

LHCb: CCRC'08 "numbers" for
February
Nick Brook



Planned tasks

- Raw data distribution from pit → T0 centre
 - Use of rfcpl into CASTOR from pit - T1D0
- Raw data distribution from T0 → T1 centres
 - Use of FTS - T1D0
- Recons of raw data at CERN & T1 centres
 - Production of rDST data - T1D0
 - Use of SRM 2.2
- Stripping of data at CERN & T1 centres
 - Input data: RAW & rDST - T1D0
 - Output data: DST - T1D1
 - Use SRM 2.2
- Distribution of DST data to all other centres
 - Use of FTS - T0D1 (except CERN T1D1)

All tasks envisaged during data taking in 2008

Activities across the sites

- Breakdown of processing activities (CPU needs)

<u>Site</u>	<u>Fraction (%)</u>
CERN	14
FZK	14
IN2P3	22
CNAF	15
NIKHEF/SARA	17
PIC	8
RAL	10

NB: No other production activities envisaged but user analysis will continue

Amount of data (per storage class)

Storage (TB)	LHCb_RAW (T1D0)	LHCb_RDST (T1D0)	LHCb_M-DST (T1D1)	LHCb_DST (T0D1)
CERN	42	3	8	0
FZK	3.7	3	1.2	6.8
IN2P3	5.7	4.6	1.8	6.2
CNAF	4	3.2	1.2	6.8
NIKHEF	12.1	3.7	1.4	6.6
PIC	2	1.6	0.7	7.3
RAL	14.7	2.2	0.9	7.1

Amount of data/site

Storage (TB)	T1D0	T1D1	T0D1	Tape	Disk
CERN	45	8	0	53	8
FZK	6.7	1.2	6.8	7.9	8
IN2P3	10.3	1.8	6.2	12.1	8
CNAF	7.2	1.2	6.8	8.4	8
NIKHEF	15.8	1.4	6.6	17.2	8
PIC	3.6	0.7	7.3	4.3	8
RAL	16.9	0.9	7.1	17.8	8

CPU Needs

CPU(kSI2k.days)	Recons	Stripping	Total
CERN	4564	888	5452
FZK	4449	866	5315
IN2P3	6889	1340	8229
CNAF	4736	921	5657
NIKHEF	5583	1086	6669
PIC	2397	466	2863
RAL	3330	648	3978
Total	31948	6215	38163

No CPU efficiency factor of 0.85 included a la TDRs

Nos of jobs/site

	<u>Total Jobs</u>			<u>Simultaneous jobs</u>		
	Recons	Strip	Total	Recons	Strip	Total
CERN	3300	1100	4400	236	79	315
FZK	3200	1100	4300	229	79	308
IN2P3	5000	1700	6700	358	122	480
CNAF	3400	1200	4600	243	86	329
NIKHEF	4000	1400	5400	286	100	386
PIC	1700	600	2300	122	43	165
RAL	2400	800	3200	172	58	230
Total	23000	8000	31000	1643	572	2215

Job Details

Job type	Duration (hrs)	i/p files (from tape buffer)
Recons	24	1x~1.8 GB
Strip	6	3x~1.0GB +3x1.8 GB

