Grid services

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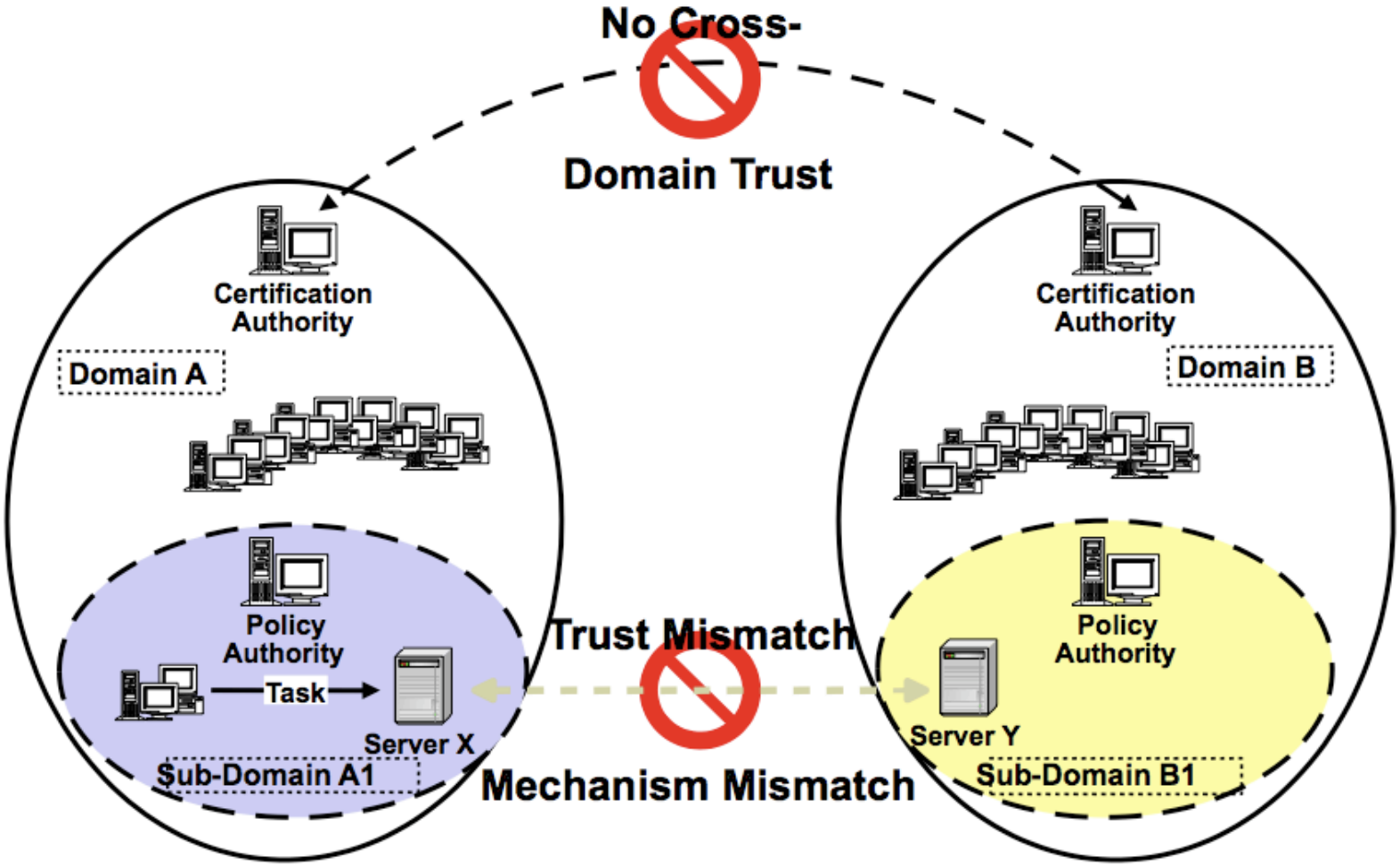
www.eu-egee.org

