Introduction to EDGeS

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CAPACITIES

What is EDGeS?

EDGeS: Enabling Desktop Grids for e-Science

1. EDGeS is a 2-year FP7 project started on the 1st of January 2008
   - Research on integrating (bridging) SGs and DGs
   - Creates infrastructure
   - Provides services

2. EDGeS is an infrastructure
   - EDGeS VO interconnected with various DGs
   - Application repository

3. EDGeS is a service for
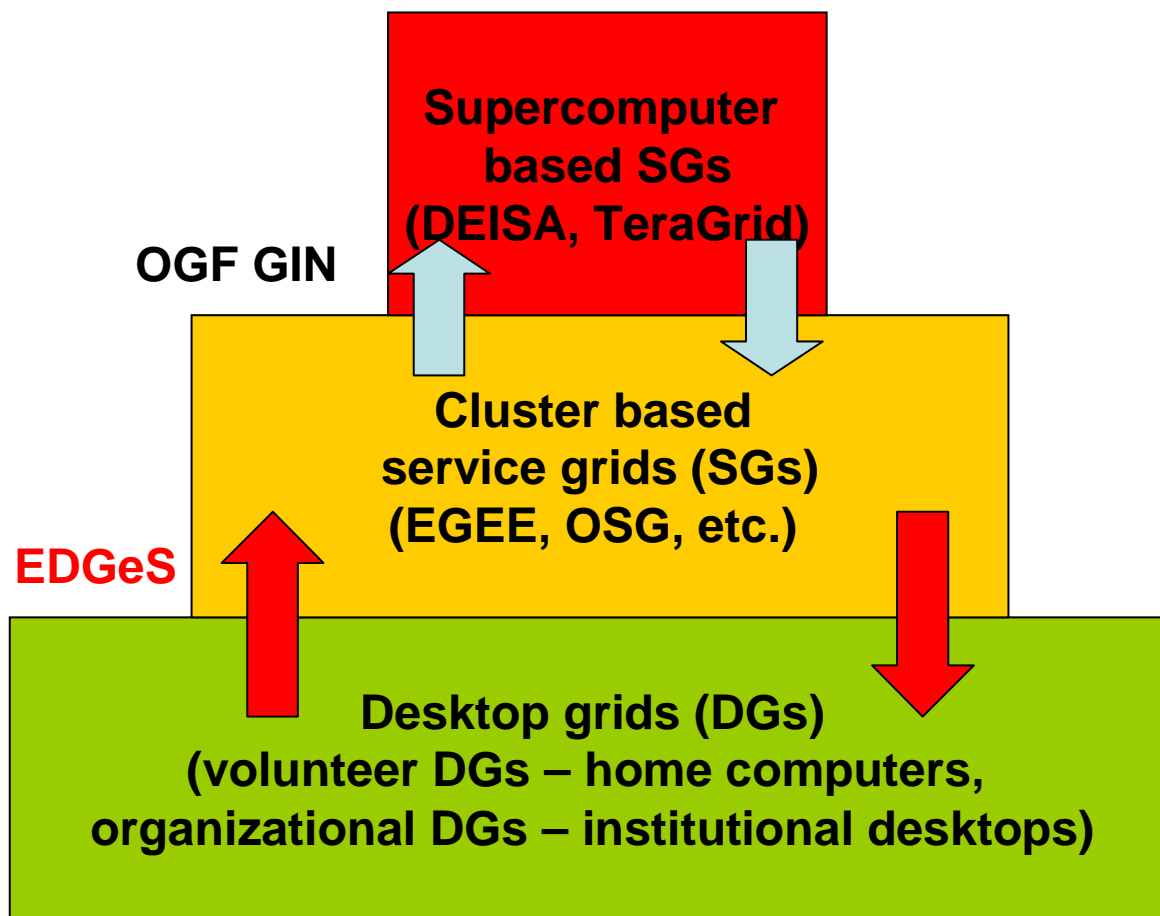   - Application porting and validation

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Project partners

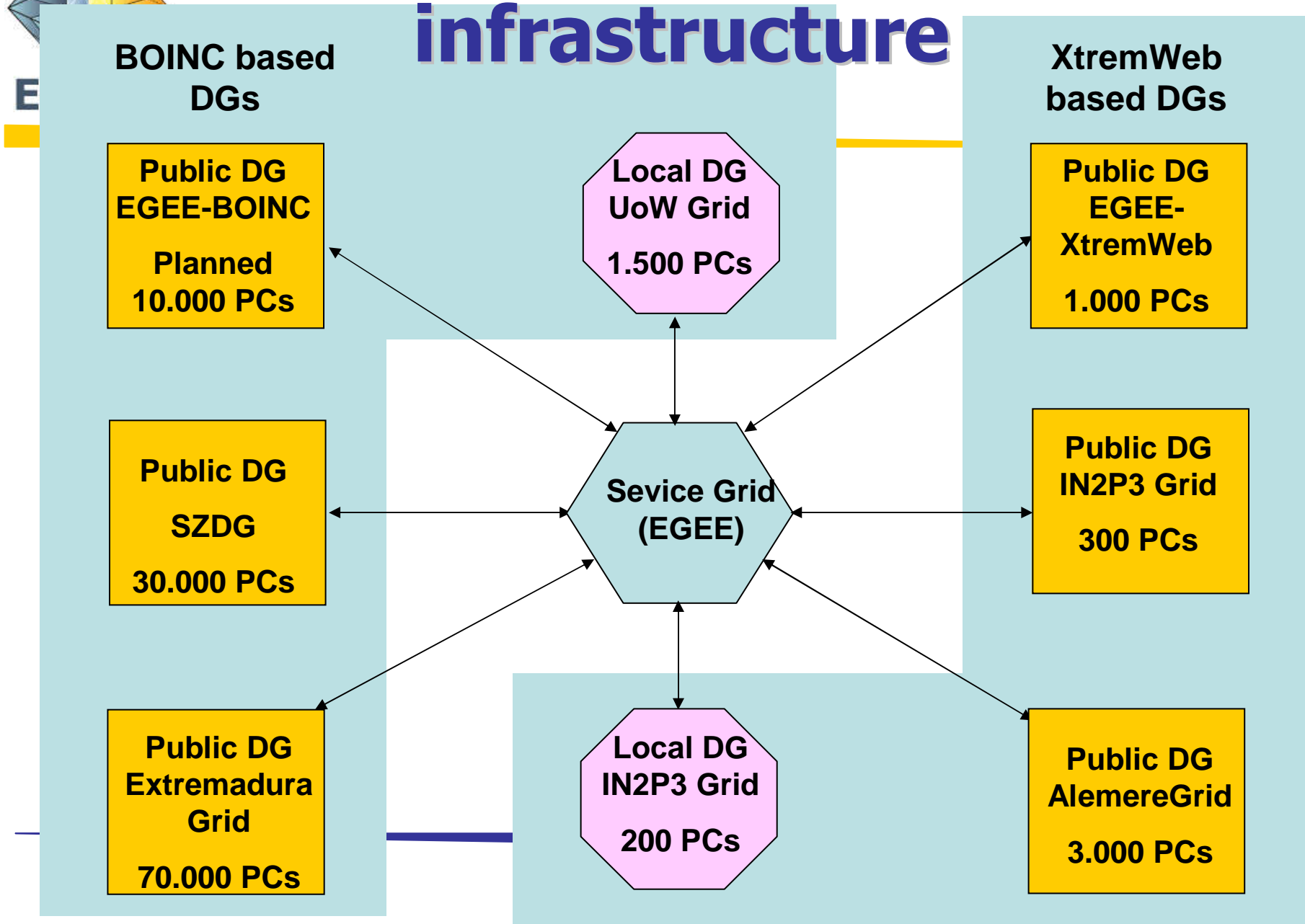| Partic. No.	Participant name	Participant short name	Country
1	Computer and Automation Research Institute of the Hungarian Academy of Sciences	MTA SZTAKI	Hungary
2	Centro de Investigaciones Energéticas Medio Ambientales y Tecnológicas	CIEMAT	Spain
3	Foundation for the Development of Science and Technology in Extremadura	Fundecyt	Spain
4	The French National Institute for Research in Computer Science and Control	INRIA	France
5	University of Westminster	UoW	UK
6	Cardiff University	CU	UK
7	Faculty of Sciences and Technology of the University of Coimbra	FCTUC	Portugal
8	Stichting AlmereGrid	AlmereGrid	The Netherlands
9	Centre National de la Recherche Scientifique - Institut National de Physique Nucleaire et de Physique des Hautes Energies	IN2P3	France

