

AiMeS

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THE UNIVERSITY
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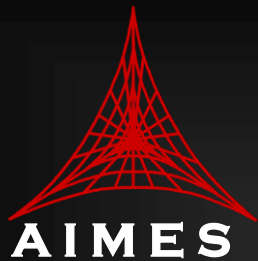
AIMES

- Advanced Internet Methods and Emergent Systems
 - Stakeholders
 - NWDA, ERDF
 - University of Liverpool
 - Commercial Partners
- October 2003



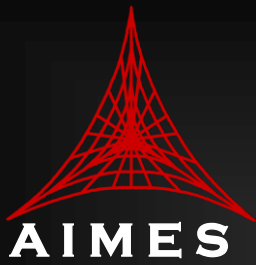
AiMeS

- AiMeS is conceived to:
 - Exploit current technology to benefit business
 - Short term (months)
 - “Utility Computing for SMEs”
- Not a centre to develop “Grid” Software
- Work with partners to develop prototype applications
- Staff of approx ~40
 - e-business team, business development, fabric and middleware



AIMES Laboratory

- Prototyping Hardware
 - CPU/Storage/Networking
- Flexibility
- Human Resources and Expertise ~ 10 Staff
 - Databases
 - Scheduling/SysManagers
 - Network Engineers
 - HPC operations
- Strategic Links
 - Regional Facilities (CLRC & e-science centres)
 - Regional Initiatives
 - International Links



Local Infrastructure

- CPU/Processing
- Storage
- Networking
- Software Stack

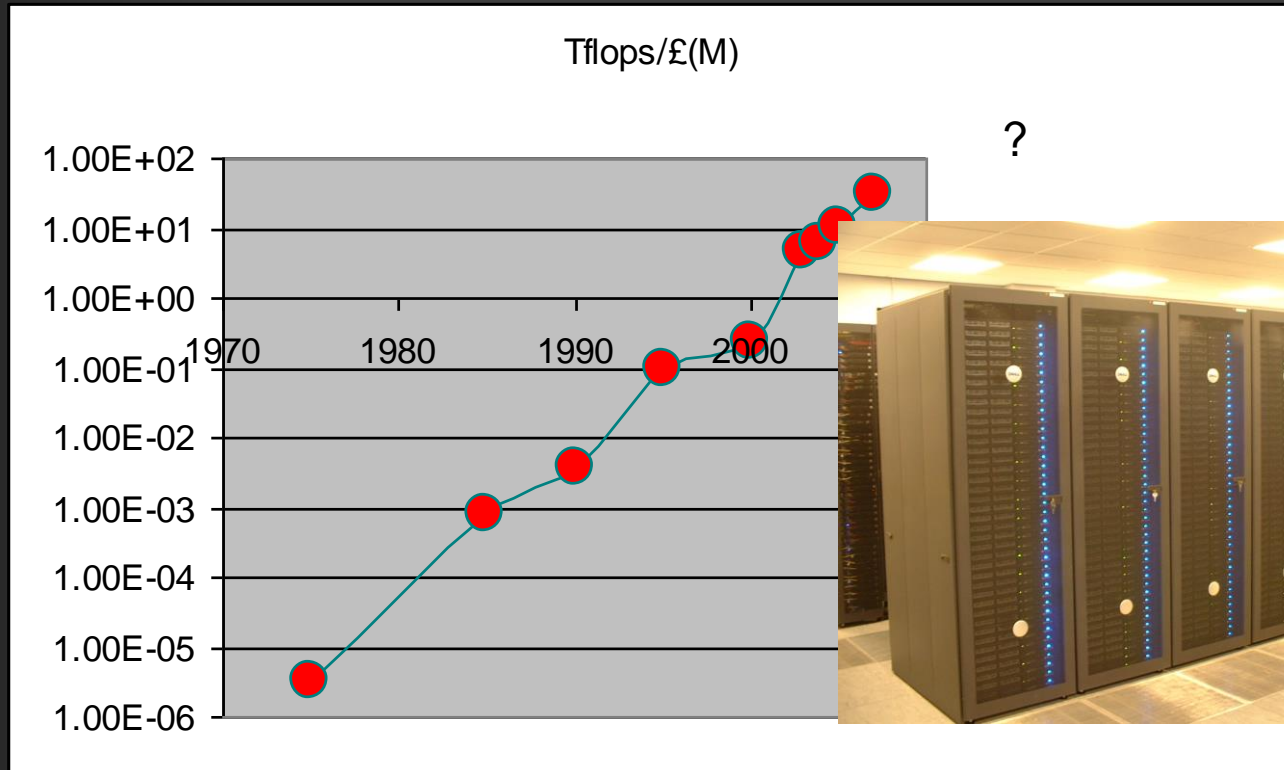


CPU/Processing

- Utility Computing
- Capability
 - “HPC”
 - Expensive
 - IA64
 - Low Latency Interconnects(Myricom...)
 - MPI based parallel applications
- Capacity
 - Commodity
 - Low Cost
 - IA32
 - Gbe
 - Parametric applications

