


Update on offline resources at CERN

and some news on:

- database for logging online processing
- benchmarking

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Outline:

- Offline resource at CERN 
 1. personal working space
 2. batch processing-TIER 0
 3. disk and tape storage
- Database for logging online processing
- Benchmarking

- Offline resource at CERN

1. personal working space
2. batch processing-TIER 0
3. Disk and tape storage

CERN is phasing out AFS:

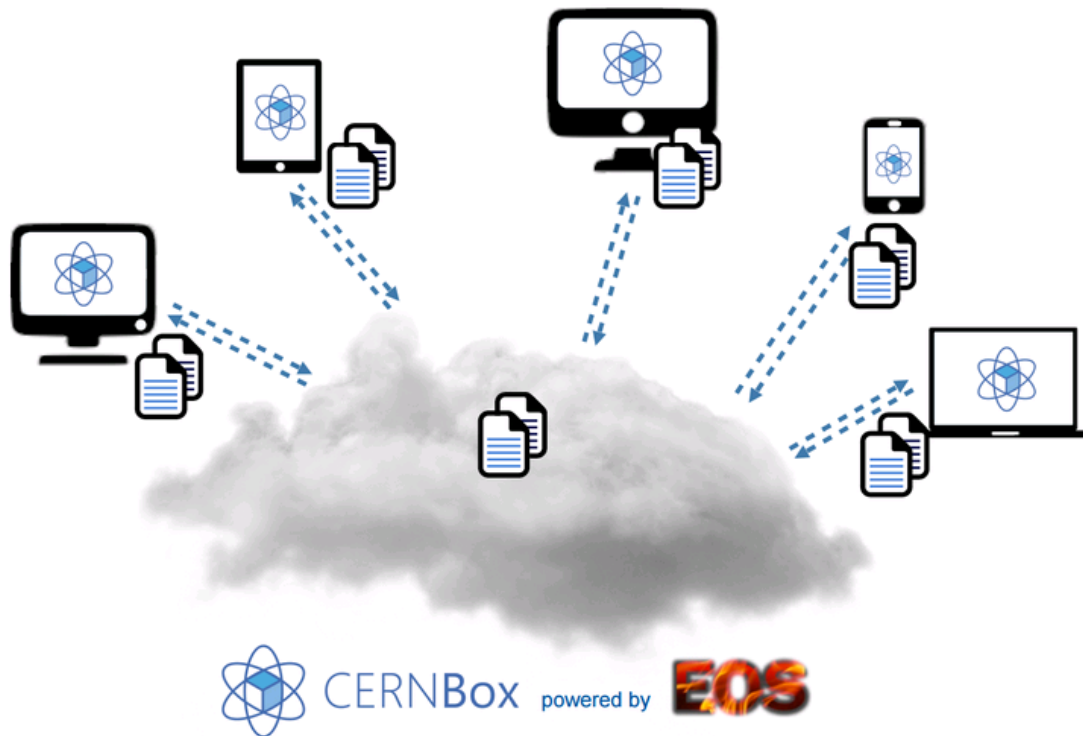
Home directories → end of 2017

Full phase out is planned during LHC long shutdown2

Where to go?

- 1) **EOS** is being proposed to replace AFS for most user cases that need **online access** → when login on lxplus, \$HOME directories are mapped from AFS to EOS.
- 2) **CERNBox**: the main motivation is to provide an easy access to the cloud storage for end-user: files in the working directory of personal devices go “automatically” to the cloud and are available always and everywhere. In case your laptop dies, data are not lost.

