CLOUDUT Infrastructure based Research and Development in UTCN

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CLOUDUT Project

- **Title:** Cloud Cercetare UTCN – CLOUDUT

  (http://cloudut.utcluj.ro/en/)
- **MySMIS ID:** 124493
- **Contract no.:** 235/ 21.04.2020
- **Project type:** Operational Program “Competitivitate 2014-2020” (POC)
- **Priority axis 1**: Research, technological development and innovation in support of economic competitiveness and business development
- **Action:** 1.1.2 Development R&D Centers networks, coordinated at national level and connected to European and international networks, ensuring researchers’ access to European and international scientific publications and databases
- **Financing:** European Fund of Regional Development, total project value: 4.955.000 RON out of which 4.950.000 RON from European funding.

Objectives

- Increasing the *research capacity*
  - Scientific competitiveness at the international level
  - High performance computing infrastructure
  - Integration into national and international cloud structures and massive data infrastructures
- Development of *interdisciplinary scientific research teams*
  - National and international research consortiums
  - Interdisciplinary domains of big data, artificial intelligence, spatial data and IoT
  - Engineering, economic and administrative applications of the regional and national economic environment

Specific Objectives

- **SO1.** Create a *CLOUDUT infrastructure* that will contribute to the development of high-performance computing resources and storage of massive data, necessary for research and scientific collaboration;
- **SO2.** Development of dedicated *cloud software platforms, services and applications*, and the implementation of massive data infrastructures, that will support the specialisation of CLOUDUT for research engineering fields;
- **SO3.** Development of *interdisciplinary scientific research teams* and the capacity to collaborate in national and international research projects;
- **SO4.** Develop the *capacity to publish*, participate to and organise scientific events.

Activities

- Implementation 2 years and sustainability 5 years
- Acquisition of computer equipment, software and services. Installation of cloud infrastructure and training of operating personnel (M1-M12)
- Development of dedicated IT services and applications for the efficient use of cloud infrastructure in scientific and engineering domains (M7-M24)
- Participation to scientific events, dissemination, advertising, management (M1-M24)

Cloud Infrastructure

Minimum requirements:

- 20 CPU processors 2GHz by 16 cores, 16GB RAM for each CPU core, support for VMWare virtualization and hyperthreading
- Storage capacity 71TB, RAID 5
- 2 AI servers. Each server has 2 CPU processors by 20 cores, RAM 512GB, SSD 1TB, 2 GPU Tesla V100 with 640 tensor cores , 32GB, support for virtualization
- 25 Gbps connectivity

Collaboration

- International organizations:
  - European Open Science Cloud (EOSC)
  - Organization for the Advancement of Structured Information Standard (OASIS)
  - University of Geneva (UNIGE)
- National cloud systems
  - Universitatea Politehnica din București (UPB)
  - Universitatea Politehnica din Timișoara (UPT)
  - Institutul Național de Cercetare – Dezvoltare în Informatică București (ICI), NI4OS Europe (National Initiatives for Open Science in Europe)

Challenges

- Interdisciplinary research domains, groups, projects
- Scientific and technical consultancy
- Research project migration onto cloud
- Applications and services development over the cloud
- Resource management
- Standardization, Interoperability, Resource sharing, European policy on open data, FAIR data, DMP (Data Mng Plan)
- Cloud services
- Scalability
- Administration in implementation and sustainability phases

Conclusions

- CLOUDUT infrastructure is an important forward step for the UTCN community
- The high performance computation infrastructure will be shared by interdisciplinary research teams
- Efficient implementation and management is a challenge, especially in the sustainability phase
- The outcomes (i.e. human, scientific, publications, services, applications, etc.) are much more important rather than the computation infrastructure itself

Many thanks for your attention!

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