Clusters de Multicores

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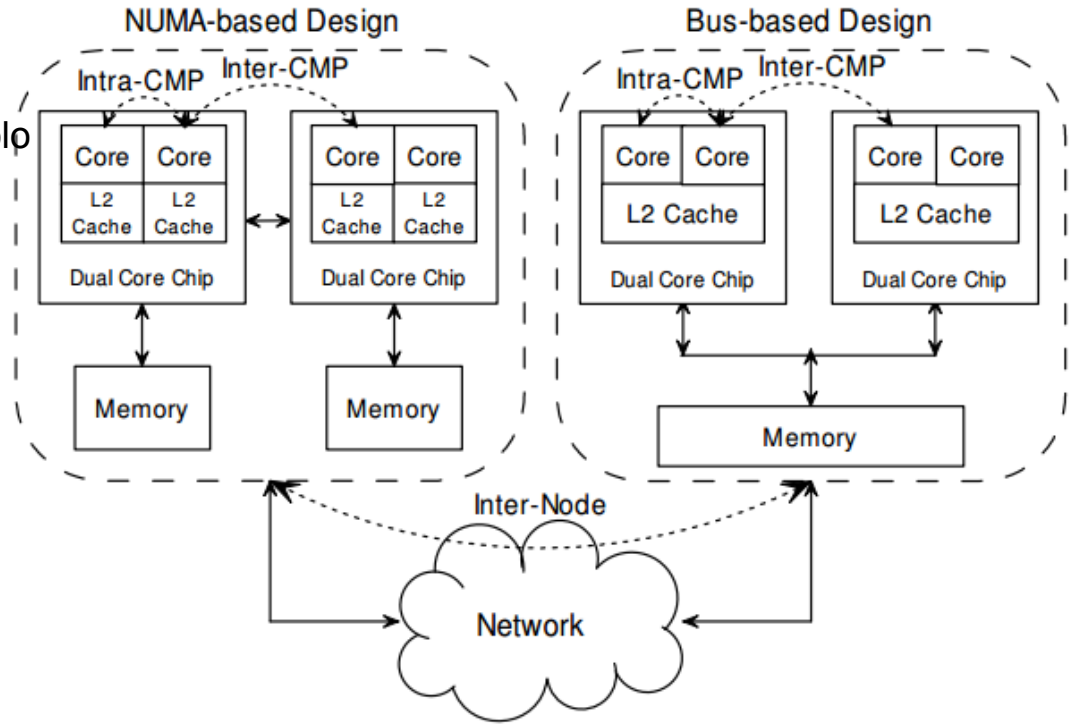
Definición

Grupo de computadoras con múltiples procesadores unidos por una red de tal forma que el conjunto es visto como un solo sistema



Conceptos - Technologies that add logical processors.

SMP or Simultaneous Multiprocessing in which one adds logical processors by adding multiple physical chips per node with one or more execution cores each.

CMP or Chip Multiprocessing in which one adds logical processors by adding multiple execution cores to one single physical chip.

SMT or Simultaneous Multithreading in which one adds logical processors by implementing multiple execution threads per execution core.

Conceptos - Three levels of communication between processors.

Intra-CMP is the communication between processors on the same chip.

Inter-CMP is the communication between chips on the same node.

Inter-node is the communication between two processors on different nodes.

Implications

Complex software

- Different Communication types

Better performance per node

Better granularity control

Examples

- Most common architecture used nowadays for HPC
  - Most processors are already multi-core/multi-thread

China’s Tianhe-2:

32,000 Intel Xeon E5-2692 12C

Hybrids

- General purpose processors
  - Commodity hardware
- HPC specific coprocessors
  - GPUs
  - MIC (Xeon Phi)
- Front end processors (SPARC)