Cosmic Reconstruction: methods and configurations

ALICE Offline Week

Timeline

Initial setup: xrootd failures accessing remote files

First prototype, 1 job/file

LPM in action, 1 job/run

Golden list completed

25/02	9/03		16/03		26/03	30/03		11/04
	PHASE 1			PHASE 2			PHASE 3	

End of cosmic runs: ~78k raw files produced (LHC08a)

"Golden" list made of 100/757 runs (~40k raw files)

Production stopped to setup tags creation
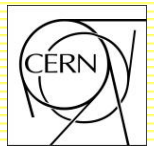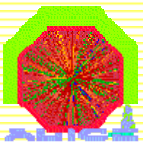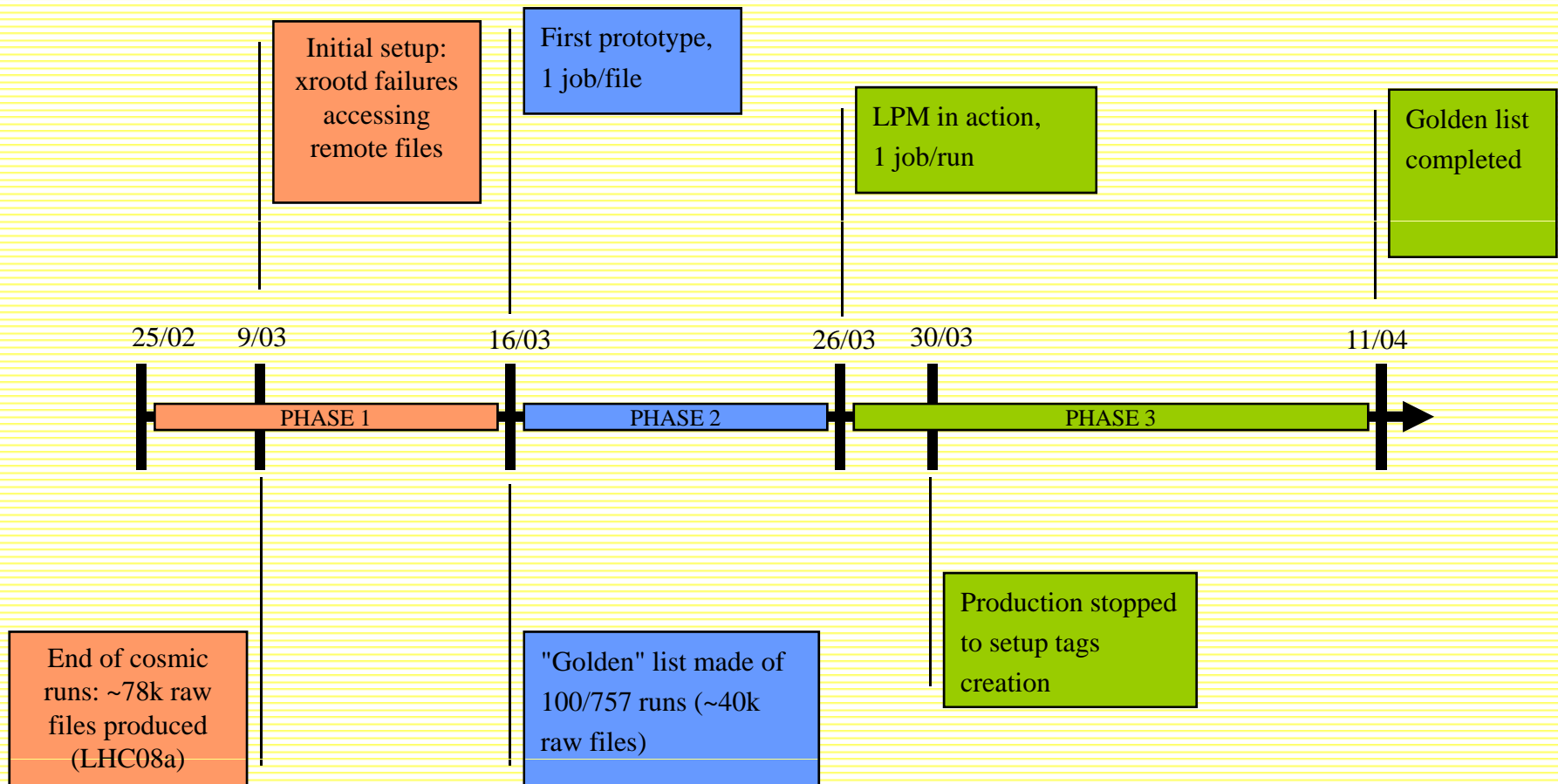
Phase1. AliRoot/xrootd fixes

