

The UFS HPC



T: +27 51 401 9111 | E: info@ufs.ac.za | www.ufs.ac.za

 UFSUV |  UFSweb |  UFSweb |  ufsuv

*Inspiring excellence.
Transforming lives.*

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



UFS
INFORMATION AND
COMMUNICATION
TECHNOLOGY SERVICES
(ICT SERVICES)

Contents

- Introduction
- Available resources
- User Account Policy
- Access to the UFS HPC
- Recommended Text editors

Introduction

About the UFS HPC

- UFS provides HPC resources to researchers
- Division of ICT Services
- General inquiries:
 - hpc@ufs.ac.za
- Support documentation site:
 - docs.hpc.ufs.ac.za

UFS HPC Team



Albert van Eck
(vanecka@ufs.ac.za)



Fanie Riekert
(riekertsjpk@ufs.ac.za)



Louis du Preez
(lategandupreezl@ufs.ac.za)

Available Resources

UFS HPC Resources

- UFS HPC is a heterogenous HPC
- Currently on Gen5
- Provides:
 - Intel Xeon CPU compute nodes
 - NVIDIA Tesla V100 GPUs
 - 2 x nodes with 4 x V100 (16GB)
 - 1 x nodes with 8 x V100S (32GB)
 - Intel Xeon Phi

UFS HPC Resources

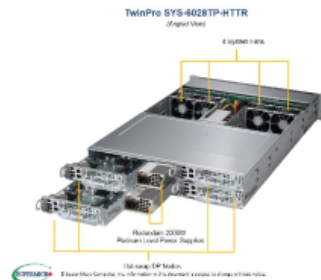
16 x Generation IV Nodes (1 024 Cores)

Intel Xeon E5-2697A v4 2.6GHz (64 Cores)

512 Gb 2400MHz DDR4 ECC Registered Memory

Intel Omni-Path 100GB PCIE

2 x 2000W PDU



8 x Generation IV Nodes (2 176 Core Threads)

Intel Xeon CPU 2.2GHz (68 Cores, 272 Threads)

256 Gb 2400MHz DDR4 ECC Registered Memory

Intel Omni-Path 100GB PCIE

2 x 2000W PDU



8 x Generation IV Nodes (2 304 Core Threads)

Intel Xeon CPU 1.5GHz (72 Cores, 288 Threads)

256 Gb 2400MHz DDR4 ECC Registered Memory

Intel Omni-Path 100GB PCIE

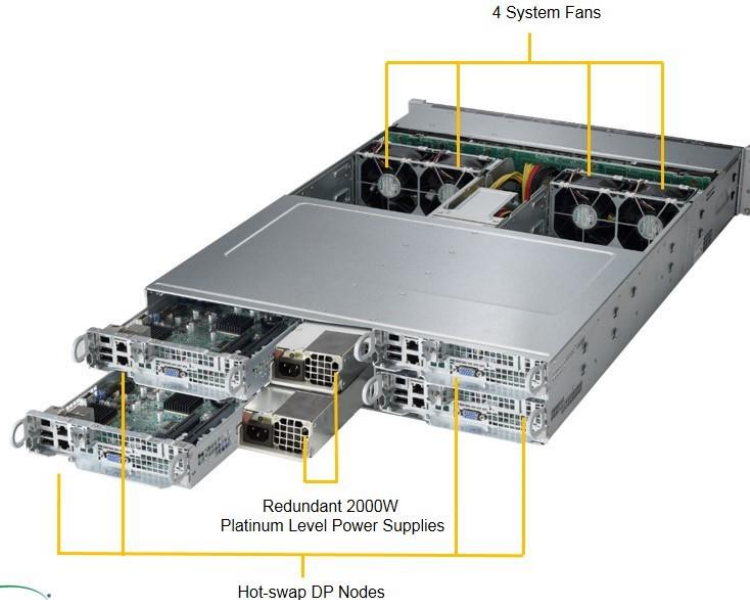
2 x 2000W PDU

UFS HPC



UFS HPC – Compute Node

TwinPro SYS-6028TP-HTTR
(Angled View)

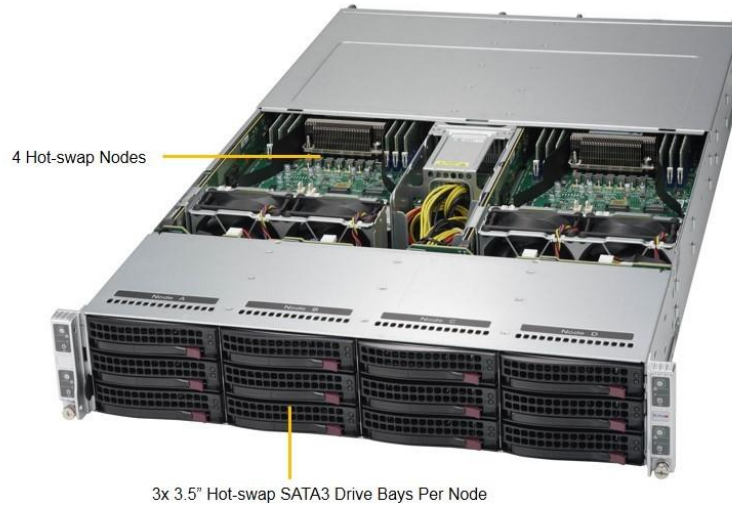


© Super Micro Computer, Inc. Information in this document is subject to change without notice.

