



## Planning for SC4 and the Initial LHC Service: Step 2

### Executive Summary

This document defines the target data rates that must be demonstrated for Tier0 – Tier1 (disk – tape) transfers during the Throughput tests of Service Challenge 4.

These numbers have been revised since the publication of the LCG and experiment Computing TDRs, based on the resources pledged by each Tier1 for the VOs that they support.

It also defines the services that each site (Tier0, Tier1, Tier2 as well as “infrastructure” sites) must provide, according to the requirements of the supported VOs.

Based on the current MoU targets, a set of target Service Classes are then defined and attached to the corresponding services.

It is foreseen that the service level delivered is monitored using the Site Functional Tests and periodically reviewed by the appropriate bodies.

To avoid changes to the numbering below, any corrections, additions or other updates will be made at the end of the document and indicated as shown below.

#### 0. Sample correction.

### Nominal Tier0 – Tier1 Throughput Rates

1. The nominal transfer rates that need to be demonstrated between CERN and each Tier1 are given in the table below.

| <i>Centre</i>                    | <i>ALICE</i> | <i>ATLAS</i> | <i>CMS</i> | <i>LHCb</i> | <i>Target Data Rate MBytes/sec</i> |
|----------------------------------|--------------|--------------|------------|-------------|------------------------------------|
| <i>Canada, TRIUMF</i>            |              | X            |            |             | 50                                 |
| <i>France, CC-IN2P3</i>          | X            | X            | X          | X           | 200                                |
| <i>Germany, GridKA</i>           | X            | X            | X          | X           | 200                                |
| <i>Italy, CNAF</i>               | X            | X            | X          | X           | 200                                |
| <i>Netherlands, NIKHEF/SARA</i>  | X            | X            |            | X           | 150                                |
| <i>Nordic Data Grid Facility</i> | X            | X            | X          |             | 50                                 |
| <i>Spain, PIC Barcelona</i>      |              | X            | X          | X           | 100                                |
| <i>Taipei, ASGC</i>              |              | X            | X          |             | 100                                |
| <i>UK, RAL</i>                   | X            | X            | X          | X           | 150                                |
| <i>USA, BNL</i>                  |              | X            |            |             | 200                                |
| <i>USA, FNAL</i>                 |              |              | X          |             | 200                                |
| <i>Target data rate at CERN</i>  |              |              |            |             | 1,600                              |

Table 1 - Nominal Network/Tape Data Rates by Site



## Service Classes

2. The Service Class is a set of parameters which share the same service level objectives. It permits an easy way of describing the high level parameters required for a service (such as the BDII is a class C rather than the BDII requires 99% availability with 1 hour response time...). These classes are based on the MoU values. The definitions of the various columns are as follows:

- **Downtime** defines the time between the start of the problem and restoration of service at minimal capacity (i.e. basic function but capacity < 50%)
- **Reduced** defines the time between the start of the problem and the restoration of a reduced capacity service (i.e. >50%)
- **Degraded** defines the time between the start of the problem and the restoration of a degraded capacity service (i.e. >80%)
- **Availability** defines the sum of the time that the service is down compared with the total time during the calendar period for the service. Site wide failures are not considered as part of the availability calculations. 99% means a service can be down up to 3.6 days a year in total. 98% means up to a week in total.
- **None** means the service is running unattended.

| Class | Description | Downtime | Reduced  | Degraded | Availability |
|-------|-------------|----------|----------|----------|--------------|
| C     | Critical    | 1 hour   | 1 hour   | 4 hours  | 99%          |
| H     | High        | 4 hours  | 6 hours  | 6 hours  | 99%          |
| M     | Medium      | 6 hours  | 6 hours  | 12 hours | 99%          |
| L     | Low         | 12 hours | 24 hours | 48 hours | 98%          |
| U     | Unmanaged   | None     | None     | None     | None         |

