Dziedzinowo zorientowane
usługi i zasoby infrastruktury
PL-Grid dla wspomagania
Polskiej Nauki w Europejskiej
Przestrzeni Badawczej

Bazaar Site Admin Toolkit (BazaarSAT)

Maciej Golik, Tomasz Szepieniec
ACC Cyfronet AGH

CGW'12 Krakow, Poland
October 22-24, 2012

INNOWACYJNA
GOSPODARKA
NARODOWA STRATEGIA SPÓJNOŚCI

Cracow '12
Grid Workshop

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Agenda

I) Introduction
II) Some concepts
III) Technical work done
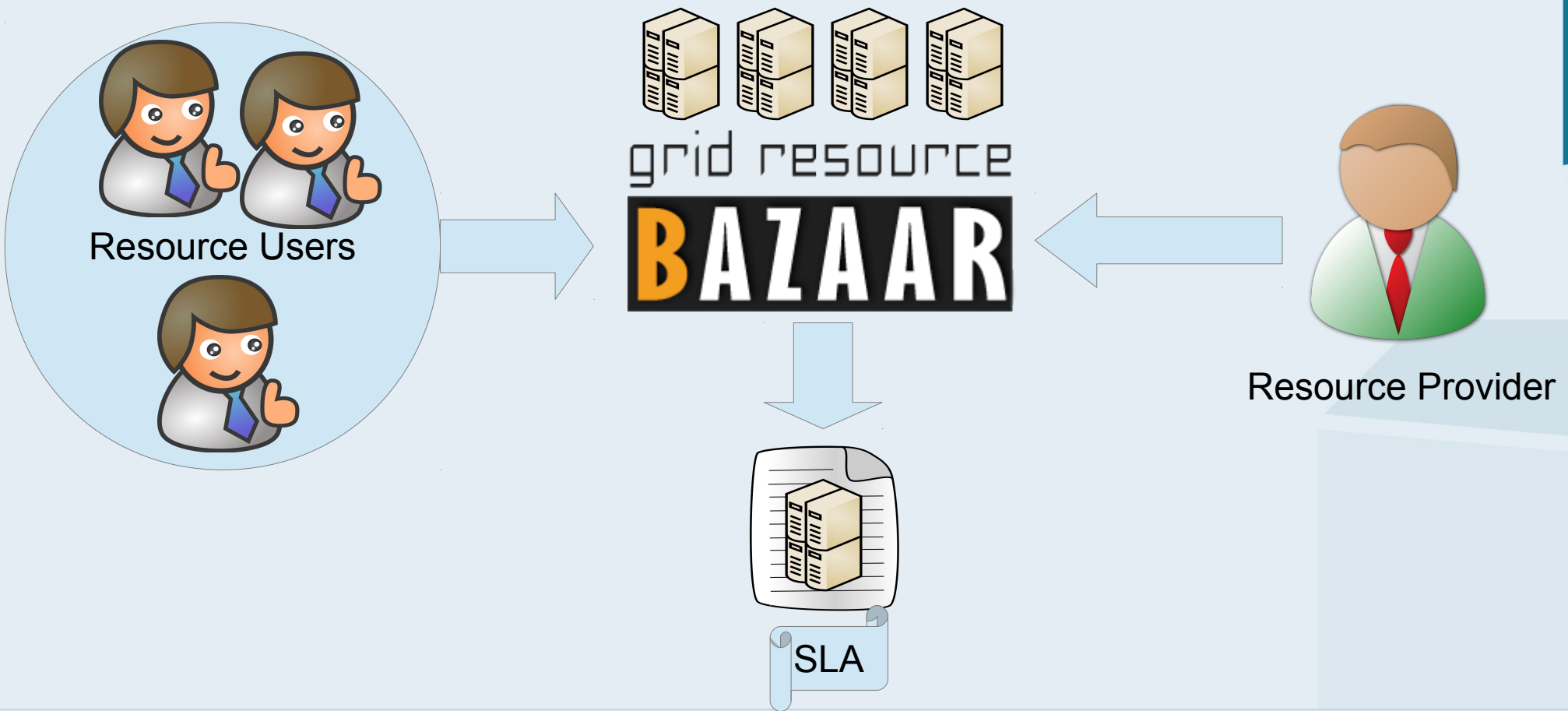
Introduction - SLA

- SLA - Service Level Agreement

- SLA - contract between Resource Provider and Resource User

- How does SLA in PLGrid look like?
  - Contains grant ID
  - Has *start date* and *end date*
  - Includes multiple metrics
    - At the moment only 2 are obligatory – *Totall Walltime* and *Total Storage Space*
    - Resource Users and Resource Providers can specify aditional metrics when needed, like: *Min RAM*, *Max Job Walltime*, etc.