UFS HPC – Storage Servers

Super Server SYS-5028TK-HTR

(Angled View – System)



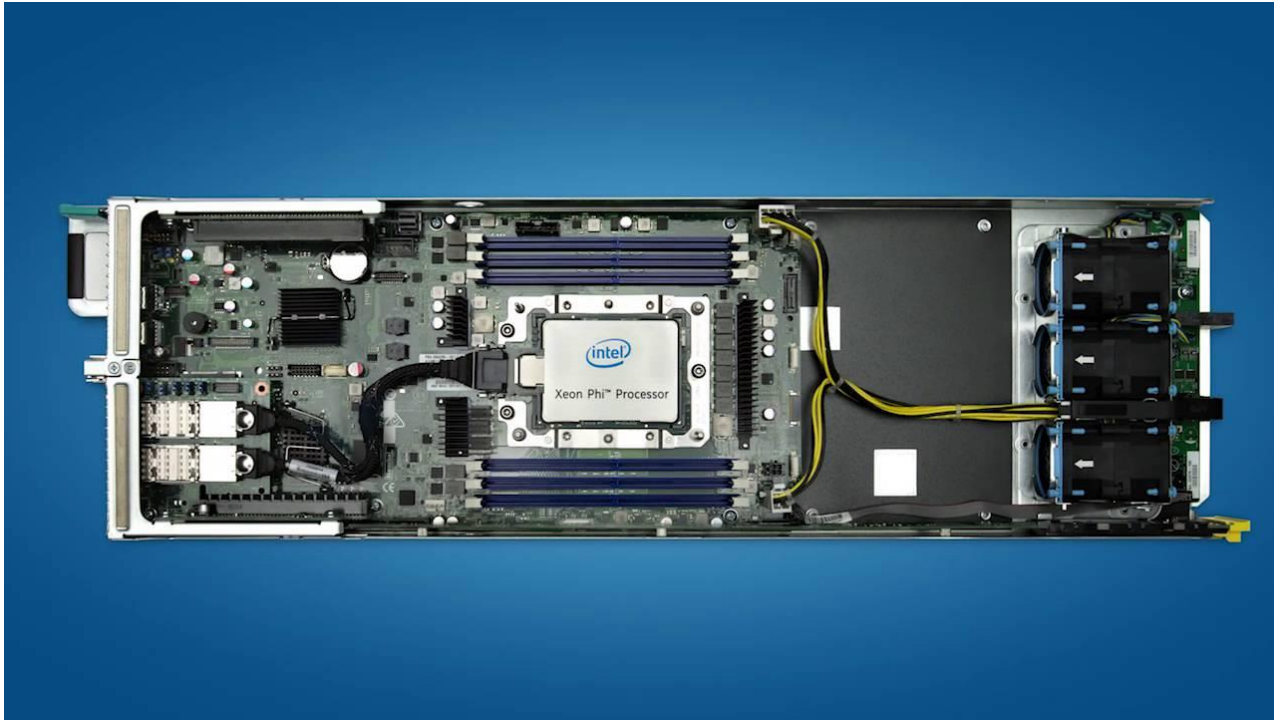
© Super Micro Computer, Inc. Information in this document is subject to change without notice.



UFS HPC - GPUs



UFS HPC – Intel Xeon Phi (MIC)



User Account Policy - Preamble

- https://docs.hpc.ufs.ac.za/getting-started/hpc_accounts/user_policy/
- Guiding principles / philosophy at the UFS HPC:
 - To provide researchers with the freedom necessary to innovate
 - To provide researchers equitable access to the UFS HPC resources
 - To remove the technical IT burden from research computing
 - To foster a healthy research computing community that can facilitate interdisciplinary research collaborations
- Additional aim is shield researchers from the burden of bureaucratic micromanagement as much as possible
- However, with a growing user base, some rules are necessary

User Account Policy – Account Credentials

- User name and password
- Must be kept confidential
- No account sharing
- To change passwords:
 - https://docs.hpc.ufs.ac.za/getting-started/hpc_accounts/change_acc_pw/

User Account Policy – Software Licenses

- Users must at all times adhere to the software license agreements of any software used on the UFS HPC
- This may include, but is not limited to:
 - Controlling access to the software
 - Properly citing the software used in research papers

User Account Policy – Resource usage

- Must make reasonable attempts to use resources as efficiently as possible. This includes:
 - Knowing the research software used and how it operates
 - Preferably testing input parameters etc, to eliminate user error from job runs
- Over-assigning resources is strictly prohibited – For example, requesting 2 GPUs when the job only requires/uses one GPU
- UFS HPC may only be used for research activities associated and endorsed by the University of the Free State.
 - For example: Crypto-currency mining would violate the clause above

User Account Policy – Storage

- Tips
 - Don't duplicate data – data in home directories are backup on a regular schedule
 - Use directories to organize your data! > just dumping files into the root folder of your home will make the terminal unusable
 - Organization example:
 - Project > Chapter > Experiment
 - Clean your directory often!

