Improvements and measurements of their influence on Grid information service performance in EGEE

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Top-level BDII Service

Grid Information system contains data about all grid resources available in the infrastructure. The nature of this service is similar to DNS (Domain Name System) which is also being asked frequently by many clients, thus must be distributed but synchronized with other instances. In EGEE the information service is called top-level BDII and is indispensable for proper operation of infrastructure e.g.:

- Resource Brokers to find clusters and match jobs
- File Transfer Service to find file transfer endpoints

Each top-level BDII instance contains c.a. 40MB of data and performs **update cycles** each few minutes which transfers the data from all grid sites.around the world.

Architecture

At the lowest, service level the information is provided by so called GRIS (Grid Resource Information System). Site BDII combines all services available at a site and exposes them to the external entities. Top-level BDIIs are the singlepoint of access to entire infrastructure

Information propagates top-down i.e. Site BDII asks GRISes, then Top-level BDII scans sites for information

Improvements

Improvements were proposed to limit amount of collected data to the scope of one VO only making a **VO-level BDII.** First step was to generate limited list of sites, those which are supporting the desired VO and then to collect from the sites only information which is relevant for the given VO. The latter step was achieved by using suitable LDAP queries (filters). For our regional VO (supported by 17 sites) we managed to limit the database from around 1.4 MB to 712 KB. Database size of typical top-level BDII is c.a 40 MB. Update cycles make huge network load. By limiting the scope the traffic shall be lower and localized. We believe the BDII service can be another service provided by the VO itself instead of Regional Operations Centre and thus fits well future EGI/NGI model