CERNBox



- CERNBox is available to all CERN users: it provides cloud data storage to anyone who has a standard CERN computing account
- It is possible to store data and to share them
- It is also possible to synchronize the CERNBox across devices like laptops, desktops, tablets, smartphones

- CERNBox is built on top of OwnCloud (open source software) and uses EOS as the storage backend.
- CERNBox's cloud storage servers are in the CERN Data Centre.
- The CERNBox **quota** for each user is **1TB**; the maximum number of files allowed is 1 million, and the maximum size of a single file is 8GB.
- The CERNBox service web site is available from <https://cernbox.cern.ch>

Some links:

<http://information-technology.web.cern.ch/services/CERNBox-Service>

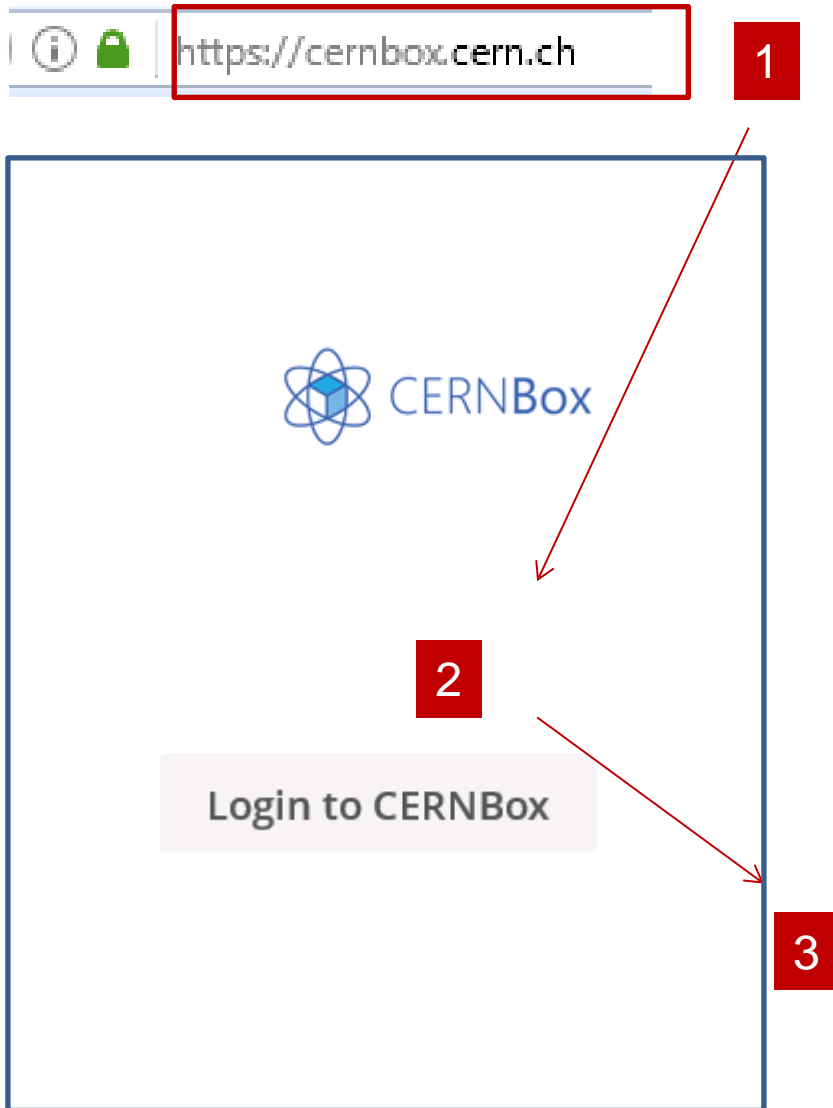
<https://cern.service-now.com/service-portal/faq.do?se=CERNBox-Service>

<http://cernbox.web.cern.ch/cernbox/en/>

<https://cern.service-now.com/service-portal/article.do?n=KB0003174>

} User's guide

How to create the CERNBox



CERN Single Sign-On

Sign in with a CERN account, a Federation account or a public service account

Sign in with your CERN account

Reminder: you have agreed to comply with the [CERN computing rules](#)

Use credentials

Username or Email address Password

epennacc ●●●●●●●●

Remember Username or Email Address [Need password help ?](#)

Use one-click authentication

 [Sign in using your current Windows/Kerberos credentials \[autologon\]](#)
Use your current authentication token. You need Internet Explorer on CERN Windows or Firefox on SLC (Firefox help here).

