Wake field simulations using GdfidL

GdfidL overview

- GdfidL – german acronym: *"Gitter drüber – fertig ist die Laube"* could be translated as *"put a grid, and ready you are"*
- Was written around '95 by Warner BRUNS, then at TU-Berlin. Has drastically improved since then.
- Present installations: CERN, ESRF, SLAC, Soleil, SRRC, TU-Berlin, …
- Features:
  - Finite differences – time domain (FDTD)
  - Cartesian mesh, allowing diagonal fillings for better approximation of curved boundaries
  - No meshing of field-free regions
  - Parallel code to run huge problems on clustered computers (10^9 mesh points)

- Comparable codes:
  - MAFIA (plan to outphase on the medium term)
  - MWS (cannot handle wake fields – limited to 32-bit address space)
  - HFSS (frequency domain – FEM - complementary)

CERN Standard FARM PC

From the CERN PC-shop description:

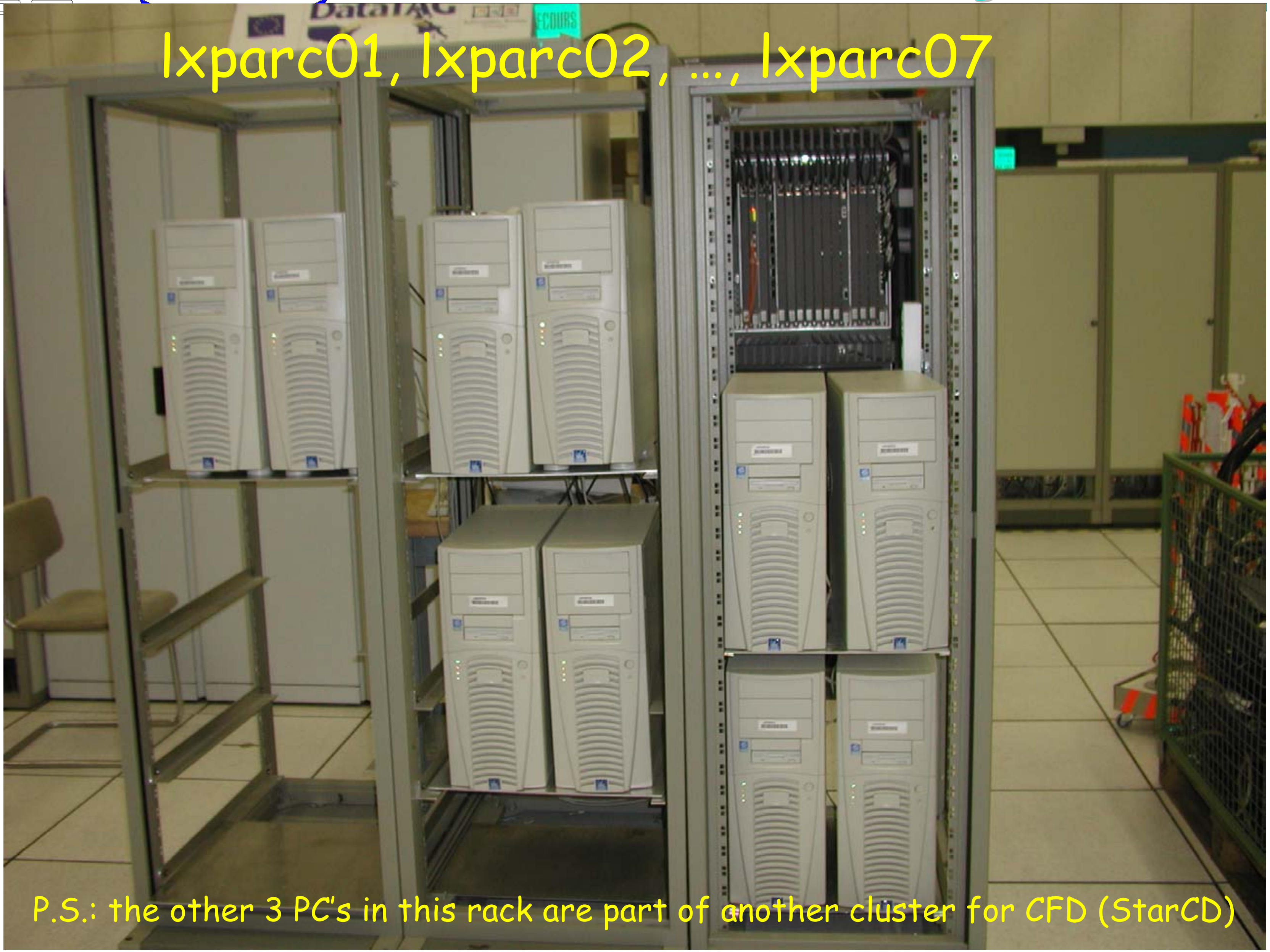
Farm Server- 2.4 GHz

SCEM : Farm Server- 2.4 GHz

well - we expanded to 4 GB

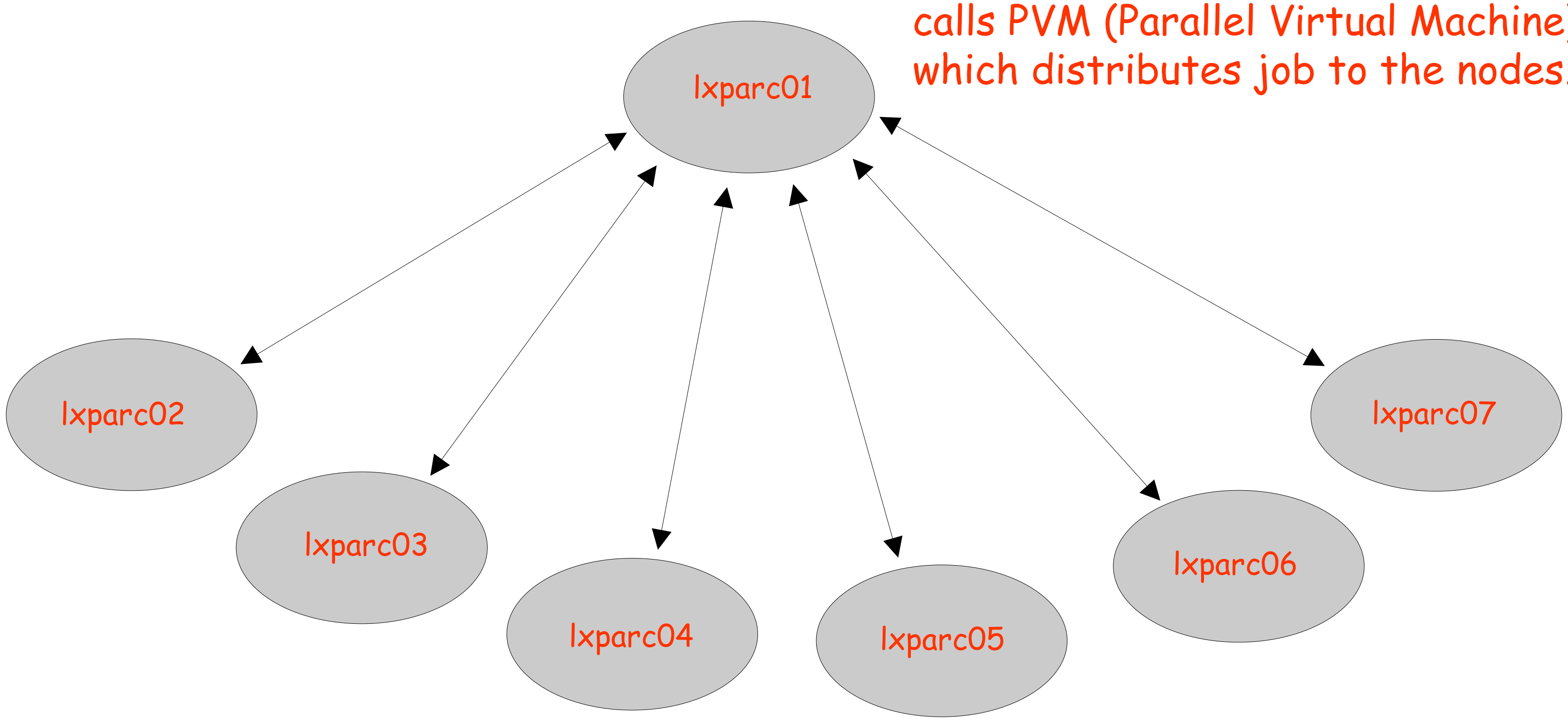
Component	Description
Processor	2 x Xeon - 2.4 GHz
Motherboard	Intel SE7500CW2
Memory	1 GB PC2100 ECC, expandable to 2 GB
Expansion Slots	1 PCI -X 64/133, 2 PCI-X 64/100,2 PCI 32/33
Floppy disk drive	3''1/2 1.44 MB
Hard disk drive	80 GB ATA100, 7200 rpm
Graphics	ATI Rage XL on board with 8 MB video memory
Network	2 x Intel Pro/100+ on board, PXE supported
Audio	n/a
Case	Midi-ATX tower, H x W x D = 520mmm x 213mm x 475 mm
External Drive Bays	2 x 5 1/4" - 1 x 3 1/2', all front accessible

The cluster (building 513)



Configuration

GdfidL,
calls PVM (Parallel Virtual Machine),
which distributes job to the nodes.



Problems which were solved: integragtion with afs (token expiry after 25 h),
Integration with LSF batch system