

**HYBRID NUMA COMA CACHING SYSTEM AND METHODS FOR SELECTING
BETWEEN THE CACHING MODES**

ABSTRACT

The present invention provides a hybrid Non-Uniform Memory Architecture (NUMA) and Cache-Only Memory Architecture (COMA) caching architecture together with a cache-coherent protocol for a computer system having a plurality of sub-systems coupled to each other via a system interconnect. In one implementation, each sub-system includes at least one processor, a page-oriented COMA cache and a line-oriented hybrid NUMA/COMA cache. Such a hybrid system provides flexibility and efficiency in caching both large and small, and/or sparse and packed data structures. Each sub-system is able to independently store data in COMA mode or in NUMA mode. When caching in COMA mode, a sub-system allocates a page of memory space and then stores the data within the allocated page in its COMA cache. Depending on the implementation, while caching in COMA mode, the sub-system may also store the same data in its hybrid cache for faster access. Conversely, when caching in NUMA mode, the sub-system stores the data, typically a line of data, in its hybrid cache.

(Fig 3a)