SC22 Network Research Exhibition: Demonstration Preliminary Abstract

In-transit remote visualization via HpFP (High-performance and Flexible Protocol)

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Abstract

In the world of numerical simulation, the scale of the target is increasing due to the complexity of the target and the need to understand unsteady phenomena. Accordingly, new innovations are needed in the visualization of simulation results. The conventional visualization method of writing the simulation results calculated by a solver into a file, which is then read by visualization software for visualization, requires an enormous amount of storage space and is time-consuming.

Therefore, in-situ and/or in-transit visualization is featured. In this method, the results of solver calculations are passed to visualization software via communication, without going through a file, and are then visualized.

Traditionally, in-transit visualization has been used as a method within the same parallel computer. However, the number of scenes where supercomputers are available on the same site is decreasing every year. Therefore, the distance between users and parallel computers is becoming farther and farther apart. In this demonstration, an extreme example of this is the in-transit visualization between Japan and the United States.

Goals

We have two goals.

1. First goal is a case where communication between Japan and US is implemented by file transfer. This can be achieved by combining current resources.
2. The second case incorporates a high-speed data transfer protocol in the communication layer to perform remote visualization; it is original In-transit visualization form.

Resources

As hardware, a supercomputer and visualization client; as software, a solver, visualization software, In-transit middleware, which is Kombyne™ allows the analysis to access the simulation's memory space and conducts analysis to avoid going through large file., a high-speed protocol for the communication layer, which is HpFP that enables data transfer with maximum use of network bandwidth., and a Japan-US line are needed for the demonstration.

Involved Parties

Parties are shown in the first section of this document.//