Mass Testing of EMI Products in Czech NGI's Virtualized Environment

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Continuous Testing

The goal of continuous testing is to get a daily preview of the state of all products, allowing developers to respond immediately to any possible issues caused by a recent code check-in.

NGI's virtualized environment [2] is used to automatically submit jobs that:

1. Install and contextualize an image for a given platform;
2. Run deployment test of a given product in a given scenario;
3. Generate fake user identities;
4. Run functionality tests as per the given product's Test Plan;
5. Compile and upload test artefacts, incl. a report in *Twiki* format.

Regular tests run every day, deploying packages from **nigthly** build repositories. Certification tests can be submitted on demand, deploying the product from a specified **registered** repostiory.

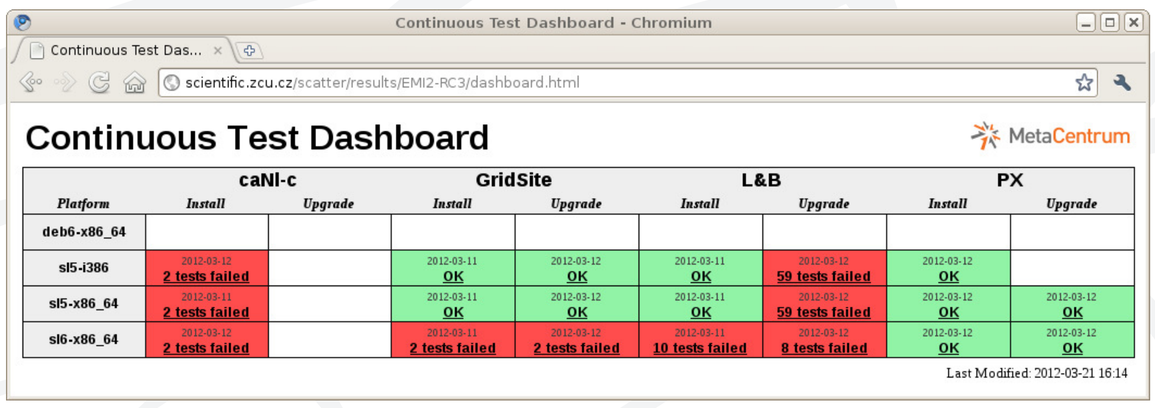

Fig. 1: Daily deployment/functionality test overview

Implementation relies on a MetaCentrum service with the capability to shedule and run a Torque job containing a whole virtual machine. The image is contextualized by the content of the job's payload and is VirtualBox compatible.

Future Work

There are other ways of exploiting the potential of the described work:

- HW-related performance study – MetaCentrum environment allows us to submit performance tests on different hardware configurations and compare effects on tested software.
- Integration and multinode testing – advanced scenarios involving multiple nodes (e. g. N clients + 1 server) can be devised, relying on virtual cluster services provided by MetaCentrum (setting up a group of virtual machines connected into a dedicated network).

References

[1] *Performance testing of L&B service*, `http://egee.cesnet.cz/cvsweb/LB/megajob_2006.pdf`

[2] *MetaCentrum Virtualization – Use Cases*, `http://www.cesnet.cz/doc/techzpravy/2010/metacentrum-virtualization-use-cases/metacentrum-virtualization-use-cases.pdf`

Performance Testing

Currently only available for L&B, based on performance tests developed for EGEE's MegaJob Challenge[1]. Testing is done for performance-critical parts of the product, giving a numeric result representing the hypothetical maximum number of jobs that could be processed in a day.

Performance Trends

Performance tests can be run for weekly snapshots of the codebase, even retrospectively, to quickly identify possible bottlenecks introduced by development. The following chart displays the performance trend on EMI's timescale.

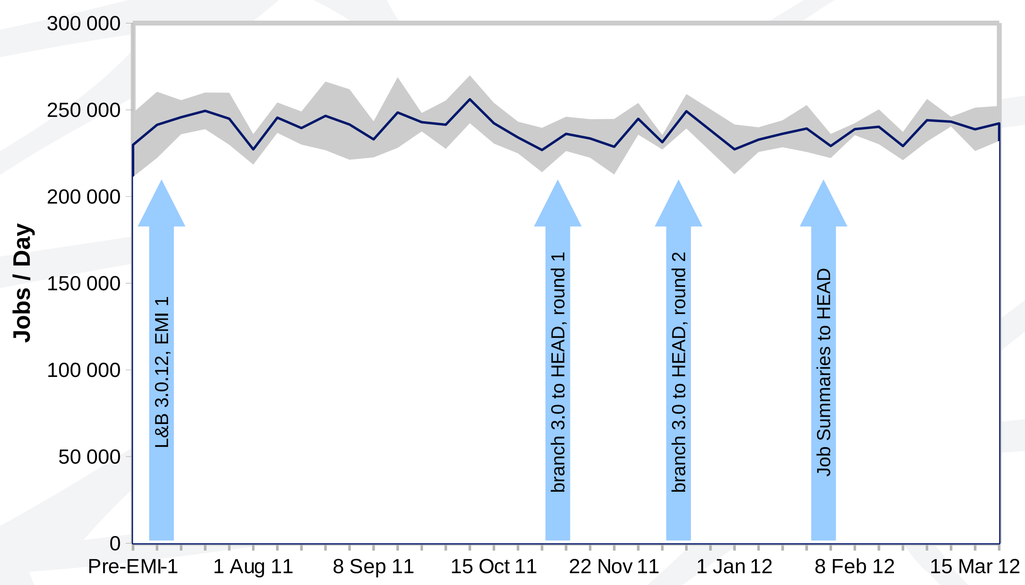

Fig. 2: Performance trend over the EMI timescale

All data points shown in the chart above were collected on identical hardware. The chart shows that the essential performance does not suffer from feature creep, meaning that normalized to the growing power of HW over time, L&B's real-life performance must be growing.

Platform / Build Settings Comparison

High degree of automation allows us to cheaply run various kinds of comparative tests. We have done comparative testing of various supported platforms (showing the expected slight advantage of 64-bit over 32-bit platforms). We have also done comparisons of various compile-time optimization strategies.

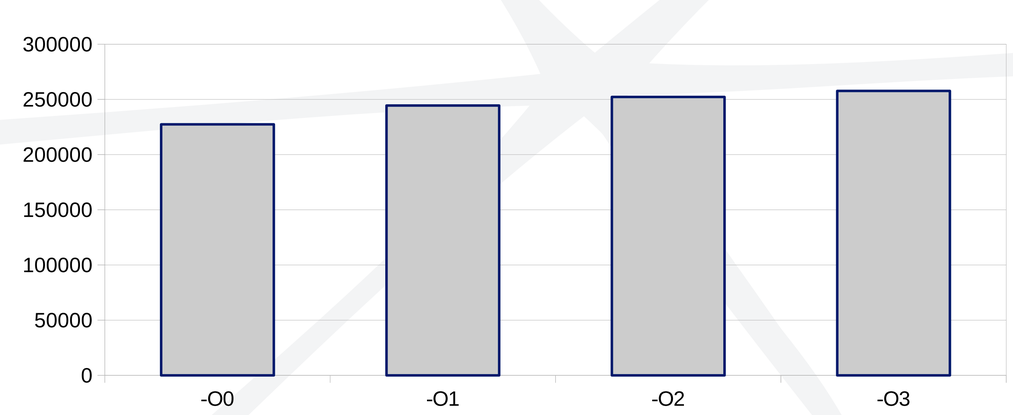

Fig. 3: Comparing various `gcc` optimization strategies

Similar comparisons may be done for various library versions, competing libraries provided by different vendors, etc.

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