Summit

UNICORE and the Fastest Supercomputer in Europe

Introduction to BSC

Research

MareNostrum Architecture

UNICORE Access to MareNostrum

Outline

Introduction to BSC

Research

MareNostrum Architecture

UNICORE Access to MareNostrum

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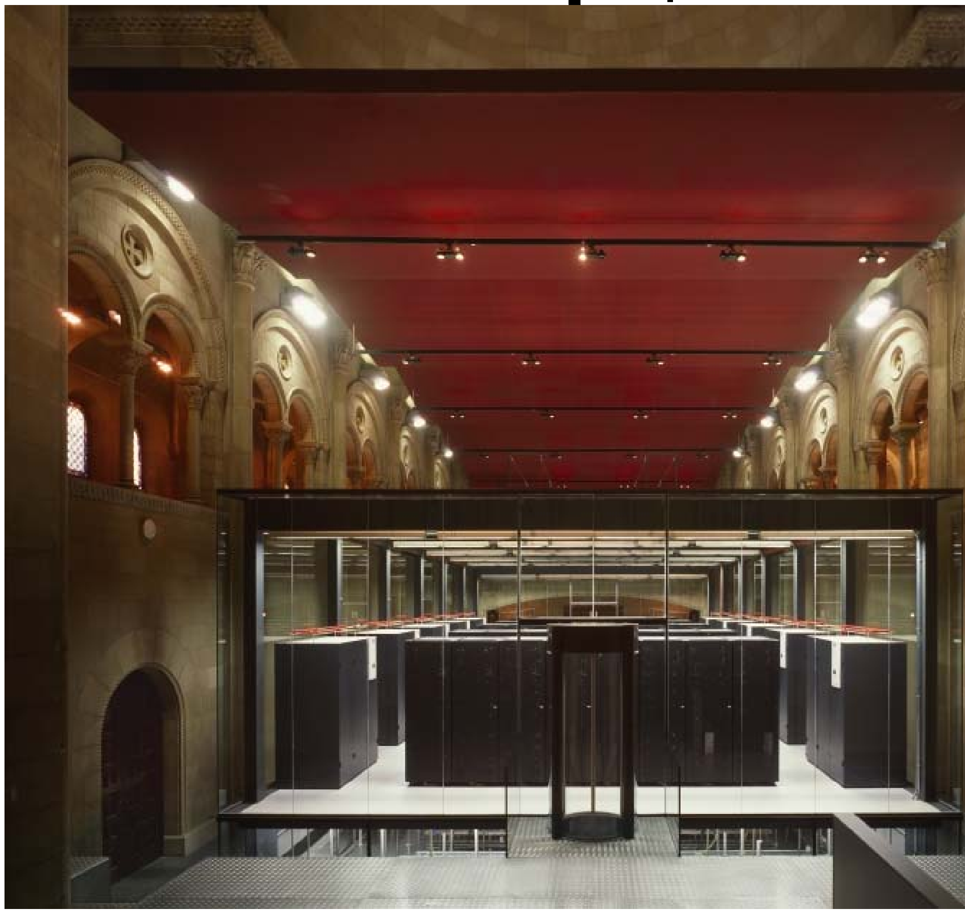

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- Spanish Government (MEC)
- Catalonian Gove

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Investigate, develop and manage technology to facilitate the advancement of Science.

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- Research Supercomp ing and Computer Architectur

- Collabora in R&D e-Science projects wi prestigious scientific teams

- Manage BSC supercomp ers to accelerate relevant

Introduction to BSC

Research

MareNostrum Architecture

UNICORE Access to MareNostrum

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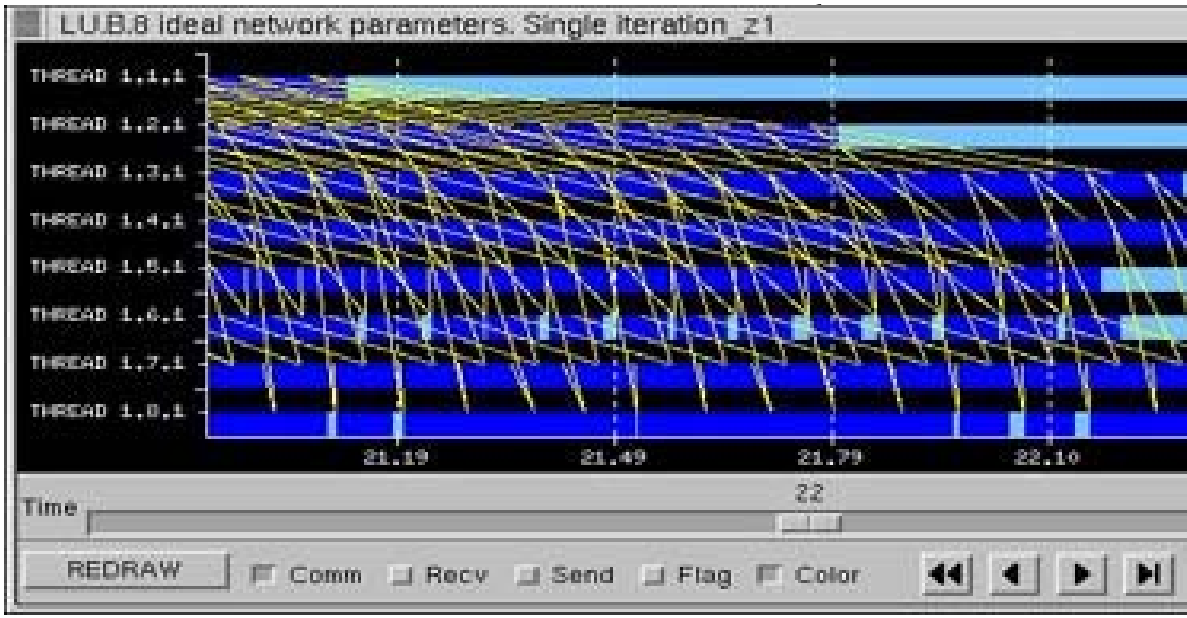

