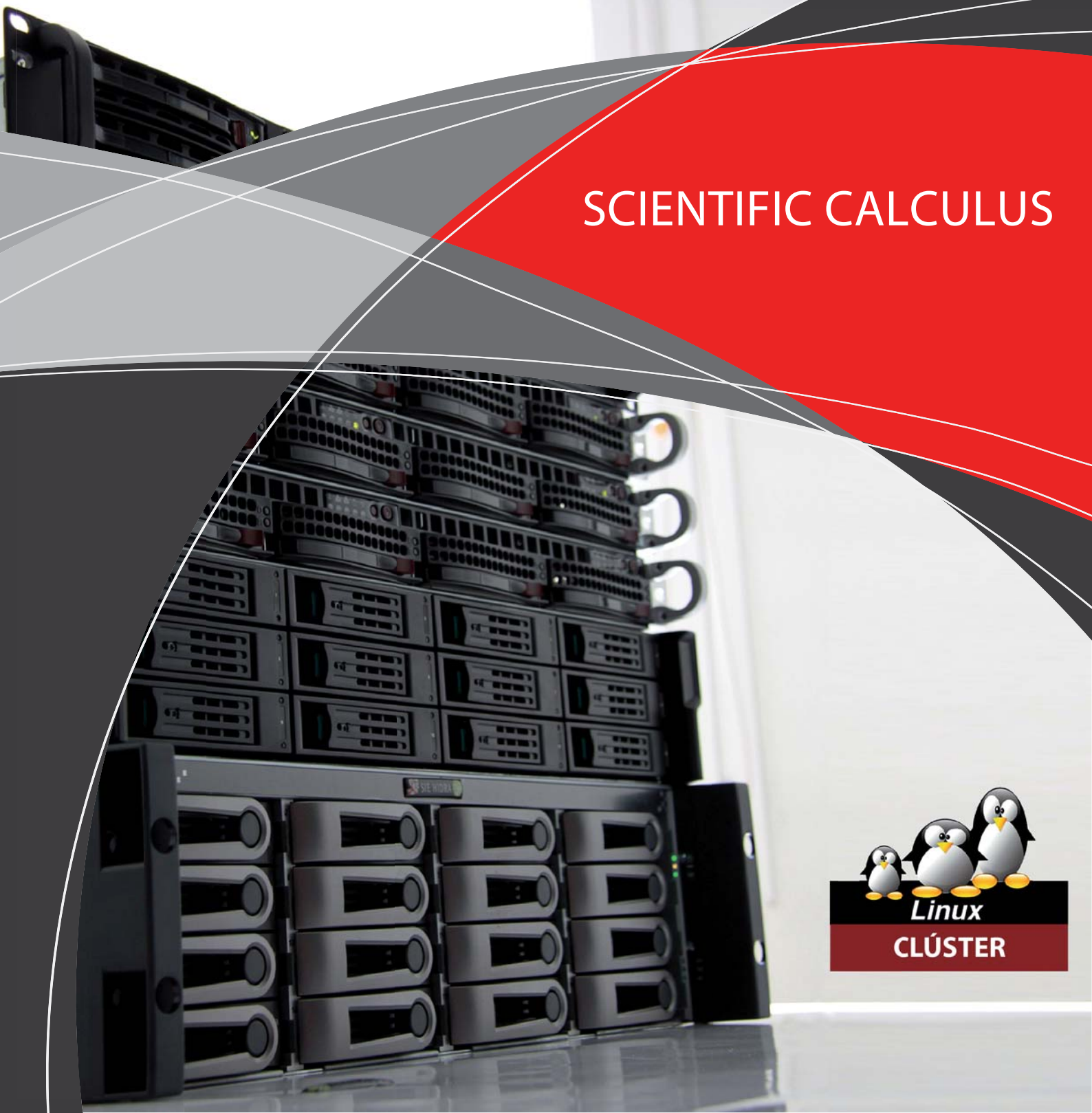
SIE
SISTEMAS INFORMÁTICOS EUROPEOS
C/ Marques de Mondejar, 29 2º
28028 MADRID (SPAIN)
SPAIN Tlf. +34 913611002
MEXICO Tlf. +52 55 41692249

