Introduction to FDR

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DESY

Overview

- Purpose of the FDR
- Data structure
- Physics prospects
- FDR-I and Reprocessed FDR-I
- Outlook for FDR-II

Purpose of the FDR

- Simulate one day of data taking at ATLAS
- Reconstruction of data on SFOs and distribution to the GRID
- Realistic detector (e.g. LAr miscalibration, cavern background)
- Two phases: FDR-1 (Jan/Feb 08) and FDR-2 (May/Jun 08)
- Goal for FDR-1: production of two data samples of 0.8 pb^{-1} each corresponding to a 10- and 1-hr run at 10^{31} & 10^{32} luminosity
- Goal for FDR-2: aim for 10^{32} & 10^{33} luminosity
- https://twiki.cern.ch/twiki/bin/view/Atlas/FullDressRehearsal

Data Structure

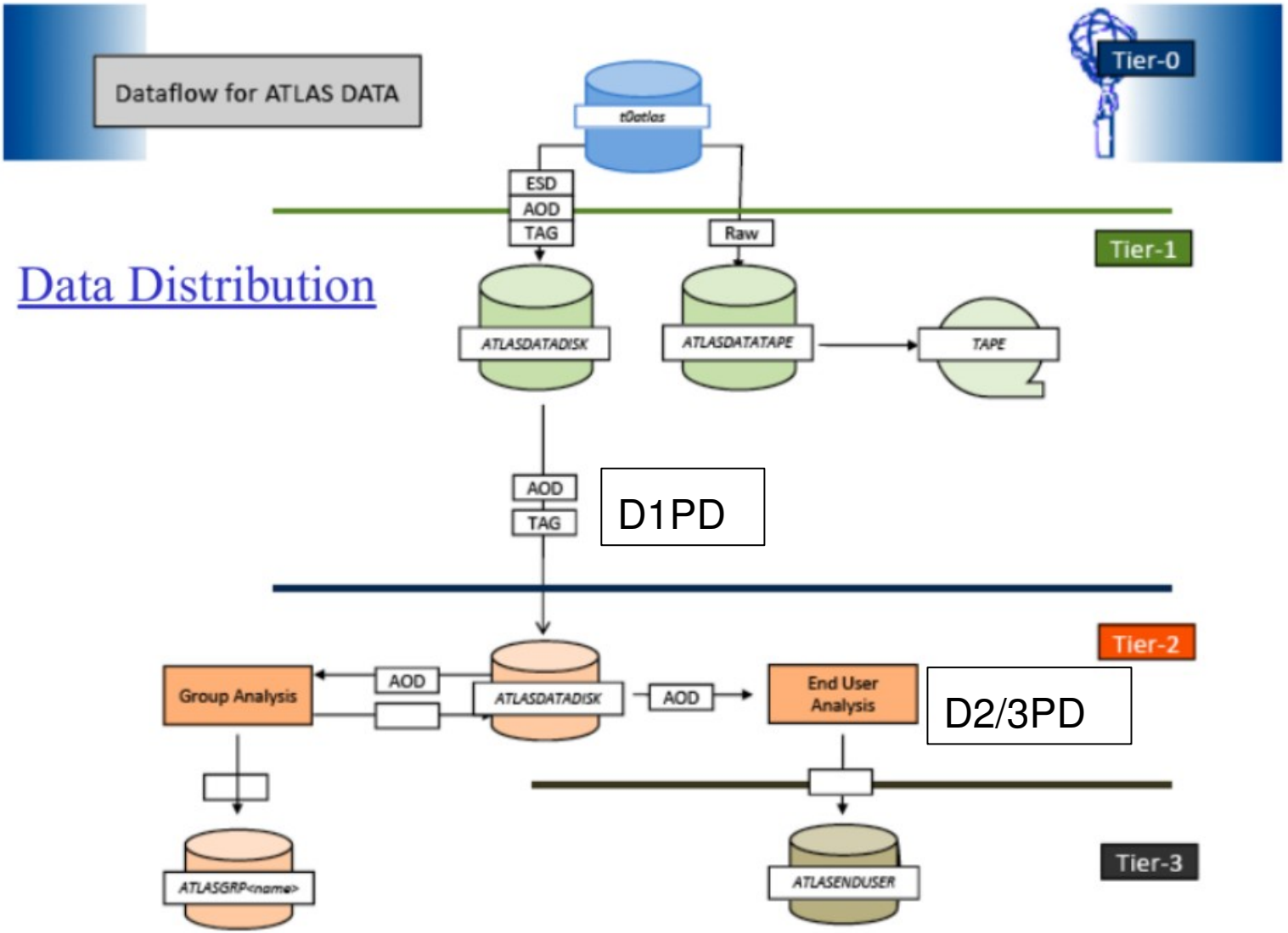
- FDR-1:
  - 10 runs of 1 hr at 10^{31} luminosity, in total 0.4 pb^{-1}
  - 10^{31} Trigger menu
  - Five streams: egamma, muon, jetTauEtmiss, minbias, express and calibration
  - Physics groups to analyze one or more streams to produce DPD ntuples: TauPhys, BPhys, SUSY, TopPhys (together with EW)

