

Telemedicine on the Grid



*The Development of Telemedicine and Teleconferencing
Using AccessGrid Technology*

Project Partners



SIEMENS



West Anglia **NHS**
Cancer Network

Macmillan 
cancer relief

SCHOOL OF CLINICAL
Medicine

Telemedicine

- To demonstrate the capability of Grid technology to improve the delivery of patient care in the West Anglia region and potentially throughout the entire National Health Service
- A partnership between the West Anglia Cancer Network, CeSC, Seimens Medical Solutions, Macmillan Cancer Relief and University of Cambridge School of Clinical Medicine

e-government

“Delivering public services in new and electronic ways to be more convenient, more joined-up, more responsive and more personalised:”

- building services around citizens’ choices
- making Government and its services more accessible
- ensuring social inclusion
- using information better

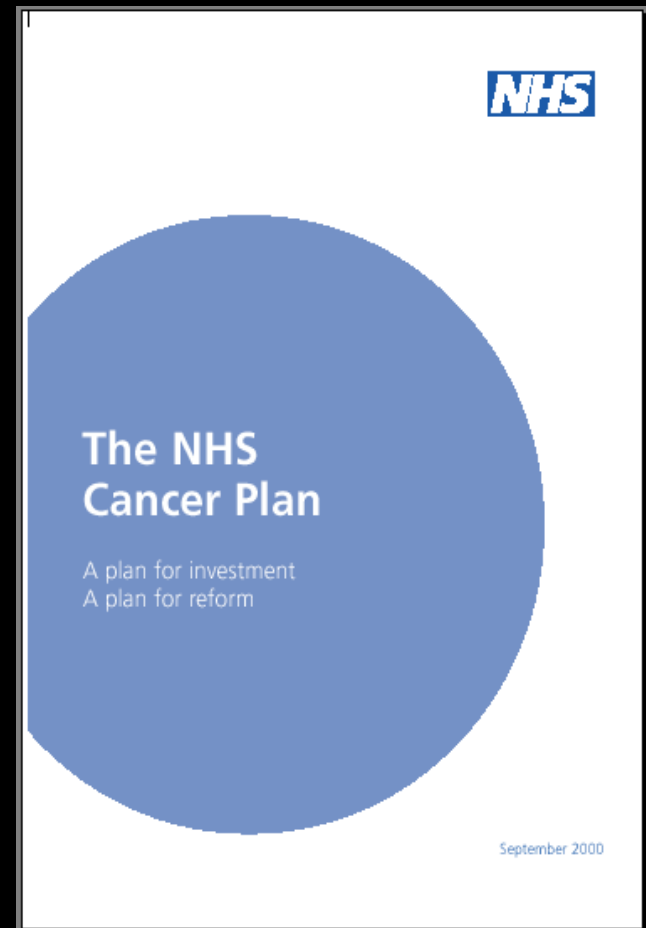


Objectives

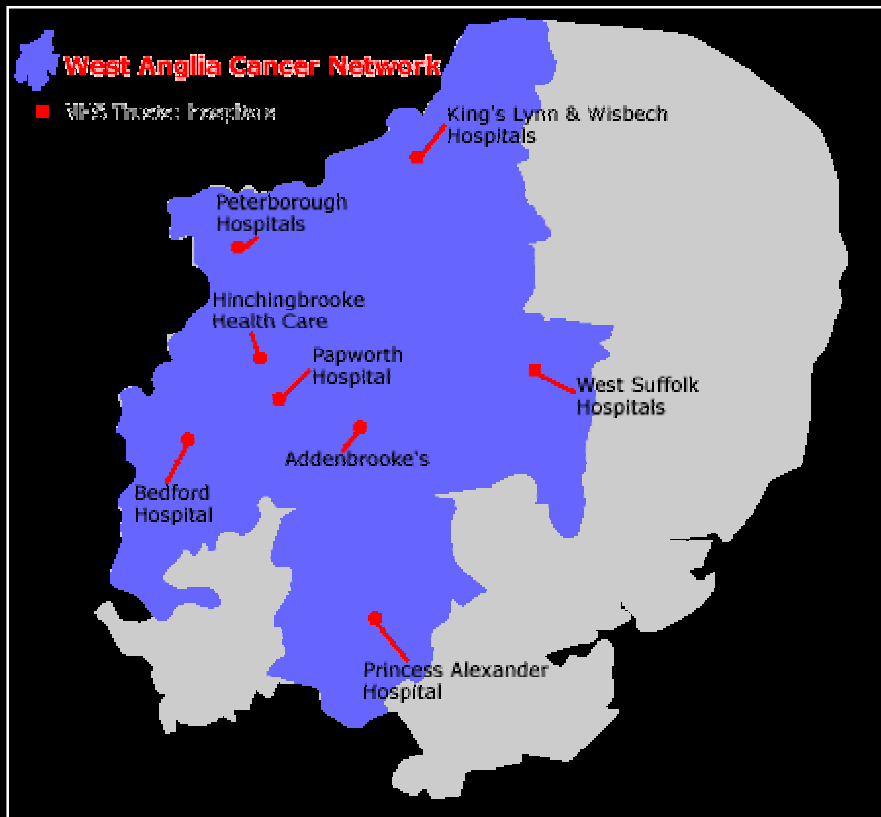
- Install, operate and evaluate a comprehensive demonstrator for voice, video and data
- Use the CeSC Access Grid facility to prototype secure VVID services
- Integrate Access Grid with the demonstrator
- Implement complex data mining from medical archives
- Investigate use of Grid resources for remote visualisation of volumetric medical images

Project Background

- NHS Cancer Plan
- MDT Meetings
 - Specialisation
 - Access to Data Sets
- Clinicians sharing expertise in a team environment
- Raise standards and improve patient care



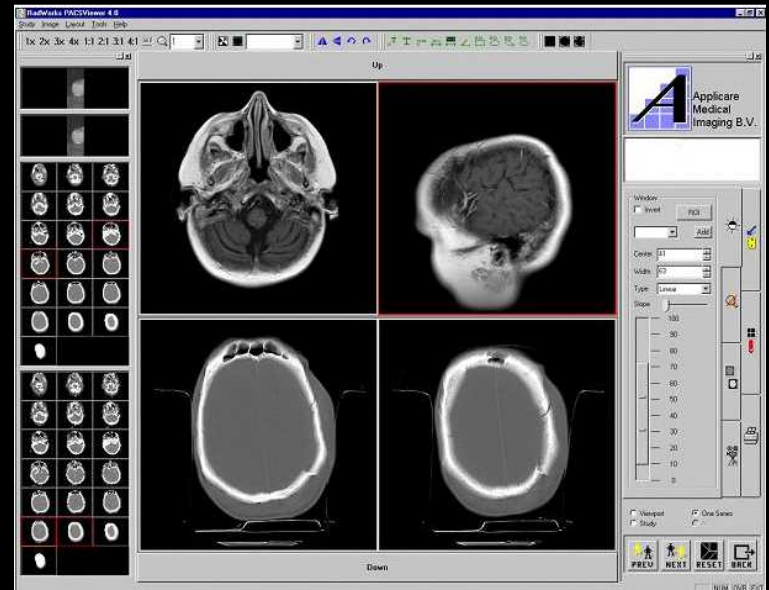
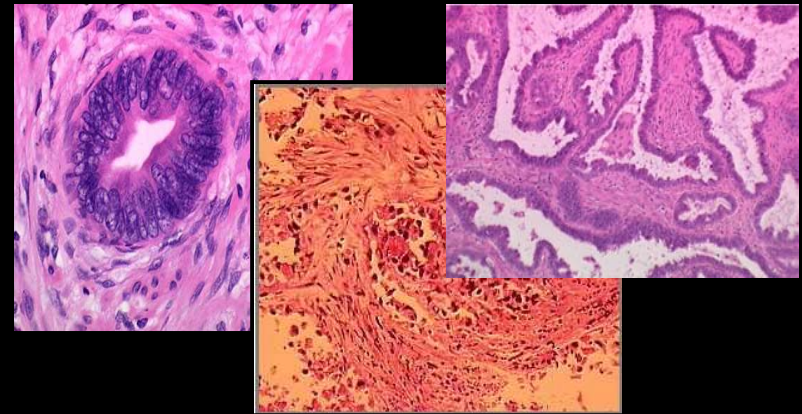
The West Anglia Cancer Network



