

# Status of setting up CernVM for use with AliEn

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# Introduction - purpose

- The purpose of this project is examining the viability of CernVM for use as compute nodes in AliEn
  - Exploratory only
- Two primary purposes
  - Homogenization of execution environment (and easier handling of applications)
  - Facility for interfacing AliEn with NorduGrid

# Challenges/Topics of Interest

- Performance loss – since applications such as AliRoot are CPU and memory critical, how will they perform in a virtualized environment?
- Configuration of AliEn testbed
  - It is necessary to set up a local version of AliEn central services (as well as a VO), as we obviously do not wish to interfere with normal AliEn operation
- Determining how to deploy jobs
  - Send to running VMs or deploy whole image?

# Already existing benchmarks

- A series of benchmarks have previously been published at the CernVM site
  - <http://cernvm.web.cern.ch/cernvm/index.cgi?page=E>
  - Series of benchmarks using synthetic tools, such as nbench (cpu), bonnie (disk io) and a mmu benchmark.
  - Also ROOT stresshpix and AliRoot simulation/reconstruction

# Benchmarks

- Have run some separate benchmarks using AliRoot's ppbench as well as PbPb tests
  - These are suites of simulations working on OCDB data
- Examined running time as well as page faults and peak memory usage

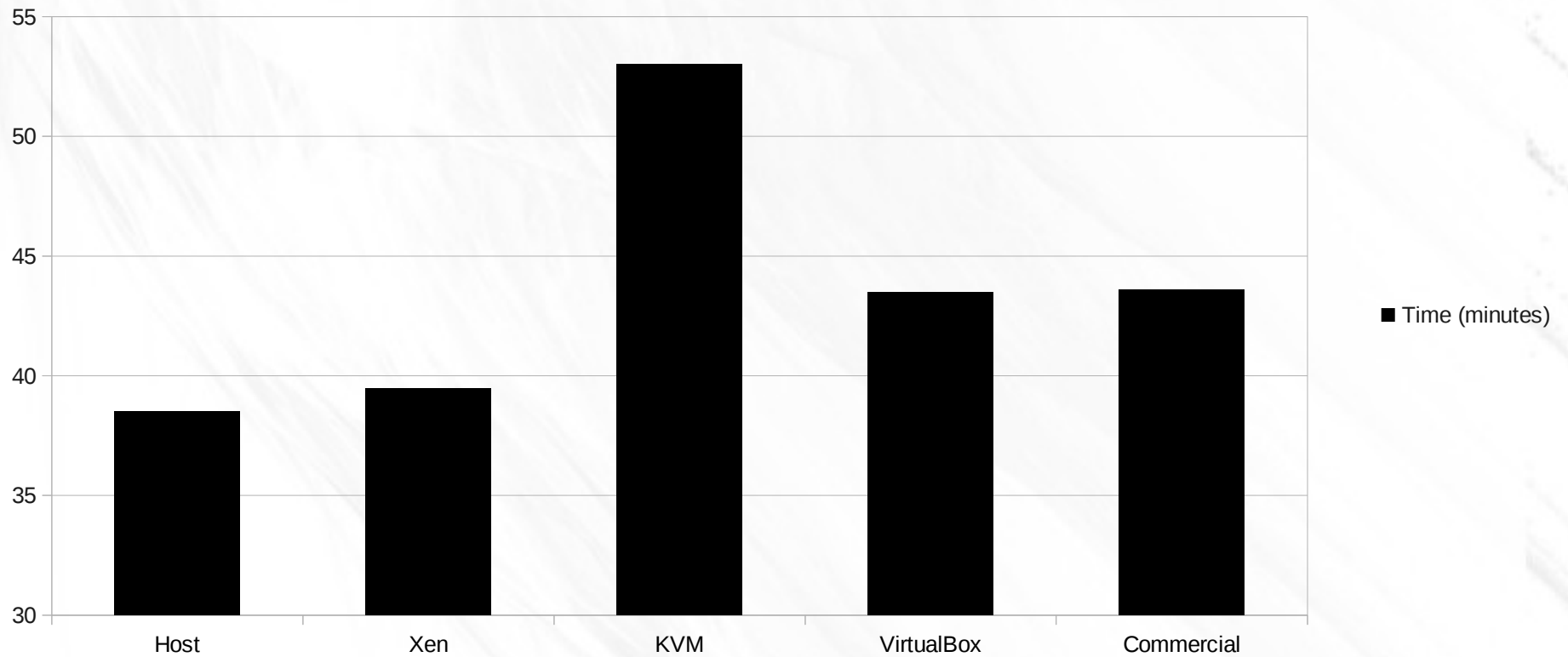
# Benchmarks

- Used four different hypervisors
  - Xen
  - VirtualBox
  - Commercial
  - KVM
- Host system: AMD Phenom X6 @ 4.0 GHz, 8GB DDR3 @ 1333 MHz, 6Gbps disk speed
- Host OS: Ubuntu 10.10

