

@GridPP

@twhyntie

# Engaging with smaller VOs and SMEs

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**#GridPP32, Pitlochry, Scotland**

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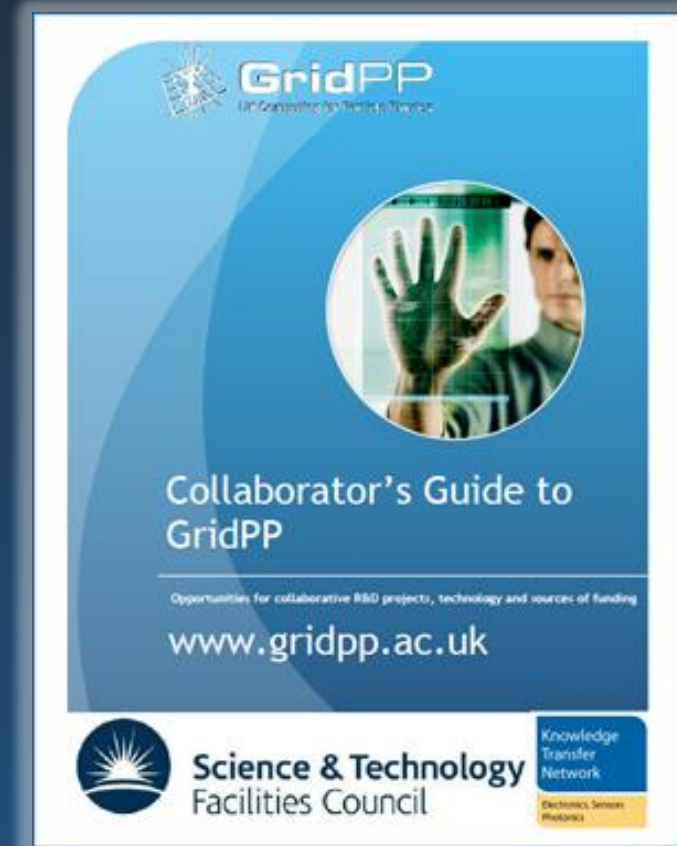
# Engaging with smaller VOs and SMEs

- What we can – and can't – offer smaller VOs and SMEs
- Experiences with smaller VOs
- Experiences with SMEs
- Case study: using CVMFS with CERN@school
- Discussion:
  - *What is the best way for GridPP to support smaller VOs and SMEs?*

# What we can offer

- Computational resources (CEs)
- Storage (SEs)
- Technical expertise and support:
  - *Use of/integration with grid tools:*
    - gLite services, WMS;
    - WebDav, Globus Online, Grid FTP;
    - Ganga, DiRAC;
    - CVMFS, instantUI (see S. Jones' talk next).
  - *High volume data transfer;*
  - *Monitoring;*
  - *Federated identity services.*

Cloud?

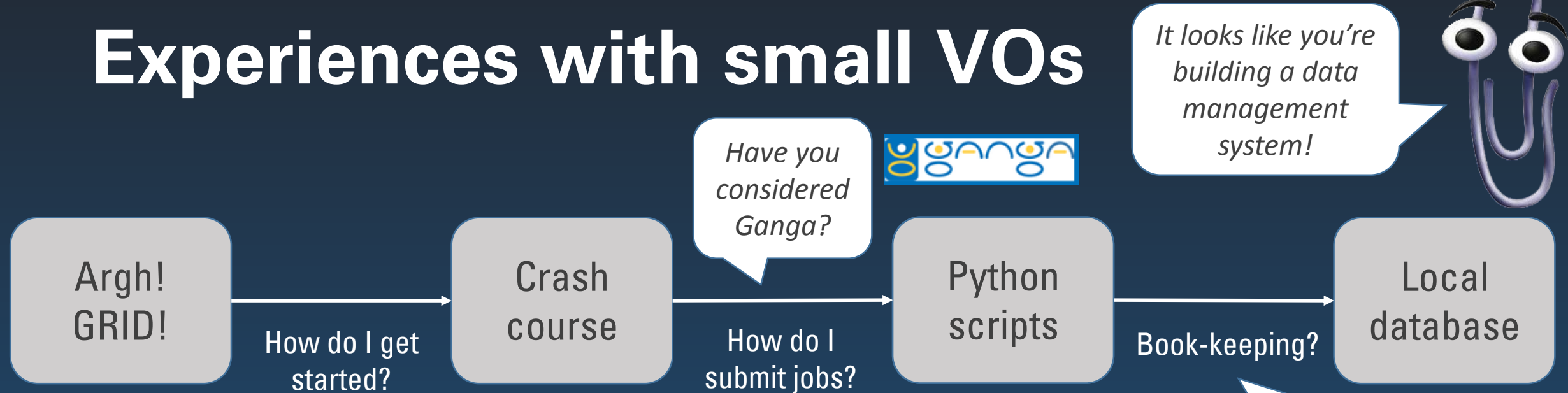


Produced by A. Efimov (KTN)