- **Cancer Centre**
 - Addenbrooke's/ Papworth
- **Cancer Units**
 - Bedford
 - Peterborough
 - West Suffolk
 - Harlow
 - Hinchingbrooke
 - King's Lynn

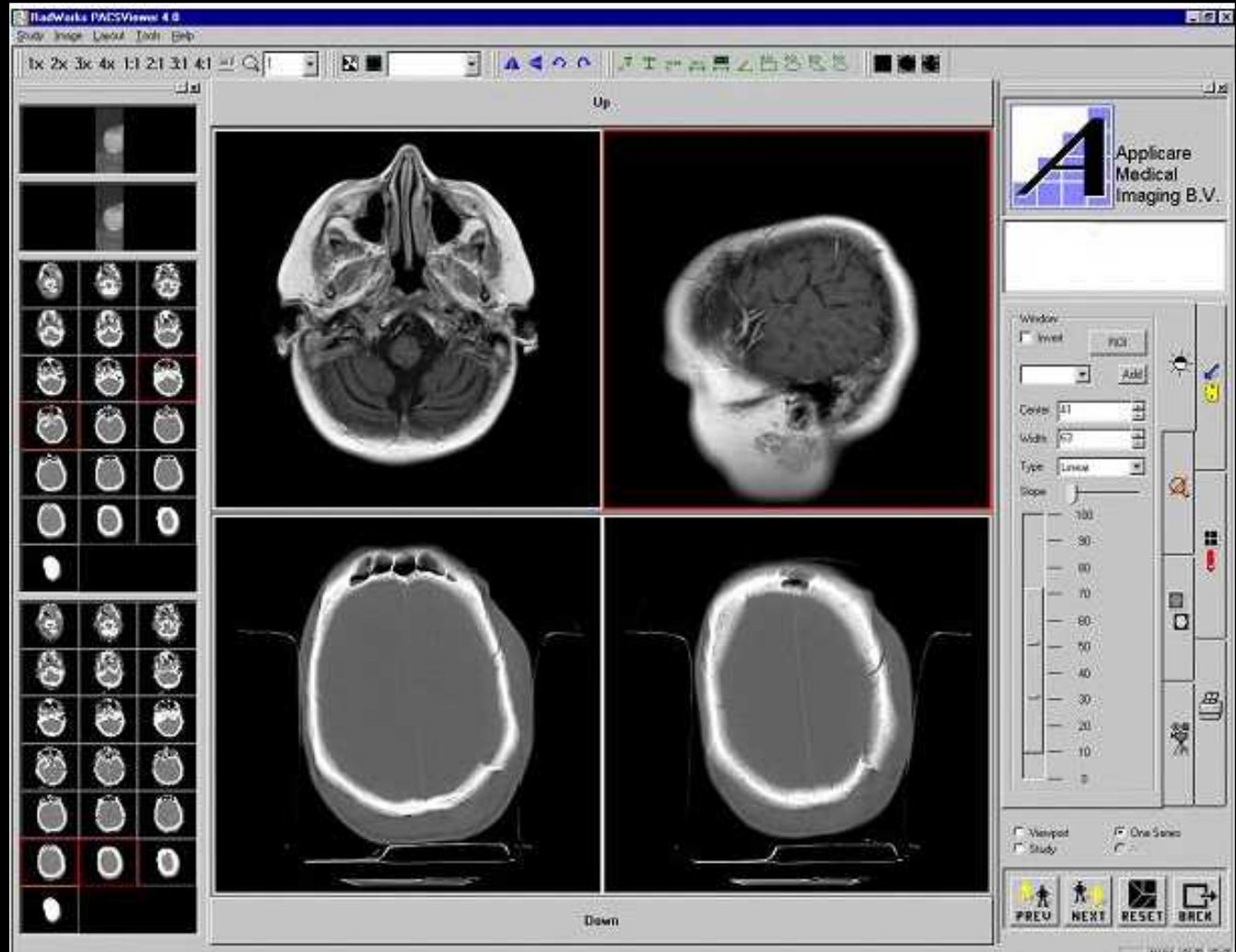
Requirements

- Support MDTs by providing:
- Multi-site videoconferencing
