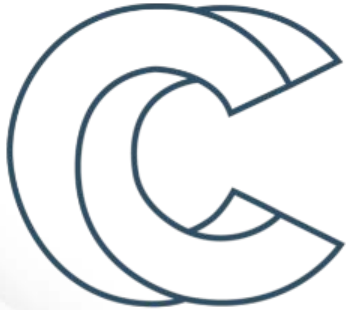

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How to access the Greek HPC Infrastructure ARIS

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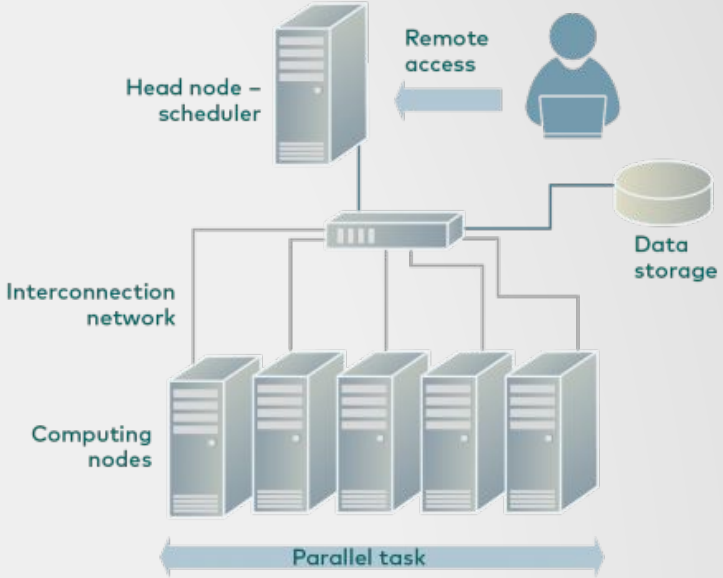
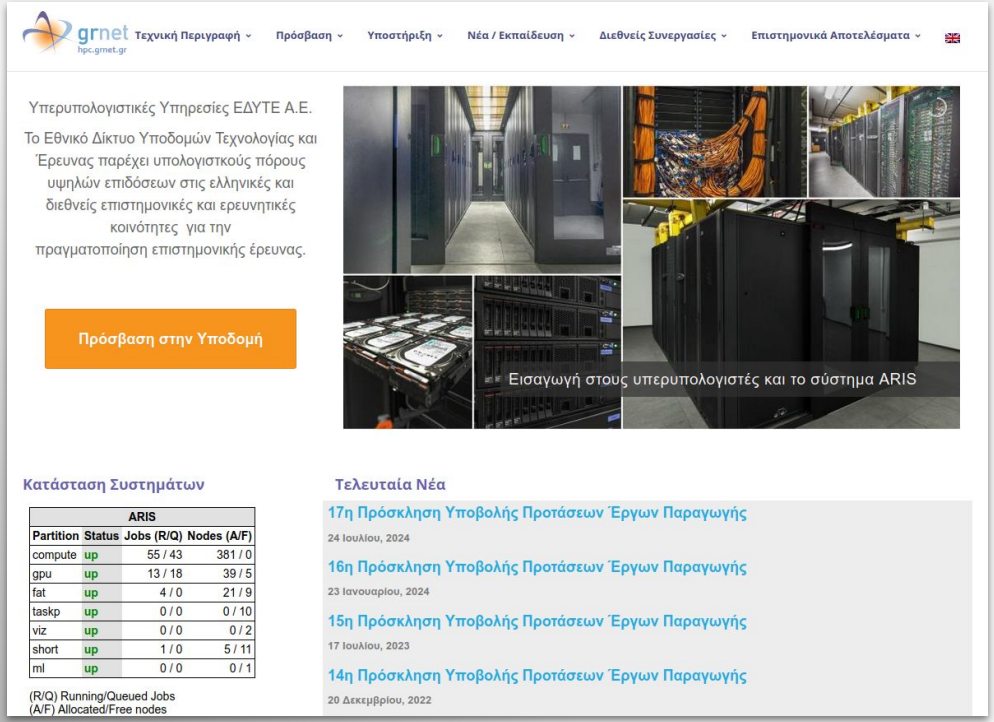
What is HPC?

