



Tier-2 @ UCSD

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Role of T2
Infrastructure Requirements
Supporting MC production
Supporting Analysis

Role of T2

- Production of all the MC the CMS experiment needs.
- Support of Data Analysis
 - Host official Data
 - Accept jobs from all CMS users
 - Host unofficial data for “local” community
 - “local” may mean many things ...

Infrastructure Requirements

- Operate a compute cluster
- Operate a storage cluster
- Operate grid interfaces to both
- Operate a Squid Server
- Operate PhEDEx installation
- May or may not operate a login facility for your local users.
- May or may not maintain cvs, twiki, etc. for your local users.

Effort Required to do this well

- Ideally, 2FTE
 - One system administrator
 - All hardware & grid interfaces etc.
 - One computing savvy physicist
 - All CMS services, incl. Data Management, and debugging support.
- At least at startup of T2 it is very important to have the necessary expertise and focus !!!

Supporting MC Production

- CMSSW installation
 - Is done centrally by CMS
 - Need local person to
 - follow up on issues !!!
 - Configure TrivialFileCatalog
- SRM for local stage-out of MC produced
 - /store/unmerged = small files locally produced
 - /store/mc = datasets of merged or downloaded files
- EGEE or OSG Compute Element
- FroNtier Squid
- PhEDEx & upload link to regional T1.

CMSSW Installation

- CMS has a list of officially supported releases.
- We distribute all of them to all T2s.
- You may find that some of your local developers need additional releases, e.g. pre-releases.
- **Do yourself and us a favor and NEVER mess with the official release area.**
- Instead have an additional local release area for your local people, and maintain that yourself as you see fit.

TFC

- CMS has a global namespace, prefixed by a local namespace. Any physical filename is thus something like:
 - /pnfs/sdsc.edu/data3/cms/phedex/store/mc/blabla.root
 - /pnfs/sdsc.edu/data3/cms/phedex/store/ is UCSD specific.
 - /mc/blabla.root would be the logical file name (lfn).
- TFC is a set of rules to convert LFN to PFN and back
- xml file: `SITECONF/$site/PhEDEx/storage.xml`
- tags:
 - lfn-to-pfn
 - pfn-to-lfn
 - protocol=["direct"|"srm"|"dcap"]
- Examples of a \$site can be checked out of CVS:

```
export CVSROOT=pserver:anonymous@cmscvs.cern.ch:/cvs_server/repositories/CMSSW
cvs -d `echo $CVSROOT | awk -F@ '{print $1":98passwd\@"$2}'` login
cvs co SITECONF/$site
```

- After you create your TFC, check it into CVS

TFC

```
<storage-mapping>
  <lfn-to-pfn protocol="direct"
    path-match="*/LoadTest07_UCSD_(.*)_*_*.*"
    result="/pnfs/sdsc.edu/data3/cms/phedex/store/PhEDEx_LoadTest07/LoadTest07_Prod_UCSD/LoadTest07_UCSD_$1"/>
  <lfn-to-pfn protocol="srm"
    path-match="*/LoadTest07_UCSD_(.*)_*_*.*"
    result="srm://t2data2.t2.ucsd.edu:8443/srm/managerv1?SFN=/pnfs/sdsc.edu/data3/cms/phedex/store/
PhEDEx_LoadTest07/LoadTest07_Prod_UCSD/LoadTest07_UCSD_$1"/>

  <lfn-to-pfn protocol="dcap" destination-match=".*"
    path-match="/+store/(.*)" result="dcap://dcopy-1.local:22138//pnfs/sdsc.edu/data3/cms/phedex/store/$1"/>
  <lfn-to-pfn protocol="direct" destination-match=".*"
    path-match="/+store/(.*)" result="/pnfs/sdsc.edu/data3/cms/phedex/store/$1"/>
  <lfn-to-pfn protocol="srm" destination-match=".*"
    path-match="/+store/(.*)"
    result="srm://t2data2.t2.ucsd.edu:8443/srm/managerv1?SFN=/pnfs/sdsc.edu/data3/cms/phedex/store/$1"/>

  <pfn-to-lfn protocol="dcap" destination-match=".*"
    path-match="dcap://dcopy-1.local:22138//pnfs/sdsc.edu/data3/cms/phedex/store/(.*)" result="/store/$1"/>
  <pfn-to-lfn protocol="direct" destination-match=".*"
    path-match="/+pnfs/sdsc.edu/data3/cms/phedex/store/(.*)" result="/store/$1"/>
  <pfn-to-lfn protocol="srm" destination-match=".*"
    path-match=".*\?SFN=/pnfs/sdsc.edu/data3/cms/phedex/store/(.*)" result="/store/$1"/>

</storage-mapping>
```