HIGH PERFOMANCE COMPUTING
SUPER COMPUTING BASED ON GPU
BIG DATA, WORKSTATION, STORAGE

SCIENTIFIC CALCULUS



COMPANY PROFILE

Sistemas Informáticos Europeos Ltd. was born in 1990 as a company dedicated to networking and communications. In 1999, the company specialized in scientific calculus based on solutions of standard hardware and open source solutions based on Linux.
Since 2001, SIE signed an agreement R&D with Enrique Lomba, General Manager of the RocaSolano Institute (CSIC, Spanish National Research Council) allowing us to increase our equipment performance, its stability, usefulness and friendliness.
Nowadays, SIE Ladon is a reference branch in the Spanish market, especially in HPPC (High Performance Computing Calculus). This is possible due mainly to two things: on one hand, we are able to offer a reduced cost, using hardware standard and Open Source software, without proprietary systems; on the other hand, we develop better solutions and offer our know-how, respecting the open source philosophy.
In 2012, SIE has started to expand its business to new markets. Now, we have been making projects in Ethiopia and México and eventually, we look forward to growing in more Latin-American countries,

WITH THE SCIENTISTS

Sistemas Informáticos Europeos Ltd. tries to help to our customers and other scientists in symposiums, workshops and conferences. We have sponsored many events such as: QSCP-XIV El Escorial, XXIII Bienal physics, NANOSPAIN 2010, Imaginenano 2011, the V High Pressure Research Group Conference (VEAP), National Materials XII Congress, HPC SysAdmin Meeting'12 and in 2012: The VI High Pressure School in Oviedo, 5th Czech-Italian-Spanish Conference on Molecular Sieves and Catalysis, The 39th International Congress of Theoretical Chemists of Latin Expression, The twentyfirst Annual International Conference on Composites/Nano Engineering (ICCE – 21) and others.

SIE

OUR CUSTOMERS

Many Researchers need workstation reliable that allows computing applications as Gaussian, Molpro, Nwchem, Comsol, Matematica, Mathlab, etc in their own workplace.
For this function, they need machines that support work 24x7, without overheating and low noise (under 28 dB), for a comfortable and effective work. Sometimes, Sie Ladon Workstations are enough for their computing needs. In other cases, they are used to develop their own codes or to test commercial applications before running them in the central cluster

" Customer satisfaction is our main goal"

Many customers in Spain and the rest of the World trust on SIE for their HPC projects because it is demonstrated that its systems are solid, scalable and the best price-quality relationship.
Currently a great deal of Spanish Universities, CSIC (Spanish National Research Council) and private companies are using SIE Ladon clusters and calculus machines.
Nowadays, Sistemas Informáticos Europeos, Ltd. is expanding to other countries in order to offer its solutions. We are being very welcome due to our true innovative solutions. These solutions cover a wide range of aspects: hardware, software and connectivity. "Just in time" solution allows the researcher to work since the very first time without any trouble at all.
Our clusters and calculus machine come with no extra cost three years limited on side hardware warranty, including phone and remote software technical support.

Here is a list of some of our best customers:

CSIC

SPANISH UNIVERSITIES

COMPANIES, PRIVATE UNIVERSITIES AND INTERNATIONAL PROJECTS

New Technologies

Last year, we have been witnessing a spectacular improvement in the design of new technology processors, the engine of the SIE Ladón equipments.

INTEL

HASWELL

The new instructions located inside Haswell technology will change the way to perform Scientific applications in the coming years, dramatically improving the runtime, thus increasing its performance and reliability.