- Grid jobs failing during remote file access, AliRoot hangs while accessing OCDB and RAW data files (TXNetFile). Same effect from aliensh when trying to download the files
- First xrootd/Castor fix: only few "bigger" (12-35MB) OCDB files were not accessible, i.e.
    - ITS/Calib/MapsAnodeSDD
    - ITS/Calib/MapsTimeSDD
    - TPC/Calib/ExB
- Larger xrootd cache parameters ("XNet.ReadCacheSize" and "XNet.ReadAheadSize"). Manual set in rec.C: the copy of the corrected AliRoot .rootrc steered by the AliEn shell script fails because replaced by the Root default one
- Several AliRoot fixes for TPC, ITS SSD/SDD, T0, V0, HMPID (see Cvetan's talk Offline weekly 28/02)

rec.C with lots of detector-specific settings: all the needed options should be put in the corresponding detector's RecoParam classes and stored in OCDB

```
itsRecoParam->SetClusterErrorsParam(2);
itsRecoParam->SetFindV0s(kFALSE);
itsRecoParam->SetAddVirtualClustersInDeadZone(kFALSE);
itsRecoParam->SetUseAmplitudeInfo(kFALSE);
itsRecoParam->SetLayerToSkip(##);

tpcRecoParam->SetTimeInterval(60,940);
AliTPCReconstructor::SetStreamLevel(1);

AliTRDrawStreamBase::SetRawStreamVersion("TB");

AliPHOSRecoParam* recEmc = new AliPHOSRecoParamEmc();
recEmc->SetSubtractPedestals(kTRUE);
recEmc->SetMinE(0.05);
recEmc->SetClusteringThreshold(0.10);

muonRecoParam->CombineClusterTrackReco(kTRUE);
muonRecoParam->SetCalibrationMode("NOGAIN");

AliMagFMaps* field = new AliMagFMaps("Maps","Maps", 2, 0., 10., 2);
AliTracker::SetFieldMap(field,1);
AliExternalTrackParam::SetMostProbablePt(0.35);

rec.SetOption("ITS","cosmics,onlyITS");
rec.SetOption("MUON","SAVEDIGITS");
rec.SetOption("TPC","OldRCUFormat");
rec.SetOption("PHOS","OldRCUFormat");
rec.SetOption("T0","cosmic");
```
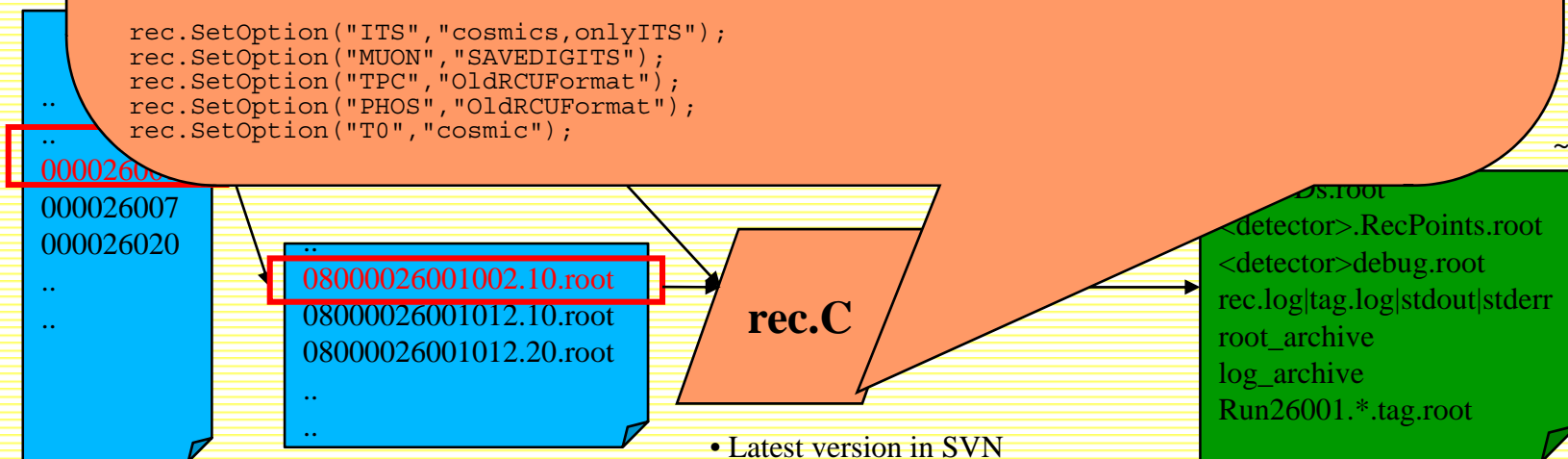
~40Mb

