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Interactive task invocation in the Virtual Laboratory

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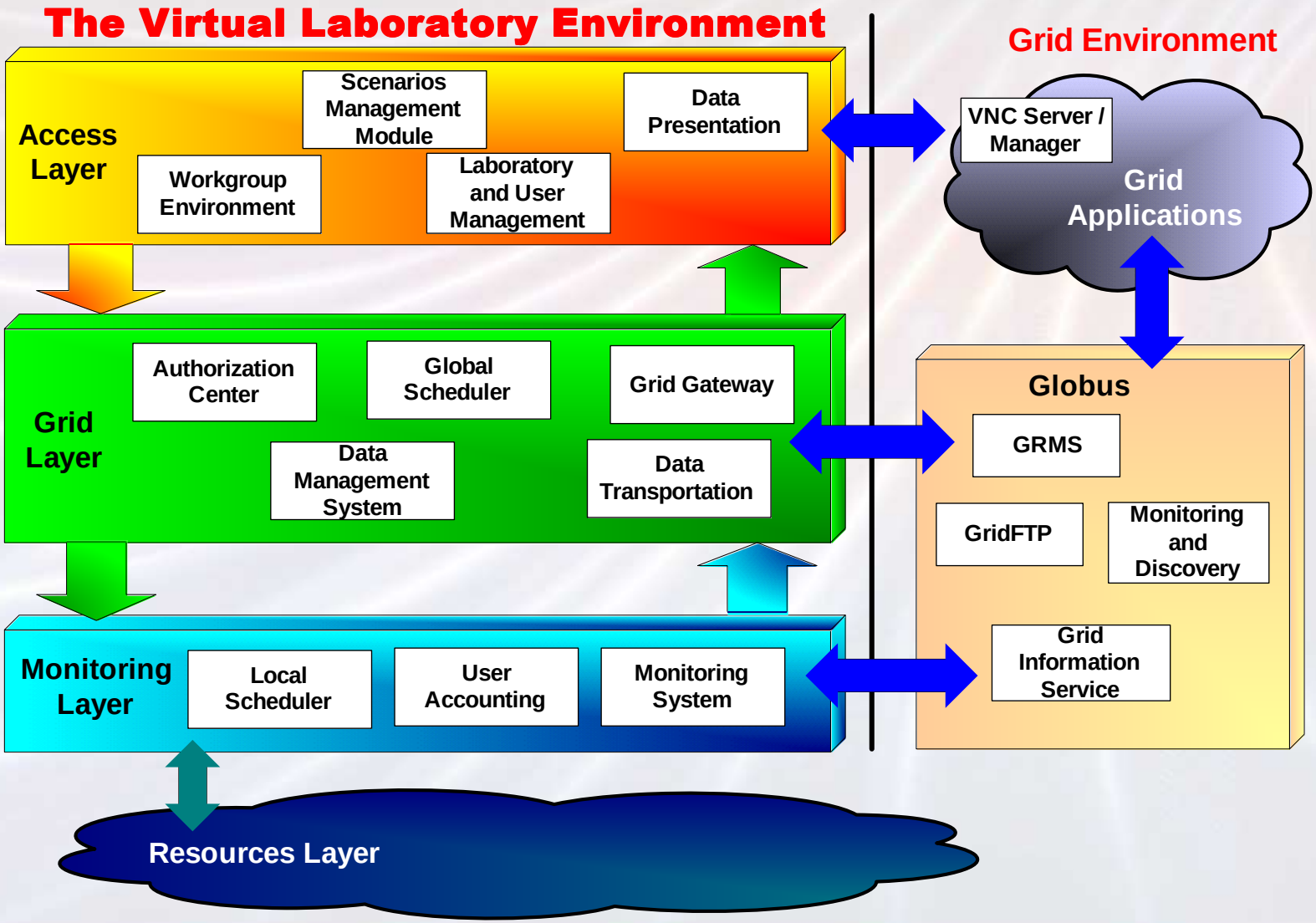
Virtual Laboratory overview

The Virtual Laboratory is a distributed environment, providing its users with the following functionality:

