HPC Usability Research Team

K computer
Computer simulations create the future

Our ultimate goal is to enable many people to use the K computer. We are developing a computing portal site to which program developers and data providers can upload their programs and data so that users of the site can make use of them as they wish. In parallel with this, we are also investigating two fundamental technologies for the site. One is virtualization technology by which a number of virtual K computers can be created on the host K computer. The other technology is a program verification scheme to detect incorrect programs before they are executed. Once these technologies are implemented, many people will be able to use the computing portal site in a fair, safe and secure way.

Team Leader
Toshiyuki MAEDA

Development of a Computing Portal Site

The diagram opposite illustrates how both program and data providers can upload their programs and data to the portal site on the K computer, which will enable a variety of people to make use of them.

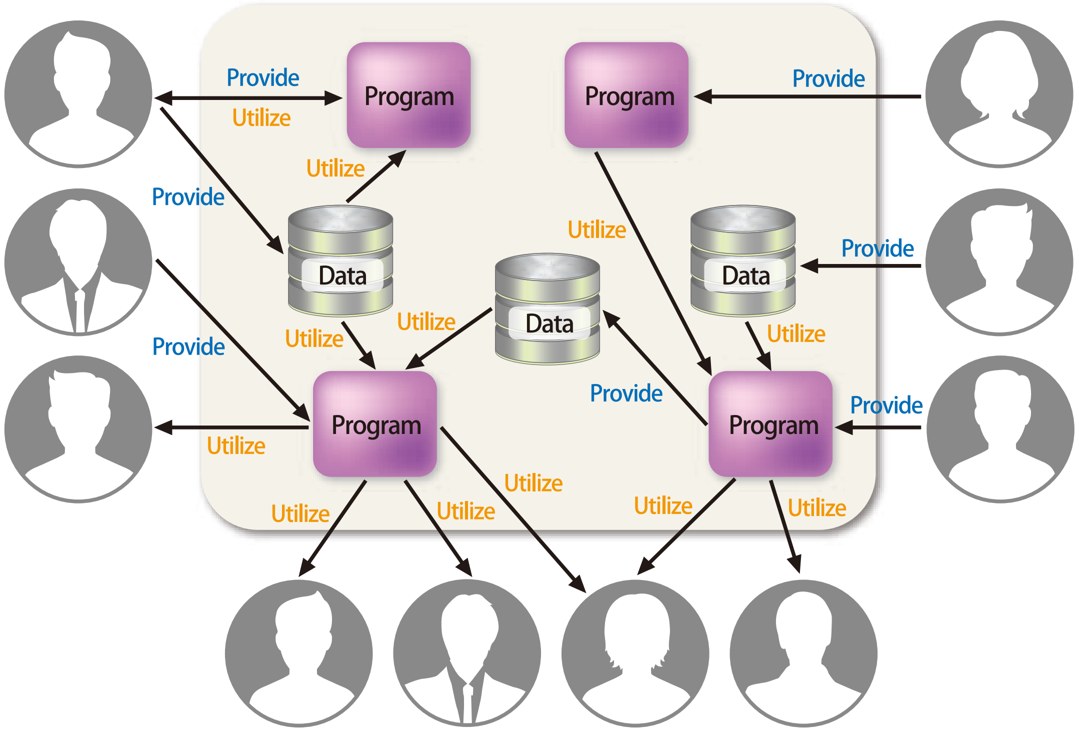
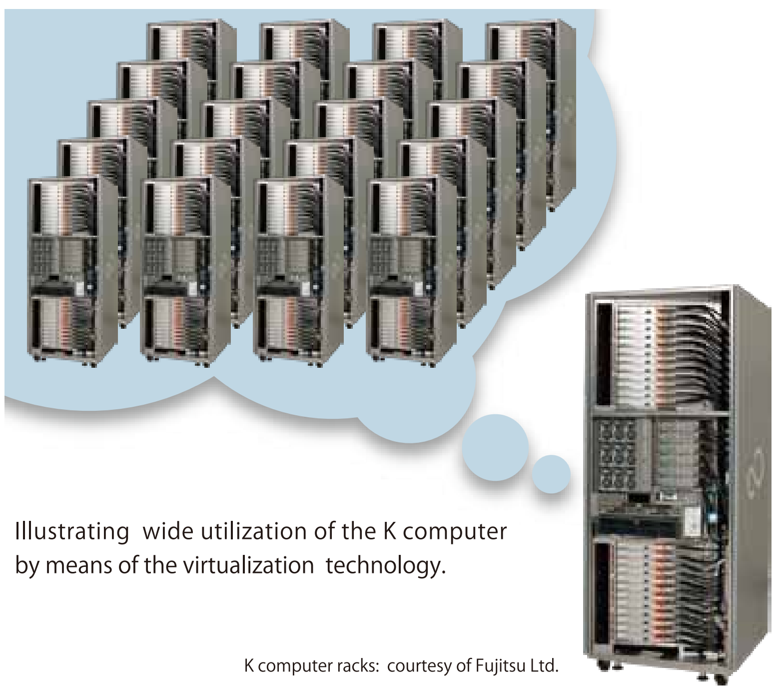


Diagram of the computing portal

Making the K computer readily available to many more people

Virtualization Technology Research

With virtualization technology, a number of virtual K computers can be created on the K computer host. This will enable a number of people to use the K computer simultaneously while maintaining data security.

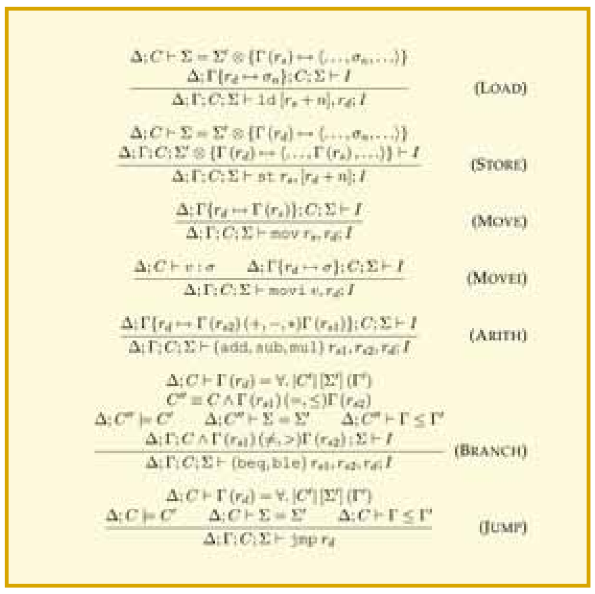


Illustrating wide utilization of the K computer by means of the virtualization technology.

K computer racks: courtesy of Fujitsu Ltd.

Program Verification Technology Research

If an incorrect program is loaded into the computing portal, many users may be adversely affected. This makes it necessary to verify programs before they are accepted into the system.



A portion of Toshiyuki Maeda's PhD thesis (University of Tokyo 2006) on program verification: Writing an Operation System with a Strictly Typed Assembly Language.