SARA
Computing & Networking Services

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Outline

- About SARA
- National and International Collaborations
- Overview of Services
- Main Operational Tasks
- Organisation
- Operational Procedures
- Tools Used

About SARA

- SARA is the Dutch national e-science support center with services in the area of high-performance computing and networking, scientific visualisation, masss data storage and grid services
- Not for profit organisation, based in Amsterdam
- Users: Higher Education & Research Community
- First supercomputer in The Netherlands at SARA in 1984 (Control Data CYBER 205)
- One of the European PRACE supernode candidates

National Collaborations

Stichting Nationale Computer Faciliteiten
www.nwo.nl/ncf

BioRange
www.nbic.nl

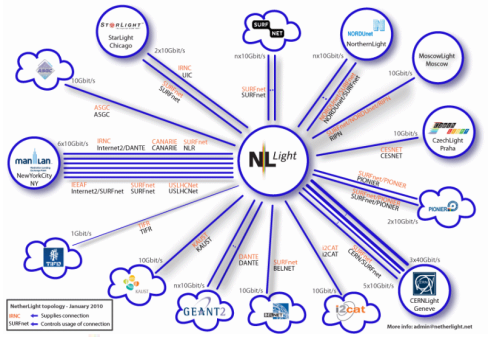
LOFAR
www.lofar.nl

SURFnet6 network
www.surfnet.nl
www.gigaport.nl

Virtual Lab e-Science
www.vl-e.nl

NL-Grid, BIG-Grid
www.nwo.nl/ncf
www.nikhef.nl
www.nbic.nl

International Collaborations

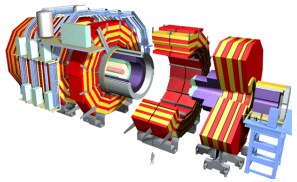


NL Light SURF NET

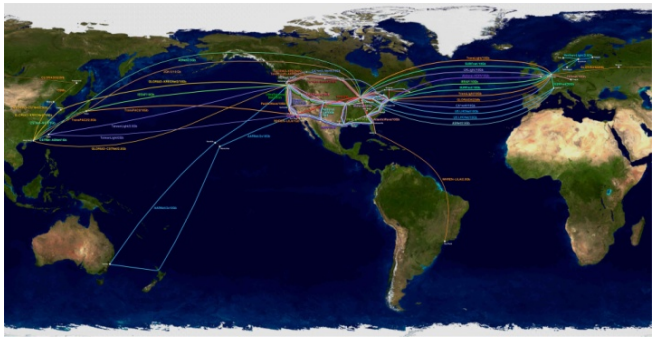
Visualization & networking
OptIPuter www.optiputer.net
CineGrid www.CineGrid.org

