

Nordic High Performance Computing for Scientific Research.

A Joint Collaboration

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RHÍ / UoI



Nordic HPC
Joint Nordic Supercomputer in Iceland





REIKNISTOFNUN
HÁSKÓLA ÍSLANDS

- Computing Services (RHÍ)
- To provide best IT services to the University of Iceland
- Played a key role in establishing first GRID collaboration with Nordugrid
- Played an integral role in NHPC entire Project

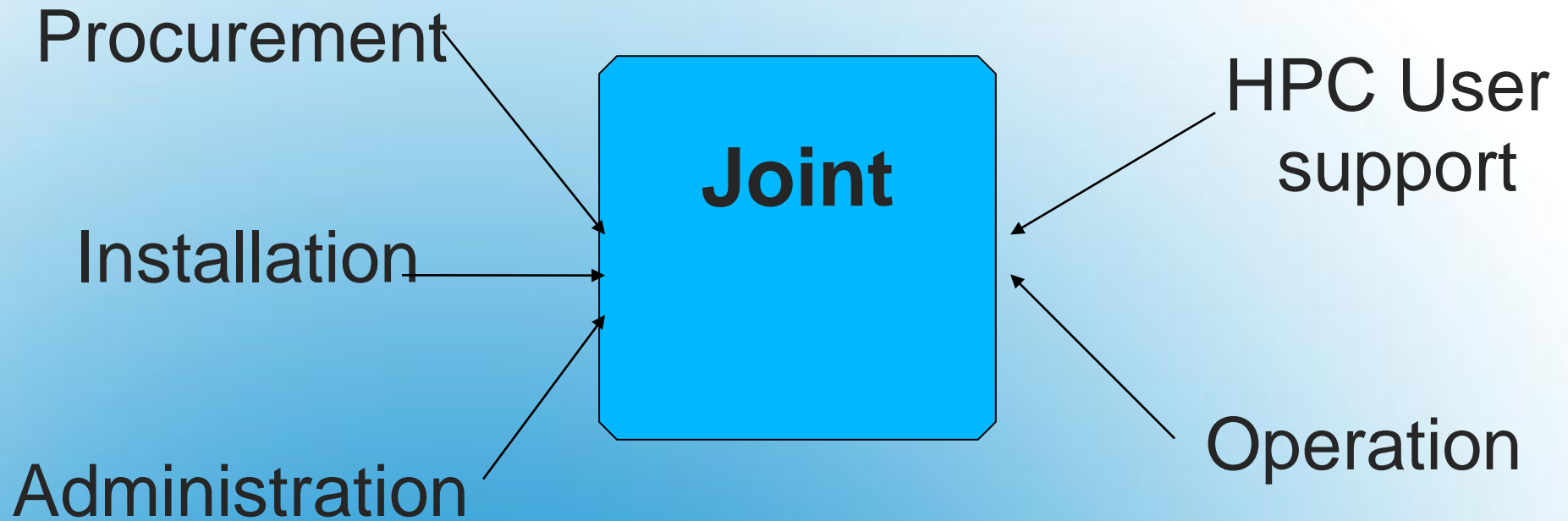
Reiknistofnun (RHÍ)

- How to Share Computational Resources across the country
- Promoting Cross-border Co-operation in Computational Science.
- overcome the differences in the procedure in procurement in the national e-infrastructure.
- Using environmental aspect eg. Renewable energy

Idea

- To provide powerful HPC to users in the scientific community in most efficient way

Objective



Milestone



Idea became Intl Project



NHPC Signing Ceremony

- Three year pilot project of one million euro proof-of-concepts.
- Collaboration between Norway, Sweden, Denmark and Iceland
- Joint procurement, installation and configurations
- Provide cost effective solution

About NHPC

- A joint procurement group created.
- One from each country
- Team carried out procurement, evaluation and selection of NHPC hardware acquisition
- Opin Kerfi / HP Selected



Procurement

- NHPC System hosted at ThorDC
- System administration group created (SAG)
- One sysadmin per country
- Provide National and local user support
- Icelandic Leadership