..
..
000026003
000026007
000026020
..
..

..
08000026001002.10.root
08000026001012.10.root
08000026001012.20.root
..
..

rec.C

<detector>s.root
<detector>.RecPoints.root
<detector>debug.root
rec.log|tag.log|stdout|stderr
root_archive
log_archive
Run26001.*.tag.root

• Latest version in SVN
• $ALICE_ROOT/test/cosmic

Errors Status

1. Jobs EXPIRED: jobs successfully go to SAVING but fail to write produced files to CASTOR2.

2. Jobs ERROR_E: "*zero CPU consumption in the last 20 mins*". The first time some raw file is accessed, it takes longer to be staged. Solved using automatic job re-submission (see later).

3. Jobs ERROR_V: AliRoot fixes from v4-11-Rev-01 to v4-11-Rev-03
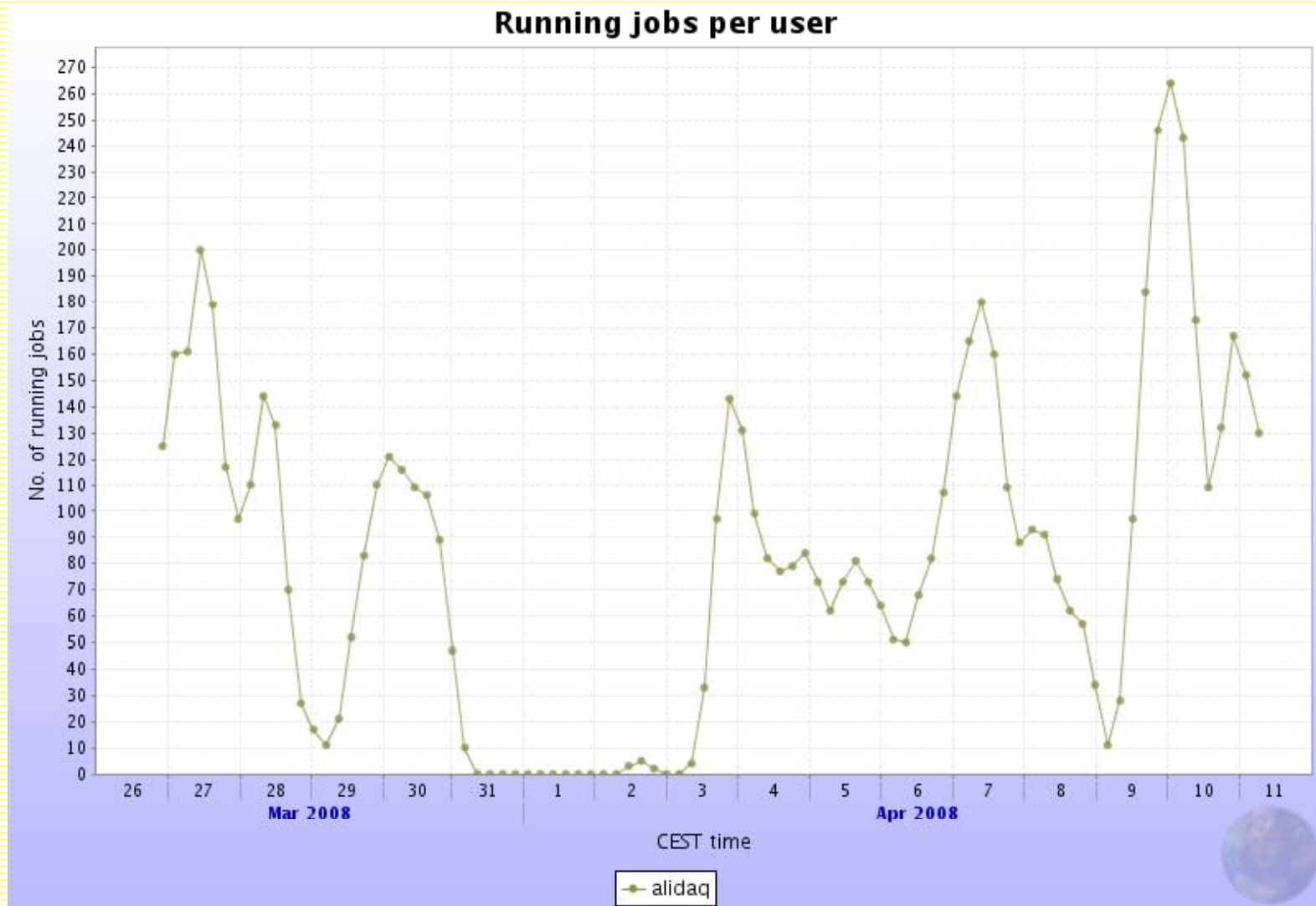
Phase 3. Automatic Production