Supporting Analysis

- Need everything that MC Prod needs
- In addition, need download links from ALL T1s !!!
 - No one T1 will have all the data!
 - Future, roughly 40% of data at FNAL, rest distributed across other 6 T1s.
 - Today most **but not all** the data available at both CERN & FNAL.
- Need one person on team who knows how to use CRAB !!! It is unacceptable for a T2 support team to not know how to submit a user analysis job to your site !!!
- Host data => under control of site data manager !!!

Name Space Organization

- /unmerged
 - Used by MC production team only
 - They should clean it up automatically!
 - If they don't, please complain !!!
- /users
 - Use for storage area for local users
 - In future also likely to be used for user analysis stageout.
 - We're not yet ready to do this.
- All other areas in namespace under the control of the T2 data manager at your site.

Access to Storage

- All users of CMS need read access to the full CMS namespace.
voms-proxy-init -voms cms
- MC Production team needs write access to /mc & /unmerged
 - This is identified via /cms/Role=production or /cms/Role=cmsprod
- Local PhEDEx agent needs write access to / (except maybe /users and /unmerged)
- CMS namespace should not be world readable.

Data Manager Responsibility

- PhEDEx is based on a request system.
 - Any CMS user may request data to be moved to your site.
 - Either central data ops or your site's data manager can accept such a request.
- You can move either full datasets or full blocks. I.e. you can satisfy part of a request.
- Let's see how this works:



PhEDEx – CMS Data Transfers

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- LoadTest Injections
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- Administer Requests

Components

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Reports

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- File Sizes

<http://cmsdoc.cern.ch/cms/aprom/phedex/>

PhEDEx - CMS Data Transfers

Info Activity Data Requests Components Reports

Replicas Subscriptions Delete LoadTest Injections Verification

Click here [Show Options](#)

Name	Filter	TO_CERN_Export TO_	Files
» /BB2MuMu/CMSSW_1_2_3-Spring07-1771/GEN-SIM		-	-
» /BB2MuMu/CMSSW_1_3_4-Spring07-1947/GEN-SIM-DIGI-RECO		-	-
» /BBbar30to50/CMSSW_1_2_0-LowLumiPU-1168963361/GEN-SIM-DIGI-RECO		-	-
» /BBbar50to80/CMSSW_1_2_0-LowLumiPU-1166809258/GEN-SIM-DIGI-RECO		-	-

ete | [LoadTest Injections](#) | [Verification](#)

Columns	DBS Sources	Nodes Shown	Node Values	port TO_CERN_M	Files
Select 1	Select none				
SIM	<input checked="" type="checkbox"/> T0_CERN_Export	<input type="checkbox"/> T2_Belgium_UCL	<input type="checkbox"/> T2_KNU_MSS	<input type="checkbox"/> T2_Taiwan_Buffer	-
SIM-DIGI-RECO	<input checked="" type="checkbox"/> T0_CERN_MSS	<input type="checkbox"/> T2_Budapest_Buffer	<input type="checkbox"/> T2_LIP_Coimbra	<input type="checkbox"/> T2_UCSD_Buffer	-
63361/GEN-SIM-D	<input type="checkbox"/> T1_ASGC_Buffer	<input type="checkbox"/> T2_CIEMAT_TMP	<input type="checkbox"/> T2_LIP_Lisbon	<input type="checkbox"/> T2_ULAKBIM_Buffer	-
09258/GEN-SIM-D	<input type="checkbox"/> T1_ASGC_MSS	<input type="checkbox"/> T2_CSCS_Buffer	<input type="checkbox"/> T2_Legnaro_Buffer	<input type="checkbox"/> T2_Vienna_Buffer	-
wLumiPU/GEN-SIM	<input checked="" type="checkbox"/> T1_CERN_Buffer	<input type="checkbox"/> T2_CUKUROVA_Buffer	<input type="checkbox"/> T2_London_Brunel	<input type="checkbox"/> T2_Warsaw_Buffer	-
809258/GEN-SIM	<input checked="" type="checkbox"/> T1_CERN_MSS	<input type="checkbox"/> T2_Caltech_Buffer	<input type="checkbox"/> T2_London_IC_HEP	<input type="checkbox"/> T2_Wisconsin_Buffer	-
.owLumiPU/GEN-SI	<input type="checkbox"/> T1_CNAF_Buffer	<input type="checkbox"/> T2_DESY_Buffer	<input type="checkbox"/> T2_London_QMUL	<input type="checkbox"/> T3_IN2P3_IPNL	-
6809258/GEN-SIM	<input type="checkbox"/> T1_CNAF_MSS	<input type="checkbox"/> T2_Demokritos_Buffer	<input type="checkbox"/> T2_London_RHUL	<input type="checkbox"/> T3_IRES_Buffer	-

