ARGOS
(A Research GMMP Operating System)

New Mexico State Univeristy
Electrical Engineering

Personnel

Principal investigator	Eric E. Johnson (EECE)	ejohnson@nmsu.edu
Faculty	Arthur I. Karshmer (CS)	arthur@nmsu.edu
Graduate students	R. Moore (EECE)	rmoore@nmsu.edu
	J. Polson (EECE)	jpolson@nmsu.edu
	M. Roberts (CS)	mroberts@nmsu.edu
	J. Thomas (CS)	jthomas@nmsu.edu

Contact

Eric E. Johnson
Department of Electrical and Computer Engineering
New Mexico State University
Box 3-O
Las Cruces NM 88003

(505) 646-4739

Project Description

Global Memory Message Passing (GMMP) multiprocessor architectures [?] are global memory architectures optimized for the message passing model of computation, in which process access environments are strictly isolated. Such architectures attempt to realize both the high performance and relatively simple code and data partitioning of shared memory multiprocessors and the reliability and verifiability claimed for the message passing model. We are building a machine of this class called the Virtual Port Memory (VPM) machine ([?], [?]).

In the VPM architecture individual processing elements reference a global memory using system-wide virtual addresses translated at the memory. There is a separate message bus used for all interprocessor messages. The processing elements have large caches with no coherency control support.

We are also developing a message-based operating system ARGOS for studying the ramifications of this architecture choice [?]. ARGOS provides each process a private address space, performing message-based communication and synchronization via messages. ARGOS uses the global memory to implement rapid message passing and copy-on-write between processes. The object manager, file manager, and pager all utilize the global memory for rapid communication and the message bus for synchronization.

We are studying the appropriate distribution of services among objects and processors given the GMMP structure. Management of objects, files, and pages thereof maps differently with non-shared global memory.

Status

Both the hardware and operating system are currently being developed.

Report Availability

The technical reports of the project are available by mail from the principal investigator at the address above.

Funding

This work is funded in part by the U. S. Army Research Office under contract #DAAL03-87-K-0106 and by a grant from the AT&T Foundation.