Singularity tests

ADC TIM at CERN
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Singularity tests

- We use cloud openstack testbed plaform at CC-IN2P3

- Configuration based on CernVM4 beta version → **SL 7.3** (Nitrogen) with Kernel **4.1.34.22.cernvm.x86_64**

- Singularity version **2.2.1** from cernvm (Feb 2017)

  - enable overlay = yes

  - allow setuid = yes

  - -rwsr-xr-x 1 root root 111632 Feb 14 2017 sexec-suid

- We use htcondor but the results and observation could be generalized to other batch system

  - I n order to run singularity, We did not use batch specific features.

- Our intention is to check the CHROOT capabilities of singularity and mount not a image but change root / on cvmfs OS tree catalog. (e.g for SL6 we could you the tree of production cervm3)

  - This option is reported from Brian Paul Bockelman with a custom made tree OS in OSG cvmfs repo.

Singularity Configuration

- **4.1.34.22.cernvm.x86_64**

- **Vanila kernel from cernvm**

- **allow setuid = yes**
- **allow pid ns = yes**
- **enable overlay = yes**
- config passwd = yes
- config group = yes
- config resolv_conf = yes
- **mount proc = yes**
- mount sys = yes
- mount dev = yes
- mount home = yes
- mount tmp = yes
- mount hostfs = no
- bind path = /etc/hosts
- user bind control = yes
- mount slave = yes
- container dir = /var/singularity/mnt

Tests

- We setup two panda resources :
  - **IN2P3-CC-T3_VM01_SL7**
    - Single Core queue
    - catchall null
    - xrdcp for stage-in, gfalcopy tool for stage-out
  - **IN2P3-CC-T3_VM02_SL7**
    - Single Core queue
    - singularity_options='-B /cvmfs,**/var/lib/condor** –contain'
    - **gfalcopy tool for stage in/out**
  - **Tests with HC template 929**

Atlas Pilot and Singularity

- **Wrapper (WN SL7 env - python 2.7)**

  - **Pilot (WN SL7 env - python 2.7)**

    - **Stage-in (WN SL7 env - python 2.7)**

      - **Atlas job payload on native OS (WN SL7 env - python 2.7)**
      - Altas job Payload on singulariry ????
      - (WN SL6 environnement python 2.6)

    - **Stage-out (WN SL7 env- python 2.7)**

CCIN2P3

gfal-copy ?

- 2017-09-20 22:47:53| 12067|base.py | WARNING: [is_stagein=False] Stage file command (export workdir=/var/lib/condor/execute/dir_32037/condorg_HtkPERuj/pilot3/Panda_Pilot_12067_1505946823; **singularity exec -B /cvmfs,/var/lib/condor,${workdir} --contain /cvmfs/atlas.cern.ch/repo/images/singularity/x86_64-slc6.img /bin/bash -c 'cd $workdir;pwd;gfal-copy** --verbose -p -f -t 3000 -D \\"SRM PLUGIN:TURL_PROTOCOLS=gsiftp\\" -S ATLASDATADISK file:///var/lib/condor/execute/dir_32037/condorg_HtkPERuj/pilot3/Panda_Pilot_12067_1505946823/ae5be5c9-dc78-466d-8495-e5d8c5c0d8be_31784.1.job.log.tgz srm://ccsrm.in2p3.fr:8443/srm/managerv2?SFN=/pnfs/in2p3.fr/data/atlas/atlasdatadisk/rucio/hc_test/56/77/ae5be5c9-dc78-466d-8495-e5d8c5c0d8be_31784.1.job.log.tgz') failed: Status=1 Output=/var/lib/condor/execute/dir_32037/condorg_HtkPERuj/pilot3/Panda_Pilot_12067_1505946823 Traceback (most recent call last):   File \"/cvmfs/grid.cern.ch/centos7-wn-preview-v02/usr/bin/gfal-copy\", line 8, in <module>   from gfal2_util.shell import Gfal2Shell   File \"**/cvmfs/grid.cern.ch/centos7-wn-preview-v02/usr/lib/python2.7/site-packages/gfal2_util/shell.py**\", line 23, in <module>   from base import CommandBase   File \"/cvmfs/grid.cern.ch/centos7-wn-preview-v02/usr/lib/python2.7/site-packages/gfal2_util/base.py\", line 32, in <module>   import gfal2 ImportError: **libboost_python-mt.so.1.53.0:** cannot open shared object file: No such file or directory

- Looks that the stage-in is running in the container with not the correct python env.

Manual tests

- In CernVM SL7 we setup a WN profile for
  - /cvmfs/grid.cern.ch/centos7-wn-preview-v02
- singularity exec -B /cvmfs,/var/lib/condor --contain /cvmfs/atlas.cern.ch/repo/images/singularity/x86_64-slc6.img
  - WARNING: Skipping user bind, non existant bind point (directory) in container: '/var/lib/condor'

  Singularity.x86_64-slc6.img> which python
  - **/cvmfs/grid.cern.ch/centos7-wn-preview-v02/usr/bin/python**

- source $AtlasSetup/scripts/asetup.sh AtlasProduction,19.2.3.6,notest --platform **x86_64-slc6-gcc47-opt**
- python: error while loading shared libraries: **libpython2.7.so.1.0: cannot open shared object file:** No such file or directory

Next steps

- The intention is to run singularity without batch system specifics

- Check the stability of chroot over cvmfs

- Check the traffic of chroot over cvmfs vs a native image

- Check the calculation memory for a job : all process tree (e.g. getrlimit / setrlimit and cgroups)