ARCADE

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Project Description

ARCADE is a distributed operating system kernel. The principal design objective was to build a system that facilitates seamless interaction among tasks executing on distributed and potentially heterogeneous processors. The system supports two primary abstractions: tasks and data units. Tasks are the active, executable elements. Data units are passive structured collections of information that are mapped into the address spaces of tasks. The services provided by the ARCADE kernel support the following operations: creation and destruction of tasks and data units, task migration, distributed shared data units, data unit locking and update propagation, and a task synchronization facility based on a programmable logic array analogy. A prototype system is currently operational on a collection of 80386-based PS/2s connected by a token ring network. A second implementation is currently being developed for System/370 processors.

Report Availability

Technical reports and articles concerning ARCADE are available via anonymous FTP from yogi.pcl.nd.edu [129.74.10.250].

References

[1] D. L. Cohn, P. M. Greenawalt, M. R. Casey, and M. P. Stevenson, "Using kernel-level support for distributed shared data," in *Proceedings of 1991 USENIX Workshop on Experiences with Distributed and Multiprocessor Systems*, pp. 247–259, Mar. 1991.

[2] D. L. Cohn, W. P. Delaney, and K. M. Tracey, "ARCADE: A platform for heterogeneous distributed operating systems," in *Proceedings of USENIX Workshop on Experiences with Distributed and Multiprocessor Systems*, pp. 373–390, Oct. 1989.

[3] D. L. Cohn, W. P. Delaney, and K. M. Tracey, "Structured shared memory among heterogeneous machines in ARCADE," in *Proceedings of 1st IEEE Symposium on Parallel and Distributed Processing*, pp. 378–379, May 1989.

[4] W. P. Delaney, D. L. Cohn, K. M. Tracey, and M. R. Casey, "Data units: A process interaction paradigm," Tech. Rep. 913, Department of Computer Science and Engineering, University of Notre Dame, Mar. 1991.

[5] K. M. Tracey, "Group management: An approach to processor sharing for cooperative multi-task applications," Tech. Rep. 91-02-01, Department of Electrical Engineering, University of Notre Dame, Feb. 1991.

[6] K. M. Tracey, "Migrating to processor sharing," Tech. Rep. 90-11-01, Department of Electrical Engineering, University of Notre Dame, Nov. 1990.

[7] K. M. Tracey, "Processor sharing: Research overview and proposal for implementation in ARCADE," Tech. Rep. 90-07-02, Department of Electrical Engineering, University of Notre Dame, July 1990.

[8] W. P. Delaney, D. L. Cohn, and K. M. Tracey, "High performance implicit communication in a distributed system," Tech. Rep. 90-07-01, Department of Electrical Engineering, University of Notre Dame, July 1990.

[9] W. P. Delaney, K. M. Tracey, and D. L. Cohn, "Unifying kernel-level and language-level approaches to distributed shared data," Tech. Rep. 89-11-01, Department of Electrical and Computer Engineering, University of Notre Dame, Nov. 1989.

[10] D. L. Cohn, W. P. Delaney, and K. M. Tracey, "ARCADE: An architecture for a distributed environment," Tech. Rep. 889, Department of Electrical and Computer Engineering, University of Notre Dame, Nov. 1988.

[11] D. L. Cohn, W. P. Delaney, and K. M. Tracey, "Data management in the ARCADE distributed environment," Tech. Rep. 887, Department of Electrical and Computer Engineering, University of Notre Dame, Oct. 1988.

[12] K. M. Tracey, *Processor Sharing for Cooperative Multi-task Applications*. PhD thesis, University of Notre Dame, Apr. 1991.

[13] W. P. Delaney, *The ARCADE Distributed Environment: Design, Implementation and Analysis.* PhD thesis, University of Notre Dame, Apr. 1989.

[14] A. Banerji, “A new programming model for distributed applications,” Master’s thesis, University of Notre Dame, July 1990.

[15] E. R. Smith, “A new distributed file system architecture for ARCADE,” Master’s thesis, University of Notre Dame, July 1990.

[16] M. J. Bellon, “A new approach to secure distributed operating system design,” Master’s thesis, University of Notre Dame, Apr. 1990.

[17] T. M. Bryden, “C language support for object-oriented programming in ARCADE,” Master’s thesis, University of Notre Dame, Nov. 1989.

[18] K. M. Tracey, “The design and implementation of an ARCADE-based operating system,” Master’s thesis, University of Notre Dame, Apr. 1989.

[19] W. P. Delaney, “Experiences with distributed shared data in ARCADE.” Department of Electrical and Computer Engineering, University of Arizona, Oct. 1990.