WHITE PAPER

Performance Tuning During Game Development Using the Intel® VTune™ Performance Analyzer

Intel® software development products

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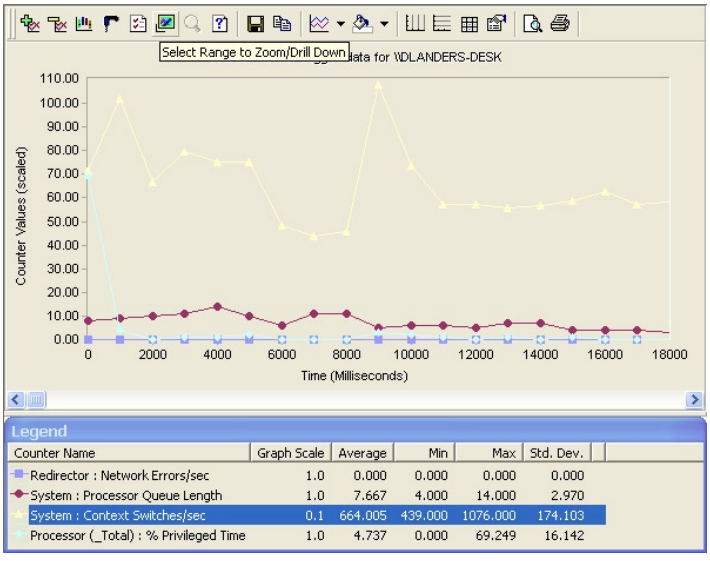
Getting a game to run efficiently across a broad range of platforms can be a difficult and trying process. Today's network-oriented games can make this task even more difficult as you try to isolate whether a performance hit is due to the system you are running on or the network connection. Using the Intel® VTune™ Performance Analyzer can make this task much easier. The VTune analyzer's features, such as Counter Monitor, Intel® Tuning Assistant, and Merge can make this daunting task go faster and with much less trouble than ever before.

Locate Trouble Spots with Counter Monitor

You can use Counter Monitor to easily display performance metrics such as CPU utilization, I/O transfer rates, and even network metrics. By using the Windows* Remote Sampling capabilities of the VTune analyzer, you can accomplish this on multiple platforms and compare the results on a separate development system. You can then "drill down" from that particular time-slice to the trouble section.

For example, Figure 1 shows the Counter Monitor results from an activity containing both the Counter Monitor collector and the Sampling collector.

Figure 1. Counter Monitor Data Collected With Sampling Data



After pressing the "Select Range to Zoom/Drill Down" button and selecting a range within the Counter Monitor view (Figure 2), press the "Drill Down to Correlated Sampling Data View" button (it looks like an electric drill) to view only the sampling data collected during that time-slice (see Figure 3).

