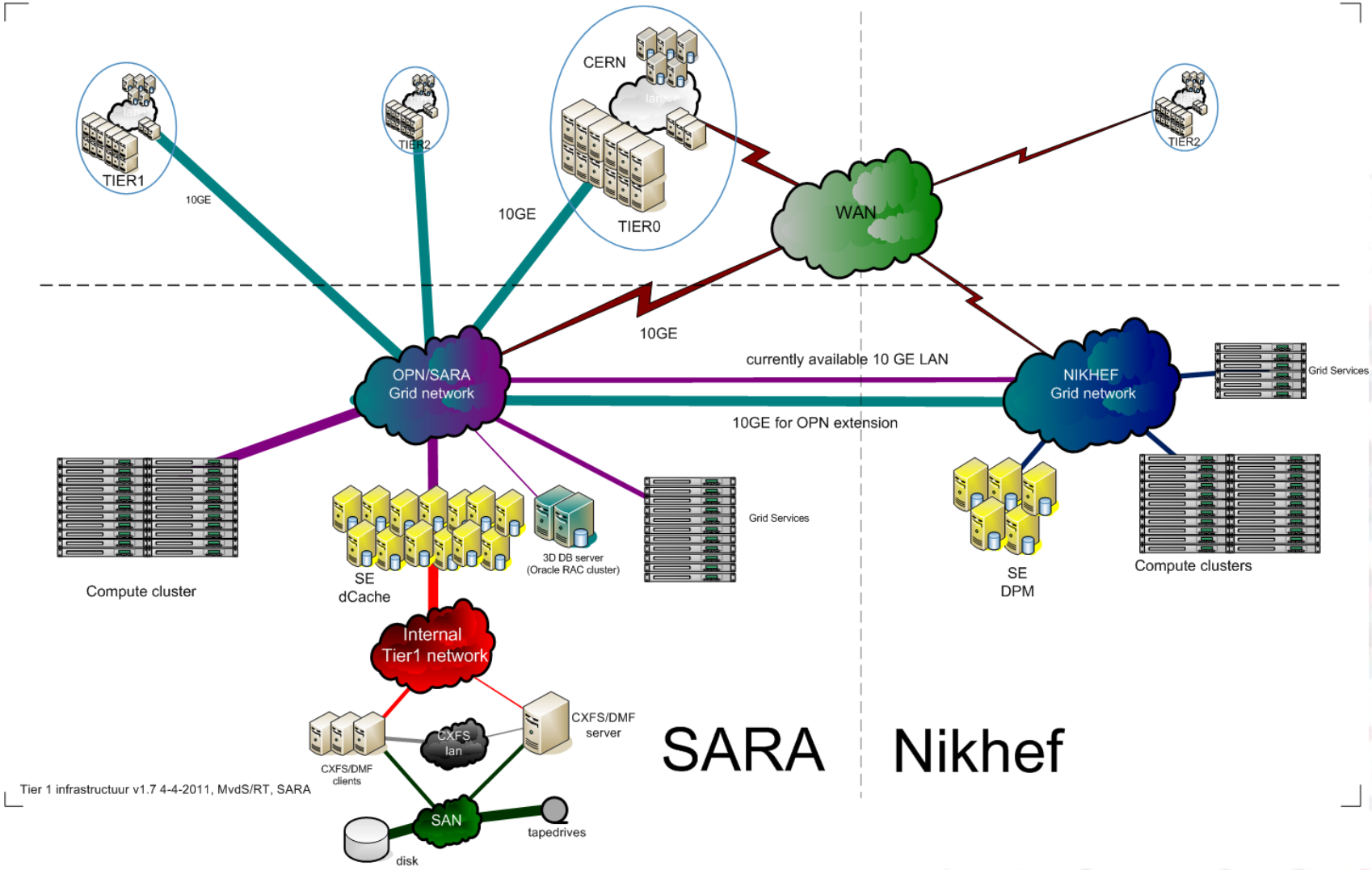
Support for multiple disciplines@SARA&NIKHEF

