

Supercomputing resources at the IAC

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<http://www.iac.es/sieinvens/SINFIN/>

Burros

(Workstations with “plenty” of RAM)

- **esel**

User room, 4GB, 420GB, 3.2 Ghz, 32 bits (reservation at: http://orff.ll.iac.es/reserva_ermas)

- **rusco**

User room, 4GB, 420GB, 3.2 Ghz, 64 bits, exabyte, DAT (reservation at: http://orff.ll.iac.es/reserva_ermas)

- **rucio**

Remote access, 16GB, 120GB, 2.0 Ghz, AMD Dual Core, 64 bits (free access)

Condor - <http://www.iac.es/sieinvens/SINFIN/Condor/> (High-Throughput Computing)

- It makes use of idle workstations in the Research Department (total pool of approx. 190 workstations).
 - Workstations available approx. 80% of the time (roughly equivalent to 152 dedicated CPUs or 1.331.520 CPU hours per year).
 - **Usage**: Perfect for parametric studies. You can run any software available at the IAC: IDL, R, etc. (*No application form needed*).
 - **Examples of uses**: creation of thousands of synthetic spectra, reduction of large quantities of images, Monte Carlo simulations, etc.
 - **Priorities**: resources shared “fairly” amongst all users.
 - **Mini-demo**.
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Clusters

(High Performance Computing)

- Distributed memory clusters:

(made of independent machines, they have to communicate through messages, i.e. MPI)

- Chimera - <http://chimera/>
- LaPalma - *no webpage yet*
- Tajinaste - <http://www.saii.ull.es/?q=node/73>

- Shared memory cluster:

(memory is shared amongst the different CPUs. Probably easier to program, i.e. OpenMP)

- Tarja - <http://www.saii.ull.es/?q=node/19>
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Chimera cluster - <http://chimera>

- 64 Intel Xeon CPUs (32 of 32 bits, and 32 of 64 bits).
 - Communication network: 2 Gigabit networks.
 - In total 560.640 CPU hours per year.
 - **Usage**: Mainly for parallel programs (typically MPI) with medium CPU and network needs. (*Application by e-mail to sinfin@iac.es*)
 - **Example of uses**: Computational Fluid Dynamics.
 - **Software**: Use available parallel software (e.g. GADGET, ABINIT), or write your own. (<http://marta/sie/survey/survey.php?surveyid=12>)
 - **Priorities**: Priority is given to large parallel jobs. Otherwise, resources shared “fairly” amongst users.
 - **Mini-demo**.
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LaPalma cluster

- Technical info:
 - 512 CPUs: IBM PowerPC 970FX at 2.2 Ghz
 - Networks: Myrinet, Gigabit, Fast Ethernet
 - One of the seven nodes of the RES (Red Española de Supercomputación)
 - Roughly, 80% of time for RES users, 20% for IAC users
 - Assuming 25% for IAC, 1.121.280 CPU hours per year.
 - **Usage**: Mainly for parallel programs (typically MPI) with large needs in terms of CPUs and network speed. (*Application form at <http://goya/inves/Servicios/SOLreservas.php>*)
 - **Example of uses**: N-bodies simulations.
 - **Software**: As per Chimera, use available parallel software (e.g. GADGET, ABINIT), or write your own. (*see User Guide*)
 - **Mini-demo**.
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ULL clusters

- IAC researchers have access as ULL staff.
 - Currently free access.
 - From January 2008 there will be a yet-to-be-determined usage fee.
 - Not “dedicated” for IAC researchers, but there is low usage by ULL staff.
 - Managed by the “Servicio de apoyo informático a la investigación” (SAII - <http://www.saii.ull.es>)
 - Clusters:
 - Tajinaste - <http://www.saii.ull.es/?q=node/73>
 - Tarja - <http://www.saii.ull.es/?q=node/19>
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Tajinaste cluster - <http://www.saii.ull.es/?q=node/73>

- Technical info:
 - 7 LS21 compute nodes, each with two dual-core AMD Opteron processors (to a total of 28 CPUs).
 - 2 GB of RAM per node.
- Not available (yet) ...
- 245.280 CPU hours per year.



Tarja cluster - <http://www.saii.ull.es/?q=node/19>

- Technical info:
 - 64 CPUs: Intel Itanium 2
 - Networks: Quadrics QsNetII, Fast Ethernet
 - 32 CPUs part of a NovaScale 6320 server (*shared memory*)
 - 560.640 CPU hours per year.
 - Usage: Interesting for IAC researchers to have access to a shared-memory cluster, programmable with e.g. OpenMP. (*Application form at <http://www.saii.ull.es/?q=user/register>*)
 - Mini-demo.
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Summary of available CPU hours