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The problem we address

Supercomputer based SGs (DEISA, TeraGrid)

OGF GIN

Cluster based service grids (SGs) (EGEE, OSG, etc.)

EDGeS

Desktop grids (DGs) (volunteer DGs – home computers, organizational DGs – institutional desktops)
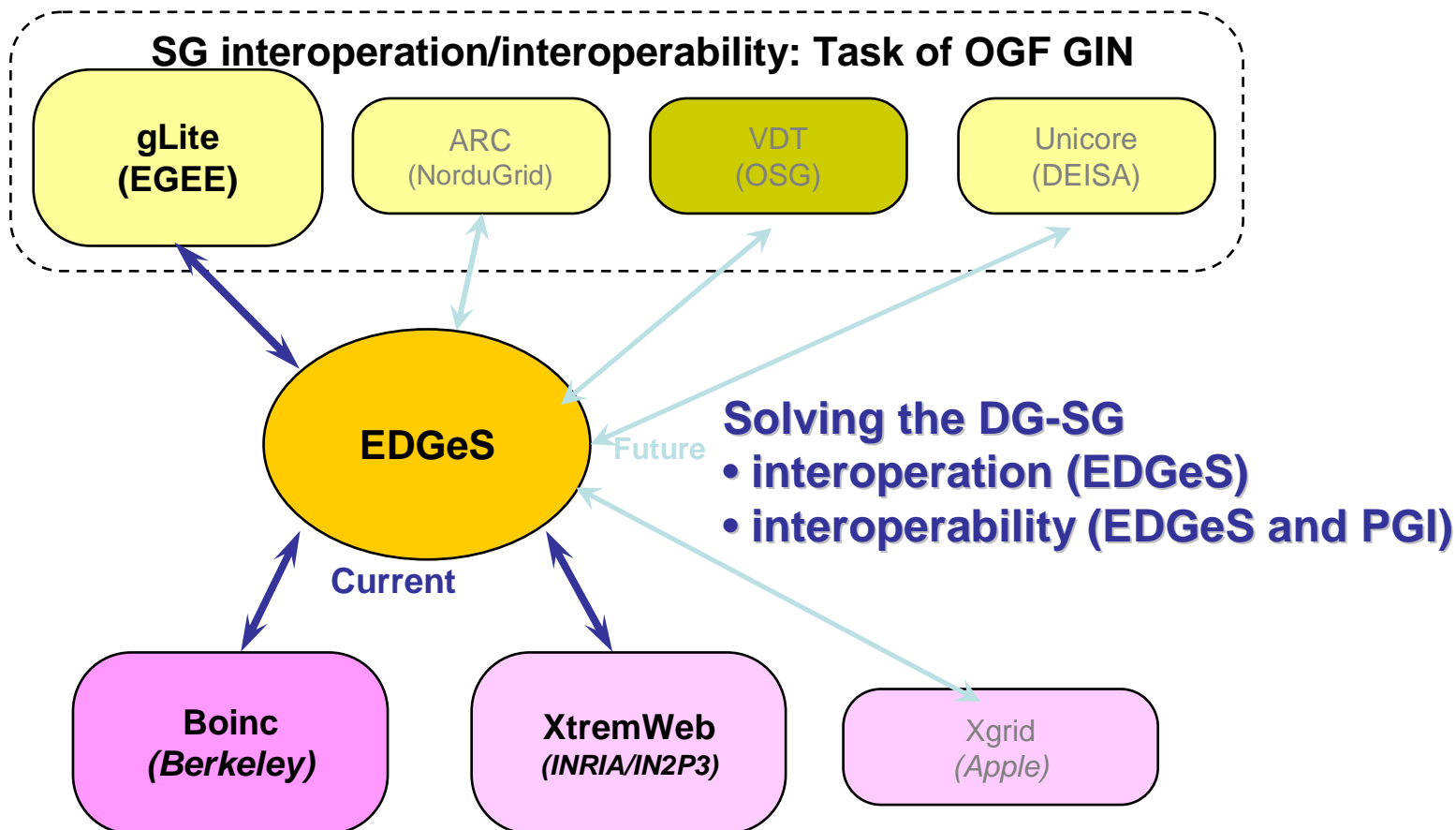
- Very expensive,

