

A national initiative of the Department of Science and Innovation and implemented by the CSIR.







CHPC

HPC Ecosystems Project

Embracing Online Education for HPC System Administrator Training

SIGHPC Education Global Seminar Series March 2023

> Bryan Johnston Senior Technologist ACE Lab CHPC, South Africa

bjohnston@ace-lab:[~]\$ whoami



HPC Recipient

Principal Technician, UKZN
 Research & Advanced Computing
 May 2013 - May 2016



- 192 core Sun HPC (Ranger chassis)
 - SysAdmin Training
 - Student Cluster Competition
 - TACC & SC'15



HPC Project Lead

- Senior HPC Technologist, CHPC
 - Project Lead: HPC Ecosystems
 - ACE Lab
 - June 2016 present
- MS Computer Science (Computing Systems)
 Georgia Tech, USA
 OMSCS Programme





South Africa - most descriptive country name!



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ISC 2021



CENTRE FOR HIGH PERFORMANCE COMPUTING



NATIONAL SUPERCOMPUTING FACILITY

- 1PF system
- (just recently) formerly Top500
- Largest HPC System in Africa (YMMV)









Cambridge





CYBERINFRASTRUCTURE SYST



HPC Ecosystems Project Overview

HPC Ecosystems Team @ CHPC (18+1)



Advanced Computer Engineering (ACE) Lab

- David Macleod (Principal Engineer)
- Eugene de Beste (Senior Technologist)
- Lara Timm (Engineer)
- O Mmabatho Hashatsi (Engineer)
- O Nyameko Lisa (Senior K/A)
- Sean February (Senior Technologist)

acelab@chpc.ac.za

CHPC Technical Team

- O Themba Hlatshwayo
- Zama Mtshali
- Zintle Sanda

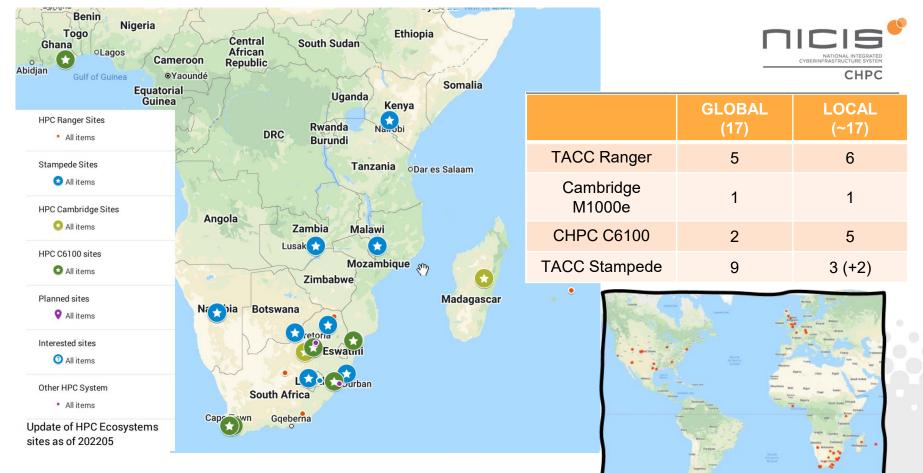
Research / Academic

Support

- O Dr. Charles Crosby
- O Mr. Inus Scheepers
- O Dr. Mthetho Sovara
- O Mr. Samuel Mathekga
- Dr. Werner Janse van Rensburg

CHPC Operations Support

- O Funeka Mafani
- Lesley Fredericks
- Nox Moyake
- O Dr. Ricardo Harry



HPC Ecosystems Project Overview





How it happens

HPC Ecosystems Project Overview

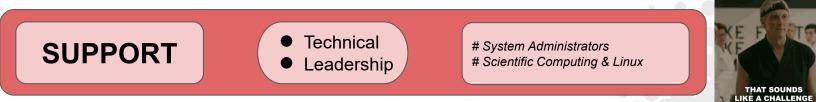
HPC Ecosystems Project - READINESS



To implement a **successful deployment** of HPC Ecosystems Resource/s, a site requires:

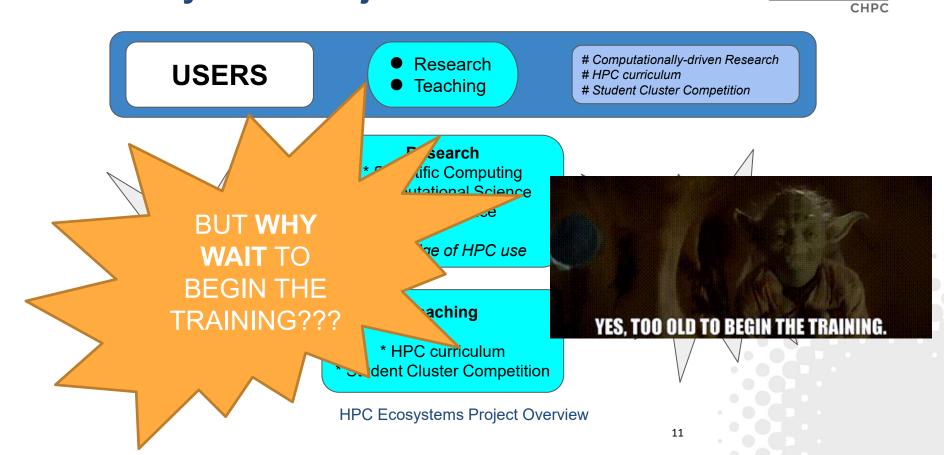






HPC Ecosystems Project – WHY WAIT?





The Traditional HPC Ecosystems Model













On-site Training (pre-COVID19)





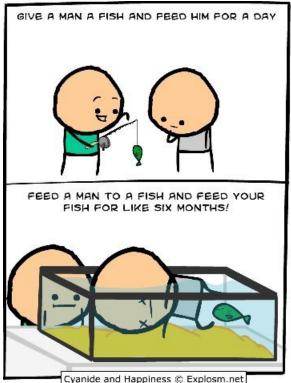


HPC Ecosystems Project Overview

larch 2019

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Give a man a fish and you feed him for a day. Don't teach a man to fish and you feed yourself. He's a grown man, fishing's not that hard.

Nick Offerman

AZQUOTES

ONLINE TRAINING

Moved Training Online in 2020 (influenced by ...) **Georgia Tech**



HPC Ecosystems Project (for SysAdmins)

- OpenHPC Virtual Labs
- HPC SysAdminWorkshops

HPC Ecosystems

TAKING EDUCATION & TRAINING ONLINE



LOWER OVERHEAD

- **Cost**: not funding participants
- Logistics: not hosting a F2F
 workshop
- Workload: long-term, can re-run online course relatively easily.

SCALABILITY

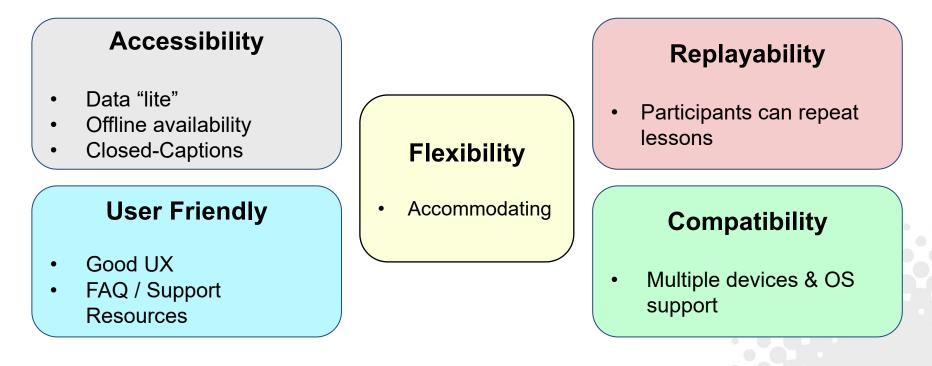
- Size: can accommodate larger
 groups
- Frequency: can run programs in parallel / quick succession / ondemand etc.
- Repeatable!