# What we *can't* offer

- Main-d'œuvre.
- Custom-built tools/solutions.
- How to manage your data.
- Industry:
  - *Resources for revenue-generating services...*
  - *...but could provide resources for pre-revenue R&D.*

# Experiences with small VOs



- Common themes/patterns:

- *Presented with a lot of tools, a lot of options;*
- *Start with whatever is simplest, or whatever works (crash course, JDL files)...*
- *Start writing scripts, maybe introduce Python...*
- *Implement a MySQL database on a local server to track data...*

- What can we do to help?

# Experiences with small VOs

- What can we learn from others?
  - *GitHub* – <http://github.com/twhyntie>, <http://github.com/CERNatschool>;
  - *Ruby on Rails* – e.g. *RailsGuides*, *RailsCasts*;
  - *Software Carpentry* – <http://software-carpentry.org>.

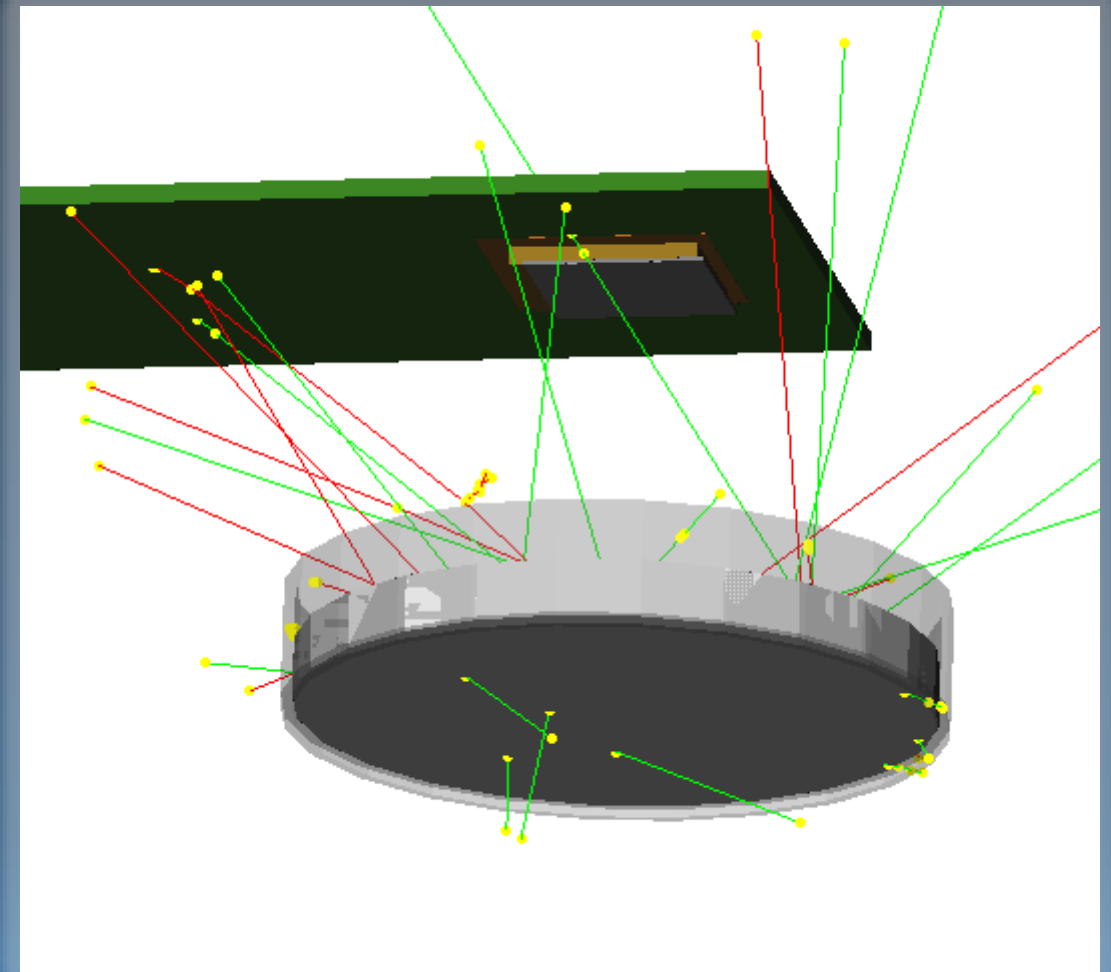
# What are we looking for in an SME?

