AFS Cell Management
Tools and Techniques

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Introduction

- Stanford has 2.6TB of data in AFS, in 54,686 volumes (as of March 1st). (1TB user home directories, 600MB data, 100MB groups and departments, 280MB classes).

- Administration takes around an hour a week, mostly creating unusual volumes, moving volumes around, and upgrading servers.

- Tools presented here developed by Neil Crellin.

- http://www.eyrie.org/~eagle/software/

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Contents

- Volume creation and management
- Managing ACLs
- Analysis and reporting
- Replicated volumes
- Monitoring with Nagios
Creating Volumes

- `volcreate` wrapper to balance where volumes are placed
- Mapping volume types to servers
- Size policy (2-4GB max for ease of moving volumes)
- Automated log volume creation with `volcreate-logs`
- Wrapper scripts for volume types (`create-user`, etc.)
Managing Volumes

- `partinfo` wrapper for usage information
- `mvto` utility for all volume moving
- Generating volume lists with `vos listvol`
- Checking for unreleased volumes with `unreleased`
- Balancing: why or why not, and possible overkill solutions
- `volnuke` wrapper to delete volumes
- Delegated volume creation ability (`remctl` and `afs-backend`)
Managing ACLs

- One PTS group per course, department, or group volume
- Help desk tools to change PTS group membership (and volume quota)
- `fsr` wrapper for users
- Be careful of IP-based ACLs: subnets work best, better to use `runauth` and machine `srvtabs` over IP ACLs
- Log volume ACLS (lik) and the potential problems
- Think about `fs cleanacl`
- Unix directory owners and their special ACLs
Tracking Volumes

- Hierarchical naming scheme for volumes
- Mount point database (mtpt, loadmtpt, cleanmtpts)
- Nightly load into an Oracle database
- Nightly reports from the Oracle database (released volumes, high accesses, volumes moved, unreleased changes, missing mount points)
- Monthly usage reports
Replicated Volumes

- Replication helps when server is down, not when it's slow
- How many replicas do you want? (2-4)
- `volcreate` and server geographic locations
- How RW and RO paths work: replicate the whole path
- Delegated volume release ability (`remctl` and `afs-backend`)
- `frak` to find changes
- Restoring a RW from a RO with `vos dump` and `vos restore`
Monitoring with Nagios

- Basic tool: \texttt{bos status}
- Monitor VLDB servers with \texttt{udebug}:
  \texttt{pt 7002, vl 7003, ka 7004}
- Available disk with \texttt{vos partinfo}
- Blocked connections and \texttt{rxdebug}
- AFS logs and kill -TSTP
- Nightly problem reports from Oracle database