eGee

Enabling Grids for E-sciencE

Site Requirements to Resource Allocation Process

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- **A site in this context is a Resource Center**
  - They host infrastructure for a variety of reasons
    - From supporting the local group projects, in the case of research centers, up to serve as national or regional general purpose computer centers.
  - There are constraints coming from the local site policies
    - Normally stronger in the case of general purpose computing centers.
  - **Dependencies on the infrastructure funding agency**
    - Justification of usage to the funding agency
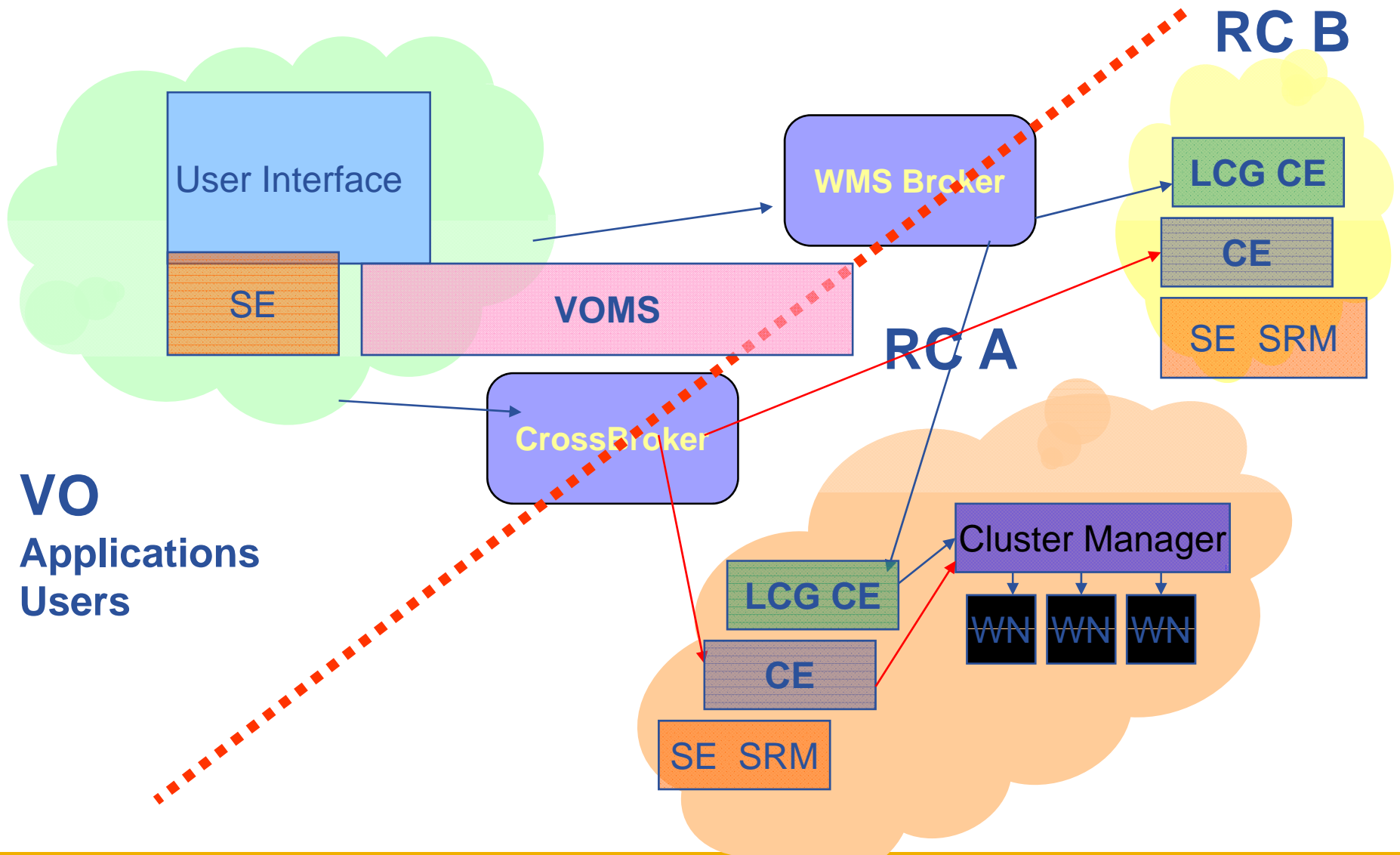   - Interaction with local resource allocation committees

- **Sites as resource maintainers and providers**
  - **Technical requirements**
    - Infrastructure Point of View
    - VO – Sites correspondence