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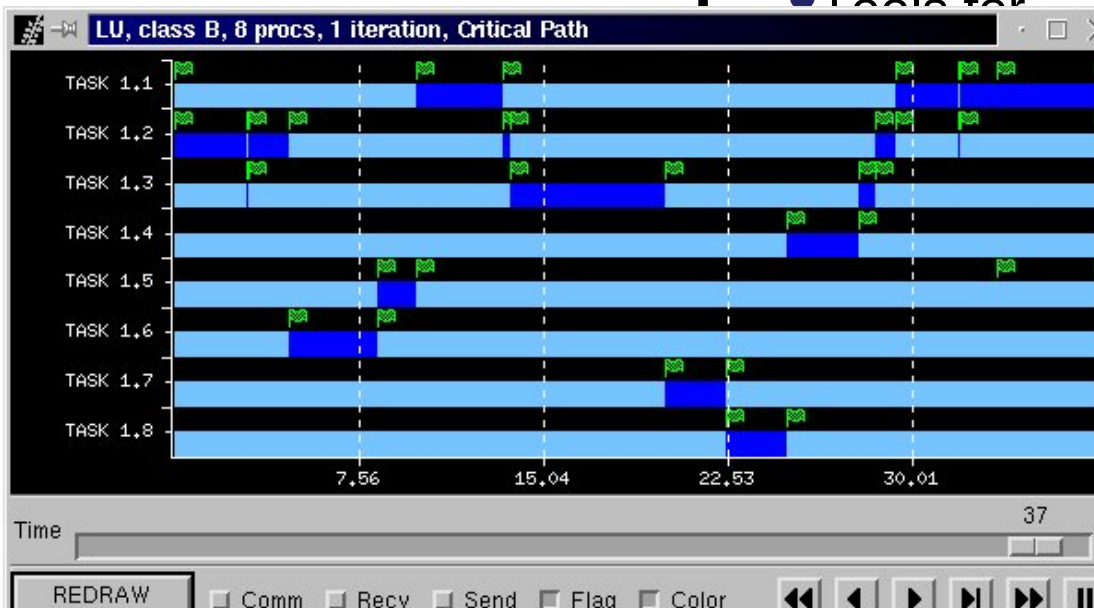
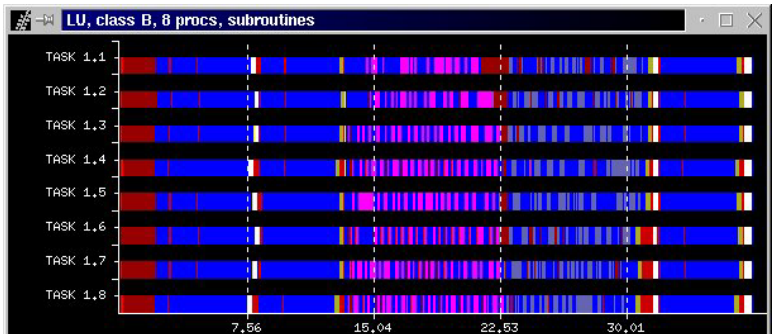
- Tools for





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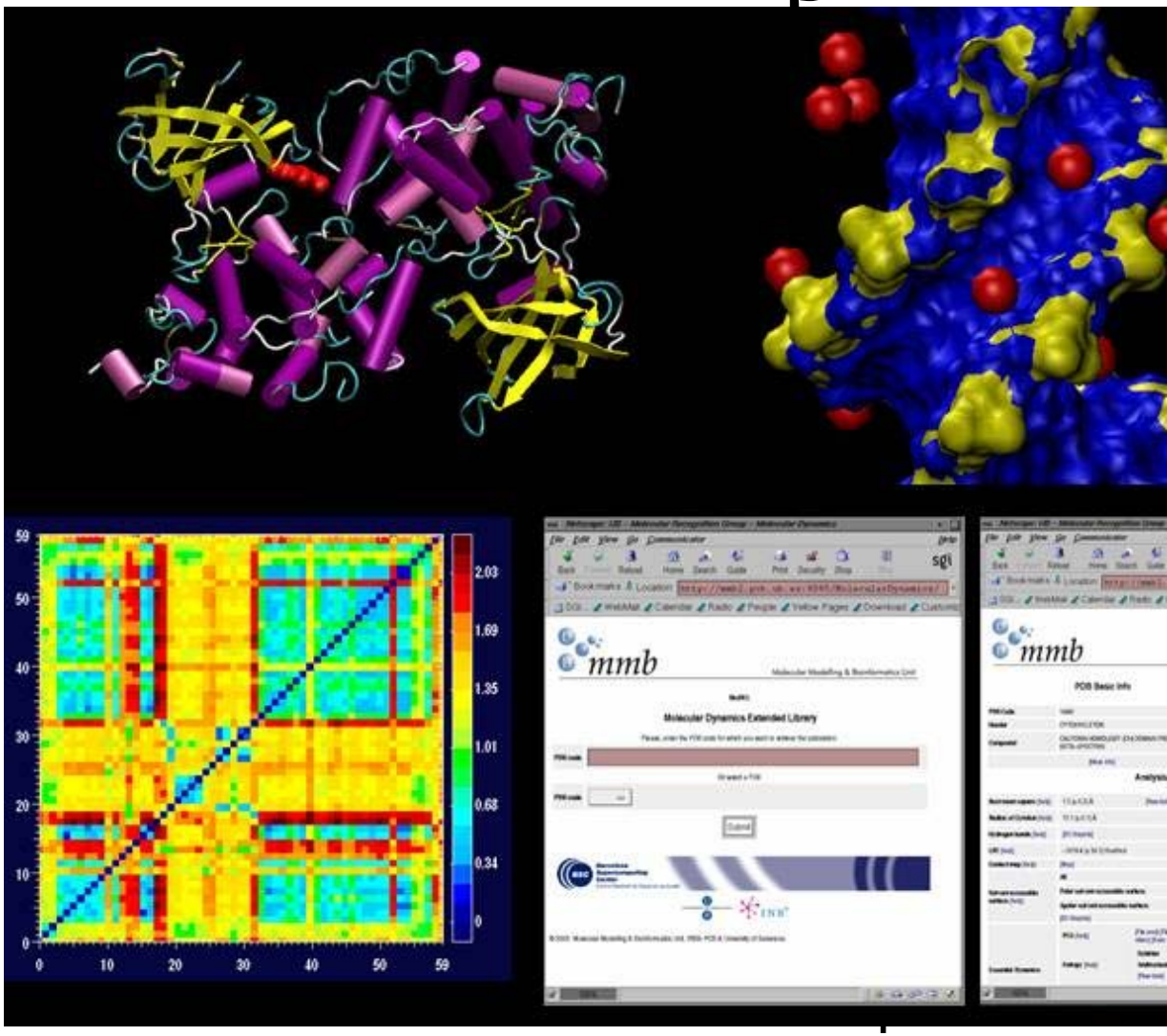
mmb
Molecular Dynamics Extended Library
mmb
PDB Basic Info