Set of basic Grid services

- Job submission/management
- File transfer (individual, queued)
- Database access
- Data management (replication, metadata)
- Monitoring/Indexing system information

VOMS (1/4)

- **Virtual Organization Membership Service**
  - Problem description

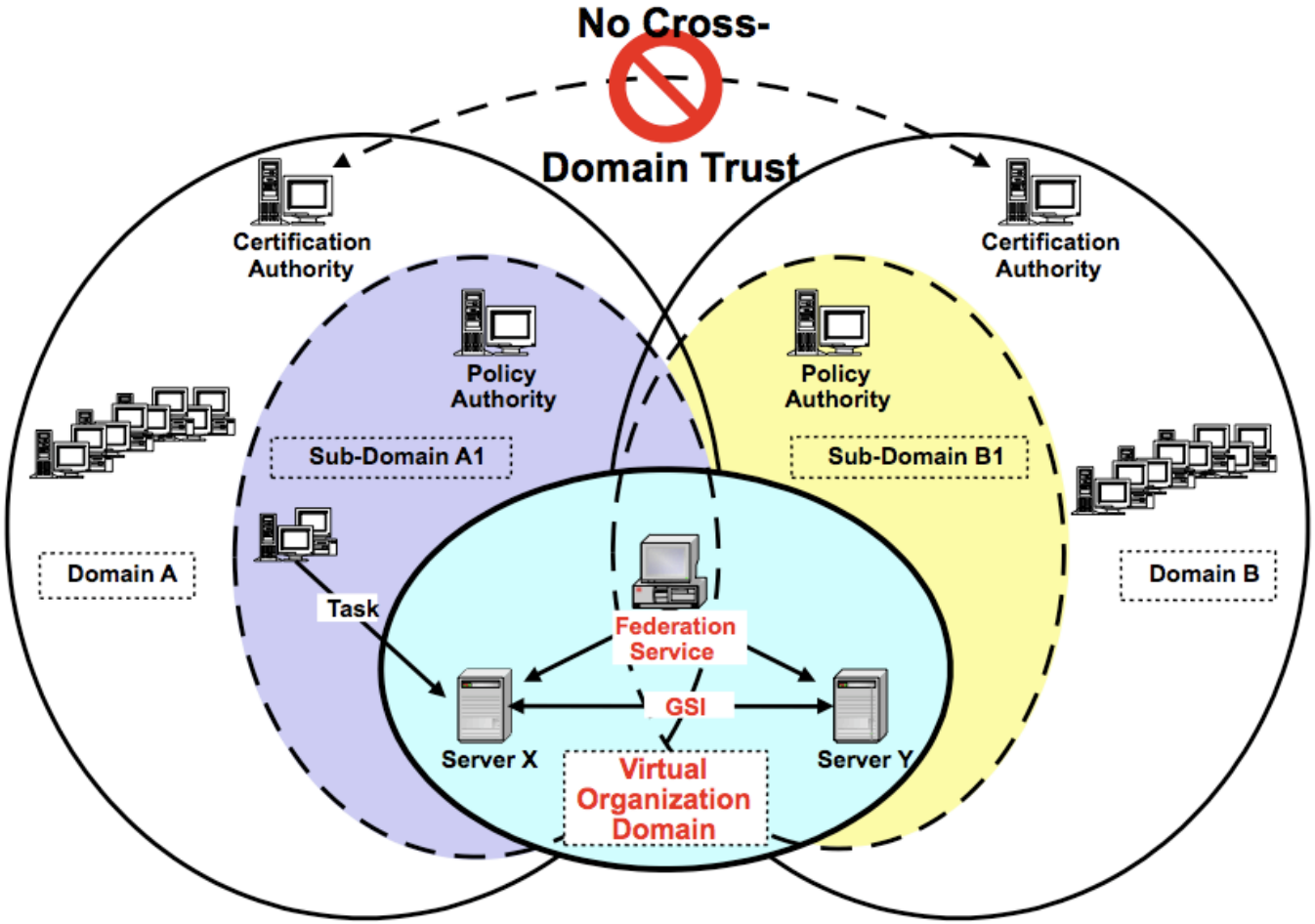


VOMS (2/4)

