

# Intel® VTune™ Performance Analyzer

Performance Tools Lab  
Intel Corporation





# Agenda

- Overview of the VTune™ Performance Analyzer
- Sampling O.S. and User-Defined performance monitoring counters
- Summary

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# Some Performance Tool Goals

- The act of measuring performance shouldn't change the performance of the software
  - Accurate, representative results with no instrumentation
  - Low intrusive performance measurements
  - Interrupt based sampling driven by CPUs registers
- Programmers need to see System-wide performance
  - Identify the software that is consuming most of the CPU
    - Application, shared objects, O.S. layer, device driver, ...
- Source code should be the normal view of the performance data
  - Each executable statement annotated with perf. data



# VTune™ Performance Analyzer - Products

- **VTune™ Performance Analyzer 7.2**
  - “Traditional” VTune analyzer
  - Remote capability, inc. Linux\*
  - Command line interface (Windows\*) included
- **VTune Performance Analyzer 3.0 for Linux\***
  - GUI-based tool runs on Eclipse
  - Stand alone viewers, command line tool also
- **VTune™ Analyzer Driver Kit**
  - Rebuild VTune™ Analyzer Linux driver for non-standard kernels (ex: errata kernels, modified kernels)
  - Red Hat, SuSE production distributions supported



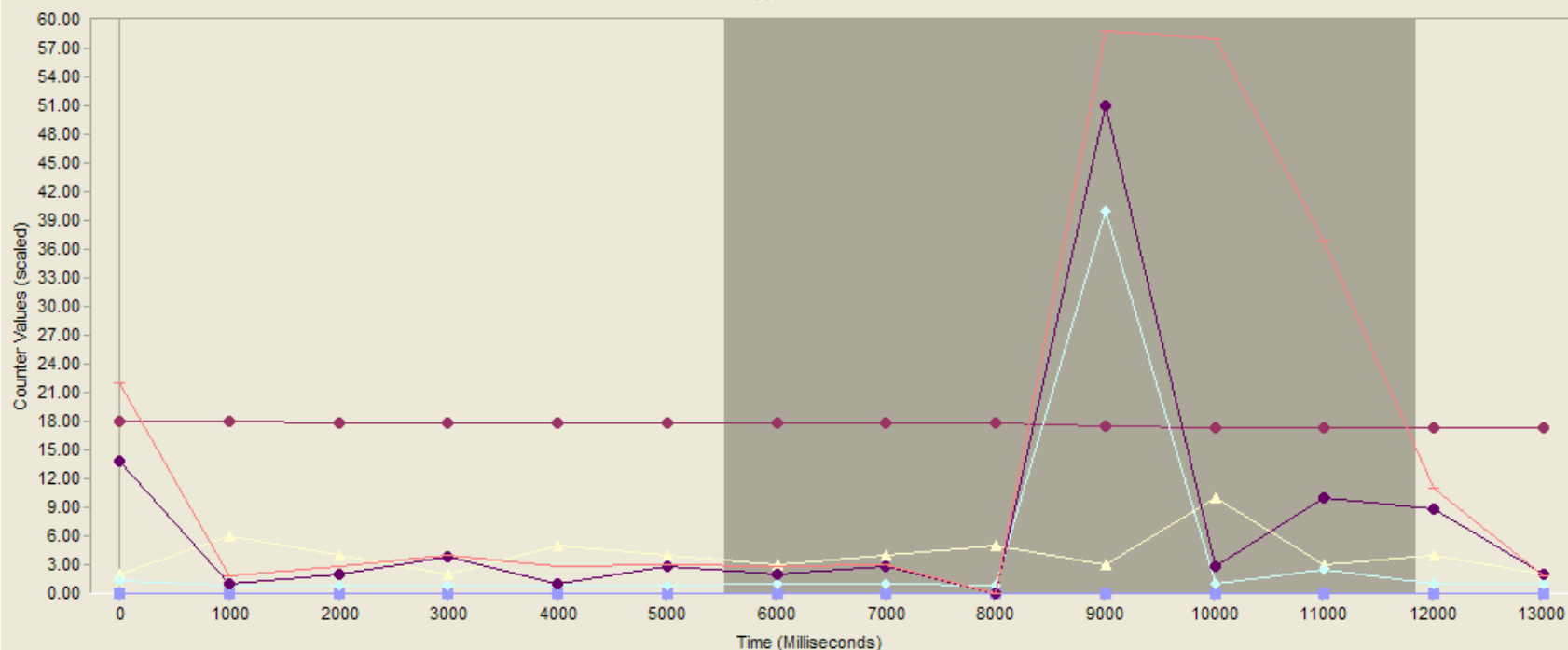
# Performance Analysis Technologies

- **Sampling - Identify Performance Bottlenecks**
  - Interrupt based sampling
    - CPU events (Event Based Sampling)
    - O.S. events (Perfmon counters)
  - Lower Overhead, less data
- **Call Graph - Examine flow of control through the app**
  - Which functions took the longest
  - Which functions were blocked the longest
  - Calling sequence critical path
  - Higher Overhead, more data



