HIGH-END COMPUTING CAPABILITY

Computing power to answer NASA's complex science and engineering questions

KNOWLEDGEBASE

HECC KNOWLEDGE BASE
https://www.nas.nasa.gov/hecc/support/kb/

Knowledgebase

- New User Orientation
- Logging In
- Filesystems & Software
- Porting/Building Code
- Transferring Files & Data
- Running Jobs with PBS
- Post-Processing Data
- Storing Files & Data
- Optimizing/Troubleshooting
- Systems Reference
- Allocations & Job Accounting
- Security and Policies
- FAQs
- Cloud Computing
- Machine Learning
- NAS Data Portal

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Featured Art

Migration

Update: The ... nux Enterprise Server (SLES) to the Red Hat Enterprise Linux-based Tri-Lab Operating System Stack (TOSS) Version 3, developed at the U.S. Department of...

31 Jan, 2022 Views: 2710

Pleiades Lustre Filesystems

UPDATE: We recently installed three new filesystems, /nobackupp17, 18, and 19, which are described in this article. Please note that these filesystems use Progressive File Layout (PFL) to dynamically stripe files to make effective use of solid state...

01 Nov, 2021 Views: 28980

Preparing to Run on Aitken Rome Nodes

To help you prepare for running jobs on Aitken's Rome nodes, this short user guide includes information on the general configuration of Rome nodes, compiling your code, and running PBS jobs. Overview of Aitken Rome Nodes Aitken includes 1,536...

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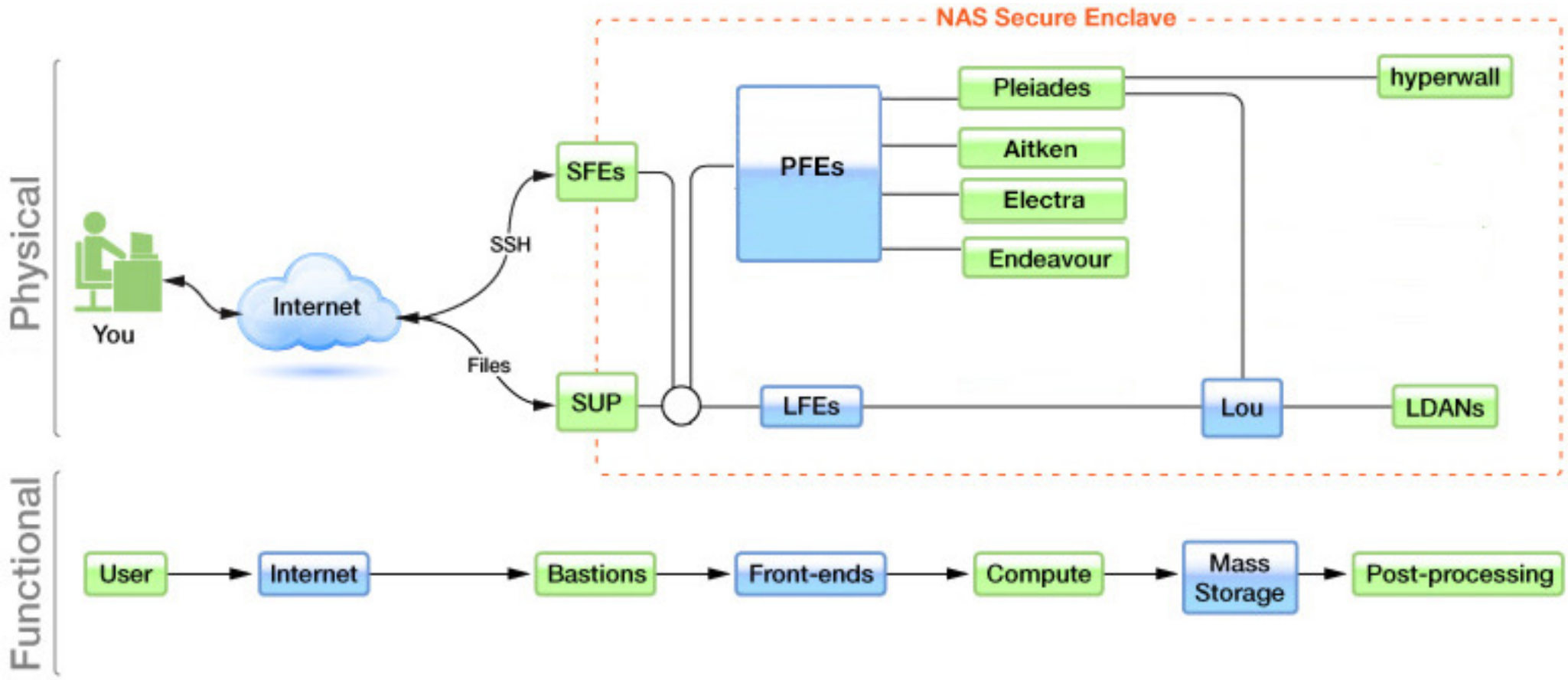
Authenticating to NASA's Access Launchpad

