Arla—a really likeable AFS-client

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Arla—a really likeable AFS-client

- free
- portable
- efficient
- supports disconnected operation and encryption of the data stream

What is AFS?

- a world-wide distributed file system
- also known as Andrew File System
- originally developed at CMU
- later commercialised by Transarc
- currently 150 public cells around the world

AFS (cont.)

- files are stored at dedicated file servers
- untrusted clients (cache managers) cache files on local disk
- clients have to prove themselves to servers

Consistency in AFS

when retrieving a file, the client gets a promise that the server will notify it before changing the file

the notification is called a *callback*

allows the client to read cached files without any network activity

Implementation of Arla

- a kernel module (*xfs*)
- a user-level daemon (*arlad*)

these communicate by sending messages over a character device

Advantages

easier development

better portability

better development tools

possible to use normal libraries

Disadvantages

performance?

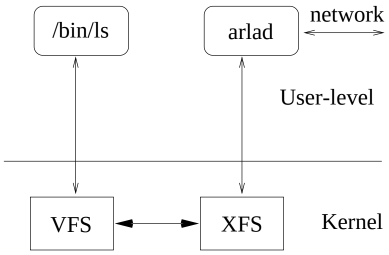
Kernel module (*xfs*)

small, $\sim$5000 lines, 32 KB on i386

implements

- a system call
- a character device
- a virtual file system

Implementation (cont.)



Performance

	UFS cold	Arla cold	Arla warm
(I) mkdir	2	2	3
(II) cp	6	18	11
(III) r.stat	2	2	3
(IV) r.grep	5	5	5
(V) compile	34	36	34

(elapsed time in seconds of Andrew Benchmark on a ThinkPad 560)

Portability

$\sim$10% operating system dependent

lwp requires machine-specific context switch code

daemon runs on any Unix-like system

works on NT with cygwin32

Portability (cont.)

Kernel modules for:

- SunOS
- Solaris
- NetBSD, FreeBSD, OpenBSD
- Linux
- AIX
- HP-UX
- Digital Unix

Security and Encryption

Kerberos 4-based (rxkad)

implementation written outside US

supports encryption of all data

Disconnected operation

allow file system operations without network connectivity

read from already cached data

write operations to a log and replay later

Disconnected operation (cont.)

	fetch on miss	no fetch on miss
consistent	connected	N/A
not consistent	fetch-only	disconnected

Future work

more performance

more platforms

more disconnected operations

file + database servers

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Availability

`http://www.stacken.kth.se/projekt/arla/`