

# Apocrita - High Performance Computing Cluster for Queen Mary University of London

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**Abstract**—This report describes the High Performance Computing cluster at Queen Mary University of London

## 1 INTRODUCTION

**A**POCRITA is a 5000+ core heterogeneous high performance computing cluster owned by Queen Mary University of London (QMUL). The cluster is managed by the Research IT team of IT Services.

It was established in 2012 by the Engineering and Physical Sciences Research Council (EPSRC) as one of the 5 regional Tier-2 Computing Centres of Excellence, through the MidPlus consortium (the universities of Birmingham, Nottingham, Warwick and QMUL) [1]

The cluster has been expanded through smaller awards and through an internal funding mechanism from 2012.

The original purpose of Apocrita was to support high throughput computing workloads to complement Minerva, a 6000 core cluster with an Infiniband interconnects managed by the University of Warwick.

Additional purchases have integrated a number of small Infiniband islands to support HPC workloads.

In November 2016, Apocrita was relocated to the Joint Information Systems Committee (JISC) Shared data centre [2] in Slough, UK (previously located at the Mile End campus).

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## 2 TIMELINE OF EXPANSION

- 2012 - Original purchase and lease of 80 IBM idataplex dx360 M3 nodes. Further lease of another 80 IBM idataplex dx360 M3 nodes. Purchase of 12 IBM x3755 M3 nodes.
- 2013 - Purchase of IBM GPFS NSDs with 100 TB storage. Purchase of 32 IBM NeXtScale nx360 M4 and Mellanox FDR IB island
- 2014 - Purchase of IBM DCS3700 expansion with additional 100TB storage.
- 2015 - Additional purchase of IBM DCS3700 expansion with additional 200TB storage.
- 2016 - Purchase of 36 IBM NeXtScale nx360 M5 and Mellanox EDR IB island. Purchase of 4 Nvidia Tesla K80 GPGPU cards. Purchase of 1PB DDN GS7K.

## 3 OPERATING SYSTEMS AND RESOURCE SCHEDULERS

- 2012 - Scientific Linux 6.2 and Son of Grid Engine (SGE) scheduler
- 2017 - Centos 7.3 and Univa Grid Engine

## **4 USER BASE AND MOST HEAVILY USED APPLICATIONS**

Apocrita is available to the staff and students of all research disciplines in QMUL and their research collaborators.

Popular applications include:- Gaussian, MATLAB, R, a wide range of genomic analysis workflows, as well as bespoke research applications compiled with gcc, PGI and Intel compilers.

## **5 FURTHER INFORMATION**

Up to date documentation giving a full description of the hardware infrastructure as well as user documentation is available from the QMUL HPC website.

<http://docs.hpc.qmul.ac.uk>

## **REFERENCES**

- [1] MidPlus website  
[http://www2.warwick.ac.uk/fac/cross\\_fac/midplus/](http://www2.warwick.ac.uk/fac/cross_fac/midplus/)
- [2] Jisc Shared Data Centre  
<https://www.jisc.ac.uk/shared-data-centre>