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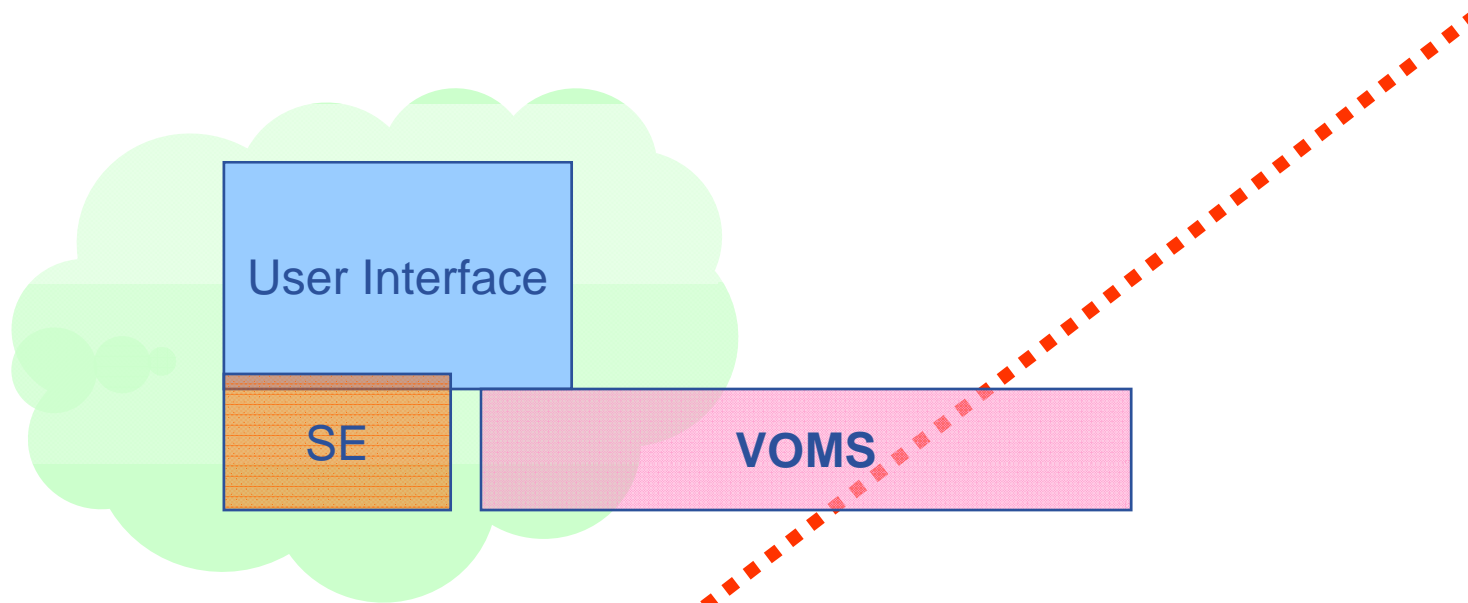
- **Classification of sites that have characteristics in common**

    - **Computing Centers (in the classical sense)**
        - Support to generic applications
        - Not dedicated to Grid Computing exclusively
        - Support to users defined at the Geographic and/or institutional level depending on the funding model
    - **General Purpose Grid Infrastructures**
        - Dedicated to Grid users
        - Support to generic applications
        - Funding model also to be analyzed
    - **Research groups running their own infrastructure**
        - Support only to certain application area
        - Application dependent issues

- **Each type has especific requirements**
    - **Very hot topic when it comes to define the NGIs**
        - The relationship NGI – Resource Centers needs to be analyzed

