

An attempt to optimize bbftp

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The behavior of bbftp is determined **by several parameters:**

- Number of paralel transfer streams (default: 1)
- “On the flight” packet compression during transfer
- Buffer size
- Input/output window size

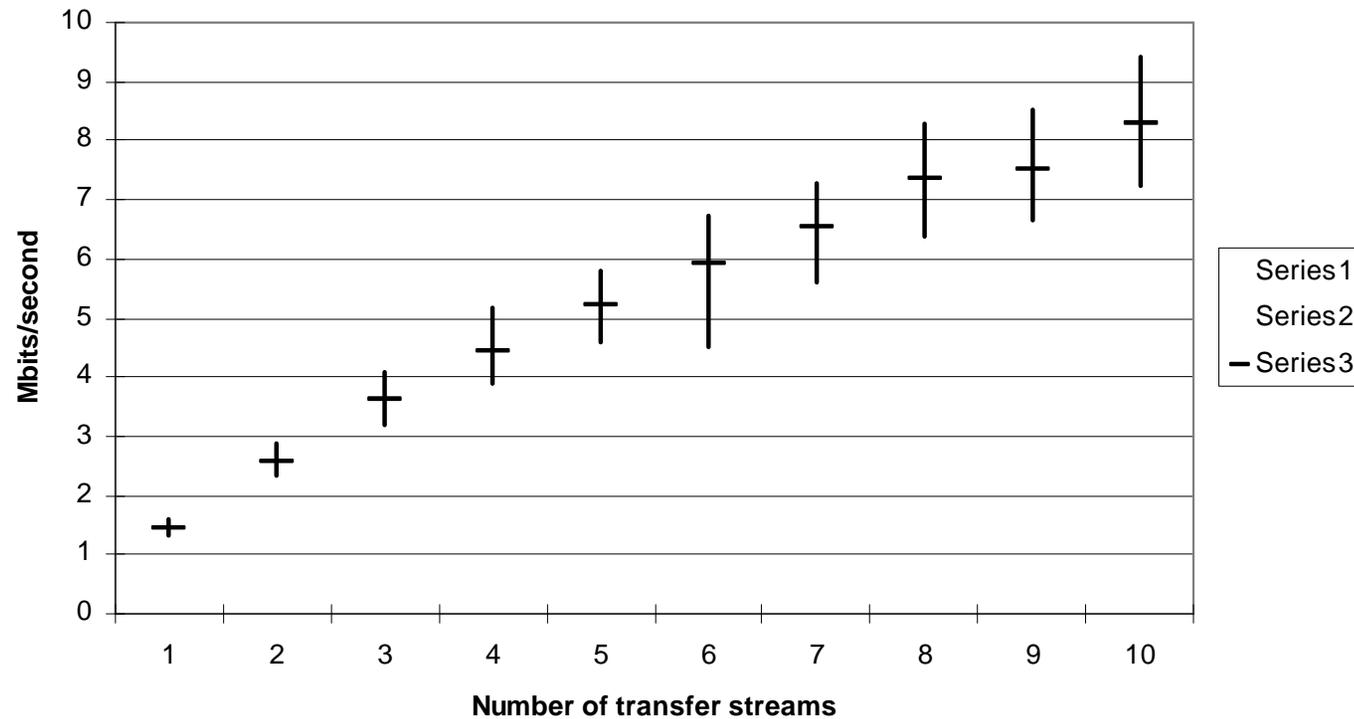
Let us change the parameters and see how it affects transfer rate! Maybe the default settings are not optimal?

