



# CDF long term data preservation in Italy

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CDF Italian collaboration, together with CNAF computing center, is developing a project to preserve at CNAF CDF data and analysis capabilities in the long term future.

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*Today:*

- *brief description of the project*
- *summary of resources*
- *cost estimate*
- *time schedule*

CDF long term data preservation task force official since June 2012.  
First report to be released to the collaboration in a few days.

Draft 0.0  
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*Goal: preserve CDF data and analysis capability in the long term future (> 10 years from now)*

Report of CDF Data Preservation task force

In the report identified requirements and possible solutions for:

- data access
- software preservation
- job submission
- documentation

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Meeting with D0 and FNAL management on the 30th of August.

Meeting with the Computing Sector at the end of September to start designing the plan.

# CDF data preservation in Italy: motivations

*Goal: preserve a complete copy of CDF data and MC samples at CNAF + services (access, data analysis capabilities)*

INFN involvement in long term CDF data preservation is important for different reasons:

- 1) INFN strongly contributed to the success of CDF; data preservation is the last phase of the experiment and INFN should have a role in it.*
- 2) A mirror archival in Europe is a necessary safety measure.*
- 3) Access to data many years from now, beyond CDF collaboration, will be under INFN control.*
- 4) Direct participation with a real case to the problem of data preservation, which is of great interest → CDF preservation system at CNAF can serve as a prototype for future experiments now supported by INFN.*
- 5) Opportunity for CNAF to take a significant role in the long term preservation of data.*

Two options:

- all raw data and MC + all ntuples → 5.1 PB
- raw data only + all ntuples (NO MC raw) → 4.0 PB

Data group	Volume (TB)
MC (raw data)	1163
MC (ntuples)	624
Data (raw)	1857
Data (production)	3834
Data (ntuples)	1492
TOTAL	8970

+ data catalogue and run conditions DB (Oracle, 250 GB)



FNAL and CNAF experts are defining the details:

- Case study: 5 PB to be transferred in a few months → 1 PB/month (380 MB/s)
- Setup at FNAL and CNAF: two options under study
  - **Push:** FNAL pushes the data to CNAF with dedicated machines
  - **Pull:** CNAF sets up transfers from Fermilab CDF dCache
- SAM station (= data access machine) at CNAF needs to be interfaced with CNAF tape system and gridftp servers.

*Tests ongoing: new sam station installed and tested @ CNAF; transfer to tape and upload of data catalogue straightforward; test of file retrieval ongoing.*

## Current services at CNAF

- SAM station to copy datasets from Fermilab and access local ones
- SAM station cache (300 TB)
- Users areas (100 TB)
- Job submission portal (eurogrid) to submit CDF jobs on dedicated resources at Tier1 and LCG
- CDF code volume

## Medium term future: maintain current services

### Long term future (> 2015): migration to archival mode

We need to guarantee

- access to data and DB
- access to CDF code
- computing resources for data analysis and MC production

The migration to archival mode will be done in collaboration with FNAL.

*To run CDF legacy code CNAF plans to use a dynamic virtual infrastructure through the INFN-developed WNoDes framework.*

## CNAF storage and computing resources

- Tape: 4PB (data raw and ntuples, MC ntuples only) OR 5.1PB (all raw data and MC)
- Disk to be used as cache for the copy: 100 TB
- 2 T10K drives\*, to guarantee 380 MB/s
- 2 servers dedicated to the copy\*, to guarantee 380 MB/s
- One server to store CDF DB
- Oracle licence
- Virtualization software licence (kvm)

*\* Used full time by CDF only for a limited amount of time; then will be available for all INFN experiments supported by CNAF.*

## Manpower required at CNAF

- 0.5 FTE x 2 years for
  - Building SAM interfaces to CNAF tape system and gridftp servers
  - Setup of the resources needed for the copy and monitoring of data transfer
  - Maintenance of current services
  - Development and test of the WNoDes dynamic virtual infrastructure
- CNAF personnel will be supported by a member of CDF Italian collaboration and work in strict contact with FNAL computing experts.

# Cost estimate - Option 1

All data copied in 2013.

*Pros:* in 2013 CDF resources at FNAL necessary for the copy will be guaranteed.

*Cons:* a copy rate of 380 MB/s is necessary (2 tape drives and 2 copy servers needed)

*NB: in the following we assume the following cost for the data copy*

*- tape: 40 euro/TB*

*- tape drive + copy server: 2 euro/TB*

*→ 42 euro/TB*

Description	Amount	Cost (keuro)
Tape	4.0 PB / 5.1 PB	168 / 215
Disk	100 TB	--
DB server	1	3
Oracle licence	1	--
Kvm licence	1	--
Post-doc	2 years	50
<b>TOTAL</b>		<b>221 / 268</b>

→ We can exploit current CDF disk at CNAF

} Already covered by CNAF

Copy splitted in two years (2013-2014)

*Pros:* the copy rate can be lower → 1 tape drive and 1 copy server are enough

*Cons:* CDF resources at FNAL necessary for the copy may not be available in the same amount as in 2014.

## 2013

Data and MC ntuples

Description	Amount	Cost (keuro)
Tape	2.1 PB	89
Disk	100 TB	--
Kvm licence	1	--
Post-doc	1 year	25
<b>TOTAL</b>		<b>114</b>

## 2014

Raw data only / raw data and MC

Description	Amount	Cost (keuro)
Tape	1.8 PB/ 3.0 PB	76/126
Disk	100 TB	--
DB server	1	3
Oracle licence	1	--
Post-doc	1 year	25
<b>TOTAL</b>		<b>104/154</b>

- Fall 2012* → Results of data transfers between FNAL and CNAF
- End 2012* → FNAL CDF data preservation project ready
- Beginning 2013* → Start implementation of FNAL CDF data preservation project
- Spring 2013* → Start data copy between FNAL and CNAF (all/1st subset)
- Spring 2013* → Start development and test of the dynamic virtual infrastructure for CDF data analysis at CNAF
- Spring 2014* → Migration of all services at CNAF to archival mode
- (Spring 2014* → Continue data copy between FNAL and CNAF (2nd subset))

## Opzione 1:

- 268 keuro (215 keuro tape + trasferimento, 3 keuro DB server, 2 anni di postdoc)

## Opzione 2:

- **NEL 2013:** 114 keuro (89 keuro tape + trasferimento, 1 anno di postdoc)
- **NEL 2014:** 154 keuro (136 keuro tape+ trasferimento, 3 keuro DB server, 1 anno di postdoc)

- Backup -

# Data to be copied at CNAF

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input dataset (Xphysr)	size (TB)	description
aphysr	80	copies of a few high-pt triggers+J/Psi - not used anymore
bphysr	359	leptons
cphysr	207	photons
dphysr	171	events for monitoring, usually not processed
ephysr	438	b-jets, met, tau , zbb
gphysr	264	jets and minimum bias
hphysr	325	B-datasets
iphysr	18	<i>i</i> for inclusive, used for special runs and usually not processed
jphysr	260	B-datasets
TOTAL	2126	