Service Level Agreement Metrics

SLA SA1 Working Group

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Introduction

- **Objectives**

To provide formal description of resources/services provided by Resource Centers (RCs) for:

- EGEE (SLA included in contract between RCs and EGEE)
- Virtual Organisation

Allows to evaluate sites operation in EGEE as well as enforce declared service level.

Areas of Interest

The SLA will/should cover following areas:

- Resources and performance (CPU, Storage)
- Connectivity
- Availability
- Software/Middleware
- VO Support
- Support and expertise
- Data privacy

Metrics should be defined for each area.

Available and editable in SA1 SLA WG twiki:

https://twiki.cern.ch/twiki/bin/view/EGEE/SLAMetrics(DRAFT)

Resource and performance

Metric	Unit	Description
CPU count	#	Total number of CPUs available for EGEE VOs (excluding service CPUs)
Cores per CPU	#	Number of cores in single CPU
CPU Performance	Si2K	Benchmark, should be measured, not (easily) configurable by site admin

- If multicore CPU are used, each core can have one job slot. Total count of job slots can not be greater than number of CPU cores.
- If site publish N-core CPU as N job slots, then CPU performance should have average value of values returned by N benchmarks run simultaneously on a single N-core CPU.

Resource and performance

Metric	Unit	Description
RAM per node	Mb	Amount of memory installed on single node (shared by all jobs running on the node)
RAM per job slot	Mb	Amount of memory available for single (not MPI) job

Resource and performance

Cluster interconnection

Metric	Unit	Description
Type		Type of interconnection (Ethernet, Infiniband, etc.)
Latency	ms	Message delivery latency
Bandwidth	Mbit	Interconnection bandwidth

This metrics are crucial for MPI jobs.

Resource and performance

Storage

Metric	Unit	Description
Type		Type of storage (disk, tape, etc.)
Size	Tb	Size of storage (of given type)
Avg. access time	ms	Depends on storage type and performance
Storage bandwidth	Mbit	Maximum bandwidth for reading and writing

Resource and performance

- **Measuring methods?**
  - GSTAT (GSTAT uses BDII, which can be easly altered by site admins)
  - GridICE with WN monitoring

  Do we trust sites? SLA is not about trust, it is a contract and should be effectively enforced.

- **How to treat heterogeneity?**
  - Define each resource type
  - Define minimum guaranteed resources

Network and connectivity

Metric	Unit	Description
Minimum connectivity		Site should provide enough connectivity to allow correct execution of SAM test jobs
Outbound connectivity from WN		Required
Inbound connectivity to WN		Optional (recommended?)

Network and connectivity

Metric	Unit	Description
Site's uplink bandwidth	Mbit	Bandwidth to a backbone network
Bandwidth to GEANT2	Mbit	Bandwidth between site and Genat 2
Packet loss	%	Per cent of lost packet
Latencies*	ms	Between site and … (?)
MTU*	Kb	Maximum Transmit Unit
Reordering*		Packet reordering

* Is it in site responsibility?

Network and connectivity

- Minimal acceptable inbound/outbound bandwidth should be relative to CPU count

- How this “Network and connectivity” metrics are related to SA2 Network SLA?

Availability

Metric	Unit	Description
Site availability	%	Per cent of time when site was available – all SAM critical test were OK
Site declared downtime	%	Per cent of time when site was in downtime

- Is SAM accurate enough?

  Taking long term average (month, year) is should be enough.

- Error relevance should be taken under consideration (from site reports).

Software/Middleware

Metric	Unit	Description
Middleware flavor		Required midleware to be installed on site (gLite, LCG, version?)
Time for update	days	Time to install latest middleware patches and updates
Time for new service deployment	days	This vary depending on type of service
Coreservices provided by site		Should this SLA cover Coreservices?

Coreservices should be covered by separate SLA, because of higher relevance for the infrastructure.

VO Support

Metric	Unit	Description
Support of mandatory VOs		Ops and Dteam
Time for new VO configuration	days	It should take days (hours?), not months
Supported Vos		List of supported VOs
Support for “catch-all” Vos		VOCE, …

Minimum number of not mandatory VOs which should be supported?

Support and expertise

Metric	Unit	Description
Ticket response time	h	Taken from GUS
Effectiveness in ticket solving	%	Per cent of ticket solved
Site administrators and security officers		FTEs, working hours
Incident response procedures		Reaction time, conformance to EGEE/ROC procedures
Number of ticket and its severity		For monitoring only. Site does not have any control over tickets it received, therefore it can to be taken under consideration during site operation evaluation.

Other metrics/requirements

- **Data privacy**
  - storage
  - pool accounts

Sites should configure it's resources (storage element, pool accounts, ...) to prevent any unauthorized data access.

Summary and conclusions

- **SLA areas:**
  - Resource and performance, Network and connectivity, Availability, Software/Middleware, Support and expertise, Data privacy
  - anything else?
- **Measurements methods**
  - easy to use, difficult to cheat
- **How to effectively enforce SLA?**
  - ROC responsibility
  - appropriate tools are necessary