Number of parallel transfer streams

- Bbftp can transfer data in parallel streams.
- I transfer a file from hep.uta.edu to d0test.fnal.gov. Each time I change number of parallel streams.
- I do the transfers with and without compressing data
- I repeat them several times, at day and night and average the results

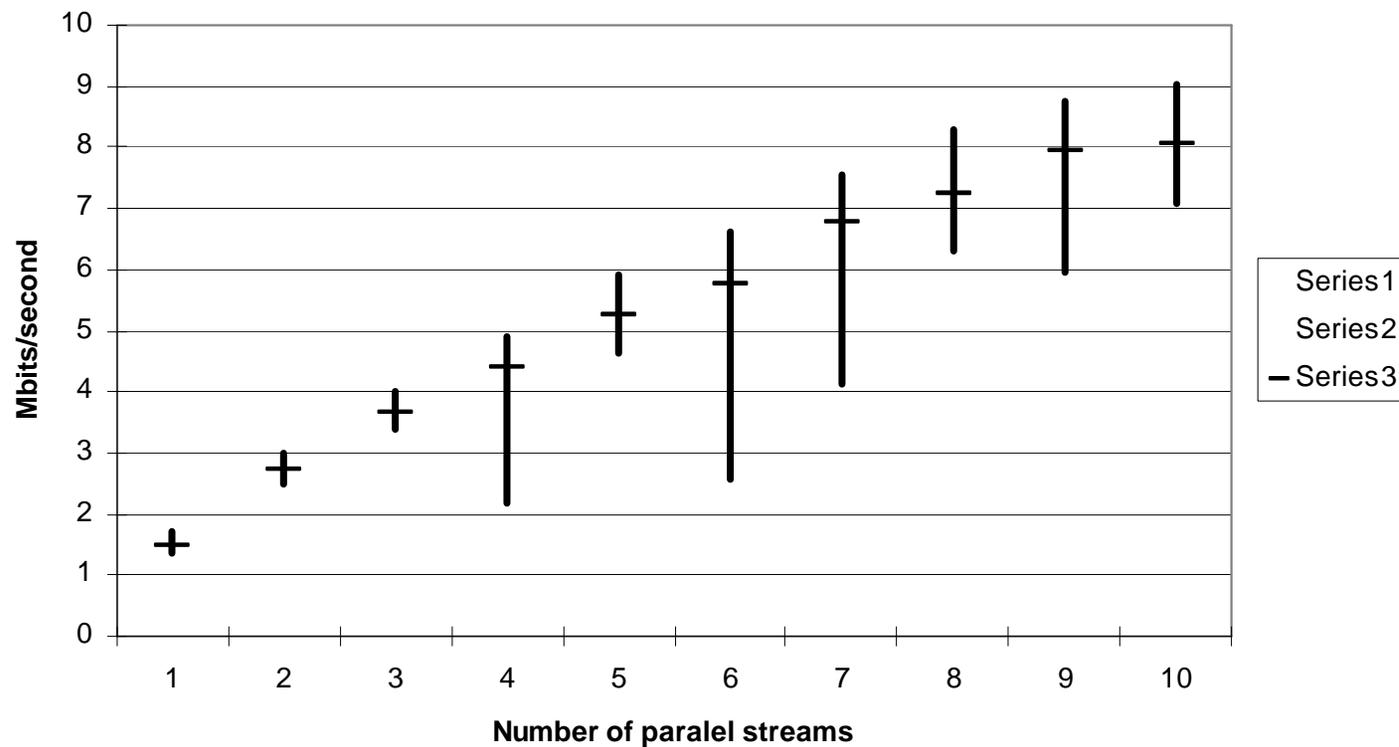
Transfer rate for various number of paralel streams

Transfer rate (without on data compression)



