

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	7
IN2P3	12
CNAF	8
NIKHEF/SARA	25
PIC	4
RAL	30

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)
<u>CERN</u>	42	3	8	0
<u>FZK</u>	3.7	1.6	0.6	7.5
<u>IN2P3</u>	5.7	2.5	1	7.2
<u>CNAF</u>	4	1.7	0.7	7.5
<u>NIKHEF</u>	12.1	5.2	2	6.1
<u>PIC</u>	2	0.9	0.4	7.8
<u>RAL</u>	14.7	6.3	2.4	5.7

Amount of data/site

Storage (TB)	T1D0	T1D1	T0D1	Tape	Disk
<u>CERN</u>	45	8	0	53	8
<u>FZK</u>	5.3	0.6	7.5	5.9	8.1
<u>IN2P3</u>	8.2	1	7.2	9.2	8.2
<u>CNAF</u>	5.7	0.7	7.5	6.4	8.2
<u>NIKHEF</u>	17.3	2	6.1	19.3	8.1
<u>PIC</u>	2.9	0.4	7.8	3.3	8.2
<u>RAL</u>	21	2.4	5.7	23.4	8.1

CPU Needs

<u>CPU(kSI2k.days)</u>	<u>Recons</u>	<u>Stripping</u>	<u>Total</u>
CERN	5134	571	5705
FZK	2695	300	2995
IN2P3	4173	464	4637
CNAF	2869	319	3188
NIKHEF	8840	983	9823
PIC	1452	162	1614
RAL	10778	1198	11976
Total	35941	3997	39938