- High-Performance Computing (HPC) is the ability to perform sophisticated calculations at high speeds.
- An HPC cluster consists of hundreds or thousands of compute servers, so-called nodes. The nodes in each cluster work in parallel with each other.
- HPC solves large problems in science, engineering, or business, that are too complex for a PC. On typical PC it might take e.g. hours, days, weeks to perform the computations, but if you use an HPC Cluster, it might only take minutes, hours, days, respectively.



GRNET HPC – ARIS



https://www.hpc.grnet.gr

GRNET HPC – ARIS: Access

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Who Can Access the System?

- Scientists and researchers affiliated with Greek academic and research institutions
- The system is free to use

How to Gain Access?

- Researchers submit project proposals to gain access
- Proposals can be submitted as:
  - **Preparatory/Development** projects, through an ongoing open call
  - **Production** projects during periodic calls

GRNET HPC – ARIS: Access

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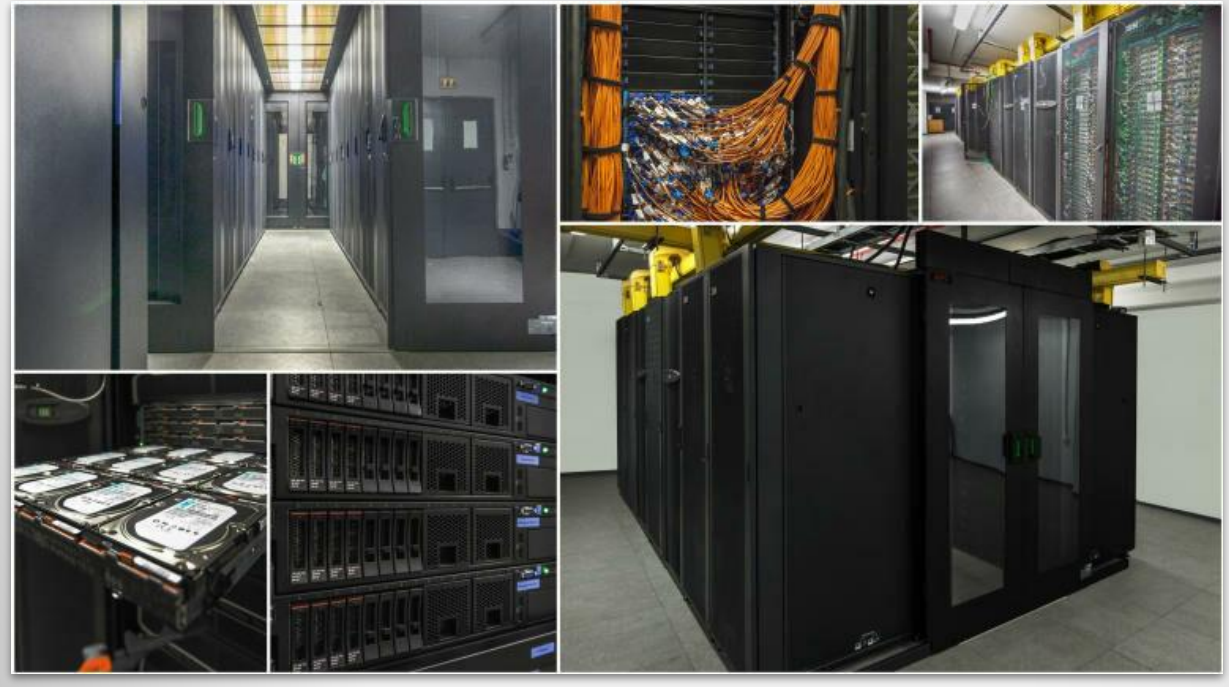
What is required?

