Estonian Grid and LHC computing

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On behalf of Estonian Grid

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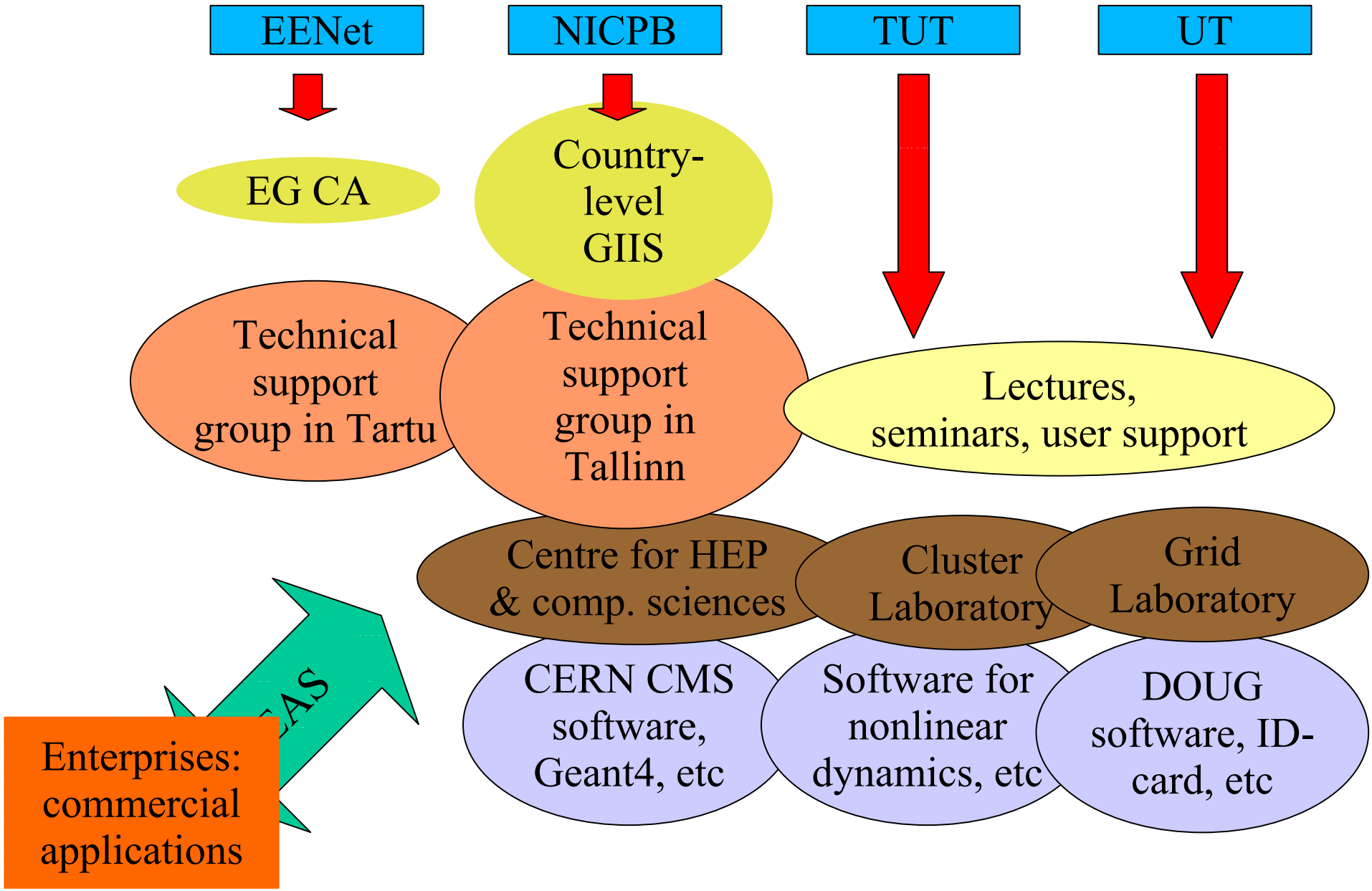
In this presentation