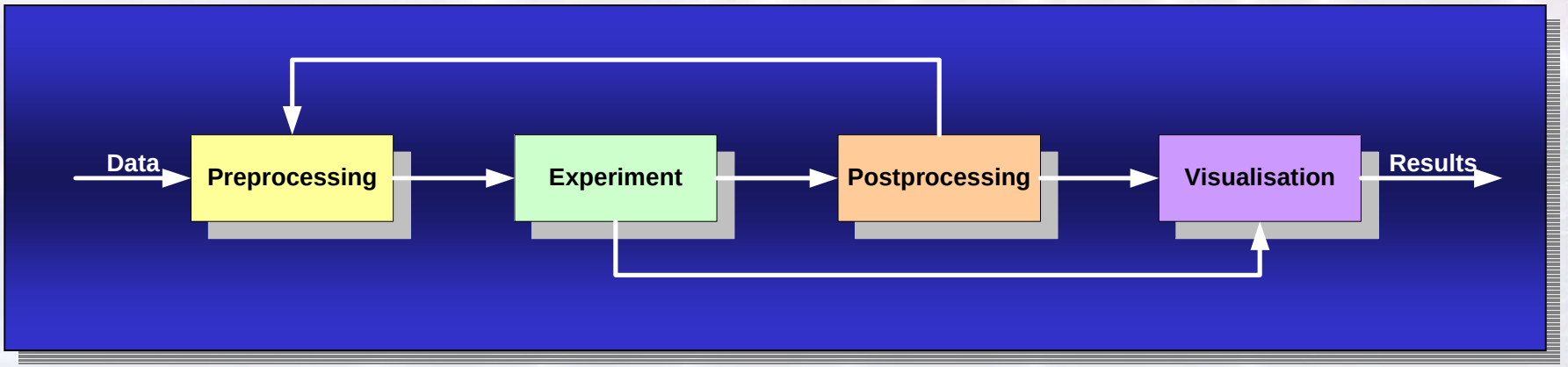
- **Remote access to complex and expensive laboratory research equipment**
- **User-customized Dynamic Measurement Scenarios**
- **Digital Science Library**
- **Data storage and management**
- **Educational potential**
- **Workgroup collaboration tools**

The Virtual Laboratory architecture



Dynamic Measurement Scenarios

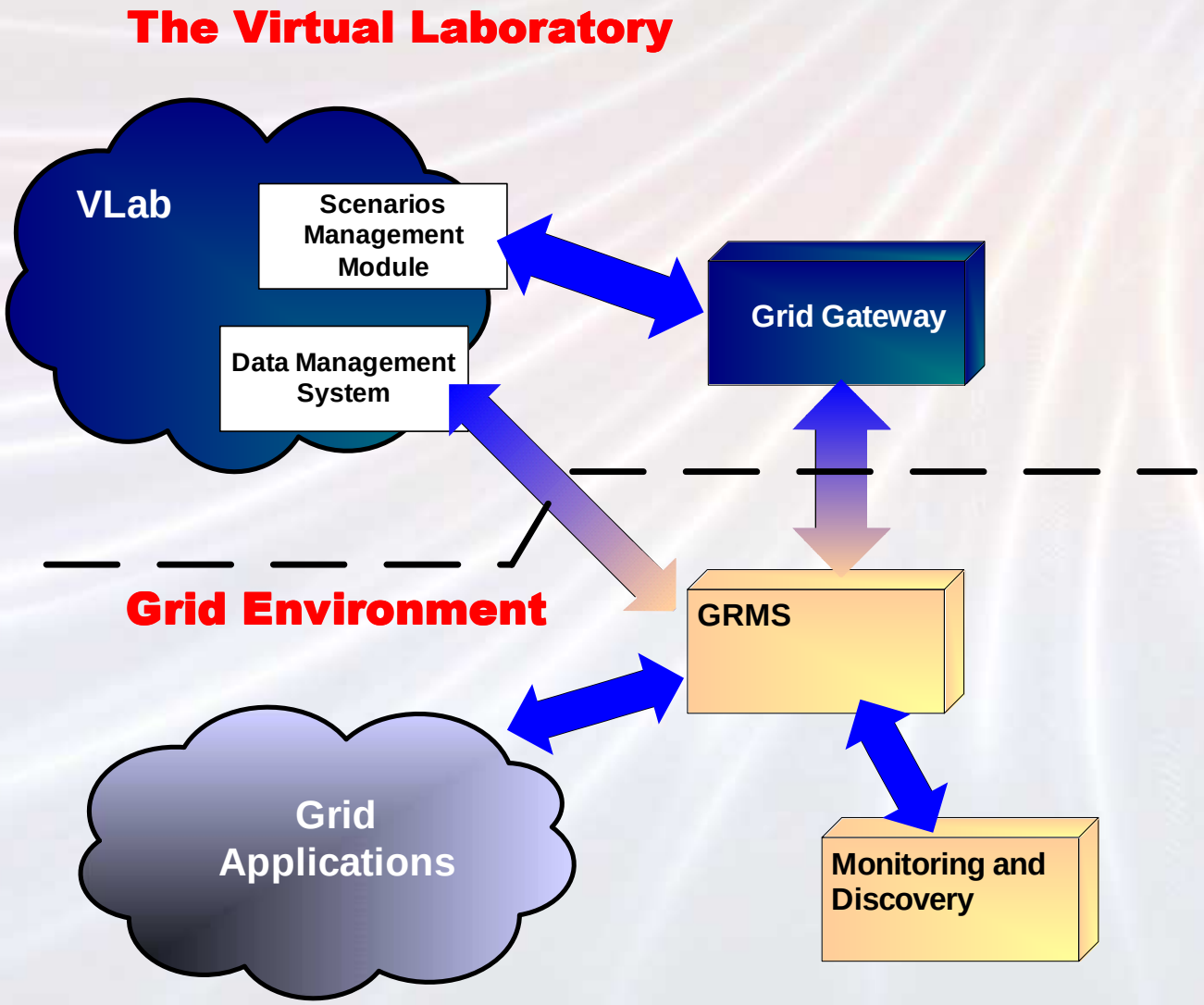
- definition of complex, multi-dimensional research experiment scenarios
- connection of experimental and computational jobs
- multiple conditions on jobs connections, determining the actual execution path
- description language for resources and connection dependencies