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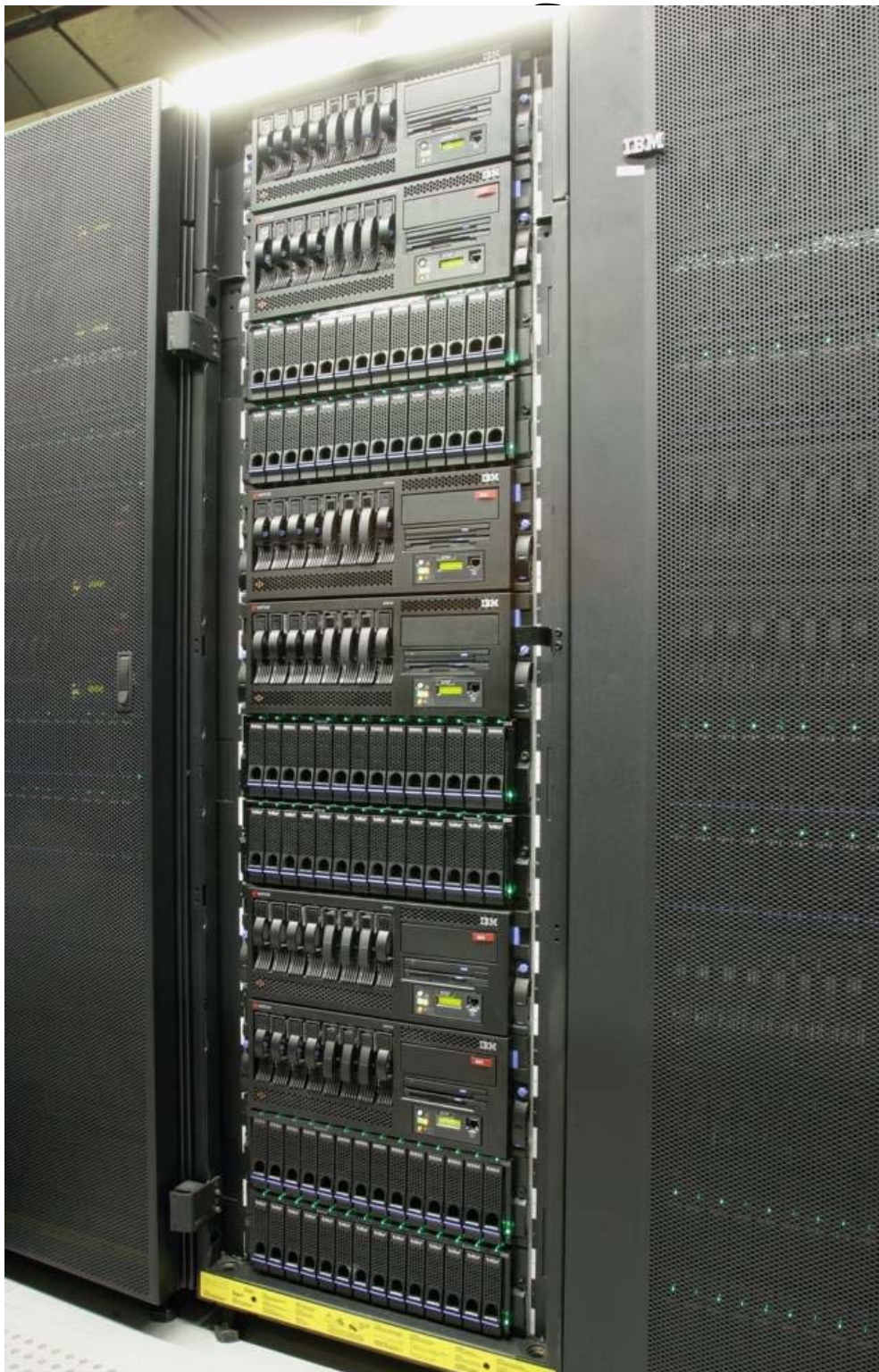
IBM

Introduction to BSC

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MareNostrum Architecture

UNICORE Access to MareNostrum

Structure

- 4.812 IBM PowerPC 970 FX processors (dual

- Myrinet

mpute Racks (RC01-RC27)
BC chassis w/OPM and gigabit ether switch
JS20+ nodes w/myrinet daughter card