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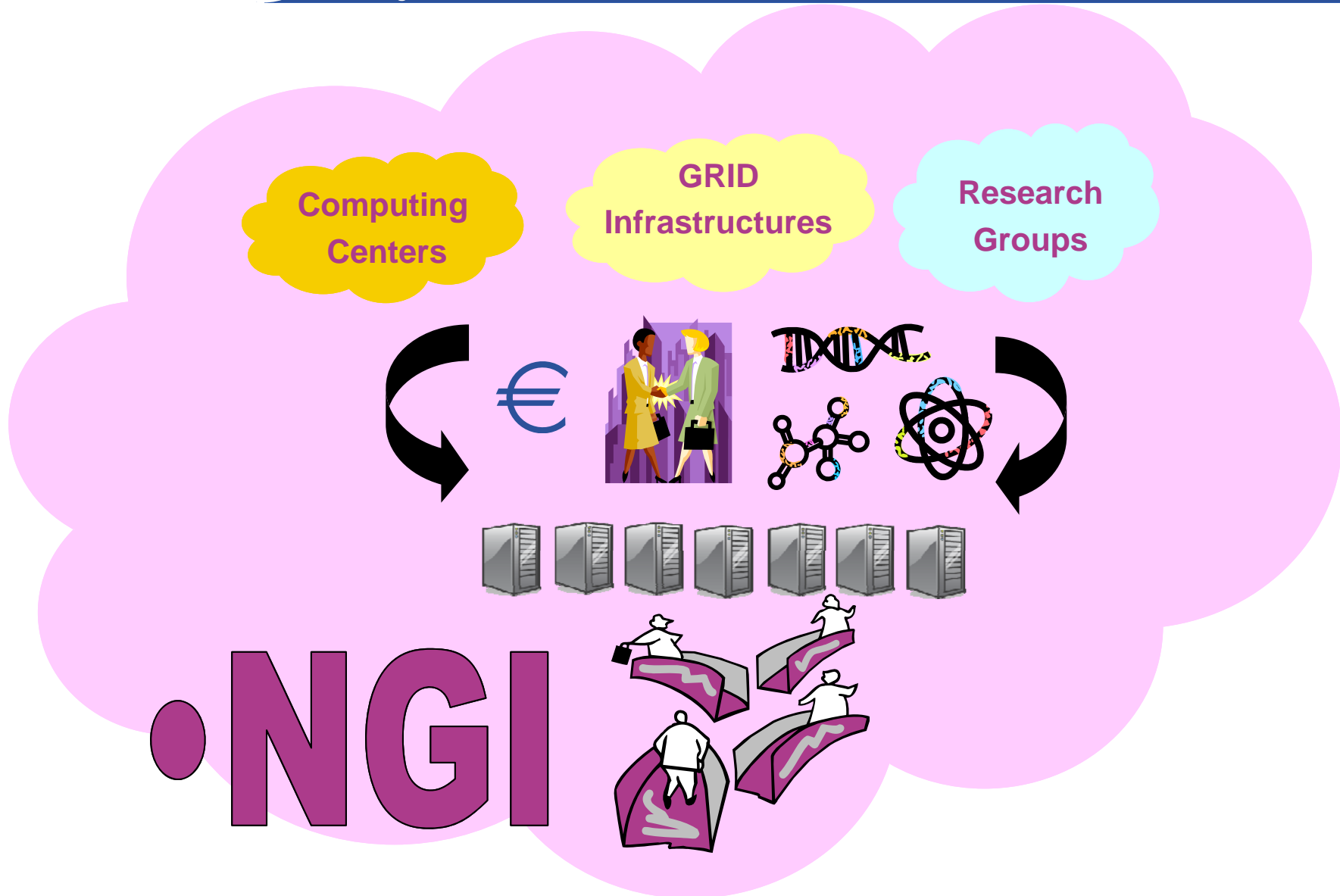
- **Requirements on the infrastructure (Hard & Soft)**
  - Modern scientific/industrial/economic applications need higher number of resources
    - Use/share/join multiple Grid resources
    - Transparently migrate between Grids according to their needs
      - *Different middlewares, different services*