Table 2 – Definition of Service Classes

## Services Required by Site / VO

3. The following table list the services required by site, the VOs for which they are required (where applicable), as well as the corresponding service class. A table of optional services is also provided.
4. VO-specific services are not covered by these tables.
5. It is assumed that the “VO-box” issue will be resolved by a new round of the Baseline Services Working Group that has recently started.



| Service     | VOs                | Class |
|-------------|--------------------|-------|
| SRM 2.1     | All VOs            | C     |
| LFC         | LHCb               | C     |
| LFC         | ALICE, ATLAS       | H     |
| FTS         | ALICE, ATLAS, LHCb | C     |
| CE          | All VOs            | C     |
| RB          |                    | C     |
| Global BDII |                    | C     |
| Site BDII   |                    | H     |
| Myproxy     |                    | C     |
| VOMS        |                    | H     |
| R-GMA       |                    | H     |

**Table 3 - Services Required at the Tier0**

6. Tier1 services are globally classified as High/Medium. The classification by service requires further discussion.

| Service   | VOs                | Class |
|-----------|--------------------|-------|
| SRM 2.1   | All VOs            |       |
| LFC       | ALICE, ATLAS       |       |
| FTS       | ALICE, ATLAS, LHCb |       |
| CE        |                    |       |
| Site BDII |                    |       |
| R-GMA     |                    |       |

**Table 4 - Services Required at Tier1 Sites**

7. Tier2 services are globally classified as Medium/Low. The classification by service requires further discussion.

| Service   | VOs          | Class |
|-----------|--------------|-------|
| SRM 2.1   | All VOs      |       |
| LFC       | ATLAS, ALICE |       |
| CE        |              |       |
| Site BDII |              |       |
| R-GMA     |              |       |

**Table 5 – Services Required at Tier2 Sites**



## Infrastructure Sites

| Service | VOs | Sites | Class |
|---------|-----|-------|-------|
| SFT     |     | CIC   |       |
|         |     | GOC   |       |

Table 6 - Services Required at Infrastructure Sites

## Optional Services

8. A site may also chose to offer one or more of the optional services listed below, negotiated with the VOs supported, where applicable.

| Service  | VOs         | Sites          | Class |
|----------|-------------|----------------|-------|
| RB       | As required | All main sites |       |
| Myproxy  |             |                |       |
| Gridpeek |             |                |       |
| Gridview |             |                |       |

Table 7 - Optional Services

## Service Dashboard

9. In order to monitor service evolution, the use of a Service Dashboard is proposed (see <https://uimon.cern.ch/twiki/bin/view/LCG/ScFourDash>).

## Maintenance Windows

10. For planned changes, the following windows are defined during SC4. Maintenance windows are periods during which the services may run at reduced capacity (class C or H) or unavailable (class M or L) without being considered as downtime in the availability calculations.

These maintenance windows are used for operations such as

- Software upgrades
- System reboots where required

The actual window times will be defined later in the SC4 planning.

## Site Functional Tests

11. Once setup, it is foreseen all above services will be regularly tested using the Site Functional Test framework. These tests will be used to produce available reports that are compared against the MoU targets.



October 26 2005, Tim Bell, Jamie Shiers

## Coordination and Meetings

12. Tier0 Service Coordination meetings take place on a bi-weekly basis. They include representatives of the various service areas and the EIS team. It will report to the PEB / MB and receive input from the experiment Task Forces.
13. Phone conference calls will take place on a weekly basis, nominally at 16:00 on Wednesdays. These calls are open to all sites and experiment representatives.
14. Service Coordination meetings for all sites are proposed on a quarterly basis. At least one such meeting will take place outside CERN per annum.
15. Technical planning and review workshops will take place approximately twice per year with an expected schedule of May / October until accelerator startup and coordinated with the LHC schedule thereafter.
16. Topical workshops will be held as required at Tier1 and / or other centres to assist in preparations for the LCG Service phase.

## Corrections and Updates

| Date     | Heading           | Details     |
|----------|-------------------|-------------|
| 00/00/00 | Executive Summary | Dummy text. |