Topic 12
European Projects

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Between 1994 and 1998 projects in the area of High Performance Computing and Networking (HPCN) were funded by the European Commission in the framework of the ESPRIT Programme. The three papers in this session originate from three different ESPRIT projects. Since its original conception in the early 1980s the European R&D Programme in Information Technologies (ESPRIT) evolved from the initial technology-push supply-side approach towards IT applications and technology take-up with an increasing involvement of the users. Currently as part of the V Framework Programme the IST Programme continues its support of research, development and demonstration of Information Society Technologies.

The first paper presents work carried out in the NEPHEW project, which promotes cluster computing as a cost effective platform for parallel computing. In particular, the project investigates clusters consisting of PCs with Windows NT and an SCI interconnect. Three computationally intensive applications are implemented on this platform: Restoration of historic film material, low-cost flight simulation for pilot training, and reconstruction of medical PET (positron emission tomography) images. In order to reduce the effort of implementing and maintaining parallel applications, the PeakWare programming environment has been ported to the target platform. The paper by W. Karl et al. reports on first experiences with this environment gained with the PET application. The experiences are promising, both with respect to the ease-of-use of the programming environment and the communication speed of the PC cluster.

The next two papers both are devoted to the development of high performance simulators, which reflects the focus of the ESPRIT programme on applications in the area of simulation. Partially by chance and partially because it is an important topic for our society, they are both in the area of traffic control.

The SEEDS project especially addresses the problem of ground traffic control at airports. It developed a simulation environment for the analysis and evaluation of distributed traffic control systems. The distributed environment consists of components for, e.g., scenario generation, visualization, actor modeling and automatic decision support systems, which are connected via a CORBA middleware. The paper by T. Hruz et al. presents one special component of this environment: The Airport Management Database System. It presents the requirements and the design of this component and also some interesting experiences with the industrial use of Java, CORBA and Open Software tools.

The HIPERTRANS project puts a focus on the modeling and simulation of urban road networks. The traffic simulator is intended to be used for the testing and the assessment of traffic control systems, for the training of operators, and

for forecasting, i.e. for predicting the effects of control decisions. Obviously, the latter use requires that the traffic simulation can be performed faster than the real traffic evolves. Thus, high performance simulation techniques are needed. The paper authored by S. E. Ijaha et al. presents an overview on the simulation system, which uses parallel execution based on model partitioning to achieve the performance necessary for forecasting.