CApIC-ACE FEDGEN Group Virtual Workshop

CApIC-ACE FEDGEN Group held a virtual workshop on High Performance Computing (HPC) on June 17, 2020. The workshop, which was organized by the Agence Francaise de Development (AFD) ACE Partners on Digital Science and Technology Network (DSTN) featured experts in the field such as:

Professor E. F. Adebiyi

Professor E. Adetiba

Dr. J. A. Badejo

Engr. Boladele Akanle

Engr. Oladipo Olaleye

Engr. Abayomi Mosaku

These experts looked at the following critical issues:

ICT Based Research @ CApIC-ACE

17th June, 2020 | A Presentation at the DSTN ACEPartners Online Seminar Series

CApIC-ACE Team Members

CApIC-ACE Team Members: Prof. Ezekiel Adebiyi, Prof. Emeka Iweala, Prof. Emmanuel Adetiba, Prof. Olubanke Ogunlana, Prof. Victor Osamor, A/Prof. Jelilli Oyelade, Dr. Solomon Rotimi, Dr Marion Adebiyi, Dr. Itunuoluwa Isewon, Prof. Olayinka Ajani, Prof. Abiodun Adebayo, A/Prof. Grace Olasehinde, Dr. Joke A. Badejo, Dr. Titilope Dokunmu, Dr. Yvonne Ajamma, Engr. Boladele Akanle, Mr. Seun Adeyemi, Engr. Oladipo Olaleye, Mr. Babajide Ayodele, Ms. Thelma Ekanem, Ms. Cynthia Adjekukor, Ms. Deborah Ugbenu, Ms. Helen Jevwegaga, Mr. David Obaoye

Presenters:
Emmanuel ADETIBA, Ph.D, R.Engr.(COREN),
Joke A. BADEJO, Ph.D, R.Engr.(COREN),

CApIC-ACE,
Covenant University, Ota, Nigeria

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PRESENTATION OUTLINE

1.0 Introduction
2.0 Ongoing ICT Based Research @ CApIC-ACE
- 2.1 Federated Genomic (FEDGEN) Cloud Infrastructure
- 2.2 Anomaly Detection in a Private Cloud
- 2.3 Federated Cloud Resource Management

3.0 Research Infrastructure @ CApIC-ACE
4.0 Conclusion

1.0 INTRODUCTION

- **CApIC-ACE Research Projects – Specific Aim 5 (FEDGEN):**
- Expand our existing High Performance Computing (HPC) facility to implement a federated cloud computing platform.
- This is to bring home genomic research to populations in Africa, customized to address specific issues of Health in Africa, namely *research capacity*, *health education*, *medication efficiency* and *enhancement of early disease diagnosis*.

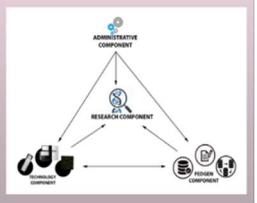


Fig 1.0: CApIC-ACE Components and Interactions

2.0 ONGOING ICT BASED RESEARCH @ CApIC-ACE

2.1 Federated Genomic (FEDGEN) Cloud Infrastructure

Cloud Computing

The fundamental idea of cloud computing is to deliver computational resources as services over the Internet (Habibi et al., 2019).

Federated Cloud

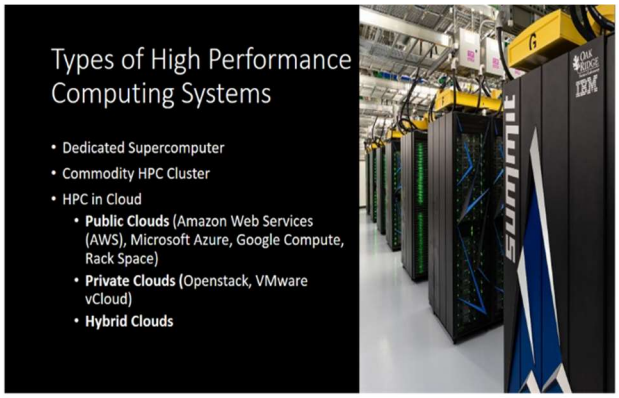
It is the deployment and management of multiple (external and internal) cloud platforms to share computing resources among collaborating institutions (Varghese & Buyya, 2018).

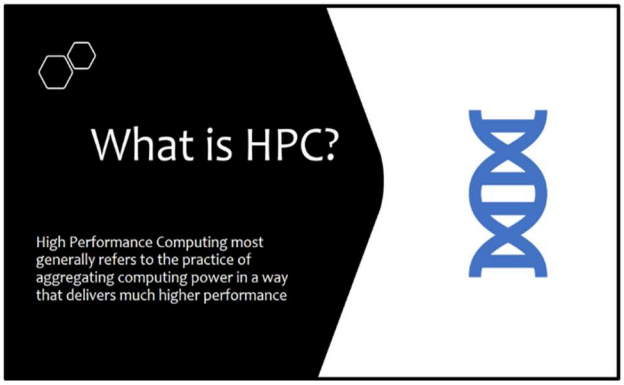
3.2 High Performance Computer (HPC)

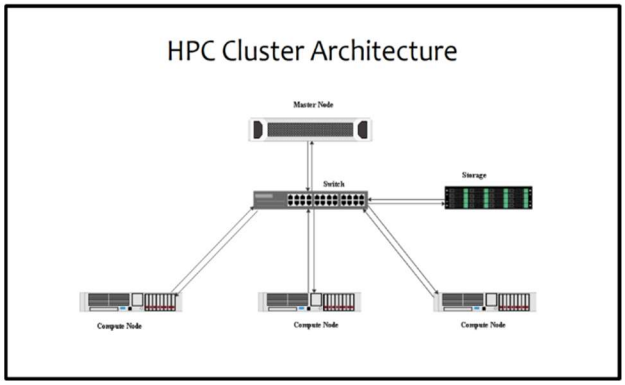
- The center currently has an installed HPC from an existing NIH grant.
- Some of the software applications currently running on the HPC are FASTQC, STAR, Trimmomatic, Trim_galore, Picard and R Studio.
- This infrastructure will be upgraded with additional HPCs to evolve a FEDGEN Cloud Datacenter.

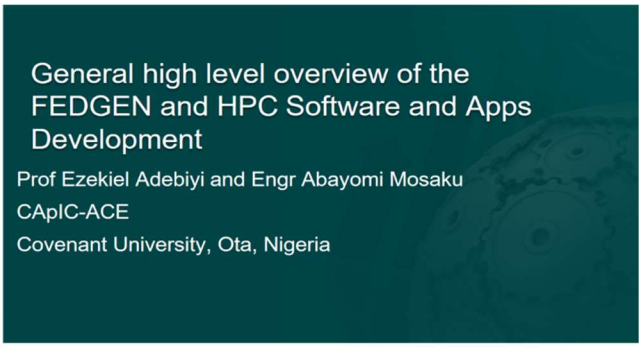
Model: Dell PowerEdge C6145
CPU: 64 CPUs x AMD Opteron™ Processor 6386SE,2.8GHz
Memory: 512 GB RAM
Storage: 101TB

Fig 3.2: FEDGEN Testbed in the Lab









…The workshop was a success!