In order to perform some basic tasks that use NAS web applications, such as changing your NAS password or logging into the myNAS portal, you must authenticate to NASA's Access Launchpad using your NASA Smartcard or RSA SecurID token. Using Your...

26 Mar, 2020 Views: 1698

System Overview



overview of basic tasks

Logging in

- Setting Up Public Key & SSH Passthrough
- Control master – multiplexing allows for multiple shells with one authentication (especially useful for multiple scps)
- VNC for running remote applications
- VirtualGL for high performance graphics
- Running IndeX on gpus viewed through a browser

Storage

- /nobackup* lustre filesystem (not backed up!)
  - nbquota -u vpascucc
    Disk quotas for usr vpascucc (uid 86349921):
    Filesystem used quota limit grace files quota limit grace
    /nobackupp12 8k 50T 60T - 2 5000000 6000000
- /home - backed up daily. Smaller quota
  - quota -u vpascucc
- /tmp - memory-based temporary local filesystem (RAM disk)
- Need faster filesystems? BeeGFS on /nobackupp3
- data transfer – (local) cp, cxfscp, mcp, shiftc, rsync/(remote) scp, bbftp/bbscp, shiftc

Pleiades

	Broadwell Nodes	Haswell Nodes	Ivy Bridge Nodes	Sandy Bridge Nodes
Number of Nodes	2,016	2,052	5,256	1,800
Processors per Node	2 fourteen-core processors per node	2 twelve-core processors per node	2 ten-core processors per node	2 eight-core processors per node
Node Types	Intel Xeon E5-2680v4 processors	Intel Xeon E5-2680v3 processors	Intel Xeon E5-2680v2 processors	Intel Xeon E5-2670 processors
Processor Speed	2.4 GHz	2.5 GHz	2.8 GHz	2.6 GHz
Cache	35 MB for 14 cores	30 MB for 12 cores	25 MB for 10 cores	20 MB for 8 cores
Memory Type	DDR4 FB-DIMMs	DDR4 FB-DIMMs	DDR3 FB-DIMMs	DDR3 FB-DIMMs
Memory Size	4.6 GB per core, 128 GB per node	5.3 GB per core, 128 GB per node	3.2 GB per core, 64 GB per node (plus 3 bigmem nodes with 128 GB per node)	2 GB per core, 32 GB per node
Host Channel Adapter	InfiniBand FDR host channel adapter and switches	InfiniBand FDR host channel adapter and switches	InfiniBand FDR host channel adapter and switches	InfiniBand FDR host channel adapter and switches

Running Jobs

- Pfes ok for light compute; use nodes for heavy compute
- Portable Batch System (PBS)
- Interactive jobs – for development and interactive work
  - `qsub -I -l select=1:ncpus=20:model=ivy,walltime=2:00:00`
- devel queue – faster queue, 2hr max walltime, node limits
  - `qsub -q devel -l select=5:ncpus=24:model=has`
- Gnu parallel for distributing small jobs across nodes
  - experiment with disk limits (‘ltop’)
- GPU nodes
  - `qsub -I -l select=4:model=sky_gpu:mpiprocs=1:ncpus=36:ngpus=4:mem=300g`

Software

- ‘module avail’
  - Selects different compilers/versions, loads packages
  - Usually need to load at min a modern compiler version any python packages
  - Could be a way to launch vis apps…
- virtualenv for python development
- Jupyter notebooks on a compute node

Development

- Porting/building code
  - Optimizing/troubleshoots: Debugging, Performance analysis, Process/thread pinning

DYAMOND data

- /nobackupp17/dmenemen/DYAMOND/c1440_llc2160/
- Atmosphere
  - /nobackupp17/dmenemen/DYAMOND/c1440_llc2160/holding/
  - nc4 F32
- Ocean
  - /nobackupp17/dmenemen/DYAMOND/c1440_llc2160/mit_output/
  - binary F32 big endian
- We'll work with you on projections/stitching!
- vis: https://data.nas.nasa.gov/viz/vizdata/DYAMOND_c1440_llc2160/GEOS/index.html

ISSUES?

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