NCF

Knowledge creation through e-innovation

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Director NCF

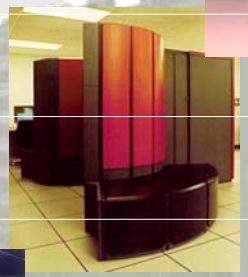

Towards a Dutch e-ECOsystem

- Early developments
- The canting of e-infra principles
- The implementation of policy

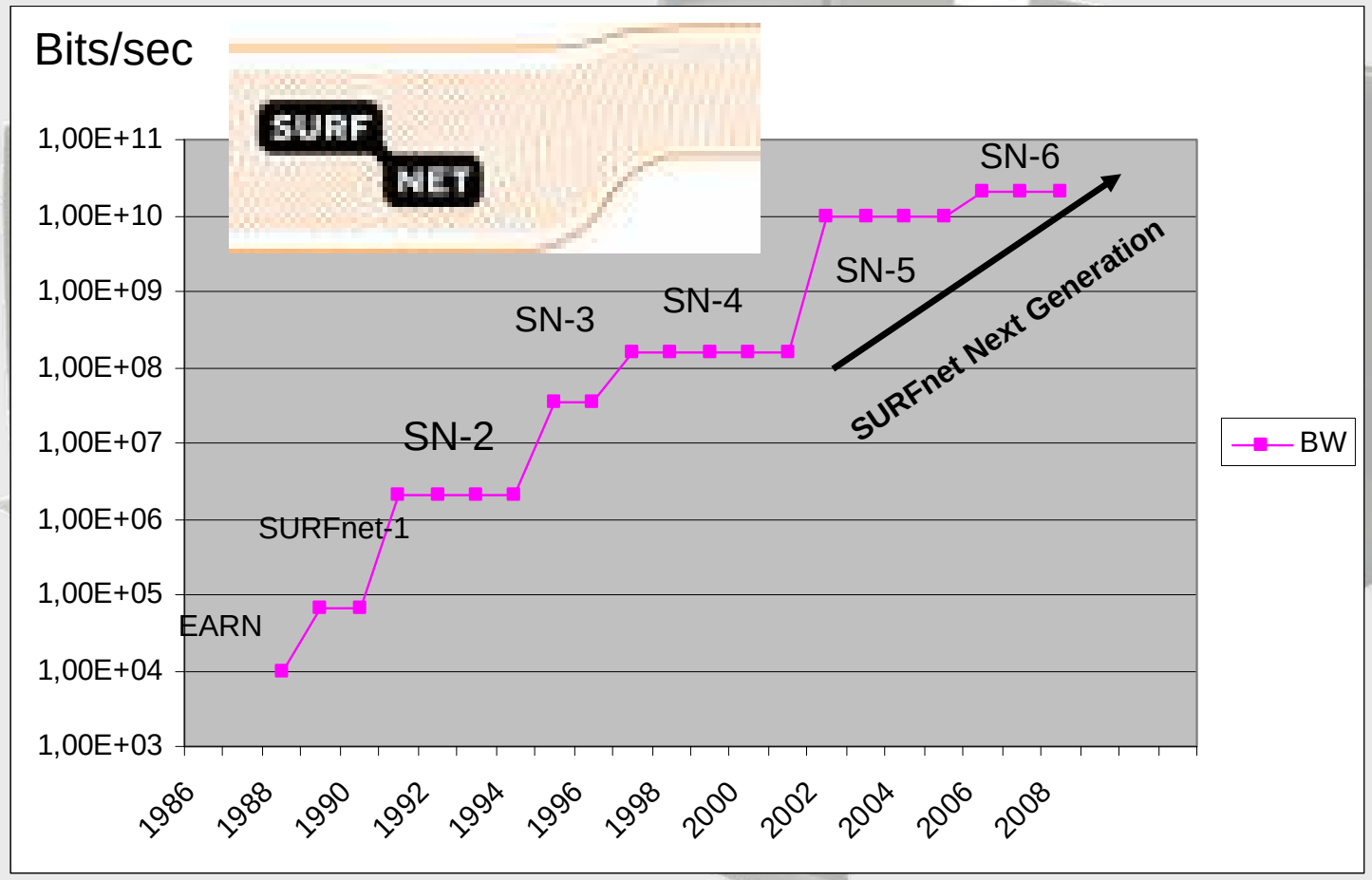
An overview of developments in e-infra-land in support of science and research