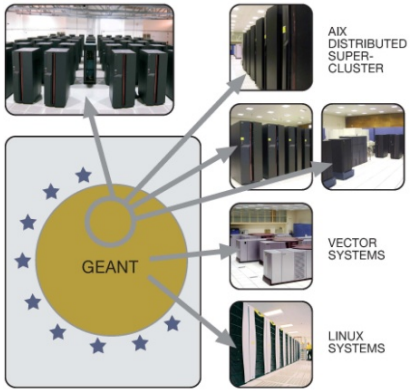
CineGrid™

GÉANT



eGee
Enabling Grids for E-science in Europe





Lambda networking
GLIF, Netherlight
www.glif.is

Supercomputing
DEISA grid
www.deisa.org

Distributed European Infrastructure for Supercomputing Applications

Data storage and processing
EGEE grid
www.eu-egee.org

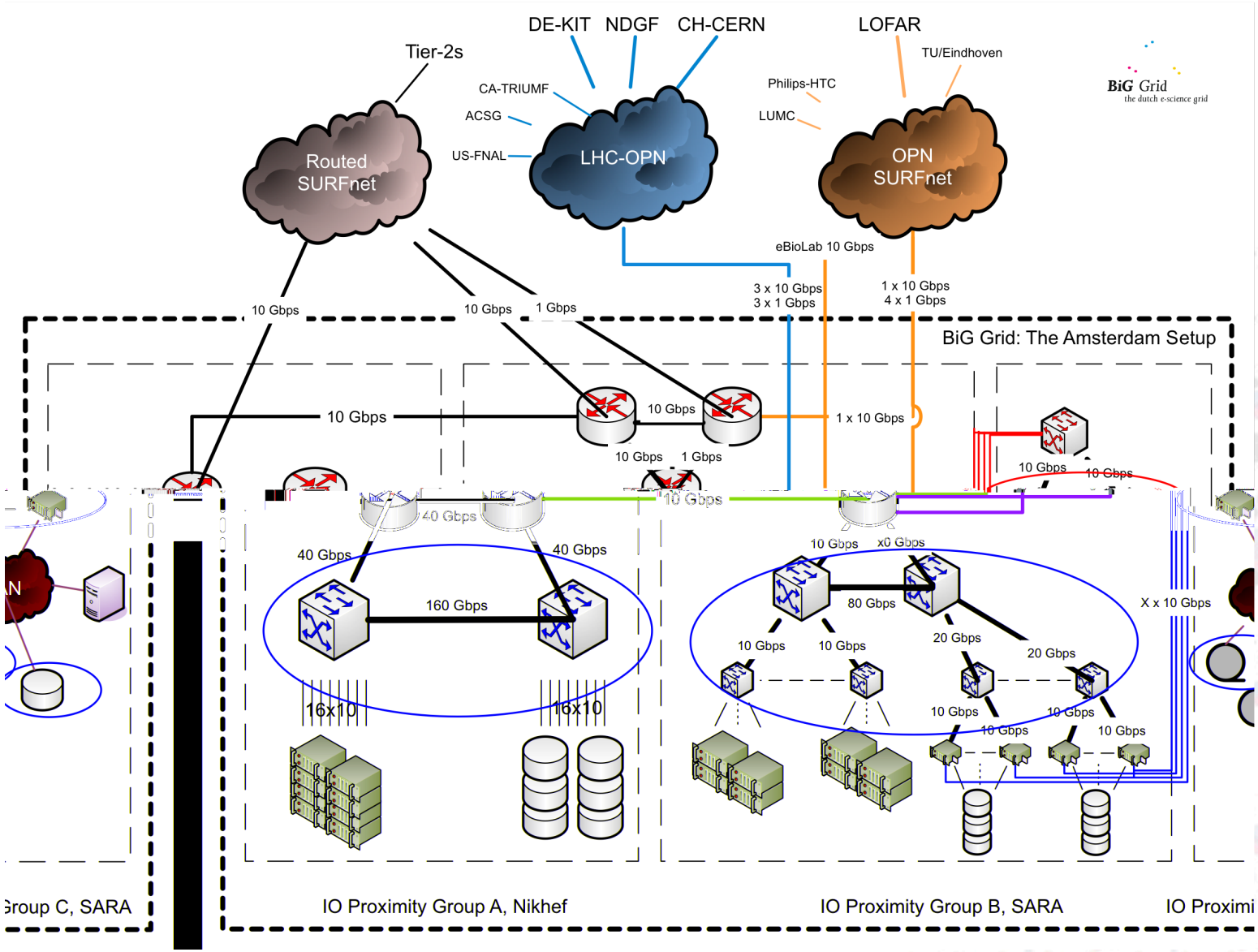
glif Global Lambda Integrated Facility

Supercomputing Services

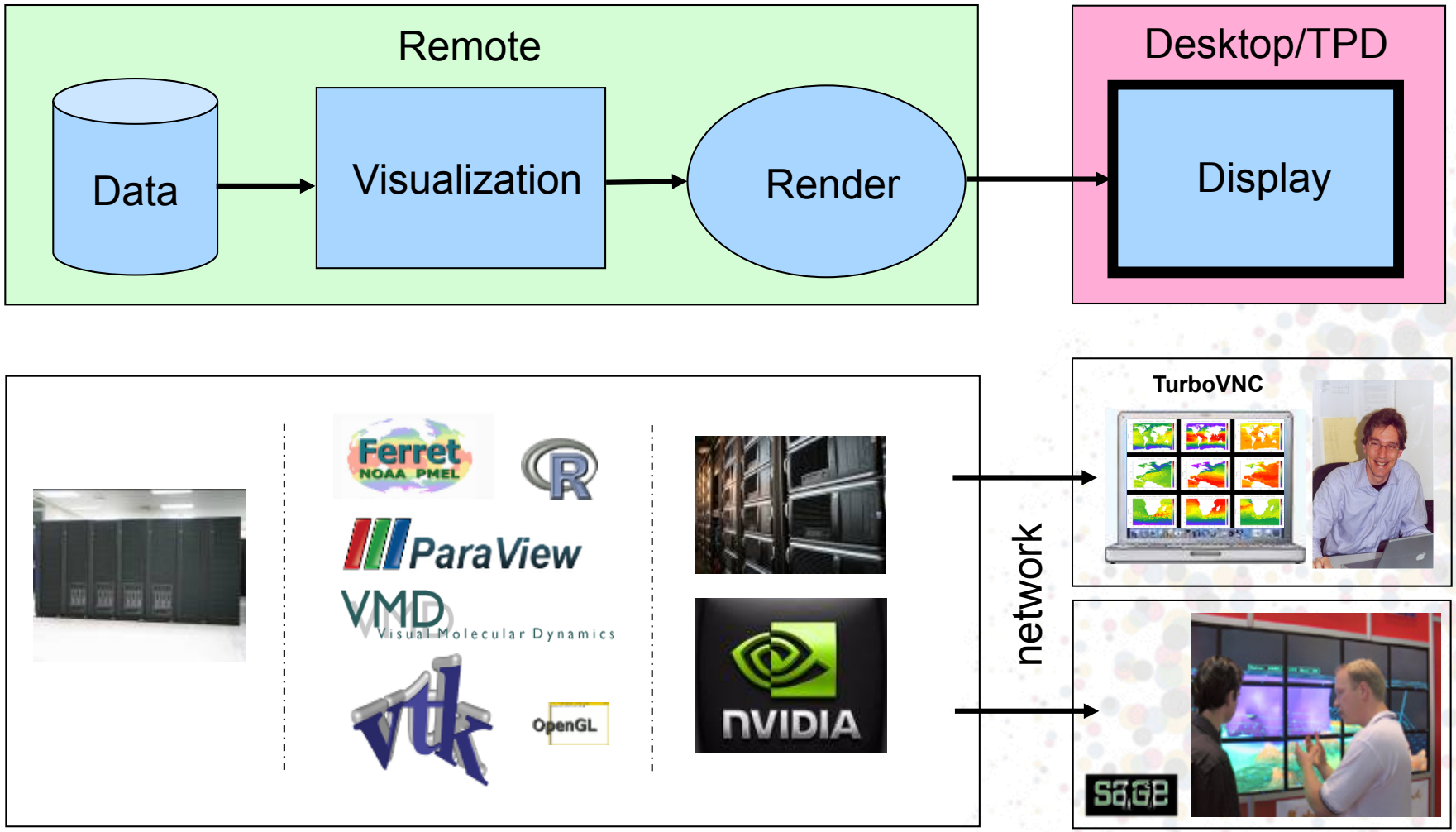
- National Supercomputer Huygens (capability computing)
  - 65 Tflop/s IBM Power 575 “hydro cluster”
  - 2nd half 2008 – end 2011
  - 3456 processors
  - 16 TeraByte memory
  - 972 TeraByte directly connected disk space
  - Water cooled

- National Compute Cluster Lisa (capacity computing)
  - 536 nodes
  - 2 Intel Quad Core Xeon (2.26, 2.33 and 2.5) GHz CPUs per node
  - Topspin low-latency high bandwidth Infiniband network
  - performance: 19 Tflop/s
  - 48 TB disk space