Operation

Model	HP BL280cG6 Servers
CPU	Intel Xeon E5649 (2.53GHz) - Westmere -EP
Memory	24GB / Node
Disk	250GB / Node
Total Number of Nodes	288
Total Number of CPU / Node	2
Number of Cores / CPU	6
Total Number of Cores in all Nodes	3456
Total Number of teraflops in all Compute Nodes	35TFlops
Storage System	X9320 Network Storage System with IBRIX Fusion Software
Total storage Capacity	71.6TByte
Interconnect	Infiniband QDR



Hardware Details

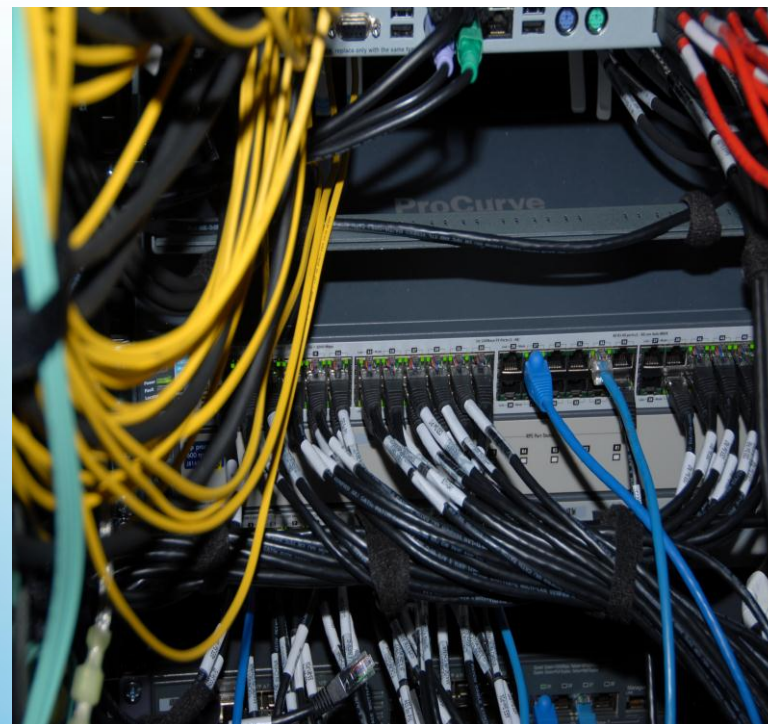
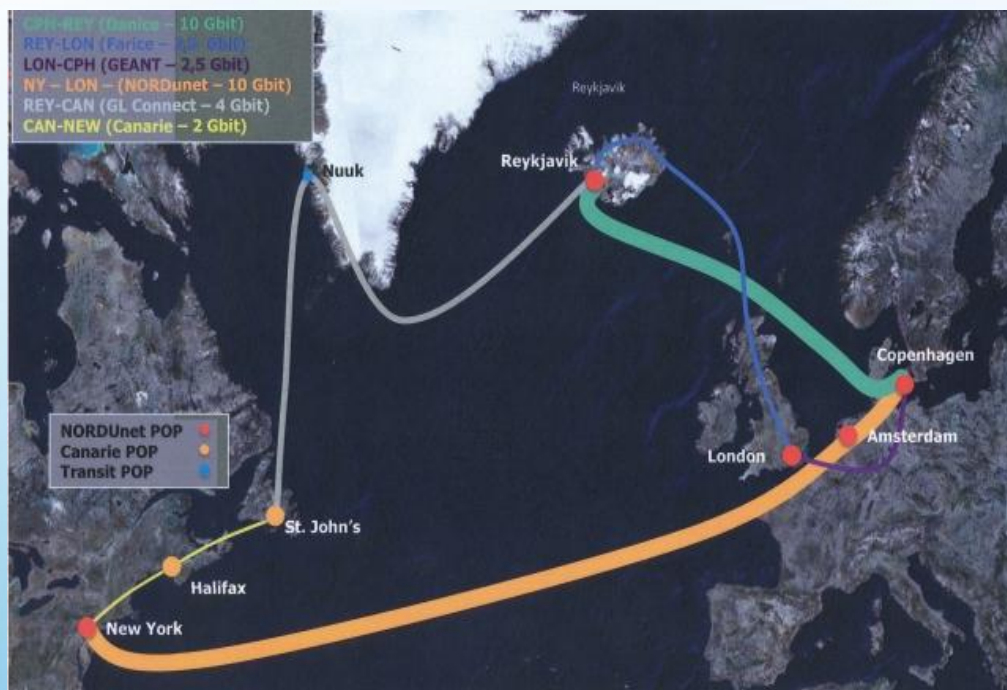
- Cluster name is “**GARDAR**”
- 3 Front nodes
- 288 nodes
- CentOS Linux is used
- With Gigabit network, Infiniband
- Based in Rocks
- 70TB Storage (IBRIX)