 [Sign in using your Certificate \[autologon\]](#)
Use a EuGridPMA trusted certificate. Don't forget to first map your Certificate to your CERN Account.

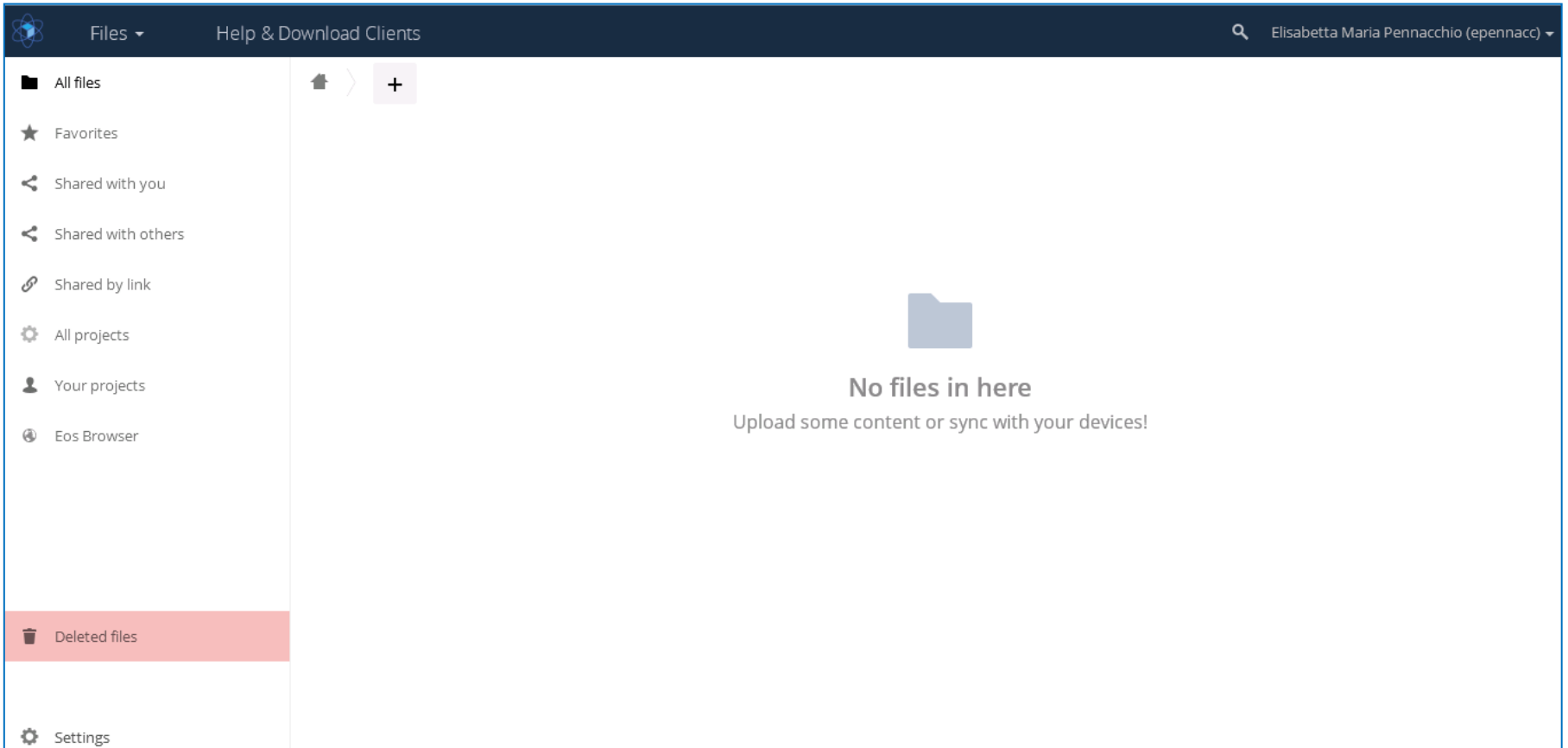
Use strong two factor authentication [\[show\]](#)

Sign in with a public service account

 [Facebook, Google, Live, etc.](#)
Authenticate using an external account provider such as Facebook, Google, Live, Yahoo, Orange.