- To effectively manage resources, software should be configured according to SLA
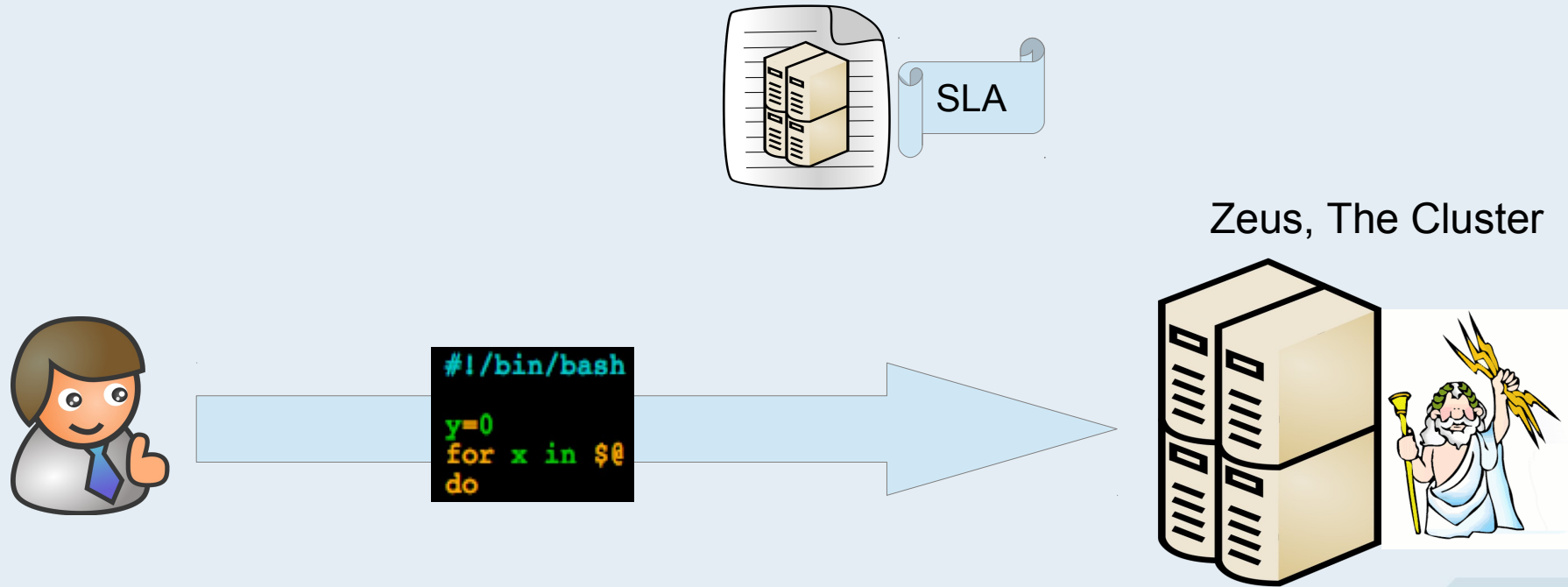
Introduction - Bazaar

„The Bazaar is a tool created to facilitate resource management in grid infrastructure. A main objective of the Bazaar is to enable better communication between two main actors in the process of resources allocation - resource providers and resource users (virtual organizations and user groups).„

Resource Users

grid resource

BAZAAR

Resource Provider

SLA

Running jobs without BazaarSAT

SLA

Zeus, The Cluster

```
#!/bin/bash

y=0
for x in $@
do
```

Before introduction of BazaarSAT:
- The information about SLA is not passed to scheduling system,
- Resource manager can't effectively manage resources,
- Users with multiple SLA (members of multiple teams) cannot specify on behalf which SLA they are running job.
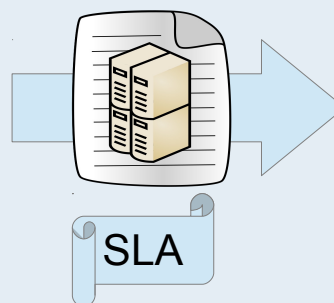
What does BazaarSAT do?