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PRINCIPLES LEARNED FROM OMSCS





ONLINE EDUCATION STRATEGIES



Drop-out / Disengagement

- Regular Office Hours
- Encourage Collaboration
- Incentivise Participation

Confusion / Overwhelming

- Community chat
- Advice & Tips for online learning

Life Happens

- Be understanding!
- Make it manageable!
- BE HUMAN!!

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ISC 2021







Implementation

HPC Ecosystems Project Overview

HPC Ecosystems Project Overview

Videos

Accessible

Downloadable

- Zero-rated
- Captions

Replayable

Compatible

User Friendly

Flexible

On Demand

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Trending		3:08
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Library	- Maria Maria Maria Maria - Secondaria - Sec	Bryan Johnston
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Show more	24 videos • 164 views • Last updated on Apr 27, 2020	4:15
RIPTIONS	Unlisted 🕶	4.02B - Add Compute Nodes into xCAT Database
Chipper Videos	X # ···	Bryan Johnston
Browse channels	Pauloide for single feet shall fairing a section of the section of	4.03A - Ready the compute node VMs



Virtual Labs



Accessible

• Off-line

- Opensource (GitLab)
- Low Resource Requirement

Replayable

Compatible

VirtualBox

User Friendly

• YMMV :-)

Flexible

- On Demand
- Transferable to Production

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Formal Workshops



Accessible

• FREE

Replayable

• Quarterly :)

Compatible

Web-clients

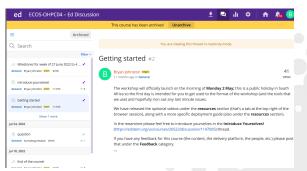
User Friendly

• YMMV :-)

Flexible

- LMS and Slack
- 1-2 weeks for 15 hours of work

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WEEK 22 - 24		o Vitalina	Morais Baptista 5 ments ago, can you ping to 8.8.8.8 from your master?					
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FEEDBACK: YOU ARE NOT YOUR USER!

HPC Ecosystems Project Overview

HPC Ecosystems Project – DO IT!

OpenHPC 101 (hpc-ecosystems.gitlab.io)

YouTube: 'hpc ecosystems 101 openhpc'

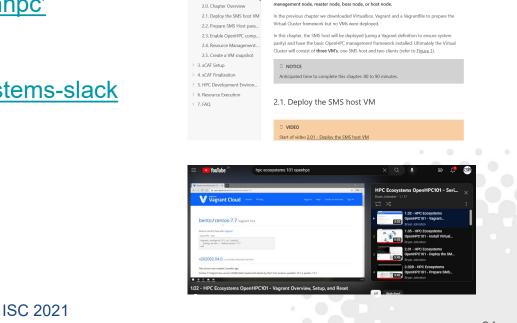
HPC Ecosystems Slack: https://tinyurl.com/sighpc-join-ecosystems-slack

HPC Ecosystems Google Group: http://tinyurl.com/SADC-HPC-Apply

NICIS CHPC Events: events.chpc.ac.za

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2. SMS Host Setup

This section will guide you through the setup of your System Management Server (SMS) host

the node that is responsible for managing the Virtual Cluster. This is often also called the

2.0. Chapter Overview

Home
 Quick Links

> 0. Introduction
 > 1. Getting Ready

2. SMS Host Setup



HPC Ecosystems Project -Acknowledgements



HPC Ecosystems Project Team

- HPC Ecosystems Project Community Partners
- Texas Advanced Computing Center (TACC)
- University of Cambridge
- STEM-Trek
- EPCC & PRACE
- OpenHPC





THANK YOU! (and stay safe)



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