No CPU efficiency factor of 0.85 included a la TDRs

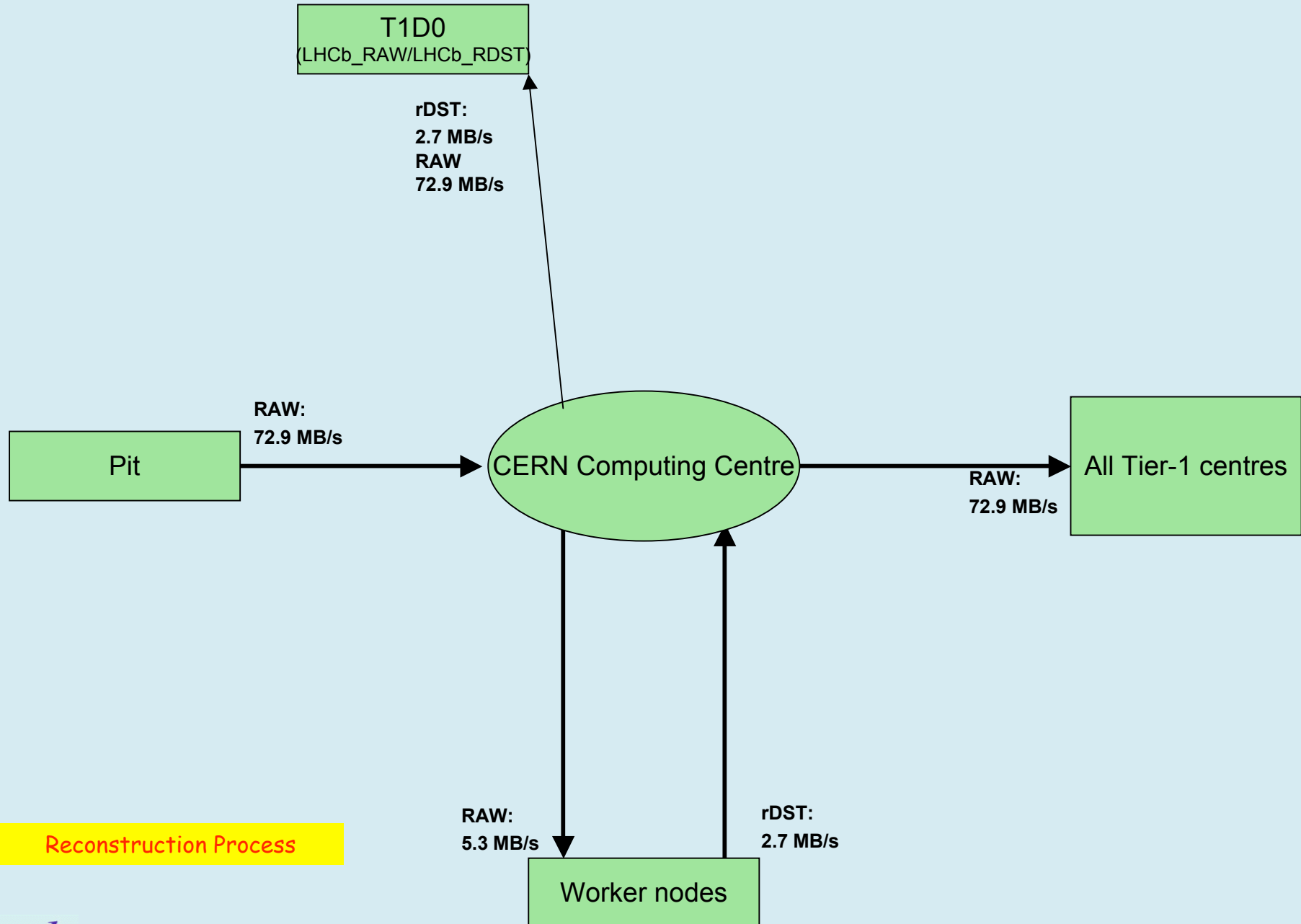
Nos of jobs/site

	Total Jobs			Simultaneous jobs		
	Recons	Strip	Total	Recons	Strip	Total
CERN	3300	1100	4400	236	79	315
FZK	1700	600	2300	122	43	165
IN2P3	2700	900	3600	193	65	258
CNAF	1800	600	2400	129	43	172
NIKHEF	5700	2000	7700	408	143	551
PIC	900	300	1200	65	22	87
RAL	6900	2400	9300	493	172	665
Total	23000	8000	31000	1643	572	2215

