



# CernVM Program of Work 2018

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CernVM, Systems, and Services Team Meeting

## CernVM

- Interactive VMs (~300 users)
- CMS OpenData
- ALICE, LHCb MasterClasses
- Cloud  
(HNSciCloud, U.K. VAC, etc.)
  - 650 unique IPs / day
  - 18 000 unique CernVMs / day

## CernVM-FS

- Production software  
(LHC experiments +  
order of 50 other VOs)
- Nightly builds  
(ATLAS, CMS, LHCb, SFT)
- Conditions Data  
(ALICE, LHCb, Belle II)
- Data, i. e. PB volume  
(LIGO, US CMS)
- Containers / OS  
(CernVM, Singularity in Open  
Science Grid)



cvmfs

Settings | Report Duplicate



1

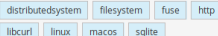
Use This!

Analyzed 12 days ago, based on code collected 12 days ago.

## Project Summary

The CernVM File System

### Tags



## In a Nutshell, cvmfs...

... has had **12,664 commits** made by **31 contributors** representing **205,621 lines of code**

... is mostly written in **C++** with an average number of source code comments

... has a well established, mature codebase maintained by a large development team with **stable Y-O-Y commits**

... took an estimated **54 years of effort** (COCOMO model) starting with its first commit in July, 2011 ending with its most recent commit 17 days ago

## Quick Reference

Project Links: [Homepage](#)  
[Documentation](#)  
[Download](#)  
[Issue Trackers](#)

Code Locations: [git://github.com/cvmfs/cvmfs.git](https://github.com/cvmfs/cvmfs.git)

Similar Projects: maxmods wallbasefs

FUSE libguestfs

Managers: [jblomer](#)

## 2017

RP	Fell	100%
NH	TS	10 months
PJ	TS	2 months
MD	SS	3 months
GG	Staff	
JB	Staff	80%

## 2018 – Possibilities

RP	Fell	100%
	TS	some months
	SS	3 months
	GSoC	3 months
	Stag	few months
GG	Staff	
JB	Staff	80%

Significant outside contributors: BB, DD

1. Maintenance and Support
2. Productizing and Deployment
3. Research and Development
4. Consolidation, Deprecation, Technical Debt Management
5. Dissemination

Statistics from 2017:

- ~ 100 tickets  
JIRA – 80, SNOW – 15, GGUS – a few
- 390 messages on mailing lists  
300 – cvmfs-talk, 90 – cernvm-talk
- 15 CernVM Security Patches
- 1 CernVM-FS major release
- 4 CernVM-FS patch releases

Expect similar load in 2018

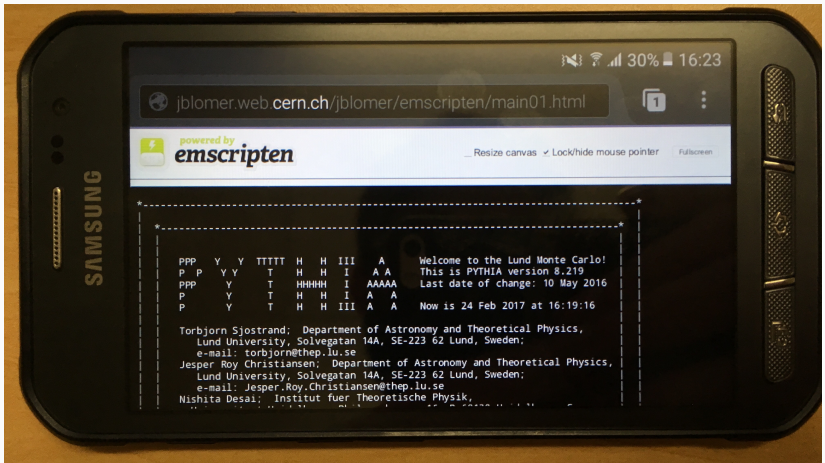
1. [RP, TS] Deployment of the distributed backend  
cernvm-\*.cern.ch, projects.cern.ch, sft[-nightlies].cern.ch
2. [JB, TS] Portals: S3 end points into the repository
  - Necessary for Docker graph driver write support
  - Useful for “end user areas” in repositories  
e.g. /cvmfs/alice.cern.ch/user/j/jblomer
3. [JB, TS] Docker graph driver including  
conversion utility from normal image to thin image
4. [RP] Repository publish-subscribe service  
Rational: clients and stratum 1s can pick-up changes almost immediately
5. [Maybe, cooperation with IT] Containerized CernVM-FS server
  - Disposable container for publishing a single transaction
  - Could turn into *lxcvmfs* cluster

Expect roughly 1 month per item

1. [RP] Content delivery: XRootD as a transport protocol
  - How does XRootD behave with many small files?
  - How can hash verification be added?
2. [RP, JB, HSF] Commercial cloud based storage based on S3 backend
  - How much of the repository transformation operations can be mapped to lambdas?
  - Do we get (near)-instantaneous world-wide replication?
  - At what cost?
3. [Only in cooperation] Containerd and CernVM-FS integration
  - Can containerd start containers from a shared file system?
4. [GSoC] CernVM-FS WebAssembly client
  - Can we run C++ to WebAssembly compiled event generators from CernVM-FS in the browser?

Not aiming at products but at answering open questions





30% 16:23

jblomer.web.cern.ch/jblomer/emscripten/main01.html

powered by  
**emscripten**

\_ Resize canvas ✓ Lock/hide mouse pointer Fullscreen

```
PPP Y Y TTTT H H III A Welcome to the Lund Monte Carlo!
P P Y Y T H H I A A This is PYTHIA version 8.219
PPP Y T HHHH I AAAAA Last date of change: 10 May 2016
P Y T H H I A A
P Y T H H III A A Now is 24 Feb 2017 at 16:19:16
```

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1. [Stag] Consolidation of `cernvm-monitor.cern.ch`, possibility to migrate to central monitoring or OpenShift
2. [Stag] Slim-down and consolidation of `cernvm-online.cern.ch` inquire needs at the workshop
3. [JB] CernVM Launch: decide on set of public contexts, inquire needs at the workshop
4. [Only in cooperation with ATLAS]: bulk extract of contents from CernVM-FS
5. [RP] Integration test setup for macOS
6. [RP, JB] Refactor CernVM-FS server side code, start building well-defined repository transformation API

## 2017

- **Linaro Connect** – CernVM ARM port
- **CurryOn** – CernVM-FS distributed backend
- **International SuperComputing** – CernVM-FS HPC extensions
- **ACAT** – Docker graph driver
- **DockerCon Europe** – Docker graph driver (by IT)
- **CodeMesh** – CernVM-FS distributed backend

## 2018

- CernVM workshop
- pre-GDB on HPC resource utilization
- CHEP
- Technical blog
- Shall we offer a 2h training for release managers?