Remote Visualization in Computer Aided Engineering

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Computer Aided Engineering software gain now the increasing distribution. To achieve additional productivity, engineering calculations are made on the special computing resources which are separate from the engineer's workstation. It can be a private cluster, or, for example, the remote computational resources being rented. Unlike a stage of calculation, a stages of preprocessing and post processing demand close interaction with the operator. The task of transmission of input data from the computer of the user to computing resources arises; among with the task of transmission of results of calculations back to engineer's workstation.

Last task seems more unpleasant. It may waste a lot of time due to large amount of data to transfer. Beside that, it may be just expensive in case of remote rented computational resources due to traffic cost.

To solve this problem a remote visualization technology may be used. It assumes that images are rendered remotely from end-user workstation, close to the place of actual engineering computations. So it is possible to read data in a fast way, convert it to small graphical representation, to send over network to the user's workstation and present via some graphical interface. The user can operate with interface as with usual visualization system. When necessary, system sends user's commands back to rendering facility, so graphical image is recreated.

In this paper we discuss the current state of scientific remote visualization system being developed in our institution with aspect of applying it to engineering computations. The systems allows to visualize computation results of DEFORM engineering system remotely. Among that we work on support of other software packages. Our system operates using SOAP and HTTP protocols, may be plugged into almost any visualization and rendering subsystem, and contains rich web interface API. Main advantages of applying this system are shortening computational and analysis cycle, zero hard disk space consumption for data analysis stage on engineer's workstation, and the ability to present computational results remotely without their actual transmission.