- small number of sites and large number of CPUs

- MPI appls

- Moderately expensive,

- moderate number of sites and CPUs

- any appls

- Inexpensive,

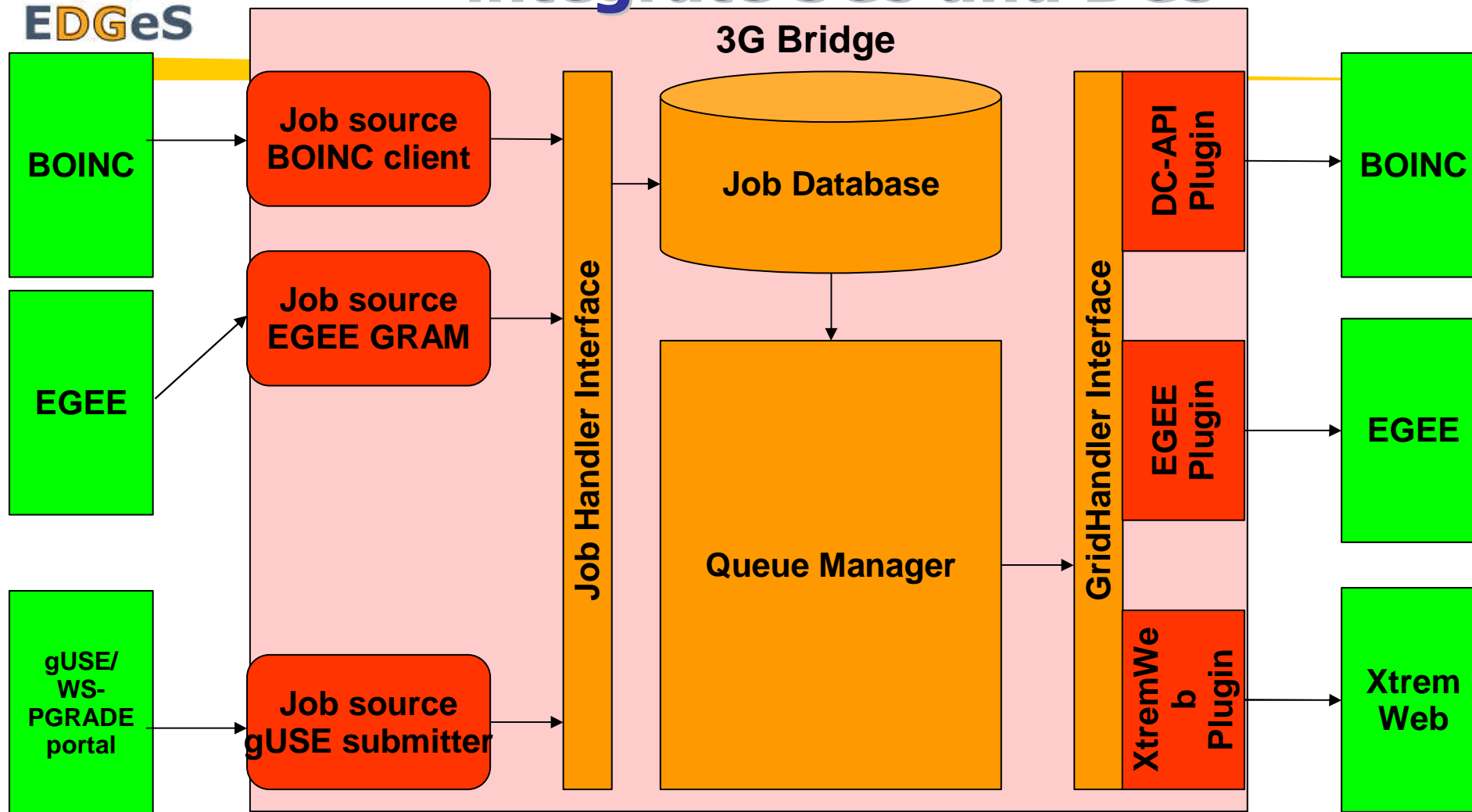- very large number of CPUs (~100K – 1M)

- Bag of task appls

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The planned EDGeS production infrastructure

BOINC based DGs

XtremWeb based DGs

Public DG EGEE-BOINC

Planned
10.000 PCs

Local DG UoW Grid

1.500 PCs

Public DG EGEE-XtremWeb

1.000 PCs

Public DG SZDG

30.000 PCs

Sevice Grid (EGEE)

Public DG IN2P3 Grid

300 PCs

Public DG Extremadura Grid

70.000 PCs

Local DG IN2P3 Grid

200 PCs

Public DG AlemereGrid

3.000 PCs

Integration of SG and DG systems

SG interoperation/interoperability: Task of OGF GIN

gLite (EGEE)

ARC (NorduGrid)

VDT (OSG)

Unicore (DEISA)

EDGeS

Current

Future

Solving the DG-SG
- **interoperation (EDGeS)**
- **interoperability (EDGeS and PGI)**

Boinc *(Berkeley)*

XtremWeb *(INRIA/IN2P3)*

Xgrid *(Apple)*

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Generic Grid-Grid (3G) Bridge to integrate SGs and DGs

Security issues

- **EGEE->DG direction**
  - In DG projects
    - Applications are trusted
    - DG server is trusted
    - Clients are not trusted
  - Therefore any EGEE application that is intended to run in a DG should be **validated** to make it trusted
  - Therefore EDGeS provides:
    - Application validation service
    - **Application repository** (AR) where trusted applications are stored
    - EDGeS bridge transfers only those applications to DGs that are stored in the AR