Sign in with your organization or institution account

your CERNBox is created...



...you can import your files/folder

The screenshot shows a file management interface with the following elements:

- Top Navigation Bar:** Contains a 'Files' dropdown menu, 'Help & Download Clients', and a user profile 'Elisabetta Maria Pennacchio (epennacc)'.
- Left Sidebar:** Lists navigation options: All files, Favorites, Shared with you, Shared with others, Shared by link, All projects, Your projects, Eos Browser, and Deleted files.
- Main Content Area:** Displays a file list with columns for Name, Size, and Modified. It shows a folder named 'myFolder' (2.4 MB, 3 minutes ago) and a file named 'SPSC-SR-206.pdf' (40.2 MB, 2 days ago). A summary row indicates '1 folder and 1 file' with a total size of 42.6 MB.
- Annotations:** A blue arrow points to a '+' button in the top navigation bar. Orange boxes highlight the 'Files' menu, the top navigation bar, and the left sidebar. A yellow box highlights the main content area. A purple box highlights the 'Settings' button at the bottom left.

Description of the user interface

(from the user's guide)

The screenshot shows a web browser window displaying a file manager interface. The interface is annotated with numbered callouts (1-8) highlighting specific UI elements:

- 1.** Back button in the browser address bar.
- 2.** Browser address bar containing the URL.
- 3.** Left sidebar navigation menu, including options like 'All files', 'Favorites', 'Shared with you', 'Shared with others', 'Shared by link', 'All projects', 'Your projects', 'Eos Browser', and 'Deleted files'.
- 4.** Main file list area, showing a table of files with columns for Name, Size, and Modified. The files listed include 'dogs', '2012-12-25 10.56.54.jpg', '20120831144137-575b796c-St_Prex_agility_A... .jpg', 'colduMarchairuz2.PNG', 'Jellyfish.jpg', 'killer whales.jpg', 'Koala.jpg', and 'Penguins.jpg'.
- 5.** Search icon in the top right navigation bar.
- 6.** User profile dropdown menu in the top right navigation bar, currently showing '(angus)'.
- 7.** Current directory path 'canBCseethis' and a '+' button to expand it.
- 8.** 'Settings' button in the bottom left corner.

Name	Size	Modified
dogs	13.7 MB	7 hours ago
★ 2012-12-25 10.56.54.jpg	1.9 MB	3 minutes ago
20120831144137-575b796c-St_Prex_agility_A... .jpg	338 kB	17 days ago
colduMarchairuz2.PNG	770 kB	17 days ago
Jellyfish.jpg	758 kB	43 minutes ago
killer whales.jpg	898 kB	43 minutes ago
Koala.jpg	763 kB	43 minutes ago
Penguins.jpg	760 kB	43 minutes ago

from the user's guide

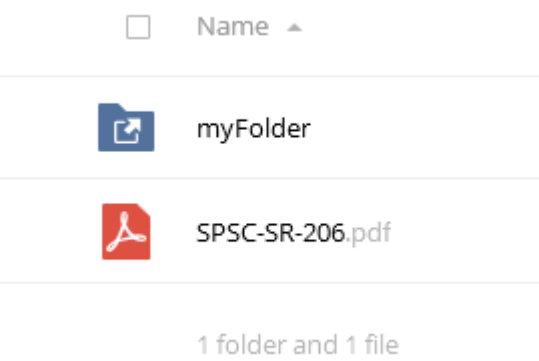
1. **Go to All Files view:** click on the CERNBox icon, 'Files', or 'All files' and display all your files in the Contents(4.) area.
2. **Help & Download Clients:** click to go to the on-line support pages.
3. **Filters:** set of filters to quickly find your files/folders, e.g. those that have been shared with you, or those that you have shared with others.
4. **Contents area:** displays the list of files/folders you have access to.
5. **Search field:** click on the magnifier icon and search for files.
6. **Personal Settings menu:** click to open your Personal Settings dropdown menu. Your *Personal* page provides the following settings and features:
 - Links to download desktop and mobile apps
 - Re-run the First Run Wizard
 - Your space usage and availability
 - Name and email
 - List of e-groups in which you are member
 - Language to be used for the user interface - The menu also has access to the *on-line Help* and the *log out* button.
7. **Navigation Bar:** provides a type of breadcrumbs navigation so that you can migrate to higher levels of the folder hierarchy up to the root level (home) **+** button. Use the **+** button to upload and/or create new files and folders.
8. **Settings:** displays which address to use to access your files using WebDAV

