

Position Paper

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In the past decade, distributed systems have become a prominent subject of computer systems research. It is obvious why this is so: People have come to rely on computer systems and traditional systems are prone to failures. Distributed systems have the potential of being much more reliable. A distributed system has enough redundancy that, when one component fails, others can take over. Increasingly, people interact through their computers by using electronic mail, file sharing, remote databases, electronic banking, and so forth. Distributed systems can bring structure and unity into the interactions between computers. People require so much computer power for some applications that a single processor cannot provide enough. Distributed systems provide an infrastructure for parallel applications.

A decade or more of distributed-systems research has yielded many techniques for solving the problems posed by distributed computing. Some of these techniques have been in daily use for some time, others are still in an experimental phase. Many research groups have built distributed operating systems, but few have become popular. This impopularity is only partly due to computer users' infamiliarity with distributed systems. It is a fact that many distributed systems that have been built to date are disappointingly slow, much slower than a traditional time-sharing system of comparable power.

The Amoeba project is a distributed systems research project that concentrates on performance aspects of distributed computing. In the project it is felt that if the system doesn't perform better than other systems in every aspect, something has been done wrong. Today, the Amoeba distributed operating system may well be the fastest of its kind.

Amoeba is a joint project of the Vrije Universiteit and the Centre for Mathematics and Computer Science in Amsterdam and the Computer Laboratory of Cambridge University. Currently, the Amoeba group is working on the first release of the Amoeba system to academic and industrial research groups by the end of 1989. Meanwhile, work continues to make Amoeba live up to its reputation of a high-performance distributed system. Research themes currently are the investigation of distributed computing over wide-area networks and in multi-organizational environments, designing user interfaces for distributed systems, developing a multiprocessor version of the Amoeba kernel, and issues of scale.