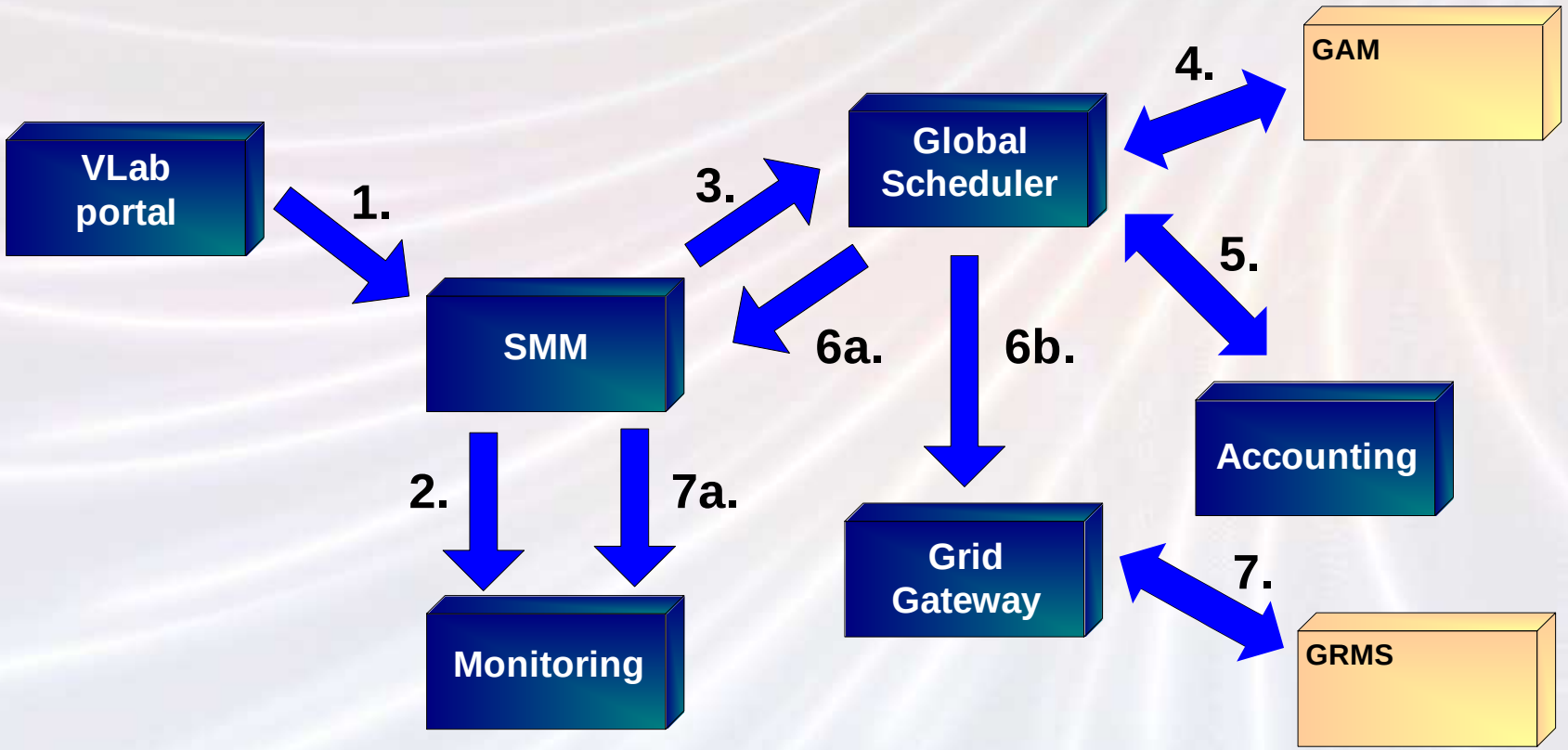
Example of a simple measurement scenario