The most outstanding specifications are:

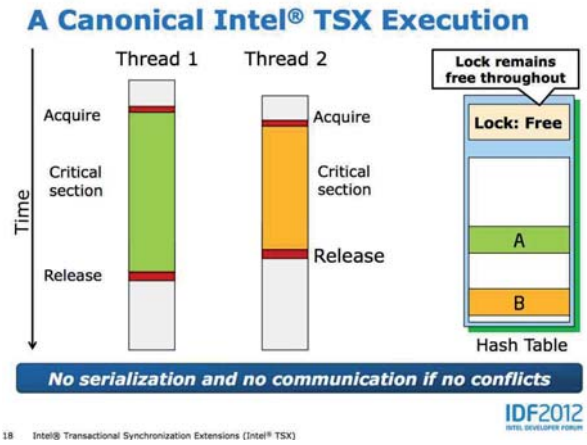
Intel® Turbo Boost Technology 2.02

Intel® Smart Cache Technology with LLC sharing between CPU and GFx cores

DDR3 Memory Speed: up to 1600 MHz

2 x16 PCIe Gen 3 Express support2, 3

Intel® Advanced Vector Extensions (AVX2.0)



Intel® Transaction Synchronization Extension (TSX – NI)

• What is TSX-NI:

–New instructions focused on Multi-threaded performance scaling

–Technologies make parallel operations more efficient via improved control of locks in SW

• Impact: Projections of up to 30% scaling benefit

–Esp. for BI/Data Analytics & Visualization apps, Collaboration is an additional target)

–Scaling improves with number of cores dependent on SW multithreaded capability

IVY BRIDGE 2600 SERIES

The second Intel Xeon E5-2600 generation gives a better performance, more cores (up until 12 cores) and more speed (with energy saving).

SANDY BRIDGE 4600 SERIES

This series allows the 32 cores machine the best performance. SIE has integrated this solution as FAT nodes in big clusters and most relevant Computing Centers of Spanish Universities and Public Centers.

E7 PLATFORMS (WESTMERE-EX)

The successor of Intel Itanium II is a platform with 80 cores able to increase them through the Intel Xeon Phi card being able to reach up to 263 cores per machine.

AMD

ABU DHABI is the evolution of Interlagos technology within the Bulldozer technology. It offers 10% performance increase, keeping its speed clock. SIE develops platforms of two and four processors up to 64 cores. The use of these machines can be either as calculus machines or as cluster nodes.

CALCULUS MACHINE BASED ON CPU

Many Researchers need workstation reliable that allows computing applications as Gaussian, Molpro, Nwchem, Comsol, Matematica, Mathlab, etc in their own workplace.
For this function, they need machines that support work 24x7, without overheating and low noise (under 28 dB), for a comfortable and effective work. Sometimes, Sie Ladon Workstations are enough for their computing needs. In other cases, they are used to develop their own codes or to test commercial applications before running them in the central cluster

We have two levels of workstation:

SIE LADÓN® WS E3 HASWELL L.N.

Intel has started to renew its processor's technology from the E3 series (one processor by mother-board), this means from the bottom upwards. Haswell technology is already a revolution in the micro-processors instruction code and will eventually be integrated in every Intel processors.

SIE LADÓN® WS E5 IVYBRG L.N.

It has two processors E5-26XX V2 Ivybridge with 24 cores.
This machine provides the highest level for a workstation, high performance for all your applications, running with the fastest speed allowing, therefore, the reduction of the time needed to achieve scientific results.
These machines allow NVDIA GTX KEPLER cards to plug them in for the use of different programs, such as VMD.
VMD is a molecular visualization program for displaying, animating, and analyzing large biomolecular systems using 3-D graphics.

CLUSTER

A computer cluster consists of a set of loosely connected or tightly connected computers that work together so that in many respects they can be viewed as a single system.
Sistemas Informaticos Europeos, Ltd. names our clusters as Ladón. In Greek mythology, it was the serpent-like dragon that twined and twisted around the tree in the Garden of the Hesperides. Ladon might be given hundred heads.

Similar to this, SIE Ladón cluster can hold one hundred or more heads (nodes). In case one of those heads is lost then this event would not affect its computing work.

