

The Sysadmin's Daily Grind: SHFS – Using SSH to Mount Filesystems

Yea, Though I Walk...

SCP and Rsync-over-SSH are both suitable for transferring files securely from one machine to another.

If however, you need to tunnel a whole file system, then the SHell FileSystem (SHFS) with different caches for speeding up access is the hero of the day.

BY CHARLY KÜHNAST

SHFS installs a kernel module that I can use to mount a remote filesystem via SSH [1]. It uses some of the FTPFS code, which has no been incorporated in LUFFS [2], but avoids most of FTPFS' unfriendly traits – the developers have re-implemented the locking facility and removed a memory hole, for example.

Performance is acceptable thanks to read-ahead, write-back, and directory-caching, as long as you restrict yourself to Linux only. If you need to mount filesystems used by other UNIX operating systems, such as Solaris and AIX,

you will have to do without the performance optimization features. The transfer will complete okay, but you can more or less shake hands with every single byte.

Not Too Innovative!

The installation is fairly painless, that is unless you try to be clever – like I did – and use GCC 3.3 pre to compile the module, completely ignoring the FAQ and casting common sense to the wind, both of which would tend to favor using exactly the same compiler as was used to compile the kernel. The results were frustrating. But in my case, the compilation issue was easily solved by using the right compiler, GCC 3.2 in my case. After unpacking the sources, you can simply enter:

```
make CC=gcc-3.2 && make insmod &
&& make install [3]
```

After a quick check to ensure that the module really has loaded (`lsmod | grep shfs` – okay, it is), you are up and running. Incidentally, the target computer does not need SHFS, the normal SSH daemon is just fine.

My first test will be to mount the `/home/charly` directory from a lab system (called *funghi*). I will be logging on with user account for *charly* on this system, as root is not permitted to log on using SSH on the remote machine:

```
shfsmount charly@funghi &
/home/charly /mnt
```

A Frenzy of File Copying

The important thing to note is that the hostname is not followed by a colon, as is the case for NFS or SMB mount operations (as in `funghi:/home /charly`). `Shfsmount` would expect a port number after the colon. The default port is 22, the standard SSH port, and this is why it was omitted in our example. Mounting proceeded without any glitches, of



course this assumed that I had write privileges in the `/mnt` directory.

To test how robust SHFS is, I mounted the same directory several times, using different mountpoints and started pushing files back and forth like crazy. The results: Of course the performance suffered (and performance is about a third less than if I were to use SCP for file copying), but the whole thing was stable.

As my last feat, I set the SUID bit for `Shfsmount` and `Shfsumount` (`chmod u+s filename`), to provide other users access to other hosts via SHFS. ■

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INFO

[1] SHFS: <http://shfs.sourceforge.net>

[2] LUFFS: <http://lufs.sourceforge.net/lufs/>

[3] You can create packages at this point: `make deb` and `make rpm` will do the trick.

THE AUTHOR

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