BazaarSAT translates SLA created in Bazaar to configuration for resource manager (TORQUE) and scheduler (Maui/Moab), and enforces proper usage of grants by users.
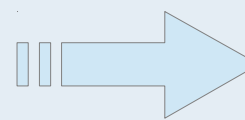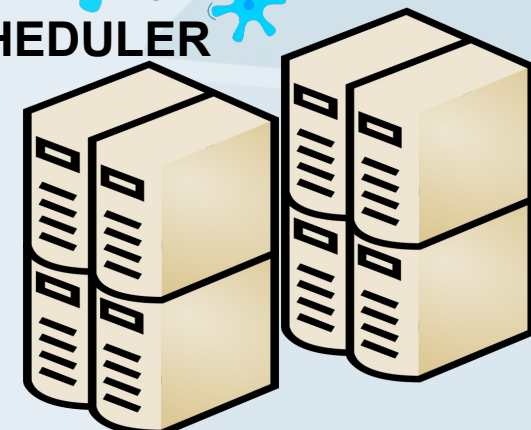
Running jobs with BazaarSAT

BazaarSAT works in 2 steps:
1. **Every hour** it creates configuration file for scheduler
2. **Every time user submits job** it performs validation
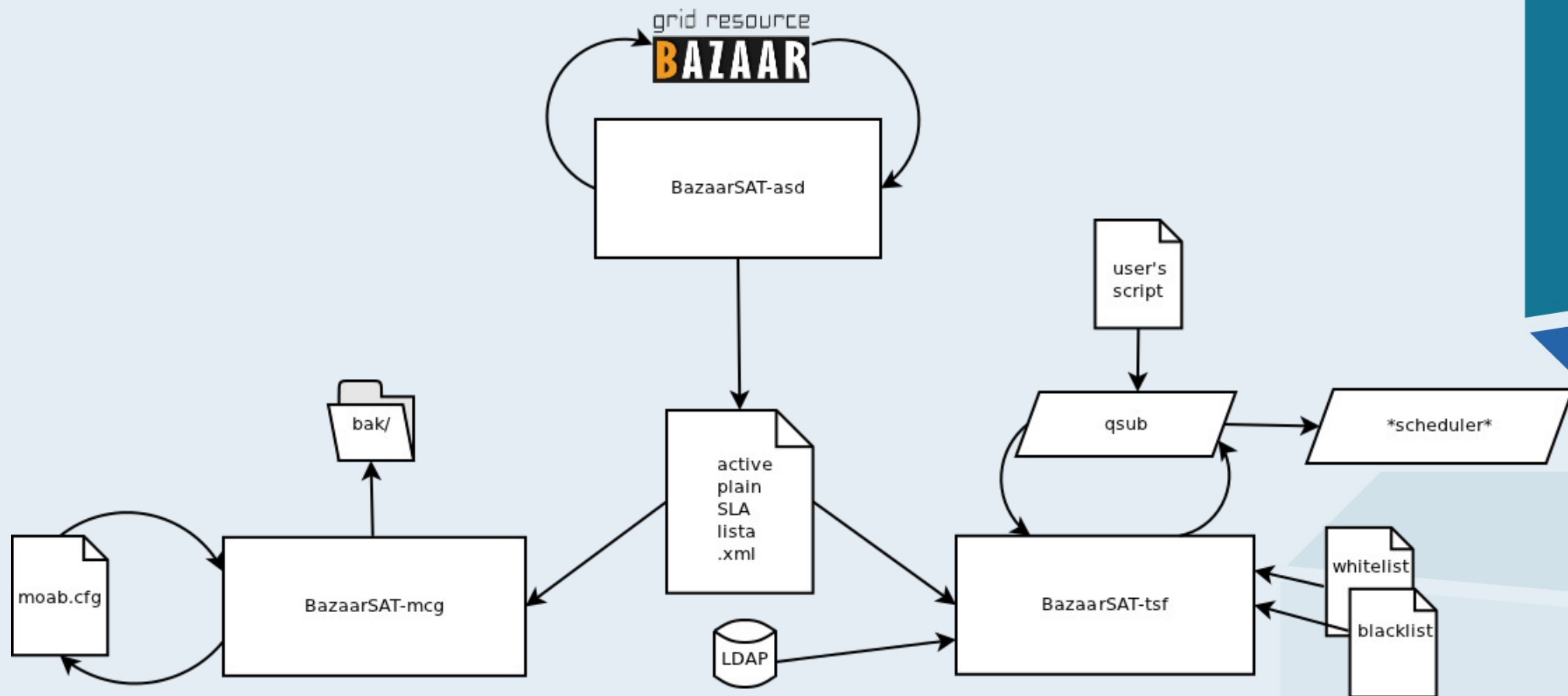
BazaarSAT main modules