Figure 2. Time-Slice Selected in Counter Monitor View

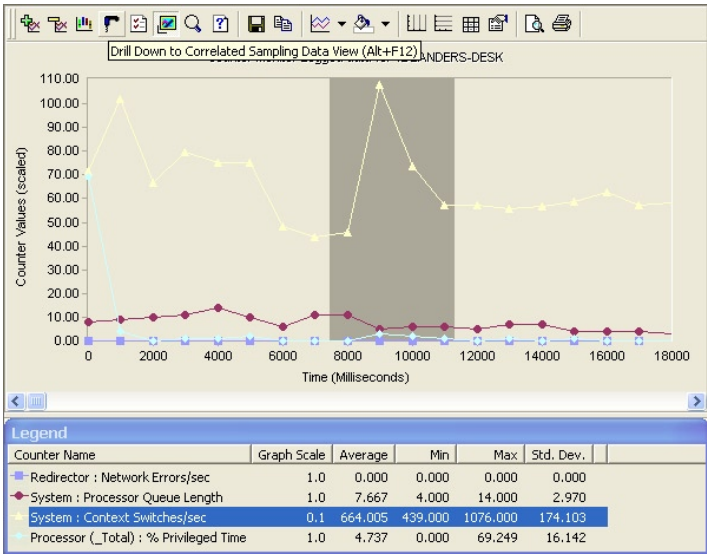
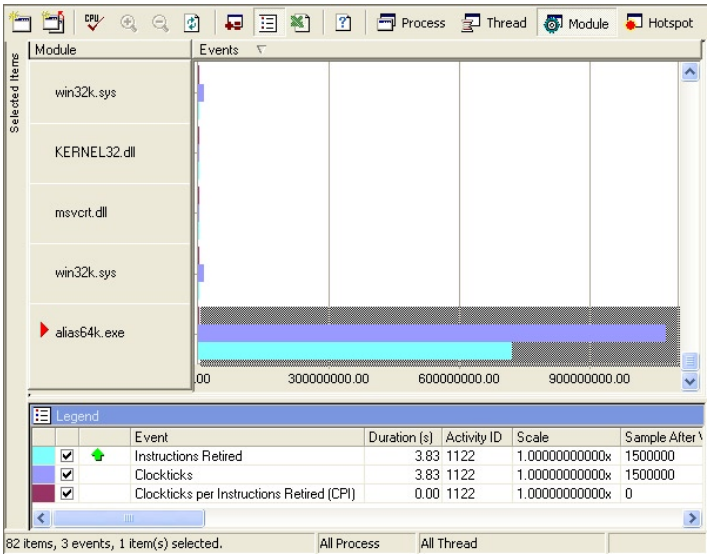
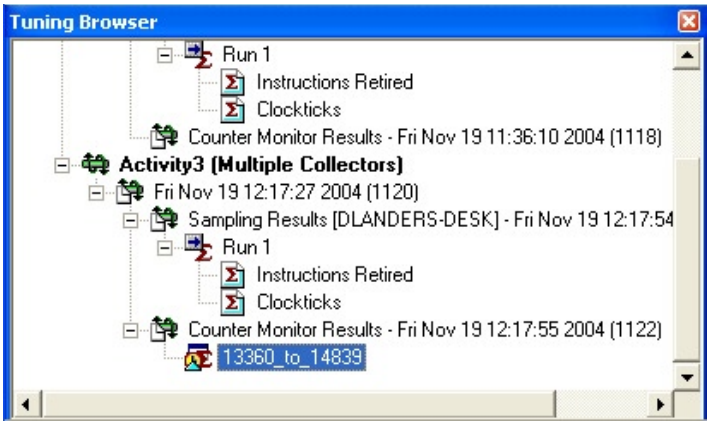


Figure 3. Sampling Data from Time-Slice Selected in Figure 2



The Tuning Browser window (see Figure 4) now includes a new node under the Counter Monitor results indicating the time-slice, in samples, used to filter the sampling data, "13360_to_14839". This makes it easy to retrieve the same data in future sessions.

Figure 4. Tuning Browser with Filtered Sampling Data Node



Once the problem area is isolated, the Intel Tuning Assistant can provide you with suggestions on how to improve your code's performance. The Assistant will suggest event-based sampling if it finds bottlenecks in your code, or it will recommend Call Graph to identify problems with the structure of your code.

Get a Clue from Intel® Tuning Assistant

Upon completion of an event-based sampling run, the Intel Tuning Assistant can provide you with suggestions and advice on how to write that segment of code more efficiently. This advice, based on Intel's years of performance tuning expertise, can greatly reduce the time it takes to get your code up and running with the best possible performance. The Tuning Assistant can identify whether a particular problem is based on cache issues, memory, I/O, or any of hundreds of other common problems and suggest the right solution for you. It will even provide you with advice on how to tune your code to get the best possible performance out of the latest generation of Intel processors. To invoke the Tuning Assistant on previously collected sampling data, press the F8 key while viewing the data.

Compare Performance by Platform with Merge Features

The Merge features (along with Pack-and-Go) allow you to directly compare the performance of your code across a wide range of platforms. You can view these results either side-by-side or merge the various results to establish a base-line average. This makes it much easier to identify a bottleneck on a particular hardware platform and troubleshoot it. Past and current results can even be merged to see how the changes you have made to your code have affected each platform, whether positively or negatively.

Performance, Compatibility, and Support

Using the VTune analyzer can help you develop applications more cost effectively, with a faster time-to-market. Counter Monitor helps you quickly isolate any trouble spots. The Intel Tuning Assistant provides you with Intel engineering expertise on all generations of Intel processors. Finally, Merge makes it possible to compare performance of multiple platforms directly. With all of these features, the VTune Performance Analyzer is the leader of a new generation of performance tuning. As a game developer, it's all about performance, after all.

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