- Unique master-job per each run, under the control of LPM tool in MonALISA (C.Grigoras)
  1. Master-job is kept running until 95% of the sub-jobs are DONE
  2. Task queue automatically re-filled if number of waiting jobs < 3500: number of ERROR_E decreases significantly
- Still some manual intervention: production gets stuck if too many ERROR_V ("rawdata not closed" or "tree not found")
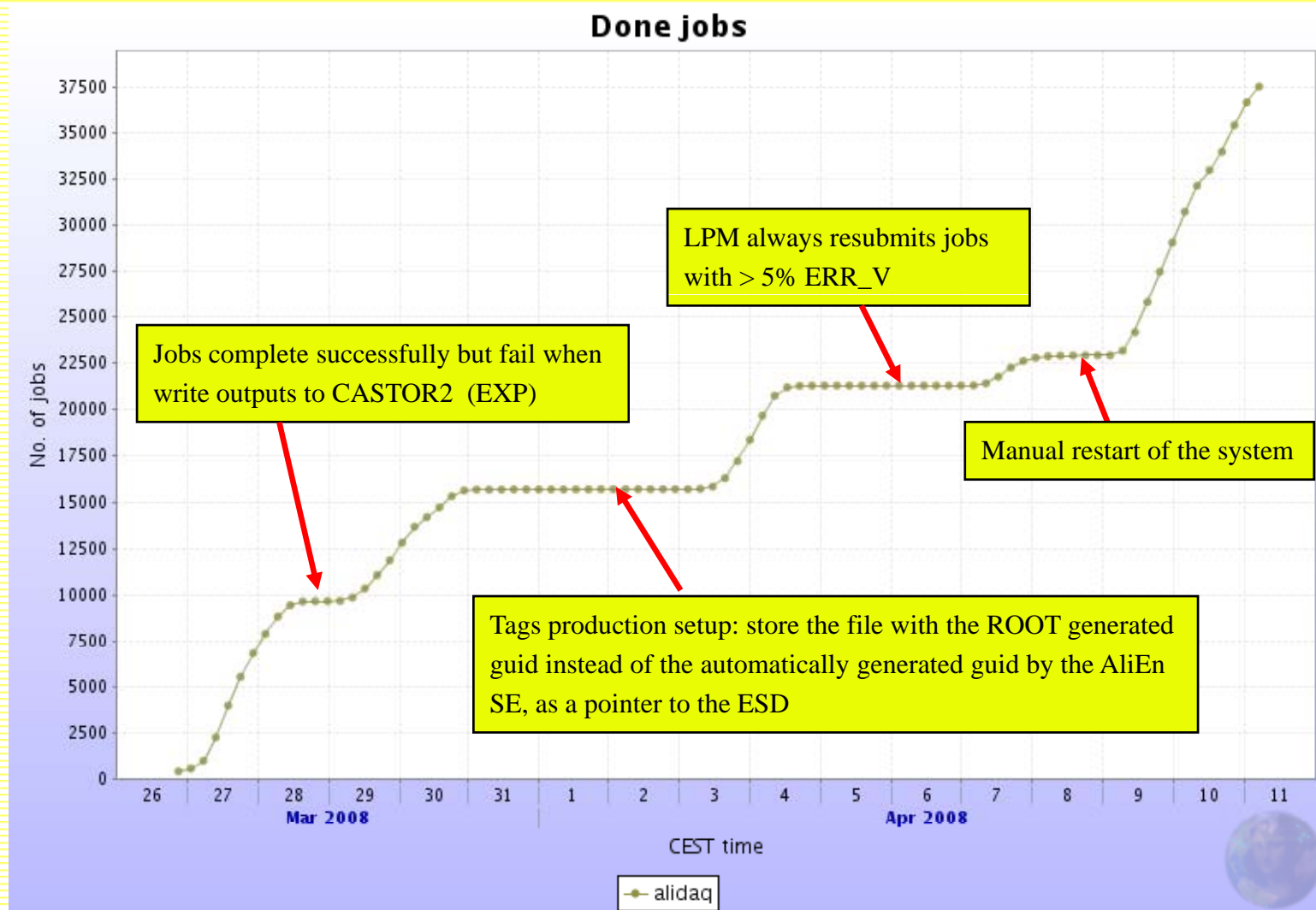

LPM in action
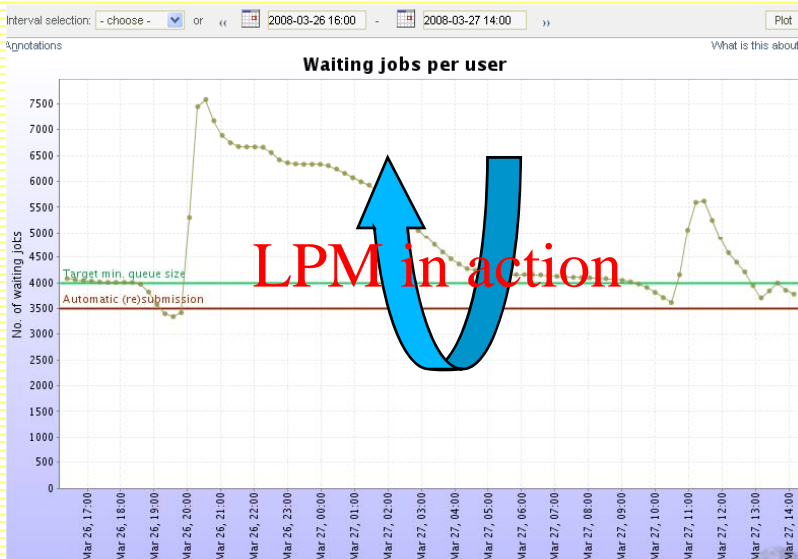
AliEn setup:
- Packages: AliRoot v4-11-Rev-03, ROOT v5-18-00b
- Partition: rawreco (CERN::LCG, CERN-gLite)
- AliEn: split per file options
- Higher priority to user *alidaq* (200 jobs in concurrent mode) since it was squeezed by *aliprod*
- Average reconstruction time per raw file: ~5mins

