 0 ;
            }
    tprint(top) ;
}

Secure Autonomous Digital Asset (SADA)

EnvironmenT for User-CenTric Information Security
Project idea

NOW:  EUREVA – PHILIPPE MARTINEAU
NEXT:  W4 – JEAN-LOUP COMELIAU
Project idea

Enable real-time cloud interaction on any screen
**Research topics**

- **Existing competencies**
  - Real-time H264 image streaming on any device
  - Cloud-based server provisioning
  - Performances:
    - 720p images - 60FPS - 5Mbps
    - 100 ms round-trip latency

- **Research topics**
  - Real-time HEVC image streaming and interaction
  - 720p – 1080p and 4K or beyond real-time streams
  - 3D images
  - Cloud & network infrastructures

- **Use cases**
  - Gaming
  - Professional images
  - ...

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*swiich*
Questions ?

Contact:

Philippe Martineau
CEO – Eureva
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Tel: +33 6 99 43 44 55
Project idea

NOW: W4 – JEAN-LOUP COMELIAU

NEXT: TELECOM PARISTECH – AHMED HADDAD
Horizon 2020
10/01/2014

www.w4software.com

jean-loup.comeliau@w4software.com

INNOVATION & EFFECTIVENESS
AGILE BPM APPLICATIONS
Skills : Collaborative Business Applications

- Workflow, BPM and digitization solutions
- Data modeling and management, Information Systems, RDBMS...
- Graphical User Interface : web2.0 and mobiles
**Project Idea:**
Develop a social Business Process Management (BPM) Platform as a Service (PaaS) capable of executing any process modeled in BPMN2, with 3 types of cloud services:
- Process orchestration services
- Data management services
- User Interface automation services

**Motivations:**
- Offer more standard solutions for business cases
- Favor business process interoperability
- Take advantage of new cloud resources to offer innovative “Social BPM”
- Push mainstream adoption of BPM in the cloud by adding the UI dimension to OMG’s BPMN2 standard
Project idea

NOW: TELECOM PARISTECH – AHMED HADDAD

NEXT: CEA LIST – BASILE STARYNKEVITCH
« Cloud at hands for enhanced mobile user experience »

Scope: ICT07/2014 “Research & Innovation actions in Dynamic configuration automated provisioning and orchestration of Cloud resources”

Objective: Mechanisms to off-load computation and storage tasks from mobile devices onto the Cloud at both design an execution time

Maurice GAGNAIRE, Ahmed HADDAD, Sawsan AL ZAHR

Contact: maurice.gagnaire@telecom-paristech.fr
           Phone: +33.1.45.81.74.11
           Cellular: +33.6.85.44.17.19
Consortium layout: expected partners

- **Offloading mechanisms**
  - Dynamic resources allocation

- **TPT**
  - Manufacturer (MD)
  - Business/market research
  - Cloud provider/manager

- **Mobile Apps Developer**
  - Mobile apps Software expertise
  - Application coding

- **Mobile Operator**
  - Cellular/wireless connectivity and networking expertise

- **Cloud-at-hands**

- **MD Manufacturer**
  - MD Power consumption expertise

- **Business/market research**
  - Techno-Economic modelling
  - Business use cases expertise

- **Mobile Apps Developer**
  - Mobile apps Software expertise
  - Application coding
Profile

NOW: CEA LIST – BASILE STARYNKEVITCH

NEXT: JERUSALEM COLLEGE OF TECH. – YORAM HADDAD
Basile Starynkevitch, CEA, LIST [DILS]
CEA/Saclay b862 PC174, 91191 GIF/YVETTE CEDEX, France
basile.starynkevitch@cea.fr

- Works within the GCC compiler
- Developing MELT, a domain specific language & plugin to customize GCC (see gcc-melt.org for more)
- Free software (GCC & MELT are GPLv3)
- Abilities: compilation & static analysis (of C, C++, Ada, Go, Fortran, D, … source code compiled with GCC & MELT)
I wish to participate in projects bringing:

- Compilation (GCC) & static analysis (MELT) **for** the Cloud:
  - Validation of specific **coding rules** (to be defined) for cloud software (in C, C++, … compiled with GCC)
  - Optimization for/of cloud software: **whole system optimization**

- Compilation (GCC) & static analysis (MELT) **on** the Cloud:
  - Take advantage of the power of the Cloud to compile software (embedded, Internet, HPC, ….) with powerful optimizations and **coding rules** validations

- Both?

