



CernVM(FS) activities in Taiwan

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About ASGC

- ASGC is WLCG tier 1 grid center for Atlas and also one of stratum-1 for cvmfs federation in Asia.
- We are working on world-wide grid, HPC and local cloud.



CernVMFS for Grid and distributed resources in Taiwan & Asia



CernVMFS + Grid in Asia

- In Taiwan and Asia, there are several WLCG activities.
- And also some other EGI VO activities:
 - Biomed, enmr
- Those applications are distributed by Grid and well maintained by WLCG, EGI or OSG infrastructure.
- Before we have CVMFS, to maintain software deployment at cluster could be somewhat painful...
 - e.g. the scalability issue for NFS.
- CVMFS really does a lot of help for scaling up resource and simplifying software deployment



CernVMFS deployment in Taiwan

- This give us motivation to maintain cvmfs stratum-1 in Taiwan.
 - And then, extend the cvmfs service to other applications.
- Brilliant thing is, we don't actually need very powerful H/W for cvmfs repository
 - VM + ceph rbd should serve most of conditions.
 - But there is always software syncing latency when mirroring LHC software from stratum-0....
 - Maybe it's caused by long network latency or what
 - Still need to be understood...



Who uses CernVMFS in Taiwan

- We also have several science applications in various scales.
 - e.g. AMS, earth science, climate change, weather research & forecasting, .. ETC
- They can either run on Grid or simply to batch clusters.
- They all need to deploy software while they need to extend their resource to different data center.
- **This makes CVMFS to be valuable, while we are dealing with software deployment to distributed resources without very strict agreement on infrastructure layer.**



CernVMFS activities in Taiwan

- **Now, the CVMFS infrastructure is widely used in our computer infrastructure.**
 - Grid job(HTC), parallel MPI jobs(HPC)
 - Put binaries, libraries to CVMFS and distribute them as much as we could...
 - Databases.(update less, read a lot)
 - For the clusters without Internet access will still need some efforts.
 - Need to setup NAT, local http proxy....
- So far so good. :)

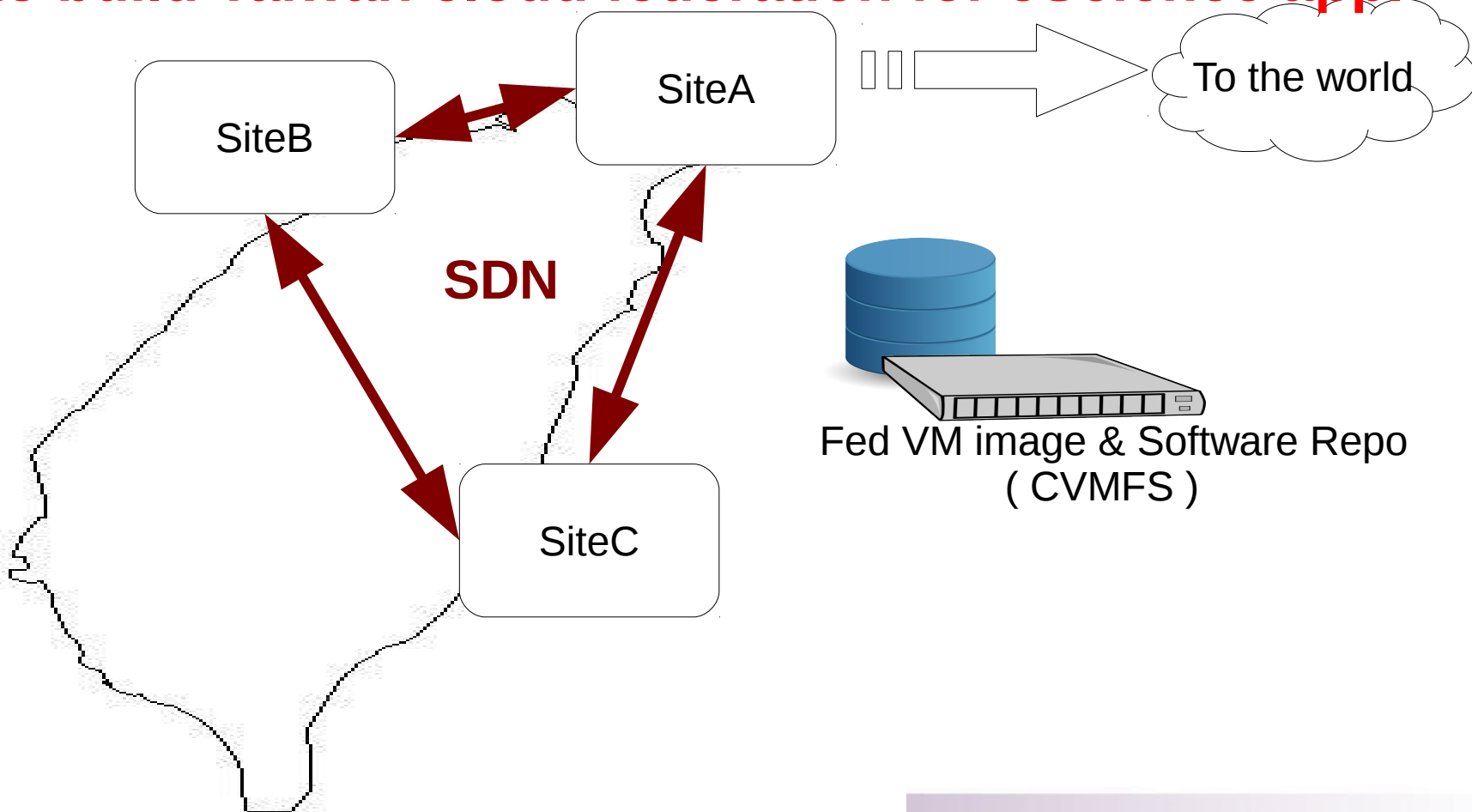


CernVM + CernVMFS for Cloud



Cloud activities in Taiwan

- Cloud federation in Taiwan
 - **CernVM3 and CVMFS are parts of our infrastructure to build Taiwan cloud federation for eScience app.**





CernVM3 performance

- CVM3 is slightly better than physical worker node in SL6.(2~5%)
 - Haven't done fully evaluation/benchmark yet, but
 - It results that CVM3 can process more events with the same cputime for AMS jobs. :)
 - Hardware platforms are the same(Dell C6220, Intel E5-2630L, 6 cores * 2, per core memory is 4GB)
 - **Maybe kernel 3.10 does the trick, but it's awesome.**
- AUFS I/O performance is rather poor(30MB/s) though.. :(
 - Virt-IO with ext4 can easily get 90MB/s.



What do we miss so far?

- CVMFS
 - Some database files are larger than 4GB.
 - Cvmfs single file can't exceed 4GB
 - Is this still the case?
- ACL?
 - Some applications don't want to be widely accessible.
 - We could only use different repo with different cvmfs public key to control access, but
 - Once repo is deployed to cluster, there is no way to avoid access from users....



Remark

- CernVM+ CernVMFS are working well now for our cloud federation & world-wide grid in Taiwan.
 - It really makes my life easy.. :)
- Setup cvmfs to supercomputer centers where have strict Internet access that still need some works(mostly, it's just polical issue)..
- Not all of applications & softwares can be put into cvmfs repo.
 - Single but big file.
 - Commercial software with license issue
 - Matlab, intel mpi..