ATLAS Tier-1/Tier-2 Associations for SC4

GDB
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Gilbert Poulard CERN-PH/ATC

Overview

❏ Production and data transfers operations
❏ Resources
❏ Associations

Production and data transfers operations: real data

❑ RAW
- o Data stored at Tier-0 and one copy at Tier-1

❑ ESD1 produced at Tier-0 (1st pass production)
- o Data replicated at two Tier-1s

❑ ESDn (n>1) (reprocessing)
- o Data produced at Tier-1
- o Replicated at the "associated" Tier-1

❑ AODm1 (1st pass production)
- o Produced at Tier-0 (m: merged files)
- o Replicated to all Tier-1s and to Tier-2s

❑ AODmn (n>1) (reprocessing)
- o Data produced at Tier-1
- o Replicated to all Tier-1s and to Tier-2s

❑ **A Tier will receive an amount of data corresponding to its share**

Production and data transfers operations: MC data

❑ Monte Carlo (Raw; ESD; AOD)
  o Mainly produced data at Tier-2s
  o Data must be transferred at Tier-1
  o "MC-RAW"; "MC-ESD"
❑ AOD should be distributed as for real data
  o To all Tier-1s
  o To Tier-2s (all?)

ATLAS Tier-1s

		CPU		Disk		Tape	
		MSI2K	%	PB	%	PB	%
Canada	TRIUMF	1.27	4.4	0.62	4.3	0.4	4.4
France	CC-IN2P3	3.02	12.6	1.76	12.2	1.15	12.8
Germany	FZK	2.4	10	1.44	10	0.9	10
Italy	CNAF	1.76	7.3	0.8	5.5	0.67	7.5
Nordic Data Grid Facility		1.46	6.1	0.62	4.3	0.62	6.9
Netherlands	SARA	3.05	12.7	1.78	12.3	1.16	12.9
Spain	PIC	1.2	5	0.72	5	0.45	5
Taiwan	ASGC	1.87	7.8	0.83	5.8	0.71	7.9
UK	RAL	1.57	6.5	0.89	6.2	1.03	11.5
USA	BNL	5.3	22.1	3.09	21.4	2.02	22.5
Total	2008 pledged	22.69	94.5	12.55	87	9.11	101.4
	2008 needed	23.97	100	14.43	100	8.99	100
	2008 missing	1.28	5.5	1.88	13	-0.12	-1.4

ATLAS Tier-2s

		CPU		Disk		Tape
		kSI2K	%	TB	%	TB
Australia	University of Melbourne	300	1.5	300	3	
China	Beijing LCG2	500	2.5	200	2	500
Czech Republic	FZU AS	1520	7.7	720	8	
France	CC-IN2P3 T2	389	2	217	2	453
	France, GRIF, Paris	504	2.6	133		
	France, LPC Clermont-F.	150	0.8	12	2	
Germany	DESY	700	3.6	340	4	
	ATLAS Federation Munich	332	1.7	146	2	
Italy	INFN-Tier-2 Federation	1600	8.2	540	6	
Japan	ICEPP	1000	5.1	200	2	
Poland	Polish Tier-2 Federation	142	0.7	14	0	
Portugal	LIP Federation (Lisboa; Coimbra)	525	2.7	84		
Romania	Romanian Tier-2 Federation	300	1.5	27	0	

ATLAS Tier-2s

		CPU		Disk		Tape
		kSI2k	%	TB		TB
Russia	Russian Federation, RDIG	1450	7.4	830	9	230
Spain	ATLAS Federation	719	3.7	270	3	
Switzerland	CSCS	663	3.4	316	4	
Taiwan	Taiwan Analysis Facility Federation	200	1.0	40	0	
UK		3024	15.4	378	4	
	Grid London					
	NorthGrid					
	ScotGrid					
	SouthGrid					
US						
	Boston/Harvard ATLAS T2	1090	5.6	480	5	
	Midwest ATLAST2	1100	5.6	465	5	
	Southwest ATLAS T2	1700	8.7	540	6	

ATLAS Planned additional Tier-2s or Federations

		CPU		Disk		
		kSI2k		TB		
Austria	UIBK Innsbruck					
Brazil	Brazilian Tier-2 Federation					
Canada	East Tier-2 Federation	506	2.6			
	West Tier-2 Federation	454	2.3			
Germany	Freiburg University	100	1.0			
	Wuppertal University	250	1.3			
Israel	HEP-IL Federation					
Slovenia	Ljubljana	300		200?		

Tier-2s	23
Planned Tier-2s or Federations	8

Associations for SC4

❑ In an ideal Grid world: no necessity to define associations or data transfer paths between Tier-1s and Tier-2s.
- o Availability of data independently of their location!

❑ Experience (Data Challenges) has shown that the situation is far from ideal.
- o Associations have to be defined.