- Grid Security Infrastructure (GSI) enables secure authentication and communication over an open network
  - Public key encryption
  - Digital X.509 certificate
  - Secure Sockets Layer (SSL) communication protocol
- Certification Authority (CA)
- grid-mapfile mechanism
- LCAS/LCMAPS mechanism allow for a more detailed definition of user privilege
- VOMS server example

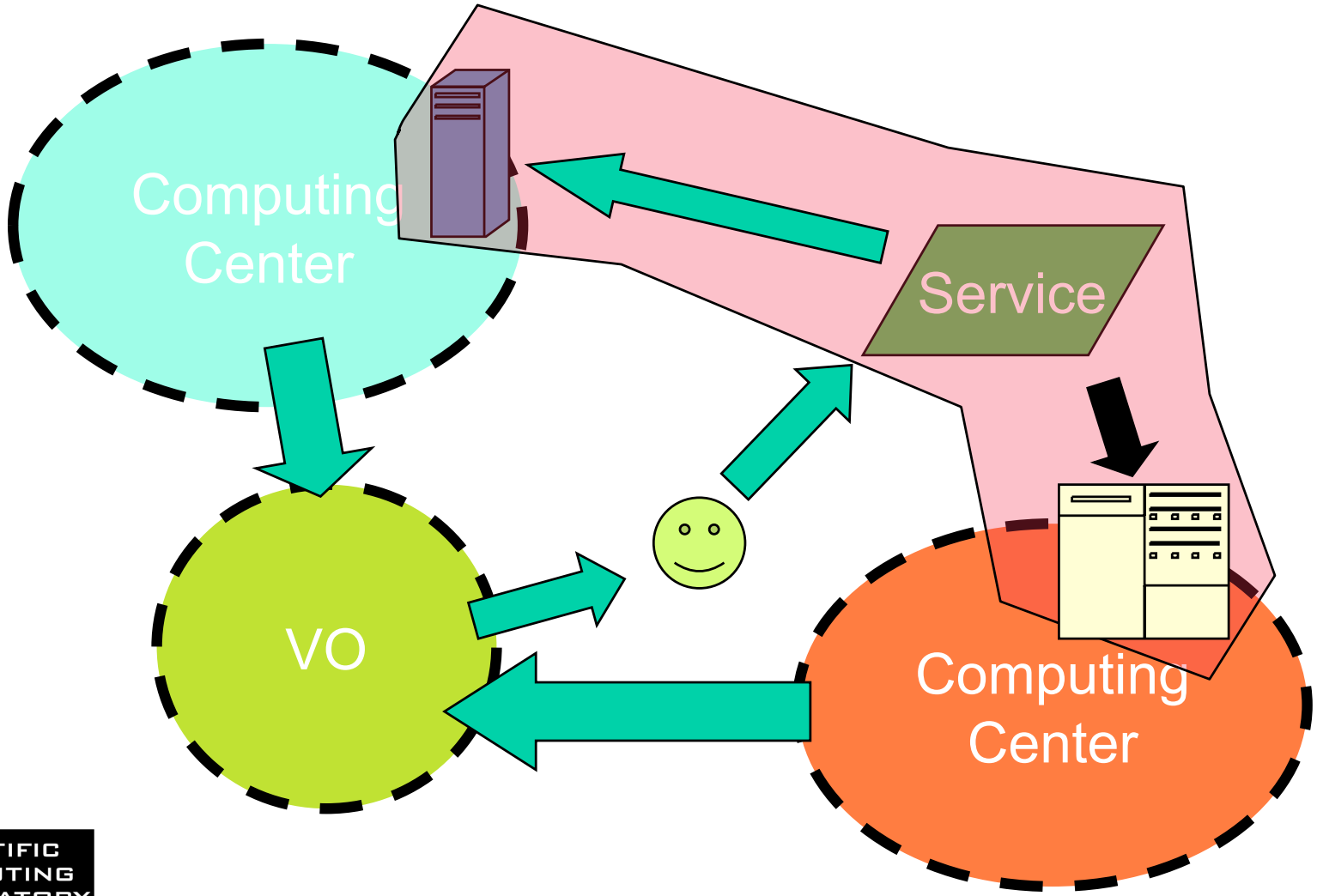
https://voms.phy.bg.ac.yu:8443/voms/aegis

