Guaranties for computing in PLGrid

Marcin Radecki
PLGrid Operations Centre
Outline

- PLGrid intro
- Computing service: metrics
- Guarantees and concept of a guarantee loss
PLGrid is a federation

Five academic computer centres – PLGrid consortium members

PCSS  

ci task  

icm  

lpp  

cyfronet  

576 TFLOPS  41248 cores  
113,26 TB RAM  5,58 PB storage
PLGrid Service Portfolio

- Computing
  - Scientific Applications
  - Domain Services
- Storage
  - MySQL DB
- VM mgmt (IaaS)
- Team Collab. Tools

Helpdesk
Trainings
- hosted
- at customer site
SLA lifecycle

SLA in PLGrid is known as “computational grant”

- Negotiate & Sign → agreed SLA
- Monitor & Control → resource usage aligned to SLA
- Account → evaluate collaboration, deliver promised results
Metrics for Compute Service

Metrics describe how capacity of a service can be consumed

- **Main: Computing time [h]**
  - Guaranteed
  - Non-guaranteed
  - Reserved
  - Preemptive (to be implemented)

- **Optional**
  - Max job walltime
  - Max job parallelism
  - Max RAM per slot
  - Max scratch space

Example: 2 jobs, each running on 10 cores for a day will consume:
\[2 \times 10 \times 24 \text{ [h]} = 480 \text{ [h]}\]
Guaranteed Computing Time

- **Guarantee:** if a user provides jobs **regularly** she/he will get resources in the amount negotiated in the computational grant (e.g. 1000h of computing time in 10 days)

- **Regularly:** in a way which allows the scheduler implement the policy of **evenly consumption** e.g. for 1000h grant for 10 days, the user should provide jobs consuming (at least) 100h daily
Concept of „guarantee loss”

Unrealistic assumption: *I have 1M hours grant. Today is my last day. Give me 1M hours.*

- Guarantee: if a user provides jobs regularly she/he will be allowed to use all resources assigned in a compute grant
- If a user does not provide enough jobs then guarantee is lost (computing time becomes non-guaranteed)
- Guarantee loss can be expressed in computing time hours
- If user provided jobs but they are waiting in the queue then guarantee loss does not take place
Loss of guarantee – lazy user
Loss of guarantee - thrifty user
Loss of guarantee – „gusty” user
Operational Tools supporting SLM

- **SLA negotiation & signing – Bazaar**
  - Precursor of e-grant

- **SLA monitoring**
  - Resource Usage Monitoring
  - Accounting in the context of a given computational grant

- **SLA control**
  - Bazaar Site Admin Toolkit – takes data from Bazaar and configures scheduling policy

- **SLA accounting**
  - User Portal
Sustainability of guarantees in PLGrid

- PL-Grid: 2009-2012
  Support: 03.2017

  Support: 03.2020

  Support: 10.2020

  Support: 11.2020

Summary

- Compute resources can be utilized using different types of compute time defined by metrics.
- Concept of a guarantee loss help to better understand offered guarantees.
What next?

Get in contact:

Marcin Radecki
m.radecki@cyfronet.pl