Transfer rate with data compression

transfer rate - with data compression



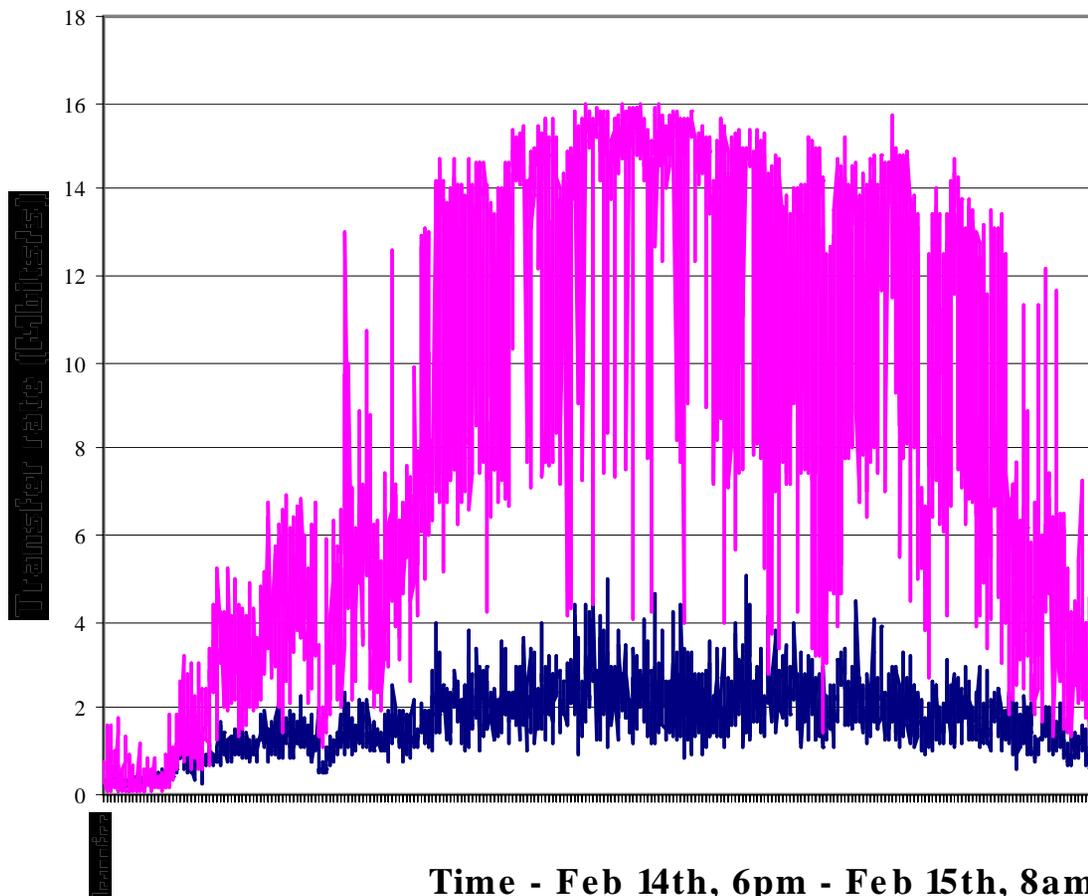
There seems to be no reason to
use data compression during
transfer

Ok, transferring in parallel increased transfer speed
But how about other users? Do they feel the effect?

- **We have made measurement with two users transferring data simultaneously: there was a negligible effect on CPU usage and only small drop in transfer rate.**
- **Right now, as I speak, we are running another test adding users to see when we can saturate the CPU and bandwidth.**
- **Obviously, I do not know result yet.**

Symmetry – how does “put” compare to “get”?