- Access to pathology & radiology images
 - Teleradiology service
 - Live microscopy
- Access to remotely stored patient records through organisational LANs



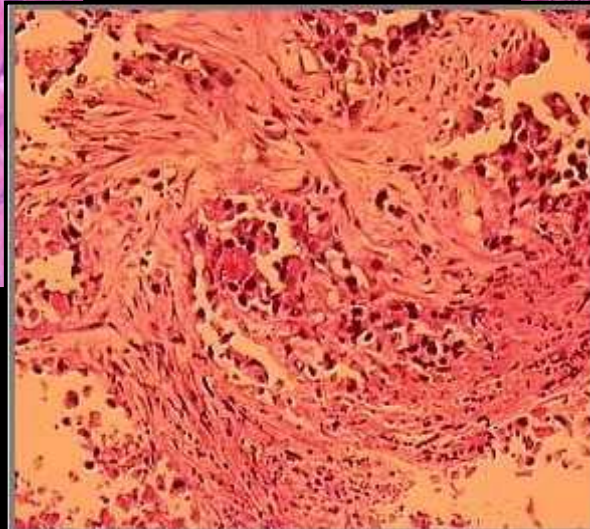
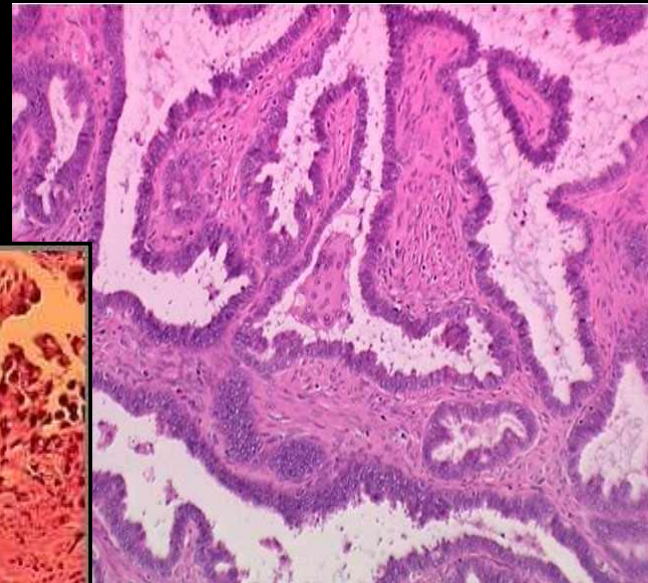
Requirements

