



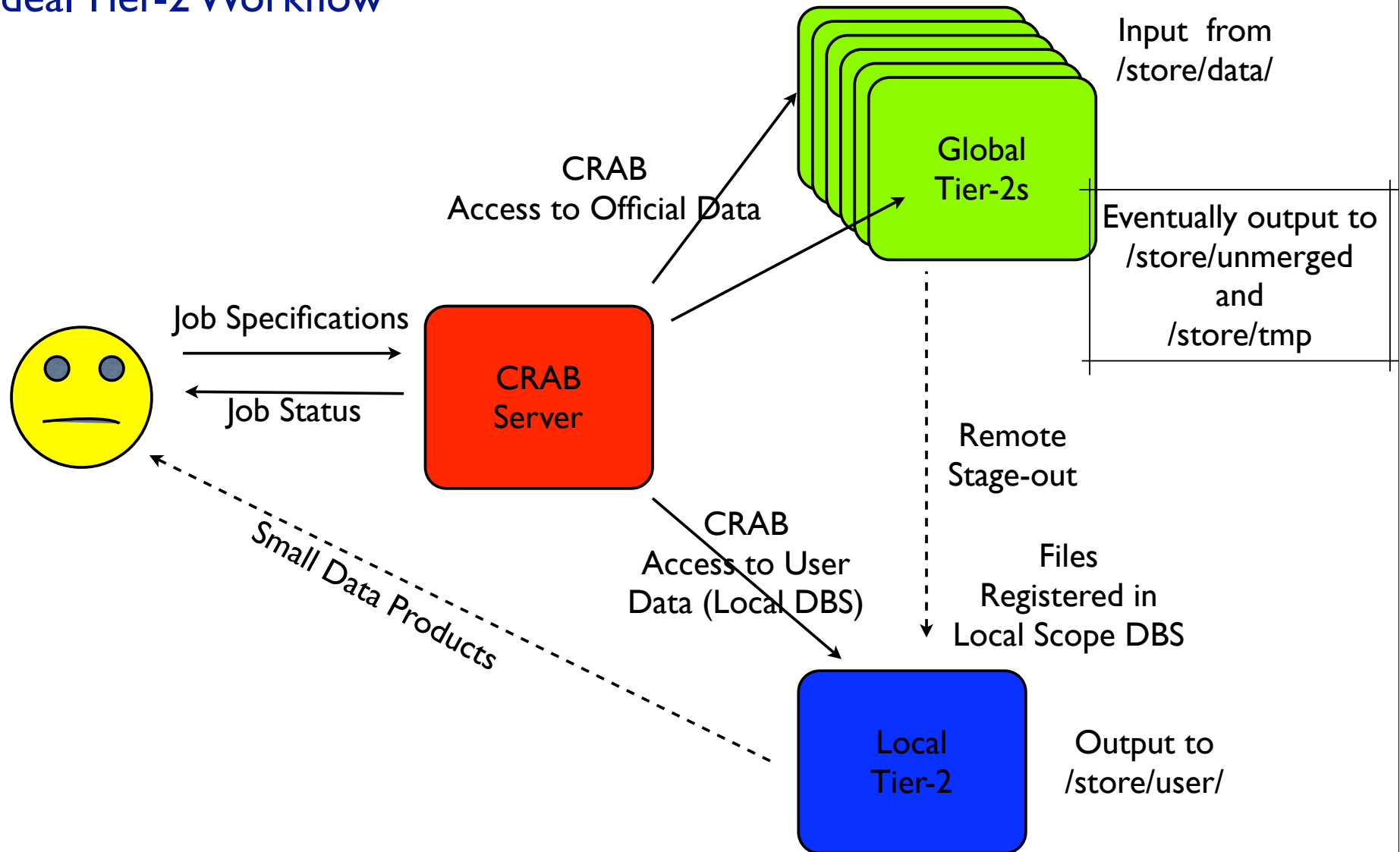
Introduction to Analysis on Tier-2s

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Tier-2 Analysis Workflow

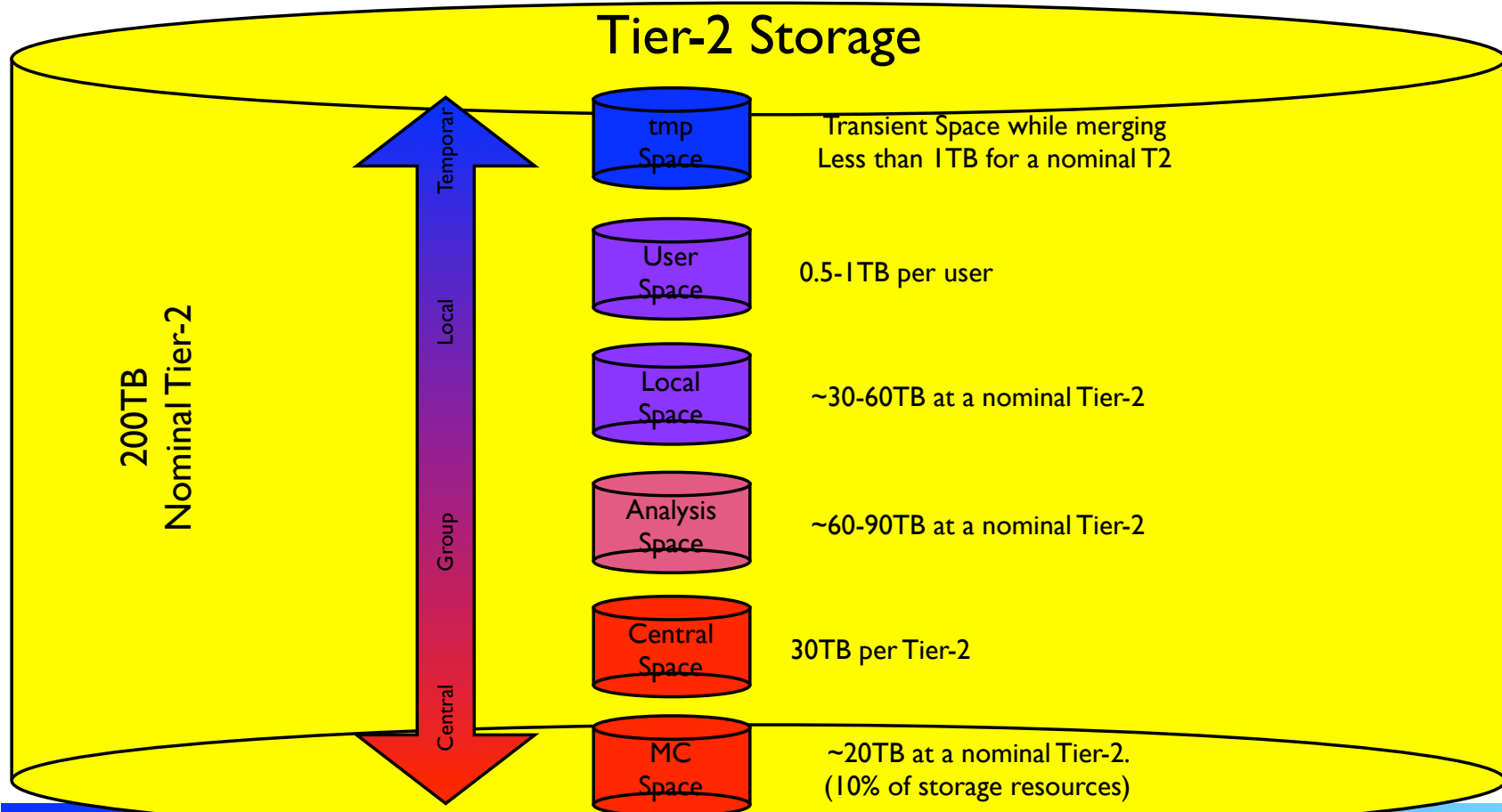
Ideal Tier-2 Workflow



Storage at Tier-2s

Storage at Tier-2 centers is broken into 6 pieces

- ➔ Transient and unmanaged to more persistent and centrally managed





Who Controls the Storage?

All numbers are for a nominal Tier-2

Central Space 30TB

- ➔ Intended for RECO samples of Primary Datasets.
- In 2008 we had expected to be able to store 2 copies of MC and data sample using the identified T2 space

Physics Group Space 60-90TB

- ➔ Assigned to 1-3 physics groups. Space allocated by physics data manager. The site data manager still approves the request, but only to ensure the group is below quota

Local Storage Space 30TB-60TB

- ➔ Controlled by the local storage manager. Intended to benefit the geographically associated community

Priorities at sub-nominal Tier-2s were given to local spacer and central space. Tier-2 centers above nominal have extra local space



Tier-2 Associations to Analysis Groups

After what seems like a very long time, we have the mappings of site to analysis groups

- ➔ The process and the mapping should be revisited once we have some operational experience with high energy data
- ➔ These mappings were chosen to optimize the types of physics expected in 2008
 - Concentration on commissioning work (DPG, POG)
 - Each country was expected to have at least 40% DPG and POG
 - Concentration on standard model analysis
 - Leave resources for search groups, but the emphasis is on commissioning work



