StorNextFS, a global Filesystem in the IT-R&D Environment at Forschungszentrum Karlsruhe

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Motivation for the project CampusGrid

• heterogenous IT-environment: vector-, SMP-, cluster-, blade-systems, SAN, NAS, Unix, Linux, Windows, Solaris, SuperUX, ....
• global view by the user
• only one user management (ADS from Microsoft)
• one job management
• metacomputing (MPI, ..), “real-time” applications
• access data for visualisation at the local workstation
• global accounting
• seamless integration into different projects and middleware concepts like gLite, LCG, D-Grid, Unicore, .. we have seen in the NEC HPC strategy talk it’s the NEC interest too!
Ideas and solution

• testing of different global filesystem solutions   StorNextFS from ADIC seems to be the best
• AFS for world wide access
• integration of Infiniband, iSCSI and FC-SAN
• Globus Toolkit 4 (GT4), gLite/LCG and UNICORE as the middleware solution in the project
• Ressource Broker (local solution!)
• security    Kerberos 5 integration
• accounting   should be solved by D-Grid and GridKa
Parts of the CampusGrid Projekt

watercooled Infiniband cluster with 32 SUN V20z and 32 FSC RX220 nodes

Infinicon 9100, Infiniband switch, MPI latency 4.0 µs between nodes
StorNextFS 2.7 beta from ADIC

• testing of LDAP/ADS integration next month
• performance tests among different platforms (AIX, Linux, Solaris) and a 4 Gbit Brocade director are running now
• integration of InfiniBand for the beta version is on the road
• NEC SX-6i as a test system should be integrated as soon as possible
The SAN CampusGrid environment
(under construction!)

- FibreChannel
  - IBM p630 Power4
  - Intel Whitebox Woodcrest
  - Intel Whitebox Woodcrest (VMware)
  - Brocade Silkworm 48000
  - Infiniband
    - 32 x Sunfire V26z
    - 32 x FSC RX220
  - Brocade Switch and IBM Blade JS20/HS20/LS20

- 2 x FSC V830, MDS
- 2 x FSC V810, AFS
- 2 x FSC V810, front-end

- IBM, FastT700
- EMC, Clarion CX700
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- SX-6i
- 32 x Sunfire V26z
- 32 x FSC RX220
The existing hardware environment

- 128 Opteron processors (V20z, RX220, 2.2 GHz)
- Intel Whiteboxes, Woodcrest, Xen and VMware tests
- IBM Bladecenter with JS20, HS20 and LS20
- 2 x V830 from FSC (Opteron, dual processor, dual core, 16 GByte, 2 x HBA)
- 2 x EMC Clarion CX700 systems using FC and S-ATA disks
- IBM FastT700
- 2 x V810 for AFS
- 2 x V810 as front-end server
- NEC SX-6i
Invitation for Tenders

• vectorcomputer
• Integration in the CampusGrid environment
• 500 GFlop/s peak and 500 GByte main memory
• Only 10 TByte local Raid-5 disks
• Integrated in the StorNextFS filesystem from ADIC
• ddt as the CampusGrid wide debugging front-end must work
• GT4, gLite/LCG and Unicore as Grid-Middleware should be a project in cooperation with the winner of the invitation for tenders