Contact [basile.starynkevitch@cea.fr](mailto:basile.starynkevitch@cea.fr)
Profile

NOW: JERUSALEM COLLEGE OF TECH. – YORAM HADDAD
NEXT: AKKA – BENOIT BAURENS
ICT 7:
Federated CloudNet and Orchestration

- Jerusalem College of Technology
  - Oldest (since 1969) school of engineering in Israel (not university)

- Computer Science Dept.
  - 200 graduates per year
  - 30 faculty members
  - MSc devoted to Communication System Engineering

Dr Yoram Haddad
Tenured Senior Lecturer and Researcher
Head of FTNet Lab
haddad@jct.ac.il
Future Networks(FTNet) Lab

- Orchestration
  - Controller performance
    - Mathematical analysis
    - Experimental performance through Mininet
  - Channel for flow state upload to controller
    - Coordinated access or Out-of-band: common control Channel

- Network abstraction
  - Primitives to abstract networks to present a Network OS(NOS) to developer
Profile

NOW: AKKA – BENOIT BAURENS

NEXT: JEMM RESEARCH – CHRISTOPHE TOULEMONDE
Advanced Cloud Infrastructure and Services
Our Competencies at a Glance

UK-FR FI & Cloud Brokerage event
Paris, Friday January 10th, 2014

Benoit BAURENS,
R&D Project Manager
benoit.baurens@akka.eu  www.akka.eu
“Architecturing” for the Cloud

It is not simply about *porting* applications and software stacks to the cloud, but rather to *integrate* them in a *scalable, elastic... framework*
Business Processes and Data Integration

Example of Recent Project’s Coordination:

A PaaS Platform for GeoData Publication and Sharing Services
Profile

NOW:  JEMM RESEARCH – CHRISTOPHE TOULEMONDE

NEXT:  GMV – ALMUNEDA SANCHEZ GONZALEZ
Christophe Toulemonde founded JEMM Research, an European IT research and advisory firm. Christophe has more than twenty five years of IT experience in various areas and roles, including enterprise architecture, enterprise security, application development, technical support and software marketing and sales. He is a recognized expert in enterprise architecture, information security, and cloud computing.

Before founding JEMM research, he covered integration and development strategies at Meta Group for EMEA. As CTO, he launched Datablue, an IBM subsidiary to support promote middleware on distributed platforms. During 15 years, at IBM in France and in the US, he held multiple technical and marketing management positions.

Sample Works

- Community : “La Sécurité Intelligente”
- Market Analysis : CISO at the crossroads of requirements
- Market Analysis : Mobility Observatory 2013
- Market Analysis : 2014 Business Intelligence Barometer
- GDFSuez
- Kingsfischer
- CCIP
- EDF
- Bouygues Telecom
- SABIC
- STC
- ...
A Business Partner in the Project Consortium

- **Demand Analysis**
  - Focused Pools
  - Panel Surveys
  - Individual Interviews

- **Market Analysis**
  - Maturity
  - Segmentation
  - Localization
  - Optimization

- **Mapping**
  - Strengths and Weaknesses in the Local Markets
  - Product Evaluation and Positioning
  - Growth Potential and Required Adjustments
  - Opportunities and Threats

- **Dissemination**
  - Study
  - Action Plan
  - White paper
  - Key Note
  - Event

- **Business and Social Values are Key Requirements from the Commission**
  - “Responding to the economic crisis to invest in future jobs and growth”
  - “Addressing people’s concerns about their livelihoods, safety and environment”

- **Your Business Partner to Sustain the Project Technical Achievements**
  - Providing the Foundations
  - Transitioning seamlessly from idea to markets (from TRL 6, 7 or 8 to TRL 9)
  - Studying the impact of the deliverables beyond the native targets
  - Identifying market and demand requirements
  - Analyzing the social impact
  - Disseminating the results to the markets

### Current Participation
- **EURO-MILS FP7 Project**
  - “Certified Trustworthy Embedded Platform for Avionics and Automotive”
    - 14 European partners including Airbus, T-Systems, Thales, SYSGO, Universiteit Gent, Université Paris Sud...
    - 3 years, €6 millions
- **JEMM Research Involvement**
  - Project Business Concepts Reference
  - Industry Panel (40 advisors)
  - Value Analysis in Adjacent Markets
Profile

NOW: GMV – ALMUNEDA SANCHEZ GONZALEZ
NEXT: SOFTEAM – ALESSANDRA BAGNATO
INTRODUCTION

1. Almudena Sánchez.  
GMV Business Development Executive  
asanchez@gmv.com

2. Private equity. Annual Sales (2012): 110 million euros (65% international market)

3. Very well known and active on standardization of space scientific data, high performance computing for sensors processors, technological partner within ESA Climate Change Initiative and playing a leading role on ESA Long Term Data Preservation.
BACKGROUND AND TOPICS OF INTEREST

- FP7, GMES-Copernicus, ESA Earth Observation and Climate Change Initiative references
- BEinGRID, ARGUGRID, FIRE CCI, OSIRIS, GLOBAEROSOL, GMES Service Element Program Forest Monitoring, GMES Service Element Program PROMOTE, ESA Long Term Data Preservation, ESA Long term data Archive on new Technologies
- Exploitation of space-based data for end-users to support the decision making
- Close relationship with many public and private stakeholders
- Access to global market

- ICT 7 – 2014: Advanced Cloud Infrastructures and Services
- ICT 15 – 2014: Big data and Open Data Innovation and take-up
- ICT 16 – 2015: Big data – research
Profile

NOW: SOFTEAM – ALESSANDRA BAGNATO

NEXT: IBM – CHRISTIAN DE SAINTE MARIE
SOFTEAM
an R&D company

name.surname@softeam.fr
SOFTEAM = 700 experts, 23 years of R&D

- **UML Tools**: Software Architecture Modeling, Open Source
- **Research**: 15+ EU Project including FP7 ModaClouds and Juniper
- **Management**: Consortium Coordination
- **Standardization**: SOA, Cloud, Enterprise Architecture, Testing, System Engineering

Andrey.Sadovykh@SOFTEAM.fr
Target: Cloud and Big Data architectures for software developers and business architects

Cloud

- How to help BAs to integrate cloud into enterprise systems?
- How to migrate legacy to cloud?
- How to design for multi-clouds?
- How to automate deployment to multiple clouds?