- Size:
  - *Not too large...*
  - *Not too small...*
- Business model:
  - *Not too open...*
  - *Not too closed...*
- Time to revenue:
  - *Not too early...*
  - *Not too late...*

*A “Goldilocks” problem...*

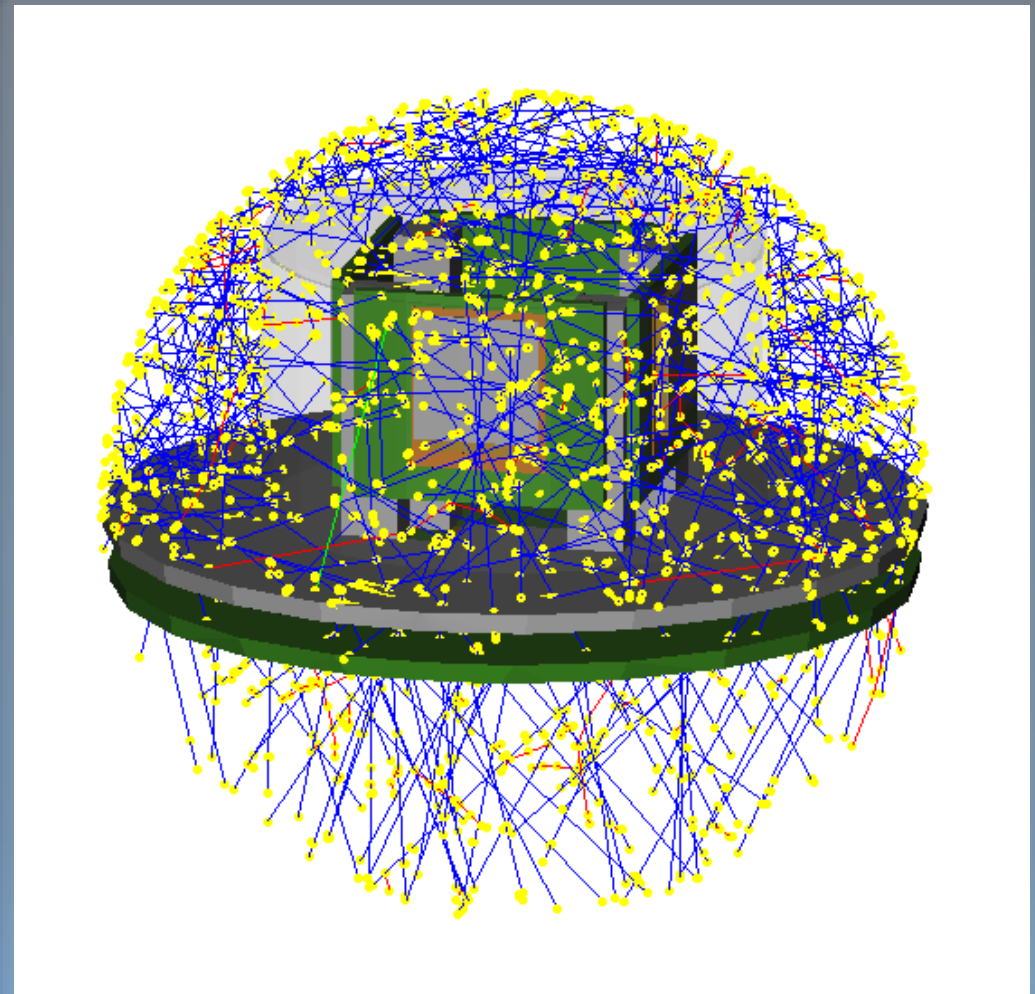
# Case study: CVMFS for CERN@school

- Allpix for CERN@school:
  - *GEANT4 app by J. Idarraga (Medipix Collaboration/CERN);*
  - *Simulates the Timepix hybrid silicon pixel detector;*
  - *Data in ROOT format (based on Mafalda), interfaced to PyROOT;*
  - *Runs in batch mode but visualisation also possible;*
  - *Configuration: GEANT4 macro, XML for geometry, input arguments to the executable.*