SIE LADONoS (Ladón cluster´s operating System) consists on a set of programs and libraries needed for the scientific applications. We also include optimization and development tools in HPC environment.
The ideal operating system for us is Centos or Scientific Linux (Open source distributions forked from Red Hat). If needed, we are able to select another Linux distribution.

DEVELOPMENT TOOLS

Open-MPI

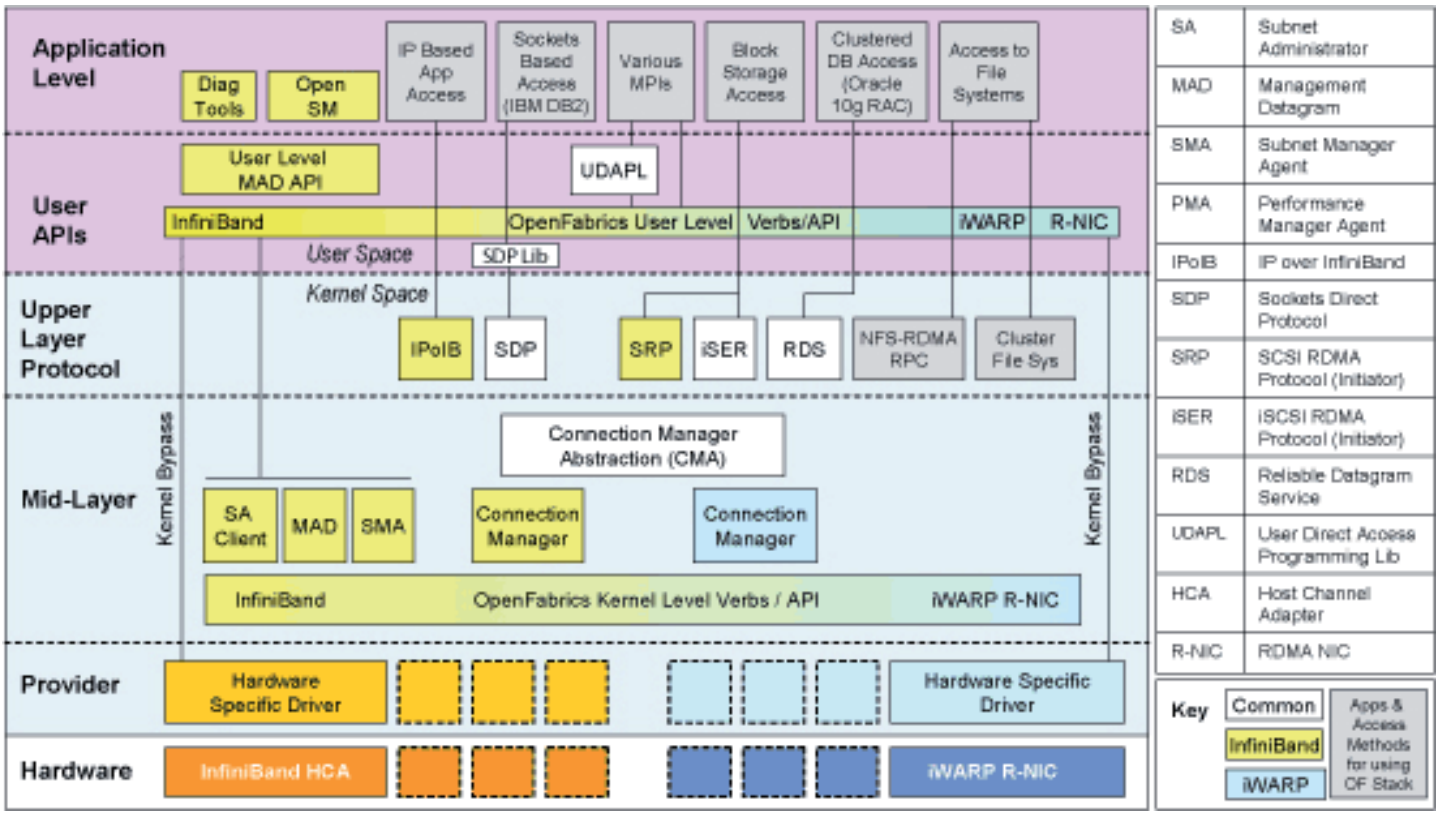
Open MPI is able to combine the expertise, technologies, and resources from all across the High Performance Computing community in order to build the best MPI library available. Open MPI offers advantages for SIE and software vendors, application developers and computer science researchers.

