

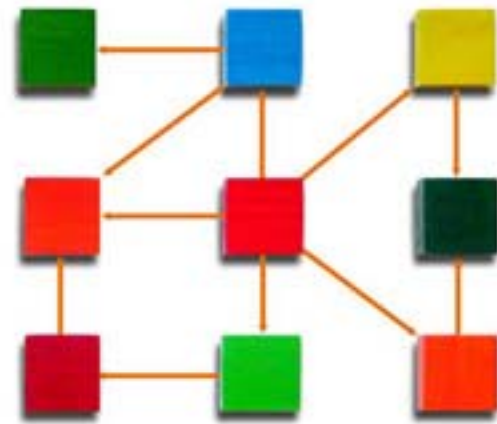
Multicore Demystified

Multicore-enabling your embedded system

You have probably noticed the rapidly increasing number of multicore architectures involving CPUs, DSPs and hardware accelerators. These new architectures offer the promise of reduced cost, increased performance, or lower power consumption. [see *What is Multicore?* below] And if you are like many development teams you have begun looking at the possibility of using multicore hardware. But unless you have a totally “clean sheet” design, you realize that your application must be multicore-enabled if you want to take advantage of these benefits. That leads to several questions:

- What changes will I need to make to my application to make it work in a multicore environment?
- How will my application communicate among the different CPUs?
- Does it make sense to use more than one operating system?
- Are there multicore standards that will protect my IP investment down the road?
- Are there tools available to help me?

Quadros Systems, in partnership with PolyCore Software, offers a suite of products, tools and services to make multicore a reality for you. Using innovative and scalable software technologies, your application can rapidly be multicore-enabled and deployed within a wide range of hardware platforms.



Multicore enablement

To migrate your application to a multicore environment, you need to have the application functions seamlessly communicate regardless of the compute engine where the function may reside. PolyCore Software has tools and runtime modules that simplify your application’s communications in a multicore environment.

Application Mapping

The application’s functions need to be assigned to a compute resource and the communications paths need to be identified. *Poly-Mapper™* is a graphical user interface tool that enables the designer to quickly map the systems’ resources, both hardware and operating systems, to the application functions. The resulting topology map is used by *Poly-Generator™* to produce routing tables, data

What is Multicore?

Multicore can be more than one computer engine on a single chip, or it can be multiple chips or even multiple boards. Compute engines may be homogeneous architectures (use the same instruction set) or heterogeneous architectures (different instruction sets). Applications are commonly deployed across a multicore environment using symmetric multiprocessing or asymmetric multiprocessing.

Symmetric MultiProcessing (SMP) is employed to dynamically assign work to available homogeneous compute engines using a common/shared operating system.

In an Asymmetric MultiProcessing (AMP) application, compute engines are assigned specific functions. The compute engines may be homogeneous or heterogeneous cores. An AMP application may use the same operating system instantiated on each compute engine or may have a different operating system for each compute engine for an assigned function. An example of AMP would be a Linux application with a graphics acceleration card.

structures and initialization enabling the intercore communications for your application. Using the same tools you can rapidly remap your application functions to optimize the use of systems resources and to fine-tune system performance. The application could be remapped and readied for testing in less than 15 minutes.

Intercore Communications

Poly-Messenger[®]/*MCAPI* provides a high level abstraction for inter-core communications. [see *What is MCAPI?* below] That means easier programming of communications between cores and simple management of message passing and data transfers. Thinking about using a general purpose OS like Linux on one core and RTX on another? *Poly-Messenger* seamlessly handles the communications between the OSes.

Poly-Messenger's virtual communication layer also readies your application for deployment on future architectures by abstracting the underlying interconnects, operating systems and network topology (bus, star, mesh, or hybrid) from the application.

Your Multicore Team

PolyCore Software and *Quadros* Systems provide an integrated solution for multicore applications which abstracts the hardware platform from the application and scales to meet the application requirements. Using our innovative and scalable software technologies, your application can rapidly be multicore-enabled and deployed within a wide range of hardware platforms.

Our experts are available to discuss your application requirements and to assist with deploying your application on a multicore topology. [Go to the multicore section of the Quadros Systems website for more information.](#)

About PolyCore Software

PolyCore Software, Inc. simplifies multicore software development, reducing time to market, risk and cost, while preserving existing software investments. *PolyCore* Software provides run-time solutions and tools for multicore platforms, serving markets as digital consumer, communication infrastructure, industrial automation, aerospace and defense and medical. Contact us for more information.

Web: www.polycoresoftware.com

Email: info@polycoresoftware.com

Tel: 650-570-5942

What is MCAPI?

The Multicore Association has defined this open standard for multicore communications. MCAPI (multicore communications application programming interface) supports a small footprint interface with low resource usage that enables source code portability across a variety of architectures .

The Multicore Association is an open membership organization that includes leading companies implementing products that embrace multicore technology. Members represent vendors of processors, operating systems, compilers, development tools, debuggers, ESL/EDA tools, simulators, as well as application and system developers, and share the objective of defining and promoting open specifications.

For more information on MCAPI, visit www.multicore-association.org/workgroup/mcapi.php