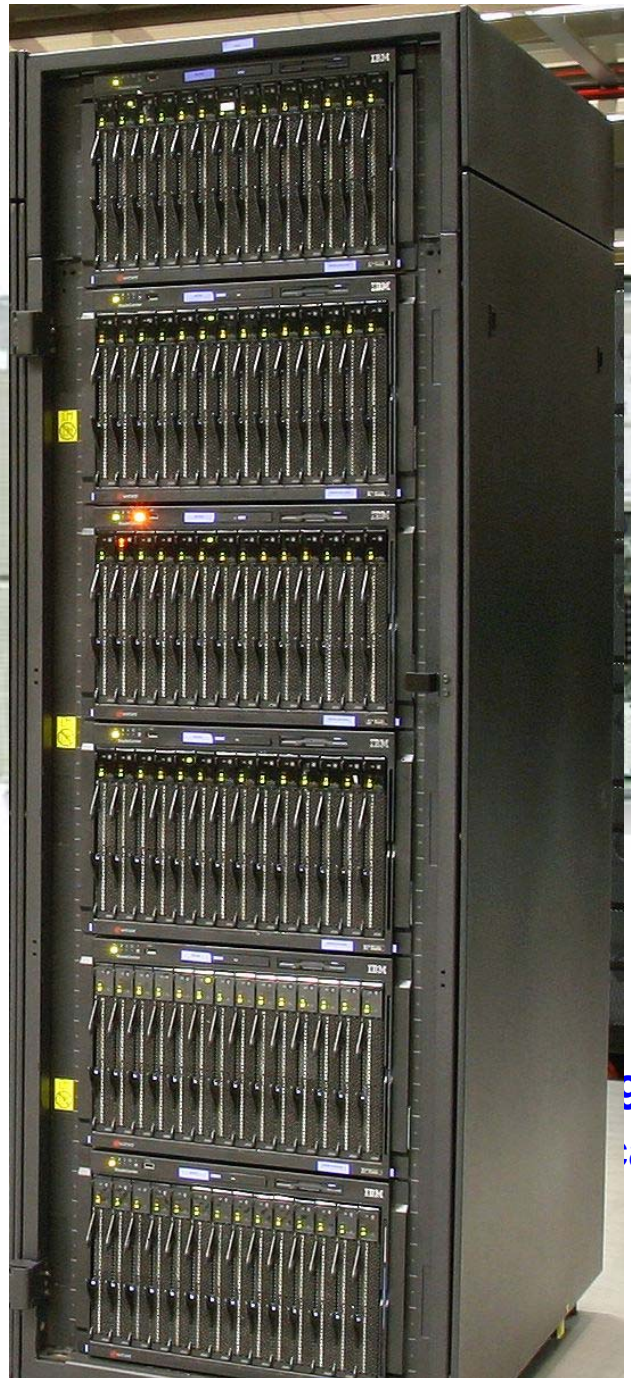
4 Myrinet Racks (RM01-RM04)
• 10 clos 256+256 myrinet switches
• 2 Myrinet spines 1280s

age Server Racks (RS01-RS07)
615 storage servers 6/rack
astT 100 3/rack
XP100 3/rack

1 Operations Rack (R
• 7316-TF3 display
• 2 p615 mgmt nodes
• 2 HMC model 7315-
• 3 Remote Async No
• 3 Cisco 3550
• 1 BC chassis (BCIO

1 Gigabit Network Racks
• 1 Force10 E600 for Gb network
• 4 Cisco 3550 48-port for 10/100 network

system desc



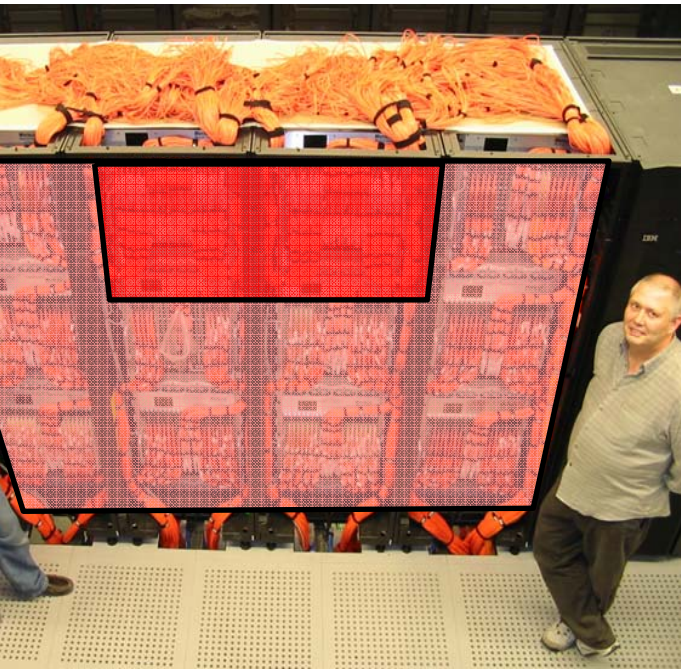
970 SMP
cache)

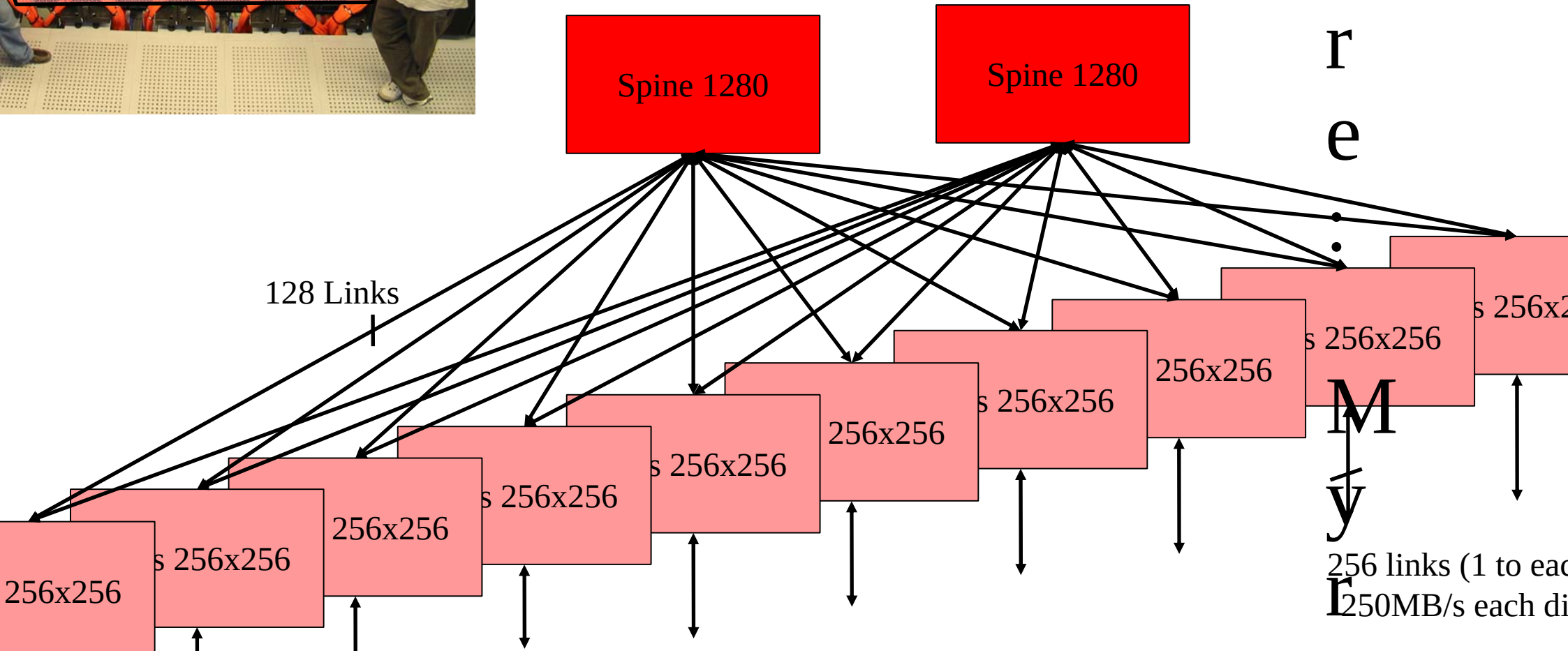
6 chassis in a rack (42U)