Physics prospects

	σ (pb)	σ *BR	Eff.*Acc.	Num at 1 pb^{-1}	Num at 5[illegible] pb^{-1}
pp->J/ψ (μ6μ4)				30,000	1,500,00[illegible]
W		20510	15%	3,077	153,82[illegible]
Wbb		111	15%	17	83[illegible]
Z		2015	15%	302	15,11[illegible]
tT	833	461	10%	46	2,30[illegible]
t-chan single t	246	80	1%	1	4[illegible]
	(Eff.*Acc. is a rough estimate. BR includes e/mu/tau)				

- Forget about Higgs discovery :)
- Background and crude signal studies still possible
- Understand detector and trigger systems
- Get used to the software tools

Data distribution



Run Structure

Original run	Tuesday run	Wednesday run	Thursday run	LB range
3048	-	-	3070	1-30
3049	-	-	3071	1-30
3050	3050	3061	3072	1-30
3051	3051	3062	3073	1-30
3052	3052	3063	3074	1-30
3053	3053	3064	3075	1-30
3054	3054	3065	3076	1-30
3055	3055	3066	3077	1-30
3056	3056	3067	3078	1-30
3057	3057	3068	3079	1-30

- Runs 3048 and 3049 (& replays) -> physics + e/gamma fakes
- Runs 3050-3057 (& reps.) -> physics events only
- Run 3058 (3080) -> physics + e/gamma fakes, 10^{32} (not there yet)
- List of datasets:

http://gridui02.usatlas.bnl.gov:25880/server/pandamon/query?mode=listFDR

FDR-1 Results

FDR-1 Experiences: Issues

TAG selection - as noted, no TAG files were distributed

However, tools have been made available to allow users to make use of the TAG db - several users have successfully tested this

TAG files are not critical for FDR-1 but will be crucial for real data

Need to test on FDR-1 reprocessing and FDR-2

Trigger - some difficulties: reading trigger info, accounting for prescales

Trigger in rapid devel

Many users found workarounds but suggested better documentation on future workarounds (should they exist)

Lumi info - not available in AOD or in COOL db

I'm not aware of any successful workarounds (there were several attempts)

Expect Lumi info will be available in reprocessed FDR-1 AODs

FDR-1 Reprocessing@Tier-0

Plan is to reconstruct the FDR-1 data first at the Tier-0: this week(?)

- Easily controlled environment that we know works
- Nonetheless, lots of teething problems getting set up again
- Will make Tag files, load TagDB, export Tag files this time as standard (another reason to use Tier-0 - we know how to do it there)
- Export ESD, AOD and Tag files (and RAW for new run - below)
- Release 13.0.40.4 will be used, with a couple of tags for metadata propagation
- Trigger info, and lumiDB info, should be usable (still to be checked)
- Only "3070-series" of runs (others are duplicates)
  - Reconstruct MB stream twice (once with low-p_t tracking enabled)

One additional run being added ("3080") - this is the "late" higher lumi run (1h at 10^{32})

- Cross-section bugs should be fixed in this
- RAW from this should also be exported, as though newly taken data
  - Stream definition for this run differs from remainder of FDR-1!

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Dave Charlton(Birmingham), 28 April 2008

FDR-2 Outlook

June 2nd

Physics Samples

- ~3M events, integrated lumi=5 pb^{-1}, 5 runs of 1h each at 10^{32} or $10^{33}/cm^2/s$

Run	Options	pb^{-1}
1	10^{32} trigger menu, no pileup, ideal geometry	0.36
2	10^{32}, no pileup, ideal geometry, fakes	0.36
3	10^{32}, no pileup, misaligned geometry, fakes	0.36
4	10^{32}, no pileup, misaligned geometry, fakes	0.36
8	10^{33}, displaced vertex, pileup, no fakes	3.6

- production with release 13.0.40.3 (and .4)
- play through in fills of a few hours each day
- streams:
  - like FDR-1: MinBias, Muon, e/gamma, Jet, Express
  - special calibration/alignment streams (private productions, decoupled from production of physics events; partial events)

Conclusion

- Despite many difficulties, FDR-1 samples widely available
- Better FDR-1 and FDR-2 data available soon
- In the meantime, get used to the tools for physics analysis and distributed computing
- Hope you will enjoy the tutorial