- A clear description of the intended application
- Justification for the need for an HPC system
- Specific computational resource requirements (e.g., number of processors, memory size)
- Expected scientific benefits

Which Applications are to be used?

- Scientific applications using parallel processing methodologies such as:
  - Distributed memory on multiple nodes (MPI)
  - Shared memory on single nodes (OpenMP)
  - CUDA (for GPU acceleration)
- Applications simulate physical phenomena requiring extensive mathematical computations
- Machine Learning (ML) and neural network training benefiting from GPU acceleration

GRNET HPC – ARIS: Infrastructure



GRNET HPC – ARIS: Infrastructure

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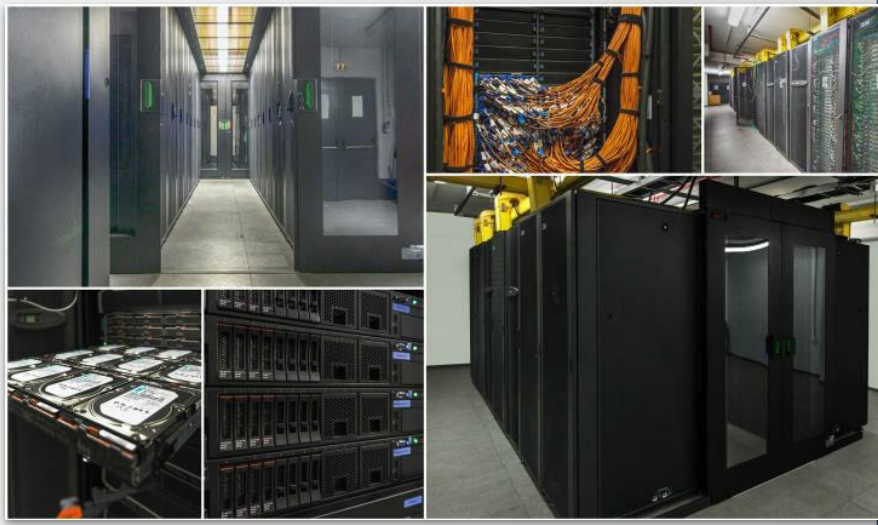
- 533 compute nodes organized in

  5 partitions/islands (node groups)
- Resource Manager: Slurm v. 16.05.11
- Operating System: Red Hat Enterprise Linux 6 & 7
- File System: 2PB IBM GPFS
- Interconnection network: Infiniband 56 Gbps
- Processing capability: 535 TFlops
- No. 468 in the Top 500 list of June of 2015