Some relevant points

- Files and folders can be **created** from the interface, or **uploaded** from a laptop (Google Chrome supports folders drag-and-drop; Internet Explorer, Firefox, Safari do not support drag-and-drop)
- Deleted files or folders in CERNBox, are not permanently deleted at that very moment. Instead, they are moved into the trash bin where they are kept for a maximum of six months
- It is possible to synchronise the CERNBox with an external device (laptop)
- Files and folders can be shared with other users:
 - 1) **Link Share**: easiest way, for ad-hoc sharing via web only and also for sharing with people who do not have CERNBox account
 - 2) **Authenticated Share**: to setup a longer term sharing with other CERNBox users
- The data can be accessed from any Web browser : files are accessible from everywhere, from different devices.
- From WEB interface you can also access some general information: list of e-group of which you are member, space usage....

- CERNBox files are stored in EOS (the disk-based storage service), in the instance EOSUSER.
- To access CERNBox files in EOS from lxplus:
 - % **cd /eos/user/<initial>/<account>**

```
[epennacc@lxplus074 epennacc]$ pwd
/eos/user/e/epennacc
[epennacc@lxplus074 epennacc]$ ls -rtl
total 82416
-rw-----. 1 epennacc wa105-comp 42197218 Apr  5 11:00 SPSC-SR-206.pdf
drwx-----. 1 epennacc wa105-comp  2497932 Apr  7 11:31 myFolder
```



From previous page;

Deleted files or folders in CERNBox, are not permanently deleted at that very moment. Instead, they are moved into the trash bin where they are kept for a maximum of six months



This directory is pre-mounted on the batch node : all files are readable by the batch system

Home directories on AFS will be phased out by the end of 2017: it is time to start using the CERNBox

- Offline resource at CERN

1. personal working space
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3. Disk and tape storage

From last collaboration meeting:

- For what concerns the protoDUNE's data offline storage and processing, starting from August 2017 onwards the protoDUNE community (SP+DP) will have access to 3 PB of EOS disks space, 6PB of Castor tape space and 1500 cores inside Condor. The organization of this space is under definition. The funding has been provided by the Neutrino Platform

The timing of resources allocation has “changed”.

These resources are available right now:

- 1500 cores inside Condor
- 6PB of Castor tape space
- 1PB of EOS disk space

These resources are allocated for the 6x6x6 data taking, and they are independent of what we are already using for the 3x1x1, but of course we can start using them

now → *Next slides will explain how to use them*

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- The protoDUNEs community (SP+DP) has access to 1500 cores inside Condor
- These cores are equally split between DP and SP (750/750)
- The access to the queue is managed via e-groups
- All users in **wa105-comp** e-group are allowed to submit jobs to the CONDOR Farm
- Instruction on how to submit jobs are here: <http://batchdocs.web.cern.ch/batchdocs/>
- It is important to use these batch resources.

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- A total disk space of 1PB is available from now here:

[/eos/experiment/neutplatform/protodune/](#)