- Brief history of Estonian Grid
- The current organizational structure of Estonian Grid
- The technical solution for Estonian Grid
- Other collaborations that we are part of
- CERN & Tier 2 plans
- Ongoing lectures and seminars about Grid in Estonia
- Cluster building and plans at NICPB
- Current scientific research projects on Estonian Grid
- Future plans

Brief history of EG (Estonian Grid)

- Jan-Dec '03 – some coordinative meetings
- Jan '04 – first components of EG: EG CA, country level GIIS and first test system enter EG
- Jan '04 – NorduGrid technical meeting in Tallinn
- Feb '04 – establishment of the Centre of High Energy Physics and Computational Sciences at NICPB to support development of local Grid applications
- Feb-Mar '04 – some first multiprocessor clusters join EG
- Apr '04 – CP/CPA draft for EG CA
- May '04 – first scientific software ported to EG
- May '04 – Establishment of Grid laboratory at the Institute of Technology of the Tartu University
- Jun '04 – establishment of EG technical coordination and support group
- Jun-Jul '04 – first massive test and scientific calculations on EG
- Okt '04? - EG technical support group publishes first article about EG and first scientific results produced with EG

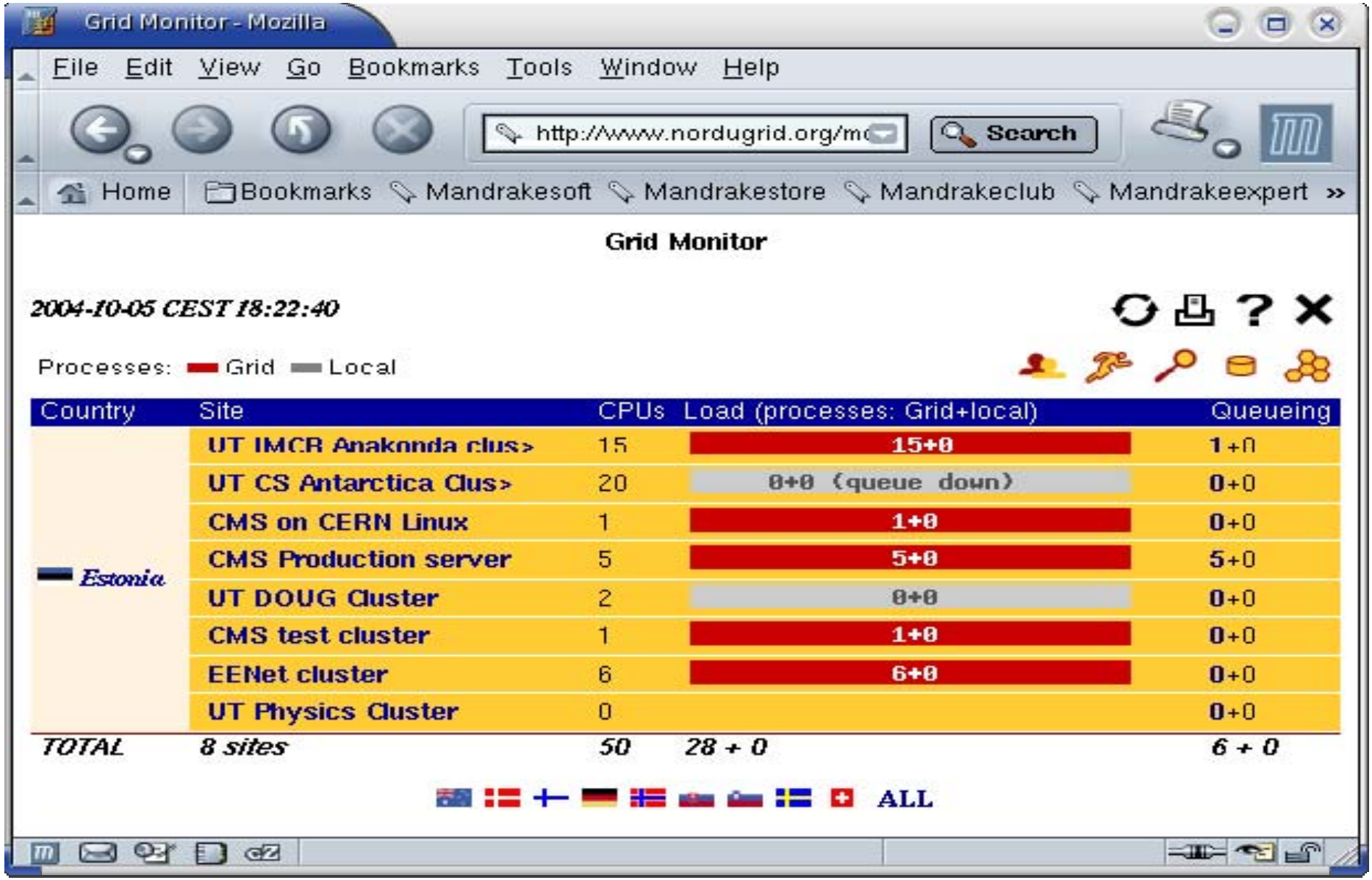
Current organizational structure



The technical solution of EG

- Choice of middleware – ARC (aka NorduGrid)
- Middleware choice due to historic and regional reasons
- At the moment 62 cpus in EG, all P4 with varying clock frequencies. Clusters use PBS as local scheduling agent
- Our CA is apporved by NorduGrid and EGEE and our country level GIIS registers to NorduGrids top level GIISes so we are part of NG and trusted by EGEE.
