Replacing DMF for Unicos
An Evaluation of Storage Management Products

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40th CUG Conference Stuttgart

Agenda

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Current Situation

- **Cray M92 with 50 GB DD61**
- **STK Robot with STK 4490, 3.5 TB data**
- **Disadvantages:**
  - **High maintenance cost**
  - **High defect risk because of age of hardware**
  - **Disk cache to small compared to stored data**
  - **slow tape drives**
  - **Low capacity of tape media**

Hardware remarks

- **IBM 3590 Magstar installed in STK silo**
  - fast (7.5 MB/sec) , high capacity (10 GB uncompressed)
  - but no automatic cleaning in silo
- **Test hardware**
  - HPSS: IBM RS6K 595, 36 GB SSA disk, HIPPI adapter, 4x3590
  - SAM−FS: Sun Enterprise 450, 2x3590
  - ADSM: server RS6K 380, 2x4490 tapes. HSM client RS6K 25T with 8 GB disk
  - DMF for IRIX: SGI Challenge DM, 2 CPU, 512 MB, 2x3590

HPSS

- **Developed in collaboration by IBM and major US National Labs**
- **Complete storage management solution, not just HSM**
- **Included in ASCI Project**
- **Platforms**
  - **Server software IBM RS6K**
  - **Mover ports under way for DEC Alpha (CERN)**
  - **Client API for AIX and Solaris**
  - **PFTP for many platforms**
- **For your hardware ask the vendor**

HPSS Features

- **Network–centered architecture, well scalable**
- **Third party data transfer**
  - network attached devices
  - command path and data path separated
- **Parallel operation**
- **Data integrity**
  - DCE security, Encina transaction monitor
- **Management distributed, GUI interface**
- **Cost: expensive**

HPSS User access

- **Standard FTP:**
  - slow, no access to special HPSS features
- **NFS version 2:**
  - slow, no access to special HPSS features
- **Parallel FTP:**
  - fast, access to HPSS features
- **Client API**
  - modeled after POSIX.1, but source code must be changed
  - Encina client required
  - fast, access to HPSS features

DMF for IRIX 1

- **Port of DMF for Unicos**
- **proven quality**
- **useful HSM**
- **Special user commands like dmls, dmfind**
- **No quotas**
- **Works on XFS filesystems**
- **Remote Access to data via NFS, but no NFS UID-Mapping**

DMF for IRIX 2

- No single name space for multiple servers
- No integration of backup and tape merge in DMF operation
- No tape management on IRIX
- Cost moderate

SAM−FS

- **Vendor Large Storage Configurations Inc.**
- **Runs on Solaris 2.4 and later, no other platforms**
- **HSM, own filesystem via Solaris virtual file system**
- **Data on background media in tar format**
- **Tape merging automatically, backup tool for metadata**
- **No database, SAM−FS meta information is kept in file .inode**
- **Cost high, price depends on type of tape and number of volumes**

ADSM

- IBM's backup and archival system
- Client/Server architecture
- HSM function available as an option
- HSM functionality comparable to DMF and SAM−FS
- Probably slower than the other products
- Integrated backup, automatic tape merge
- Price moderate, if ADSM is already in use

Evaluation Results

- **Different solutions for Supercomputing and University**
- **Supercomputing:**
  - **HPSS best solution but funding needs to be set up**
  - **In the meantime use DMF for IRIX**
  - **Reasons:**
    - **SGI hardware available**
    - **DMF know–how exist from Unicos**
    - **fair price**
- **University:**
  - **Uses ADSM/HSM because backup service is already in place**

DMF Experiences

- **Field test at RUS**
- **In our opinion GA to early**
- **Missing:**
  - **Option –a on xfsdump (delivered early 98)**
  - **dmaudit**
  - **tape merge still broken, SPR number 711851**
- **Features we would like to see:**
  - **integrated backup**
  - **automatic tape merge**
  - **aggregate quotas**

Links

- **HPSS**
  - **http://www.sdsc.edu/hpss/**
  - **http://www5.clearlake.ibm.com:6001/**
- **DMF for IRIX**
  - **http://www.cray.com/products/software/storage/dmf/index.html**
- **SAM-FS**
  - **http://www.lsci.com/lsci/products/samfs.htm**
- **ADSM**
  - **http://www.storage.ibm.com/software/adsm/adsmhome.htm**