User Account Policy – Community

- On rare occasions a user may be asked to stop a job (by the UFS HPC team)
 - Other users may need additional resources in an emergency (Finishing an additional experiment requested by a reviewer, etc.)
 - The job will only be stopped if consent is given
 - Fosters good will to accede to the request if possible – you may be on the other end of the request some day
 - The UFS HPC team will manage communication in these cases
- Community participation
 - Report errors on documentation pages
 - Suggest valuable outside resources for software packages – Ex. Helpful tutorials, etc
 - Contribute user documentation to the documentation site

Access to the UFS HPC

Obtaining access to the UFS HPC

- Whole process is documented at: https://docs.hpc.ufs.ac.za/getting-started/hpc_accounts/obtain_acc/
- Send an email to hpc.ufs.ac.za:
 - Subject line: “**User account request**” Student number and/or Staff number
 - Include the following information:
 - Name and Surname
 - Name and contact details of supervisor (Or indicate if you are a supervisor)
 - Department
- Send request from the email address you wish to use
- A confirmation email with login details will be sent to the email address above

Login to the UFS HPC

- Whole process is documented here: https://docs.hpc.ufs.ac.za/getting-started/using_ufs_hpc/howto_login/
- What you need:
 - User name and password
 - SSH Client
 - Active internet connection (when at home) or Connection to the UFS network
- Methods are dependent on your OS
 - Windows – Dedicated SSH client (PuTTY)
 - Linux – Nothing, login from the terminal
 - Browser (Can run a terminal session in the browser)

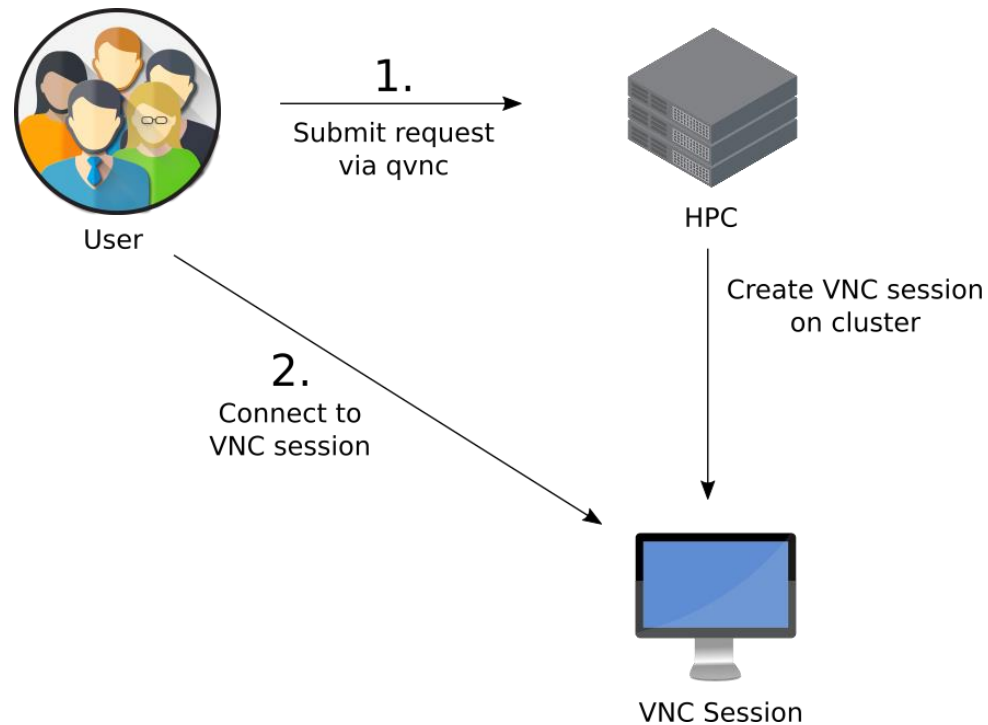
Windows + PuTTY demonstration

Browser Demonstration

Login Troubleshooting

- NR 1 reason for login problems: Not entering details correctly
 - User name and passwords are **case-sensitive**
 - Password is not visible while typing – Open a text editor and type the password in without looking at the screen – Check if it is correct.
 - Note: After 3 unsuccessful login attempts > IP will be blocked by the login server for 10 minutes. I.e. Retry after 10 minutes
- NR 2 reason – Connection problems
 - In PuTTY check for **(Inactive)** in window title
 - Ensure internet/network connection is working
 - Ensure that a firewall or anti-virus is not blocking SSH connection (Port 22)
 - Ensure the address is entered correctly: login.hpc.ufs.ac.za (Port 22)

Using qvnc



Text Editors

- Many parameter files are associated with terminal applications
- Good text editor is priceless. Many options available
- Windows
 - Notepad++
- Linux
 - Kate
 - Xed / Gedit / Distribution Defaults
- Cross-platform
 - Atom
 - Vim (gvim)