- **BazaarSAT-asd (active sla downloader)** – downloads list of active site SLA for specified site

- **BazaarSAT-mcg (maui configuration generator)** – creates Bazaar specific configuration for Maui (Moab)

- **BazaarSAT-tsf (torque submit filter)** – filters jobs submited by users, by validating user specified grant ID and metrics like max job walltime, can automaticaly apply default grant ID specified by user in PLGrid Portal

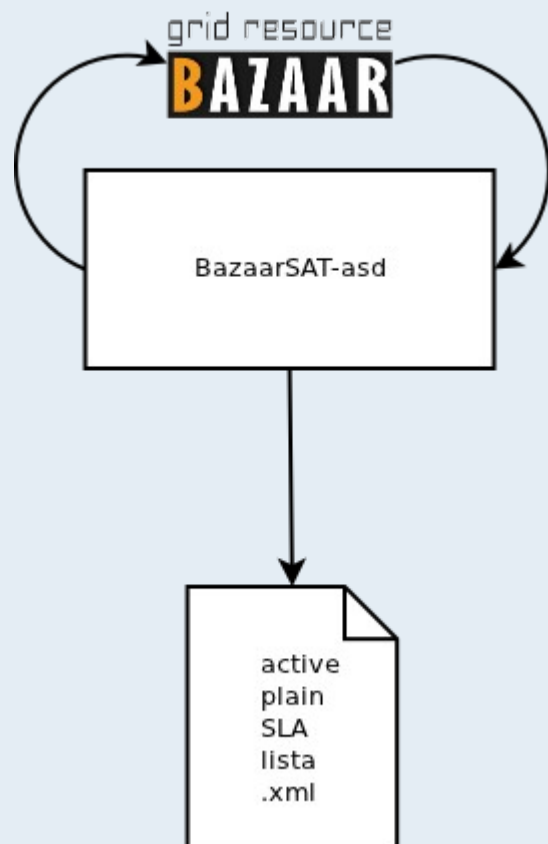# BazaarSAT schema

BazaarSAT-asd
(active SLA downloader)

Downloads list of active site SLA for specified site

Single SLA parameters:

- Grant ID (name of SLA): **plgmgolik2012b**
- SLA user (unix group): **plgmgolik**
- Start date: **2012-07-01**
- End data: **2012-12-31**
- Metrics:
  - Total Walltime: **10000**
  - Max Job Walltime: **155**
  - Total Storage Space: **40**
  - ...

BazaarSAT-mcg (maui configuration generator)

Creates Bazaar specific configuration for Maui (Moab)