Production using LPM (1)

Running jobs per user

Production using LPM (2)

Done jobs

LPM always resubmits jobs with > 5% ERR_V

Jobs complete successfully but fail when write outputs to CASTOR2 (EXP)

Manual restart of the system

Tags production setup: store the file with the ROOT generated guid instead of the automatically generated guid by the AliEn SE, as a pointer to the ESD

No. of jobs

CEST time

Mar 2008

Apr 2008

alidaq

Production Monitoring

Run#	Partition	Chunks	Total size	First seen	Last seen	Transfer status	Processing status	Staging status
	LHC08a ▼			Last 3 months ▼		- All - ▼	Started ▼	- All - ▼
26042	LHC08a	662	600 GB	09 Mar 2008 16:11	09 Mar 2008 19:12		579 / 662 (87%)	
25959	LHC08a	435	392.8 GB	08 Mar 2008 23:47	09 Mar 2008 00:10	ALICE::FZK::DCACHE_TAPE	390 / 435 (89%)	
26020	LHC08a	2849	2.535 TB	09 Mar 2008 16:37	09 Mar 2008 18:56		2760 / 2849 (96%)	
26024	LHC08a	4	13.57 MB	09 Mar 2008 17:46	09 Mar 2008 17:46	ALICE::SARA::DCACHE	2 / 4 (50%)	
26010	LHC08a	1063	966.1 GB	09 Mar 2008 15:45	09 Mar 2008 16:38	ALICE::CCIN2P3::DCACHE_TAPE	924 / 1063 (86%)	
25974	LHC08a	254	227.5 GB	09 Mar 2008 06:04	09 Mar 2008 06:16	ALICE::FZK::DCACHE_TAPE	222 / 254 (87%)	
25964	LHC08a	1414	1.256 TB	09 Mar 2008 00:09	09 Mar 2008 01:19	ALICE::FZK::DCACHE_TAPE	1355 / 1414 (95%)	
26007	LHC08a	273	248.1 GB	09 Mar 2008 15:28	09 Mar 2008 15:41		229 / 273 (83%)	
26006	LHC08a	231	206 GB	09 Mar 2008 09:21	09 Mar 2008 09:37		214 / 231 (92%)	
25984	LHC08a	3881	3.455 TB	09 Mar 2008 06:16	09 Mar 2008 09:27		3770 / 3881 (97%)	

ALICE Repository

- 🌐 ALICE Repository 📶
  - 📄 Google Map
  - 📄 Shifter's dashboard
  - 📄 Running trend
  - 📁 Production info
  - 📁 Job Information

/alice/data/2008/LHC08a/000026

Next Cosmic

- According to the current reconstruction time per raw file, a "quasi-online production" is doable

