



Panel discussion:

What are the Necessary Ingredients for Scalable OpenMP Programming ?

Moderator:

Wolfgang E. Nagel (ZHR)

Panelists:

Eduard Ayguade (CEPBA),

Mark Bull (EPCC),

Barbara Chapman (UH),

Larry Meadows (Sun)

Alistair Rendell (ANU),

Stefano Salvini (NAG),

Mitsuhisa Sato (Tsukuba),

Sanjiv Shah (Intel)

What are the Necessary Ingredients for Scalable OpenMP Programming?

Question 1:

Large shared memory systems will have **non uniform memory access (NUMA) !**

- How do we cope with it?
- Memory placement will be an issue, for ccNUMA systems as well as for software distributed shared memory systems.
- Do we need additional directives, or can this be handled efficiently enough by the underlying system?

What are the Necessary Ingredients for Scalable OpenMP Programming?

Question 2:

Do we need more **asynchronosity** in the OpenMP API in order to be able to build scalable applications?

- Task queues, nested parallelism, more flexible and elegant synchronization primitives have been proposed, their validity has been demonstrated, yet **except for nested parallelism**
- the compiler manufacturers are very hesitating to attack it
- these elements did not yet find their way in the OpenMP API.

What are the Necessary Ingredients for Scalable OpenMP Programming?

Question 3:

What about OpenMP on Clusters?

- Several compilation systems for the usage of OpenMP on Clusters are under development.
- So far OpenMP even ignores the existence of ccNUMA systems.
- On the other hand HPF was not particularly successful in the past.
- Is Cluster-OpenMP a promising approach to implement parallel applications on a poor man's parallel computer?
- Can Cluster-OpenMP be an alternative to MPI?

What are the Necessary Ingredients for Scalable OpenMP Programming?

Question 4:

What about performance issues on scalable systems?

- Is performance an issue for OpenMP programming at all?
- What are the major limiting factors (performance wise)?
- What should we do with the busy waiting approach?
- How should we find performance bottlenecks with data misplacement?
- Should we find everything manually by hand?

What are the Necessary Ingredients for Scalable OpenMP Programming?

Final Question:

By the way, **what is**
Scalable OpenMP Programming?

Where are we heading?