KWLOC

The Portable Hardware Locality (hwloc) software package provides a portable abstraction (across OS, versions, architectures, ...) of the hierarchical topology of modern architectures, including NUMA memory nodes, sockets, shared caches, cores and simultaneous multithreading. It also gathers various system attributes such as cache and memory information as well as the locality of I/O devices such as network interfaces, InfiniBand HCAs or GPUs

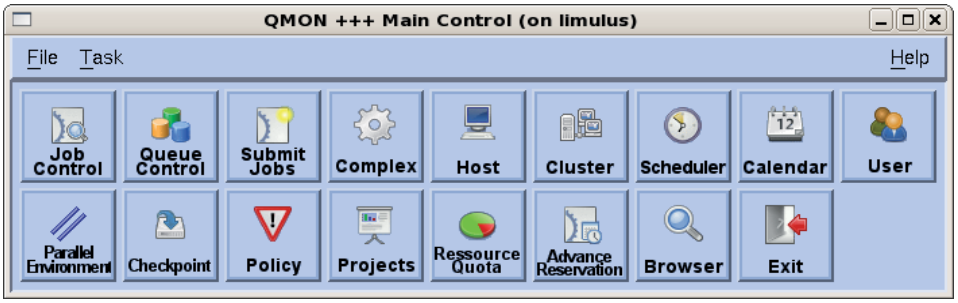
OFED (Only for Infiniband networks)

The OpenFabrics Enterprise Distribution (OFED™) is open-source software for RDMA and kernel bypass applications. OFED is used in business, research and scientific environments that require highly efficient networks, storage connectivity and parallel computing.



OPEN GRID SCHEDULER/GRID ENGINE

Open Grid Scheduler/Grid Engine is a commercially supported open-source batch-queuing system for distributed resource management. OGS/GE is based on Sun Grid Engine, and maintained by the same group of external (i.e. non-Sun) developers who started contributing code since 2001.



GPU CUDA SYSTEMS

CUDA is NVIDIA's parallel computing architecture that enables dramatic increases in computing performance by harnessing the power of the GPU (graphics processing unit).

CLUSTER SHELL (CLUSH)

ClusterShell is an event-driven open source Python library, designed to run local or distant commands in parallel on server farms or on large Linux clusters.

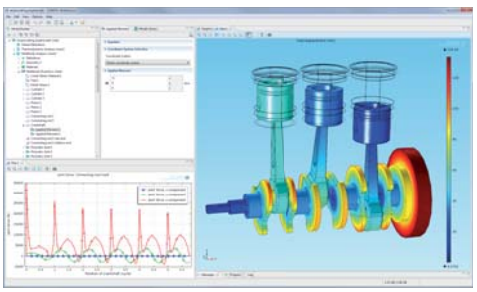
GANGLIA

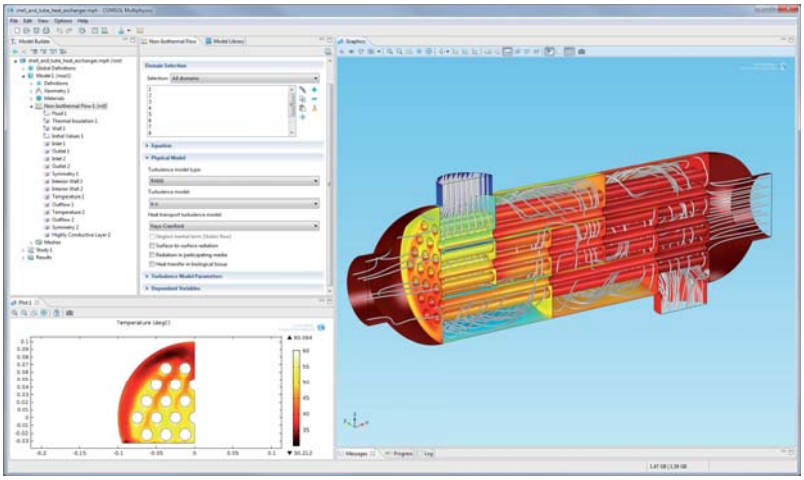
Ganglia is a scalable distributed monitoring system for high-performance computing systems such as clusters and Grids.