# Case study: CVMFS for CERN@school

- Preparing Allpix for CVMFS:
  - *Allpix built in SLC6 with cmake;*
  - *Dependent on GEANT4 and ROOT libraries – also SLC6;*
  - *(All prepared on a CERN VM);*
  - *Create a tarball of everything necessary to run;*
  - *Versioning achieved by numbering the tarball: XXX-YY-ZZ;*
  - *Also include a README.md with the GitHub commit SHA.*



# Case study: CVMFS for CERN@school

CVMFS Stratum-0 Uploader You are logged in as: /C=UK/O=eScience/OU=QueenMaryLondon/L=Physics/CN=tom whyntie

**/cvmfs/cernatschool.gridpp.ac.uk**

project [/cvmfs/cernatschool.gridpp.ac.uk](#)  
mounting point [/cvmfs](#)

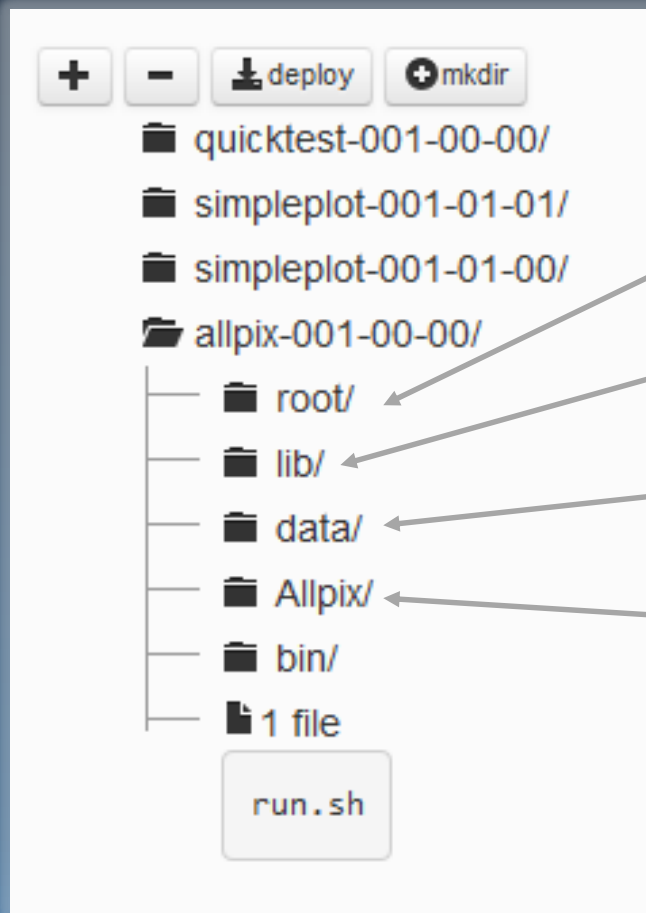
project content

+ -

- 📁 quicktest-001-00-00/
- 📁 simpleplot-001-01-01/
- 📁 simpleplot-001-01-00/
- 📁 allpix-001-00-00/
  - 📁 root/
  - 📁 lib/

uploaded	deployed	error	deleted	name	uploaded at
				<a href="#">quicktest-001-00-00.tgz</a>	23 Mar 2014, 15:36
				<a href="#">quicktest-001-00-00.tgz</a>	23 Mar 2014, 15:34
				<a href="#">allpix-001-00-00.tgz</a>	21 Mar 2014, 15:56
				<a href="#">allpix-001-00-00.tar</a>	21 Mar 2014, 15:26
				<a href="#">simpleplot-001-01-01.tgz</a>	16 Jan 2014, 22:00
				<a href="#">simpleplot-001-01-01.tgz</a>	16 Jan 2014, 14:16
				<a href="#">simpleplot-001-01-01.tgz</a>	16 Jan 2014, 13:48
				<a href="#">simpleplot-001-01-00.tgz</a>	20 Dec 2013, 18:49

# Case study: CVMFS for CERN@school



ROOT lib/, etc/, bin/ from SLC6 binaries

GEANT4 libraries from SLC6 binaries

GEANT4 data required by the simulation

Allpix files built on SLC6

```
tar -czf allpix-001-00-00.tgz allpix-001-00-00/
```