VOMS (3/4)


No Cross-
Domain Trust
Certification Authority
Certification Authority
Policy Authority
Policy Authority
Sub-Domain A1
Sub-Domain B1
Domain A
Domain B
Task
Federation Service
GSI
Server X
Server Y
Virtual Organization Domain

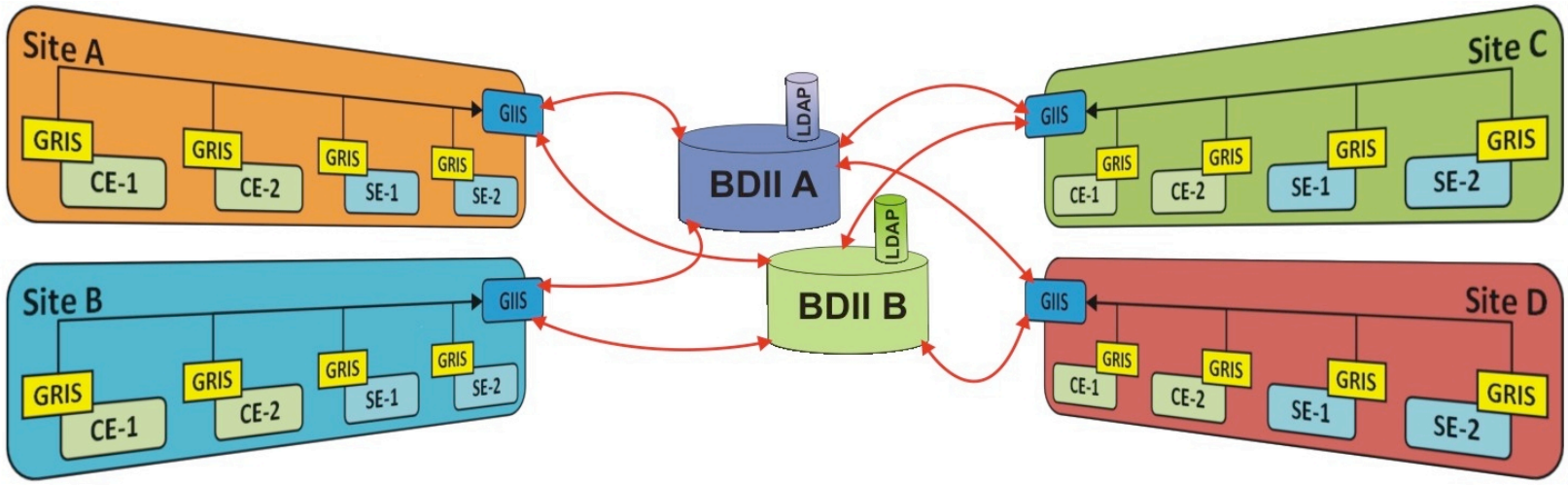
VOMS (4/4)

- Use delegation to establish dynamic distributed system



BDII (1/2)

- **Berkely Database Information Index**
  - Information Service (IS)
    - Globus Monitoring and Discovery Service (MDS)
      - *GLUE Schema*
      - *Lightweight Directory Access Protocol (LDAP)*
      - *Distinguished Name (DN)*
      - *Directory Information Tree (DIT)*
      - *Grid Resource Information Server (GRIS)*
    - Relational Grid Monitoring Architecture



