DMA ST1

BOF: HEP & WIMP

Discussion Topics

Possibilities aka Challenges

- Community Size
 - Ratio Users/Specialists?
- Software Maintenance
 - Environment distribution
 - Librarians
- Data Reduction
 - Aggressive RD wrt HL-LHC
 - Event size, trigger rates,...

Discussion Topics

Possibilities aka Challenges II

- Locality Compute & Storage
 - Distributed/centralized resources
 - Authz ID mapping global/local
 - Namespaces
- Data Management
 - Data lifecycles
 - Replication & archival
- Heterodox architectures
 - GPUs
 - non-x86 archs

Example Compute: ATLAS Global Jobs

Running jobs



Example Transfers: ATLAS Global Data Ingres/Egress

Daily total transfer size



DESY. DMA ST1 – BOF HEP and WIMP

Operations

Continuous Operations: man power critical

- Software Management
 - Continuous maintenance necessary
 - Especially with python version jungles
 - Distribution of sw contexts
 - CVMFS established CDN in HEP
 - Apptainer: rootless user context container engine
 - Container lifetime limit to external dependencies (Kernel API changes, repository lifetime limited by source OS EOL, protocol evolution of external resources...)
- How silo'ed software+environments+data in the future?

Developing Authz Evolution

WLCG: Migration from X509 Authz to Token Authz

- X509: authentification central element
 - Decommisioned in favour of WLCGTokens
 - X509 based job submission not possible from 2024 on
- WLCGTokens
 - Ongoing development, especially regarding storage
 - Not well defined claim scopes (currently)
 - Path vs role based authorization
 - Bypassing local POSIX (path dependent) authorization
 - Dependence on up stream token validation

Data Management & Namespace

Scalable Data Management

- Rucio
 - Object Store like overlay namespace
 - No URNs ~~> RSE URLs
 - Access control moving upstream from sites to VOs & their IAMs
- Local POSIX (Analysis Facilities)
 - Path dependent access control
 - Diverging VO authz and local POSIX authz needs to be avoided
 - Set up dependent namespace mapping necessary

Data Management & Namespace

Scalable Data Management

- Meta Data management
 - Identification, selection, addressing
 - Sub-element adressing, e.g., event, picture,... ~> de/serialization for optimimal performance
- Data Lifecycle
 - Data locality management
 - Tape ↔ Mass Storage Disks ↔ LAN/WAN ↔ Compute Disk ↔ Compute Mem
 - Data aggregation, QOS optimization
 - Tape carousel
 - Ingress/Egress ~ + Peering
 - LAN ↔ NREN ↔ GPI ↔ Cloud Providers w. escalting (in-/)egress pricing