Development of advanced computing

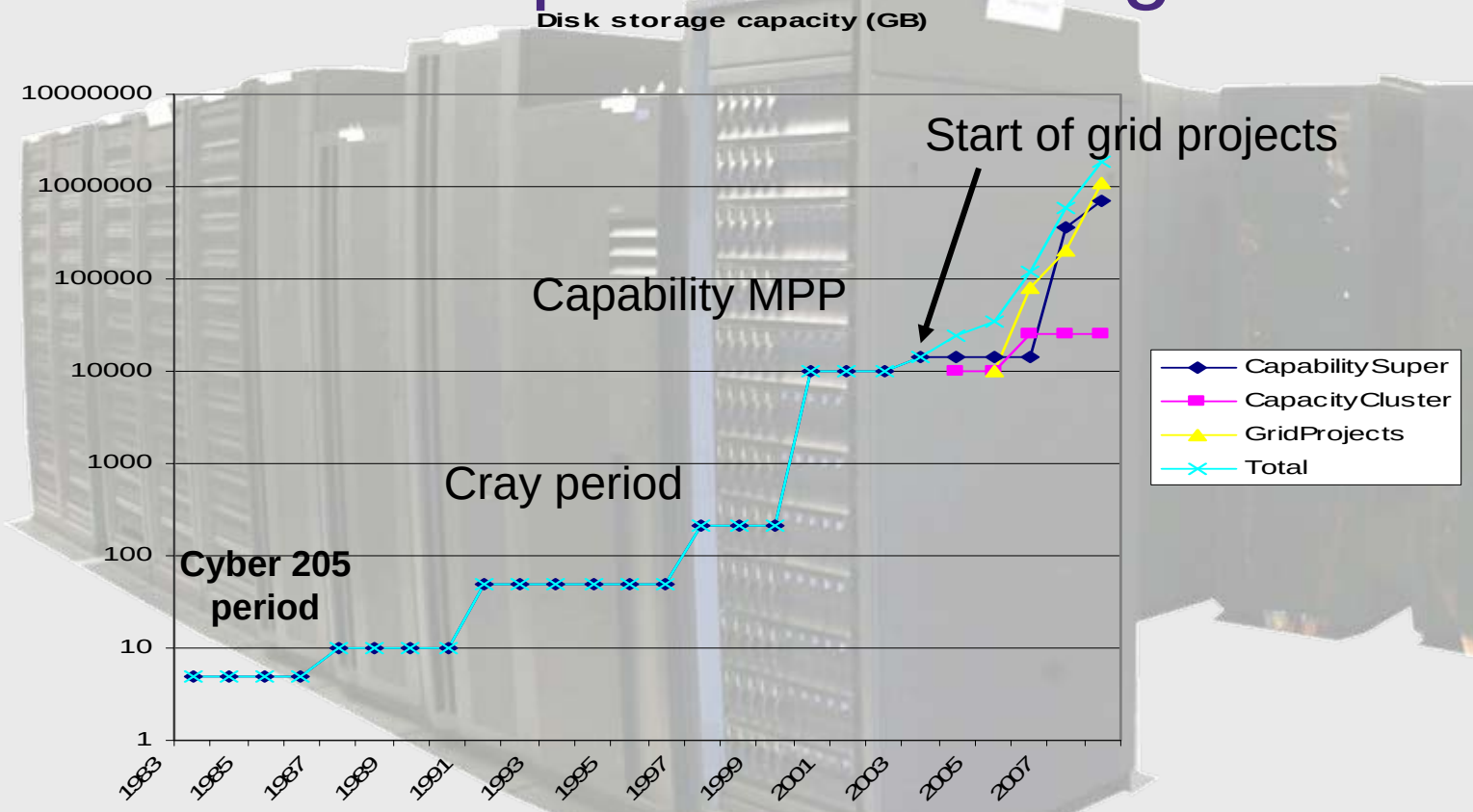





Development of advanced networking



Development of storage




Starting to think integrated

- Networking development was a stand alone process;
- Storage requirements require and involve
  - more thinking ahead
  - data acquisition
  - data protection
  - data curation
- Computing developments create diversity in components and architectures