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BDII (2/2)

- GStat

  `http://goc.grid.sinica.edu.tw/gstat/`

- GOC DB

  `https://goc.gridops.org/`

RGMA

- **Relational Grid Monitoring Architecture**
  - Global distributed relational database
  - Model is more powerful than the LDAP-based one
  - Advance query operations
  - Architecture consists of three major components
    - Producers - provide the information
    - Consumers - request the information
    - Registry - mediates the communication between the Producers and the Consumers
- **EGEE Accounting Portal**

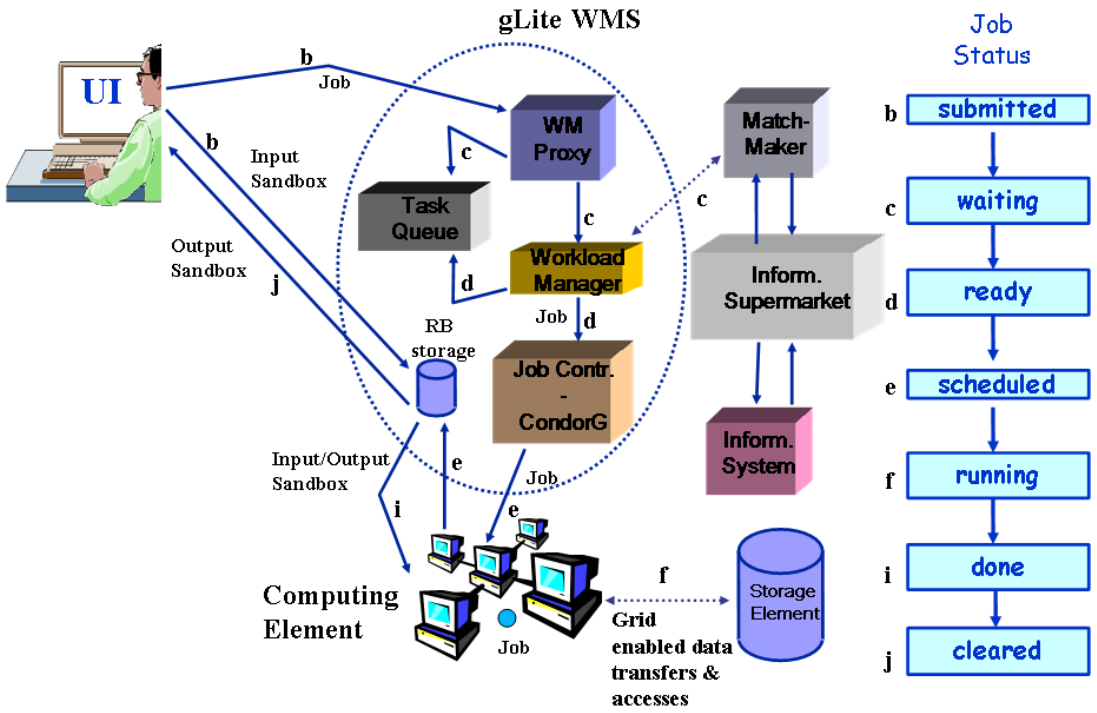
http://www3.egee.cesga.es/gridsite/accounting/CESGA/egee_view.php

WMS(1/2)

- **Run the Workload Management System**
  - To accept job submissions
  - Dispatch jobs to appropriate Compute Element (CE)
  - Allow users
    - To get information about their status
    - To retrieve their output
- **A configuration file on each UI node determines which WMS node(s) will be used**
- **When a user submits a job, JDL options are to:**
  - Specify CE
  - Allow WMS to choose CE (using optional tags to define requirements)
  - Specify SE (then WMS finds "nearest" appropriate CE, after interrogating File catalogue service)

WMS (2/2)