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Security issues

- DG->EGEE direction
  - EGEE requires user certificates and VO acceptance to run jobs
  - DGs submit their applications to the EDGeS VO with the DG system administrator's certificate proxy
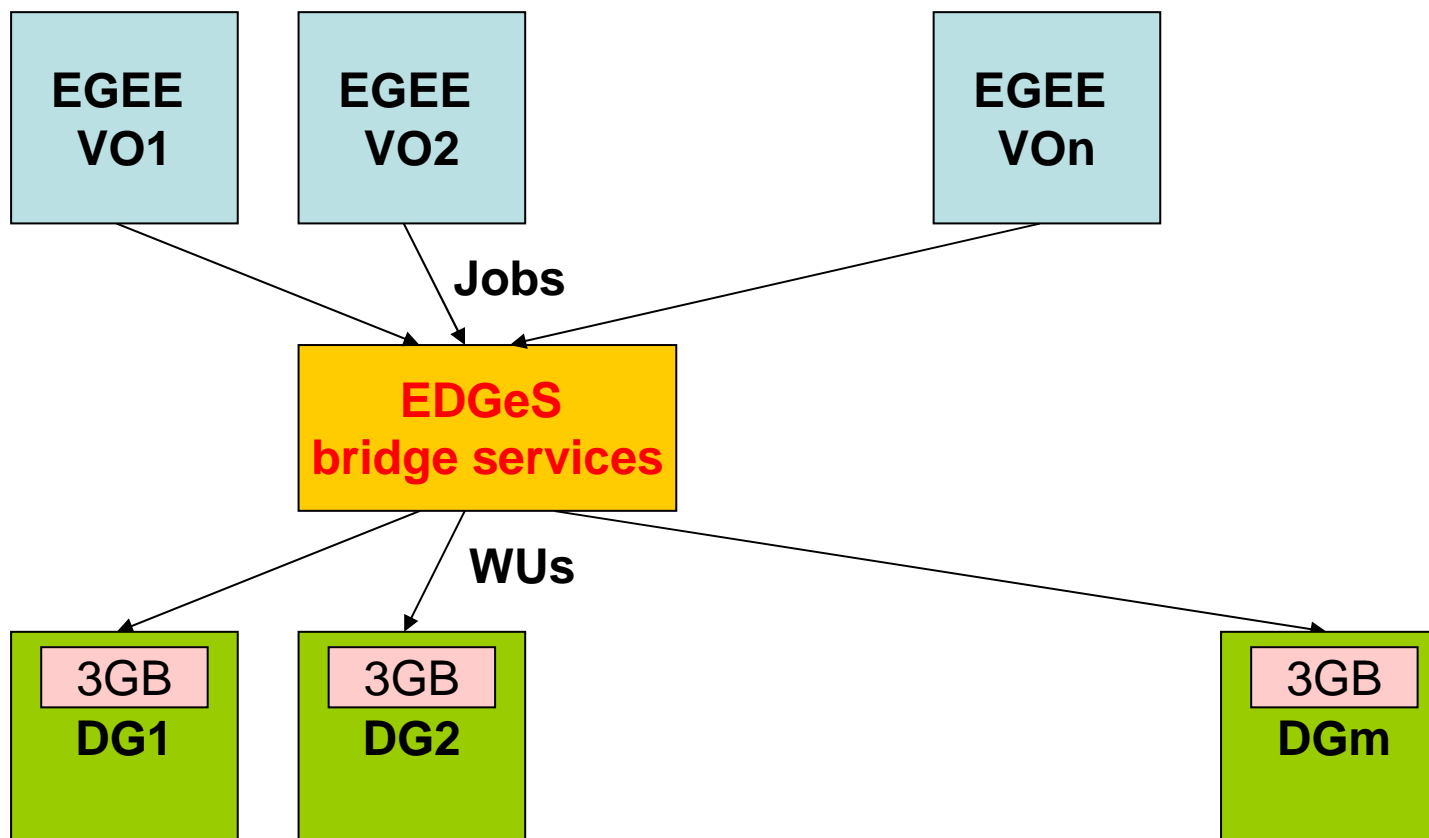 - DG sys admins should register in the EDGeS VOMS

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EGEE VO → DG system via EDGeS services
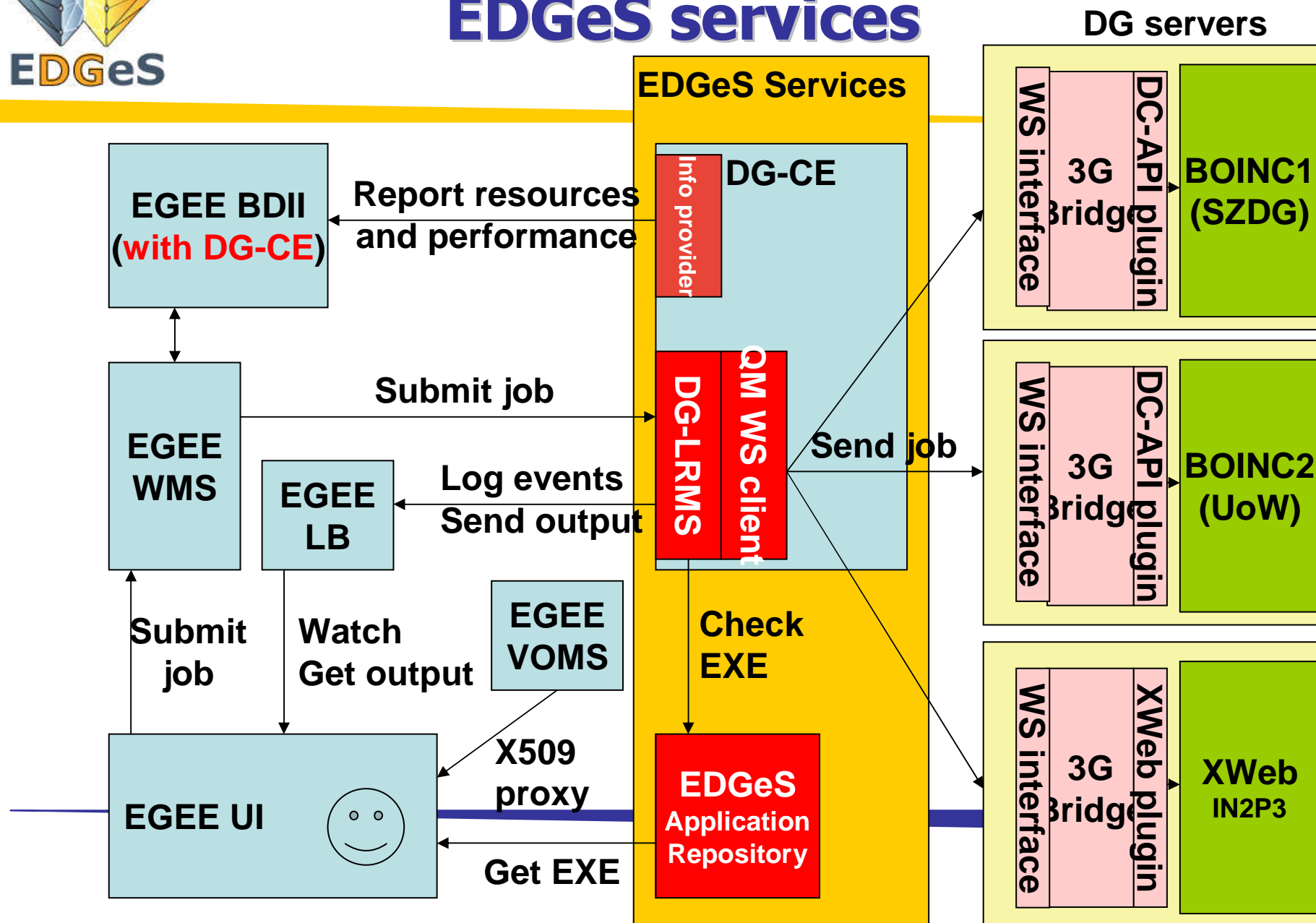
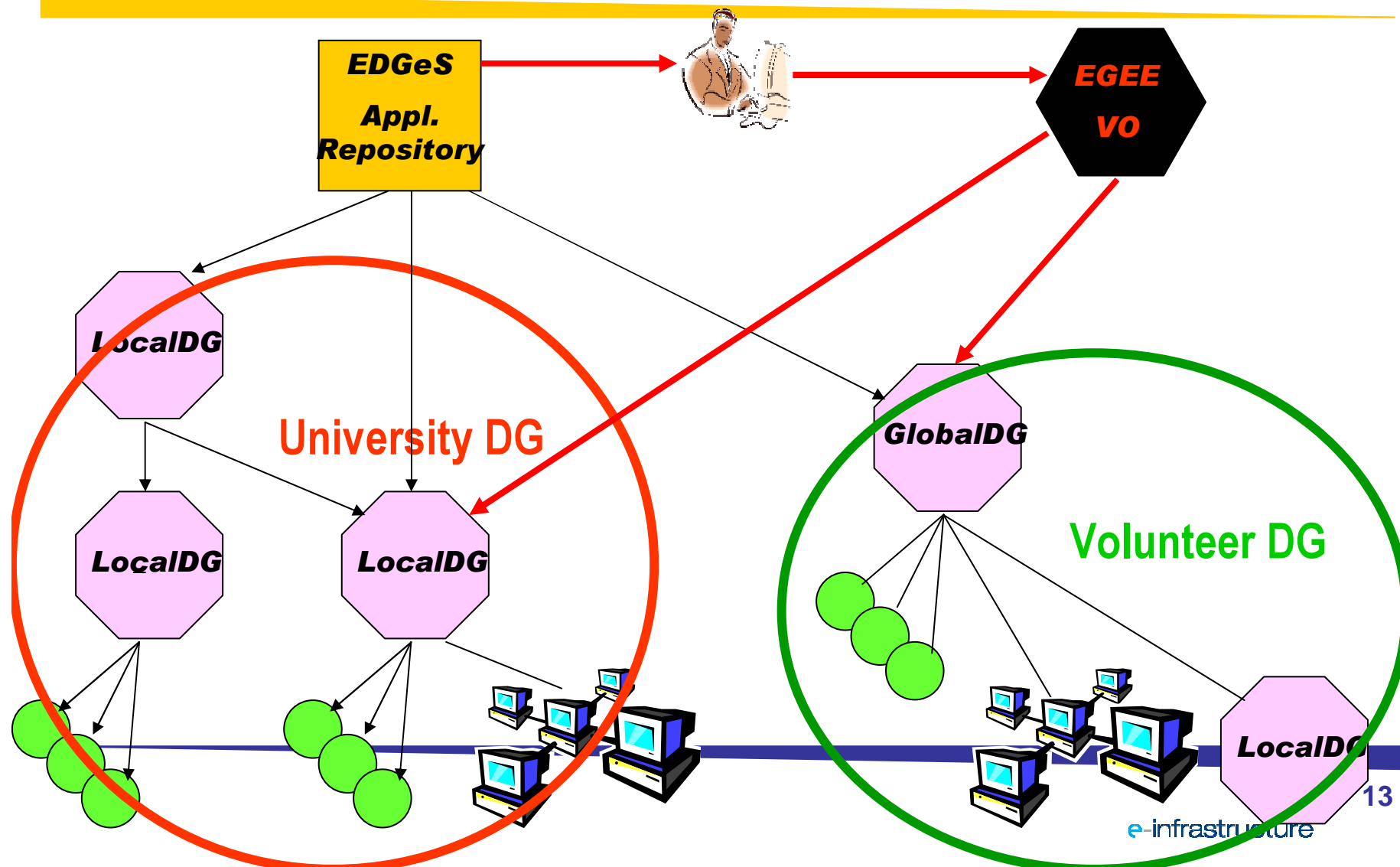# The EGEE-EDGeS-DG infrastructure: EGEE->DG direction