Cache for tape

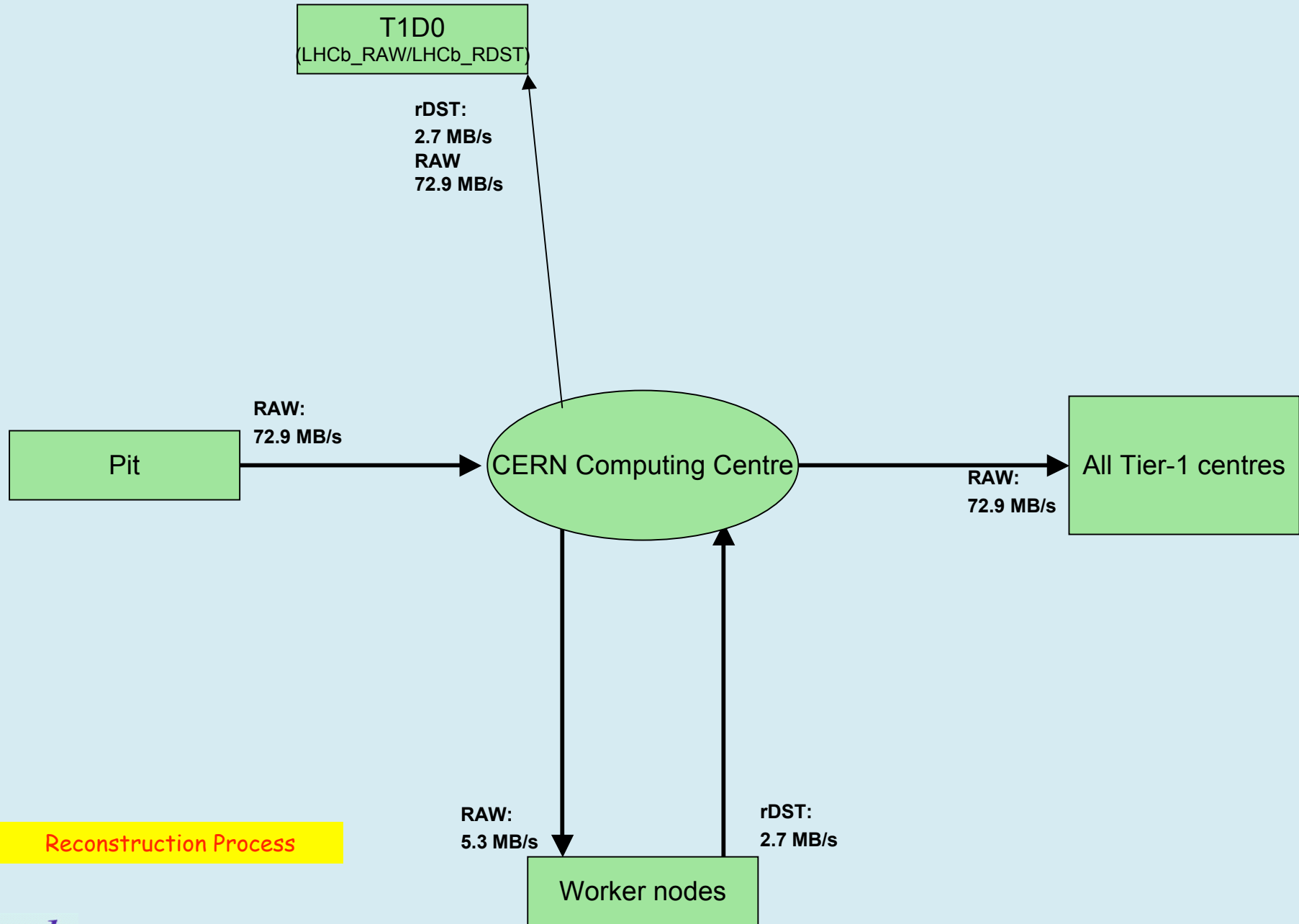
Cache(TB)	LHCb_RAW (T1D0)	LHCb_RDST (T1D0)
<u>CERN</u>	1.8	0.5
<u>FZK</u>	1.8	0.5
<u>IN2P3</u>	2.8	0.7
<u>CNAF</u>	1.9	0.5
<u>NIKHEF</u>	2.2	0.6
<u>PIC</u>	1	0.3
<u>RAL</u>	1.3	0.4

