

CernVM - a Virtual Software Appliance for LHC applications

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CernVM is a Virtual Software Appliance to run physics applications from the LHC experiments at CERN. The virtual appliance provides a complete, portable and easy to install and configure user environment for developing and running LHC data analysis on any end-user computer (laptop, desktop) and on the Grid independently of operating system software and hardware platform (Linux, Windows, MacOS). The aim is to facilitate the installation of the experiment software on an user computer and minimize the number of platforms (compiler-OS combinations) on which experiment software needs to be supported and tested thus reducing the overall cost of software maintenance for LHC.

CernVM Operating System, based on rPath Linux, fits into a compressed file smaller than 100 MB and represents a common platform that can host software frameworks of all four LHC experiments. The experiment software stack is brought into appliance by means of CVMFS, a file system specifically designed for an efficient and 'just in time' software distribution. In this model, the client downloads only necessary binaries and libraries as they get referenced for the first time. By doing that, the amount of software that has to be downloaded in order to run the typical experiment tasks in the Virtual Machine is reduced by an order for magnitude.

In this contribution we describe the architecture and implementation of CernVM and CVMFS as well as plans to evolve CVMFS into content delivery network using combination of P2P and HTTP protocols.

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