

# Simulation capabilities @CNAF

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N. Terranova (INFN-CNAF)

n\_TOF meeting, Bologna 12–13 November 2018

Dipartimento di Fisica e Astronomia, (DIFA)

- 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.

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.

### 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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## 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.cnaif.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 backedup and a quota is applied.

```
soft quota = 100 MB (guaranteed)
```

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:  
Last 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.

## Access (cont'd)

- GEANT4 calculations for the two Recoil Proton Telescopes, n-p scattering;
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**NB:**

**Access credentials cannot be lent**

**[nicholas.terranoval@cnafl.infn.it](mailto:nicholas.terranoval@cnafl.infn.it)**



- 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.terranoa@cnaf.infn.it**

Available calculation resources

A proposal for code versioning

Sign in - GitLab

https://baltig.infn.it/users/sign\_in

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INFN

## GitLab CE @ INFN

`servnaz@lists.infn.it`

INFN - Open source software to collaborate on code

LDAP/AAI INFN

Standard

LDAP/AAI INFN Username

nterranova

Password

\*\*\*\*\*

☐ Remember me

Sign in

# baltig (cont'd)

The screenshot shows the GitLab web interface for the 'n-TOF' project. The browser address bar shows the URL `https://baltig.infn.it/ntof`. The left sidebar contains navigation links: Overview, Details (selected), Activity, Issues (1), Merge Requests (0), Members, and Settings. The main content area shows the project details for 'n-TOF', including a 'Leave group' button and a 'Global' dropdown. Below this is a search bar and a list of subgroups and projects. The list includes 'PRT' and 'GEANT4-docker', both created 1 month ago.

n-TOF - GitLab

https://baltig.infn.it/ntof

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Projects Groups Activity Milestones Snippets

Search or jump to...

N n-TOF

Overview

Details

Activity

Issues 1

Merge Requests 0

Members

Settings

n-TOF Details

N

n-TOF

Leave group Global

Search by name New project

Subgroups and projects Shared projects Archived projects Last created

P PRT 0 1 month ago

G GEANT4-docker 0 1 month ago

<< Collapse sidebar

# baltig (cont'd)

The screenshot shows the Baltig web interface for the 'PRT' project. The left sidebar contains a 'Repository' section with links to Files, Commits, Branches, Tags, Contributors, Graph (selected), Compare, and Charts. Below this are 'Issues' and 'Merge Requests' sections, both showing 0 items. The main content area is titled 'n-TOF > PRT > Graph' and shows the commit history for the 'master' branch. A search bar at the top of the graph area allows for finding specific revisions. The graph itself is a vertical timeline of commits, with a red line indicating the current branch. The commits are listed on the right side of the graph, with their corresponding commit hashes and dates on the left. The commits are as follows:

- Initial commit
- PRT: starting source and header files
- PRT: removed tarball
- PRT: sergio's sources and header files
- PRT: removed tarball
- PRT: modify README
- new input files from Alice

The graph shows a sequence of commits starting from the 'Initial commit' at the bottom, moving up through the 'PRT: starting source and header files' and 'PRT: removed tarball' commits, then through the 'PRT: sergio's sources and header files' and 'PRT: removed tarball' commits, and finally reaching the 'PRT: modify README' commit at the top. The 'new input files from Alice' commit is also shown, but it is not part of the main branch sequence. The graph is titled 'master' and the current branch is 'master'.



```
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/sergio-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.terranoval@cnaf.infn.it](mailto:nicholas.terranoval@cnaf.infn.it)