    - Users using more than one Grid, going towards interdisciplinarity
- **Interoperability is a necessity for Sites**
  - From the point of view of Economic/Administrative/Human effort
    - Tipically largue sites operate more than Grid infrastructure at the level of operations
    - Computing cores are shared among all the projects
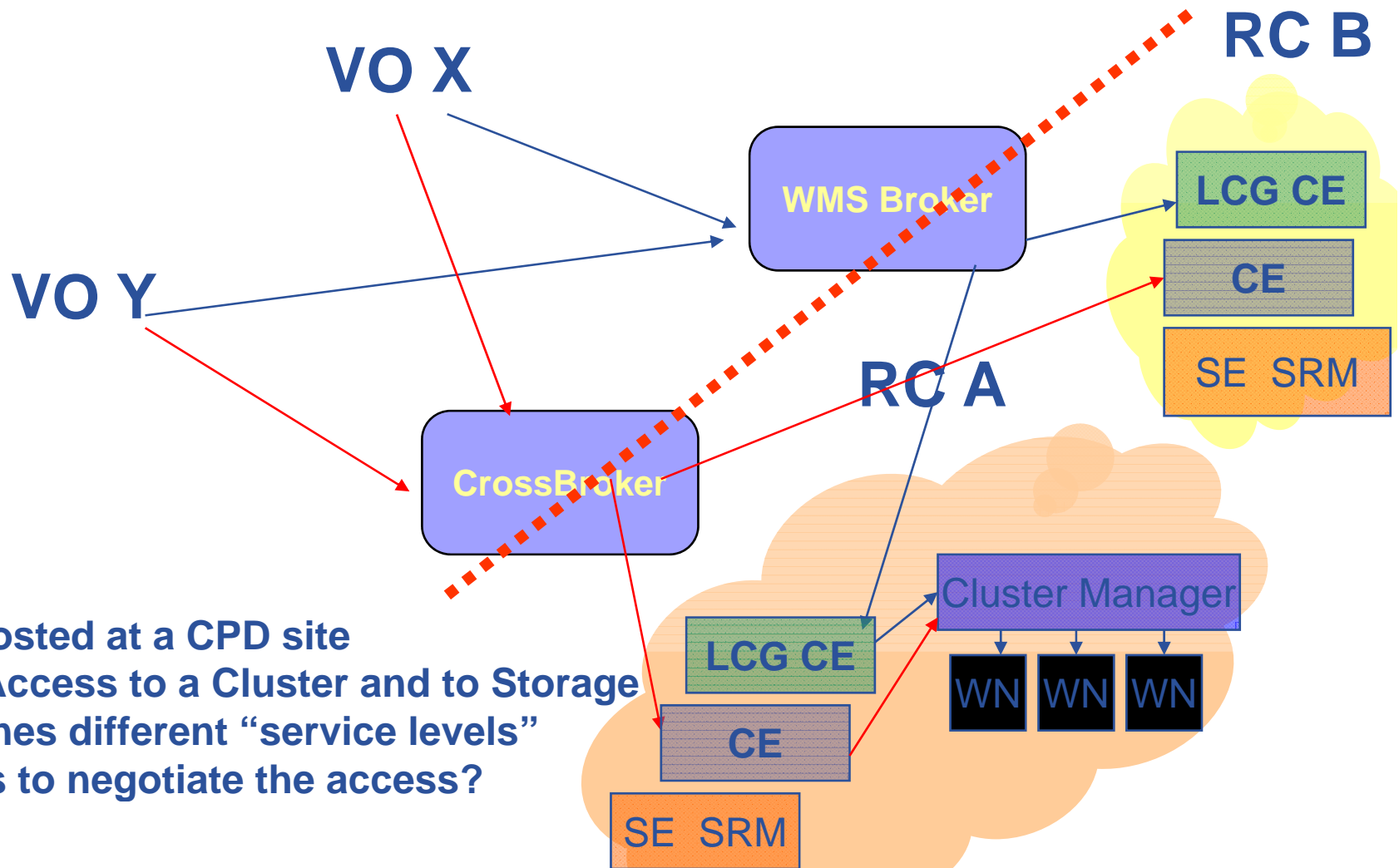   - Resource Allocation is done at the level of queue/scheduler configurations