CT
Images



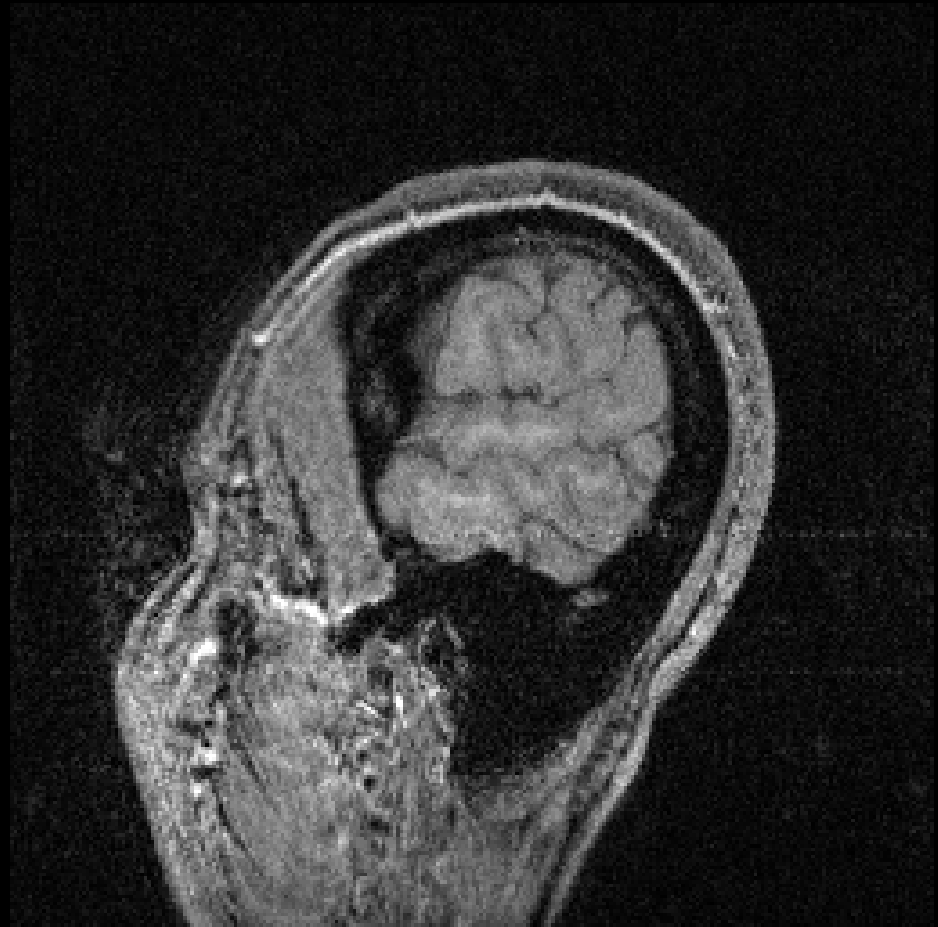
Requirements

Pathology: Live Microscope, Faithful Colour



Requirements

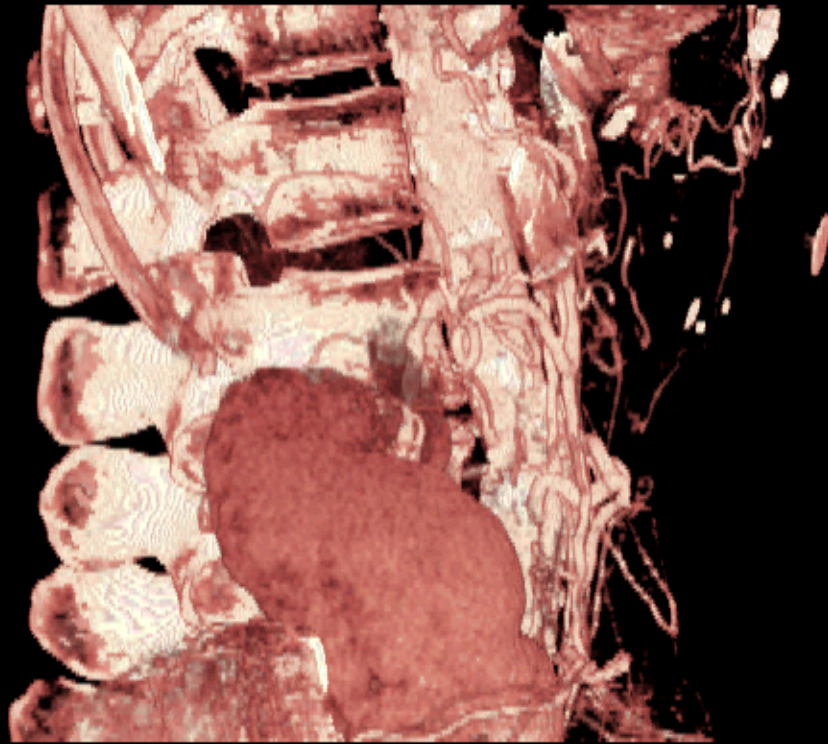
MRI Data is big
16777216 voxels
for typical scan