- Every grant has it's own configuration
- Multiple grants hidden behind regexp
- Automatically computes parmeters
- Configuration file contains only ACTIVE grants
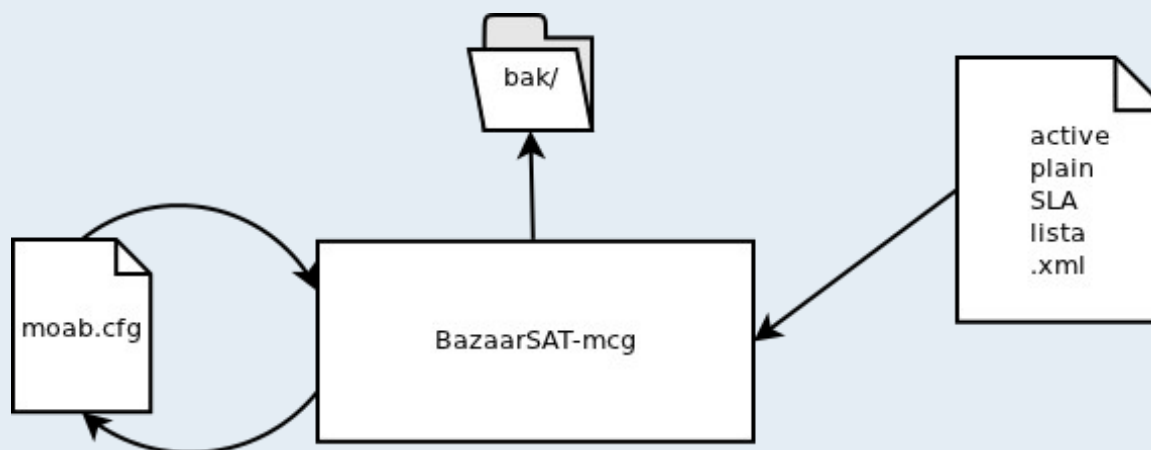
BazaarSAT-mcg - example

Part of XML (for user plgmgolik):

```
<PlainSLA slaId="400">

   <SLAName>plgmgolik2012b/SLAName>

   <ResourceUser>plgmgolik</ResourceUser>

   <SLAPeriod startDate="2012-07-01" endDate="2012-12-31">

      <TotalWalltime>10000</TotalWalltime>

      <TotalStorageSpace>40</TotalStorageSpace>

      </SLAPeriod>

</PlainSLA>
```

BazaarSAT RULE:

ACCOUNTCFG[.*] PRIORITY=100 MAXPROC=100 BSAT_FSTARGETBASE=1000

RESULT:

ACCOUNTCFG[plgmgolik] PRIORITY=100 MAXPROC=100 FSTARGET=41.491 # 2012-07-01 - 2012-12-31 / TotalWalltime=10000

BazaarSAT-tsf (torque submit filter)

Filters jobs submited by users, by validating user specified grant ID and metrics like max job walltime, can automaticaly apply default grant ID specified by user in PLGrid Portal

- torque submit filter AKA "qsub wrapper"
- called by qsub
- qsub passes its arguments and user script and waits for 'decission'
- can be used with any other submit filter
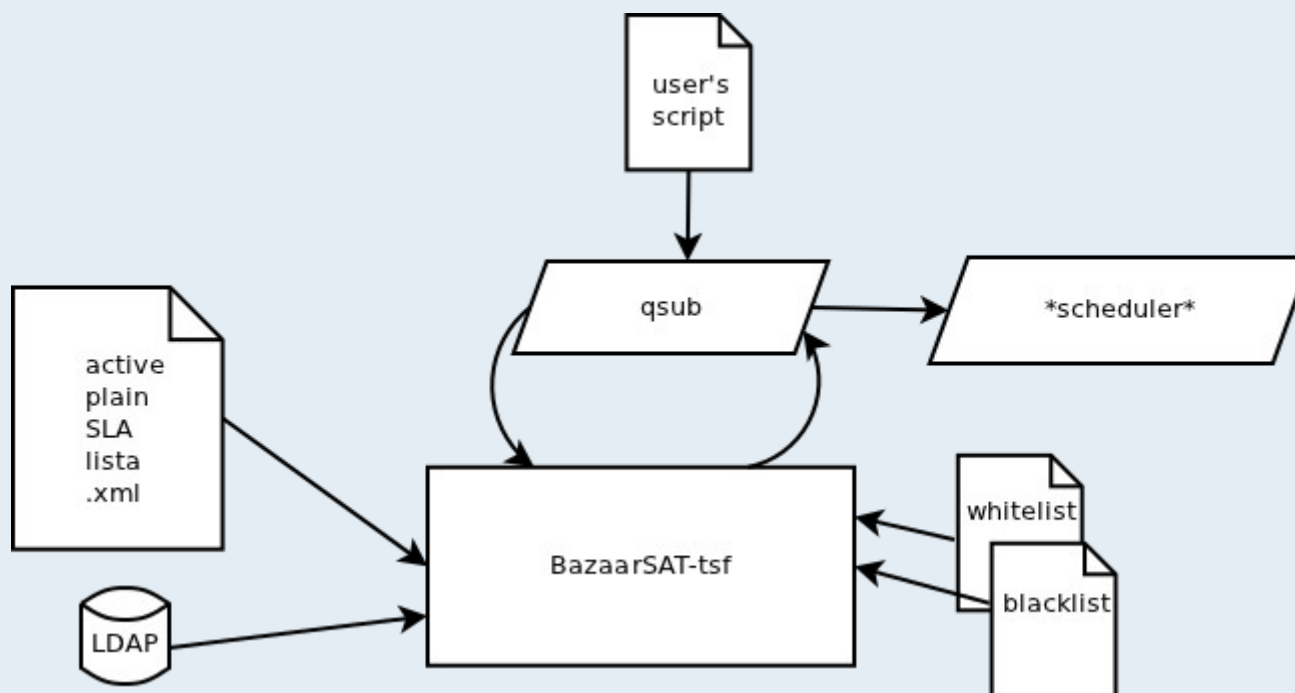
BazaarSAT-tsf - more

