

HPCN

A Tool for European and Chinese Users

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A few questions:

HPCN?

Why HPCN?

Why HPCN in China?

Why European HPCN?

Why Sino-European HPCN?

- Why for China?
- Why for Europe?

HPCN?

HPC - High-Performance Computing

Traditional (rather expensive)

Single-processor computers

- Vector computers

Multi-processor computers

- Shared-memory computers
- Distributed-memory computers
- Individual processor nodes
 - Scalar (generally superscalar)
 - Vector
 - Scalar and vector

Distributed Computing

Networked servers (also expensive ones)

Networked workstations

Networked Pcs

Networked "all of them"

All working

- on a single program run
- in a co-ordinated way

New software

parallel and distributed applications

tools for parallelization and distribution

HPN - High-Performance Networking

Need for fast data transfer

- for distributed computing
(communication is **the** bottleneck)

Need for high data-volume transfer

- Web applications
- commercial applications
- less important in distributed computing

New technologies

- fiber optics
- ATM
- SCI

Why HPCN?

Relatively cheap tool for technological development

Simulation

- gives faster results than physical (chemical, etc...) experiments
- allows more playing with parameters
- allows more thorough investigation

High performance multi-media applications

High data volumes transported over very long distances

Why HPCN in China?

Fast growing economy

High need to improve productivity

Exploding telecommunication demand

High investments in high-tech infrastructure

Need for information spreading in a huge country

- Video on Demand
- Education far away from teaching centres
- High-performance Web Server
- High demand for most advanced networking technologies

High demand for numerical modelling

- environment and weather forecast
- seismic and oil reservoir simulation
- aviation and automotive design

Why European HPCN?

European HPCN =

- European application user
- + European hardware provider
- + European software provider
- + European know-how provider

Long-time HPCN users in Europe

- automotive industry
- national aviation industry
- transnational aviation industry
- oil reservoir simulation
- environment and weather
- chemical and pharmaceutical industry
- mobile communication simulation
- banking

Well-known HPCN software and know-how providers in Europe

- Finite-element codes
- Chemical modelling
- Tools for parallelizing and distributing codes
- Environment and weather modelling

HPCN hardware providers present, but less widely known than US or Japanese

- Parallel computers
- Networking for distributed processing

Generally more flexibility because smaller businesses

More easy discussions than with Japanese (cultural difference)

Experience in transnational co-operations thanks to EU programs

Why Sino-European HPCN?

New challenges due to

- co-operation
- new, sometimes unthought of problems
- different approaches to problem solving
- differences in applying technologies
- different technological starting points

Applying existing technologies to new environments

Applying existing know-how to new technologies

Creating totally new HPCN approaches

Why for China?

Getting new technologies

Learning the European approach

- US and Japanese HPCN culture already present

Developping HPCN usage in the industry

Tool for developping the industry inside the country (off the east coast region)

New possibilities to reach and teach people in rural areas and small towns

Create a comprehensive HPCN industry in China

Why for Europe?

China is a huge market of the future

- Population: 1.212 billion
- GDP per capita (1995): US \$ 573
(2000): US \$ 1,300
- GDP growth rate (1995): 12 to 13%

Fast growing middle class

- more individuals with
income > US \$ 100 000 / year
than in any European country

New partners for product development

Operation within bigger dimensions

New approaches

New applications

New products

What are the advantages for both?

Developping HPCN skills

Developping new intelligent products

Therefore more competitiveness in

- the booming Chinese market
- the more crowded European market
- other markets