

# ParallellDatorCentrum



# PDC Background

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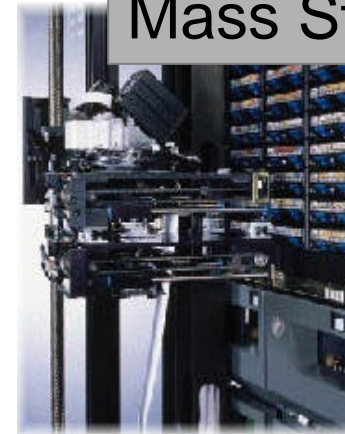
- PDC founded in 1989
  - Research on parallel computing
  - Massively parallel computers available to Swedish researchers
    - CM-2, CM-200, MasPar MP-1, DEC-Cluster
- General Computing Center with IBM SP2 in 1994
- Major Swedish high-performance site in 1995 (HPDR decided)
- HPDR evaluation in 1996 resulting in contract 1997-1999
- Currently under support of The Swedish Research Council



# PDC: The Main Swedish Centre for Scientific Computing

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- Services to Swedish academic research
    - Computer resources
    - High-end Visualisation (VR-CUBE)
    - Mass storage
    - Support/Consultancy
      - Parallelisation,  
Performance Optimisation,...
  - Collaborations and Projects
    - EU-projects
    - The Grid (Globus, DataGrid,...)
    - NPACI international affiliate
    - Parallel and Scientific Computing Institute (PSCI)

IBM SP (300 PEs)  
Fujitsu VX (3 PEs)  
sgi Onyx 2 (12 PEs)  
PC Linux clusters  
VR-CUBE(6 wall)  
ImmersaDesk  
Mass Storage 48TB



# Computing resources



3 processor  
Fujitsu VX  
Vector processor



12 processor  
sgi Origin 2000  
used as graphics  
engine for the VR-  
CUBE

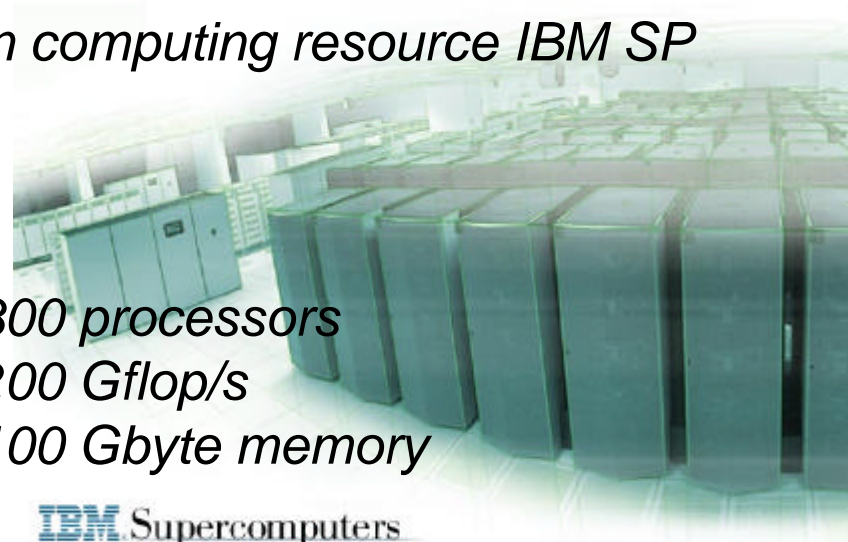


KTH  
Linux  
Lab

Linux-Lab PC Cluster  
16 processors PIII

Linux Cluster  
Stockholm Bioinformatics Centre  
102 processors (PIII and Athlon)

Main computing resource IBM SP



300 processors  
200 Gflop/s  
100 Gbyte memory

IBM Supercomputers  
[www.ibm.com/rs5000/](http://www.ibm.com/rs5000/)

IBM SP (KALLSUP2)  
Computer for  
research and education  
at KTH, 32 processors NH-II