This is for processing - CERN needs cache adding for pit transfer

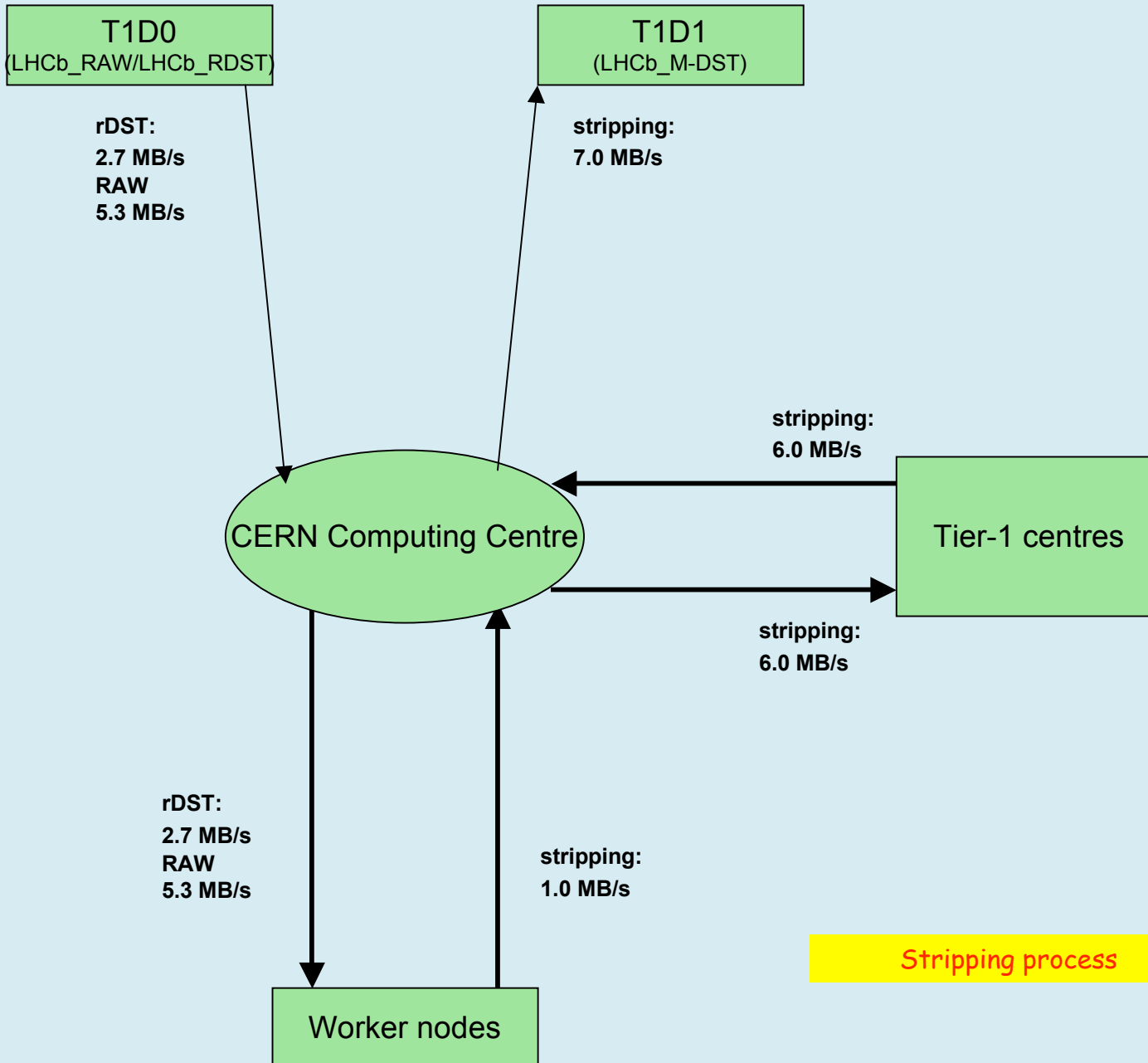
CERN CASTOR cache for data taking

- Guaranteed 8 hour migration time
 - More likely 3 hours