Grid Data management tools and operational considerations

❑ We rely on Grid services and on our own tools
- o FTS service between 2 sites to manage data transfers asynchronously and reliably
  - ➢ It's a service and needs attention from the local **system managers**.
- o LFC is a Grid file catalogue system that can support distributed catalogues
  - ➢ Again a service that needs a database installation and again demands attention from local **system managers**.
- o ATLAS Distributed Data Management System
  - ➢ Uses these building blocks to build a hierarchical and distributed data cataloguing and data transfer system
  - ➢ Central dataset catalogues contain information on all datasets and their locations.
  - ➢ Local file catalogues give the correspondence between logical file names and physical file locations in Grid SE.

❑ It was soon realized that it's not possible to ask all Tier-2s to set up and maintain FTS services and local file catalogues

❑ Intermediate solution is to have these services hosted by Tier-1s

Associations for SC4: Tier-1s

❑ Concept of "pairing"
   o The resources of the "associated" Tier-1s should match

❑ T1 associations was discussed in Mumbai
   o BNL (24%)   <-> CC-IN2P3 (13.5%) + FZK (10.5%)
   o SARA (13%) <-> TRIUMF (5.3%) + ASGC (7.7%)
   o CNAF (7.5%) <-> RAL (7.5%)
   o PIC (5.5%)   <-> NDGF (5.5%)

Associations for SC4: Tier-2s

- ❑ For Tier-2
  - o "obvious" associations
  - o Expression of interest from Tier-2
  - o "some" ideas
  - o Try to adjust the resources
    - ➤ **CPU** power at Tier-2 -> MC data to be **stored** at Tier-1
- ❑ Note that this is the ATLAS view
  - o Concept of regions
    - ➤ Asia Pacific
    - ➤ Central Europe.
    - ➤ Etc
- ❑ Still under discussion
- ❑ We propose to explore alternative data transfer paths (to get experience).

- ❑ Long term: expect to move away from hierarchical model

Associations for SC4 and further operation tests

- ❑ BNL
  - o All Tier-2s in USA
- ❑ TRIUMF
  - o All Tier-2s in Canada
- ❑ NDGF
  - o Slovenia
- ❑ PIC
  - o Spanish ATLAS federation
  - o Portuguese Federation
- ❑ RAL
  - o All Tier-2s in UK
- ❑ CNAF
  - o All Tier-2s in Italy
- ❑ FZK
  - o All Tier-2s in Germany
  - o CSCS (Switzerland)
  - o Polish federation
  - o Prague

- ❑ NIKHEF
  - o Russian federation
  - o HEP-IL federation (Israel) (to be confirmed)
  - o Alternate path for NorthGrid (UK)
  - o Alternate path for Prague
- ❑ CC-IN2P3
  - o All Tier-2s in France
  - o ICEPP (Tokyo)
  - o Beijing-LCG2
  - o Romanian federation
- ❑ ASGC
  - o Taiwan Analysis Facility
  - o Melbourne
  - o Beijing-LCG2
  - o ICEPP (Tokyo)
- ❑ Not clear yet
  - o UIBK (Innsbruck)
  - o Brasilian T2 Federation

ATLAS Tiers Association (SC4-draft)

	Tier-1	% CPU	Associated Tier-1	MC-T2 (%)	Tier-2 and Planned Tier-2			
Canada	TRIUMF	5.3	SARA	4.9	East T2 Fed.	West T2 Fed.		
France	CC-IN2P3	13.5	BNL	14.5	CC-IN2P3 AF	GRIF	LPC	HEP-Beijing
					Romanian T2	ICEPP Tokyo		
Germany	FZK-GridKa	10.5	BNL	19.4	DESY	Munich Fed.	Freiburg Uni.	Wuppertal Uni.
					CSCS (CH)	Polish T2 Fed.	FZU AS (CZ)	
Italy	CNAF	7.5	RAL (7.5)	8.2	INFN T2 Fed.			
Netherlands	SARA	13.0	TRIUMF (5.3) ASGC (7.7)	7.4	Russian Fed.	FZU AS (CZ)		
Nordic Data Grid Facility		5.5	PIC (5.5)	1.5	Slovenia			
Spain	PIC	5.5	NDGF (5.5)	6.3	ATLAS T2 Fed	LIP T2		
Taiwan	ASGC	7.7	SARA	2.5	Taiwan AF Fed	Melbourne Uni.	ICEPP Tokyo	HEP-Beijing
UK	RAL	7.5	CNAF (7.5)	15.4	Grid London	NorthGrid	ScotGrid	SouthGrid
USA	BNL	24	CC-IN2P3 (13.5) FZK-GridKa (10.5)	19.8	BU/HU T2	Midwest T2	Southwest T2	
No association (yet)					HEP-IL Fed.	UIBK	Brazilian T2	

G. Poulard - CERN PH

14

ATLAS Tiers association

❑ Some "mismatches":
- o FZK-GridKA: Disc (10.5%); MC-T2 (19.4%)
- o RAL: Disc (7.5%); MC-T2 (15.4%)

❑ Solutions?
- o Alternate transfer paths
  - ➢ NorthGrid <-> SARA-NIKHEF
  - ➢ Prague <-> SARA-NIKHEF