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# A Study of Performance Visualization

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## Abstract

keywords : Information Visualization, Performance Visualization, Real-time Monitor, Performance Monitoring Tool

Usual, visualization mean scientific visualization that expression of vast data use computer graphics. For example field of fluid mechanics, high polymer chemistry etc. A goal of Scientific Visualization is complex numerical value make simplify and easy to understand.

Nowadays use computer graphics to communication with information, For example Window System(e.g. X Window System, Windows, ToolBox), WWW browser(e.g. Mosaic, Netscape), information retrieval, visual programming, etc. The reason of great variety of utilization is highly efficient computer become popularization. Recently a lot of computer applications present graphical user interface used computer graphics. These use of computer graphics is named Information visualization.

The goal of Information Visualization is not only easy to understand but also interact with information. Appearance of graphical user interface (GUI) make people familiar to computer.

This paper give a consideration of Performance Visualization and building performance monitoring tool. There is various performance measurement tool that frequently used visualize to parallel programming environment. for example

- JED

JED - Just An Event Display - is simple event display tool that provided basic trace management support, user-definable event specification, user-customizable graphical presentation based on a standard Gantt chart (time line) display, and a user-extensible analysis and display architecture. JED is targeted at parallel, multitask programs running on the Ceder multiprocessor system.

- ParVis

ParVis - Parallel Program Visualization - is designed to work with Multilisp, a parallel Lisp dialect. In order to provide the user with information regarding the behavior of programming, ParVis records events describing state transitions within

tasks and communication between tasks during a program run, and then generates a graphical display of this information.

There is plenty of performance measurement tool for parallel environment, but measurement tool for non parallel and real-time environment is very few.

Designing and building complex real-time computing systems without considering the time management capabilities is very difficult. It is almost impossible to detect or fix a timing bug for real-time programs. A timing problem further complicates system modification, reconfiguration and maintenance.

In this study, build an Real-Time Performance Monitoring Tool which can help to grasp the state of execute of real-time system. This monitoring tool for the Real-Time Mach. The tool consists of Data analyzer, Reporter, Event Tap, Pentium Counter Control Server and Real-Time Monitor. Data analyzer is analyze monitoring data. Reporter and Event Tap bring from ARM.

ARM - Advanced Real-Time Monitor - is to visualize the system 's internal behavior for the designers of ARTS Kernel. ARM runs on X11 window and visualizes the target system's runtime behavior in real-time.

In this study, build Real-Time Monitor is Motif based tool designed to monitoring the target system's runtime behavior in real-time. The goal of this performance monitoring tool is to visualize Task and Thread behavior on real-time system's for Real-Time Mach . Task create and delete and Thread create and delete status is crucial for Real-Time Mach.

I would like to mention that out line of this Real-Time Performance Monitor tool. The Real-Time Performance Monitor Tool which cooperates with Event Tap, Reporter and Pentium Counter Control Server, and Monitor Tool made from Data Analyzer and Visualizer.

- Event Tap : Event Tap collect events and store them in private data buffer.  
(from ARM)
- Reporter : This is process on the target host which is responsible for communicating with the Data Analyzer.(from ARM)
- Pentium Counter Control Server : This is a process on the target host which is communicating with the Visualizer.(original)
- Monitor Tool
  - Data Analyzer : This is a process on the local host which is analyzes monitoring data.
  - Visualizer : Visualizer is visualizes the system behavior and information each of Task and Thread.

Task/Thread state information on the target system is obtained by system specification. Data analyzer uses the given Task/Thread state information, and the analysis data used Monitoring tool. Because a real-time system is time critical, the monitoring activity must produce a minimum amount of interface. Of course, it is difficult to totally eliminate the interference.

In real-time systems, grasp of the runtime system behavior is very difficult to capture from the system. This approach was provide a Real-Time Performance Monitoring Tool for visualize Task and Thread information so that we can understand system state details.