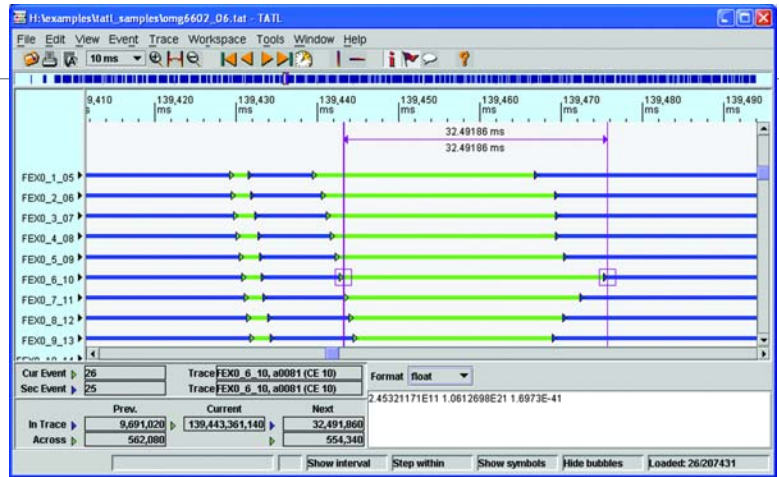


Trace Analysis Tool and Library (TATL™)

System-Level Performance Analyzer

- View dynamic multiprocessor and multicore interactions
- Detect performance bottlenecks
- Visualize deadlocks
- Highly scalable
- Minimally intrusive



TATL Event Viewer

The Trace Analysis Tool and Library (TATL™) from Mercury Computer Systems helps software developers tune and debug real-time multiprocessor and multicore processor applications. Designed for system sizes from a few to several hundred processors, the TATL tool provides insight into the dynamic interactions among processors in systems of all sizes.

Debugging real-time applications can be complex, whether they are based on multiprocessors or multicore processors such as the Cell Broadband Engine™ (BE) processor. Source code debuggers and printf statements affect the real-time execution of the application while providing little understanding of the communications and dependencies among processors. The TATL tool uses minimally intrusive trace analysis to clarify processor interactions. User-defined events are logged in local memory with minimal overhead, allowing the system to proceed with real-time processing. By logging these events at the beginning and end of interactions such as message sends/receives and requests/grants of a shared resource, a developer can collect data on the complex communication and control patterns of the application.

In addition to logging events from multiprocessor applications, TATL can debug multicore applications running across one or more Cell BE processors. TATL can log and synchronize user-defined events from any of the SPEs (synergistic processor elements) and the PPE (Power™ processor element) core of the Cell BE processor. This allows developers to visualize application interactions among the SPEs and PPE within a single Cell BE processor, or even between the SPEs and PPEs of multiple processors.

Logged events can be collected at any time for convenient viewing and analysis in the Event Viewer and Histogram Viewer. The synchronized timelines from the multiple processors provide a dynamic view of their interactions. The time between two events can be easily measured and compared to real-time constraints.

Recording Data

The TATL tool's event recording library provides an application programming interface (API) for logging of real-time events across multiple processors. Functions are provided for initializing trace buffers, recording events and data, setting trigger controls, and defining event groups for selective data recording. With a closely synchronized time base across multiple processors, the events between processors can be accurately correlated using TATL.

Once initialized, the TATL library enables recording of events and key data at any time throughout the application. Events are recorded with minimal intrusiveness, quickly recording the event identifier, timestamp, and optional user-defined data to the event buffer in local memory.

In complex applications distributed over many processors, many events need to be recorded to understand the system operation. To limit the run-time impact of recording a large number of events, the TATL library provides precise control over which events are recorded. Functions are provided to create and control the recording of multiple overlapping groups of events, even allowing run-time control for maximum flexibility.

Complex applications may also have functional or performance problems that appear infrequently or sporadically. Such problems can be approached by collecting data over an extended period of time. Indefinite data collection in a buffer of finite size, however, requires flexible control over the period that the event data is kept in the buffer. Just like the software equivalent of a logic analyzer, the TATL tool provides several triggering mechanisms for recording the event traces. Triggers can be set to start recording, end recording, or center the recording on a particular event. This flexibility enables the pertinent debugging information to remain in the event buffer and not be overwritten by inconsequential data.

Analyzing Data

The TATL Event Viewer provides a graphical interface that displays synchronized traces along the same time scale, allowing instant comparison of the traces. Features such as the dual time markers give TATL a logic analyzer feel and make timing analysis easier. The time difference displayed between the time markers can be used to verify real-time constraints across traces.

The Event Viewer is designed to ease the analysis of events and data from large numbers of traces. Most visual aspects of the display can be customized to maximize the number of events viewable on the screen. With the Event Viewer's zooming capabilities, the scope of the view can be quickly transitioned from an overview of all trace events down to a specific event or anywhere in between. A timeline shows the current location and scope of the view relative to the entire trace. Navigation through the traces can be performed using a powerful event search function. Sophisticated search parameters that define the desired information and scope of the search make finding events quick and easy. These features working together make TATL a powerful event analysis tool.

Complicated applications can produce more trace data than can be easily evaluated by simply viewing the traces. In such cases, statistical techniques can help pinpoint problem areas in the application. The Histogram Viewer provides easy-to-use statistics generation and histogram viewing of data and timing relationships from events across traces. For viewing the effects of altering an application from one run to another, statistical changes can be compared from within the tool with its statistical comparison features.

TATL is a valuable tool for developing complex applications in complex configurations. In some cases, system-specific features have been added to TATL to further aid in application development. For a full list of these features, contact Mercury.

Features

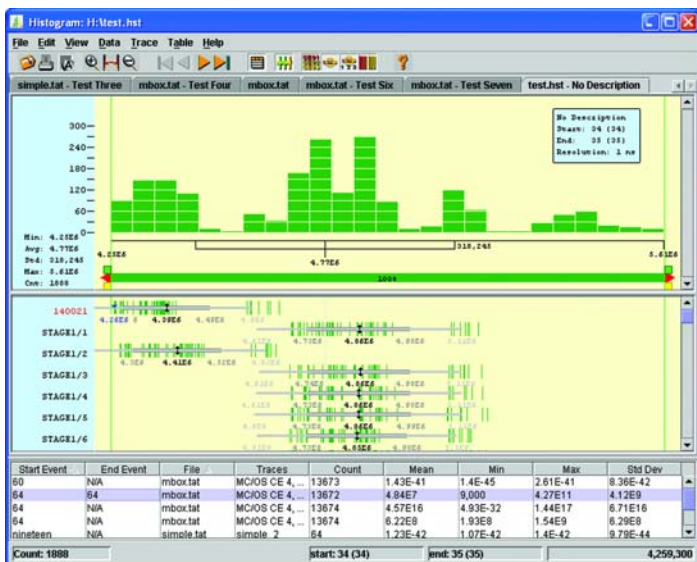
- Synchronized across multiple processors or the PPE and SPEs of a Cell BE processor
- Analyze thousands of events
- Full control of event recording, including data recording
- Measure exact time between events on different processors
- Fully customizable viewing of event data
- Statistical comparison between runs
- Document application performance and acceptance criteria

TATL System Requirements

TATL is available as a standalone application or as a plug-in to Eclipse.

Ordering Information

Contact Mercury for a free product demonstration or for ordering information.



TATL Histogram Viewer

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