# Benchmarks

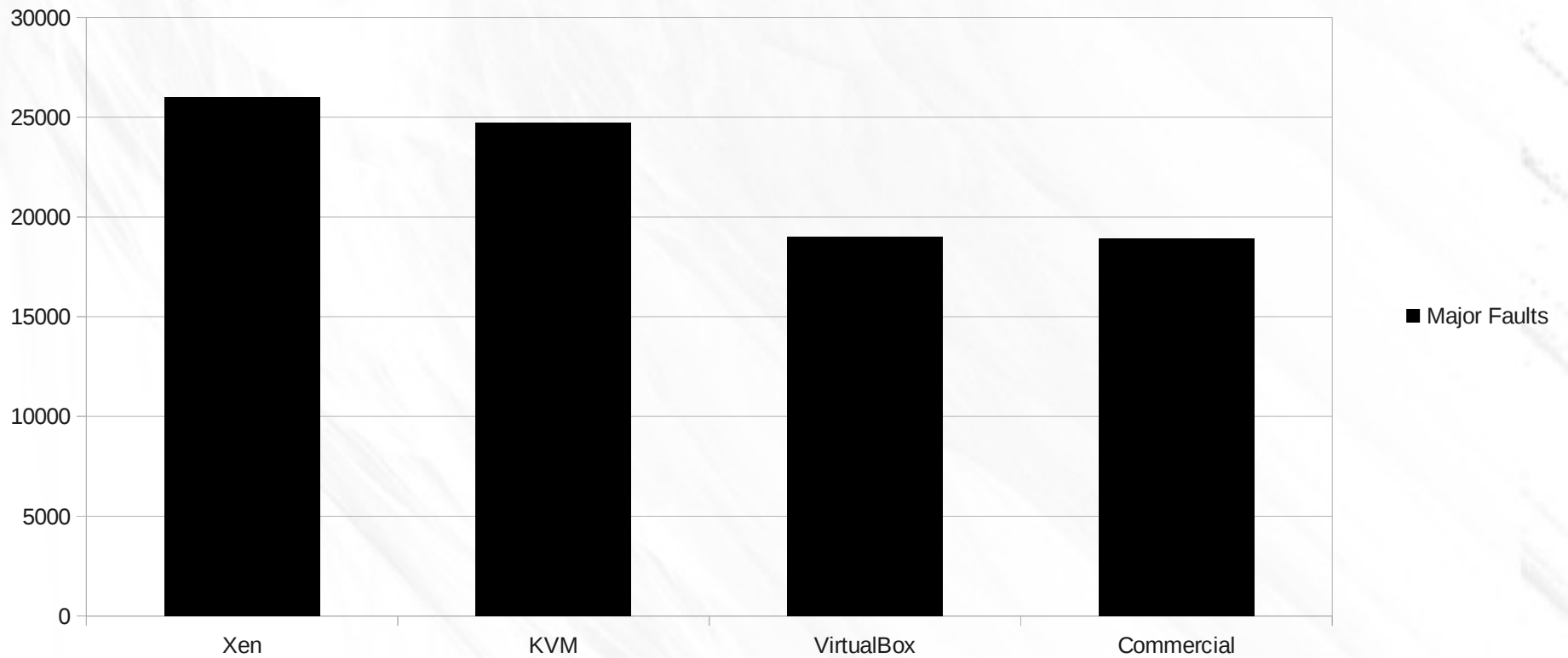
- Software used:
  - AliRoot v4-21-16-AN
  - ROOT v5-27-06b
  - GEANT3 v1-11-21
- VM Resources: 1024 MB RAM, 1 CPU
- Measurement method
  - Primarily bash scripts combining UNIX time, date and ps commands
  - Examined other options such as Valgrind, but found it to be overkill when all that was really desired was performance of existing app

# PPBench – Running time





# PPBench – major page faults



# AliEn

- Setting up a local AliEn testbed has been non-trivial
- Used notes from previous work by Philippe Gros

# AliEn testbed

- Current setup: CS running VO-box services
  - CE and PackMan set up, setting up xrootd SE
- Want to do this:
  - Desirable to have users able to connect through aliensh. May currently only connect as admin using the “alien”-command (using password)

# AliEn Testbed

- Current aliensh-problem..
  - Alien-token-init does not work, producing following error message:
    - 110127 15:40:18 18184 XrdLink: Unable to send to bbr090.19164:36@alien; bad address
    - 110127 15:40:18 18184 XrootdXeq: bbr090.19164:36@alien disc 0:00:00 (send failure)
- Also, in ClusterMonitor.log:
  - Mar 8 13:01:00 debug 1 AliEn::Config -> Warning: no ApiService defined for your site
- Note that authentication does seem to be working properly.

# Further work

- Finish setup of AliEn testbed
  - Some work remains, but progress being made..
- Use CernVM as/on compute nodes
- Explore different ways of distributing jobs
  - Distribute jobs to already-running virtual machines?
  - Deploy entire image (disk and bandwidth heavy?)
    - The prior alternative seems more viable in the case of CernVM. Disk images tend to be of a size largely prohibitive of the latter. Running VM can balloon and deflate as needed anyway.

# Further Work

- Goal is to measure performance of jobs running in the AliEn system using (and not using, for comparison) CernVM.
- Note that this might be accomplishable with the current setup (just submit the jobs as an admin), should aliensh prove troublesome to fully configure. Still, would prefer to get aliensh working.

# Acknowledgement

- Bjarte Kileng – Much of the AliEn work
- Håvard Helstrup
- Philippe Gros – AliEn notes