

Monitoring Virtual Devices in Mass Storage Environments

The Scientific Data and Computing Center (SDCC) at Brookhaven National Laboratory (BNL) is a major scientific data storage site with more than 90 PB of archived experimental data, which amount is supposed to grow exponentially during the next several years in connection with the newly emerging enormous storage needs of ATLAS – one of the four particle physics experiments based at the Large Hadron Collider (LHC), CERN, Geneva. The Large Hadron Collider (LHC) is the biggest particle accelerator/collider in the world and BNL is a Tier 1 data center for the ATLAS collaboration.

BNL's data storage model is based on the use of the High Performance Storage System (HPSS) which is a flexible, scalable, policy-based Hierarchical Storage Manager, developed as the result of a collaboration among five Department of Energy laboratories and IBM.

The challenge is to meet the data storage and processing requirements of the Relativistic Heavy Ion Collider (RHIC) experiments (at BNL) and especially the newly emerging enormous storage needs of the ATLAS experiment.

In the above context the presentation will review BNL's data storage complex design and architecture with a special emphasis and focus on proprietary optimization and monitoring software.

The developed tools use gathered statistical information to provide adaptive methods and techniques for device management and rigorous performance tuning and optimization of the entire storage environment. The software suite provides an intuitive user-friendly web-based interface enabling dynamic parameter visualization based on a priority-driven device-monitoring paradigm and addresses the following major technical issues:

- maintain the health of the deep storage archive
- identify which data volumes are degrading and move the valuable data to new volumes
- predict device failures before they actually happen and service the devices
- identify the backlogs and congestions to optimize the bandwidth of deep storage systems
- balance the usage of deep storage devices and media
- detect and protect storage devices and media from unauthorized access
- enable encryption feature on encryption capable devices

Summary

Monitoring Virtual Devices in Deep Storage Environments

Primary author: Mr CHOU, Tim (Brookhaven National Laboratory)

Presenter: Mr CHOU, Tim (Brookhaven National Laboratory)

Track Classification: Data Management & Big Data