COMMERCIAL PROGRAMS

Sistemas Informáticos Europeos, Ltd. markets some scientific commercial programs such as:

- INTEL CLUSTER STUDIO XE
- COMSOL MULTIPHYSICS
- MATHEMÁTICA
- MATERIALS STUDIO





SIE LADÓN® GPU is based on Tesla® Kepler™, the High Performance on GPU ACCELERATORS

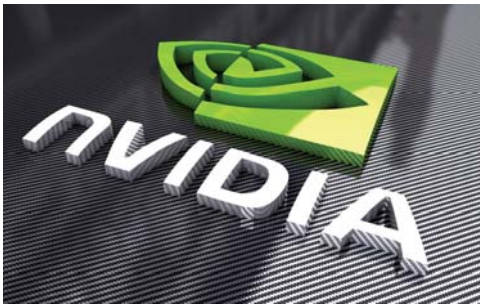
NVIDIA Tesla K-series GPU Accelerators are based on the NVIDIA Kepler™ compute architecture and powered by CUDA®, the world's most pervasive parallel computing model. They include innovative technologies like Dynamic Parallelism and Hyper-Q to boost performance as well as power efficiency and deliver record application speeds for seismic processing, biochemistry simulations, weather and climate modeling, image processing, computational physics and data analytics.

There are already many applications that support CUDA standard.

Some examples of these are:

- Amber for molecular mechanical
- NWChem for computational chemistry
- ANSYS Fluent is a Fluid Dynamics program
- MATLAB GPU Computing
- WOLFRAM MATHEMATICA is a tool that simplifies GPU programming with CUDALink and OpenCLLink

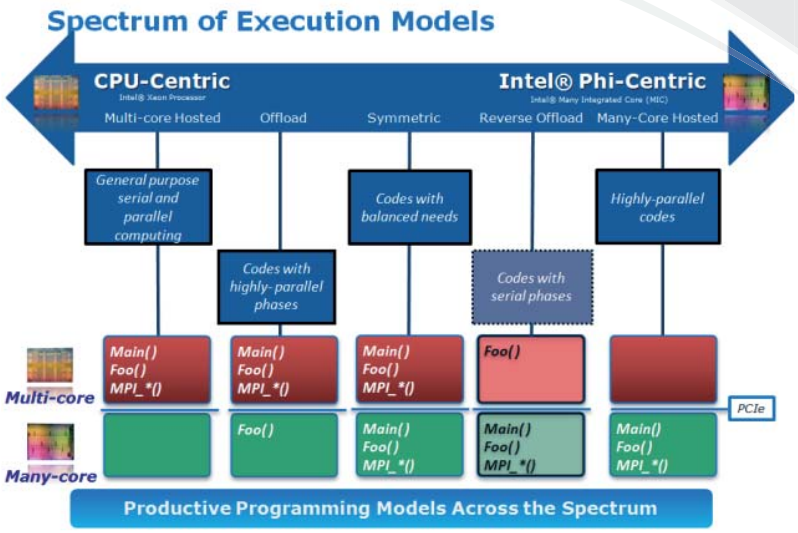
SIE LADÓN® GPU might integrate from one to four Nvdia kepler cards, that means around 10.000 GPU cores of power computing. This machine can be integrated as a cluster node with Infiniband connection. The outcome of this set of computers is a cluster with a low latency networking able to manage up to 360.000 GPU cores. This is the best power saving per core solution.



