# What is OpenAFS?

Andrew File System
Distributed Filesystem with Unique Properties
Open Source Descendant of Transarc AFS

# Strengths of AFS

Volume Management
Scalability (?)
Security (ACLs, Encryption)
Client Cache
Replication

# Some Limitations of AFS

Sync-On-Close
Whole-File Locking
Kerberos IV
Legacy Encryption
Complex Administration
Windows Issues

# Some Protocol Details

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Rxrpc Relative of ONC (XDR)
Support for Streaming, Reliable RPCs (in Ubik)
Extensible RX Security Class
Layered on UDP/Dgram*

# Some Server Details

Quorate Clustered Database Server
(Protection Server, Vlserver)
Arbitrary Number of Network Fileservers
(Fileserver/Volserver)
Vlserver Implements Transparent Fileserver
Redirection

# Volume Concept

Filesevers Host Volumes (Virtual Disk)
Volumes Have Backup Clones, Replica
Clones
Backup Volumes (Presently) May Be
Accessed With RW Replica On-Line

# Cache Manager

Kernel-Mode Filesystem on Unix*
Cache Manager Implements Block Cache
File Integrity Protected Via Callback (Ancestor of Oplock)
Read Only Volumes Use 1 Callback
Etc

# OpenAFS Developments 1.4.0/1

Pthreads (tviced, tbutc)
Vastly-Improved Windows Client
Client for MacOS X
Roaming Client Detection
LFS
Linux 2.6
Many Bugfixes/Improvements

# AFS Developments Planned 1.6

Windows IFS Driver (Eric.JW@umich.edu)
Enhanced Encryption (Rxgk, Rxk5 [us])
Database Server Improvements?
Rxtcp

# AFS Developments We'd Like To See

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Server-Side Byte-Range Locking
Arbitrary Volume Snapshots*
Enhanced Replication
Journaled Fileserver
New Management Tools (Check Back)

# Rxk5

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Native Krb5 Implementation of Rx Security
Completes AFS Kerberos V Suite
Kerberos V Encryption
Keeps CM Architecture As It Is (Portable
Kernel-Mode Crypto)

# K5SSL

Partial Kerberos V Implementation With
Interesting Properties
(By Marcus Watts)
Fast Portable Crypto Implementations (AES,
DES3, Arcfour, ++ :)
Stripped Down (Doesn't Parse Keytabs,
Implement a KDC, etc)
Emulates OpenSSL EVP Interface in User and
Kernel Mode

# Filesystems In Kernel Space

UML Development Environment
Debugger Support
Fun

# AFS/Kerberos Workshop 2006

AFS/Kerberos Best Practices Workshop
June 12-16
University of Michigan