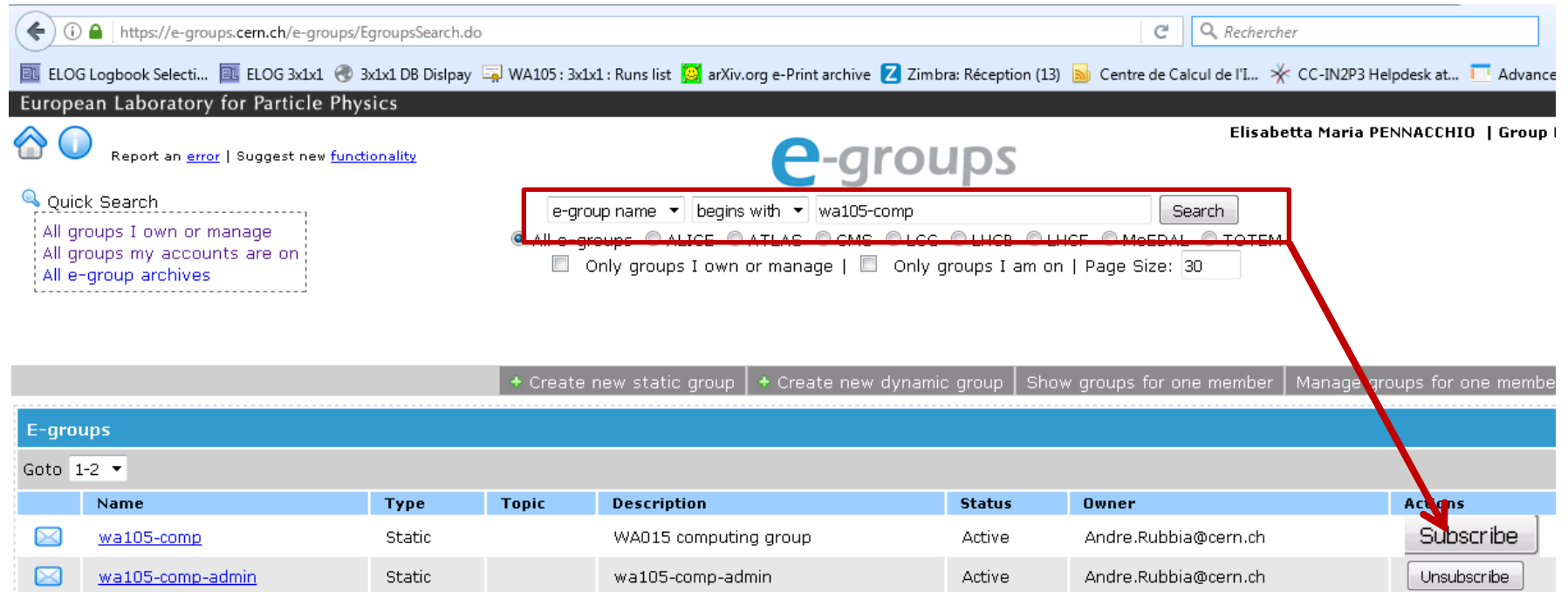
From August this space will be of 3PB, equally shared between SP/DP.

- This space aims to store, at the moment, result from MC production with LArSoft, results from beam group simulations.
- All users in **wa105-comp** e-group are allowed to read files
- In case you need to write files in this space please add yourself to the e-group *[eos-experiment-cenf-np02-writers](#)*
- 6PB of tape space on CASTOR are already available

One remark:

All users in wa105-comp are automatically authorized to access these resources.
If it is not yet done, **please add yourself to wa105-comp e-group:**

<https://e-groups.cern.ch>



The screenshot shows the e-groups website interface. At the top, there is a search bar with the text "Rechercher". Below the search bar, there are navigation links and a user profile for "Elisabetta Maria PENNACCHIO | Group". The main content area features a search filter for "e-group name" set to "begins with" and "wa105-comp". A red box highlights this search filter, and a red arrow points from it to the "Subscribe" button in the table below.