Example of DMS diagram

Batch job scheduling

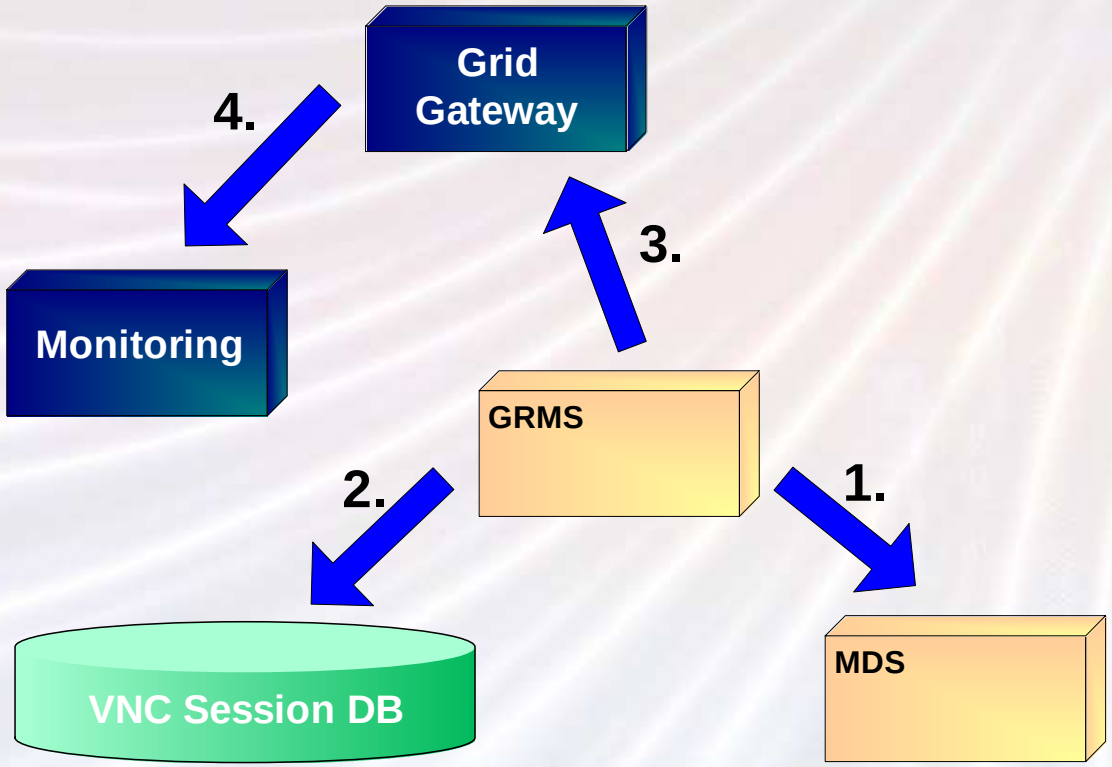


Interactive tasks: Task submission



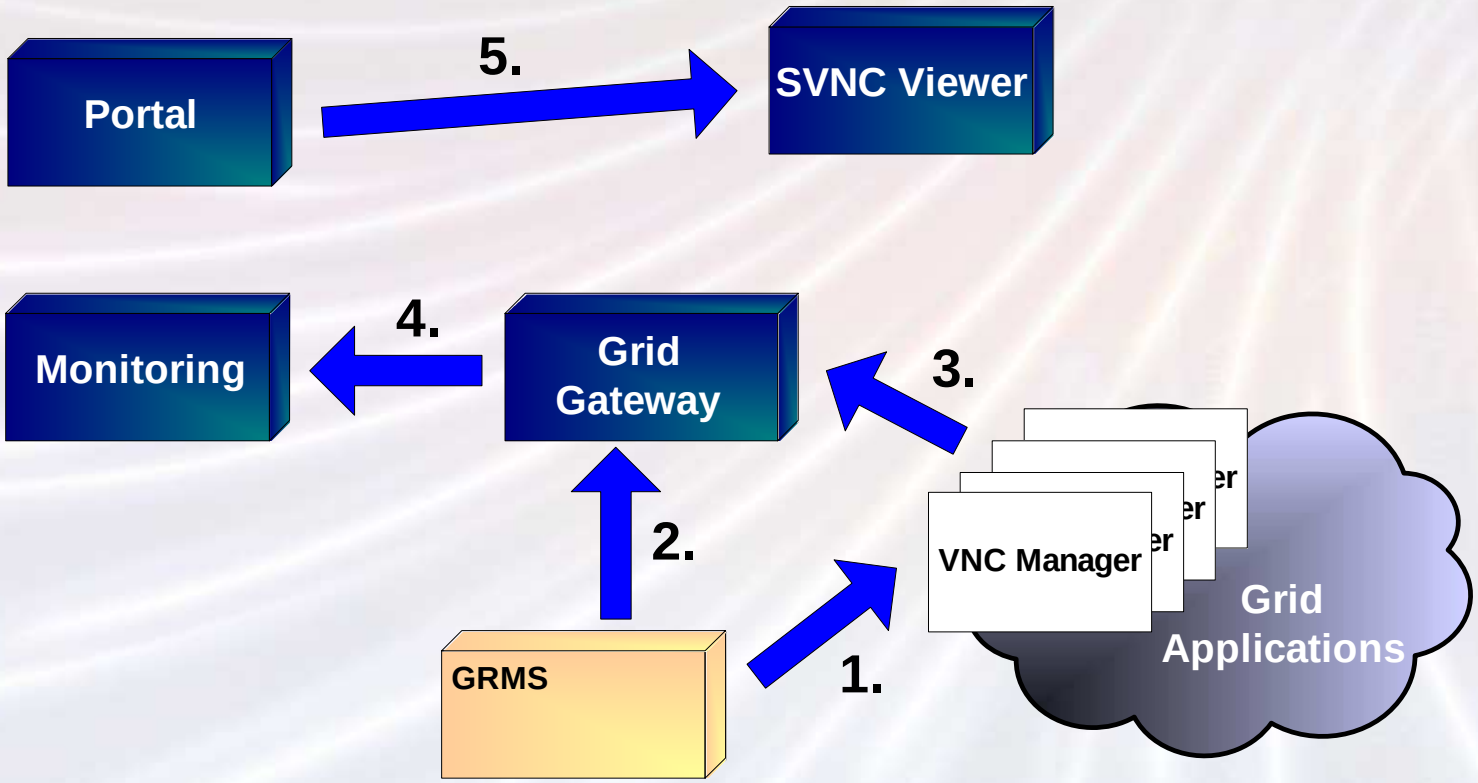
1. Task is sent to SMM module
2. Task is added to the DB
3. Task sent to Global Scheduler
4. Grid authorization in GAM
5. Accounting verification
6b, 7. Task submitted to GRMS (via Gateway)