# Sampling – O.S. Events

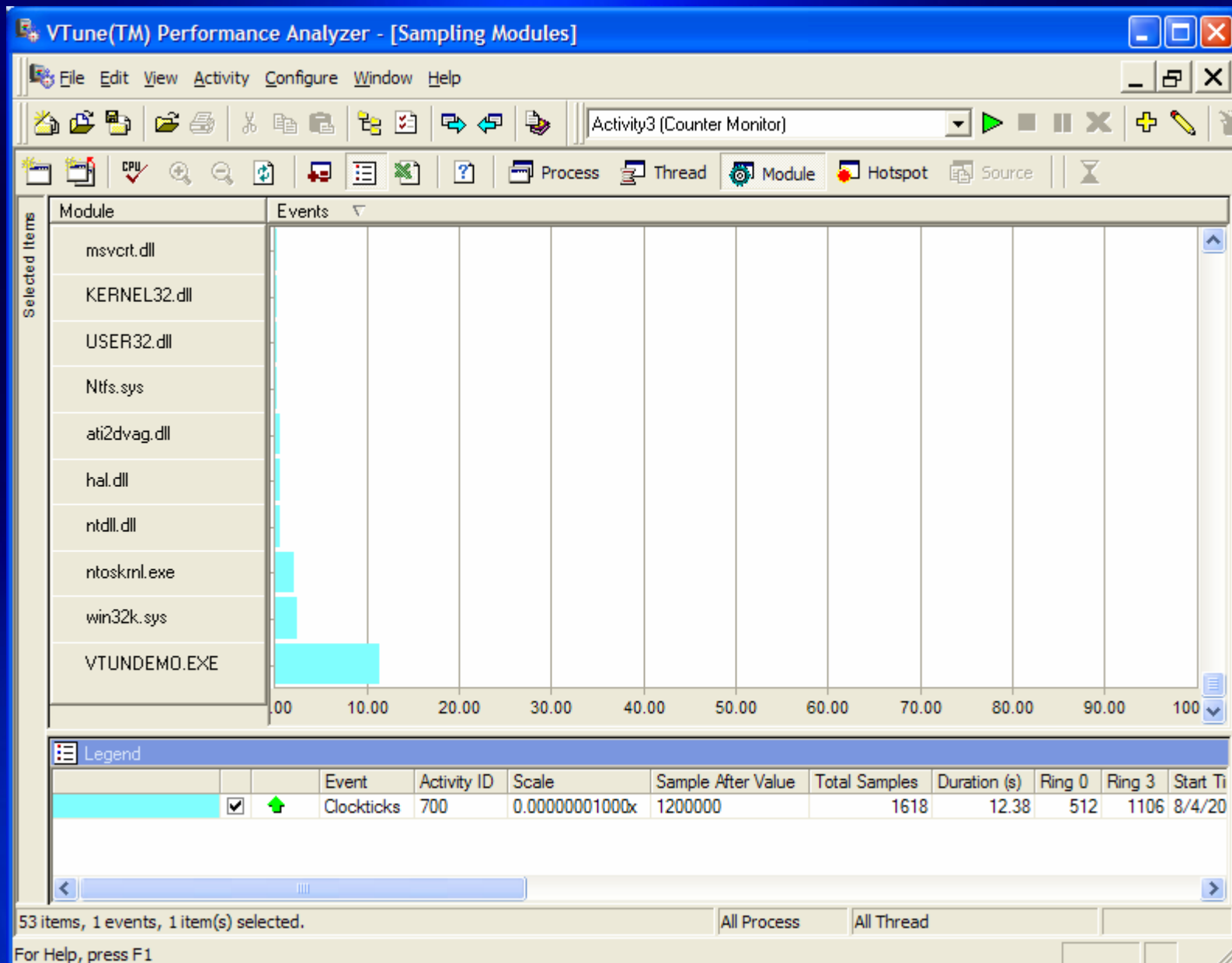
- **Monitor the Counters in Registry**
  - Sample the counters periodically
  - Show a real-time graph of the data
- **Allows addition of user defined counters**
- **When a counter value does something bad:**
  - What was the app doing when the counter value changed?
    - Highlight that part of the graph on the overall run
    - Do the VTune™ Analyzer's normal drill down to source



### Legend

Counter Name	Graph Scale	Average	Min	Max	Std. Dev.	
Redirector : Network Errors/sec	1.0	0.000	0.000	0.000	0.000	
Memory : Available Bytes	0.0000001	177634736.000	174051328.000	180236288.000	2398297.000	
System : Processor Queue Length	1.0	4.071	2.000	10.000	2.093	
System : Context Switches/sec	0.001	3922.143	865.000	40032.000	10401.394	
Processor (_Total) : % Privileged Time	1.0	7.501	0.000	51.022	13.154	
Processor (_Total) : % Processor Time	1.0	15.001	0.000	58.982	21.011	







VTune(TM) Performance Analyzer - [Source View - [C:\...\VTune\Examples\VTuneDemo\VTUNDEMO.C]]

File Edit View Activity Configure Window Help

Activity3 (Counter Monitor)

Address	Line	Source	Clockticks
0x1100	67	}	
	68		
	69	// Does a float division	
	70	// Takes the most time of all routines in this demo	
	71	float divd_rout( float par1, float par2)	
0x1104	72	{	0.11%
	73	int i;	
	74	float ret_value;	
	75		
0x110A	76	for(i = 0; i < 10; i++)	3.07%
0x1122	77	ret_value = par1/par2;	26.53%
	78		
0x112D	79	return ret_value;	0.11%
	80		
0x1130	81	}	0.74%
	82		
	83		
	84	float test_oror1(float divd, float divs, int signif)	
0x1134	85	{	0.32%

Function Summary				Counter Monitor Results - Thu Aug 04 08:43:52...
Address	Size	Function	Class	Clockticks (700)
-----	-----	--- Selected Range ---	-----	0.00%
0x1000	0x67	test_if		27.27%
0x1067	0x6E	test_if1		25.58%
0x10D5	0x2F	test_memset		10.36%

For Help, press F1



# Summary

- Free evals, supported platforms, technical papers, ...
  - [www.intel.com/software/products/vtune/](http://www.intel.com/software/products/vtune/)
- VTune™ Analyzer User Forums
  - <http://softwareforums.intel.com/ids>