Transfer rate for "get" and "put" directions using



— From d0test
to
hep.uta.edu

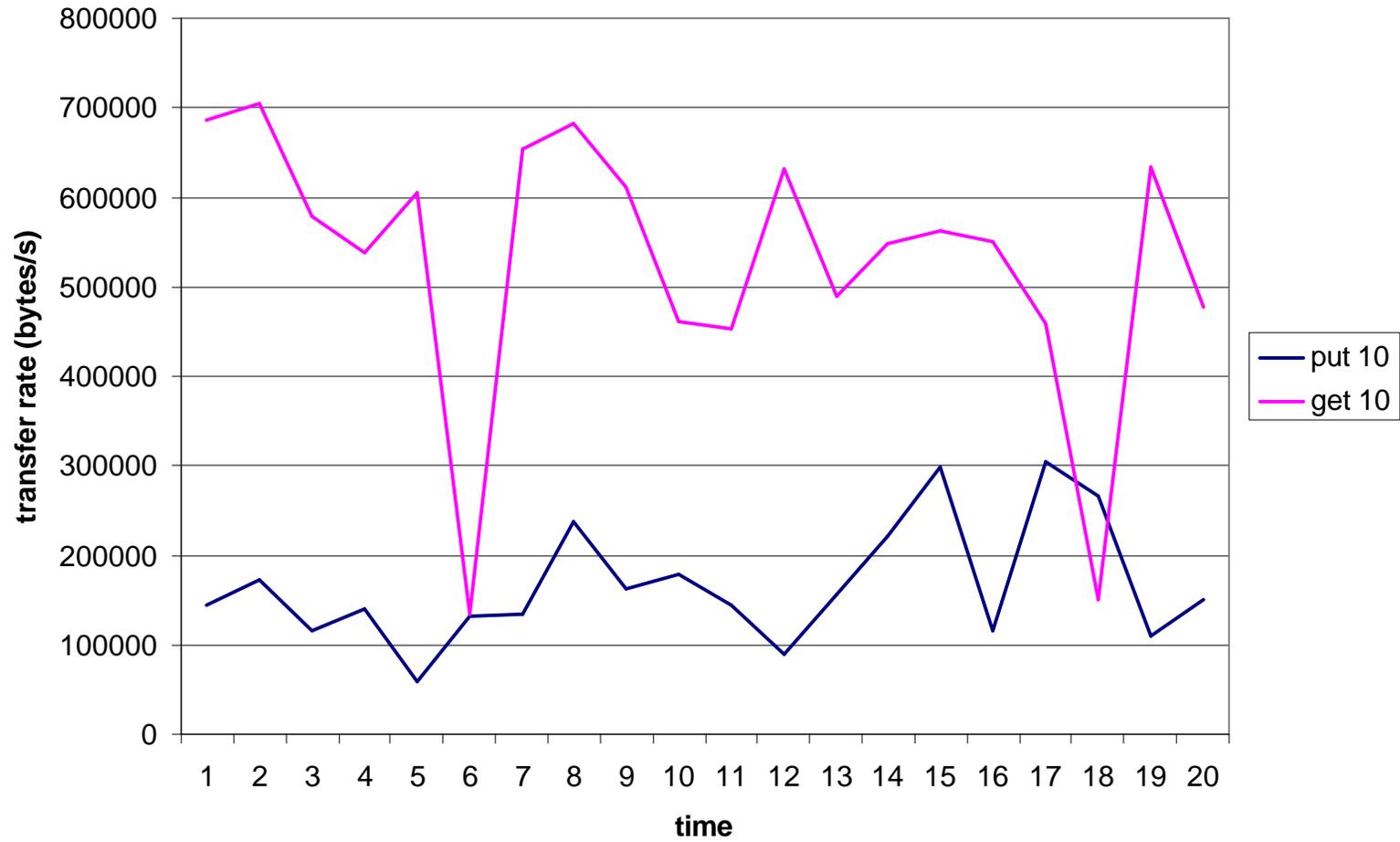
— from
hep.uta.edu
to d0test

Symmetry tests using new bbftp

New bbftp symmetry tests (1 paralel stream)



Symmetry test with 10 paralel streams and new bbftp



Put-get (a)symmetry

- The transfers to and from bbftp server do not seem to be symmetric,
- Direction “get from server” seems to be preferred
- This seems to be true for both old and new bbftp
- Install bbftp server on the machine you would like to export data from

Another parameter which could affect the transfer rate: buffer size.