Interactive task: VNC session scheduling



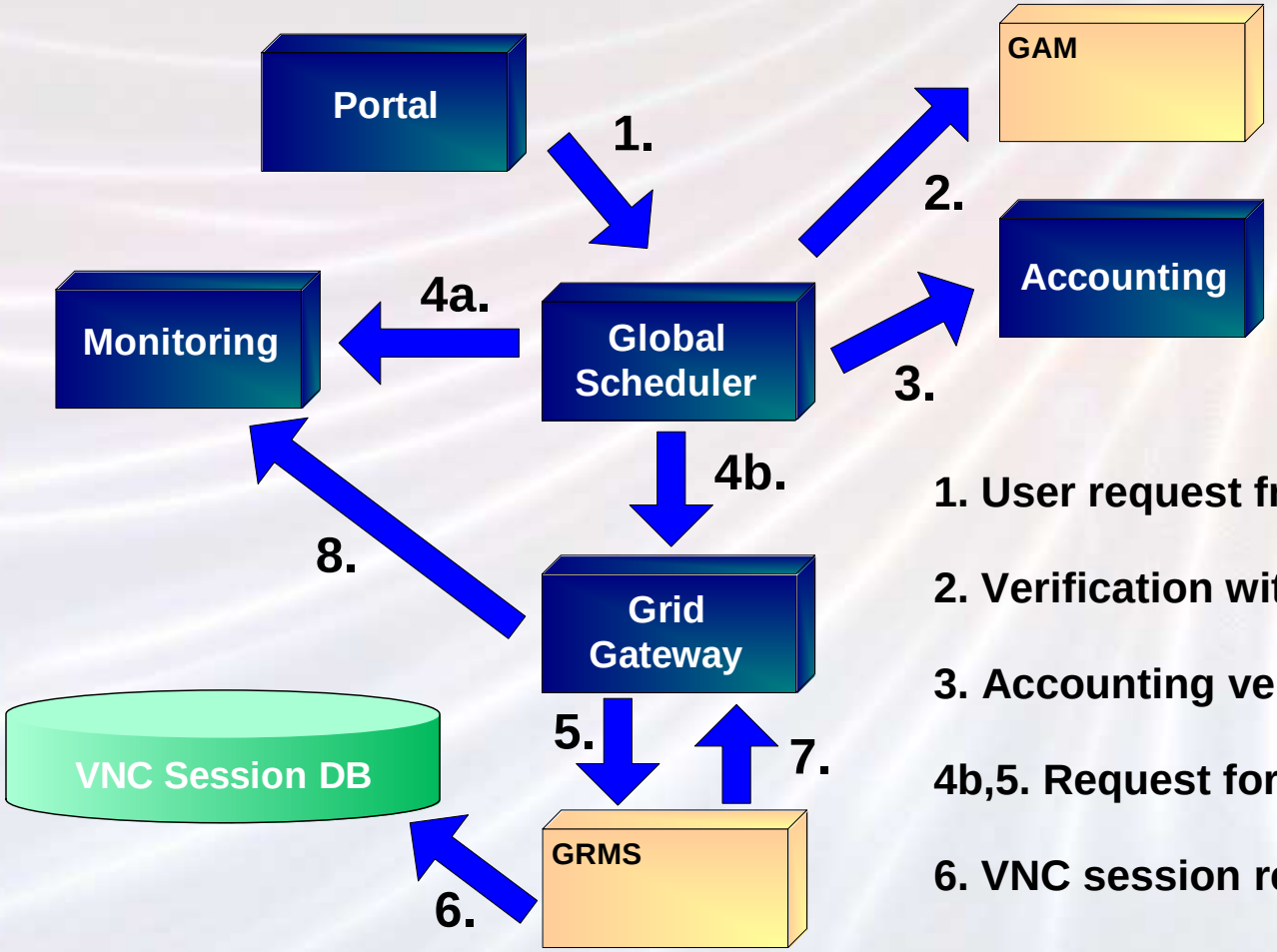
1. GRMS checks with MDS for resources
2. GRMS verifies free slot for VNC session
3. GG is informed of status change (notification)
4. Task status updated in VLab DB

Interactive tasks: Establishing a secure connection



1. GRMS launches scheduled task
2. GRMS sends notification to Gateway
3. VNC Manages sends task info
4. Gateway sends info to Vlab DB (Monitoring)
5. User launches SVNC viewer

