

The Rebirth of DMF on IRIX

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Production DMF Platforms

- ◆ Two CRAYS C90s and one J90
- ◆ 4 BMX, 32 – STK 4490 for the C90s
- ◆ 2 SCSI, 4 – STK 9490 for the J90
- ◆ J90 has 4 user file systems – 36 GB each
- ◆ Three times a day dmmigall is executed
- ◆ Reduce dumps tapes to 1/10 of previous usage

Online Web Metrics

- ◆ science.nas.nasa.gov/Groups/HSP/metrics.html
- ◆ Each Cray has, batch job, file space, system, network and megaflops statistics
- ◆ Files smaller than 1 MB, 90% # of files
- ◆ Files greater than 1 MB, 97% of the data

Testbed DMF Platforms

- ◆ SGI 02000 64 CPUs and 16 GB memory (6.4)
- ◆ SGI PowerChallenge XL 4 CPUs and 1 GB (6.2)
- ◆ SGI 02000 4 CPUs and 1 GB (6.4)
- ◆ SGI 02000 8 CPUs and 2 GB (6.5SEbeta)
- ◆ Two SCSI channels to 4 STK 9490s
- ◆ 9–15 GB DMF file system

Free Evaluation Version of DMF

- ◆ www.cray.com/products/software/storage/dmf/index.html
- ◆ Compressed tar file less than 10 MBs
- ◆ Thirty day temporary license via email

DMF Planning Process

- ◆ What is the daily tape traffic, file usage by size and age?
- ◆ How long should new and recall data stay online?
- ◆ What type of files to keep online?
- ◆ How big should each user DMF file system be?
- ◆ How big should /usr/dm and the journal file systems be?

DMF IRIX Installation

- ◆ Review the latest README file
- ◆ Download patches from support.sgi.com/index.html
- ◆ Use `inst` to install patches and DMF software
- ◆ Connect SCSI tape drives and reboot
- ◆ Use `hinv` to display tape devices

DMF Changes

- ◆ IRIX DMF uses (DMAPI)
- ◆ Book – System Management: Data Storage Management (XDSM) API.
- ◆ www.opengroup.org/publications/catalog/c429.htm
- ◆ Reference Model for Open Storage System Interconnection
- ◆ www.ssswg.org/public_documents.html
- ◆ bit file id, file handle

New User Commands

- ◆ **dmfind** – find with DMF options
- ◆ **dmls** – ls with DMF state information
- ◆ **dmattr** – list of DMF attributes

```
% dmattr -a owner,size,state,path JuNk.*
```

```
9999 134217728 DUL JuNk.128.2
```

```
9999 2097152 DUL JuNk.2.1
```

New System Commands/Features

- ◆ **dmmaint – license, configure, checking, activate**
- ◆ **dmcapture, dmloadfs, dmdskmsp**
- ◆ **File system management policy**
- ◆ **File migration/free policy**
- ◆ **MSP selection policy**
- ◆ **Expanded selections to include age, size, uid, gid**

Renamed System Commands

- ◆ **dmhit -> dmscanfs**
- ◆ **dmdbase -> dmdadm**
- ◆ **dmmigall -> dmmigrate**
- ◆ **fsmon, fsdaemon, dmmctl -> dmfsmon**

What Your Vendor Never Told You

- ◆ **dmdbcheck** – verifies dmf, tape, cat databases
- ◆ **Use after dmsnap**
- ◆ **Disaster Recovery** – Before 1st and after last journal

DMF Benchmarking

- ◆ **SPR 711694 – two tape drives writing over a SCSI channel causes an IO error**
- ◆ **Tape support does not share tape drives between MSP**
- ◆ **63 files, 4032 MB of non repeating pattern**
- ◆ **Create, archive, restore**
- ◆ **STK 9490 drives**

DMF Benchmarking

- ◆ Timing is in minutes

System	S/T	Dmput	Dmget
J90	1s2t	34	21
J90	1s4t	27	14
J90	2s2t	32	17
J90	2s4t	23	11
O2000	2s2t	24	23
XL	2s4t	24	12

SGI Support

- ◆ Tens of Millions \$\$ hardware, MOUs, 7x24 maint.
- ◆ Three full time analysts and field engineer onsite
- ◆ Next door SGI Mountain View HQ
- ◆ DMF Software Support Great

Critical Problems between workgroups

Process is broken – at times, months to solve issue

If NAS can't get premium service, then what site can?

Vendor Recommendations

- ◆ Vendor needs to be able to solve any critical problem quickly or quickly explain why not
- ◆ Vendor needs dmmaint more integrated, Start Here button, previous DMF conf, edit any conf, check confs, with auto correct
- ◆ Vendor needs better tape subsystem in IRIX.

Customer Recommendations

- ◆ **Critical Problems use both crinform and escall**
- ◆ **Tape support and subsystem needs to be better before used in production**
- ◆ **Download DMF for your site evaluation**
Only need a workstation with 5–20 GB disks, ftp
- ◆ **Use the evaluation version of DMF for testing and learning**