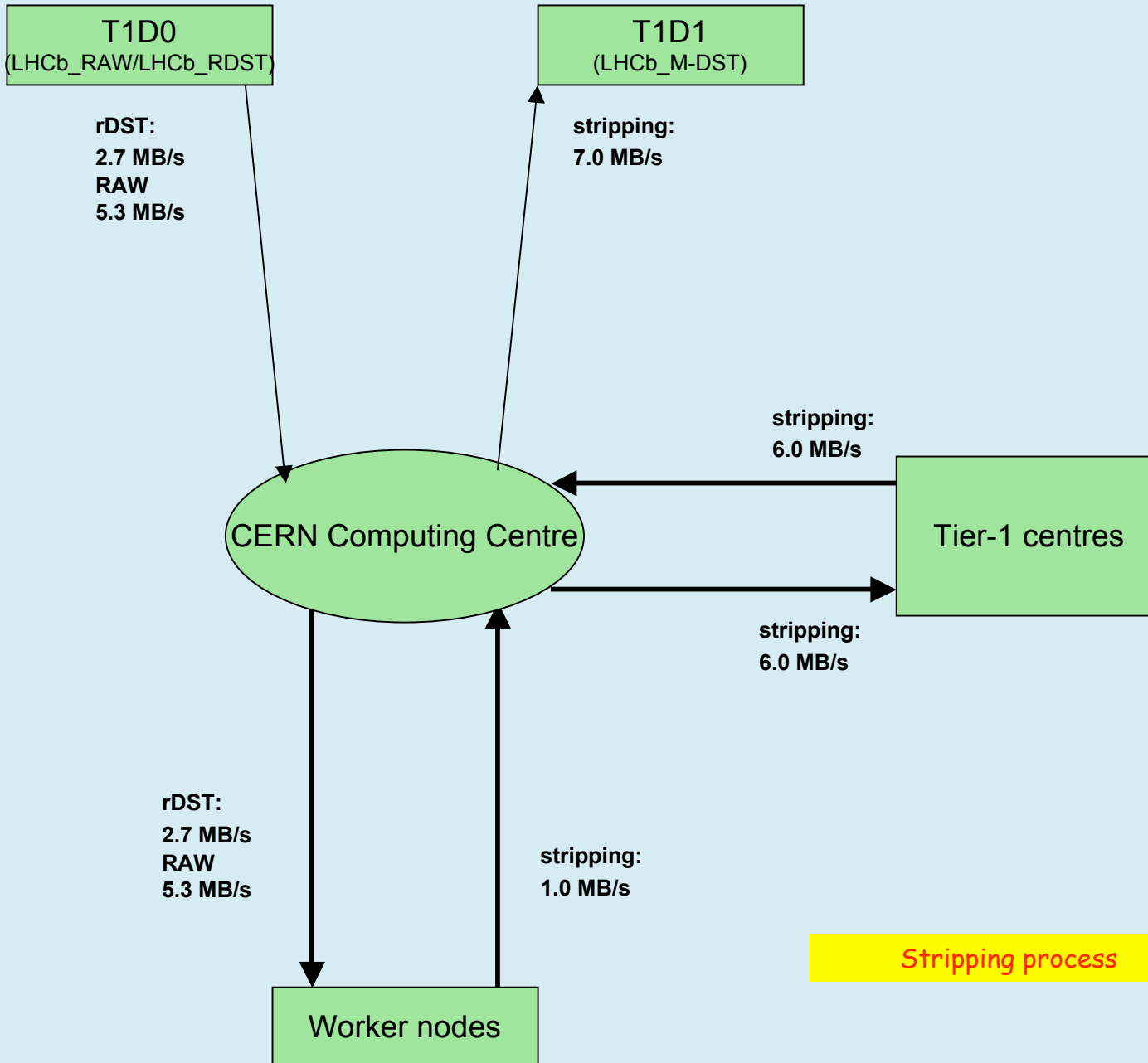
Job Details

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

CERN CCRC08



Reconstruction Process