Conceiving the grid

- “making things easy, like plugging your TV (fridge, iron, toaster…) in a socket”
- “wouldn’t it be nice to use all free (PC-) cycles in the world as one supercomputer”

….

- Visions are great but reality is tedious…
  - Rumors claim that seti@home has been the biggest polluter ever worldwide
- None of these early elements play a role or are leading in present day grid developments


Yet

- Grids are everywhere
- Are a dominating development effort around the world
- Fit the needs of many researchers and research projects
- Stimulate thinking about efficiency of resources, of cooperations between groups etc.


e-Science

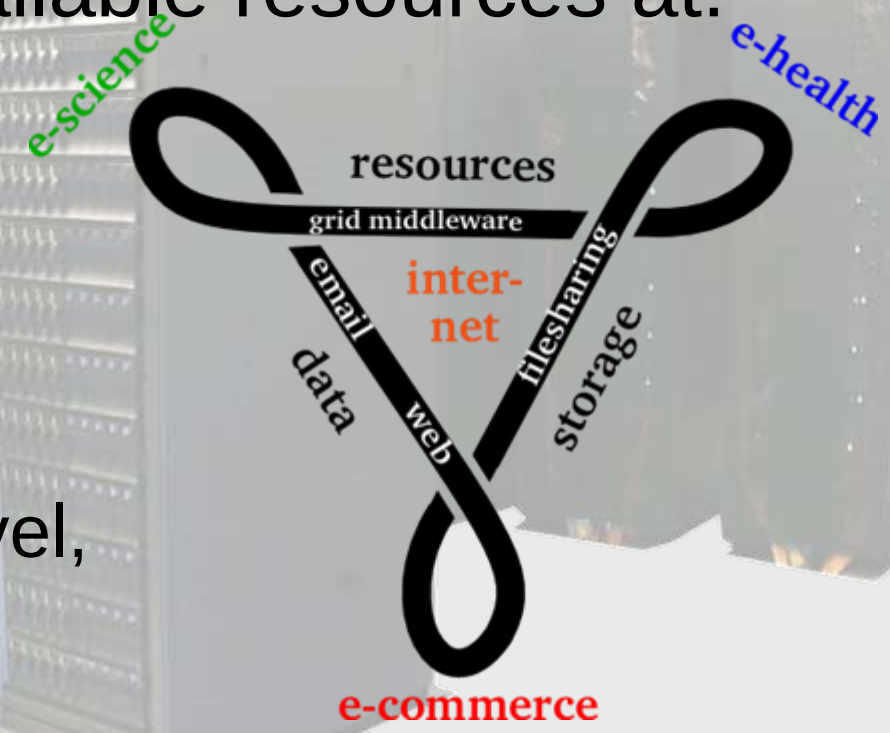
- e-Science is the name of the collective efforts, to
  - use the grid-based infrastructure to the best
  - develop the notion of cross border, cross discipline and cross resource collaborations
  - develop new science based data-driven research
  - Note that e-infrastructures are as important to science as other basic infrastructures are to society


Aspects of well managed e-infrastructures

- Modern science and research require the most advanced e-infrastructures:
  - To be competitive in quantity and quality;
  - To be cost effective;
  - To be attractive (brain gain and education);
  - To be innovative and
  - To contribute to European/national wealth creation

e-Issues to be addressed

- Integration of all available resources at:
  - User level;
  - Technical level;
  - Data level;
  - Support level;
  - Research project level,
- To achieve:



To achieve:

- Maximum return on investment;
- Shorten time-to-solution;
- Support for collaborative opportunities;
- Exchange of knowledge and ideas;
- Reduce the bleeding at the edge


Dutch e-Infrastructure in concept

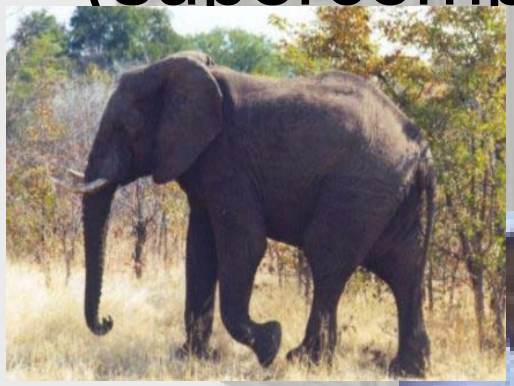
- Dutch e-infrastructure has been canted:
  - From a network and a few large resources
  - Into a coherent science and research grid, supported by
    - The fastest network around,
    - Integrated resources
    - A usage and development infrastructure


Purpose of the Dutch Science Grid is

- to create a
  - User friendly,
  - Well endowed,
  - Sustainable,
  - Expandable,
  - European interconnected,
  - Based on international standards,
  - Trend setting,
- Grid of resources and interdisciplinary contacts


