

Studies on Construction Method of Distributed Operating System Based on the Abstraction of Computer Resources

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It is desirable to be able to use resources of more than one computers at the same time, in an environment which plural computers are connected via a network. Furthermore, it should be possible to use these resources without being conscious of physical locations of each resources. Various investigations of distributed operating systems have been done for realization of such location transparency. However, the location transparency which conventional distributed operating systems provide have some problems.

In order to solve the problems of conventional distributed operating systems, it is necessary to make a operating system structure itself suitable for distributed environment. From these background, this thesis propose a new construction method of a distributed operating system to utilize resources of more than one computers effectively. And Solelc distributed operating system which is built based on the proposal method is described.

In Solelc, single kernel manages all computers in a system. By managing computers in this way, location transparency of resource operations and a resource management with considering whole system are realized. In Solelc, the abstraction of computer resources is done in order to realize such management of computers. Exactly, by mechanisms which work on each computers for doing the abstraction of computer resources, an environment which provides location transparency in resource management is realized. By having a kernel work on this environment, the kernel works with location transparency, and the kernel gets possible to manage more than one computers at the same time. As a result, single kernel gets possible to manage all computers and a resource management with considering whole system is realized. In addition, an advantage to simplify processing of the kernel by unified resource management is provided. As a result, processes work with location transparency, and they get possible to use resources of whole system effectively.