CPU Processing

- TFlop /£M

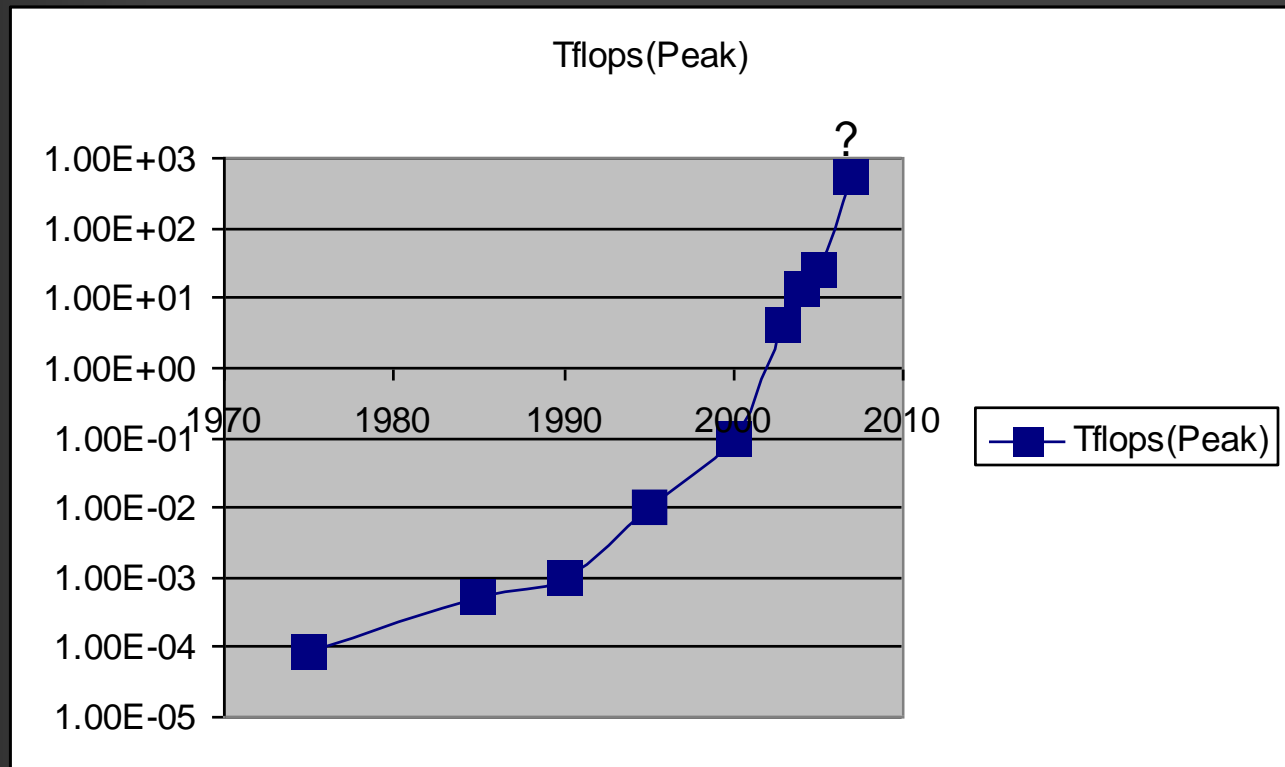


Capital, Infrastructure/Staff/Power



CPU Processing

- Peak Performance





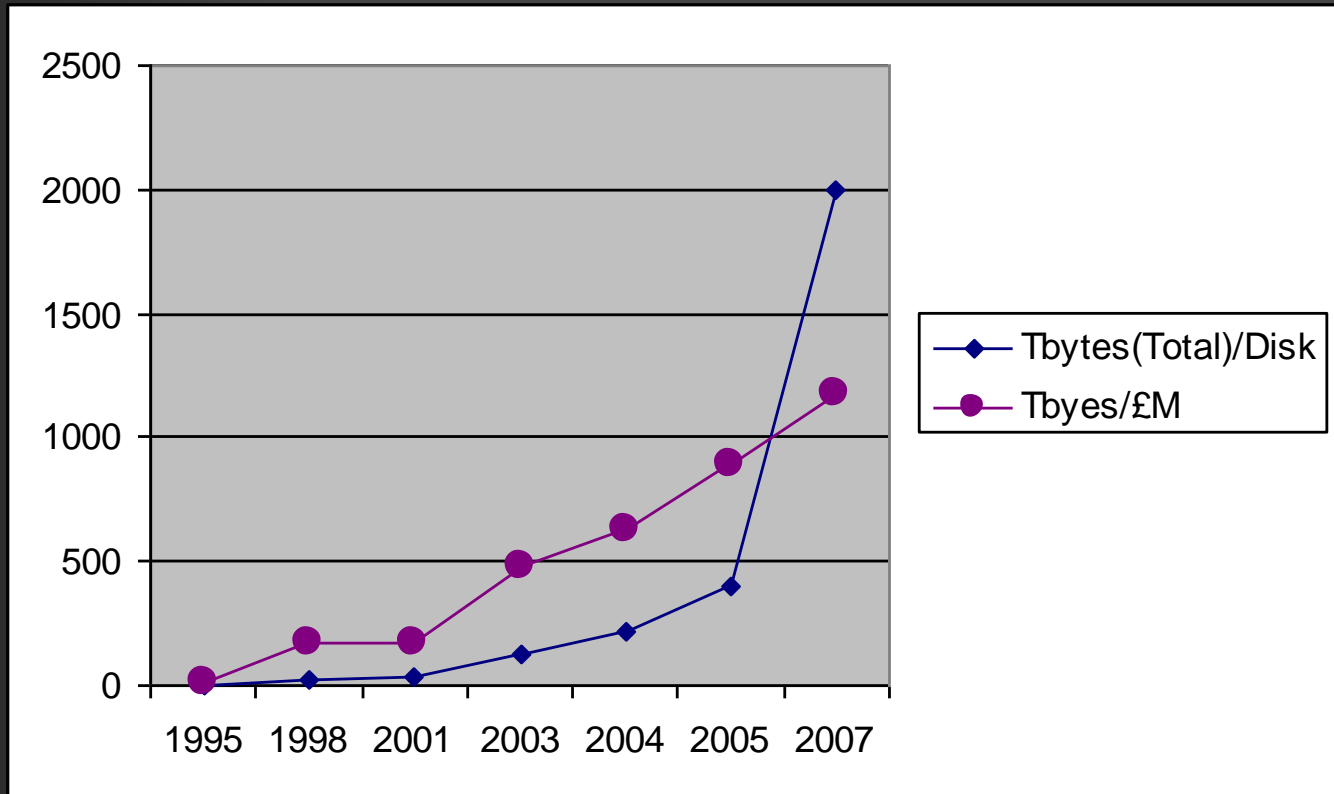
CPW/Clusters

- Within 12 months
 - 4 major clusters (2000 nodes total)
 - 1Gbe and 10Gbe connections
- Deploy parallel and parametric apps
 - Not in one location/latency
- Expect about 30% utilization
 - handling the peak demands
- Link to Common Store
- Interoperable commercially oriented Grid



Storage

- Cost/TByte Chart





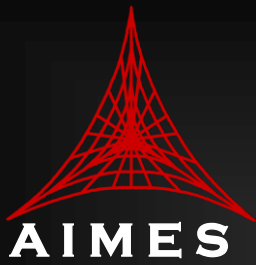
Storage

- Since 1998
 - Speed
 - Capacity
 - Reliability
- Moving to PByte Range
- In “Grid” computing it is the “poor relative”
 - Working with major vendors to produce systems that will support 10-100PByte store



Networking

- LAN and Interconnects
 - Focussing on commodity Gbe
 - Force10
 - ~\$100 port
 - 4 × 10Gbe Links/50km of dark fibre
 - 300 fully non-blocking ports
 - 5Tbit/s Backplane