The elephant and the ant

About the non-contrast between HPC (supercomputing) and grids





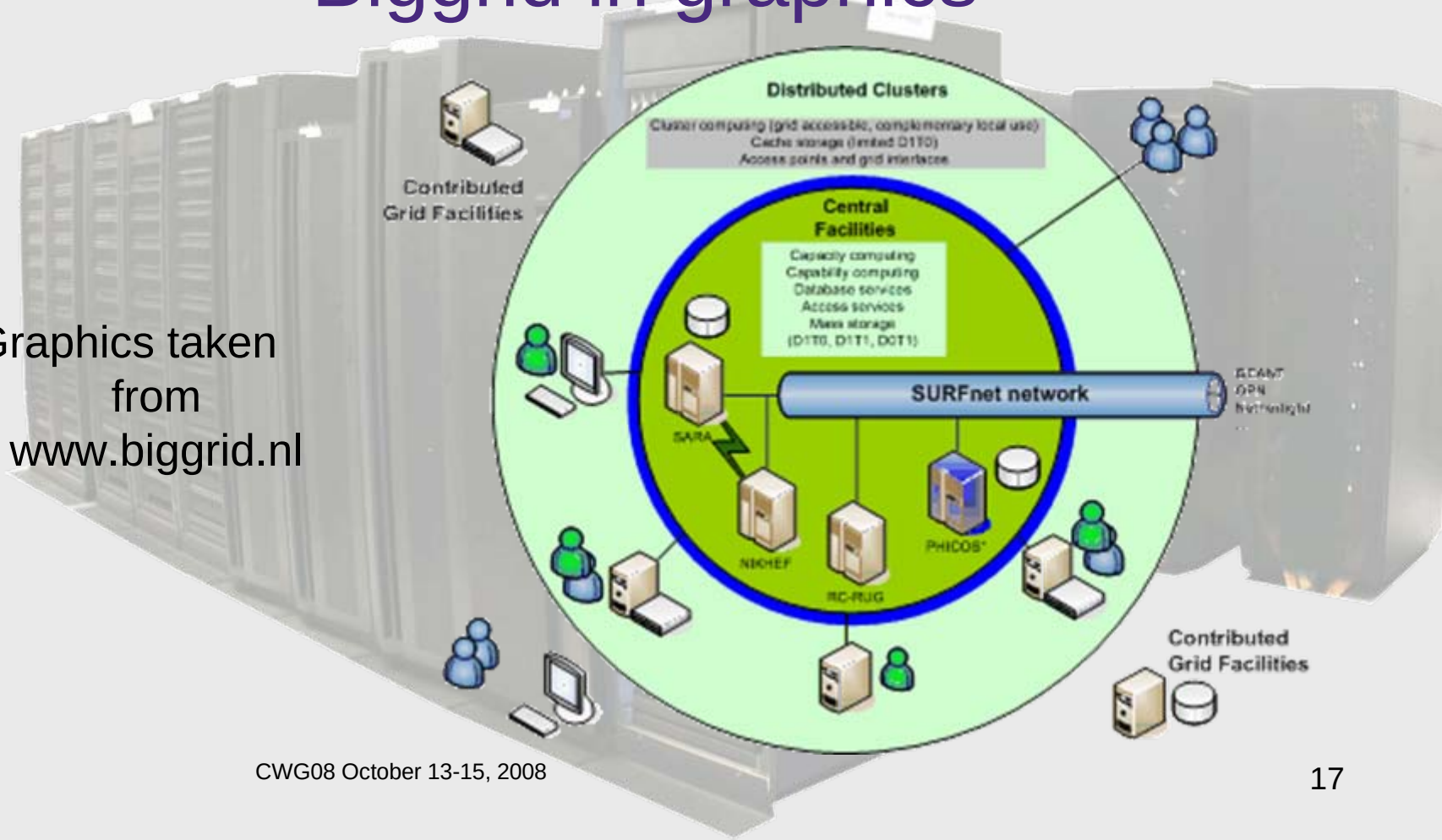
The Dutch grid effort is named BigGrid

("Big" refers to the name of the granting program issuing the call)

- A cooperative development project, executed in cooperation between:
  - NBIC, the National BioInformatics Centre,
  - Nikhef, the National institute for subatomic physics;
  - NCF, the NWO National Computing Facilities Foundation
- Project host: NCF
- A five year term 2007-2011
- Encompassing the Netherlands CERN-Tier-1 infrastructure

Biggrid in graphics

Graphics taken from www.biggrid.nl




Project goals: Means to realise an efficient usage of the infrastructure

- Realise proper access to the resources
  - Network wise
  - Software wise
- Advocate the usage of the infrastructure to scientific disciplines and virtual organisations (VO's) as broadly as possible;
- Offer tailored support at a disciplinary level;
- Offer a user friendly, yet internationally standard middleware environment;
- Conduct dissemination and education activities concerning the use of the resources and facilities


Project details (1)

- Supervisory board (3 parties)
- Board of directors
- Executive team
  - Operations
  - Support and development
- Housing and physical services:
  - SARA, CIT-RUG, Nikhef, Philips Research)


Project details (2)

- 20% dedicated to broaden the user base and raise interest from new disciplines;
- Full Tier-1 (CERN-terminology) realisation;
- Separate European tender procedures for
  - Storage, presently added: 1.100 TB disk storage;
  - Compute, capacity added. 40.000 SpecInt2006 rate (ca. 1600 cores);
- Middleware environment:
  - compatible with gLite software stack
  - Completed with VL-e PoC distribution, a packaging of software products, used in the het Virtual Laboratory for e-Science (VL-e) (http://www.vl-e.nl/, a development program lead by Prof.dr. L.O. (Bob) Hertzberger)

(PoC=Proof of Concept)


Users

- Typically the usual groups
- However, the project encompasses a significant effort to engage users from all disciplines
- Ultimately also HPC users to be gridified
- User board to be established


Budget breakdown (approx.)

€ 28,8*	Total budget
€ 4	Capability computing*
€ 8	Grid support*
€ 10	Central Facilities*
€ 2	Distributed facilities*
€ 0,5	Software
€ 4	Application specific support

* With additional contributions from parties and FP7 (EGEEx)


Sustained funding….

- All organisations involved in e-infrastructures are working on a shared vision on the future of e-infra funding
- Network, grid, HPC,…
- Basically requesting to sustain present funding of all e-infra *activities and ambitions* at a level that renders all these activities sustainable for the next ten years!


