

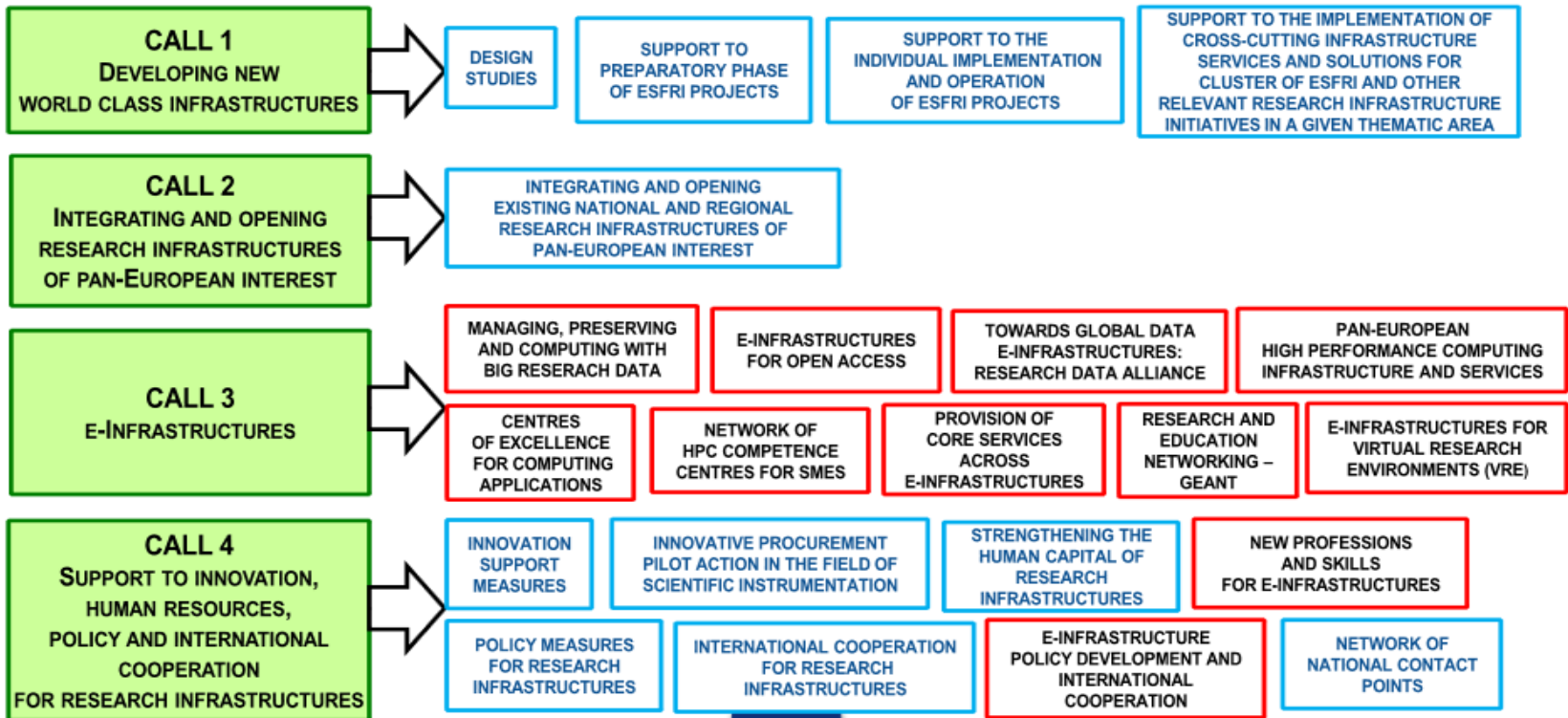
Infrasupp-4 ed altre opportunità

M.Cristina Vistoli

INFN CNAF



RESEARCH INFRASTRUCTURE (DRAFT) Work Programme 2014-2015





Unit C1 – infrastructures

Head of Unit Augusto Burgueno Arjona

⌋ **Data and computing**

- Carlos Morais Pires
- Luis Busquets Perez
- Jarkko Siren
- Darko Karacic

⌋ **HPC**

- Leonardo Flores Anover
- Aniyam Varghese
- Tsvetanka Kalfin

⌋ **VREs**

- Antonios Barbas
- Wim Jansen
- Athina Zampara

⌋ **Core services**

- Sonia Spasova

⌋ **Connectivity, Geant**

- Jean-Luc Dorel
- Athina Zampara

⌋ **Skills**

- Darko Karacic
- Wim Jansen

⌋ **International cooperation**

- Aniyam Varghese
- Leo Flores Anover
- Jean-Luc Dorel

⌋ **Policy**

- Anni Hellman

Call coordinator Darko Karacic

Conditions for the Call on e-Infrastructures:

Specific conditions :

- Proposals should be structured around **Networking, Service and Joint Research Activities**
- The **Software** to be developed needs to be **open source**
- A **Data Management Plan** to be developed enabling data preservation, on-line discoverability, authorisation and re-use of data
- Clear **Metrics (KPIs)** to be proposed and used;
- **Open Access to Publications** resulting from the project;
- Usefulness of services to the end user community and financial **sustainability** to be ensured;