- 2 TB cache

CERN CCRC08



Reconstruction Process

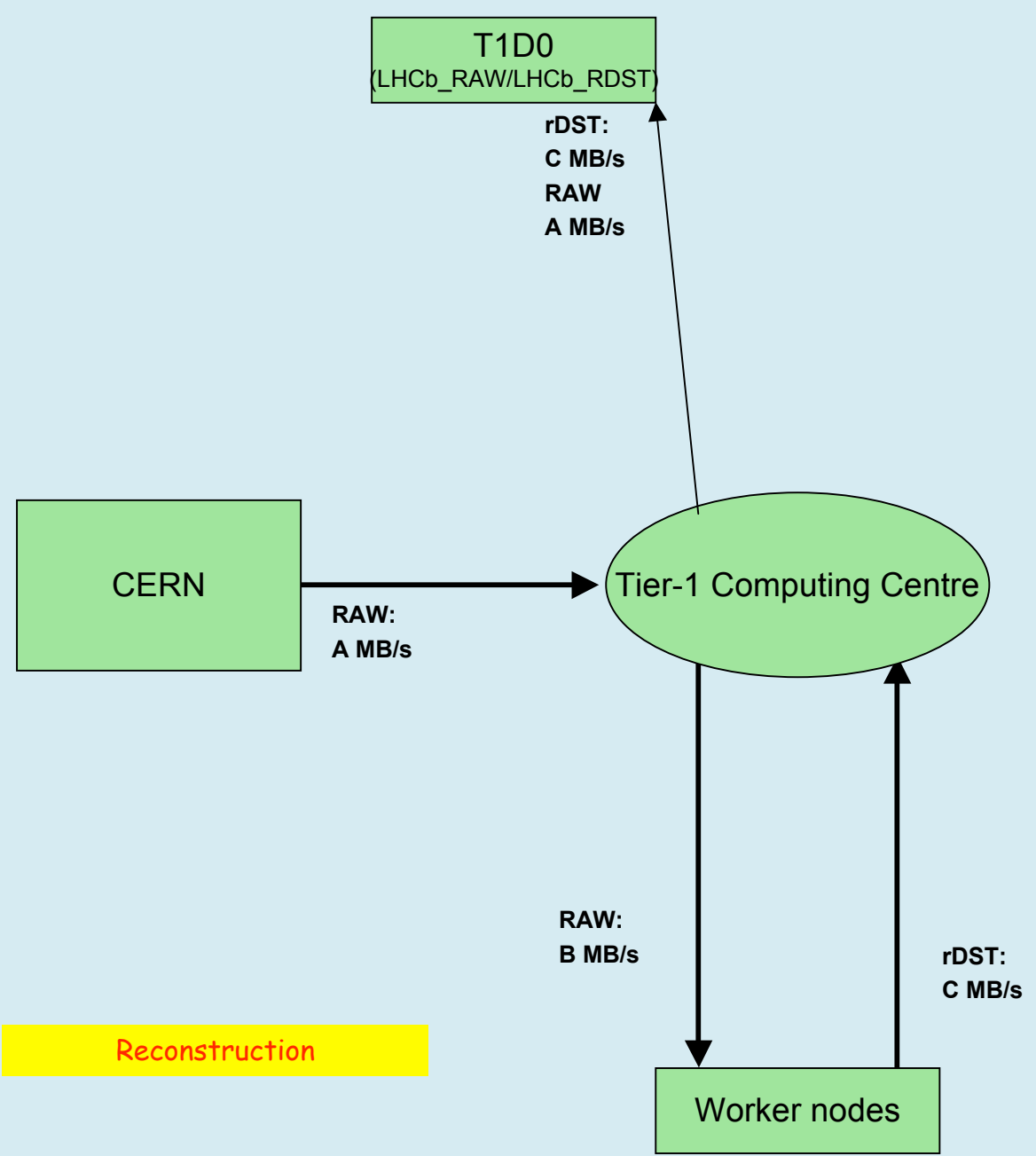


(Note: This should be pinned on disk cache in between rDST production & stripping)

