§4.   Development of User Friendly Interface for Simulation Code

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There are many simulation codes exit to analyze various aspects of the nuclear fusion plasma. However, in order to use these simulation codes widely, the user friendly interface is required. Therefore, the authors have been studying the web interface to the simulation code. Because the web browser is an essential tool, the user are not bothered to install the extra application to use the simulation code. Furthermore, because the developer do not need to distribute the software, it is easy to maintain the software.

In order to demonstrate the utility of this approach, the author has been developing the web interface to star code developed by Sunahara. Star code is a simulation code that runs under the super computer. It is run by the the shell scripts and reads the values of the variables from text files using namelist function of FORTRAN. Thefore, the user has to edit shell scripts and namelist files by hand. However, it is difficult especially for those who are not familiar with the mainframe computer.

To edit the namelist file, the web based system provides the interface to the namelist (Fig 1). The system was built using Ruby on Rails (RoR). It reads the definition of the namelist parameter written in XML, and creates the web interface. The created namelist files and shell scripts are sent to the server using SSH. When the execution is completed, the results are stored in the relational database, and they can be reused later (Fig 2). While the authors used RoR 2.0 to develop the system, RoR 3.0 was released. Many changes have been made from the version 2.0 to 3.0. The authors expected that the newer version would be released and it would be difficult to build the same software
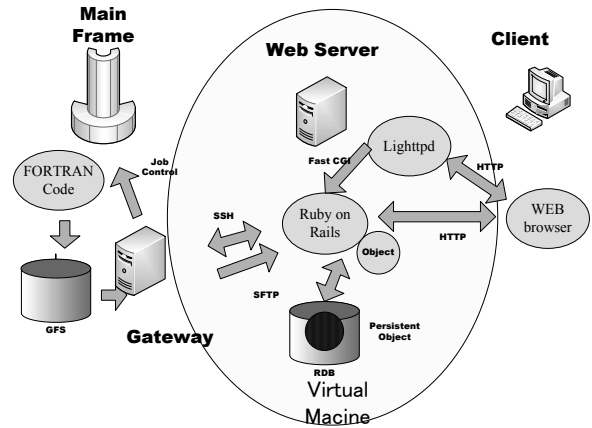

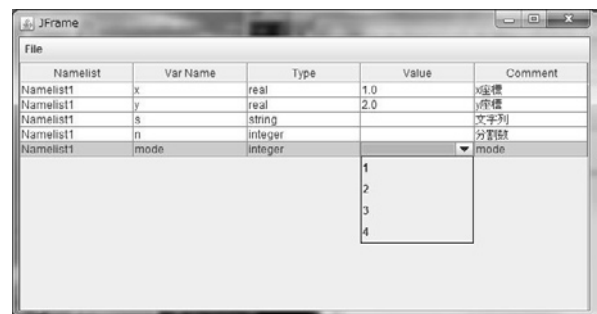Fig.1 : Namelist editor using RoR.

Fig 2 : Overview of the system

Fig 3. Standalone Namelist Editor

enviroment in the future.   In order to preserve the enviroment, a virtual machine is used. Futhermore, using the virtual machine, it becomes easy to move the environment to the other PC. The virtual technology used here is KVM (Kernel-based Virtual Machine). This is a standard function of the Linux kernel, and other software components are not necessary.

There is another similar project in ILT to provide a web interfaces to the existing simulation code, and they introduced QUATRE-I Science's RCM System Software. However, the parameter editor of RCM cannot handle the parameter of the exisnting code very well because the namelist format is too flexible to handle automatically. Therefore, the authors adopted the namelist editor approach of the web interface into the system; the editor reads the metafile to define the namelist, and produces the interface to edit namelist. However, because RCM can run standalone applications only, and it is difficult to incorporate RoR application into the system. Therefore, the authors has been developping a standalone namelist editor (Fig.3).
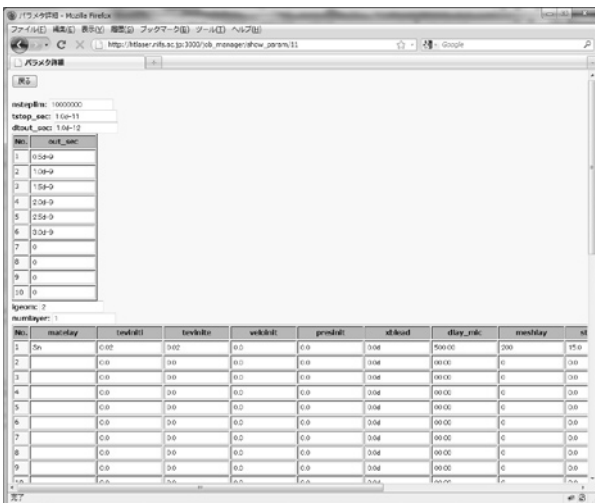
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