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Status of the NA2 COMP task

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Abstract

The objective of NA2 task COMP is to provide a grid-enabled distributed computing infrastructure for ILC related analysis and simulation activities. This memo describes the current status of the computing infrastructure at the various institutions.

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1 Introduction

Developing and optimising detectors and carrying out comprehensive simulations and data analyses often require a significant amount of computing resources. The goal of the NA2 task COMP is to provide such infrastructure for ILC related R&D activities. The resources are distributed over various locations and are made accessible in a homogeneous and transparent way by use of grid middleware.

EUDET funded institutions contributing to this task are DESY, Tel Aviv University and University of Bonn. This document provides a brief overview over the situation at these sites.

2 Hardware resources

During the year 2006 DESY, Tel Aviv University and University of Bonn purchased new computing and storage resources to extend or set up grid-enabled computer clusters at their institutes to provide additional resources for the virtual organisations (VO) `ilc` and/or `calice`. The latter are the organisational structures for grid users working on ILC or CALICE related activities.

DESY received in total 30000 EUR of which 23010 EUR have been spent on six SunFire X4100 machines with four CPUs. The remaining money has been invested into two SunFire X5400 file servers with 24 TB storage each with a total cost of 56000 EUR. These are used pro rata for EUDET activities. The newly acquired resources were integrated in the already existing DESY grid computing infrastructure and were promptly available.

Tel Aviv University has spent approximately 10000 EUR on five dual core PCs with roughly 3 TB RAID5 storage. Here the new hardware was also used to extend existing resources.

Bonn University purchased 10 dual CPU dual core SunFire X2200 machines for 34974 EUR in December 2006. Since the group moved from Freiburg to Bonn in 2006, it was necessary to set up a new grid computing cluster from scratch in Bonn leading to some delay with respect to the original schedule. The hardware is expected to become available around the turn of the year 2007/2008.

The EUDET resources can be accessed from members of the VOs `ilc` and/or `calice` and are embedded into existing ILC grid infrastructure.

In total the virtual organisation `ilc` is currently supported by approximately 30 different sites in Europe, America and Asia. Storage resources for this VO are provided by approximately 20 sites. The corrsponding numbers for the VO `calice` are roughly a factor of two smaller. Some of those institutes running ILC grid resources are fairly large (> 1000 CPUs). The provided storage space is typically a few TB per site. But both (non-EUDET funded) CPU and storage resources are in general not exclusively dedicated to the VOs `ilc` and/or `calice`. It is unfortunately not possible to obtain the ILC shares from publicly available site information. Therefore it is hard to estimate the total available ILC resources for all sites.
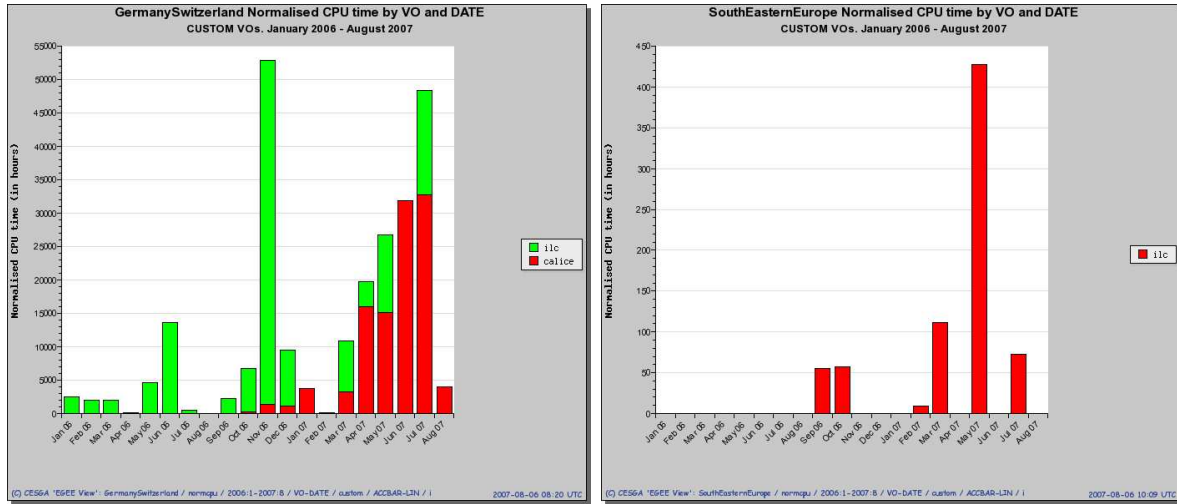
Figure 1: CPU usage versus time for the grid computing sites DESY Hamburg, DESY
Zeuthen and University of Freiburg (left) and for Tel Aviv University (right)
for the VOs `ilc` and `calice` (from EGEE accounting portal). The contribution
of University of Freiburg to the left plot is negligible.

3 Usage of available resources

The consumed CPU time versus time for the EUDET funded sites DESY and Tel Aviv
University is shown in Figure 1. The displayed time range is from January 2006 to
beginning of August 2007. A few general features can be recognised. First of all the
usage of ILC grid resources has significantly increased over the considered period. In
particular CALICE has started to use the grid for their test beam analysis on a regular
basis since the beginning of 2007. The grid usage of the VO `ilc` is subject to large
fluctuations as function of time. Comparing DESY with Tel Aviv University one sees
that there is a significant imbalance between the two sites. The used resources differ
by approximately a factor of 100. Even during periods where DESY usage reaches
a maximum like e. g. in November 2006 the Tel Aviv site has not been used at all.
Obviously the load is not yet optimally shared between the sites.
Overall one sees that the grid gains more and more acceptance within the ILC user
community. Despite of a certain overhead associated with sending jobs to the grid, the
vast potential is recognised. In general user feedback is rather positive. Job success
rates in the order of 90 % to 95 % are achieved.

4 Conclusion and outlook

The EUDET funded hardware has been timely integrated into the existing sites at
DESY and Tel Aviv University. The installation at Bonn University slightly lags behind
schedule due to an unanticipated move of the group from Freiburg to Bonn in the year

2006. Bonn University is expected to contribute resources at the end of this year or at the beginning of next year.

The total usage of ILC grid resources has significantly increased over the last 18 months. In particular CALICE now routinely uses the grid to store and analyse their 13 TB of test beam data. Unfortunately the load is presently distributed unequally among the ILC grid sites. Here some more advertisement is needed to make more users aware of the sites which are less used to eliminate this imbalance.

Acknowledgement