Stripping process

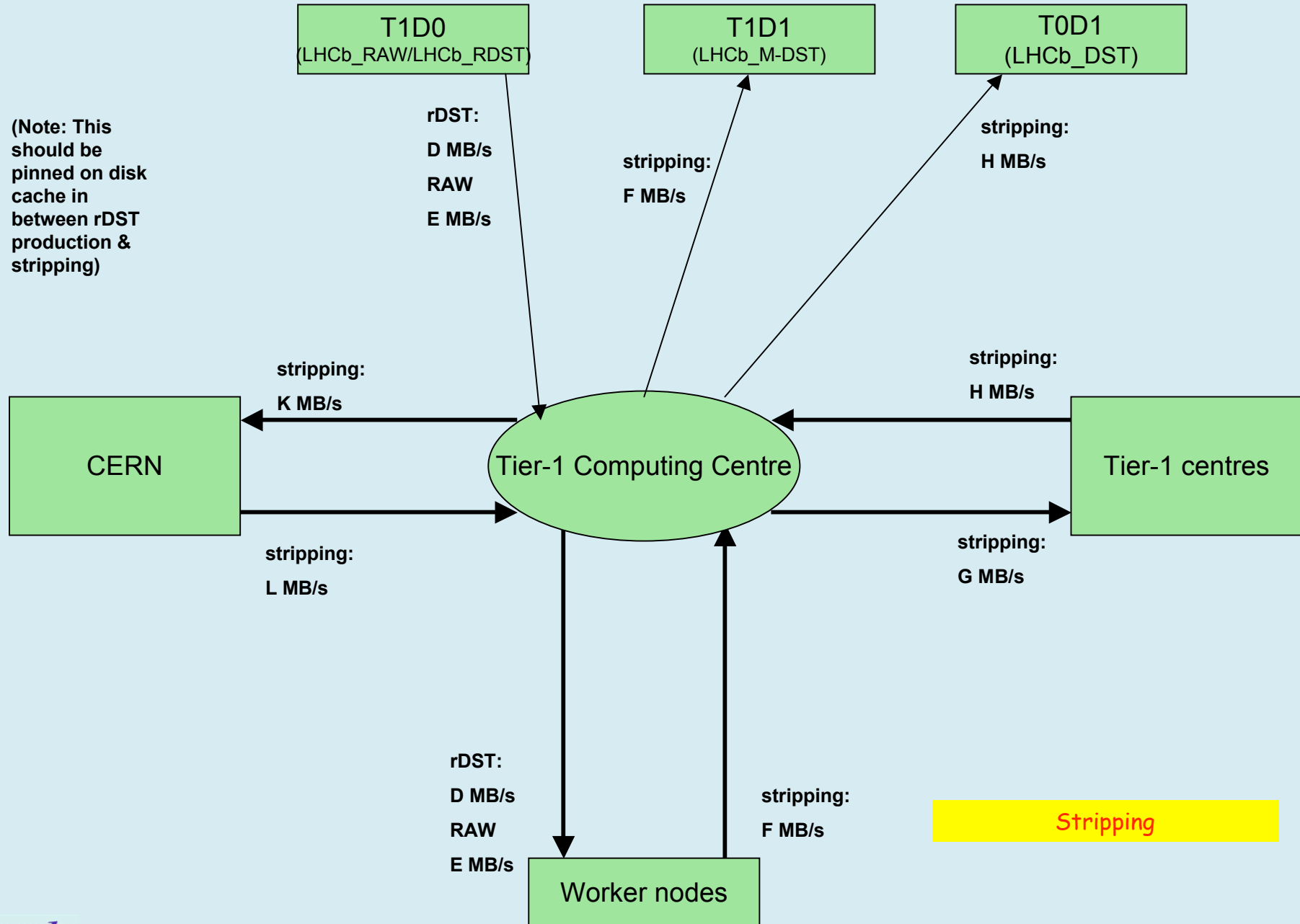
Tier-1 CCRC08

(refer to attached spreadsheet for numbers)



Reconstruction

(Note: This should be pinned on disk cache in between rDST production & stripping)