Ron Trompert

SARA&NIKHEF LHC Tier1



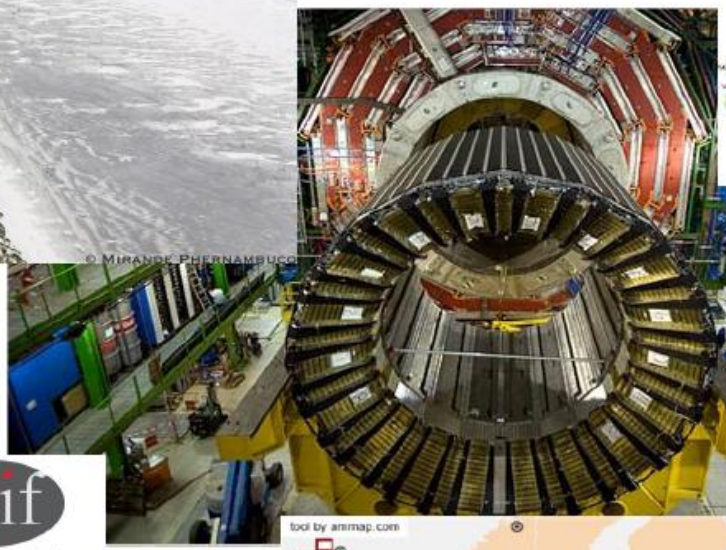
Infrastructure

- Hardware
  - IBM supercomputer
  - Dell infiniband compute cluster
  - Grid
  - Cloud
    https://www.egi.eu/indico/getFile.py/access?resId=0&materialId=slides&contribId=208&sessionId=7&subContId=5&confId=452
  - Hadoop
  - webDAV
- Software
  - gLite
  - UNICORE (PRACE)

Projects

- NIKHEF is a High Energy Physics Institute
- SARA has been a HPC centre hosting Supercomputer for the Dutch scientific community for 40 years and has been dragged into the HEP arena by our friends at NIKHEF. SARA and NIKHEF participated in the EDG and EGEE projects and now in EGI InSPIRE

SARA Project involvements



vl·e

PRACE

egi European Grid Infrastructure
Towards a sustainable grid infrastructure

EUDAT

AMSTERDAM LIGHTHOUSE

CINEGRID AMSTERDAM

glif
Global Lambda Integrated Facility

DEISA

SURF NET

LCG

EPIC

HPDMnet
High Performance Digital Media Network

BBMRI
Biobanking and Biomolecular Resources Research Infrastructure

HPC-Europa2
Pan-European Research Infrastructure on High Performance Computing

GÉANT

OptIPuter

nbic

BiG Grid
the dutch e-science grid

Projects

- SARA has taken part in the DEISA and PRACE projects focusing on the HPC community
- SARA is taking part in EUDAT starting October 1st this year

- SARA and NIKHEF collaborate in the BiG Grid project

BiG Grid

Data and information are available in ever larger quantities, and researchers face a distributed data explosion ... BiG Grid is now enabling researchers in the Netherlands to meet these challenges.

Detectors, medical imaging instruments, micro-arrays, and multi sensor instruments are producing amounts of data that are rapidly exceeding the capacities of their current local data storage and computing environments. The revolution in digital archiving is bringing new challenges to data curation and pers istency. Enabling the Dutch e-Science community to make the leap is what BiG Grid is all about.

BiG Grid

- Partners: NBIC, NCF, NIKHEF, SARA, Groningen University, Philips
- Users
  - Everybody
  - Continuously looking for new users

About Users

- For SARA, being a national HPC centre implies that serving multiple users or user communities is in our DNA
- Different kinds of users:
  - (multi)national VOs containing a large number of people sharing resources
  - Individual users or user groups (mostly national) in need for resources that they cannot get elsewhere
    - Collaborating on a small scale or not at all

Technical Challenges

- Multiple user communities have various needs and they need to share storage and computing resources
- Tailored solutions are sometimes necessary
- Expand the available number of solutions
  - Hadoop
  - Cloud
  - WebDAV

About users

- **The Grid:**

  “Grid computing is coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organizations”

  (I. Foster, C. Kesselman. -The Grid: Blueprint for a New Computing Infrastructure, 1999)

- **Virtual Organization:**

  Contains persons working on common project and are sharing resources

About users

- The definition of the Grid and virtual organisations maps exactly on the large VO use case, like the LHC experiments. So users of a large VOs are taken care off by offering a Grid solution
- HPC users typically work alone, need lots of CPU cores with high-bandwidth low latency interconnect. Taken care off by HPC centres/PRACE
- How about the other users?
  - Users that are not organised in a virtual organisation of several thousand people but work alone or in small groups?
  - Users that have a fairly large datasets that they cannot store and process locally but would rather share their toothbrush than their data or only want to share data with a small group of people
  - Although availability and reliability is OK, the Grid is very much tailored to serve (large) virtual organisations rather than individuals or small groups

SARA&NIKHEF

- **Interest a coordinated action of large Resource Centres at European level?**
  - **Yes**