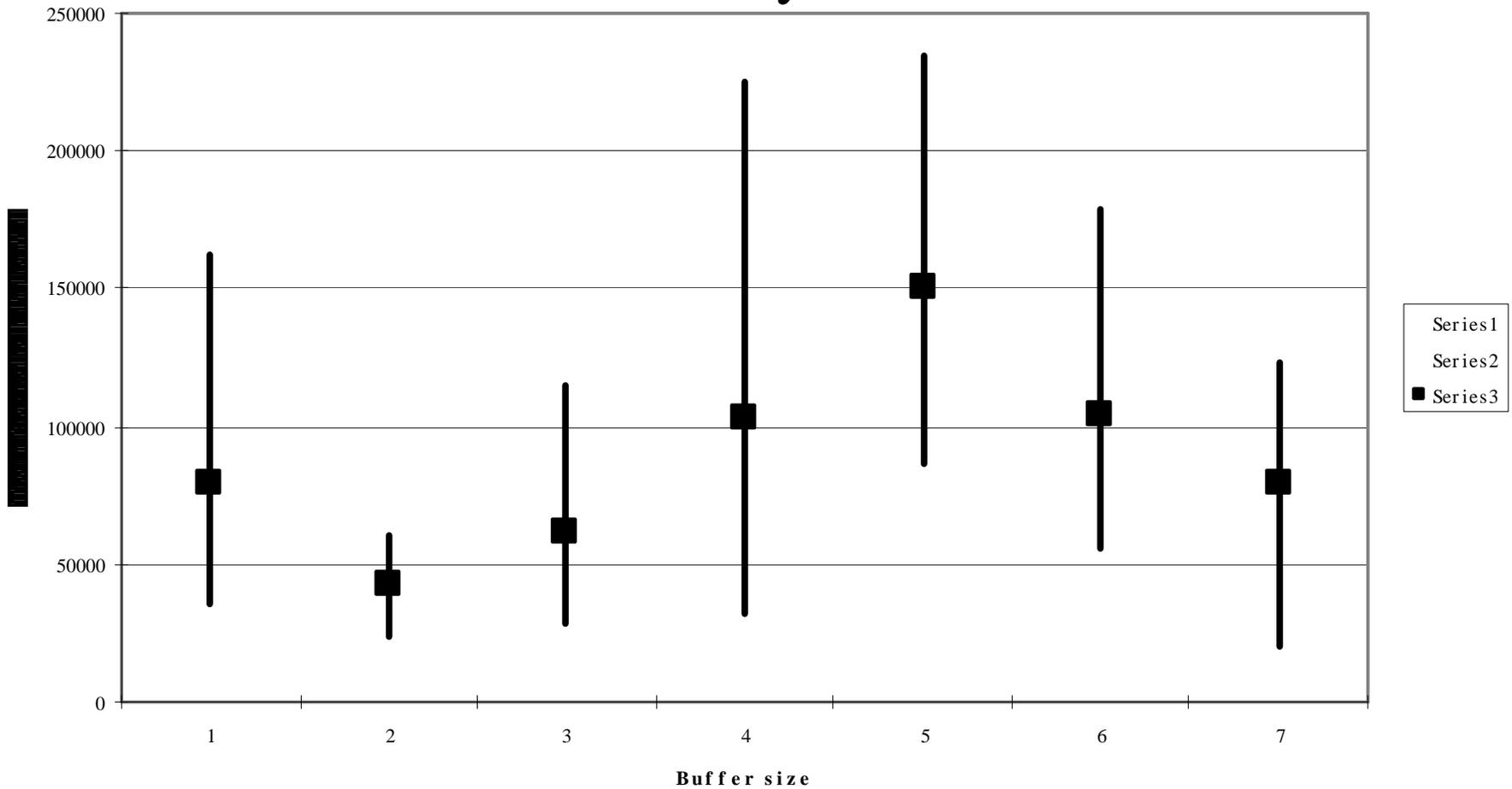
- Problem: bbftp version used in SAM is old and does not allow users to change the buffer size.
- The most recent bbftp version is 2.2.0-beta0 and it allows change of buffer size.
- I have installed bbftp 2.2.0-beta0 client on d0test and server on heppc13.uta.edu and did some tests

Transfer rate as function of buffer size

(1=256;2=512,3=1024;4=2048;5=4096;6=8192;7=16384)

