Establishment of e-Science environment for HVEM

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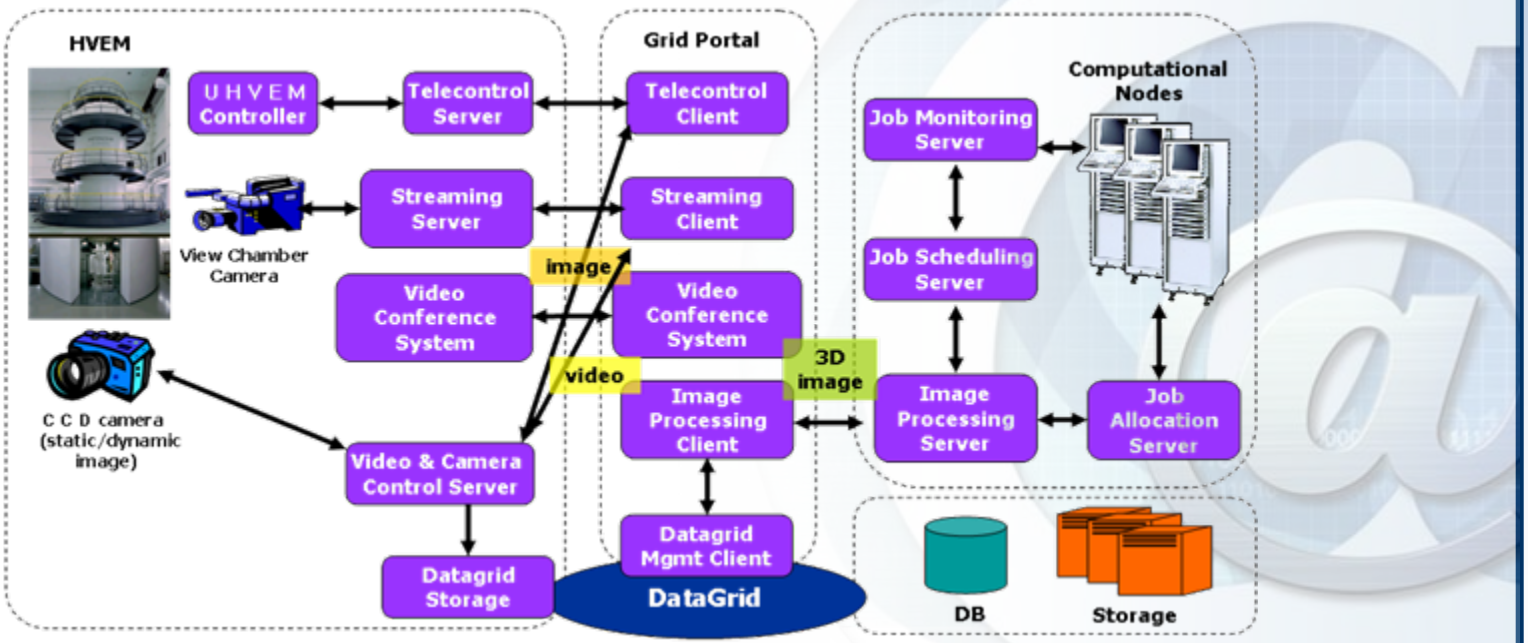
HVEM Grid System

- **High Voltage Electron Microscope (HVEM) Grid system is a powerful tool designed upon the concepts of Grid and Web Service**
  - To control instruments remotely
  - To manage and control 3-D processing of images
  - To store data automatically



Remote Control

- The HVEM remote control service allows users to remotely control HVEM hardware (e.g. FasTEM, Goniometer, CCD camera) via encapsulated web services
- Images from the HVEM are streamed to the users through a video server that employs NaradaBrokering