International embedding

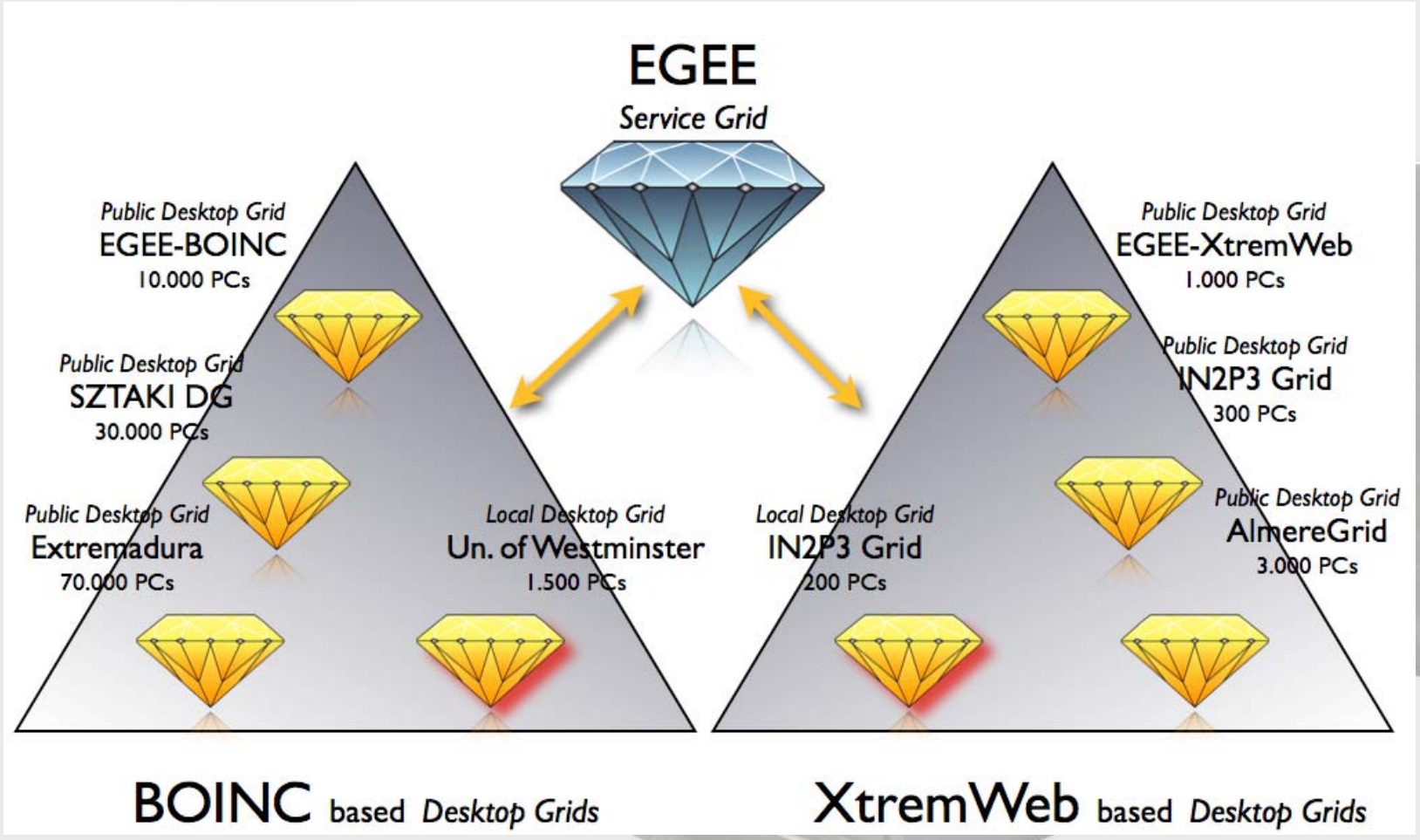
- NL participates in
  - EGEE (1,2,3, ..)
  - DEISA (1,2,..
  - PRACE
  - DRIVER
  - PARADE
  - EGI
  - e-IRG
  - Grid5000
  - -…

Partnership for Advanced Computing in Europe


A message from other NL grid-activities:

