Developing Multicore Systems with Poly-Messenger® & Simics®

Application Migration and System Design for Multicore

Virtutech and PolyCore Software ease the development of multicore and multinode systems.

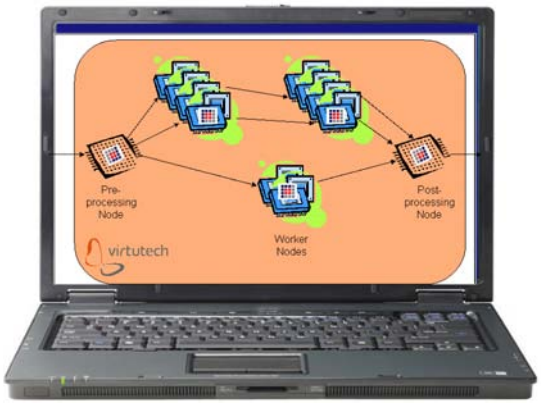
As silicon vendors and system architects move forward with complex multicore processors and multi-node system designs, software developers are becoming increasingly challenged by the need to properly manage data communications between each processing node within the system.

In order to maximize system flexibility and performance, communications between processing nodes of a distributed or multicore system should be coordinated, prioritized and managed. This task becomes increasingly difficult for developers when the number of processing elements increases, when underlying hardware architectures or data transports vary, or when data routing becomes complicated. Another aspect that often makes this task difficult is the catch-22 situation between software development and hardware availability.

Poly-Messenger®, Poly-Generator™ & Poly-Mapper™

Poly-Messenger is a fast, flexible, configurable, and hardware transparent communications solution that has been tailor-made for multicore and multiprocessor systems.

Poly-Messenger, manages the transparent exchange of data between processing elements. It provides efficient data routing, system flexibility and scalability by supporting customizable subnets, queues, endpoints, and nodes. It also supports auto-discovery so that the system can be easily scaled by changing the number of actual processing nodes. Developers are able to write their multicore/multi-processor applications without concern for the actual number of physical processing nodes that are available now, or in the future.

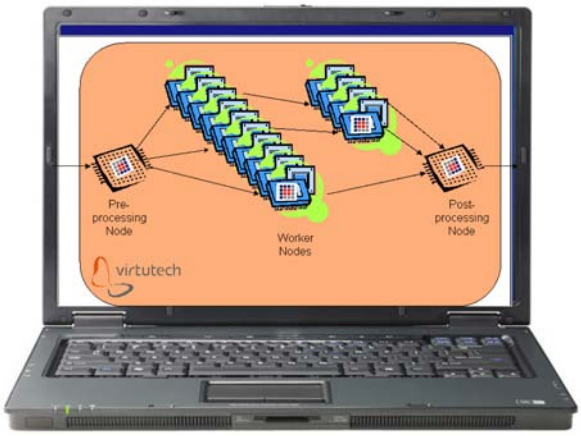


Poly-Messenger Manages Communications Between Processing Nodes

Poly-Mapper allows developers to graphically create communications topologies and inter-connections for multicore and multi-node distributed systems. Once these communications routes have been defined, Poly-Generator automatically generates the software code necessary to implement that that topology, all within hours instead of weeks. This fast development pace allows developers to iteratively evaluate a large set of system configurations in order to optimize the application.

Simics

Virtutech® Simics runs on a standard laptop or desktop PC and provides software and system developers with a virtual platform that can be used to develop full software for any system - from single-core boards all the way up to extremely complex heterogeneous multicore systems.



A Full Software Development Environment on a Standard PC

Because virtual platforms developed using Simics are functionally accurate at the hardware/software interface, they execute precisely the same binaries that will run on the physical target. This allows all software including firmware, operating system, drivers, and application code, to be designed, deployed, and debugged - all while using the virtual platform.

Simics high fidelity combined with its real-world usable performance has led many of our customers to agree that over 90% of their software development, test, and integration can be performed, on Simics alone. Simics benefits don't stop at the development platform however.

The adoption of a Virtualized Systems Development™ as a key element of the product life-cycle can result in sweeping cost and schedule savings across several disciplines, including product marketing, software engineering, integration and test, support and sales.

PolyCore Software & Virtutech Benefits

Early-Stage System Architecture Definition: The combination of PolyCore Software and Virtutech enables developers to quickly model their system architecture long before hardware is available.

System Debugging: Because Simics provides a fully virtualized development environment, the ability to analyze and debug a multicore or multi-node system is extraordinary. Simics allows a full system stop – that is, a full stop of every component, clock, interrupt controller within the model. This allows a bug to be identified and resolved without the rest of the system moving on past a point of detection and correction.

Flexibility and Scalability: Both Simics and Poly-Messenger have been developed to provide a high degree of modularity and scalability. This allows software engineers to quickly modify their "hardware" configurations in order to run different what-if scenarios. Because the whole solution runs on a virtual platform, developers can even modify hardware specifications such as memory latency to see the effect on the overall system functionality or performance.

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