

The integration of BBFTP with the SAM system

Status Report

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The goal

Goal of the project was configuring and testing a SAM station to use BBFTPⁱ instead of rcp as file transfer method.

What is available

The sam station droide is now configured to use bbftp.

I have set up a cvs repository called bbftp on the CD/ODS cvs area. It includes the original bbftp v1_9_4, the modified code to change the authentication procedure, the bbrcp wrapping script and some documentation. Note that the original bbftp release comes with the libraries libcrypto.a and libz.a for several platforms: these libraries gets corrupted checking them in and out of the cvs repository for reasons that I didn't have time to investigate. If problems occur at building time, the original libraries can be found in the tar ball that bbftp distributes at <http://ccweb.in2p3.fr/bbftp>.

What was done

A new sam station, named droide, was installed and tested on droide.fnal.gov. This station runs master, fss and stager servers. During testing a few inconsistencies in the documentation and running problems were found and are reported later in this document.

BBFTP v1_9_4 was used for this test. The release comes with 2 source packages: the bbftp client and the daemon. The packages built easily on Linux (droide) and IRIX (d0test) (see INSTALL note in the package).

BBFTP was tested running the daemon in background as the sam user looking at port 4021 (the bbftp default port). Note that this port can be easily changed by the use of the flag "-w port_num" for both client and server or by hard coding the port number in the bbftp sources. The bbftp client accepts a list of commands in input from a file only (no user interface is implemented); the commands are very similar to the standard ftp and are well documented in the man pages that come with the package. I couldn't find the man page of the daemon, instead.

The bbftp client can run several parallel tcp streams, performing compression on the fly. By some tests that Michael Diesburg has done, it looks like 7 streams are a good choice for an optimized transfer rate; on the fly compression was also used during the sam tests.

In order to simplify the inclusion of bbftp within sam, I have written a wrapping script that mimics the syntax of rcp. The script writes a temporary file in /tmp that bbftp uses as list of commands. Only the user sam is allowed to use the script. I have performed many tests on this script especially to check the consistency of the exit status (see file TESTS in the cvs repository); for example, if bbftp can connect to the server but tries to transfer a

non existing file, it exits 0 (no error); the wrapping script checks if conditions like these occurs and exits 1 (error). This preserves the sam error handling mechanisms.

This script was renamed rcp and put in the directory `$$SAM_STATION_DIR/bin/` together with bbftp (the client): for the station master the path to the rcp wrapper comes before the unix rcp; this way sam uses bbftp transparently.

Details on the retrieve test

I've created a project named ggtest to retrieve a file cached on the d0test sam station, and the relative python script to be used with sam run project gg_project.py.

I've run the bbftp daemon in background (bbftpd -b) as user sam on d0test.

From droide:

```
> sam run project gg_project.py
```

The file was delivered using bbftp in a transparent way. This is a line from the log file `~sam/station__droide__dev__droide/trace :`

```
02/07/01 16:37:31 droide.SM.SAMINFO 22249:
INFO FileDelivered Station=droide FileName=sim.qcd_02_05.2_1000evts.355-0953-
c5.02
EncpOutput=Using bbftp v.1.9.4 to transfer file.
Starting under pid 22891 on Wed Feb 07 16:37:01
>> USERNAME sam PASS
<< bbftpd version 1.9.4 : OK
>> COMMAND : get /sam/cache1/sam/do_not_erase/sim.qcd_02_05.2_1000evts.355-
0953-c5.02 /sam/cache1/boo/sim.qcd_02_05.2_1000evts.355-0953-c5.02
<< OK 283008482 bytes got in 28.8 secs (9.61e+03 Kbytes/sec or 75.1 Mbits/s)
```

Storing was not tried for problems in writing directly to the cache of d0test.

Open issues: the authentication method

The authentication between the bbftp client and the server is still an open issue. The bbftp daemon supports several authentication methods and protocols (shadow password, security password, AFS, PAM). The daemon looks through the local or yp passwords to authenticate the client. This method can be broken where the Kerberos authentication system is strictly enforced. Finding an alternative way of authenticating the client and the server was not the focus of this test. A final decision on how to cope with this issue from a general point of view has not been taken so far.

The test with sam was performed hard coding the sam password in the client executable. The password was masked character by character to avoid easy ways of finding it out (like using the "strings" command). The user sam was then given a local passwd on d0test.

Problems encountered during the droide sam station testing.

1. The product sam_user v2_2_6 does not have the files globals.py and globals.pyc in `$$SAM_USER_DIR/ v2_2_6/src/python` which are needed by run_project.py in the same directory. The script run_project.py is invoked when issuing a `>sam run project file.py.`
2. The example python script to store motecarlo files, which comes with the product sam_user v2_2_8 (and v2_2_4b), does not work. The error reported is `Code: method unimplemented (Category Operating System)`

3. When storing, the auto-destination does not work. I was using `sam v2_1_2 -q dev` on droide; station, fss and stager `v2_2_6`.
4. Using the web interface to the sam database of data file (development), I have retrieved the file names for the file location `d0test.fnal.gov:/sam/cache1/sam/do_not_erase`; clicking on these file names I've got information for files with a similar but different name; these latest files are not in the database.

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References

ⁱ <http://ccweb.in2p3.fr/bbftp>