

CIFS client for Solaris



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What is the CIFS client?

- Virtual File System module (smbfs)
 - > Allows “mount” of CIFS shares
 - > File & directory access via normal APIs (open, read, write, close, readdir...)
- New commands:
 - > mount_smbfs
 - > smbutil
- Java Desktop (GNOME) will use this instead of the Samba “smbclient” library

Initial Release Goals

- Essential file & directory operations
- Make smbfs/net smb MT-safe
- Support Solaris Zones, Trusted Extensions
- AD-compatible authentication
- Password “keychain”, PAM hooks
- Stability (no P1,2,3 bugs)

Initial Release Limitations

- Single user credentials per mount point
 - > Owner of mount is owner of everything inside
 - > CIFS ACLs neither used nor presented
- Deferred Features
 - > mapped-file access
 - > page cache, DNLC
 - > IPC pipes (RPC support)
 - > port 445 (SMB over TCP)
 - > Unix extensions

OpenSolaris community participation on these?

Where we started

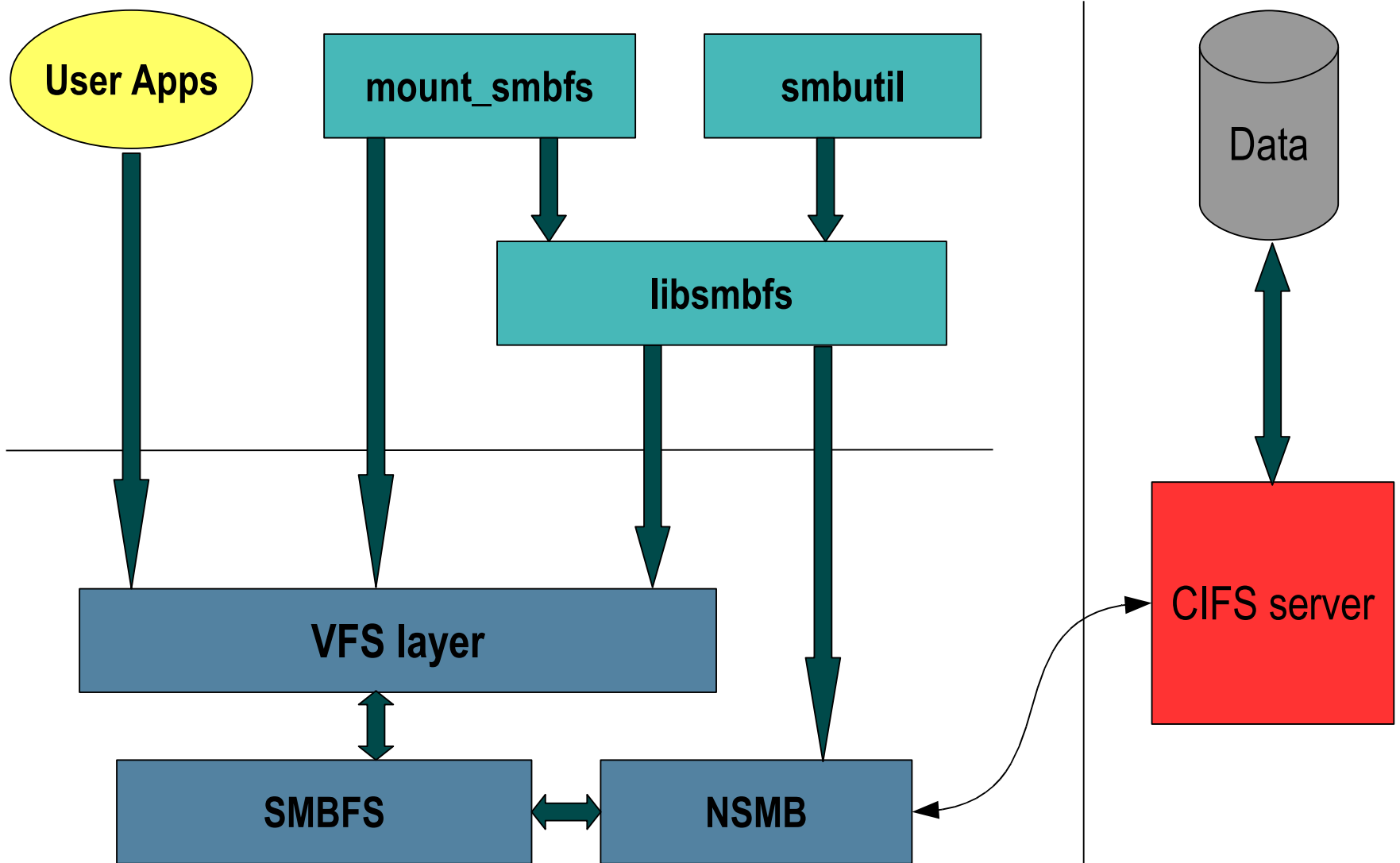
- Identified possible code bases to use:
 - > BSD/Darwin (Apple), Linux, Samba, ...
- Selection issues:
 - > Internal rules on use of open-source
 - > Interface similarity (VFS, DKI)
- BSD/Darwin code selected, plus
- VFS I/F from OpenSolaris NFS

Design Approach

- Keep Darwin design as much as possible
- Two kernel modules:
 - > smbfs -- virtual filesystem module
 - > netsmb -- SMB networking driver
- smbfs library, commands
- Most of the above are like Darwin, but...
- The smbfs module is more like NFS now.