NHPC / Cluster

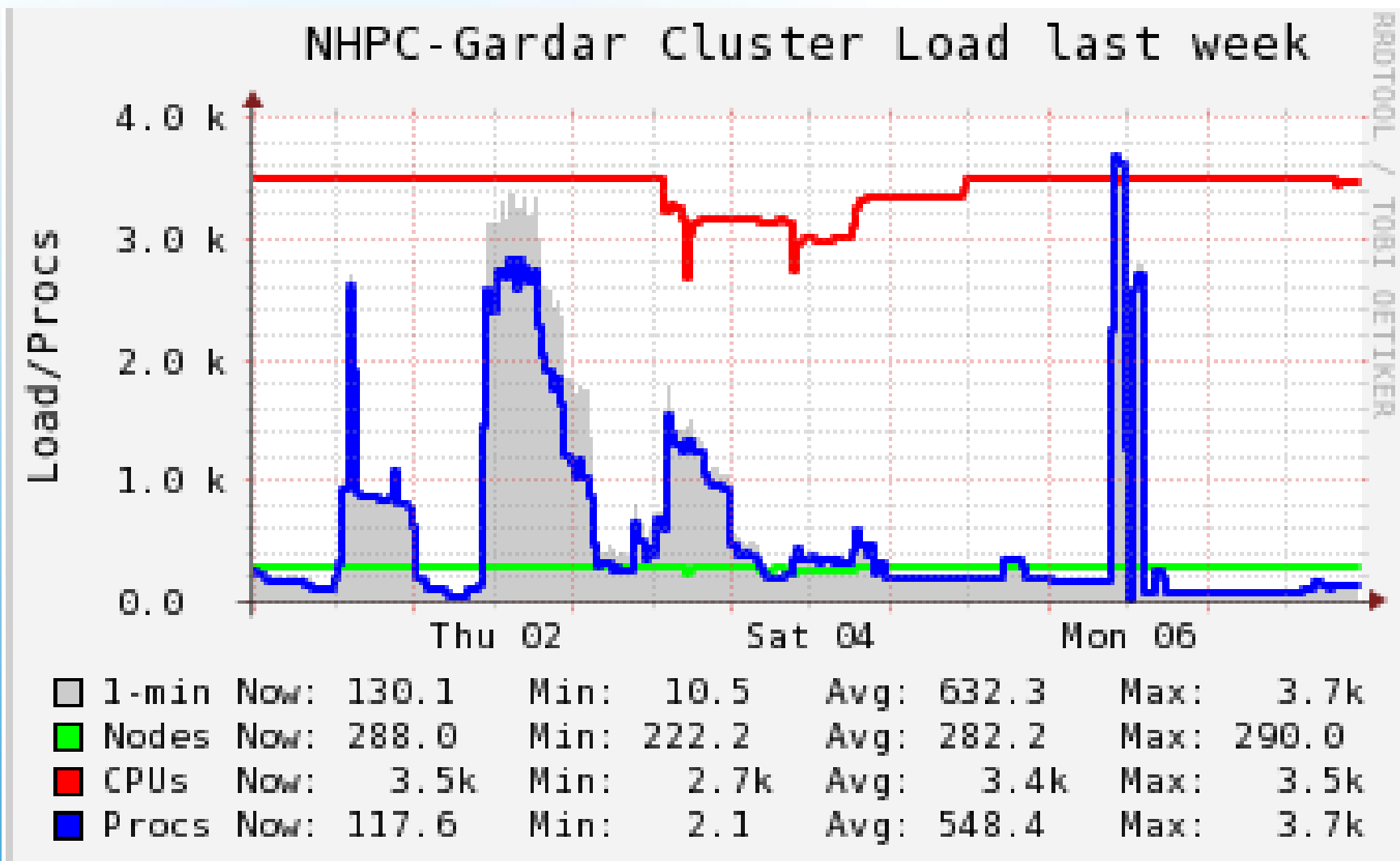


NHPC / Cluster

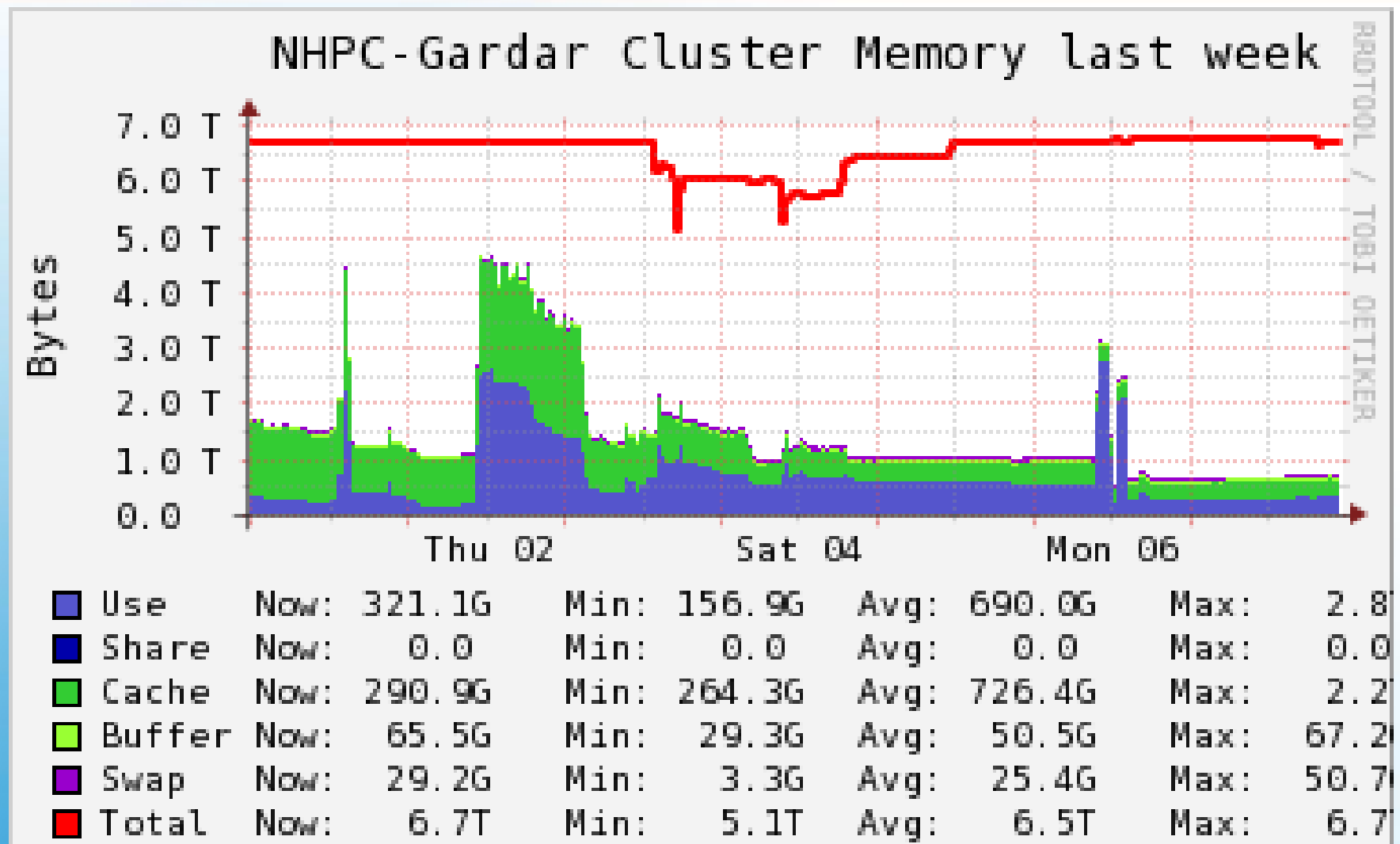


- 2x10 Gbit/s connection to Rhnet
- Two Front nodes with 10 Gbit/s connection with NRENs

