While this program description (revised and touched up) conveys the general area of research in operating systems and distributed systems that NSF has supported in the past. It is a core area. This material derived from NSF Link
http://www.nsf.gov/pubs/2005/nsf05629/nsf05629.htm

Operating Systems and Distributed Systems

Parallel and Distributed Operating Systems (PDOS)

Many computer systems are general-purpose, meaning that they use commodity hardware and the systems software supports a variety of applications. General-purpose computer systems include uniprocessors, shared-memory multiprocessors, local area distributed systems, clusters, and wide area distributed systems. Operating systems are used for a wide array of hardware devices including mobile devices and applications: glasses, watches, phones etc. Operating systems used for these special purpose devices can be derivatives of general purpose operating systems.

The PDOS topical area supports research and education projects that advance the state of the art in operating systems software for the range of computer systems described above. The goals are to improve the capabilities, reliability, and efficiency of existing systems, to create new ways to utilize current technologies, and to harness the potential of emerging technologies. Projects are expected to increase our fundamental understanding of how to design and build better operating systems and/or to create new types of systems and systems services and to demonstrate their utility through empirical prototypes that are evaluated and disseminated to the community.

Specific topics of interest to the PDOS area include the following:

- **Resource management:** Scheduling, virtual memory management and protection; management of multiple levels of memory hierarchy and file systems; process and data migration; scalable and robust methods for communication and synchronization; virtualization of resources and efficient resource utilization; and resource management across heterogeneous platforms with distinct administrative boundaries.
- **System services:** Mechanisms that enable dynamic coalitions, such as peer-to-peer or ad-hoc groups; membership, naming, and authorization services; local and remote resource discovery and resource requests services; system monitoring for performance tuning or to provide resilience to faults; support for debugging large, widely dispersed distributed systems; checkpoint and recovery services; configuration management; and customizable and adaptable systems services.
- **System architecture:** New ways to organize systems, such as peer-to-peer; software architectures that scale to handle thousands of components; software architectures addressing changing trends, such as in sizes or speeds of processors, memory, address spaces, and backing store; multi-threaded kernel design and kernel-level management functions for end-to-end provisioning of services; and dynamic, customizable kernels.
- **System properties:** Fault-tolerance and reliability; replication; efficiency; security; scalability; and, ability to cope with unexpected events; improving manageability, configurability and accountability while reducing the associated costs and overheads.