

Introduction to Xanadu

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Preface

This is an introduction to the Xanadu high performance computing cluster.

Here you will watch a series of videos and do some exercises that are meant to help you understand the cluster, get you connected to it and starting to do work.

Contact us

If you need help please contact us on...

Part I

Principles

1 What is High Performance Computing?

1.1 Watch the video

This first video covers the motivation for using HPC resources in the biological sciences.

<https://www.youtube.com/embed/Yz8W3-iEdzE?si=XgibQkMb37Wlpqt1>

1.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

What does the acronym HPC stand for?

- (A) Hark! Party Crashers!
- (B) High Performance Computing
- (C) Hearty Pork Chili

Why do we use HPC resources in the biological sciences?

- (A) Biology is too easy, so we need to keep ourselves occupied by learning other skills.
- (B) If we analyze data on our laptops, we won't be able to use them to watch cat videos.
- (C) Typical consumer-grade computers don't have enough computing power to handle many large datasets.

2 The Components of a Computer Cluster

2.1 Watch the video

The second video explains the main components of a high performance computer cluster.

https://www.youtube.com/embed/6loMm3xRKxQ?si=Ke-nFew_55rH9Jbc

2.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

What is the name of the node you connect to / login on?

- (A) head node
- (B) login node
- (C) submit node
- (D) all of the above

Which of the following is not a partition on xanadu?

- (A) general
- (B) himem2
- (C) lowmem1

3 Xanadu HPC: Submit Node Details

3.1 Watch the video

The second video explains the main components of a high performance computer cluster.

<https://www.youtube.com/embed/gPD6kXy6Qh0?si=EPsOrL-sQgm682bE>

3.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

Can you run analyses on the head node?

- (A) yes
- (B) no

Which compute nodes can hpc-ext-5 access?

- (A) gpu nodes
- (B) all of them
- (C) xanadu-01-5

4 HPC in Bioinformatics: How does it help?

4.1 Watch the video

The second video explains the main components of a high performance computer cluster.

<https://www.youtube.com/embed/dV6mM-GJeII?si=Q6X8HtYdnR9XhZsf>

4.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

How is the queue managed?

- (A) importance of jobs
- (B) first come first serve
- (C) number of resources requested

What is parallelism or multi-threading?

- (A) use of multiple cpu
- (B) reservation of RAM
- (C) submitting multiple jobs

If you take 5 files, and run a job using 3 cpus per file, how much are you decreasing the time it takes for your job to run?

- (A) 125-fold
- (B) 3-fold

- (C) 15-fold

5 RAM vs CPU

5.1 Watch the video

The second video explains the main components of a high performance computer cluster.

https://www.youtube.com/embed/znqJvkcQnLg?si=lnn_VoNxj4-LLLS

5.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

RAM is:

- (A) Readily Available Memory
- (B) Random Access Memory
- (C) Read Access Mounts

CPU is:

- (A) memory
- (B) software
- (C) processors

6 Connecting to Linux Server

6.1 Watch the video

The second video explains the main components of a high performance computer cluster.

<https://www.youtube.com/embed/oWnz1PXlAws?si=ps2-42tzN9-aCAfv>

6.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

What command do you use to log in?

- (A) terminal
- (B) SSH
- (C) submit

Does the name of your login node start with

- (A) hpc-int
- (B) xanadu
- (C) hpc-ext

Part II

Practice

7 Connecting to Xanadu - Hands-On

7.1 Watch the video

The second video explains the main components of a high performance computer cluster.

<https://www.youtube.com/embed/OL1DD-FhcL0?si=cxe0yibI6Hys3nlQ>

7.2 Test your knowledge

After watching the video, check your knowledge by answering the following questions.

Question 1?

- (A) a1
- (B) a2
- (C) a3

Question 2?

- (A) a1
- (B) a2
- (C) a3

References