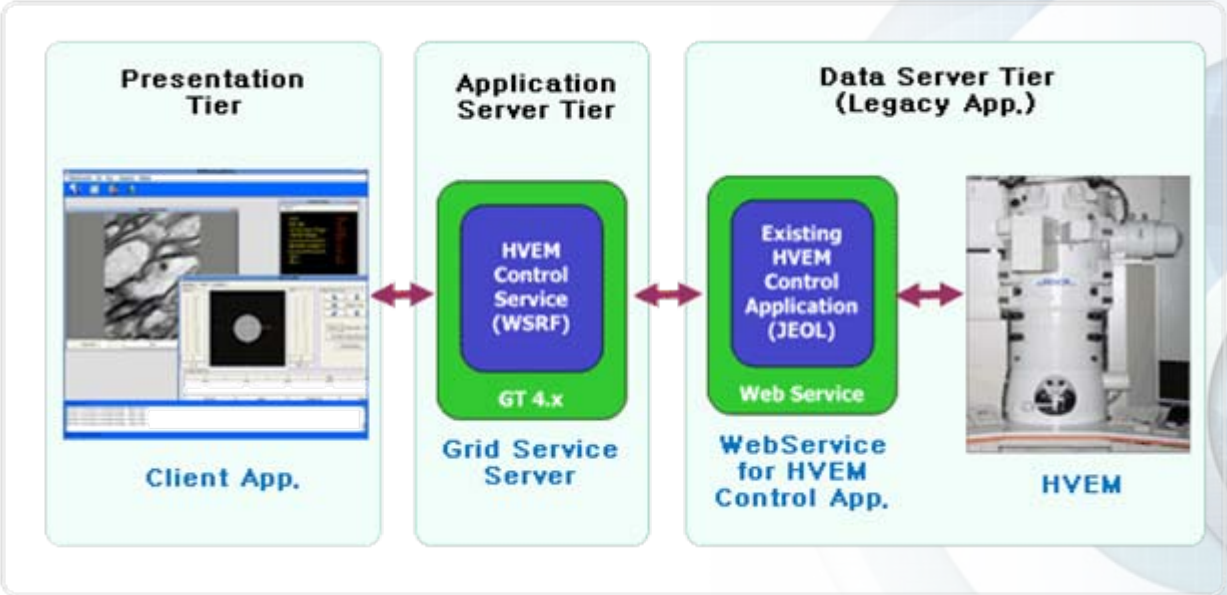
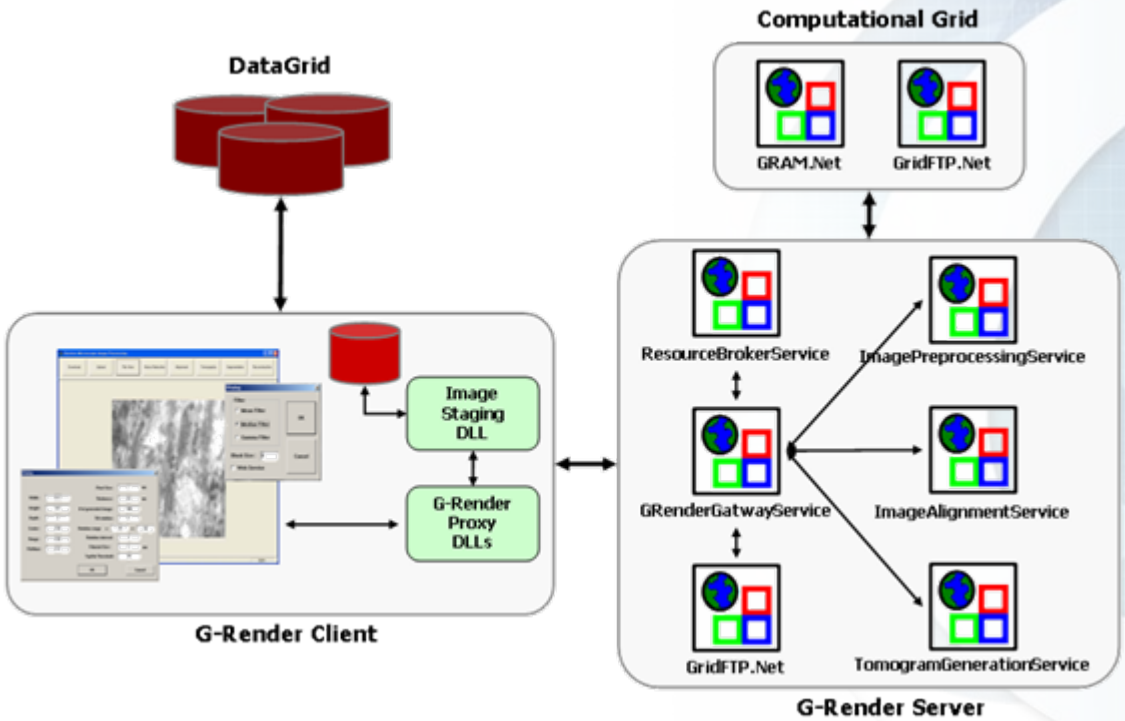