Local Networking Capacity

- 1999
 - Fast Ethernet
 - Peak data flows (1Gb/s)
- 2003
 - Gbe
 - Peak data flows (100Gb/s)



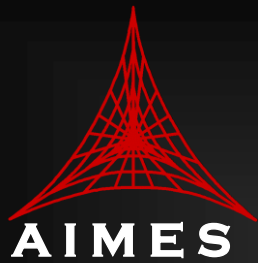
External Connections

- Links to outside world
 - Only Gbit
 - Prototyping 10Gb using Force 10 and 4 clusters
- Link between AiMeS Lab and AiMeS Business Centre
 - 100Mb Microwave!



Software Stack

- Key Features
 - Functionality
 - Reliability
 - Maintenance
- Short term
 - Commercial Solutions (e.g. Scheduling and Storage Cost Accounting)
 - AiMeS Software
- Tracking and Evaluation
 - TeraGrid Compatibility (Major US Labs/DOE)
 - European e-science initiatives
 - Use “Grid” as it emerges



Total Cost of Ownership

- Capital Expenditure
- Deployment Cost
- Maintenance
- Infrastructure
 - Cooling (power)
 - Building Costs /TFlops/m²
- Staff Costs
- Security



Summary

- Technology is moving fast
 - Utility processing
 - Solving Power/\$ rising faster than Moore's "Law"
 - Applications and opportunities