

Virtualization environments in the Neutral Beam research activity for the ITER NBTF project

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Abstract

Effective operation of the simulation and analysis software tools represent a key component for a successful research project, both in the design phase and during the analysis of results. Several different software frameworks have been installed in the context of the ITER-NBI project and actively used for SPIDER and MITICA experiments hosted at the NBTF (Neutral Beam Test Facility) by Consorzio RFX, such as: CATIA, Ansys, Smarteam, AutoCAD, MathCAD, Mathematica, MATLAB. These are generally further provided in three different configurations: they can be locally installed on personal workstations, shared on a computational cluster, or deployed as a new instance in a virtual environment. Each solution has pros and cons. On one hand the deployment in a personal workstation often requires specific maintenance procedures for the system and the software configuration and update. On the other hand the centralized server deployment is usually easier to manage but lacks of flexibility and high customization related to each user.

This work proposes a solution based on VDI (Virtual desktop infrastructure), which gives a personal desktop environment on a central server. The specific desktop images have been made available to the users over the network via front-end clients which can be either simple desktop PCs or thin clients.

The VDI technology provides the end user with the flexibility of a personal workstation, while the central resource management allocates computational resources in a very efficient way. Once the specific computational power requests have been properly assessed, it allows to access the same software environment both from office and also from home where the limited network connection bandwidth requires a considerable terminal compression and protocol optimization in order to make 3D graphic application usable. This grants an optimal support to the remote workers too. The outlined installation has been tested with computational intensive tasks, such as heavy numerical simulations or 3D graphical rendering, making the users satisfied with system responsiveness.

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