- In addition to standard OpenSSL generated certificates there have been successful tests to use the national ID card

EG monitor


Grid Monitor - Mozilla
File Edit View Go Bookmarks Tools Window Help
http://www.nordugrid.org/mo
Search
Home Bookmarks Mandrakesoft Mandrakestore Mandrakeclub Mandrakeexpert
Grid Monitor
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Processes: Grid Local
Country Site CPUs Load (processes: Grid+local) Queueing
Estonia
UT IMCR Anakonda clus> 15 15+0 1+0
UT CS Antarctica Clus> 20 0+0 (queue down) 0+0
CMS on CERN Linux 1 1+0 0+0
CMS Production server 5 5+0 5+0
UT DOUG Cluster 2 0+0 0+0
CMS test cluster 1 1+0 0+0
EENet cluster 6 6+0 0+0
UT Physics Cluster 0 0+0
TOTAL 8 sites 50 28 + 0 6 + 0
ALL

Other collaborations

- Nordic Grid Neighbourhood – we are part of the neighbourhood program and also host their website http://www.nicpb.ee/NordicGrid/
- NorduGrid – we work closely with the middleware developers providing feedback and suggestions for changes. NG technical meetings in Tallinn Jan, Dec '04
- CERN – as the initiator for LCG CERN is the most important international body to develop Grid at the moment. Estonia is the only Baltic state that has an official relationship with CERN at the moment
- NICPB is planning to become a Tier-2 center for CERN/LCG although accoring to current plans it is still unshure, if it will be just us or in cooperation with Finland

Ongoing Grid lectures and seminars

- For one year there have been Grid seminars at Tartu University and now a new series of seminars is starting in Tallinn University of Technology
- Starting this fall Estonian IT College has taken Grid systems as one of their extra curricular subject and it has received some popularity with practical sessions having up to 20 students actively studying Grid