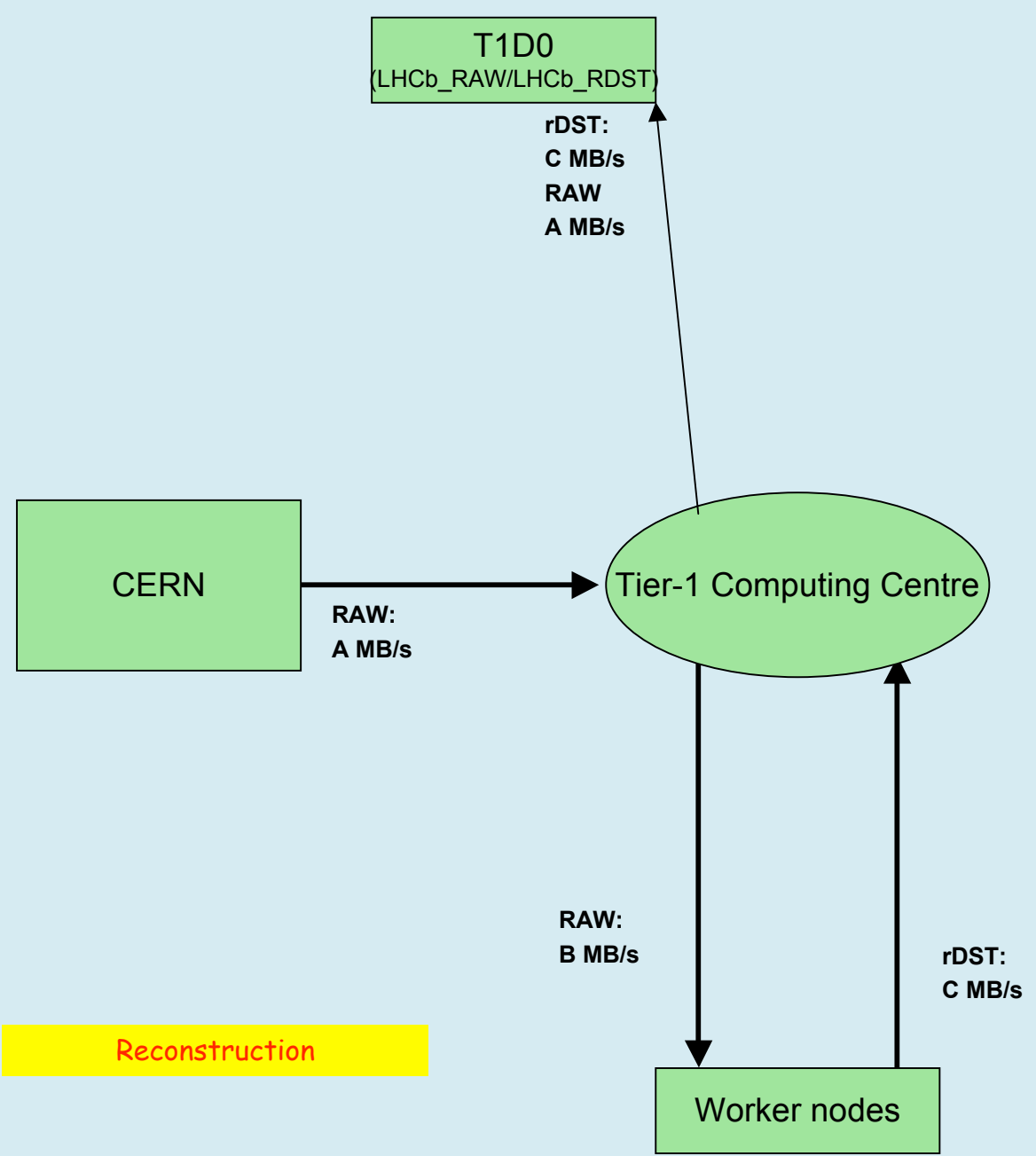


(Note: This should be pinned on disk cache in between rDST production & stripping)