- Checks if user has supplied grant ID

- Checks if user can use specified grant ID

- Automaticaly adds default grant ID form LDAP

- Add additional SLA metrics, like Max Job Walltime or Min RAM

- Multiple policies:

  - Inform user about wrong settings

  - Try to automaticaly fix wrong settings but do not reject the job

  - Force proper settings, and if it's not possible – reject job

- Can work in transparent mode – only log all actions, do not reject jobs

BazaarSAT utils

Tools for administrators:

- torque_submitfilter – script that allows using multiple submit filters
- qsubi - wrapper for qsub that allows adding default grant ID for interactive qsub session

Tools for users:

- plg-show-grant-info – show all grants available to user on this site
- plg-show-default-grant – show users default grant ID
- plg-show-grant-details – show details (metrics, members) of specified grant ID

plg-show-grant-info

```
[plgmgolik@ui bsat_test]$ ./utils/sgi.py -a


Your active PL-Grid grants on THIS site:
+---------------------+------------+------------+--------------------+--------------------+
| GrantID             | Start Date | End Date   | Total Walltime [h] | Total Storage [GB] |
+---------------------+------------+------------+--------------------+--------------------+
| abrakadabra         | 2011-06-20 | 2012-12-31 |               1000 |                100 |
| plgmgolik2012b (*)  | 2012-08-03 | 2013-02-03 |               1000 |                 40 |
| test                | 2012-06-01 | 2012-12-31 |            1000000 |             100000 |
+---------------------+------------+------------+--------------------+--------------------+
* default grant
```

```
[plgmgolik@ui bsat_test]$ ./utils/sgi.py -sa
 abrakadabra        2011-06-20 2012-12-31    1000      100
 plgmgolik2012b (*) 2012-08-03 2013-02-03    1000       40
 test               2012-06-01 2012-12-31 1000000   100000
```

plg-show-grant-details

```
[plgmgolik@ui bsat_test]$ ./utils/sgd.py

name      : plgmgolik2012b
start     : 2012-08-03
end       : 2013-02-03
walltime  : 1000
storage   : 40
group     : plgmgolik
users     : PERSONAL_GRANT
```

Technical notes

Requirements:

- Python 2.4+
- python-ldap
- Scientific Linux 5.0-6.3
- certificate registred in GOCDB:
  - host certificate
  - *OR* user certificate with site admin privilages

Links:

- Wiki: https://docs.plgrid.pl/display/IPLG/BazaarSAT
- SVN: https://gforge.cyfronet.pl/plugins/scmsvn/viewcvs.php/?root=bazaarsat

E-mail:

- m.golik@cyfronet.pl
- t.szepieniec@cyfronet.pl

Thank you!