EDGeS usage scenarios for EGEE VOs

1. Use the EDGeS bridge services to send jobs to the DGs connected to EDGeS

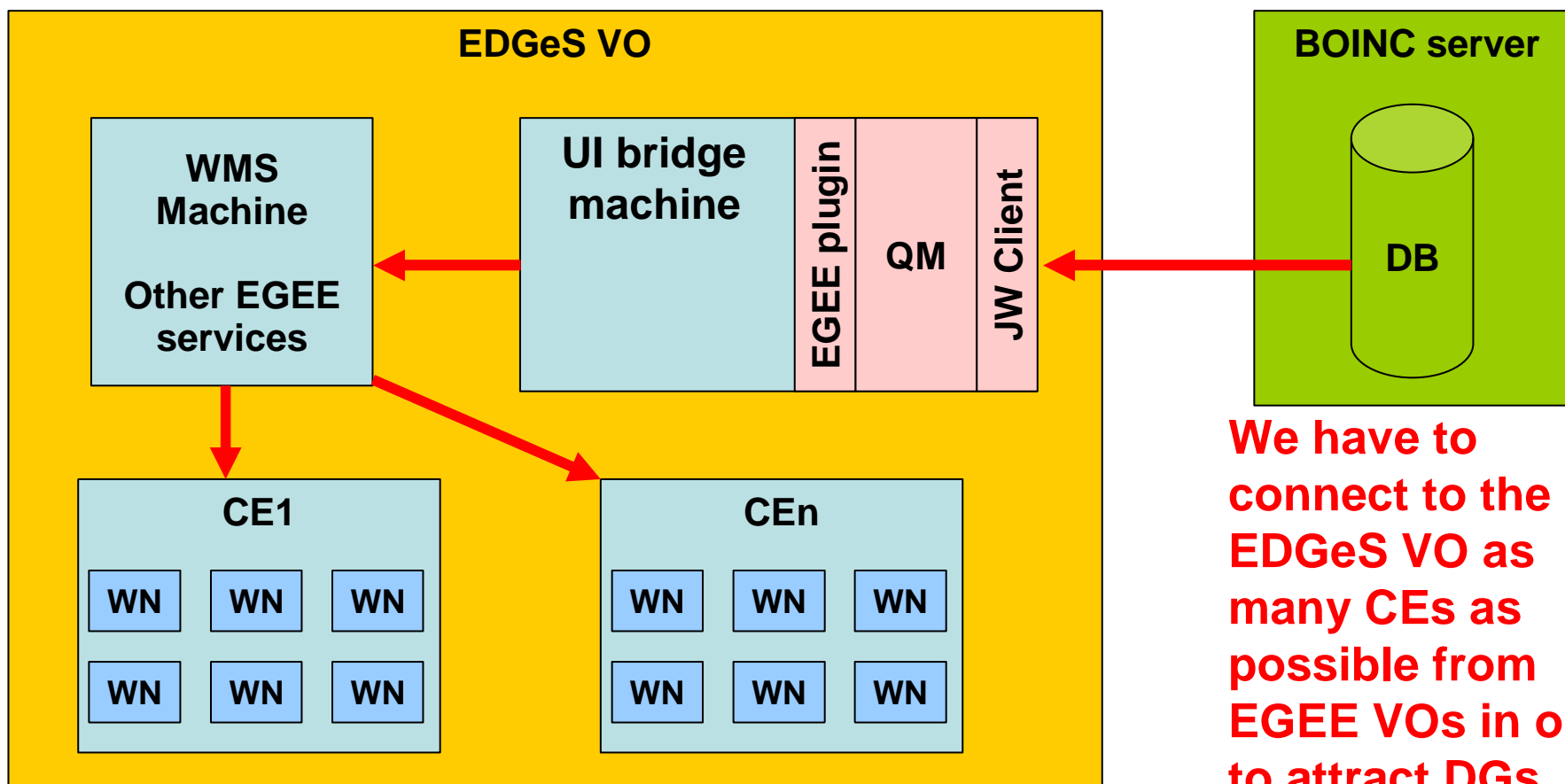2. Extend the EGEE VO with local DGs using the EDGeS technology

