



Durham
University

Institute for Computational
Cosmology

CASE STUDY

DiRAC Memory Intensive Service at Durham University preserves complex cosmological simulation data



Collaboration is key at DiRAC sites and we expect it from our technology providers. We have seen Spectra step up to the mark more than once since the deployment of our Spectra T950 Tape Library. We've received very good support and advice from the Spectra team at every step of the way."



Dr. Alastair Basden,
Technical Lead for the
DiRAC Memory
Intensive Service,
Durham University

AT A GLANCE

Challenges

- High memory requirements
- Growing data volume demands
- Need for petaflop compute power
- Large-scale storage capacity

Solution

- Deploy Spectra T950 library
- Use LTO tape drives
- Add second T950 for HPC
- Support long-term retention



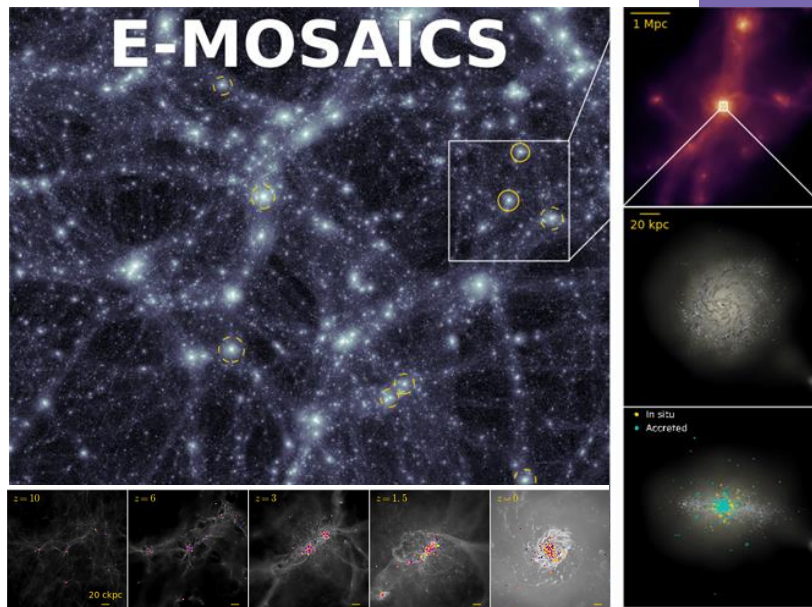
CHALLENGE

The DiRAC Memory Intensive Service, the seventh increment in a series of HPC clusters at Durham University, provides researchers with a combined 812 nodes (including both the COSMA7 and COSMA8 systems), with between 512GB-1TB RAM each and totaling 58,700 cores of computing power. The cosmological simulations generated at Durham require large amounts of memory and RAM, and the Durham facilities are unique in providing about 230TB of RAM spread throughout their HPC cluster. The growing need for ever-higher memory-intensive computing generates significant data volumes. Petaflop compute and petabyte storage requirements are integral to DiRAC-supported projects.

SOLUTION

Durham University originally sought a solution that would archive in an open file format and handle incremental and full backups, enabling them to implement a comprehensive data protection strategy to ensure long-term storage and retention. They deployed a Spectra T950 Tape Library with LTO tape drives because of Spectra's reputation for outstanding support and long-term commitment to customer success. In 2021, UK Research and Innovation (UKRI) announced funding of DiRAC-3, an initiative to upgrade computing power at all four DiRAC sites. Durham deployed a second Spectra T950 Tape Library with LTO-8 drives and media, to support this initiative. The new HPC systems will be three to five times more powerful than the existing DiRAC machines. Looking to the future, Spectra will continue to work in a spirit of collaboration to build enduring success for technology and storage requirements at Durham.





Created by the Virgo Consortium utilizing the Memory Intensive Service, these "E-MOSAIC" simulations are the first simulations that self-consistently follow the formation and evolution of star clusters and their host galaxy in a full cosmological setting.

DURHAM UNIVERSITY'S ENVIRONMENT

SOLUTION INFORMATION

The Spectra T950 Tape Library is designed and built to meet the stringent requirements of the enterprise for data integrity, data security and high reliability. The T950 reduces staff involvement significantly, scales in capacity and throughput, and supports multiple generations of current and future tape formats.

Why Durham University Chose Spectra

- User accessibility and performance
- Easy-to-use
- Scalability
- Affordability
- Excellent Support
- Recommended in industry

ENVIRONMENT

- Two Spectra T950 Tape Libraries each with four LTO-8 tape drives and media
- Spectra Certified Media
- BlueScale® Vision Camera
- BlueScale® Standard Encryption
- Atempo Miria Archiving

ABOUT DURHAM

Durham University is home to the DiRAC Memory Intensive Service, based in Durham's Institute for Computational Cosmology (ICC). DiRAC (Distributed Research Utilizing Advanced Computing) is the integrated supercomputing facility for theoretical modeling and HPC-based research in particle physics, astronomy and cosmology and nuclear physics. It is a key part of the infrastructure supporting the UK's Science and Technology Facilities Council (STFC) Frontier Science program. Four UK universities – Cambridge, Durham, Edinburgh and Leicester – are responsible for delivering DiRAC's HPC services.