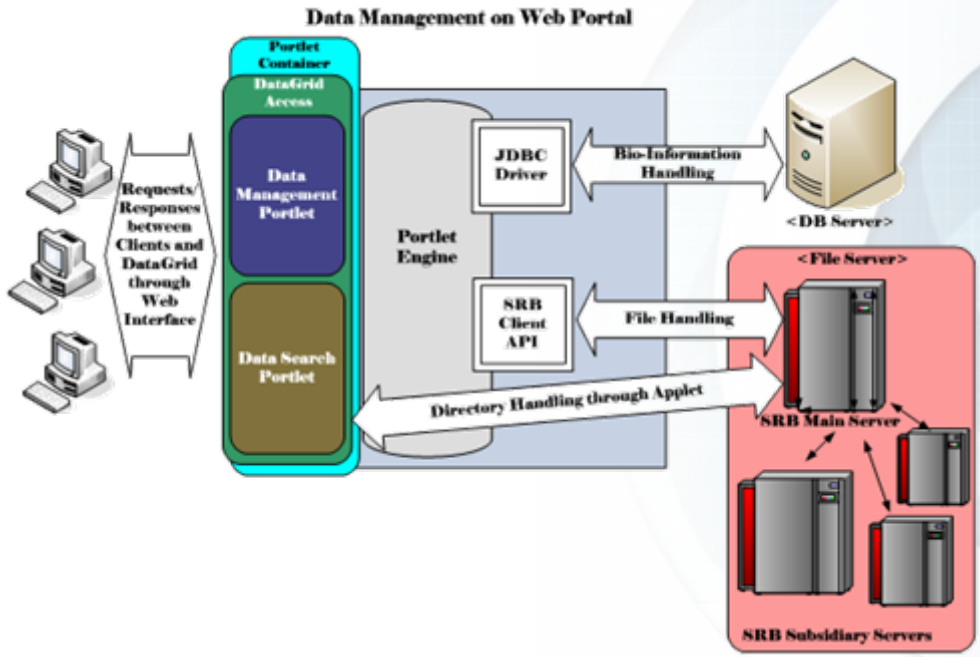
Image Processing (G-Render)

- G-Render enables high-performance image processing by utilizing the Grid to acquire unlimited computing power
- 3-step image processing service
  - Image preprocessing
  - Image alignment
  - Tomogram generation
- Each service is based on WSRF.Net



Data Grid

- **Data are stored in a Storage Resource Broker (SRB) and a database**
- **SRB stores**
  - 2-D images from the CCD camera
  - 3-D images processed from 2-D images and related documents
- **DB stores**
  - Bio-information and meta-data of the images stored in SRB
- **The DataGrid can be accessed through a Web Portal**



On the Web

- **For more information on HVEM and our project, visit our homepage at** http://e-science.kbsi.re.kr.

Issues

- **For remote operation,**
  - The biggest hurdle is the network latency !
  - QoS
- **G-render**
  - Most graphics libraries are on Windows !
  - How to work with Windows workstations in the Grid ?
  - WSRF.net is immature
- **Data Management**
  - Standard needs to be established for data models
- **Common infrastracture**
  - Security (authentication/authorization)
  - How to’s
  - Portals
  - Streaming

Thank you