Stress tests

Two twin machines for tests : Glite 3.1 BDII and VO-leve BDII for VOCE VO

Classic TL BDII

VO-level BDII

Each bar represents probe query response time tested under a specific load. Ranges are represented by colours, height of a colour bar is equivalent to number of queries answered within the range. Yellow represents answers which took longer than 10 sec
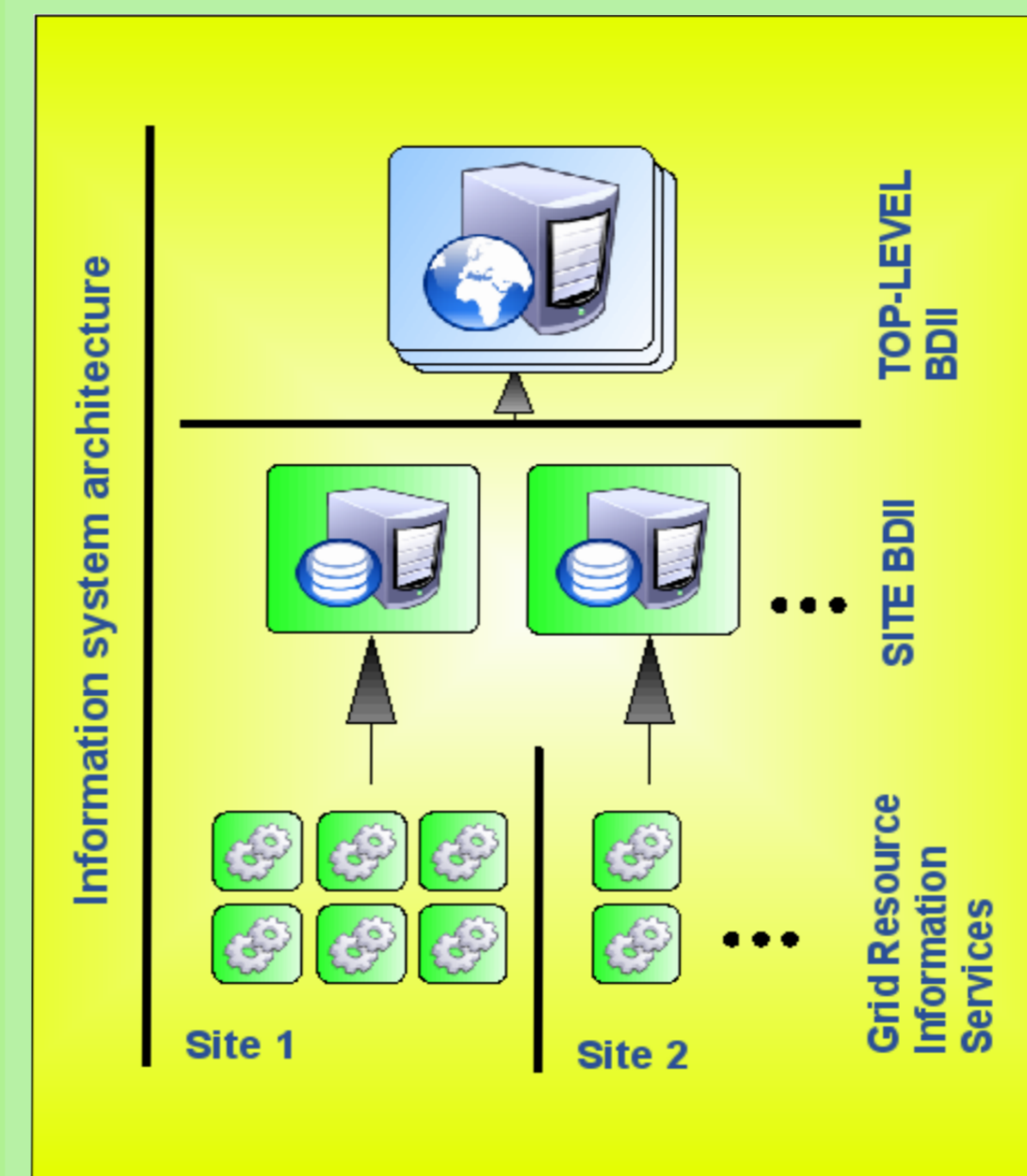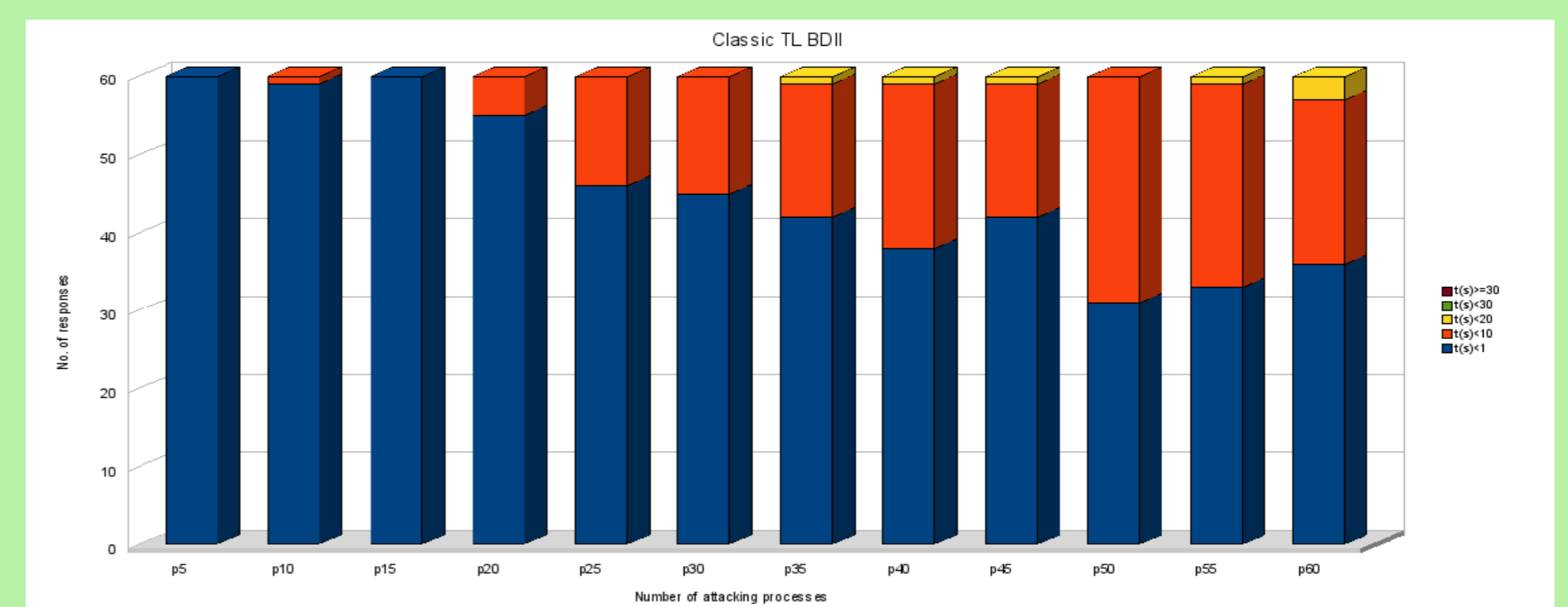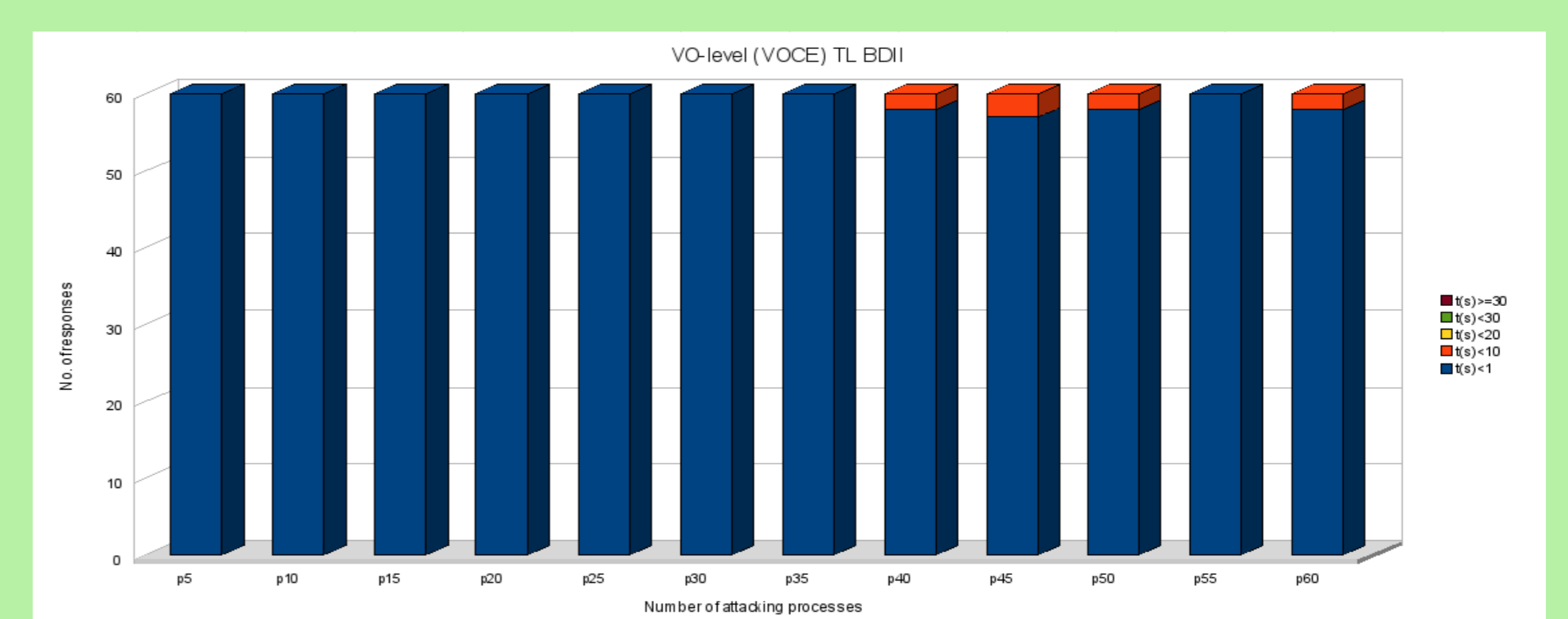
Measurements

To measure perfomace of improved information service we used stress-tests framework. The framework submits grid jobs which make load on the service by asking queries to the service instance. We selected queries which are typical for production tools in order to simulate real world environment.

We measure response time of a simple **probe query** under gradually increasing service load.

Measurement procedure starts from 5 processes asking stress-test queries and finishes at 60 with step of 5.

It is expected that probe query response time will increase with number of stress-test queries. Important limit is 10 sec. as this is EGEE production timeout indicating a service failure.

Results

It can be observed that typical top-level BDII performs worse than VO-level and fails to respond probe query within 10 sec. limit under higher loads. The proposed approach can be easily implemented in the existing infrastructure.