"Supercomputing is now accessible for every researcher and scientist"

INTEL XEON PHI: ALTERNATIVE SOLUTION x86

Intel Xeon Phi® is supported in SIE LADÓN® EX_80 and SIE LADÓN® GPU platforms. Each node offers around 260 cores with the advantage based on the familiar x86 programming model.
These solutions make the researcher not to need to rewrite his programming code, reducing the migration time to just a few days versus GPU classics solutions which would entail several months of work.



General Specifications

Product Family/Architecture for Highly Parallel Applications

Based on large number of smaller, low power, Intel Arch. Cores

512-bit wide vector engine

Compliments Intel® Xeon® processor product line

Provides breakthrough performance for highly parallel apps

Same source code supports both Intel® Xeon® & Intel® MIC

Initially a co-processor with PCI Express form factor

Specifications Intel Phi card SE10

Up to 61 cores, 4 threads per core

Up to 8GB GDDR5 memory (up to 352 GB/s)

225-300W (Cooling: Both passive & active SKUs)

x16 PCIe Form-Factor (requires IA host)

INTERNATIONAL STRATEGYC PARTNER

INFORMATICA EL CORTE INGLES

In the last five years, our company has been collaborating with Informática "El Corte Ingles" within Spain. Our Ladón series has been commercialized as Inves Ladón in the Centralized Procurement System State.

Since 2012, both of our companies have been collaborating in the International Expansion of SIE products. Informática "El Corte Ingles" has several International Offices in the following countries: Portugal, Czech Republic, United Kingdom, Argentina, Brasil, Chile, Colombia, Costa Rica, Dominican Republic, Mexico, Panama, Peru and USA (East Coast, Mas & FL).

Informática El Corte Inglés, an Information and Communication Technologies (ICT) company in the El Corte Inglés Group (#7th in the Spanish Ranking 5000), is a company which specializes in supplying services of technological consulting, ICT solutions and outsourcing to large and medium-sized companies, as well as to bodies of the Public Administration, to which it provides the innovation necessary for adapting to the newest business models, along with its experience and knowledge in every sector within the market.

INTERNATIONAL PROVIDERS

Sistemas Informáticos Europeos, Ltd. makes the equipments with the components of the main manufacturers in the World. With these partners, we have the Technical Certified that warranties the most standard quality.

INTEL GOLD PARTNER.

For several years, SIE keeps this certified. Our technicians get a continuous training updating their knowledge on new technologies. Recently they have got the Intel Xeon Phi Certificate. We are one of the three Spanish companies being have authorized to commercialize this technology.

AMD PREMIER PROVIDER

SIE has always made a choice for this manufacture in order to provide solutions for the largest range of cores per machine or node.

SUPERMICRO CERTIFIED PARTNER

SIE uses this manufacture´s motherboards and components to integrate some of its solutions, in especially low noise machines (under 28 dB).

APC

APC provides protection to SIE computers against some of the leading causes of downtime, data loss and hardware damage: power problems and temperature. Also, APC has racks which mean an ideal solution for SIE Ladón Cluster given that they provide power consumption and temperature control systems.

