Upgrade to ISSP 3.0 – our experience

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History

o Using DMF since 1996
o Multiple data copies, primary in tape library, offsite in commercial storage facility
o Primary data storage
  ❑ 0 to 1 Petabyte in 15 years
  ❑ 1 Petabyte to 2 Petabytes in 10 months
o Relocated entire facility in February 2011

Computing facilities
o SGI Altix ICE - 96 nodes – installed 2009
o SGI cluster – 20 node – Windows 2008 R2 HPC

Major use
o Scientific research and operations
o Remote sensing research, vegetation management, soil and water
o Climate modelling, global circulation models and regional climate models (joint research with CSIRO)
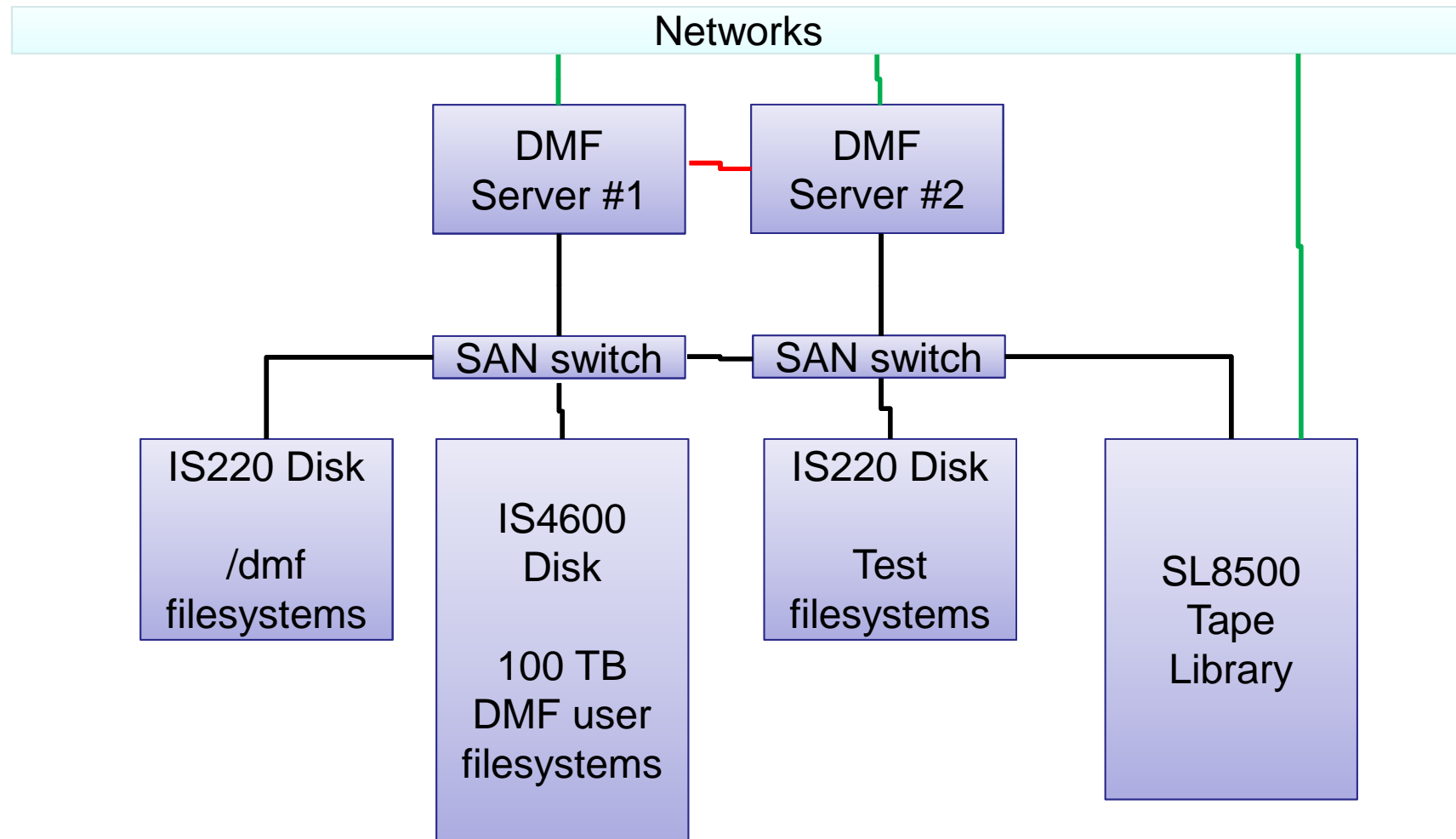
Facilities

Tape

- Oracle SL8500
- 10,000 slots, licenced for 7,000 slots
- 6 x HP LTO4 – 800GB
- 2 x IBM LTO5 – 1500GB
- 2 x Oracle T10000C – 5000GB

High Availability configuration - outline

Upgrade Path

- ## Old configuration
  - Altix 450 (IA64)
    - 8 Gbit/s fibre channel
    - 10 gigabit Ethernet
    - DDR Infiniband
  - SLES11SP1
  - ISSP 2.5 (DMF 5.5)

- ## New configuration
  - C2108-RP2 (x86_64)
    - 8 Gbit/s fibre channel
    - 10 gigabit Ethernet
    - QDR Infiniband
  - SLES11SP2
  - ISSP 3.0 (DMF 6.0)

Preparation phase

- Setup two new x86_64 servers
  - T9840D tape drives
  - IS220 disk array (/dmf/home, /dmf/spool, /dmf/journals, /test1)
  - SLES11SP2
  - ISSP 3.0
  - SuSE High availability extension (HAE)
- Configuration
  - Configure HAE from scratch based on steps in DMF HA guide
    - High Availability Guide for SGI InfiniteStorage (007-5617-006)
  - Replica of production environment, tape drives, disk, networks on a smaller scale
- Testing
  - Running mix of continual recalls and migrates with network load

Migration phase

- Live HAE migration from IA64 to x86_64 servers
  - Setup both new systems with HAE with only stonith defined
  - Shutdown inactive HAE node on IA64 systems
  - Moved all SAN/network cables from IA64 server to new server
  - Booted new server and confirmed disk/tape/networks ok
  - Exported/Imported HAE config (CIB) from production (IA64) system to new (x86_64) system after removing stonith definitions
  - Stopped all HAE services on active HAE node on IA64 server
  - Started all HAE services on new server
  - Tested services from client systems Altix ICE, Windows PCs
  - Shutdown other IA64 server, moved cables, tested, booted, tested HAE failover

What didn't work

- Existing features
  - dmaudit from command line - LC_ALL sort problem (SGI patch)
  - tape/disk I/O performance is not the same (under investigation)
  - stonith deathmatches using bonded (backup) heartbeat network

- New features
  - dmarchive and Panasas (under investigation)

Lessons

- Good documentation: High availability guide for SGI Infinitestorage
- Apart from some issues with IPMI and stonith, it all worked

Plans and Issues

Plans

- Start using some of new features in DMF 6.0/ISSP 3.0
    - dmarchive
    - alternate recall options if primary drives are busy
- Integrate dmarchive use with our Panasas disk array on Linux cluster
- Increase size of disk array on DMF server

Issues

- Change in data storage patterns due to change in business/research
- Budget

Questions

Remote Sensing Centre,

Department of Science Information Technology Innovation and the Arts

http://www.qld.gov.au/environment/land/vegetation/mapping/remote-sensing/