

VIRTUAL ARCHITECTURE AND INSTRUCTION SET FOR PARALLEL THREAD COMPUTING

ABSTRACT OF THE DISCLOSURE

A virtual architecture and instruction set support explicit parallel-thread computing. The virtual architecture defines a virtual processor that supports concurrent execution of multiple virtual threads with multiple levels of data sharing and coordination (e.g., synchronization) between different virtual threads, as well as a virtual execution driver that controls the virtual processor. A virtual instruction set architecture for the virtual processor is used to define behavior of a virtual thread and includes instructions related to parallel thread behavior, e.g., data sharing and synchronization. Using the virtual platform, programmers can develop application programs in which virtual threads execute concurrently to process data; virtual translators and drivers adapt the application code to particular hardware on which it is to execute, transparently to the programmer.

Figure 1