Installation Instructions

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See below the instructions for installing the s3fs file encryption and decryption on a fresh install of a new Linux Mint distribution. A number of the instructions have come standard from the course web page and Blackboard. Near the bottom are the important instruction steps that are unique to this project. It is crucial that the steps are followed in order. Typically, the instructions would be to configure the s3fs project first. However, since there have been modifications to the Makefiles, the commands must be executed so that it is first made, installed, then configured.

Next, the steps outline the movement of the included passwd-s3fs file and the secret key. The secret key in my case is a 32 character long password in plain text. There are two function calls that must be changed in the fj2262encrypt.cpp file in the /src/ folder of the /fj2262_s3fs_project directory. Their location is described in the last steps, but you will need to manually change the path to wherever the secret key is saved.

If you already have a base installation of Crypto++ 9, and s3fs 1.74, you can replace the following files:

/src/fdcache.cpp
/src/fdcache.h
/src/Makefile.in
/src/Makefile.am

And add the following files:

/src/fj2262encrypt.cpp
/src/fj2262encrypt.h

However, this method is not recommend as it has not had as much thorough testing as the methods outlined below. If you do believe that you have the necessary FUSE and Crypto++ files and dependencies, skip below to the 'Installation of modified s3fs folder' section and follow the steps outlined there.

Lastly, the source code that I use in the fj2262encrypt.h file calls for the 'cryptopp' directory in /usr/include. If for any reason the /usr/include/cryptopp folder name has been changed and the s3fs project cannot find a /usr/include/cryptopp directory that contains the Crypto++ 9 library, the program will not be able to compile and run.

Installation of FUSE

FUSE was officially merged into the mainstream Linux kernel tree in kernel version 2.6.14. In Ubuntu 10.04, if you typed the following command in a terminal:

fusermount –version

You will find that the current version of FUSE installed in Ubuntu is 2.8.1. To avoid any potential issues caused by version, we will install FUSE 2.8.6, the latest version, to our Ubuntu. We can download the latest code of FUSE in the following address:

http://sourceforge.net/projects/fuse/files/fuse-2.X/2.8.6/
After you download fuse-2.8.6-tar.gz, use the following command to extract the archive and go to the extracted folder:

tar -zxvf fuse-2.8.6-tar.gz
cd fuse-2.8.6

Now executing the following commands to install FUSE 2.8.6 on your Ubuntu. Note that you may need use sudo to execute them.

./configure
make
make install

You should finish the installation of FUSE 2.8.6 by now. Try to type the following command:

fusermount –version

If it returns any version number, you are good to proceed to next section. If there is any error happened during the installation, make sure again that you use sudo to execute the installation commands.

Installation of s3fs

To begin with, you need to first get an Amazon S3 account at the following link:
http://aws.amazon.com/s3/
Before extracting, compiling and installing s3fs, you need to install the prerequisites first. Note that whenever you met a permission denied issue during installation, use sudo.

apt-get install build-essential
apt-get install libfuse-dev
apt-get install libcurl4-openssl-dev
apt-get install libxml2-dev
apt-get install mime-support

Some of the prerequisites may have been installed already, so do not worry if the prompt says 0 package is newly installed.

Installation of Crypto++

In your Ubuntu, you can use the apt-get command to install Crypto++ library into your system. First you need to check which libraries you need to install using the following command:

apt-cache pkgnames | grep -i crypto++

The output will be:

libcrypto++-utils
libcrypto++9
libcrypto++9-dbg

libcrypto++-dev
libcrypto++-doc

After finding 5 packages related to Crypto++, you need to install three of them:

apt-get install libcrypto++9 libcrypto++9-dbg libcrypto++-dev

Remember to use sudo if you have permission problems with apt-get.
After the installation, you will find the following folder:

/usr/include/crypto++ which means you successfully installed the Crypto++ library into your Ubuntu.

Installation of modified s3fs folders

Extract the fj2262_s3fs_project folder to the location of your choice. In this case it will be /home/user/Desktop

Navigate to the /fj2262_s3fs_project folder and view the contents
Move the 'passwd-s3fs' file to the /etc/ folder by entering in:

cp /fj2262_s3fs_project/passwd-s3fs /etc/

Change the security permissions on the password file by entering

Sudo chmod 640 /etc/passwd-s3fs

Next move the secret key file to your documents or another folder of your choosing

cp /fj2262_s3fs_project/mySecretKey.txt /home/user/Documents

Next, modify the fj2262encrypt.cpp file in the /src/ folder of the fj2262_s3fs_project directory.

Change lines 37 and 108 to read the location of the stored secret key

It should read in the following format:

ReturnSecretKey("/home/user/Documents/ mySecretKey.txt", secretKey);

Next, execute the following commands IN THE FOLLOWING ORDER

sudo make
sudo make install
sudo ./configure –prefix=/usr

Finally, mount the bucket via:

sudo /usr/bin/s3fs jonnynaborsfinalbucket /mnt –o allow_other