NHPC / Networking

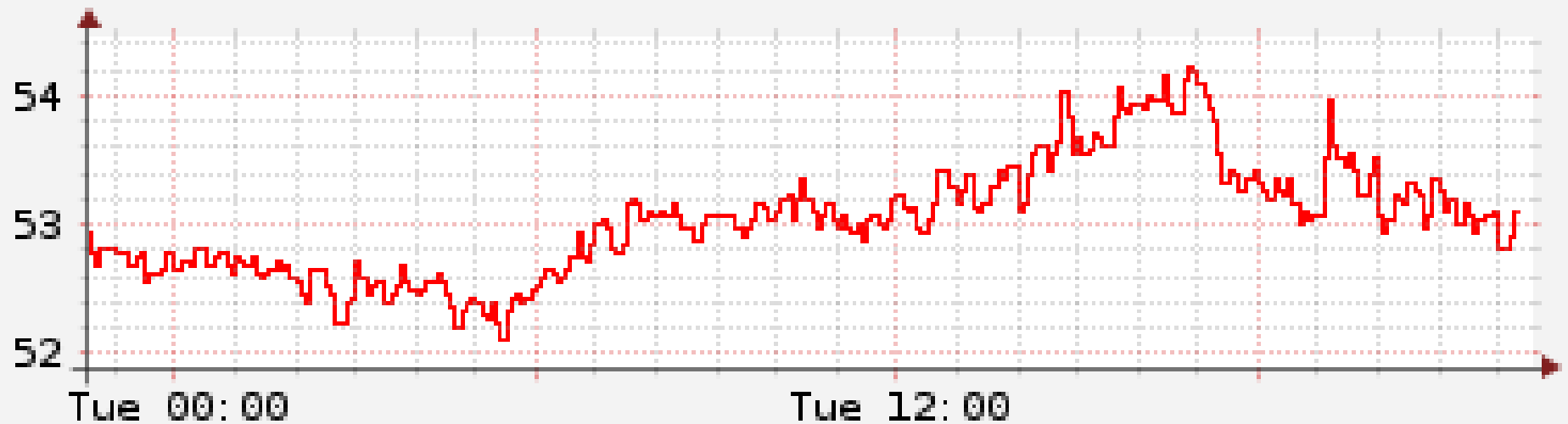


NHPC Usages snapshot



NHPC usages snapshot

NHPC Total Power Consumption (kW)



NHPC Power Consumption

High Performance Computing makes possible for
advanced scientific calculation, simulation and
modeling

Some examples:

- Quantum chemistry (eg, dalton)
- Weather forecasting
- Chemical Simulations (Gromacs)
- Bio-chemistry, etc

Areas

- Each country share the computing power according to their investment
- Opportunity to Icelandic research community
- Research and scientific community can apply the CPU hours via (nhpc@hi.is) for smaller jobs.
- For larger jobs via the University of Iceland (Vísindasvið), every 6 months – next July 1st

CPU Hours Allocation

- Hope to see a scalable project with more hardware, more countries and for an extended period
- NHPC can be a platform for further collaboration in super-computing, eg, exchange of resources.

Future Prospects

In the Press

[Stöð 2 and Vísir](#)

[Computer World](#)

[Ingeniøring/forskning](#)

[RUV](#)

[Morgunblaðið](#)

Research Government Agencies

[Vetenskapsradet – Sweden](#)

[Nordforsk](#)

[Nordisk globaliseringsarrangement](#)

Websites

[The NHPC Project](#)

[Ministry of Education](#)

[University of Iceland](#)

[THORDC](#)

[SNIC](#)

[UNINETT](#)

Magazine

[A Nordic Supercomputer in Iceland](#)

Presentations

[Nordunet Conference 2011](#)

NHPC in Media

Please explore

<http://nhpc.hi.is>

Thank you



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