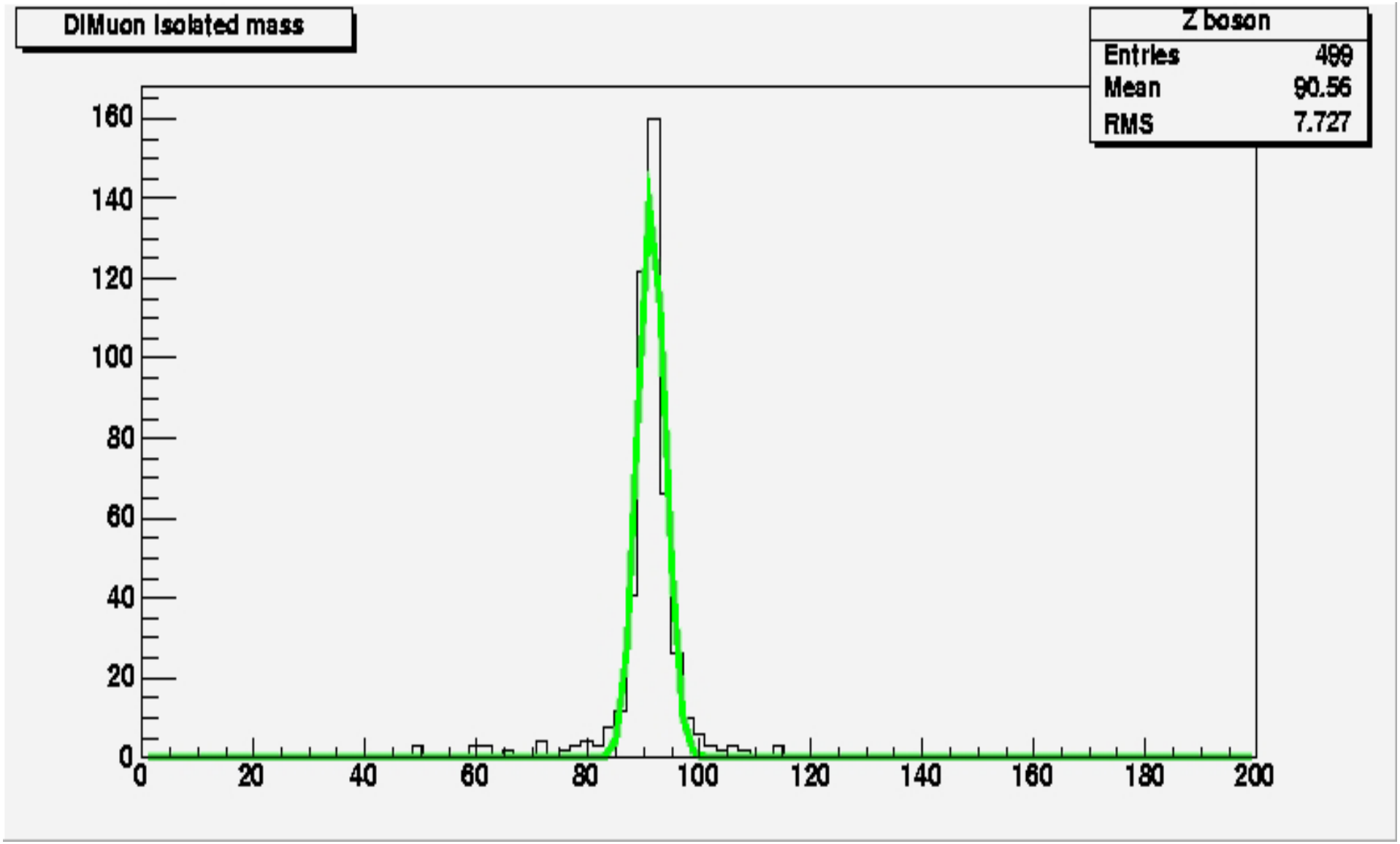
Clusters

- Currently clusters have all been based on Intel P4 or P4 Xeon architecture.
- Preliminary analysis show that AMD Athlon64 systems are about 30-40% faster in scientific calculations than the equivalent P4-s already in 32bit emulated mode and hence the future plans are to use more AMD based clusters
- NICPB is currently investigating with some providers to buy a 16 cpu cluster as a research and study platfrom for Estonian CERN summer students
- CMS, which NICPB is a member of, has also shown keen interest in using Athlon64 or Opteron based systems for their performance and is considering porting it's simulation and reconstruction software to 64bit architecture

Current scientific research projects

- NICPB has been doing research in two subjects
  - CMS detector simulation and event reconstruction studies for LHC
  - Geant4 simulations of radiation source detection
- UT scientists have performed research using DOUG which is a partial differential equations solver in Grid environment
- There are upcoming uses for genetic research and solid state physics, where the applications are still being ported to a Grid environment

DiMuons from EG



Future plans of EG

- Incorporate new software and help different scientific groups to come to Grid
- Expand the Grid by new resources and new services
- Keep an eye on LCG developments especially on gLite
- Try to build a strong connection with our northern and southern partners in Grid businesses

Q & A