

GSoC CernVM-FS

HTTP/2 support

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About Me

- My first year at GSoC,
- sophomore at UC Berkeley,
- Double majoring in *Computer Science* and *Applied Mathematics*.

3 interesting facts about me:

- big fan of open-source software development.
- actively participating in various hackathons.
- co-founder of *Bookseives* - a mobile application startup based out of the San Francisco Bay Area.

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HTTP/2 Support in CernVM-FS

HTTP/2 is the newest version of HTTP network protocol. The **multiplexing of requests and responses** in HTTP/2 technology allows:

- some additional performance improvements,
- escape from head-of-line blocking, which is the biggest issue with respect to the pipelining functionality of HTTP/1.1 protocol.

“**HTTP/2 support**” project is designed to implement some new features in CernVM File System in order to:

- reduce the latency for all data transfers
- automatically decide if parallel connections (HTTP/1.1 on the other end) or multiplexed connections (HTTP/2) should be used.



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We took the implementations related to HTTP/2 from **libcurl**, which is a free client-side URL transfer library. The newest version 7.43.0 of libcurl (the approximate release date is June 17th, 2015) contains:

- the multiplexing feature of HTTP/2 protocol.
- various example codes for efficient utilization of multiplexed requests and responses.

What we have done so far?

We extended our Download Manager of CernVM-FS with:

- two separate interfaces (*Regular_Test* and *Multiplexing_Test*) that make sure that both HTTP/1.1 and HTTP/2 act properly in this software.
 - HTTP/1.1 in *Regular_Test*
 - HTTP/2 in *Multiplexing_Test*
- Integrated new external libraries (the newest version of libcurl and nghttp2) and tools that enable the utilization of multiplexing functionality from HTTP/2 technology.
- Extended the cvmfs download manager by a vectorized interface, so that a number of download jobs can be sent and received at once.
- Helped curl community to debug libcurl's code for the upcoming release of libcurl 7.44.0.

THANK YOU