Stripping process

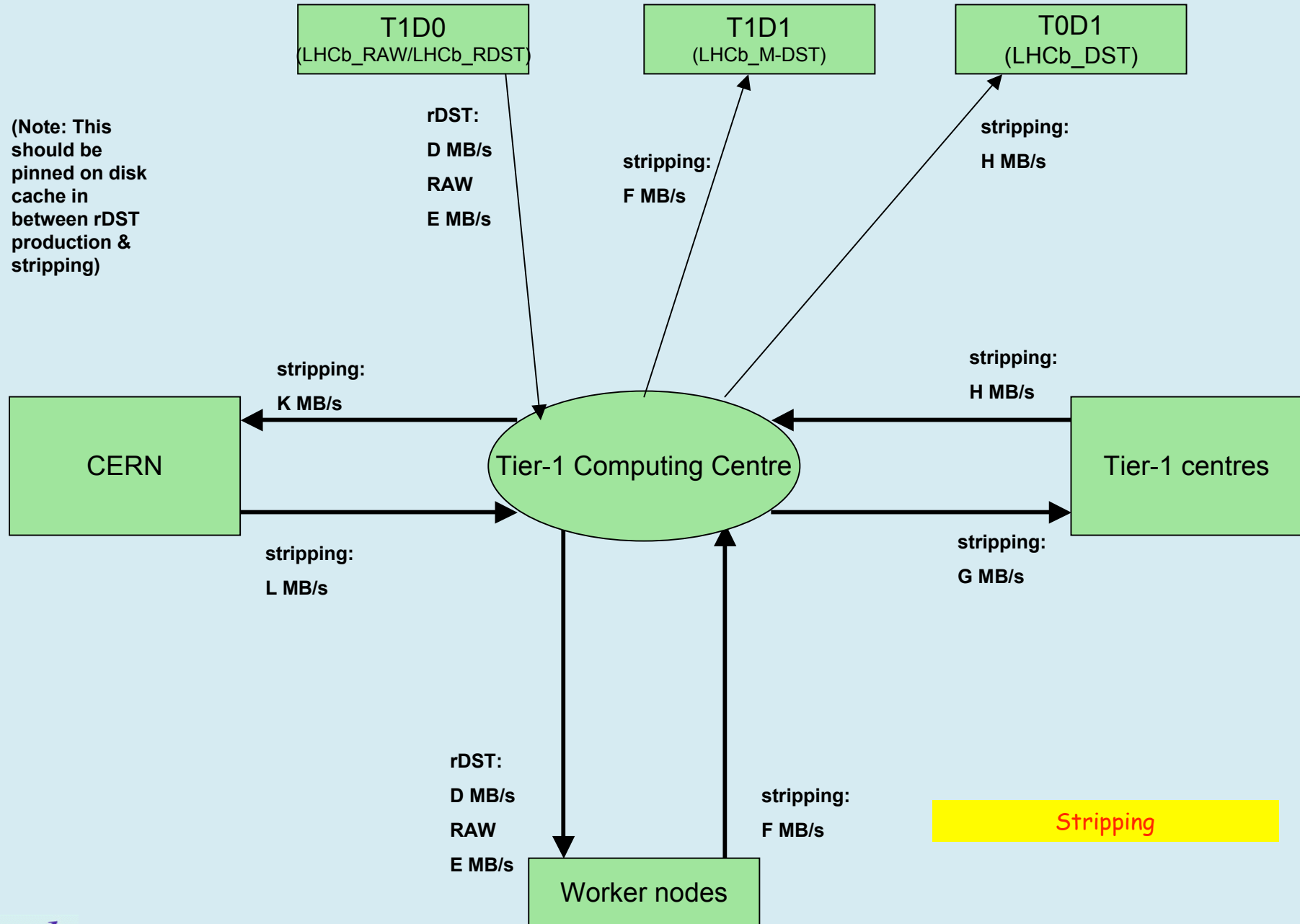
Tier-1 CCRC08

(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)		3.7	5.7	4	12.1	2	14.7	42	
	rDST produced (TB) (LHCb_RDST)	3	1.6	2.5	1.7	5.2	0.9	6.3		
A	RAW: CERN-> T1 (MB/s) (LHCb_RAW)		6.4	9.9	6.8	20.9	3.5	25.5	72.9	
B	Recons: RAW to WN(MB/s) (LHCb_RAW)	5.3	2.8	4.3	3	9	1.5	11		
C	Recons: rDST to MSS (MB/s) (LHCb_RDST)	2.7	1.4	2.2	1.5	4.5	0.8	5.5		
	Strip: DST from WN to T1D1 SE (TB) (LHCb_M- DST)	1.2	0.6	1	0.7	2	0.4	2.4		
	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	1.4	2.2	1.5	4.5	0.8	5.5		
E	Strip: RAW from MSS (MB/s) (LHCb_RAW)	5.3	2.8	4.3	3	9	1.5	11		
F	Strip: DST from WN to T1D1 SE (MB/s) (LHCb_M-DST)	1	0.6	0.9	0.6	1.8	0.3	2.1	6	
K	Strip: DST from T1 to CERN T1D1 (MB/s) (LHCb_M-DST)		0.6	0.9	0.6	1.8	0.3	2.1		
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	
		Source	FZK	-	0.6	0.6	0.6	0.6	2.6	
			IN2P3	0.9	-	0.9	0.9	0.9	4.1	
			CNAF	0.6	0.6	-	0.6	0.6	2.8	
			NIKHEF	1.8	1.8	1.8	-	1.8	8.6	
			PIC	0.3	0.3	0.3	0.3	-	1.5	
			RAL	2.1	2.1	2.1	2.1	-	10.4	
			Total Incoming	5.7	5.3	5.6	4.5	5.9	4.1	
			Destination (LHCb_DST)							Total outgoing
	Strip: DST distribution (TB)		FZK	IN2P3	CNAF	NIKHEF	PIC	RAL	Total outgoing	
		Source	FZK	-	0.6	0.6	0.6	0.6	3	
			IN2P3	1	-	1	1	1	4.7	
			CNAF	0.7	0.7	-	0.7	0.7	3.2	
			NIKHEF	2	2	2	-	2	9.9	
			PIC	0.4	0.4	0.4	0.4	-	1.7	
			RAL	2.4	2.4	2.4	2.4	-	12	
			Total Incoming	6.5	6.1	6.4	5.1	6.7	4.7	

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	Red	Blue	Red	Red
Reconstruction	Blue	Red	Red	Red
Stripping	Blue	Red	Red	Red
DST distribution	Red	Blue	Red	Red

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