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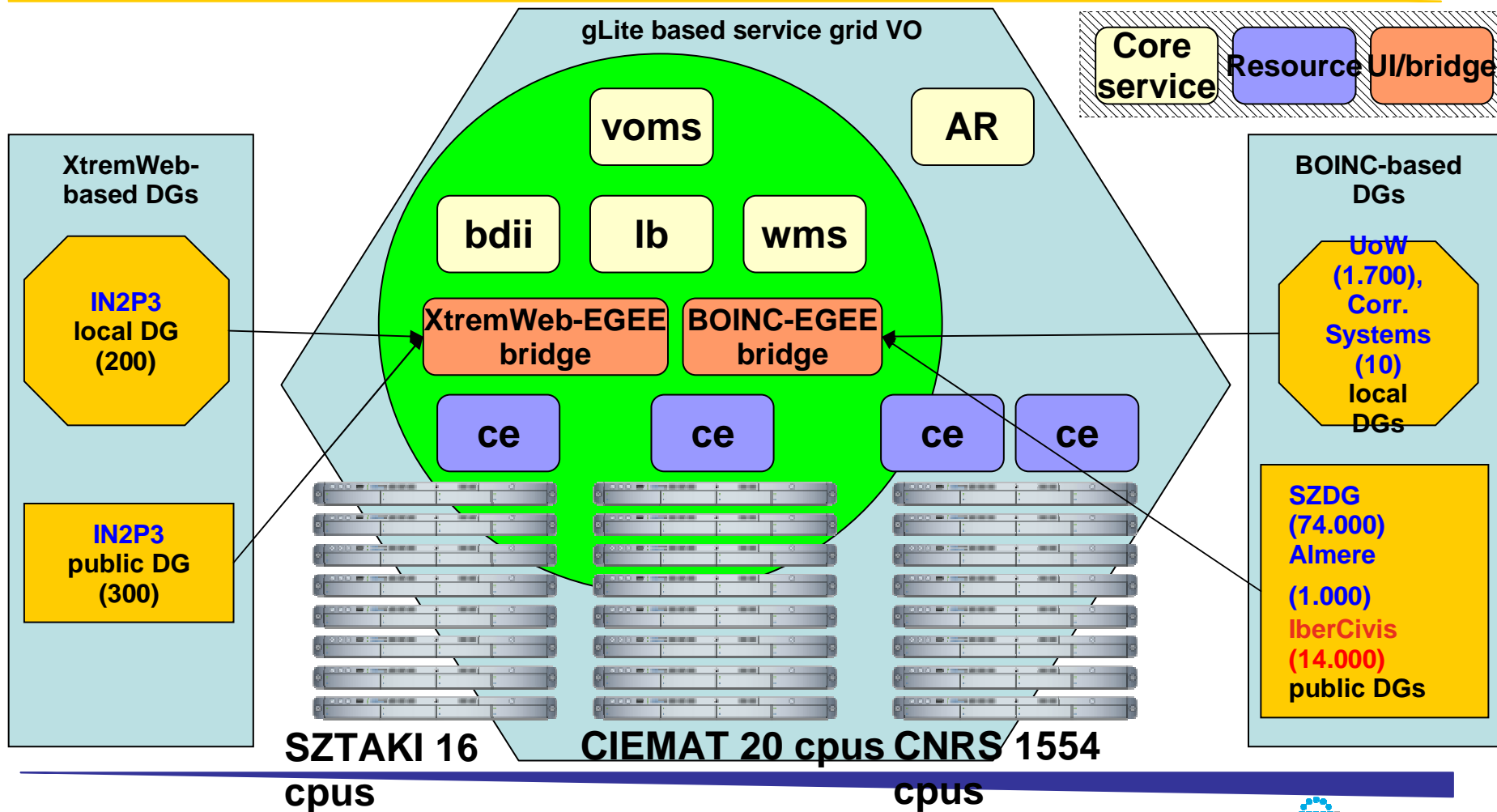# EGEE User access to EDGeS

EDGeS Appl. Repository

EGEE VO

LocalDG

University DG

LocalDG

LocalDG

GlobalDG

Volunteer DG

LocalDG

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BOINC->EGEE direction: Structure of the EDGeS VO

EDGeS VO

WMS Machine

Other EGEE services

UI bridge machine

EGEE plugin

QM

JW Client

CE1

WN WN WN
WN WN WN

CEn

WN WN WN
WN WN WN

BOINC server

DB

We have to connect to the EDGeS VO as many CEs as possible from EGEE VOs in order to attract DGs

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Production DG-EGEE Infrastructure

gLite based service grid VO

Core service

Resource

UI/bridge

voms

AR

bdii

lb

wms

XtremWeb-EGEE bridge

BOINC-EGEE bridge

ce

ce

ce

ce

XtremWeb-based DGs

IN2P3 local DG (200)

IN2P3 public DG (300)

BOINC-based DGs

UoW (1.700), Corr. Systems (10) local DGs

SZDG (74.000) Almere (1.000) IberCivis (14.000) public DGs

SZTAKI 16 cpus

CIEMAT 20 cpus

CNRS 1554 cpus

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EDGeS VO activity according to EGEE Accounting Portal

