Simulation capabilities @CNAF

N. Terranova (INFN-CNAF)

 n_TOF meeting, Bologna12--13November 2018

Dipartimento di Fisica e Astronomia, (DIFA)

$\overline{ ext{CV}}$

- MsC in Energy and Nuclear Engineering @UniBO (2012);
- PhD in Nuclear Engineering @UniBO+CEA(Cadarache): thesis on FY covariances (NEA-WPEC-SG37) and UQ for reactor applications (2016) (CONRAD, APOLLO2);
- Post-Doc @CEA(Saclay): Monte Carlo methods for sensitivity analyses (2017) (TRIPOLI4);
- Fixed-term research fellow @INFN-CNAF(Bologna): Software development for middleware applications.

Plan

Available calculation resources

A proposal for code versioning

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CNAF presentation

CNAF Tier1 Data Center:

- 390kHS06 CPU power
- 40000 cores
- 34PB disk
- 52PB tape



From: https://www.cnaf.infn.it/calcolo/



From: D. Salomoni, Introduction to DevOps course.

CNAF presentation (cont'd)

Cloud@CNAF

- Some resources of cloud computing are separated from the large part of Tier1 farming;
- Physical or virtualized resources;
- More flexible for smaller needs (experiments);
- HPC cluster (e.g. GPU).

CNAF presentation (cont'd)

Cloud@CNAF

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- Physical or virtualized resources;
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$n_{-}TOF$

- 16 cores and 8Gb RAM
- 10Tb on Tier1 Storage

Access

```
Terminal
File Edit View Search Terminal Help
[nicholas:~] $ ssh nterranova@bastion.cnaf.infn.it
nterranova@bastion.cnaf.infn.it's password:
Last login: Tue Nov 6 17:02:01 2018 from 172.16.10.16
                           INFN CNAF - Bastion Host
                            (login03.cnaf.infn.it)
             In case of problems, mail to: sysop@cnaf.infn.it
N.B.: Home directory content is not backupped and a quota is applied.
soft quota = 100 MB (quaranteed)
hard quota = 200 MB (exceeding data may be periodically deleted to reach
                     soft limit, in function of home dir space)
/scratch" is temporary unavailable.
-bash-4.1$
```

Access (cont'd)

```
nterranova@ntof-machine:~
File Edit View Search Terminal Help
-bash-4.1$ ssh nterranova@131.154.96.145
nterranova@131.154.96.145's password:
ast login: Tue Nov 6 16:02:35 2018 from login01.cnaf.infn.it
[nterranova@ntof-machine:~] [devtoolset-7] $
                                                        nterranova@ntof-machine:/opt
File Edit View Search Terminal Help
[nterranova@ntof-machine:/home] [devtoolset-7] $ ll
total 0
drwx----- 2 amanna amanna 83 Oct 12 07:39 amanna
drwx-----. 3 centos centos 95 Oct 3 13:31 centos
drwx----- 8 cmassimi cmassimi 216 Nov 9 08:54 cmassimi
drwx----. 8 nterranova nterranova 244 Oct 17 13:13 nterranova
[nterranova@ntof-machine:/home] [devtoolset-7] $ cd /opt/
[nterranova@ntof-machine:/opt] [devtoolset-7] $ ll
total 0
drwxr-xr-x. 6 root root 52 Oct 12 09:47 cmake
drwxr-xr-x. 6 root root 58 Oct 14 19:47 geant
drwxr-xr-x. 3 root
                        root
                                   26 Oct 12 09:42 rh
drwxr-xr-x. 19 nterranova nterranova 242 Aug 23 15:51 root
```

Access (cont'd)

- GEANT4 calculations for the two Recoil Proton Telescopes, n-p scattering;
- Other accounts can be added to perform Monte Carlo simulations;
- Resources can be opened to other participants;
- A queue manager system can be envisaged.

$\overline{\text{Access}}$ (cont'd)

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NB:

Access credentials cannot be lent

nicholas.terranova@cnaf.infn.it



n_TOF machine

- CentOS-7
- Geant-4.10.02, ROOT-6.14.04, Boost-options, git etc.. are already installed
- No graphics support.

Ask me for any further installation. nicholas.terranova@cnaf.infn.it

Plan

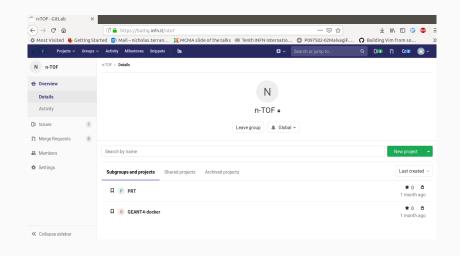
Available calculation resources

A proposal for code versioning

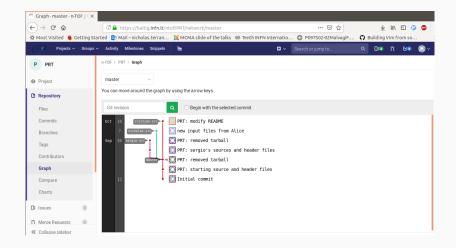
baltig



baltig (cont'd)



baltig (cont'd)



```
nterranova@ntof-machine:-/Programs/GEANT4/PRT

File Edit View Search Terminal Help

[nterranova@ntof-machine:-/Programs/GEANT4/PRT] [devtoolset-7] nicholas-src ± git branch -a
master

* nicholas-src
remotes/origin/HEAD -> origin/master
remotes/origin/master
remotes/origin/nicholas-src
remotes/origin/nicholas-src
remotes/origin/segio-src
[nterranova@ntof-machine:-/Programs/GEANT4/PRT] [devtoolset-7] nicholas-src ± [
```

```
git clone https://baltig.infn.it/ntof/PRT.git
git checkout <branch_name>
git checkout -b <new_branch_name>
```

Thank you for your attention nicholas.terranova@cnaf.infn.it