- Tool for the shifter: UI installed to run reco choosing the chunks of interest for a given run

```
$ALICE_ROOT/test/cosmic/rec.sh 26042
```
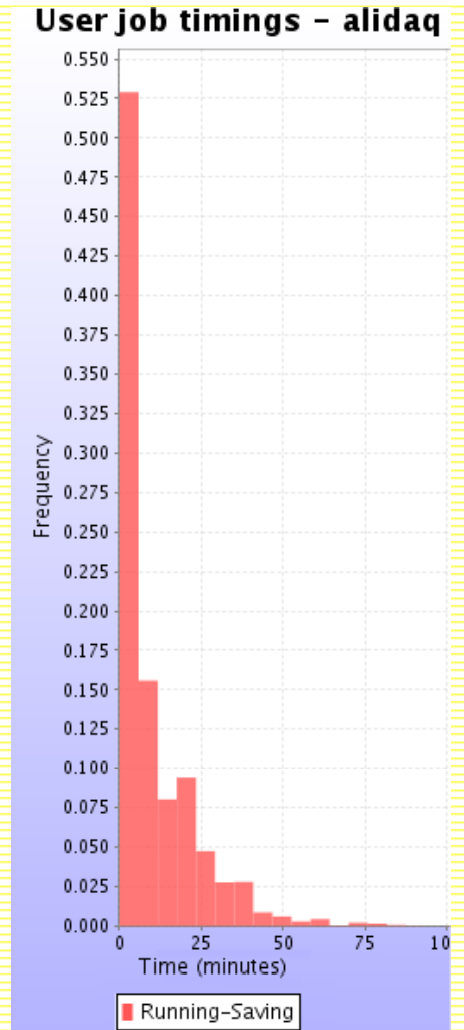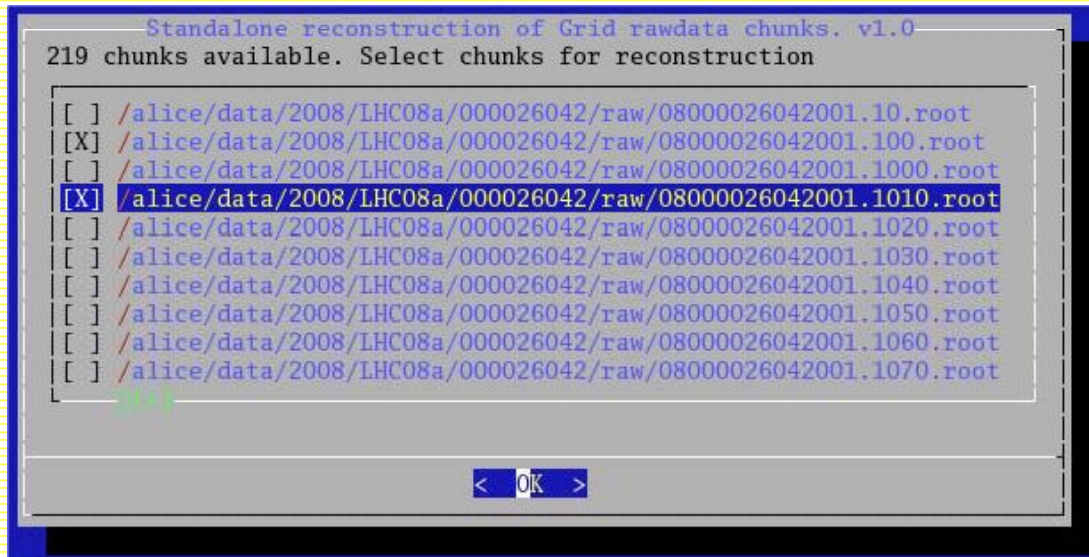
Conclusions

- Golden list successfully reconstructed, what's next?

- Painful to prototype code on the GRID: sometimes code works locally but not on the GRID, sometimes you wait hours to get a result and if it is not the expected one… $##ò#!!

- LPM has been proved to be a very useful tool
  - Some improvements needed (max number of re-submissions, handling ERROR_V)

- xrootd/alien/ROOT traffic during reconstruction is being monitored using MonALISA

- Need feedback from experts, only ITS gave answer

- Next data taking: runs will be processed after SHUTTLE advertises the EoR?

- Thanks to Fabrizio, Latchezar, Cvetan, Peter, Pablo and Costin for the help to debug and fix the code