General questions

In this section you will find general questions answered.

What is COMPUTAEX?

It is the Computing and Advanced Technologies Foundation of Extremadura (hereafter referred to **COMPUTAEX**) and willingly of the Junta de Extremadura, as founding institution, was established as an organization in nature non-profit foundation. Recorded in the Register of Foundations of Extremadura, has legal personality and full capacity to act and can make, therefore, all necessary acts to fulfill the aims for which it was created.

What is CénitS?

CénitS is the Extremadura Supercomputing, Technological Innovation and Research Center aimed to promote and disseminate hpc services and advanced communications to the researcher communities of Extremadura, or that company or institution that requests it and thus contribute through technological improvement and innovation, improving the competitiveness of enterprises.

What is LUSITANIA?

LUSITANIA is the name given to the supercomputer that **CénitS** houses, whose distinguishing feature is its shared memory. You can see all the technical features in detail in **LUSITANIA** technical features section [1].

Which are the goals of the Foundation COMPUTAEX?

The Foundation’s aim is to promote the development of information technologies, the use of intensive computing and advanced communications as tools for sustainable socioeconomic development, encouraging the participation of civil society mobilising their resources and paying special attention to co-operation between public and private research centres and the productive sector.

The Foundation’s main objective is to create, operate and manage the Supercomputing Centre of Extremadura.

What is a supercomputer?

It is a computer with calculation capabilities far superior to the common, depending on the season. Today's supercomputers tend to become tomorrow's ordinary computers.

What is parallel computing?

Parallel computing is a form of computation in which many resources are carried out simultaneously to solve a problem:

- Running on a computer with multiple CPUs.
- The problem is divided into separate parts.
- Each part is running simultaneously.

Why parallelize?

- Results are obtained in less time (wall clock time).
- It is a solution to large/complex problems.
- It allows parametric scanning.
- Study of different variants of the problem.
- Current processors are of n-cores.

What is shared memory?

Shared memory is one of the mechanisms listed under the name of Inter Process Comunication (**IPC**), along with semaphores and message queues (**FIFO**). Using shared memory, as its name suggests, we can create shared memory areas by several processes. Thus process changes made to the values stored in shared memory are visible to other processes using the same shared memory.

What is a queue?

A queue is a particular kind of collection in which the entities in the collection are kept and processed in incoming order.

The queue configuration (priority, resources, runtime,...) is applied to the entities in the collection.

What is a queue manager?

A queue manager is a management system to plan and control task executions in the collection, to optimize resources, to minimize costs and maximize applications performance.

What is MPI?

MPI (**Message Passing Interface**) is a standard that defines the syntax and semantics of the functions contained in a message passing library, designed to use it in programs that exploit the existence of multiple processors.

Message passing is a technique used in concurrent programming to provide synchronization between processes and to allow mutual exclusion.

Its main feature is that it does not require shared memory, so it is very important in distributed systems programming. In LUSITANIA supercomputer platform it can be used when a job runs on more than one node.

You can find more information:

- http://www.mcs.anl.gov/research/projects/mpi/ [2]

What is OpenMP?

OpenMP (**Open Multi-Processing**) is an application programming interface (**API**) for shared memory multiprocessing programming in multiple platforms. It could also be defined as a portable and scalable programming model that gives developers a simple and flexible interface to develope parallel applications for platforms ranging from desktops to supercomputers.

In LUSITANIA supercomputer platform, this API has the entire potential of the compute nodes, since they are characterized by their large volume of shared memory.

You can find more information:

- http://openmp.org/wp/ [3]

How can i use LUSITANIA supercomputer resources?

To make use of LUSITANIA supercomputer resources, it must be filled the request resource form [4].

After reviewing your request, CénitS will provide the neccesary information to access and use LUSITANIA supercomputer.

What services does CénitS offer?

CénitS provides the infrastructure, resources and technical support to carry out scientific, technical and business projects where required:

- High-performance computing (HPC).
  - Shared memory system for high performance.
- Large storage capacity.
  - High availability.
  - For critical applications.
  - Backups.
- Infrastructure and service settings.
  - Requirements definition, design and implementation.
  - Definition of quality parameters (QoS, bandwidth, fault tolerance,).
  - Definition and implementation of security policies.
    - Vulnerability Analysis.
    - Definition of firewall rules.
- Consulting:
  - Code parallelization.
  - Simulation / Emulation.
  - Optimization.
  - Cloud / Grid.
- Training.
- Cooperation / agreements.
- Support for research, development and technological innovation.

If you want to request resources from our centre:

- Resource request [5].

What is an example of computing capacity offered by LUSITANIA?

LUSITANIA supercomputer has a maximum power calculating peak of 1850 GigaFLOPS . The **FLOPS** (Floating point Operations Per Second) is used as a measure of computer performance, especially in scientific calculations that require heavy use of floating point operations.

What could compare LUSITANIA storage capacity with?

Supercomputer **LUSITANIA** storage capacity available could be divided into:

- 2 TB of main memory.
- 276,68 TB of secundary memory in hard disks storage (11,68 for scratch).
- 392 TB of secundary memory in tape storage.

It could be storage around a million and a half copies of "Don Quixote" and 435 dvd information in main memory.
It could be storage around 182 millions copies of "Don Quixote" and 60,280 dvd information in disk storage.
It could be storage around 257 millions copies of "Don Quixote" and 85,405 dvd information in tape storage.

Links
[1] https://www.cenits.es/en/cenits/lusitania [2] http://www.mcs.anl.gov/research/projects/mpi/ [3] http://openmp.org/wp/ [4] https://www.cenits.es/en/formularios/resource-request-form [5] https://www.cenits.es/en/cenits/resource-request