Blade Center
- 14 blades per chassis (7U)
  - 28 processors
  - 56GB memory
- Gigabit ethernet switch

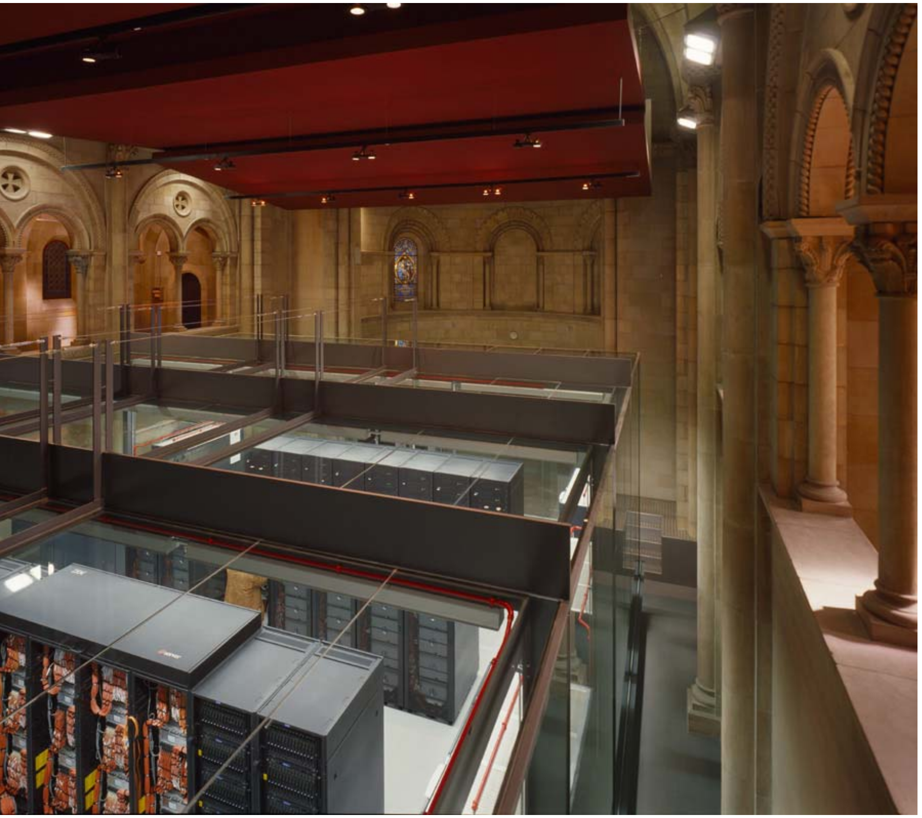
blades, blade

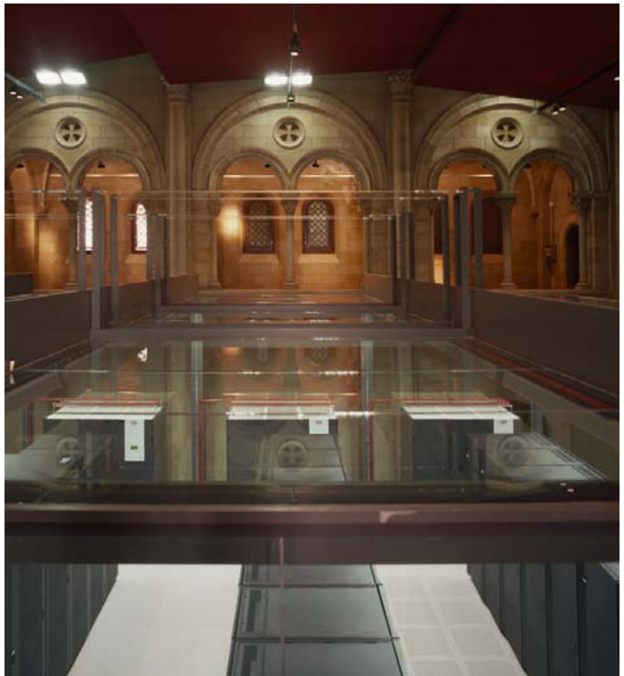
Hardware: My

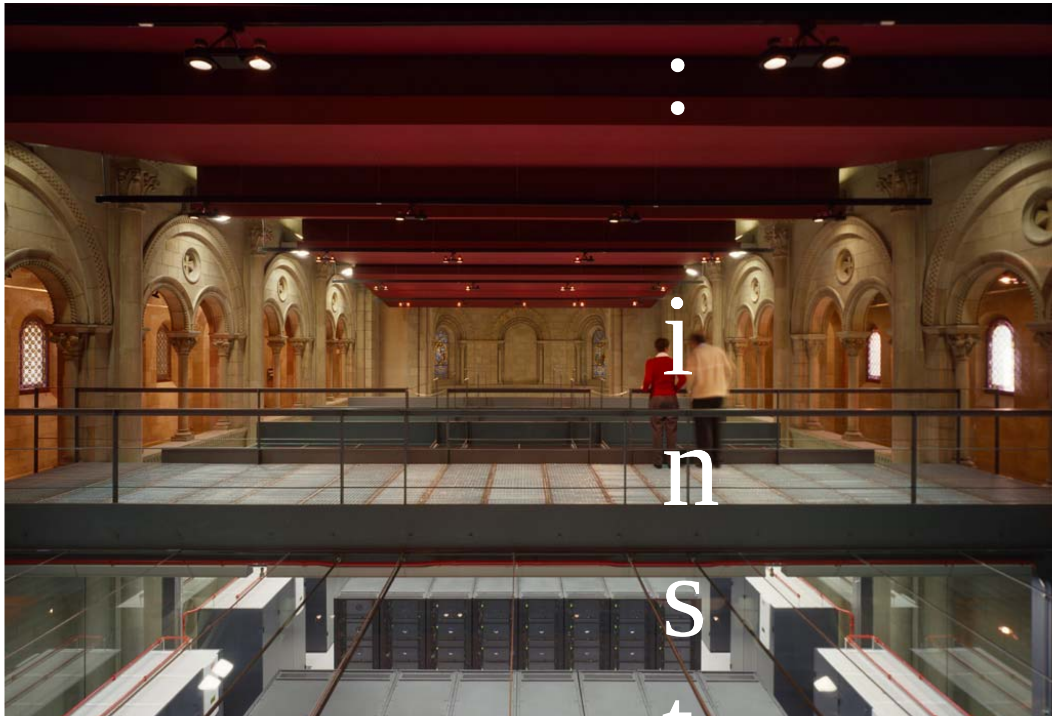




256 links (1 to eac
250MB/s each di







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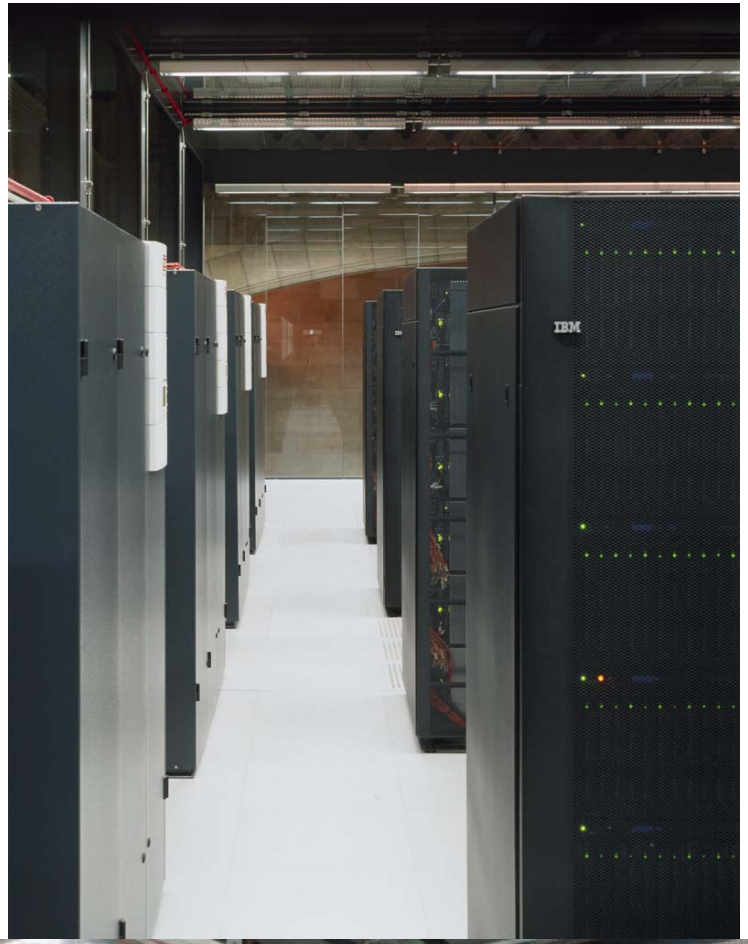
IBM

TOP500® SUPERCOMPUTER SITES

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te ountry / Year	Computer / Processors Manufacturer	Computer Family Model	Inst. type Installation Area	R_{max} R_{peak}	N n
OE/NNSA/LLNL nited States/2005	*BlueGene/L* **eServer Blue Gene Solution** / 65536 IBM	**IBM BlueGene/L** eServer Blue Gene Solution	**Research**	136800 183500	1
BM Thomas J. Watson esearch Center nited States/2005	*BGW* **eServer Blue Gene Solution** / 40960 IBM	**IBM BlueGene/L** eServer Blue Gene Solution	**Research** Information Processing Service	91290 114688	9
ASA/Ames Research enter/NAS nited States/2004	*Columbia* **SGI Altix 1.5 GHz, Voltaire Infiniband** / 10160 SGI	**SGI Altix** SGI Altix 3700	**Research**	51870 60960	1
he Earth Simulator Center apan/2002	**Earth-Simulator** / 5120 NEC	**NEC Vector** SX6	**Research**	35860 40960	1 2
arcelona Supercomputer enter pain/2005	*MareNostrum* **JS20 Cluster, PPC 970, 2.2 GHz, Myrinet** / 4800 IBM	**IBM Cluster** JS20 CLuster	**Academic**	27910 42144	9