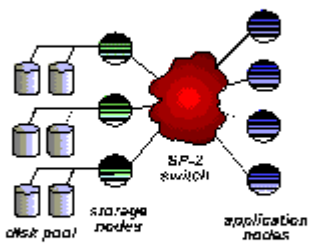
# Mass Storage Facility

*Tivoli storage management for backup and archiving  
Capacity: 48 TByte*

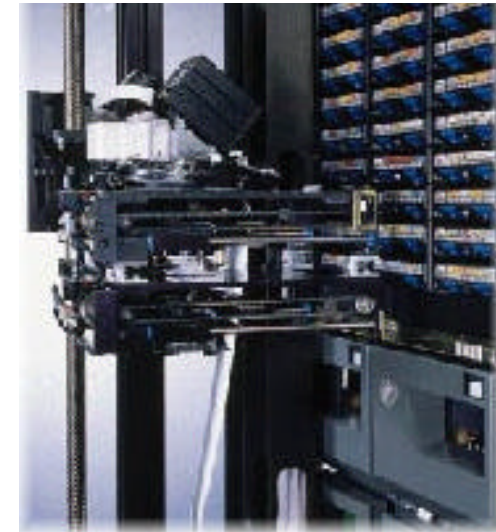
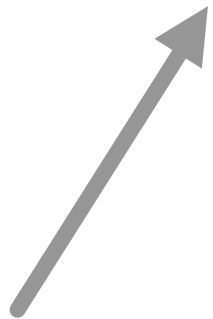
**GPFS: A New Cluster/Parallel File System**

**GPFS Parallel File System**

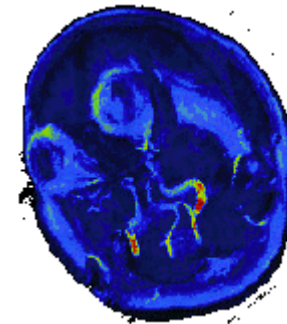
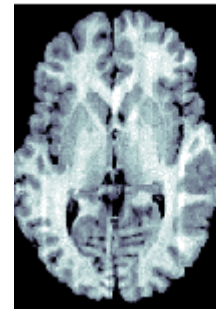
- GPFS file systems are striped across multiple shared disks on multiple storage nodes
- Independent GPFS instances run on each application node and storage node.
- Storage nodes provide shared disk access to all GPFS instances
- GPFS uses client caching and distributed fine-grained locking
- Fault tolerance is provided by logging, data replication, and RAID support
- Standards-compliant (Posix) programming interface



The diagram illustrates the GPFS architecture. It features a central red SP2 switch connected to two groups of nodes. On the left, 'storage nodes' are shown, each with two disk icons. On the right, 'application nodes' are shown, each with a single disk icon. The switch is labeled 'SP2 switch'.



*GPFS Parallel file system on the IBM SP*



*Large datasets, e.g. Brain image database*



# PDC Environment - Storage

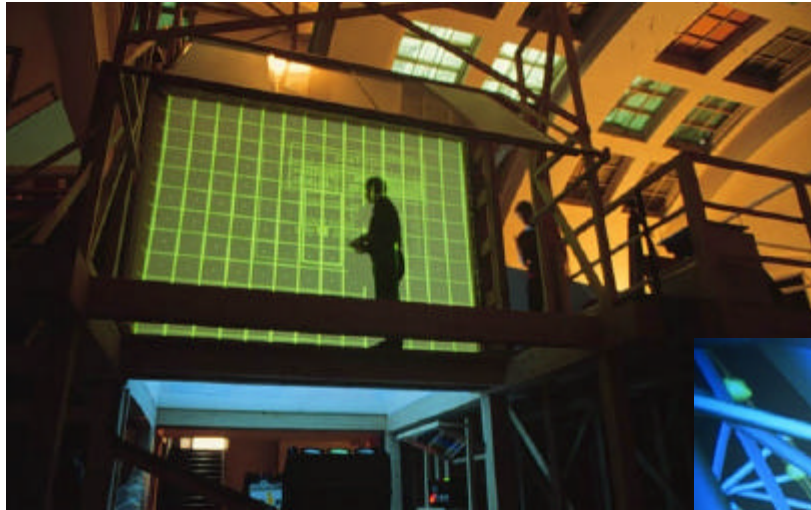
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- User home areas in AFS
  - /afs/pdc.kth.se/home/<1st letter of username>/<username>
- Hierarchical Mass Storage (HSM)
  - 42 TByte capacity
  - Data Migration Facility (DMF)
  - IBM 3494 Tape Library server, IBM 3590 Magstar tapedrives
  - 50 GByte/user quota
- Parallel file system on Strindberg (GPFS)
  - Large files and intensive I/O
  - Run jobs from PIOFS and move data to HSM
- /scratch (local scratch on every node)



# High-end Visualisation

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*Virtual Reality Cube*

*A 6-wall fully immersive  
virtual reality facility*



# Networks