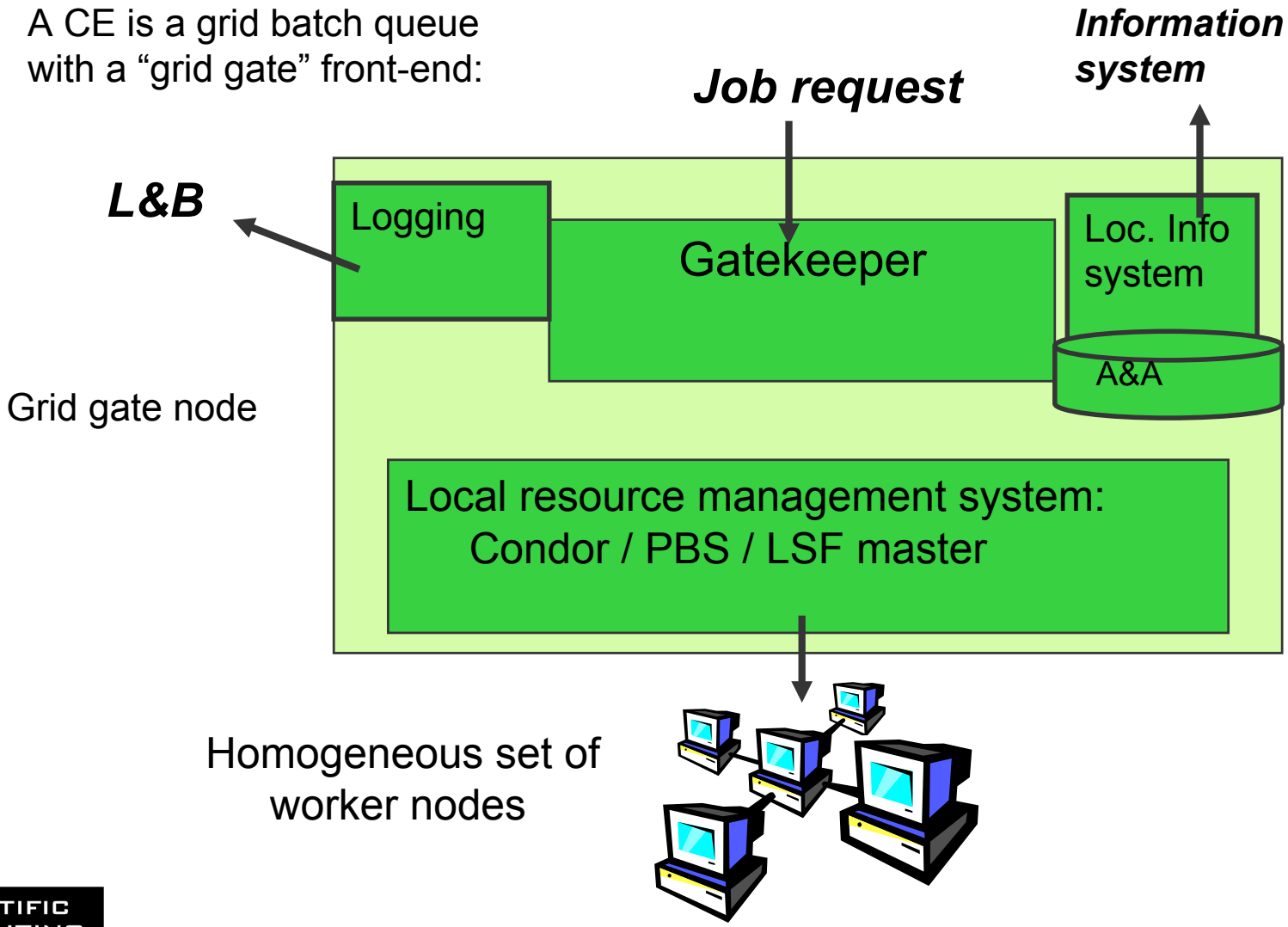
- **Workload Management System**



- **WMS monitoring tool**

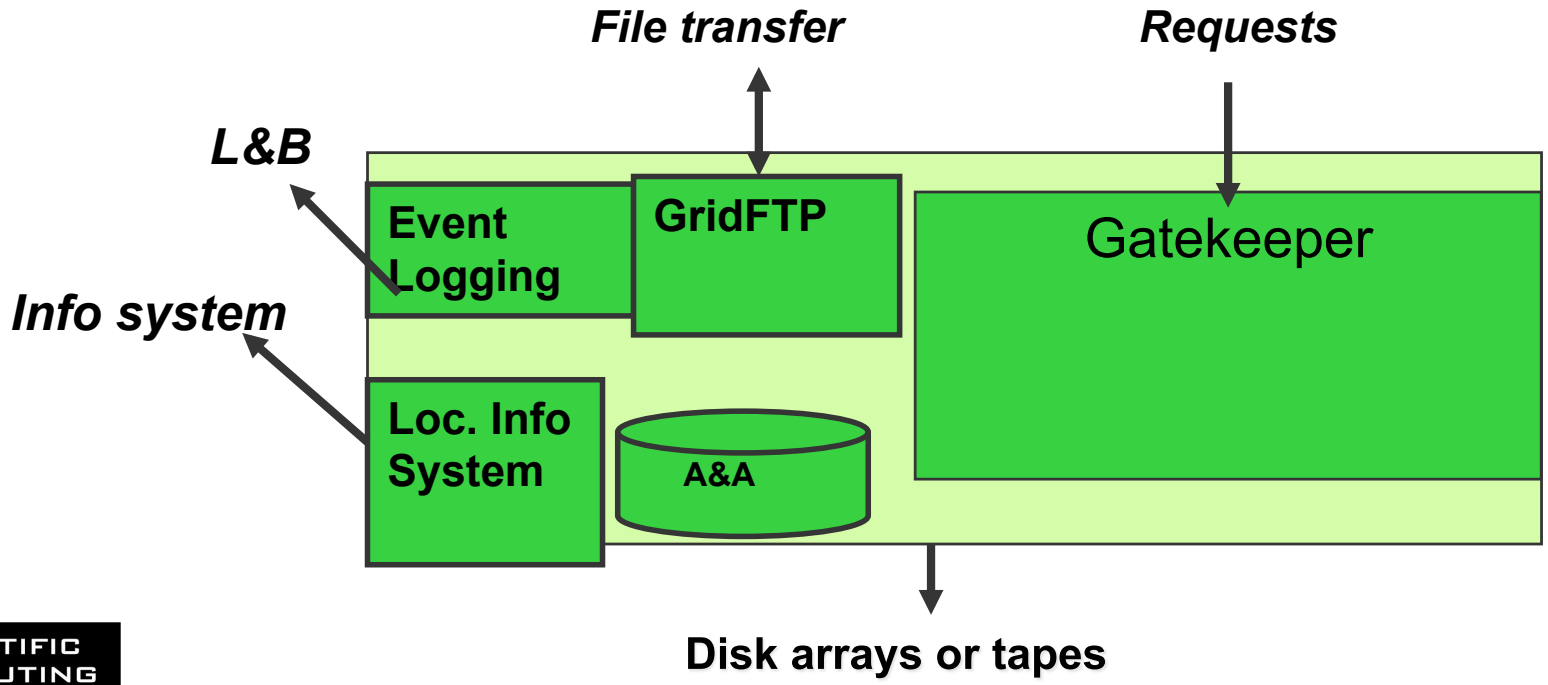
- **Logging and Bookkeeping service**
  - Who did what and when?
  - What's happening to my job?
  - Usually runs on WMS node

A CE is a grid batch queue with a “grid gate” front-end:



SE

- Storage elements hold files: write once, read many
- Replica files can be held on different SE:
  - "close" to CE; share load on SE
- File Catalogue - what replicas exist for a file and where are they?



Other Grid services

- PX (MyProxy)
- FTS (File Transfer Service)
- LFC (Logical File Catalog)
- AMGA (ARDA Metadata Grid Application)

What really happens