Select whichever sites you want to look at.
 This is useful to find out which sites have your dataset,
 As well as how much, as well as,

Columns DBS Sources Nodes Shown **Node Values** port TO_

Node Values

- Node blocks
- Node files
- Node bytes
- Destined blocks
- Destined files
- Destined bytes
- Missing blocks
- Missing files
- Missing bytes
- % Complete (files)
- % Complete (bytes)

Filter rows

- Show all rows
- Show interesting rows

You only want to see stuff that is relevant to the sites you selected !!!

Cancel Apply

You can dig down for the specific files you are missing.

Show Options


Name	Filter	T2_Caltech_Buffer 1
◀◀ /Z4jet_100ptw300-alpgen/CMSSW_1_5_2-CSA07-2228/GEN-SIM-DIGI-RECO		Missing files 7
◀◀ /Z4jet_100ptw300-alpgen/CMSSW_1_5_2-CSA07-2228/GEN-SIM-DIGI-RECO#65e9568b-34f2-4d97-ad18-d72b363be9b7		7
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/5AF48D3D-A65C-DC11-9AF0-00E08134923B.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/063E3544-B75C-DC11-9CDD-0030488A1310.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/84461E8E-525D-DC11-90B6-00304889D41C.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/9432660A-1A5D-DC11-8240-0030488A0F46.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/C2FE8F2D-7E5C-DC11-B94D-00304889D562.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/E448E4AB-A35C-DC11-BFDA-00304889D54A.root		N
/store/mc/2007/9/5/CSA07-Z4jet_100ptw300-alpgen-2228/0004/F6F70C28-7E5D-DC11-B9A2-0030488A0B60.root		N
Total		7

Central Data Ops recently cleaned house, deleting a lot of files that were lost, or simply bookkeeping errors. If a dataset doesn't complete -> complain to phedex ops !!! When complaining, provide detailed info, including url's to these phedex monitoring pages.

[Show Options](#)

You can filter datasets.

Name	T2_UCSD_Buffer Bytes
<input type="text" value="CMSSW_1_5_2"/> <input type="button" value="Filter"/>	
» /Charmonium_Pt_20_inf/CMSSW_1_5_2-CSA07-2213/GEN-SIM-DIGI-RECO	1.7 TB
» /QCD_Pt_30_50/CMSSW_1_5_2-CSA07-2048/GEN-SIM-DIGI-RECO	2.0 TB
» /QCD_Pt_50_80/CMSSW_1_5_2-CSA07-2049/GEN-SIM-DIGI-RECO	1.8 TB



PhEDEx - CMS Data Transfers

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DB Instance: [Production](#) »»
Frank Wuerthwein | [Sign out](#)
Logged in via Certificate
View: [my](#) | [global](#)

[Overview](#) | [Create Request](#) | [View Requests](#) | [Request Details](#) | [Administer Requests](#)

[Your pending tasks](#)

- None

[Your transfer requests](#)

- 31 Approved
- 1 Disapproved

**You can request datasets,
and generally administer them
after you are logged in.**



Summary



- It is possible to have a fully functional T2.
- It's not easy yet.
- And it probably will always be a significant commitment of effort.
- Be prepared to invest 2FTE at least at the beginning.