Quick Search

- All groups I own or manage
- All groups my accounts are on
- All e-group archives

Search filters: e-group name, begins with, wa105-comp, Search

Navigation: All e-groups, ALICE, ATLAS, CMS, LCG, LHCB, LHCb, MoEDAL, TOTEM

Options: Only groups I own or manage | Only groups I am on | Page Size: 30

Actions: + Create new static group, + Create new dynamic group, Show groups for one member, Manage groups for one member

Name	Type	Topic	Description	Status	Owner	Actions
wa105-comp	Static		WA015 computing group	Active	Andre.Rubbia@cern.ch	Subscribe
wa105-comp-admin	Static		wa105-comp-admin	Active	Andre.Rubbia@cern.ch	Unsubscribe

Conclusions of CERN resources

- CERN is phasing out AFS, and EOS and CERNBox are proposed to replace it. CERNBox allows access data by WEB interface and by login on lxplus
- The relevant aspects of the CERNBox have been discussed, and links to user's guide have been provided as well.
- CERN is providing resources for TIER0 processing, disk and tape storage:
 - 1500 cores,
 - 1PB EOS disk space (→3PB)
 - 6PB CASTOR tape space
- These resources are equally split between SP and DP, and are already available

database for logging online processing

- All steps of the online processing are stored in a dedicated database (<https://indico.fnal.gov/conferenceOtherViews.py?view=standard&confId=13938>)
- The architecture of the database has been completely modified, to better cope the event rate of the 6x6x6: every processing step has its own dedicated table, in order to avoid dead locks. The partition key for tables, and the index to be used in queries are under study
- The web interface is unchanged:

WA105 

List DAQ Runs 3x1x1

Click on the run id cell to show/hide details on this run

run id	Data type	Start Time	Number of sequences	Automatic logs	Remarks	Actions
702	pulser	2017-04-03 22:43:11	2			Valid remarks run:702
701	pulser	2017-04-03 22:24:28	1			Valid remarks run:701
700	pulser	2017-04-03 21:42:02	1			Valid remarks run:700

The filling of the database has been integrated in the processing:

the shifter can monitor from the WEB pages how it is going on, and immediately detect if something is stuck (data transfer, batch processing.....)

695											pedestal	2017-04-03 19:11:31	1
Seq Name	DAQ TimeStamp	Local EOS TimeStamp	Local EOS Path	Nb of Events	Central EOS TimeStamp	Central EOS Path	Reco TimeStamp	Reco Path	Analysis TimeStamp	Analysis Path			
695-0.ped.cal	2017-04-03 19:11:31	2017-04-03 19:14:37	/eos/data /pedestals /695-0.ped.cal	207	2017-04-03 19:16:34	/pedestals /695/695-0.ped.cal							

legenda:

1) copy to local EOS **1**

3) copy to CERN **3**

2a) data processing **2**

2b) analysis **2**

Benchmarking

- The code for benchmarking has been updated to accept as input binary files from 3x1x1 data taking
- The event header is read, and some basic distributions are filled (the examples provided by Slavic at the general meeting have been integrated in benchmarking code)

```
dlardaq::EventDecoder DaqDecoder( 1280, 1667 );

DaqDecoder.Open(filename);
size_t nev = DaqDecoder.GetTotEvents();

hraw_nev->Fill(nev);

if (ipass>0) out<<" total number of events " << nev <<endl;

//set the number of events to be read
//maxevt --> set by -e option (default ==-1, read full tree)
//nev --> number of events in the input binary file

int neve;
if (maxevt==--1) neve=nev;
if (maxevt>-1) neve=maxevt;
if (maxevt>nev) neve=nev;

if (ipass>0) out<<" ----> " << neve<<" events will be analyzed " <<endl;

for(size_t i=0;i<neve;i++) {

dlardaq::evheader_t evh;
std::vector<dlardaq::adc16_t> adc;
DaqDecoder.GetEvent( i, evh, adc);
// cout<<"Event number " <<evh.ev_num<<endl;
// cout<<"Event size " <<evh.ev_size<<endl;
// cout<<"Event quality flag " <<bitset<8>(evh.dq_flag)<<endl;
// cout<<"Trigger number " <<evh.trig_info.num<<endl;
// cout<<"Event timestamp:" <<evh.trig_info.ts.tv_sec <<" s " <<evh.trig_info.ts.tv_nsec<<" ns" <<endl;

hraw_nevsize->Fill(evh.ev_size/(1024*1024));
}

fout->cd();
hraw_run->Write();
hraw_seq->Write();
hraw_nev->Write();
hraw_nevsize->Write();
```