Country Mappings

	T2_AT	T2_BE	T2_BR	T2_DE	T2_CH	T2_CN	T2_EE	T2_ES	T2_FI	T2_FR	T2_IT	T2_KR	T2_PT	T2_RU	T2_UK	T2_US
FWD phys				1												1
QCD				1						1						2
Higgs								1		1	1					1
EWK								1		1	1				1	1
SUSY	1			1							1				1	1
Top		1		1				1		1						1
Exotica										1				1	1	1
B Physics					1	1			1							1
Heavy Ions														1		0
egamma										1	1				1	2
Jets/MissET				1					1			1		1		1
Muons								1			1			1		2
B-Tagging	1		1							1						1
Tracker				1						1	1					1
Tau / Pflow							1			1	1					1
Trigger DPG								1							1	1
Reserve																2
Unallocated		?											1			1
Current Resources	0	1	1	3	0	0	1	5	2	8	5	1	0	1	4	15
Fall Resources (*)	2	1	1	6	1	1	1	5	2	9	7	1	1	4	5	21
POGs/DPGs	1	0	1	3	0	0	1	2	1	4	4	1	0	2	2	10
POG fraction	0.5	0	1	0.5	0	0	1	0.4	0.5	0.44	0.6	1		0.5	0.4	0.48



By Group

Forward - T2_US_Wisconsin (T2_DE_DESY at start of data taking)

QCD - T2_DE_DESY, T2_FR_CCIN2P3, T2_US_Caltech, (T2_US_MIT)

Higgs - T2_ES_IFCA, T2_FR_GRIF, (T2_IT_Roma), T2_US_MIT

EWK - T2_ES_CIEMAT, T2_FR_CCIN2P3, T2_IT_Legnaro,
T2_UK_London_Brunel, T2_US_UCSD

SUSY - (T2_AT_Vienna), (T2_DE_RWTH), T2_IT_Bari,
T2_UK_London_IC, T2_US_Florida

Top - T2_BE_IIHE, (T2_DE_DESY), T2_ES_IFCA, T2_FR_IPHC,
T2_US_UCSD

Exotica - T2_FR_GRIF, (T2_RU), T2_UK_SGrid_RALPP, T2_US_Purdue



By Group

B-Physics - (T2_CH_CSCS), (T2_CN_Beijing), T2_FI_HIP, T2_US_MIT

Heavy Ion- T2_RU

E-gamma - T2_FR_GRIF, T2_IT_Roma, T2_UK_London_IC, T2_US_Caltech,
(T2_US_UCSD)

Jets/MET HCAL - T2_DE_DESY, T2_FI_HIP, T2_KR_KNU, T2_US_Purdue
(T2_RU)

Muon - T2_ES_CIEMAT, (T2_IT_Legnaro) (T2_RU), T2_US_Purdue,
(T2_US_Florida)

B-Tagging - (T2_AT_Vienna), T2_BR_UERJ, T2_FR_IPHC, T2_US_Nebraska

Tracker - T2_DE_RWTH, (T2_FR_CCIN2P3), T2_IT_PISA,
T2_US_Nebraska

Tau/PFlow - T2_EE_Estonia, T2_FR_CCIN2P3, T2_IT_PISA, T2_US_Florida

Trigger - T2_ES_CIEMAT, (T2_UK_London), T2_US_Wisconsin



Why are we switching to CRAB Server?

Technical Improvements -

- ➔ CRAB server removes the limitations on the size of the input sandbox
- ➔ CRAB server allows the user to disconnect once the workflow is upload (Don't have to wait for many jobs to be submitted)
- ➔ Can provide better resubmission functionality

Management Improvements

- ➔ The CRAB server can allow CMS to have central places where priorities are controlled
 - Without the CRAB server priorities will have to be controlled on the local CE - Effort intensive to change and very static

Support

- ➔ CRAB server gives CMS central points where jobs are submitted through. Support people will have access to logs and configurations which should improve our user support



Motivations for /store/user

We need to give people places to write to that are not Castor at CERN

- ➔ Users are writing to tape
 - This uses tape resources without bound, which we don't have planned
 - Files are small, which is lowering the average file size on tape and the efficiency of the tape system
 - Need to support users on disk resources at Tier-2s

The concept of keeping it on the local Tier-2 was to divide the problem

- ➔ At a nominal Tier-2 40 users are support
- ➔ Keeping it by institution and local provides us with better chance for efficient support and management. The admin will hopefully know the user, the supervisor, or at least the group

Why write files into local scope DBS?

- ➔ Listing files through Grid tools is not like using file system commands
- ➔ Provides us with a consistent way to sum the usage for all sites



Accessing User Products

In this scheme user data products produced at a Tier-2 are stored in `/store/` user of the “local” Tier-2

- ➔ Files are registered in DBS
- ➔ Small data products can be pulled to the local desktop
- ➔ Large data products will be accessed with CRAB
 - CRAB supports sending jobs to data based on the information in local scope DBS
 - A colleague can also access this sample at my local Tier-2 with CRAB

What happens if the whole group wants access?

- ➔ The files need to be replicated, made official data and moved around
- ➔ Proposal is to have a space called `/store/results`
 - Data migrated to here will be registered in PhEDEx, placed in global scope DBS, and moved physically on the storage
 - This tool is not developed



Today

There is active development in the CRAB server to support the workflows discussed

➔ Daniele will cover the time line

There are deploy issues in getting people /store/user space and training local communities and physics groups on data management issues

➔ Thomas will cover some of these.

There is time in the schedule for discussion