Application Control Module for SAGE

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Background and Motivation

Scalable Adaptive Graphics Environment (SAGE) is a graphics streaming middleware for supporting collaborative scientific visualization environments that allow scientists to easily build a tiled display wall (TDW) composed of multiple computers and monitors. Furthermore, it allows scientists to share scientific images and videos stored or generated on local or remote computers through the use of network streaming techniques. Recently, SAGE has attracted increasing interest in the scientific community because it can potentially help scientists collaborate for a common scientific goal through the visualization on the TDW. However, the original SAGE does not provide any functions and methods for allowing applications to obtain user inputs from its user interface, SAGE UI, although scientists as users can manipulate operations related to window management. Therefore, there exists a major operational issue in SAGE-based TDW that may hinder its practical use.

Our solution

The principle of our solution to the operational problem of SAGE is to build a module that enables scientists to control application events as well as window management events in SAGE UI. Based on this principle, we have succeeded in developing a built-in application control module for SAGE. Our module offers transparency and usability in operation to SAGE users wherever SAGE-enabled application nodes are.

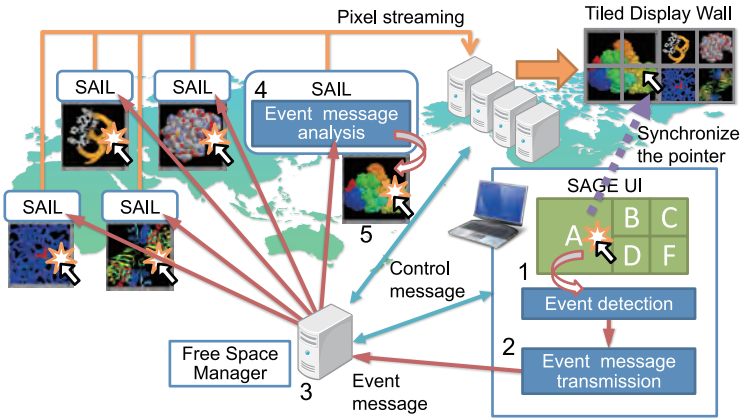
Features

- Unified, seamless, and transparent control of application and window management events in SAGE UI.
- X11-based visualization tools can easily adopt the application control module as a plug-in.
- The application control module allows users to manipulate multiple applications simultaneously.

How it works

Our built-in application control module provides three major functions: event detection, event message transmission, and event analysis. First, a user's request to an application is detected as an event (1). Then, a corresponding event message is generated and transmitted to the Free Space Manager, which manages information for applications running in SAGE (2).

The Free Space Manager transfers the received message to the target application (3). The SAGE Application Interface Library (SAIL) in the application analyzes the received event message and then converts it to an X-based event message for the target application (4). Finally, the target application responds with the delivered event (5).



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