

## Worldwide LHC Computing Grid - High Level Planning for Phase 2

15/12/2005

ID	Date	Milestones Description and Verification	Status Progress	Notes Comments References Hyperlinks Dependent Milestones	Coordinator
SC3-1	01.09.05	<b>Service Challenge 3: start of stable service phase</b>	Done.	Including at least 9 Tier-1 and 10 Tier-2 sites.	J.Shiers
SC3-2	31.12.05	<b>Service Challenge 3: successful completion of stable service phase</b>		<b>5 Tier-1s and 5 Tier-2s</b> must have achieved the following targets: (a) appropriate baseline services operational	J.Shiers
SC3-3	28.02.06	<b>Performance and throughput tests complete</b>		CERN-disk > network > Tier-1-disk and tape. Goal is to maintain for one week an average aggregate throughput of 1 GB/s from disk at CERN to disk at the Tier-1s; each Tier-1 capable of accepting 150 MB/sec to disk and 50 MB/sec to tape. All Tier-1 sites must participate. At least 5 Tier-1s must satisfy individual site throughput goals.	J.Shiers
OPN-1	31.12.05	<b>Tier-0/1 high-performance network operational</b> at CERN and 3 Tier-1s.		FNAL, SARA and IN2P3	D.Foster
DRC-2	31.12.05	<b>750 MB/s data recording demonstration at CERN:</b> Data generator → disk → tape sustaining 750 MB/s for one week using the CASTOR 2 mass storage system.			B.Panzer
2006					
SC4-1	28.02.06	<b>All required software for baseline services deployed</b> and operational at all Tier-1s and at least 20 Tier-2 sites		List of what needs to be installed on each site is available.	J.Shiers
OPN-2	31.03.06	<b>Tier-0/1 high-performance network operational</b> at CERN and 6 Tier-1s, at least 3 via GEANT.		FNAL, SARA, IN2P3, TRIUMF, BNL and CNAF. CNAF and FZK on GEANT.	D.Foster
SC4-2	28.02.06	<b>Use cases and service level support defined for SC4</b> SC workshop at CHEP		Defines in detail: - the SC4 success criteria for each Tier-1(SC4-5) - the LCG Services operations (IS-1).	J.Shiers
CAS-1	15.03.06	<b>Castor2 Readiness Review</b>			A.Cass
SC3-4	31.03.06	<b>All services on all Tier-1 sites monitored</b>			J.Shiers
SC3-5	31.03.06	<b>Proposal on availability levels</b> specified in Annex 3 of the WLCG MoU (adjusted for sites that do not provide a 24 hour service)			J.Shiers
SC4-3	30.04.06	<b>Service Challenge 4 Set-up:</b> Set-up complete and basic service demonstrated, capable of running experiment-supplied packaged test jobs, data distribution tested.			J.Shiers

DRC-3	30.04.06	1.0 GB/s data recording demonstration at CERN: Data generator → disk → tape sustaining 1.0 GB/s for one week using the CASTOR 2 mass storage system and the new tape equipment.		Depends on DR-5 in CERN Fabrics.	B.Panzer
SC4-4	31.05.06	Service Challenge 4: Start of stable service phase,		<b>Including all Tier-1s and 30 Tier-2 sites</b> The service must be able to support the full computing model (use cases and services to provide) of each experiment, including simulation and end-user batch analysis at Tier-2 sites.	J.Shiers
SC4-5	30.09.06	Service Challenge 4: Successful completion of service phase		1) <b>8 Tier-1s and 20 Tier-2s</b> must have demonstrated availability better than 90% of the levels specified in Annex 3 of the WLCG MoU [adjusted for sites that do not provide a 24 hour service] 2) Success rate of standard application test jobs greater than 90% (excluding failures due to the applications environment and non-availability of sites) 3) Performance and throughput tests complete: Performance goal for each Tier-1 is the nominal data rate that the centre must sustain during LHC operation (see Figure 3): CERN-disk > network > Tier-1-tape. Throughput test goal is to maintain for one week an average throughput of 1.6 GB/s from disk at CERN to tape at the Tier-1 sites. All Tier-1 sites must participate.	J.Shiers
DRC-4	30.09.06	1.6 GB/s data recording demonstration at CERN: Data generator → disk → tape sustaining 1.6 GB/s for one week using the CASTOR mass storage system.			B.Panzer
DBS-1	30.09.06	Full LCG database service in place		Milestone for all Tier 1 sites	D.Duellmann
IS-1	30.09.06	Initial LHC Service in operation  The details should be defined before end of March at CHEP workshop.		Capable of handling the full nominal data rate between CERN and Tier-1s. The service will be used for extended testing of the computing systems of the four experiments, for simulation and for processing of cosmic-ray data. During the following six months each site will build up to the full throughput needed for LHC operation, which is twice the nominal data rate.	J.Shiers
2007					
IS-2	01.01.07	24 hour operational coverage at all Tier-1 centres		Defined as a Fabric Milestone (CC-5) and there should be a plan for each Tier1 site, 6 months in advance July 2006.	J.Shiers
IS-3	02.04.07	LHC Service Commissioned: A series of performance, throughput and reliability tests completed to show readiness to operate continuously at the target data rate and at twice this data rate for sustained periods.		Criteria for success: 1) <b>All (11) Tier-1s and 30 Tier-2s</b> must have demonstrated availability better than the levels specified in Annex 3 of the WLCG MoU [24 hour coverage]  2) Success rate of standard application test jobs greater than 95% (excluding failures due to the applications environment and non-availability of sites)	J.Shiers

**Notes**

1. Throughput rates are measured by the FTS service
2. Availability and job reliability rates are measured using standard system test jobs and experiment-provided packaged application jobs, run using the Site Functional Test (SFT) framework.
3. Targets for response time and availability are specified in Annex 3 of the WLCG MoU. These may be unrealistic and may be inappropriate as measures of the quality of the service. The metrics will evolve and improved measures and targets will be agreed by the Grid Deployment Board.
4. In the case of sites that do not provide 24 hour operational coverage prior to 2007 the calculation of availability will take this into account – e.g. in the case of a failure outside of a period of coverage the “clock” could be stopped until the beginning of the next period of coverage.
5. The baseline services are documented in version 1 of the Baseline Services Group Report. A supplement to this is scheduled to be produced before the end of November 2005.
6. The new reporting procedure, to be introduced when the WLCG Phase2 management organization is in place, is likely to include a standardized report for each Tier-1 site and Tier-2 site/federation, reviewed monthly by the GDB.