(see diagram, next slide)

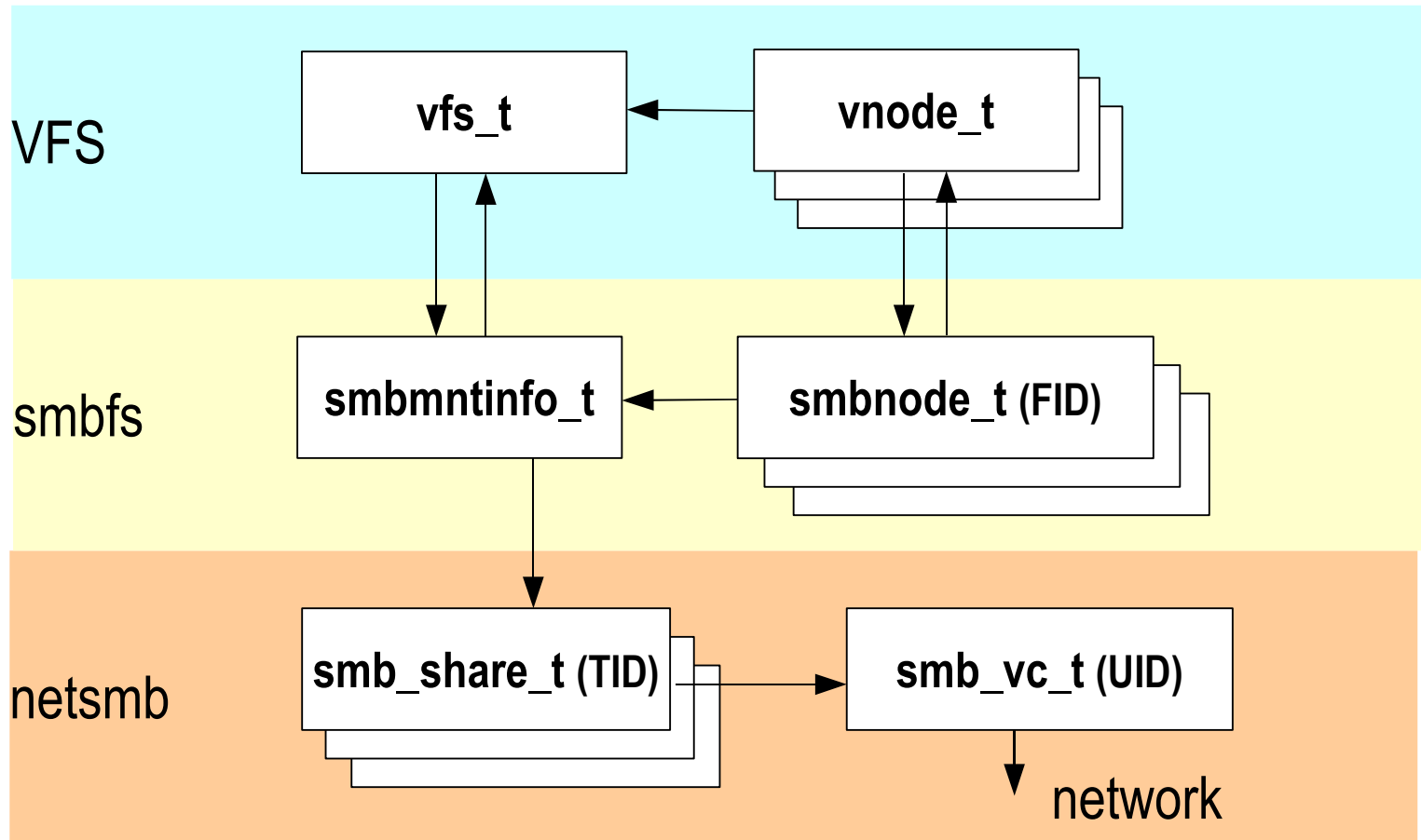
CIFS client subsystem on Solaris



More About the Design

- Most SMB protocol knowledge is in netsmb
 - > Can be tested independently of smbfs
 - > Opportunity for sharing code w/ other OS
- Most OS-specific code is in smbfs
- VFS interface code mostly from NFS
- Guts of VFS/vnode ops from Darwin
- The difficult work is in smbfs

in-kernel data structures



Current Status

- Alpha - done (see OpenSolaris code drop)
 - > Authentication via NTLMv2, krb5
 - > Essential file & directory operations
- Beta, code-complete (expected Oct. `07)
 - > Make smbfs/net smb MT-safe
 - > Password “keychain”, PAM hooks
 - > Support Solaris Zones, Trusted Extensions
- Nevada integration (Nov.-Dec. `07)
 - > Testing, Testing...
 - > Stability (no P1,2,3 bugs)

Follow-on Work

- Implement Deferred features (slide 4)
- GNOME integration
- Improved connection management
- CIFS open per user-process open
- IPC pipes (for RPC support)
- Over-the-wire locking
- Multi-user mounts (like NFSv4)
- “idmap” (Unix owner from CIFS ACL)

Lessons Learned

- VFS interfaces: BSD, Solaris, ...
- Kernel environment, concurrency
- Port it first, then add features
- Mix-n-Match approach has risks
- Have to track CIFS protocol evolution

Credit where Credit is Due

- In case this looks like “advertising” to anyone:
“This product includes software developed by
Boris Popov.”
- Copyright license (etc.) files are here:
usr/src/uts/common/fs/smbclnt/smbfs/netsmb/
COPYRIGHT CREDITS README
- In his CREDITS file, Boris Popov also
gives credit to:
 - > The Samba Team
 - > Thursby Software
- We thank Apple too, for their work on this code.

More information

opensolaris

<http://www.opensolaris.org>

CIFS Client Project (smbfs)

<http://www.opensolaris.org/os/project/smbfs>

Contact us:

see “leaders” on the project page,
also the “discuss” link, etc.