Campos Plasencia
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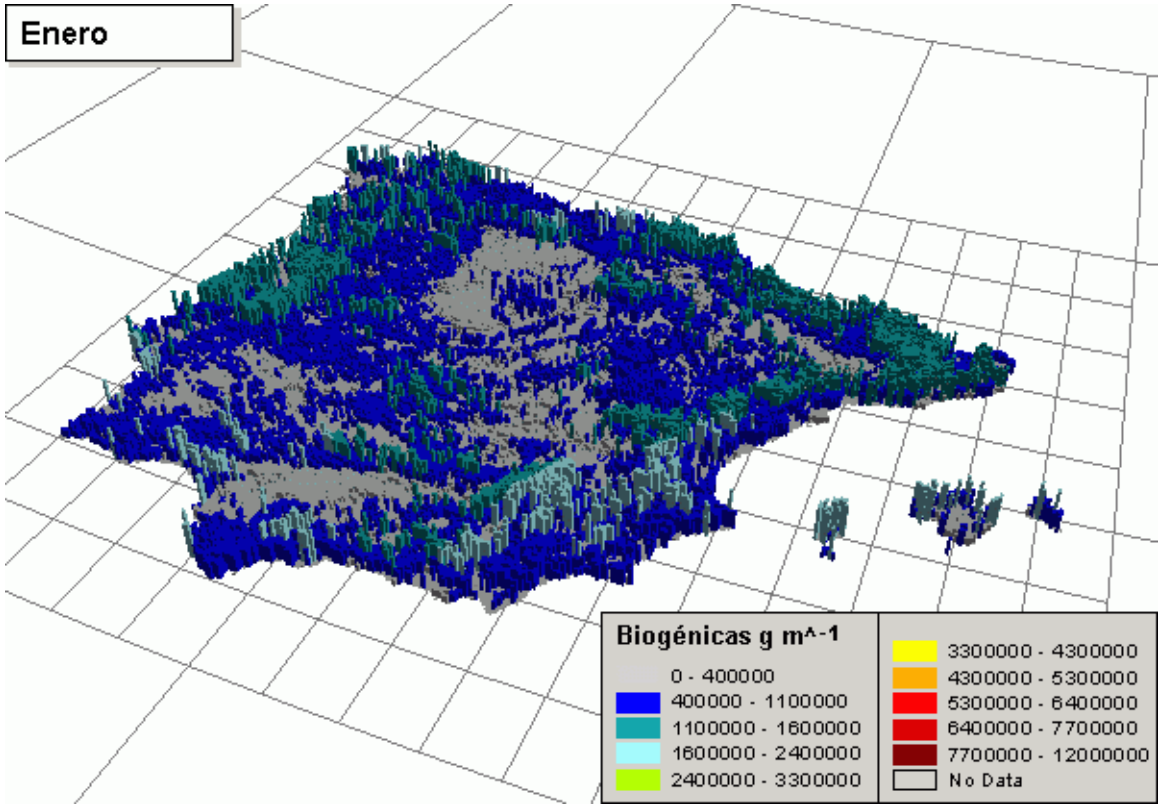
n Group
rch of nuclear fusion materials
w-up of crystal particles

Javier Jiménez Sendín
Technical University of Madrid
• Turbulent channel simulation with Re
numbers of friction of 2000

Orozco
nstitute of Bioinformatics
ar dynamics of all
ative proteins
folding simulation



Markus Uhlmann
CIEMAT
• Direct Numerical S
of Turbulent Flow W
Suspended Solid Pa

osé Caturla
sity of Alicante
of the behavior of materials under
e conditions of pressure and
ature

Gustavo Yepes Alonso
Autonomous University of Madrid
• Hydrodynamic simulations in Cosmology
• Simulation of a universe volume of 500
Mpc (1,500 million light years)

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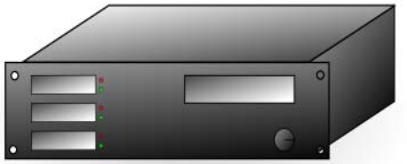
USER