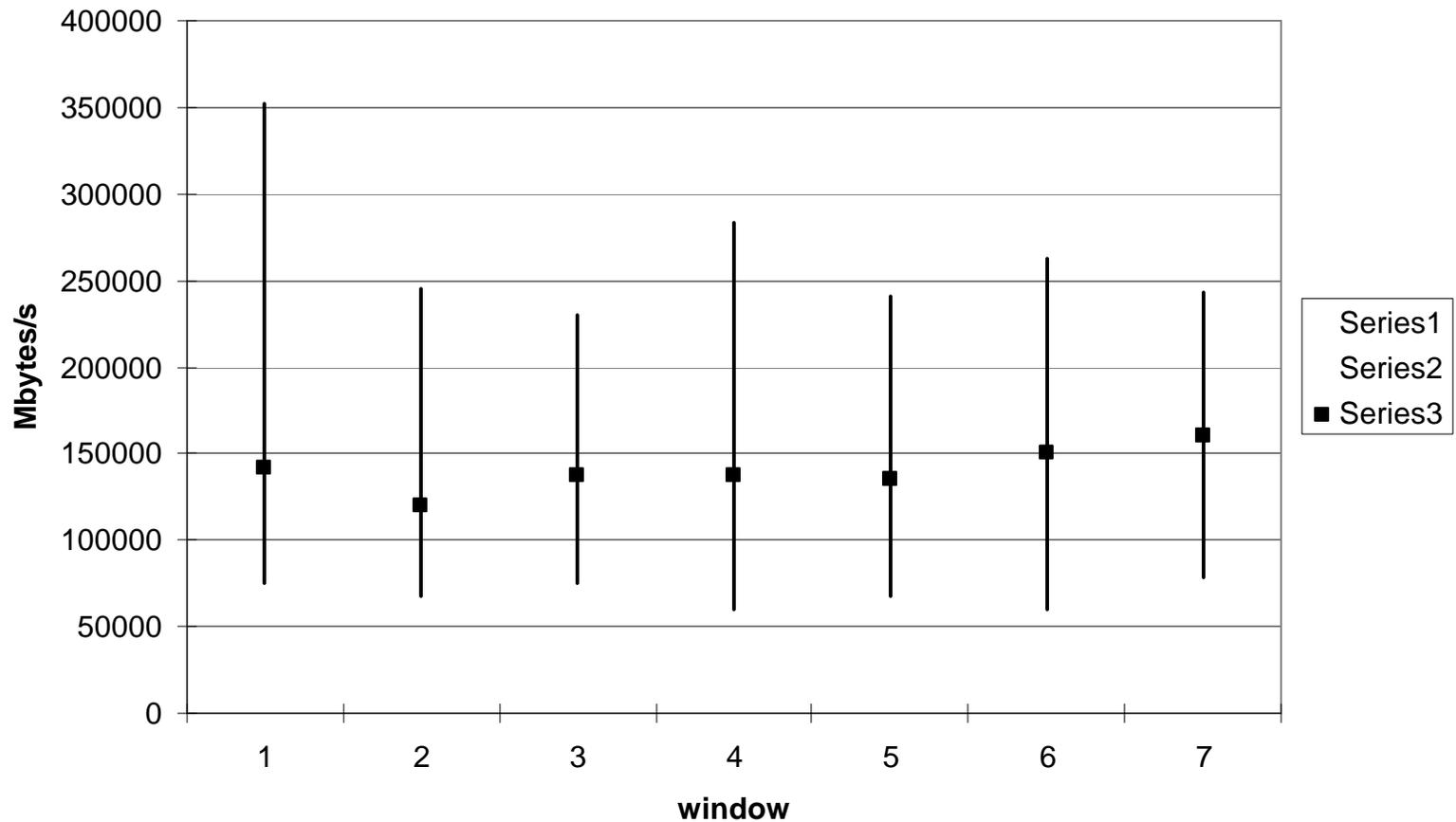
Buffer size effect on transfer rate

2800 kbytes



Changing the window size

Transfer rate as a function of window size
(1=256,2=512,3=1024,3=2048,5=4096,6=8192,6-128000 bytes)



**Changing buffer size does not
have any obvious effect on the
transfer rate**

- Neither does the input/output window size.

How does SAM bbftp compare to bbftp-2.2.0-beta0 (the “cutting edge bbftp”)

It is not possible to compare directly yet.

SAM bbftp runs between hep.uta.edu and d0test

Bbftp-2.2.0-beta0 runs between heppc13.uta.edu and d0test

(I could not install bbftp server on any computer I like)

For the time being I refuse to make a recommendation whether SAM people should or should not upgrade the SAM bbftp.

Conclusions

- **The parallel streams can increase transfer rate by a factor 6-7**
- **The question “how it will affect other users” needs to be more carefully understood. Tests are under way.**
- **No reason to compress data during transfer – it does not help.**
- **changing buffer size does not improve transfer rate**
- **Window size does not affect transfer rate**
- **It is too early to say whether SAM should upgrade bbftp to most recent version.**
- **Put and get transfers are not symmetric!**