EDGeS - Enabling Desktop Grids for e-Science

- Connect Service Grids (EGEE, BIG-Grid,...) with Desktop Grids (SZTAKI Desktop Grid, AlmereGrid, Extramadura Grid..., to provide even more resources to scientists
- Provide a Bridge between these type of Grids for automatic job sharing
- Provide an Application Development Methodology to port applications to the Grid
- Two year, EU funded project (started 1-1-2008)
- Dutch participation: AlmereGrid, Erasmus MC

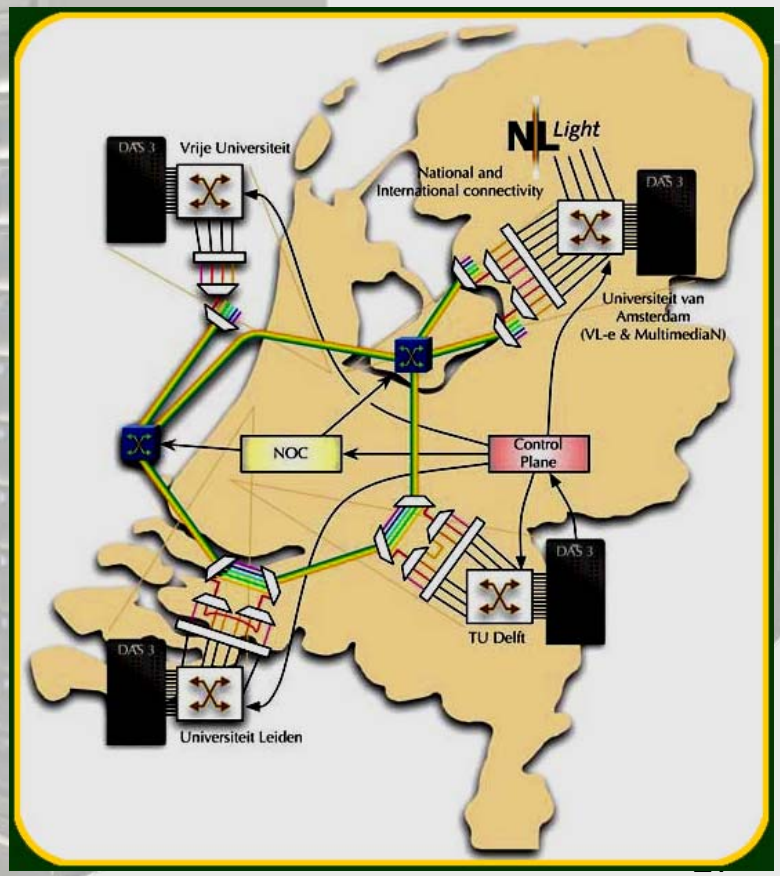

EGEE
Service Grid
Public Desktop Grid
EGEE-BOINC
10.000 PCs
Public Desktop Grid
SZTAKI DG
30.000 PCs
Public Desktop Grid
Extremadura
70.000 PCs
Local Desktop Grid
Un. of Westminster
1.500 PCs
Public Desktop Grid
EGEE-XtremWeb
1.000 PCs
Public Desktop Grid
IN2P3 Grid
300 PCs
Public Desktop Grid
AlmereGrid
3.000 PCs
Local Desktop Grid
IN2P3 Grid
200 PCs
BOINC based Desktop Grids
XtremWeb based Desktop Grids

NCF

DAS-3 StarPlane

StarPlane

- A “Distributed ASCI Supercomputer”-project
- Where the applications completely control the network
- Using the cream of modern switched light path technlogy
- A prototype high performance grid




DARE project

- DARE=Digital Academic Repositories
- Each university has one (and only one) Digital repository <>
- All connected and standardised
- NARCIS repository search system
- www.narcis.info
- “information grid”

e-IRG Knowledgebase

- e-IRG Knowledgebase
- Developed/maintained by the e-IRGSP2
- Contains information:
  - Organisations
  - Centres
  - Systems!!
  - Policies
  - Networks
  - Grids
  - Projects
  - …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The End