PRELIMINARY

Cluster 1: EU-T0 PILOT

Sub-project: PRIVATE

EU-T0 commits to implementing an innovative and sustainable new paradigm. It implies the investigation of innovative business models (e.g. in cooperation with the Helixnebula project). For such a purpose a "pilot model" will be supported exploring: interoperation of publicly funded EU-T0 infrastructures with commercial cloud services providers in a hybrid platform; interoperation with HPC centres; provision of services (on-demand) outside the collaboration; subcontracting services and infrastructures to private companies. It will collaborate with the European private companies offering to develop new frontier ideas for big-data management. This will allow the private sector to be competitive worldwide.

Sub-project: ACCADEMY

The involvement of Computer Science institutes already in place in different centres would empower the global EU-T0 research component in IT context. EU-T0 will contribute developing and executing training programs and university curricula that will combine computing and science competences in support of "data scientist" professions.

Interest from EU-T0

- Interesting aspects for EU-T0
 - “(1) Defining and updating university curricula ...”
 - “(2) Developing and executing training programmes...”
 - EU-T0 European Graduate School – interdisciplinary between data science and physics Integration with / usage of existing summer schools
 - KIT has a strong background due to GridKa School, KSETA graduate school and being a university
 - INFN has GSSI and Bertinoro School

INFRASUPP-4-2015 – New professions and skills for e-infrastructures.

Specific challenge

- The changing methods of (digital) science and research require that researchers, professors and students receive adequate support in computing and networking, as well as in handling, analysing and storing large amounts of digital content. Formal education for emerging professions of e-infrastructure operators, research technologists (including those possessing computational skills, e.g. in parallel programming), data scientists or "data librarians" hardly exists today. Professional recognition of these communities and the development of appropriate curricula, training and skills are crucial to ensure effective services to institution staff and students. Training opportunities should be available at all levels and for all communities potentially engaged in research and innovation related activities.

Scope

- Proposals should address one or more of the following areas:
- (1) Defining or updating university curricula for the e-infrastructure competences mentioned above, and promoting their adoption.
- (2) Developing and executing training programmes (including for lifelong learning) for the above mentioned professionals working as part of a team of researchers or supporting research teams.
- (3) Support the establishment of these professions as distinct professions from that of a researcher. Create a reference model which defines their competencies, supported by case studies and best practices relating to e-infrastructures skills, human resources management, support tools and related institutional practices. Develop alternative means for recognising non-research contributions by research technologists and data scientists.
- (4) Support networking and information sharing among already practicing e-infrastructure experts, research technologists, computation experts, data scientists and data librarians working in research institutes and in higher education.
- (5) Awareness raising activities; establish and promote e-infrastructures community champions to advocate on new jobs and skills needs at schools, universities and scientific communities.

Expected impact

- The number of high level education institutions offering degrees for e- infrastructure experts, research technologists, data scientists and data librarians will increase. Graduates and practitioners in these fields will have access to degrees, programmes and information sharing tools to improve their skills. The majority of European researchers will thus have access to training on e-infrastructures to develop related skills. The number of individuals able to design, develop and maintain e-science tools and services as well as to support researchers with computational and data expertise will increase significantly.
- Type of action: Coordination and support actions
- Budget. 2.5 ME
- Deadline: 14/1/2015

Cosa è stato fatto ?

- È stato istituito un gruppo di interesse a livello di eu-t0
- Coordinatore Achim Streit KIT
- Per INFN : Mauro Morandin – Scuola di Bertinoro , Cristina Vistoli – collaborazione con GSSI

LEIT -ICT 4 – 2015: Customised and low power computing

- **Specific Challenge:** A key structural change overtaking computing is the move towards a low- power computing continuum spanning embedded systems, mobile devices, desktops, data centres, etc. The demand for low-power multi/many-core computing systems is intensifying across all market segments. Capitalising on Europe's industrial and technology strengths in low power computing and embedded and cyber-physical systems, the objective is to strengthen European competitiveness in the key parts of the emerging computing value chain. With the wider diffusion of embedded ICT and cyber-physical systems, security becomes increasingly important to be addressed across all levels starting from secure and trusted zones supported on hardware and software level.


Scope:

- Research & Innovation Actions should cover one or both of the following themes:
 - **Next generation servers, micro-server and highly parallel embedded computing systems based on ultra-low power architectures:** The target is highly performing low- power low-cost micro-servers, using cutting-edge technologies like, for example, optical interconnects, 3D integrated system on chip, innovative power management, which can be deployed across the full spectrum of home, embedded, and business applications. Focus is on integration of hardware and software components into fully working prototypes and including validation under real-life workloads from various application areas. Specific emphasis is given on low-power, low-cost, high-density, secure, reliable, scalable small form-factor datacentres ("datacentre-in-a-box"). Proposals requesting a Large contribution are expected.

Scope – cont.