Requirements

Overlay (unused)

CT Data is
Complex
Example for
partially
segmented
Image



The Demonstrator

- H.320 compliant ISDN videoconferencing
- Integrated multi-point control unit (MCU)
- Wide angle video camera
- Microphones with echo cancellation and AGC
- SVGA data from PC
- Tandberg 6000 & 800



Multi-Disciplinary Team Rooms

- 4 pilot sites initially - running since March 2002
- NHS funded remaining 4 hospitals
- 8 MDT Rooms in 8 hospitals
- 5 hospitals have launched MDT rooms
- 3 due before Christmas 2002 v
- Capital investment from each Trust 20k-50k

Multi-Disciplinary Team Meetings

- Gynae MDT established since February 2002
 - Lymphoma - Due November 2002
 - Upper GI - Due November 2002
 - Dermatology - Due December 2002
 - **All running**



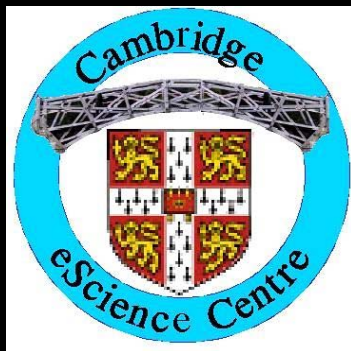
Networking and the NHS

- NHSnet
 - Limited bandwidth
 - Often at maximum capacity, No QoS
- ISDN
 - Rapid development and initial VVID experience
 - 384 kbps per site (ISDN 6)
 - Multisite service requires (PRI 18)
 - Bridge requires 50 Channels of ISDN
 - Steady migration to IP in 2003

Initial Rollout

- Multi-site MDT meetings at the Cancer Centre
 - Gynaecology
 - Upper GI
 - Lymphoma
 - Dermatology
- ISDN - Addenbrooke's (18 ch PRI)
 - Bedford (6 ch BRI)
 - Peterborough (6 ch BRI)
 - West Suffolk (6 ch BRI)

The Reality!



NeSC Launch 25th April 2002

The Problem with



- Four PC solution (Linux/Win98/Win 2K)
- Expensive
- Hardly PnP
- Dedicated node operator for every event
- QoS issues
- Security

The NHS Solution

- Integrate existing commercial VVID system into Access Grid
 - “Access Grid in a box”
 - Low entry cost and easy to operate
 - Integration with other network services, e.g. DICOM
- Generic solution for clinical collaboration
 - Advanced collaborative environment for teaching and research

The Vision

- Use the CeSC Access Grid facility to prototype secure VVID services
- Integrate the Access Grid with the demonstrator system
- Investigate use of CeSC grid for remote visualisation of volumetric images
- Implement complex data mining from medical archives

Funding

- Macmillan Cancer Relief
 - £70,000
- Siemens Medical Solutions
 - £145,000
- DTI funding
 - £172,000
 - Additional £72,500 confirmed in August 2002

Year One Milestones

- Installation of voice, video and data demonstrator at four WACN sites
- Train NHS staff in effective use of system
- Specify NHS requirements for Access Grid
- Prototype CeSC Access Grid for anonymous medical VVID services
- Develop additional code to ensure data security

Year Two Milestones

- Integrate remote volume visualisation into Access Grid
- Customise Access Grid with NHS requirements based upon demonstrator and prototype CeSC system
- Integrate demonstrator hardware and software with Access Grid system

Year Three Milestones

- Full implementation and evaluation of the NHS specific Access Grid system across the eight WACN sites
- Implement data mining of XML compatible data sources

Summary

- Highly topical application
 - NHS Cancer Plan
- Using technology to improve clinical decision making processes
- The demonstrator is up and running in all eight sites - January 2003
- Upgrade network bandwidth in 2003