RC B

User Interface

WMS Broker

LCG CE

CE

SE

VOMS

SE SRM

RC A

CrossBroker

VO
Applications
Users

Cluster Manager

LCG CE

WN WN WN

CE

SE SRM

User Interface

SE

VOMS

VO
Applications
Users

VO requires hosting (may be at any center or at several?)
Hosting can be replicated for higher availability
VO should "auto-control", find resources, etc
VO manager: manage VOMS (but VOMS multi-VO?)
Can we integrate "all" VO services in a reasonable way?
How many sites support a VO?

RC B

VO X

VO Y

WMS Broker

LCG CE

CE

SE SRM

RC A

CrossBroker

Cluster Manager

LCG CE

WN WN WN

CE

SE SRM

- **RC is hosted at a CPD site**
- **Offers Access to a Cluster and to Storage**
- **CE defines different "service levels"**
- **Who has to negotiate the access?**

VO X

VO Y

WMS Broker

CrossBroker

Resource Center B
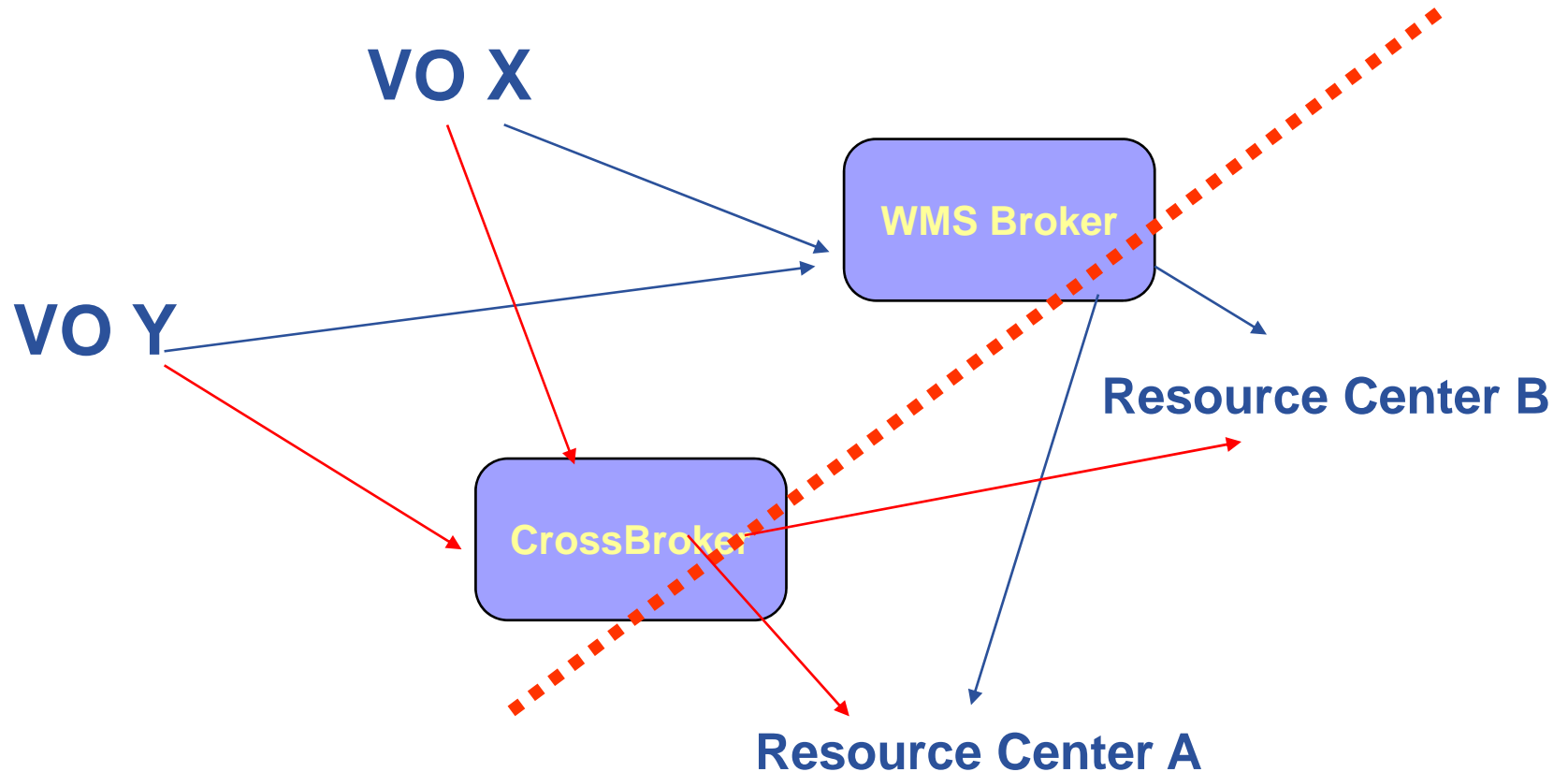
Resource Center A

- **The role of brokers is to "negotiate" the usage of distributed resources**
- **They know about Information Do they know about accounting?**
- **Added value: use of several RC at same time, use of pre-reserved services**

- General purpose Infrastructure centers

  - **Computing Centers or Grid Infrastructure providers allocate resources to Grid infrastructure because**
    - A Mandate of the funding agency
    - Participation in Grid projects: a share goes to the users of the project

- Research groups
  - Resources are allocated to application areas related with the interest of the local researchers
  - Tipically they are tied to the existence of a common project at least with another team member of the same VO.

How will sites solve the problem of resource allocation in NGIs model

- If the infrastructure is financed to support the NGI
  - **A local access comittee can decide how to allocate resources on a per VO basis**

- If the infrastructure is financed for general purpose computing
  - **Need to match the local access comittees allocation policies, with VO allocation policies**
    - A necessity when justifying resource usage to funding agencies
    - Many places allocate resources to users only through their own allocation comittees.

  Need to work it out at the level of Virtual Organizations !!

- **Service Level Description and Service Level Agreements with the Resource Centers**
  - **Very accurate accounting mechanism is necessary !!**

- **Interoperability is a "must" for large sites to commit resources to the Grid**

- **Site resource allocation made on a per VO basis seems a feasible approach**

    - The actual model needs still to be discussed and elaborated
    - Very important for the success of the NGI model

- **The interaction with the local access comittees will require the signature of special Service Level Agreements with the largue infrastructure resource centers**

    - In the end is a problem if whi has finnanced the resources and with which purpose
    - Accounting will become increasingly important.