- **New cross-layer programming approaches** empowering developers to effectively master and exploit the full potential of the next generations of computing systems based on heterogeneous parallel architectures and constituting the computing continuum. Beyond performance, optimisation should include energy efficiency, time- criticality, dependability, data movement, security and cost-effectiveness. Research should also aim at radically increasing the productivity in programming and maintaining intrinsically parallel code by marginalising the need for dual expertise - application engineering and computer system engineering. Focus is on holistic approaches hiding the complexity between the computing HW component level and the level of application families. Proposals requesting a small contribution are expected

Expected impact

- Reinforce and broaden Europe's strong position in low-power computing in traditional and new market segments by strengthening the technology competences of European suppliers and the academic community.
- Reduction of energy consumption of servers by 2 orders of magnitude as compared to state of the art in 2013.
- Double the productivity in efficiently programming and maintaining advanced computing systems powering cyber-physical systems as compared to state of the art in programming embedded systems in 2013.
- Increase the adoption of form-factor data-centres and heterogeneous highly parallel computing systems.
- Higher involvement of SMEs, both on the supply and the demand-side.  Increased adoption of concurrency in applications across all sectors; higher degree of parallelism in applications; increased public trust in embedded applications due to secure and reliable architectures
- Budget : 37 ME
- Scadenza 14 Aprile 2015

LEIT -ICT 16 – 2015: Big data - research Specific Challenge

- The activities supported within LEIT under this topic contribute to the Big Data challenge by addressing the fundamental research problems related to the scalability and responsiveness of analytics capabilities (such as privacy-aware machine learning, language understanding, data mining and visualization). Special focus is on industry- validated, user-defined challenges like predictions, and rigorous processes for monitoring and measurement.

Scope: Research & Innovation Actions

- Collaborative projects to develop novel data structures, algorithms, methodology, software architectures, optimisation methodologies and language understanding technologies for carrying out data analytics, data quality assessment and improvement, prediction and visualization tasks at extremely large scale and with diverse structured and unstructured data. Of specific interest is the real time cross-stream analysis of very large numbers of diverse, and, where appropriate, multilingual, multimodal data streams. The availability for testing and validation purposes of extremely large and realistically complex European data sets and/or streams is a strict requirement for participation as is the availability of appropriate populations of experimental subjects for human factors testing in the domain of usability and effectiveness of visualizations. Explicit experimental protocols and analyses of statistical power are required in the description of usability validation experiments for the systems proposed. Proposals are expected, where appropriate, to make best possible use of large volumes of diverse open data from the European Union Open Data portal and/or other European open data sources, including data coming from EU initiatives like Copernicus and Galileo.
- Collaborative projects to define relevant benchmarks in domains of industrial relevance, assemble the data resources and infrastructure necessary for administering and validating the benchmarks and organise evaluation campaigns with a commitment to producing public reports on the performance of participants against the defined benchmarks. Since the goal is to create big data analysis and prediction benchmarking environments of sufficient general usefulness to be able to become self-sustaining after the end of funding, proposals will have to provide detailed and convincing exit strategies.

Expected impact

- Ability to track publicly and quantitatively progress in the performance and optimization of very large scale data analytics technologies in a European ecosystem consisting of hundreds of companies; the ability to track this progress is crucial for industrial planning and strategy development.
- Advanced real-time and predictive data analytics technologies thoroughly validated by means of rigorous experiments testing their scalability, accuracy and feasibility and ready to be turned over to thousands of innovators and large scale system developers.
- Demonstrated ability of developed technologies to keep abreast of growth in data volumes and variety by validation experiments.
- Demonstration of the technological and value-generation potential of the European Open Data documenting improvements in the market position and job creations of hundreds of European data intensive companies.
- Budget : 38 ME
- Scadenza 14 Aprile 2015

POR FESR 2014-2020

- Oltre h2020, ci sono i fondi distribuiti dalla CE alle varie regioni nazionali
- È possibile stabilire sinergie tra progetti h2020 e progetti por fesr
 - Ad esempio a livello europeo h2020 leit e social innovation si fa il progetto di ricerca
 - La parte di deployment, implementazione per portare innovazione alle imprese regionali si realizza finanziata dai progetti FESR
- L'Europa ha chiesto a ciascuna regione di fare un piano strategico dove si individuano le traiettorie principali sulla base delle specifiche realtà locali, chiamandole «smart specialization strategy»
- La Regione Emilia Romagna ha fatto un piano che identifica come traiettorie di sviluppo ad esempio, le scienze della vita, l'agroalimentare, edilizia e costruzioni etc
- Analogamente hanno fatto le altre regioni anche se con tempistiche non omogenee
- Dovremmo coordinarci per aggredire questi piani strategici regionali per ampliare l'impatto dell'istituto verso lo sviluppo della società
- Il 'calcolo' o l'ICT giocano un ruolo importante e trasversale ma non esclusivo, cioè ci possono essere altre specializzazioni dell'istituto che possono incrociarsi sulle traiettorie di sviluppo regionali