MDE environment delivery
- SaaS mode
- Collaboration over cloud

Big Data

- How to leverage Big Data in business architectures?
- How to link business semantics with business objects?
- How to port business objects to various Big Data models?

Model as a Big Data
- Storage, replication, search
- Access, search

Andrey.Sadovykh@SOFTEAM.fr
Profile

NOW: IBM – CHRISTIAN DE SAINTE MARIE
NEXT: UNIV. OF BATH – JAMES DAVENPORT
IBM France Lab interest in collaborative R&D projects
IBM France Lab Profile

IBM France Lab is the R&D component inside IBM France
- Created 2010
- 700+, based near Paris, Nantes, Nice, Toulouse
- French expertise connected worldwide

IBM France Lab genealogy
- Centre Scientifique d’IBM France
- Innovation Lab in Montpellier
- ILOG
  - Worldwide leader in
    - rule based systems
    - constraint programming
    - math programming
  - 300+ R&D in France
  - Acquired by IBM in 2009
- Numerous smaller R&D teams from other acquisitions

CAS France Lab is the center for advanced studies inside IBM France Lab
- Missioned to support innovation through collaboration in IBM France Lab
IBM France Lab R&D competence

Application lifecycle management

Business rules, events and decisions management

Analytics and optimization

Visualization, mobility

Hardware

allocate aircrafts / crews?
cost / carbon emission?
inventory cost / customer satisfaction?
risk / potential reward?

User Tools
Repository
Execution Server
We are happy to look at all opportunities to participate in proposals or projects where we can contribute in our areas of competence

- We have experience in collaborative projects and in the preparation of proposals
- We are prepared to invest and to contribute actively in the right proposal

In the context of the “Cloud infrastructure and services” call, we are more particularly interested in exploring

- New usages of API fabric based on open API normalization (Cloud Foundry)
- Cloud-centric cognitive computing in an API eco-system (Watson)
- Continuity across private, public and hybrid Clouds
- SLA Policy authoring, governance and operation of Cloud resources, apps and services
- API and non-API based application composition

We are a product development unit, not a research lab

⇒ Guarantee of maximum impact
Profile

NOW: UNIV. OF BATH – JAMES DAVENPORT

NEXT: NATURAL SECURITY ALLIANCE – ANDRE DELAFORGE
Identity and Clouds

What makes (public) cloud computing different (from an internally-managed bureau = private cloud)?

- Loss of ownership of data (obviously)
- Loss of ownership of metadata (less obviously)
- This is actually the cause of much ill-expressed unease about cloud computing
- Loss of unified personnel/hierarchy information
- (including, but not limited to, passwords)
- How can I terminate an employee's right to use a remote facility?
Attribute-Based Authentication [1, 2]

- The cloud's mechanisms are set up (at contract time) to trust the user's attribute-issuing mechanisms
- Can be set up to allow a tracing authority (arbiter)
- Who is involved at global setup, and then only in the event of dispute


See: Cloud Accountability Project http://www.a4cloud.eu/

James Davenport http://staff.bath.ac.uk/masjhd
Profile

NOW: NATURAL SECURITY ALLIANCE – ANDRE DELAFORGE

NEXT: NONSTOP
Natural Security for Horizon
2020 ICT
10th of January, 2014
Strong Authentication Standard
Based on business requirements

- Natural Security is an authentication standard for online & offline transactions, based on:
  - specifications available to all vendors
  - evaluation & certification process
- Natural Security Alliance:
  - support & develop uses cases of the Natural Security Standard
  - Member of Fido Alliance
  - Working group on online authentication
Profile

Now: NONSTOP

Next: END
Who are we?

- Contact: Pascal.Gallard@nonstop.fr
  - Website: http://www.nonstop.fr

- Architect of reliable and highly available IT
  - Created in 1998
  - Expert in continuity and disaster recovery plan

- Both hardware and software solutions

- One decade of
  - Technology watch and import
  - r&d projects
Europe-wide distributed

- Mesh of Datacenters me-centric (user-centric)
  - Don't move to the cloud: be part of the cloud

Expansion place (shared dc):
Running area for resources

Subsidiary:
Partnerships

- **Challenge:**
  - How to build a trusted and reliable DC on top of a partly corrupted components?
    - Backdoors, DC failures, Deny of service
- **Early step experience at French level**
  - Nuage project (http://www.nuage-france.fr)
- **Expertise needed:**
  - Strong authentication and encryption
  - Meshed and virtualized networks (LISP / TRILL)
  - Local carriers
  - Distributed storage provider
  - Ready to integrate on other big data project
Thank you