Work Units bridged to EGEE from different DGs

The EGEE-EDGeS-DG infrastructure: DG->EGEE direction

EGEE user access to EDGeS via portal

EDGeS Appl. Repository

Service Grid EGEE

PGRADE portal

LocalDEG

University DG

LocalDEG

LocalDEG

GlobalDEG

Volunteer DG

LocalDEG

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EGEE user access to EDGeS via portal

EGEE VO1 — EGEE VO2 — EGEE VOn

Jobs

PGRADE portal — EDGeS bridge services — EDGeS VO

WUs

DG1 — DG2 — DGn

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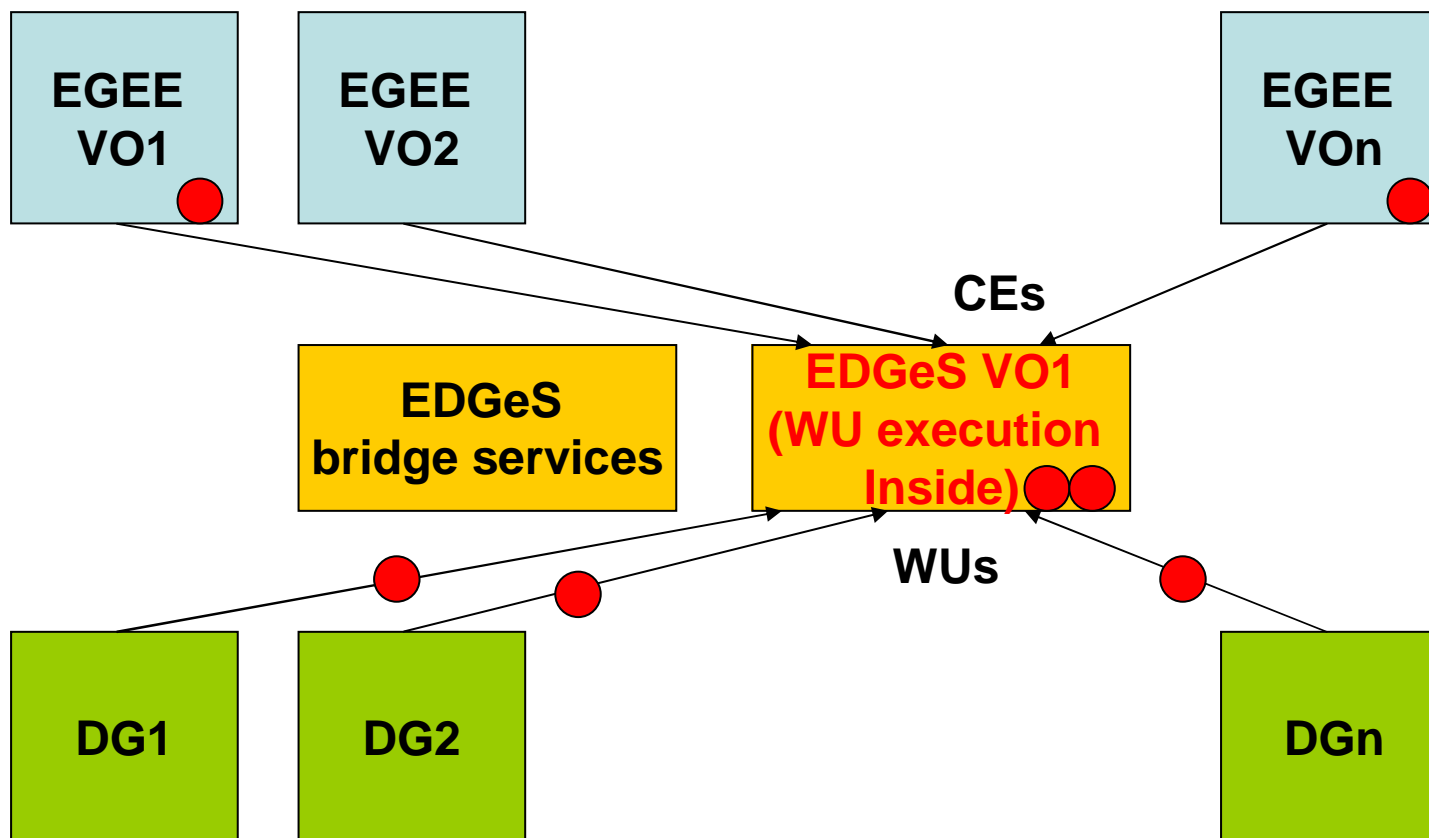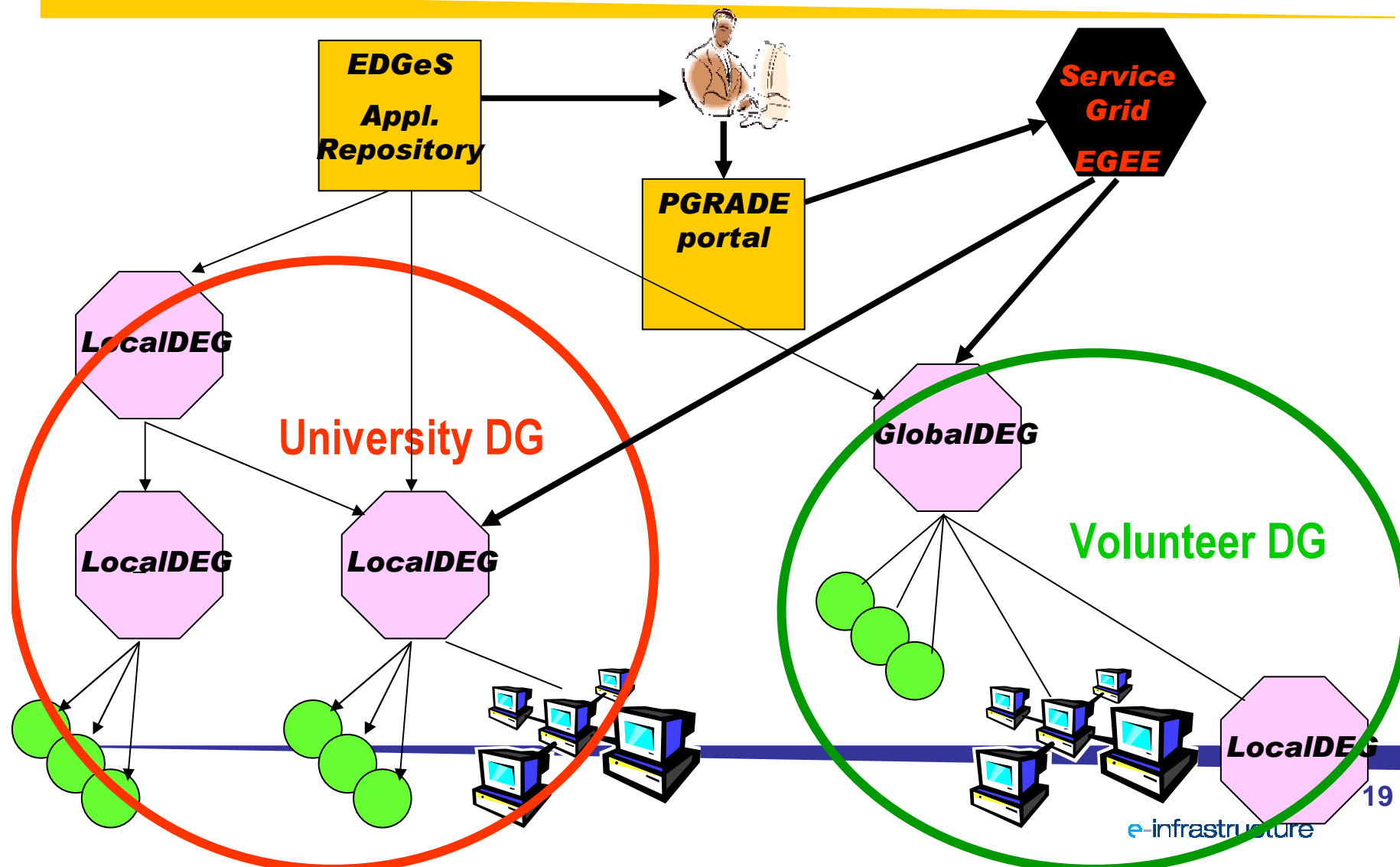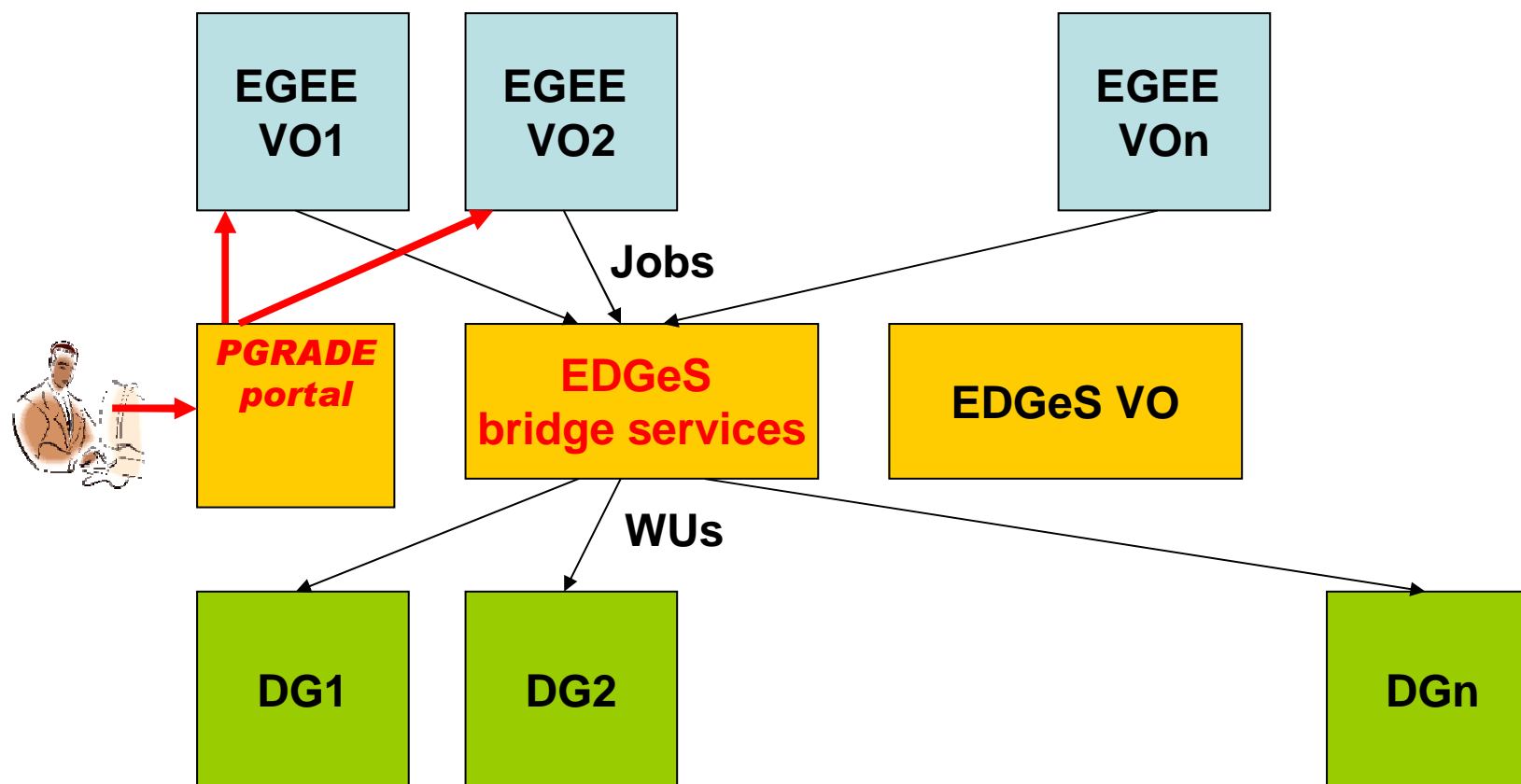
NA1: MoUs with other projects

- **Signed MoU with EGEE III**
  - Jointly select EGEE applications that should be migrated to EDGeS
  - Collaboration in porting these appls to EDGeS
  - EGEE support for the establishment and operation of the EDGeS VO
  - Organizing joint events (summer school, user forum meetings)
- **Signed MoUs with**
  - EELA-2
  - SEE-GRID-SCI
  - Russian Academy
  - ETICS-2
- **Prepared MoU with**
  - IberCivis DG

Summary

- EDGeS connects
  - BOINC or XtremWeb DGs
  - and gLite based SGs
- EDGeS is an open infrastructure:
  - Any BOINC or XtremWeb DG can join
  - Any gLite based SG can join
- Any EGEE user can access EDGeS
- Any EGEE VO can be extended with DGs based on EDGeS bridge technology
- EDGeS helps any EGEE user community in porting their applications into EDGeS

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Thank you for your attention ...

Any questions?

For more information please visit the EDGeS Website:

Join the EDGeS User & Industry Forum here!

http://www.edges-grid.eu/

Please contact us if you need support in porting your application to EDGeS!

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