Breakdown of rate per site

Label		CERN	FZK	IN2P3	CNAF	NIKHEF	PIC	RAL	Total	
	RAW: CERN-> T1 (TB) (LHCb_RAW)		6.9	10.6	7.3	8.6	3.7	5.2	42	
	rDST produced (TB) (LHCb_RDST)	3	3	4.6	3.2	3.7	1.6	2.2		
A	RAW: CERN-> T1 (MB/s) (LHCb_RAW)		11.9	18.4	12.6	14.9	6.4	8.9	72.9	
B	Recons: RAW to WN(MB/s) (LHCb_RAW)	5.3	5.1	7.9	5.4	6.4	2.8	3.8		
C	Recons: rDST to MSS (MB/s) (LHCb_RDST)	2.7	2.6	4	2.7	3.2	1.4	1.9		
	Strip: DST from WN to T1D1 SE (TB) (LHCb_M- DST)	1.2	1.2	1.8	1.2	1.4	0.7	0.9		
	Strip: DST from CERN to T1 TOD1 (TB) (LHCb_DST)		1.2	1.2	1.2	1.2	1.2	1.2		
D	Strip: rDST from MSS (MB/s) (LHCb_RDST)	2.7	2.6	4	2.7	3.2	1.4	1.9		
E	Strip: RAW from MSS (MB/s) (LHCb_RAW)	5.3	5.1	7.9	5.4	6.4	2.8	3.8		
F	Strip: DST from WN to T1D1 SE (MB/s) (LHCb_M-DST)	1	1	1.5	1.1	1.3	0.6	0.8	6	
K	Strip: DST from T1 to CERN T1D1 (MB/s) (LHCb_M-DST)		1	1.5	1.1	1.3	0.6	0.8		
L	Strip: DST from CERN to T1 TOD1 (MB/s) (LHCb_DST)		1	1	1	1	1	1	6	
			TOD1 Destination (LHCb_DST)						G	
	Strip: DST distribution (MB/s)		FZK	IN2P3	CNAF	NIKHEF	PIC	RAL	Total outgoing	
			-	1	1	1	1	1	4.9	
			1.5	-	1.5	1.5	1.5	1.5	7.5	
			1.1	1.1	-	1.1	1.1	1.1	5.2	
			1.3	1.3	1.3	-	1.3	1.3	6.1	
			0.6	0.6	0.6	0.6	-	0.6	2.7	
			0.8	0.8	0.8	0.8	0.8	-	3.7	
H			Total Incoming	5.3	4.7	5.3	5.1	5.7	5.5	
			Destination (LHCb_DST)						Total outgoing	
	Strip: DST distribution (TB)		FZK	IN2P3	CNAF	NIKHEF	PIC	RAL	Total outgoing	
			-	1.2	1.2	1.2	1.2	1.2	5.6	
			1.8	-	1.8	1.8	1.8	1.8	8.7	
			1.2	1.2	-	1.2	1.2	1.2	6	
			1.4	1.4	1.4	-	1.4	1.4	7	
			0.7	0.7	0.7	0.7	-	0.7	3.1	
			0.9	0.9	0.9	0.9	0.9	-	4.2	
			Total Incoming	6	5.4	6	5.8	6.5	6.3	

Data Access

- Will need SRM 2.2 SE with correct space tokens
 - LHCb space tokens are:
 - LHCb_RAW (T1D0)
 - LHCb_RDST (T1D0)
 - LHCb_M-DST (T1D1)
 - LHCb_DST (T0D1)
 - LHCb_MC_M-DST (T1D1)
 - LHCb_MC_DST (T0D1)
 - LHCb_FAILOVER (T0D1) ← NEW!!!!
- Need access to lcg utils/GFAL on WN
 - Will be using lcg-gt & lcg-cp as a minimum as part of running applications
 - Data access is using local protocol on returned TURL from lcg utils
 - Data is NOT copied to local WN disk before being read from application

Databases

- Conditions DB at CERN & Tier-1 centres
 - For February will use static information replicated using "streaming" from CERN to Tier-1's
 - No plans to test replication of conditions DB Pit \leftrightarrow Tier-0 (and beyond) during February
 - Application access rate will be 10's kB per job at start-up
- LFC
 - For February will use local T1 instance if available & tested (probably RAL, IN2P3 & CNAF)
 - Use "streaming" to populate the read-only instance at T1 from CERN
 - Programme of testing already under discussion with above sites

Data Retention

- There is NO need to keep data in February's exercise
- February exercise schedule

	Pre-tests 1 (January)	Pre-tests 2 (early Feb)	Week1 (18 th Feb)	Week2 (25 th Feb)
Raw data distribution				
Reconstruction				
Stripping				
DST distribution				

Summary

- February dress rehearsal will test full data-recons-stripping chain at expected 2008 rates
- Estimates of resource needs, concurrent jobs & data access given
 - Wish to test access to DB services at site, Conditions DB & LFC replicas
 - Access data using local protocol from SE