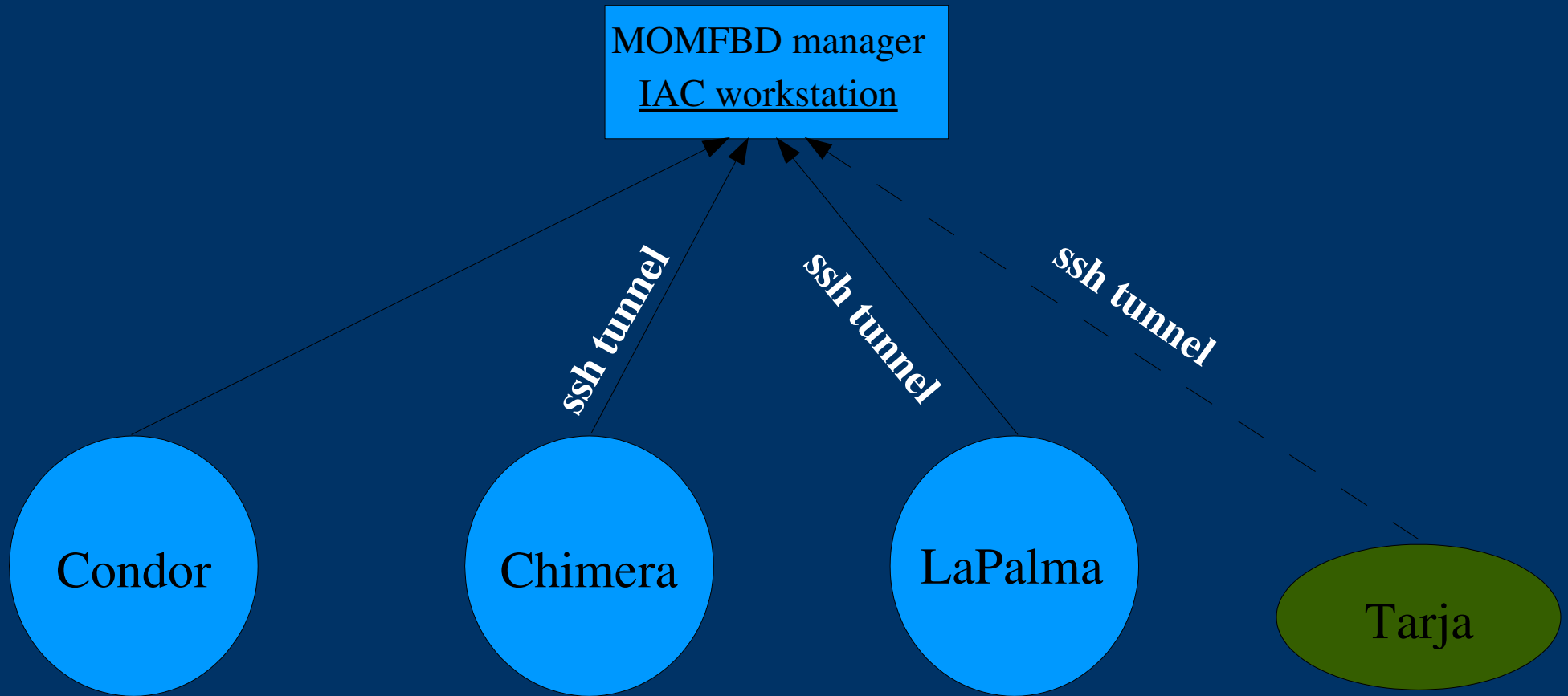
(per year)

- Exclusive for IAC researchers:
 - Condor: 1.331.520
 - LaPalma: 1.121.280
 - Chimera: 560.640
 - **TOTAL:** 3.013.440 (“equivalent” to 344 CPUs)
 - Shared with ULL staff:
 - Tarja: 560.640
 - Tajinaste: 245.280
 - **TOTAL:** 805.920 (92 CPUs)
 - As a comparison:
 - Swinburne Centre for Astrophysics & Supercomputing
(<http://astronomy.swinburne.edu.au/>)
 - 1160 CPUs (145 * 2 quad-core), available for the whole University.
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Supercomputing User Support at the SIE

- We can help you to:
 - identify the right resource/s for your supercomputing needs.
 - get started with the different queuing systems (submission scripts, submission commands, tricks, tips, etc.).
 - modify* your code to run in parallel.
- Example user support:
 - Modify MOMFBD code (<http://dubshen.astro.su.se/wiki/index.php/MOMFBD>) and prepare scripts to run in a *homemade* grid.

Supercomputing User Support at the SIE (2)



Supercomputing future resources...

- GPGPUs
 - *http://www.iac.es/sieinvens/SINFIN/Sie_Courses_PDFs/SIEminarioGPU.pdf*
- BOINC (*to tap onto the 200-300 IAC Windows workstations?*)
 - *<http://boinc.berkeley.edu/>*
- Grid (computing, data grid)
 - Unicore, Globus, VO
- ...

Let us know your needs!