STORAGE SOLUTIONS: SIE LADON MEGASTORE IV

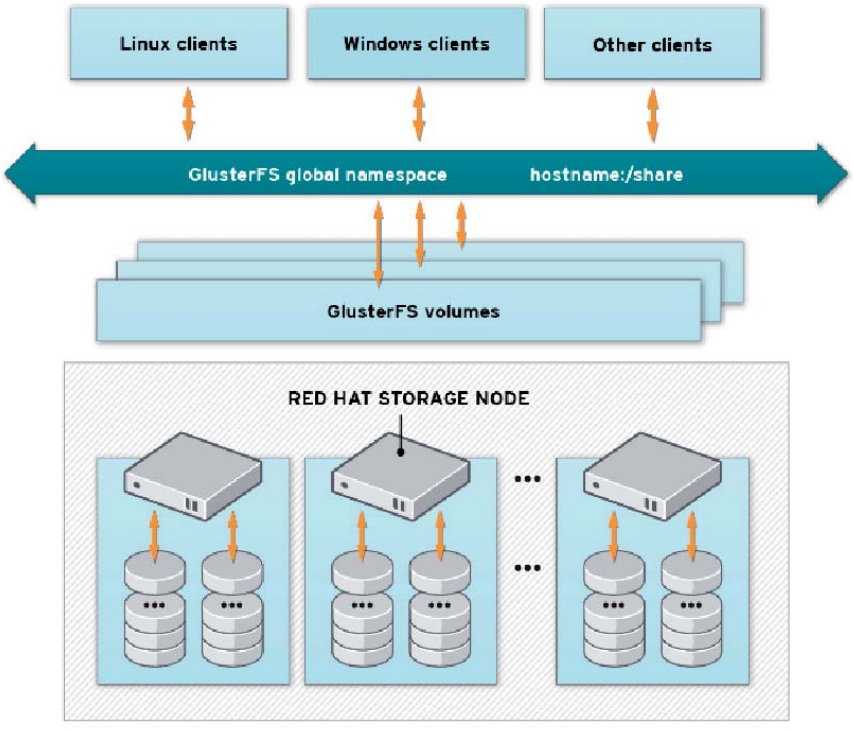
Sie Ladón Megastore IV is the evolution of the previous versions of this reliable system to storage scientific results, big data, backup, video and photo files, etc.
Sistemas Informáticos Europeos Ltd. provides solutions type NAS, iSCSI and "cluster Storage" with connectivity Gigabit, 10G and Infiniband, QDR as well as FDR.

SIE LADON MEGASTORE IV is available in three ranges:

ENTRY: for small departments and companies
It offers a low cost solution keeping the same quality of the rest of range.
Storage between 9 TB and 28 TB can be found within SAN and NAS functionality.

ENTERPRISE: for medium departments, Computing Centers and medium companies
It offers advantage specifications such as flash cache, deduplication service, Snapshot, Redundant cabinets, etc. Storage from 30 TB to 276 TB in just one cabinet and to 900 TB with additional cabinets.

CLUSTERED DATA: Designed for Supercomputing Centers, Big Data applications as well as to integrate with Cluster Calculus. Based on Gluster software, Open Source well known products allows high performance, high concurrent access, including a many redundant cabinet.



GlusterFS is a powerful network/cluster that allows distribute takes a list of subvolumes and distributes files across them, effectively making one single larger storage volume from a series of smaller ones.
Replicate is used for providing redundancy to both storage and generally to availability
We offer solutions from a few TeraBytes to some PetaBytes according to your necessities.

All SIE Megastore IV systems are Linux, Windows and Mac OS compatible.

SIE MEGASTORE IV

Specifications

	Freenas	Gluster	Open-E
Hardware Raid Manager	●	●	●
Software Raid Manager	●	●	●
Volume Manager	●	●	●
Multi Volumen Creation	●	●	●
ZFS Manager	●		
Snap-shots	●		●
Fail-Over Balancing two machines		●	O
Replica Services	●		●
Deduplication Service	●		
Smart disk Status	●	●	
SSD Cache power	●		O
Manager Web Interface	●		●
NFS Services	●	●	●
Windows Share Services	●		●
Quota	●		●
Ldap Permission		●	●
Local User Permission	●		●
Active Directory Permission	●		●
ISCI Service	●		●
High Performance Files Service	●	●	●
LAN and Vlan Trunk Compatible			●
Infiniband Support		●	●
10Gb Support		●	●
Free software	●	●	

●= included
O= optional

SIE
SISTEMAS INFORMÁTICOS EUROPEOS

Sistemas Informáticos Europeos
C/ Marques de Mondejar, 29 2º
28028 MADRID (SPAIN)
Spain Tlf. +34 91 361 10 02
MexicoTlf. +52 55 41 692 249