1. PVM at TU Munich

Research grant SFB 342 “Methods and Tools for the Use of Parallel Computer Architectures”, German Science Foundation

A Methods and Tools

A1 Execution and Runtime Tools
A3 Specification, Analysis, Modelling
A4 Classification and Parallelization by Reduction Analysis
A5 Parallel Inference Systems
A6 Methods for the Specification of Distributed Systems
A7 Efficient Parallel Algorithms and Schedules
A8 Construction of Heteromorphic Parallel Systems

B Applications

B1 Parallel CAD for VLSI
B2 Parallel Databases
B3 Parallel Hierarchical Numerical Algorithms
B4 Parallel Simulation of Highly Complex Digital Systems

C Industrial Partner SIEMENS AG

C1 Load Balancing of Databases on NUMA-Systems, Reliability and Fault Tolerance of Parallel and Distributed Systems
C3 Parallel and Distributed Simulation of Highly Complex Systems

Architectures and Programming Models

LAN of > 600 workstations, heterogeneous
LAN of 120 HP 9000/720 workstations, heterogeneous
ATM switch with heterogeneous workstations (IBM, HP and SUN)

iPSC/2, iPSC/860, PARSYTEC SC, Power Explorer, ...

KSR-1, KSR-2

CRAY YMP

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PVM

MPI

P4

MMK $\rightarrow$ MMK/X

NX $\rightarrow$ NXLib

Tools (Performance Analysis, Visualization, Debugging, Load-Balancing)

A1 Methods and Tools

PVM + CODINE / CONDOR

- Load Balancing
- Distributed I/0
- Fault Tolerance
- Tool Integration

Also: MPI, NXLib, ...

Future Interests: Consideration of heterogeneous high-speed environments (ATM)

B1 / B4 Parallel CAD for VLSI

Parallel layout synthesis
initial placement (GORDIAN)
final placement (DOMINO, SPACER)
routing
Test pattern generation
Simulation
Partitioning

Using MMK-X, NMP, ParMod-C, PICL, PVM, P4 on networks of workstations

B3 Parallel Hierarchical Numerical Algorithms

Combination technique for the solution of 3D POISSON equations on a network of 110 HP 9000/720 workstations

1.1 G Flops (> 5 times CRAY-YMP 4!)

Speedup: 80

Efficiency: 75 %

A5 Parallel Inference Systems

Parallel Theorem Prover SPTHEO on 120 HP workstations

World's fastest theorem prover!

B2 Parallel Database System MIDAS

see companion paper by Pawlowski