LHC Tier1 Data Storage Service



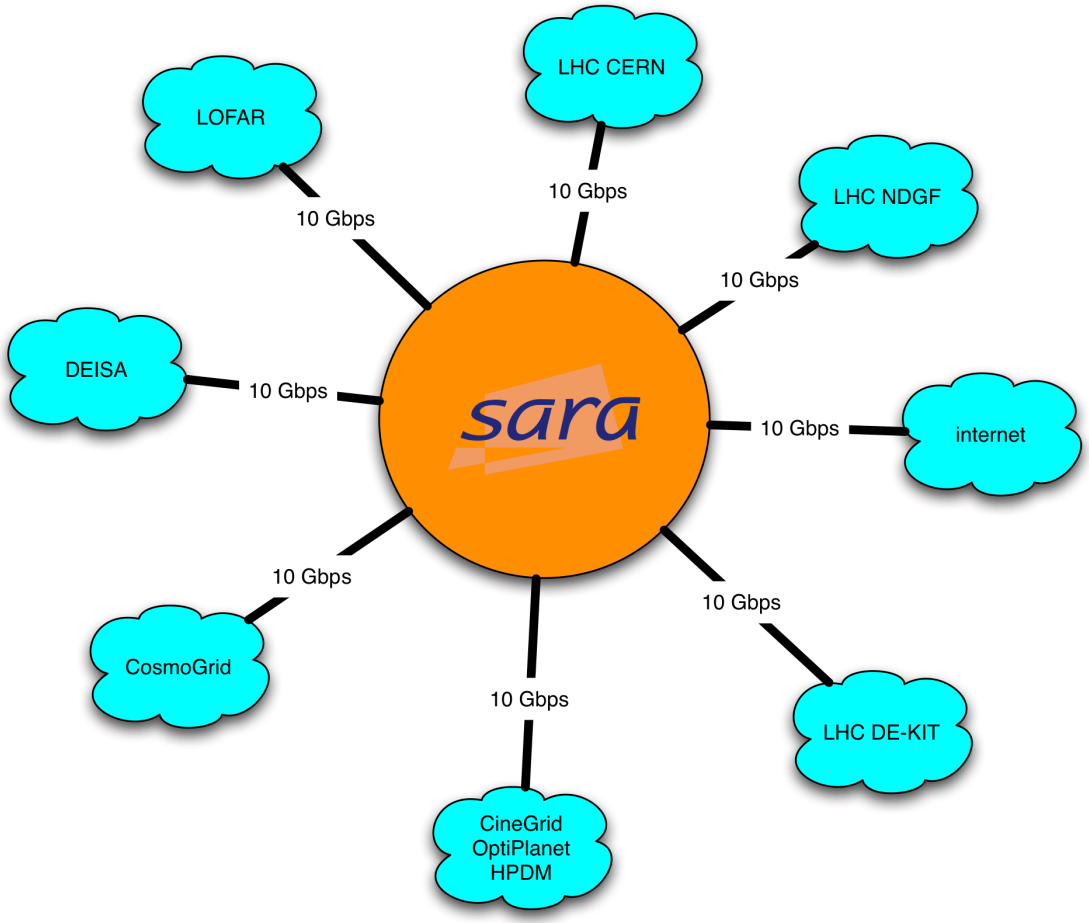
Remote Visualisation Service



High Resolution Visualisation

CosmoGrid: Dutch Computing Challenge Project: DCCP 2008 – 2009 /DEISA Extreme Computing Initiative: DECI 2008, 1.1 M core hours / 3.15 M core hours (2.2 / 4.65), Storage: 110 TB, DCCP: Huygens Amsterdam + Cray XT4 Tokyo: coupled via lightpath
A cosmological N-body simulation with 8,589,934,592 particles

80+ Gb/s External Connectivity



Main Operational Tasks

- Operations & support for the Dutch National Supercomputer Huygens (capability computing)
- Operations & support for the Dutch National Cluster Computer Lisa (capacity computing)
- Mass Storage (LHC TIER-1, LOFAR, BioRange, …)
- Grid & e-science services (EGEE, …)
- Visualisation services (Render Cluster, Tiled Panels, …)
- Network infrastructure (IPv4 + IPv6, Ethernet, CWDM)
- Operations of SURFnet6 (Dutch NREN network)
- Operations of NetherLight (Dutch optical exchange point)

Organisation

- SARA has around 60 employees
  - Operations, User Support and Innovation
- Divided in six groups
  - Supercomputing
  - Networking
  - Cluster Computing
  - e-Science Support
  - Mass Storage
  - Visualisation
- Operations divided in three areas
  - Supercomputing
  - Networking
  - Grid & Mass Storage

Supercomputing Operations Procedures

- Business day support (9:00-17:00)
- Incident reports via telephone and email
- Each day 1 person is responsible for accepting and dispatching incidents
- Rest of group is actively monitoring systems

Networking Operations Procedures

- 24x7 support
  - Working days from 8:00 to 20:00 (2 shifts)
  - Outside these hours on-call duty engineer
- ITIL based
- Incident reports via telephone and email (8:00 – 20:00)
- Active monitoring (nagios) outside business hours
- On-call duty engineer alerted by beeper via active monitoring software

Grid & Mass Storage Operations Procedures

- Business day support (9:00-17:00)
- Incident reports via grid ticketing systems (GGUS, etc) and mailing lists
- Each day 1 person is responsible for accepting and dispatching incidents
- Rest of group is actively monitoring systems

Tools Used

- Nagios
- Ganglia
- Cacti
- PHP-Syslog-NG
- Rancid / CVS for version control
- cfengine
- Email notifications
- Wiki, trac
- Home built software
- Remedy ARS workflow system
- Grid ticketing systems like GGUS
- Ticket tool to inform users about networking issues