Interactive tasks: Prolonging the VNC session



1. User request from portal

2. Verification with GAM

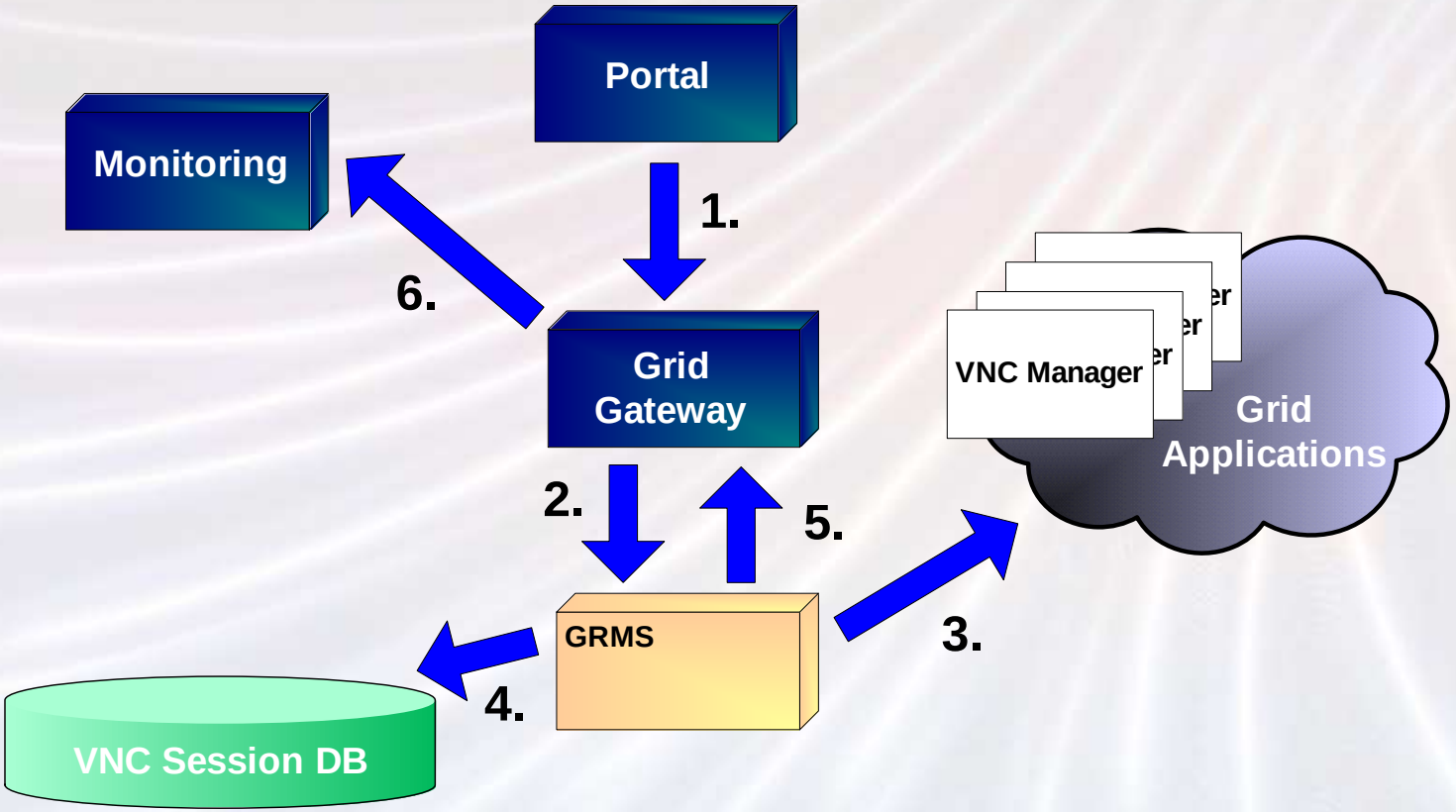
3. Accounting verification

4b,5. Request forwarded to GRMS

6. VNC session reservation

7,8. GRMS Answer forwarded and updated in VLab DB

Interactive tasks: Ending the VNC session by the user



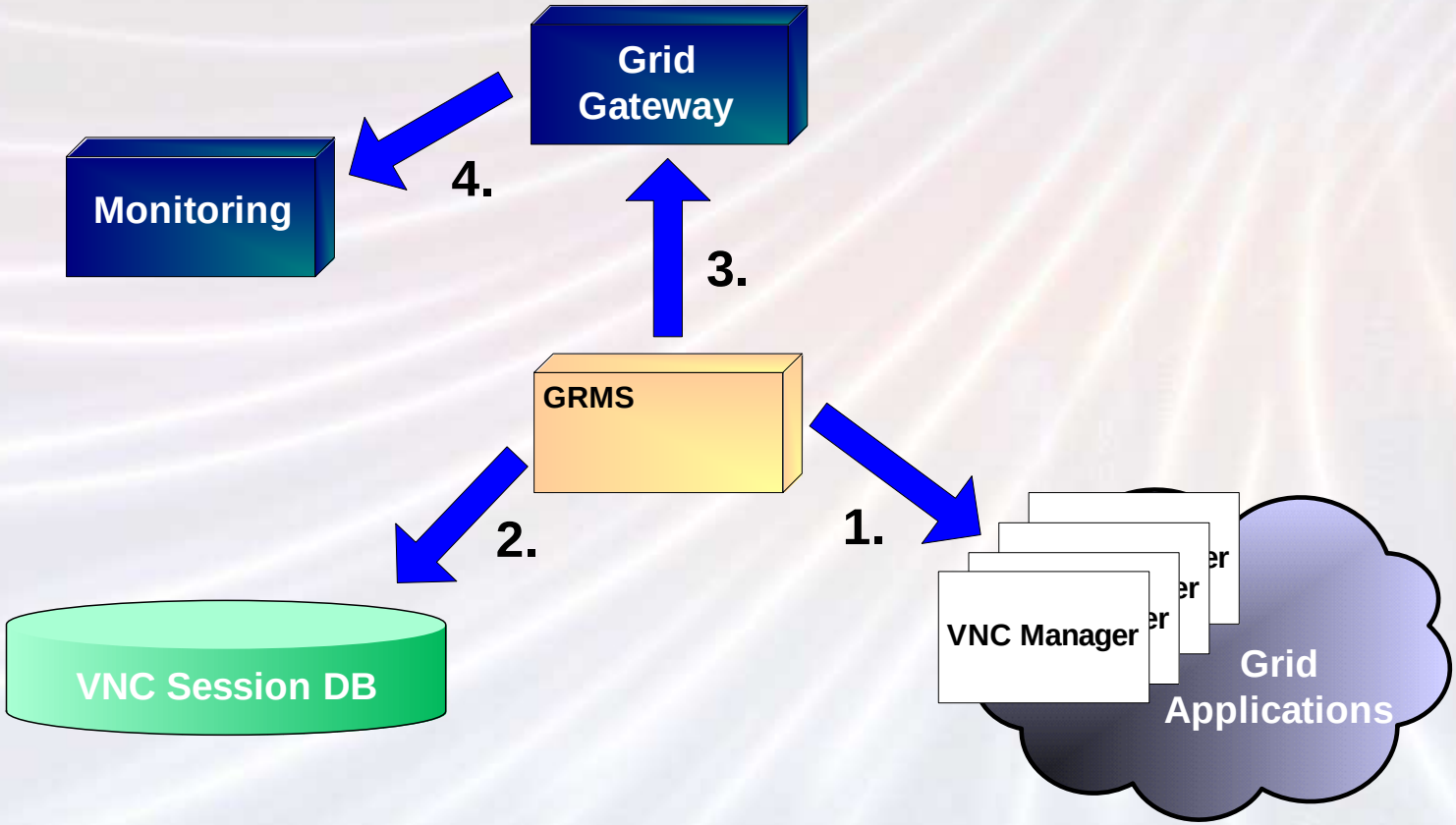
1,2. Request to end session forwarded to GRMS

3. End signal sent to VNC Manager

4. Update in the session DB

5,6. Task status updated in the VLab DB

Interactive tasks: Ending the VNC session by the system



1. GRMS sends end signal to VNC Manager
2. Update in the session DB

3,4. Task status updated in the VLab DB

Summary

Scheduling of the interactive task creates new possibilities for a wide range of Grid-based systems.

Invocation of user-interactive tasks can be divided into the following main steps:

- **Task submission**
- **VNC session scheduling**
- **Establishing secure connection**
- **Ending the VNC session**

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