ssh

LOGIN NODES

SUBMIT

BATCH SYSTEM CONTROLLER



JOB

Distributed
European
Infrastructure for
Supercomputing
Applications

BSC is

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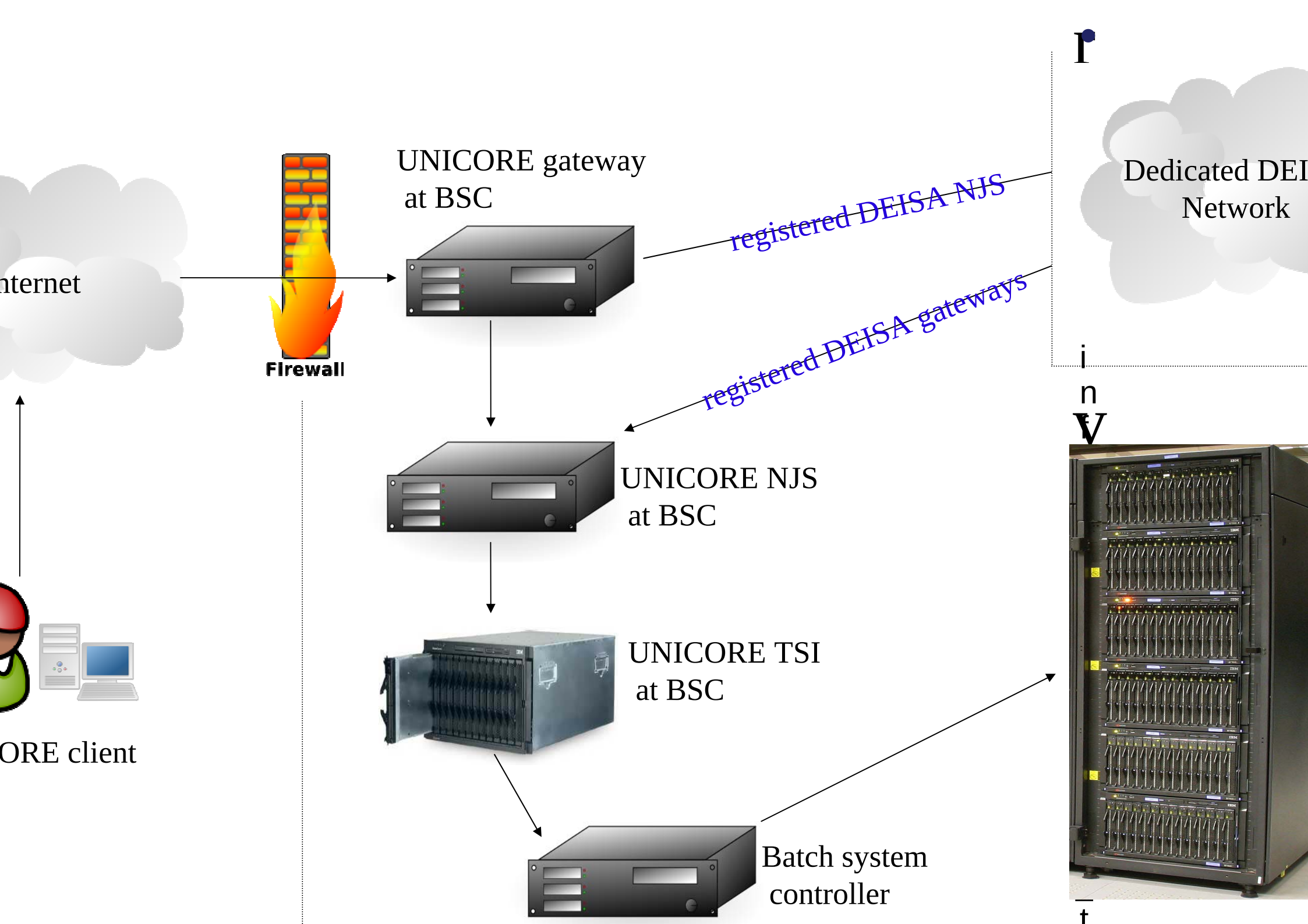
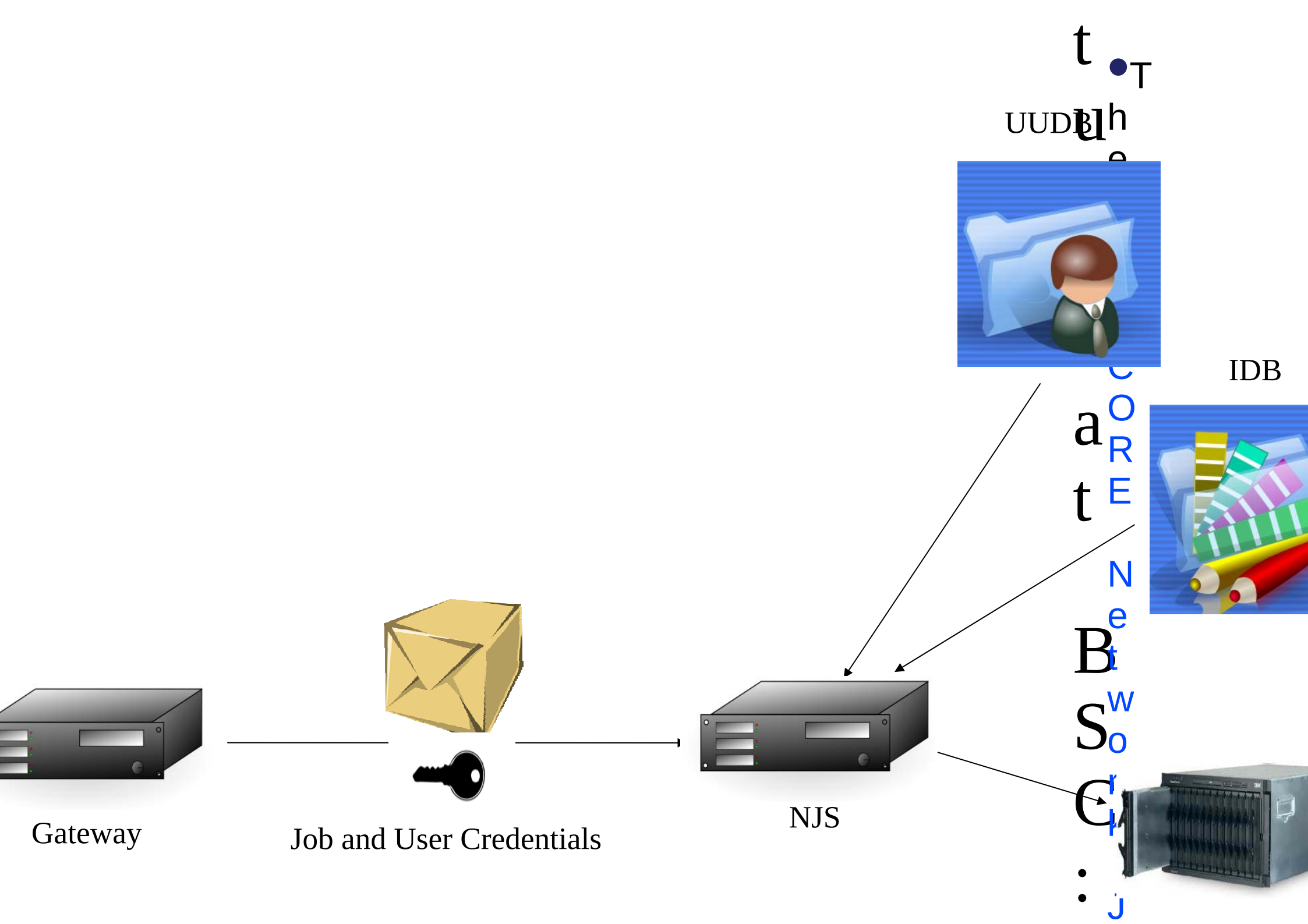
- ssh connections woul


UNICORE gateway
at BSC
Firewall
registered DEISA NJS
registered DEISA gateways
Dedicated DEI
Network
UNICORE NJS
at BSC
UNICORE TSI
at BSC
Batch system
controller

Creating BSC: Gateway

- The UNICORE Gateway


UUDB
IDB
Gateway
Job and User Credentials
NJS

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- The UUDB contains

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- The Targ System Interface (TSI) is located in the MareNostr m 'login nodes'.

- Same environment than locally submitted jo

- The TSI translates an Abstrac Job Objec

BSC: current

- A new TSI is beir developed
- Targets the SLURM batc system
- It will be needed wher SLURM replaces LoadLeveler as a production batch system at BSC
- The job script from

ure at BSC:

- The IDB does not allow an accurate description of MareNostrum resources:
- No support for classes
- No arbitrary constraints
- CPU limits (Unicore) vs. 'wall clock' limits (BSC)

at BSC:

- The MareNostrum supercomputer will be used by local and remote users
- UNICORE provides a mechanism to access
- Common to several sites
- Batch syste

nk you !