# Case study: CVMFS for CERN@school

```
/c/c/a/run.sh
#!/bin/bash
export LD_LIBRARY_PATH=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/lib/:/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/root/lib/:
SLD_LIBRARY_PATH
export PATH=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/:/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/bin:$PATH
source /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/root/bin/thisroot.sh

# GEANT4 interaction data
export G4LEDDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/G4EML0W6.32/
export G4LEVELGAMMADATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/PhotonEvaporation2.3/
export G4NEUTRONHPDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/G4NDL4.2/
export G4NEUTRONXSDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/G4NEUTRONXS1.2/
export G4PIIDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/G4PII1.3/
export G4RADIOACTIVEDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/RadioactiveDecay3.6/
export G4REALSURFACEDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/RealSurface1.0/
export G4SAIDXSDATA=/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/data/G4SAIDDATA1.1/

#/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix-build/allpix /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix-build/
macros/LUCID_batch.in /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix-build/models/cernatschool.xml ./ lucidtest 1000 1000 -1
/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix-build/allpix $1 /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix-build/
models/cernatschool.xml $2 $3 $4 $5 -1
```

**run.sh:** set the environment variables (`$LD_LIBRARY_PATH`, `$PATH`), call `thisroot.sh`, set the GEANT4 data locations, call the `allpix` executable (with input arguments...).

# Case study: CVMFS for CERN@school

```
runallpix.jdl
# Allpix test with CVMFS
Executable = "/bin/sh";
Arguments = "/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/run.sh /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix/allpix/macros/
LUCID_batch.in ./ gridtest 1000 1000";
StdOutput = "stdout.txt";
StdError = "stderr.txt";
OutputSandbox = {"stdout.txt", "stderr.txt", "H06-W0087_gridtest_0000000001.root", "H09-W0094_gridtest_0000000001.root", "F05-
W0087_gridtest_0000000001.root", "H06-W0088_gridtest_0000000001.root", "J08-W0094_gridtest_0000000001.root"};
#
```

- So a simple JDL file for running: executes run.sh with run.sh (full path) and input arguments as “Arguments”; retrieves the ROOT files, output and error messages.
- Allpix has been deployed with CVMFS and run on CERN@school-enabled sites – hurrah!

# Case study: CVMFS for CERN@school

The screenshot shows a GitHub repository page for 'twwhyntie / gridtester01'. At the top, it indicates the repository is 'PUBLIC' and shows 1 Unwatch, 0 Stars, and 0 Forks. Below this, the current branch is 'master' and the file being viewed is 'gridtester01 / runallpix.jdl'. A commit by 'twwhyntie' is shown, dated 'a minute ago', with the message 'Added allpix JDL file.' and 1 contributor. The file details show it is 8 lines (7 sloc) and 0.519 kb. Action buttons include Open, Edit, Raw, Blame, History, and Delete. The code content is as follows:

```
1 # Allpix test with CVMFS
2 Executable = "/bin/sh";
3 Arguments = "/cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/run.sh /cvmfs/cernatschool.gridpp.ac.uk/allpix-001-00-00/Allpix
4 StdOutput = "stdout.txt";
5 StdError = "stderr.txt";
6 OutputSandbox = {"stdout.txt", "stderr.txt", "H06-W0087_gridtest_0000000001.root", "H09-W0094_gridtest_0000000001.root", "F05-
7 #
```

# Case study: CVMFS for CERN@school

- Headline summary – ça marche!
- Reasons for success:
  - *Very easy to use - particularly like the web interface (Bootstrap);*
  - *Versioning simple to implement (and can map to GitHub SHA);*
  - *Fantastic support from GridPP.*
- Next steps (for me):
  - *Documentation – with a fully worked example.*
- Similar story with instantUI (see Steve's talk next) - ça marche!
  - *Actually used a CERN SLC6 VM. Could we use GridPP cloud VMs for this too?*
  - *Dan Traynor has set up CloudStack at QML (isolated) – VMs for new users?*

# Discussion: how best can we help?

- What can we offer small VOs and SMEs?
  - *Quite a lot – resources, technical expertise and support...*
  - *...but we can't do their jobs for them.*
- Smaller VOs:
  - *We heard some great success stories from non-LHC VOs;*
  - *Is there more we can do, particularly in the early stages? Documentation?*
- SMEs:
  - *What can we offer? Testbeds, Cloud resources, workshops?*
- Learn from CVMFS successes in other areas?
  - *Data management? Book-keeping tools?*

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# Thanks for listening!

## *Any questions?*

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