GRNET HPC – ARIS: Infrastructure

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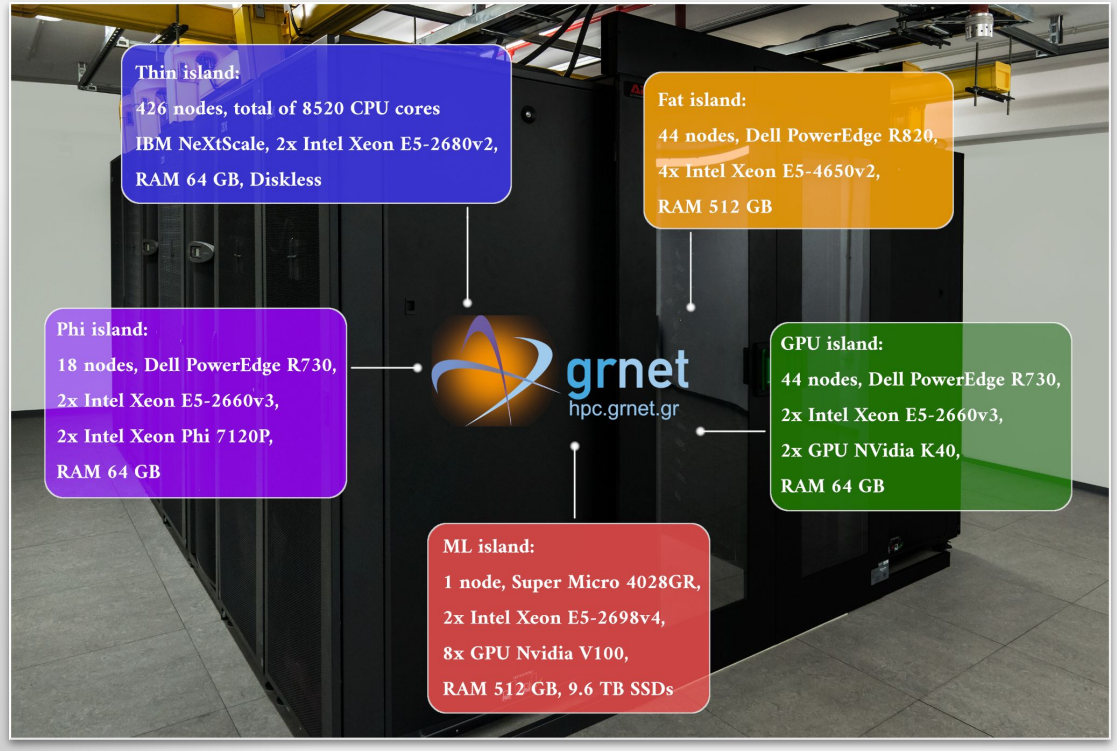

Preparatory/Development Projects

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- The call for preparatory/development projects is open continuously
- Evaluation results are provided within 10 business days of submission
- Selected projects start within 1 month after evaluation

- Provide access to ARIS for researchers in Greek institutions to:
  - Preparatory - Type A: Perform scalability tests
  - Development - Type B: Support code migration and optimization

- Duration: Up to 2 months for Type A, and 4 months for Type B

Preparatory/Development Projects

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- The maximum number of core hours provided in detail:
  a. **100,000 core hours** on the **Thin Node Island**
  b. **50,000 core hours** on the **GPU Island**
  c. **50,000 core hours** on the **Xeon Phi Island**
  d. **100,000 core hours** on the **Fat Node Island**

- The total requested core hours **must not exceed 100,000 core hours**

- Users should fill the submission form
- View form in PDF: **preparatory.pdf**
- Report after 2 months and within 30 days after project completion

Production Projects

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- The call for production projects is periodically (2 times per year)
- Allocate up to 5 million core hours per project (total max 41 million core hours)
- The application must be completed in English
- PI must be affiliated with a Greek academic/research institution
- International collaborators allowed, but cannot be PIs
- Commitment to utilizing allocated resources and acknowledging ARIS in publications
- GRNET reserves the right to publish project summaries and performance results
- Access to the System ends 12 months after the acceptance/allocation date
- Final report for approved projects: 2 months after access ends

Production Projects

- **Selection Criteria**
  1. **Scientific Excellence (K1)**: Impact, novelty, and adherence to international standards
  2. **Need for Use (K2)**: Justification for using ARIS HPC resources
  3. **Adequacy (K3)**: Experience and expertise of PI and team
  4. **Applicability (K4)**: Compatibility with ARIS system and resource availability

- **Total: 41 million core hours** allocated as follows:
  - Thin nodes: 30 million core hours
  - Fat nodes: 7 million core hours
  - GPU nodes: 3 million core hours
  - Intel Xeon Phi nodes: 1 million core hours
  - Machine learning: 30,000 GPU-card hours

Useful Links

- The system's technical specifications are available in the Technical Description
- The access and usage policies are outlined in the ARIS Access Policy
- ARIS Terms of Use (Acceptable Usage Policy)
- User should accept the Privacy Policy
- For detailed information and announcements, register for the HPC Announcement List
- ARIS Documentation

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Thanks!

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