

Intel® VTune™ Amplifier 2017 for Systems Release Notes for FreeBSD* OS Target

Installation Guide and Release Notes

26 August 2016

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1 Introduction

Intel® VTune™ Amplifier 2017 for Systems for FreeBSD* operating system provides an integrated performance analysis and tuning environment with graphical user interface that helps you analyze code performance on systems with Intel® 64 architectures. It provides a target package for collecting data on the FreeBSD* system that is then displayed on a host system supporting the graphical interface, either via the remote capability or by manually copying the results to the host.

This document provides system requirements, installation instructions, issues and limitations, and legal information for both the host and target systems.

2 What's New

- Support for the next generation **Intel® Xeon® Processor E5 v4** Family (formerly codenamed "Broadwell-EP")
- Bug fixes

3 System Requirements

For an explanation of architecture names, see <http://software.intel.com/en-us/articles/intelarchitecture-platform-terminology/>

Host Processor requirements

- For general operations with user interface and all data collection except Hardware event-based sampling analysis
 - ○ A PC based on an IA-32 or Intel 64 architecture processor supporting the Intel Streaming SIMD Extensions 2 (Intel SSE2) instructions (Intel Pentium® 4 processor or later, or compatible non-Intel processor).
 - For the best experience, a multi-core or multi-processor system is recommended.
 - Because the VTune Amplifier for Systems requires specific knowledge of assembly-level instructions, its analysis may not operate correctly if a program contains non-Intel instructions. In this case, run the analysis with a target executable that contains only Intel instructions. After you finish using the VTune Amplifier for Systems, you can use the assembler code or optimizing compiler options that provide the non-Intel instructions.
- For Hardware event-based sampling analysis (EBS)
 - EBS analysis makes use of the on-chip Performance Monitoring Unit (PMU) and requires a genuine Intel processor for collection. EBS analysis is supported on Intel Pentium® M, Intel Core™ microarchitecture and newer processors (for more precise details, see the list below).
 - EBS analysis is not supported on the Intel Pentium 4 processor family (Intel NetBurst® MicroArchitecture) and non-Intel processors.
 - However, the results collected with EBS can be analyzed using any system meeting the less restrictive general operation requirements.
- The list of supported processors is constantly being extended. Here is a partial list of processors where the EBS analysis is enabled:

Mobile processors

Intel® Atom™ Processor

Intel® Core™ i7 Mobile Processor Extreme Edition (including 2nd, 3rd, 4th and 5th Generation Intel® Core™ processors)

Intel® Core™ i7, i5, i3 Mobile Processors (including 2nd, 3rd, 4th, 5th and 6th Generation Intel® Core™ processors)

Intel® Core™2 Extreme Mobile Processor

Intel® Core™2 Quad Mobile Processor

Intel® Core™2 Duo Mobile Processor

Intel® Pentium® Mobile Processor

Desktop processors

Intel® Atom™ Processor

Intel® Core™ i7 Desktop Processor Extreme Edition (including 2nd, 3rd, 4th and 5th

Generation Intel® Core™ processors)
Intel® Core™ i7, i5, i3 Desktop Processors (including 2nd, 3rd, 4th, 5th and 6th Generation Intel® Core™ processors)
Intel® Core™2 Quad Desktop Processor
Intel® Core™2 Extreme Desktop Processor Intel®
Core™2 Duo Desktop Processor

Server and workstation processors

Intel® Xeon® processors E7 family
Intel® Xeon® processor E5 family
Intel® Xeon® processors E3-1200 family
Intel® Xeon® processors 65xx/75xx series
Intel® Xeon® processors 36xx/56xx series
Intel® Xeon® processors 35xx/55xx series
Intel® Xeon® processors 34xx series
Quad-Core Intel® Xeon® processors 7xxx, 5xxx, and 3xxx series
Dual-Core Intel® Xeon® processors 7xxx, 5xxx, and 3xxx series

System Memory Requirements

1. At least 2 GB of RAM

Disk Space Requirements

2. About 700 MB free disk space required for all product features and all architectures

Host Software Requirements

- Supported Linux distributions:
 - Red Hat* Enterprise Linux 6 and 7
 - CentOS* versions equivalent to Red Hat* Enterprise Linux* versions listed above
 - SUSE* Linux* Enterprise Server (SLES) 11 and 12
 - Fedora* 22 and 23
 - Ubuntu* 12.04, 14.04 and 15.10
 - Debian* 7.0 and 8.0
- Supported Windows* releases:
 - Microsoft* Windows* 7 and SP1
 - Microsoft* Windows* Server 2008
 - Microsoft* Windows* 8 and 8.1

- Microsoft* Windows Server 2012*
 - Microsoft* Windows* 10
- Supported OS X* releases:
 - OS X* 10.9.*
 - OS X* 10.10.*
 - OS X* 10.11.*
- To view PDF documents, use a PDF reader, such as Adobe Reader*.
- To enable automatic product updates with the Intel Software Update Manager, use Java* version 1.6 or higher.

Target Requirements for FreeBSD*

Target Processor Requirements

Intel® Xeon® processors E7 family Intel®
Xeon® processor E5 family

Operating System Requirements

- FreeBSD v10.1 x64 based environment

Notes:

- For collection:
 - The collection utilities make use of the Performance Monitoring Unit (PMU) and Architectural Model Specific Registers (MSR) and therefore require a genuine Intel processor for collection.
 - Collected results can be analyzed using any system meeting the less restrictive general operation requirements.
 - Collection requires a non-virtual machine to ensure access to the on-chip PMU and Architectural Model Specific Registers (MSR). The collection utilities are not supported within a virtual machine environment or on the Android emulator.

4 Target FreeBSD* collection

Running VTune Amplifier 2016 for Systems on FreeBSD is similar to other Linux* distributions but it also has many important differences that affect the usage model. The model we use for FreeBSD is the standard embedded paradigm of collecting trace data on your FreeBSD target and visualizing this data on a Linux* system where you have installed VTune Amplifier.

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VTune Amplifier 2016 supports the following usage modes for **event-based sampling analysis** and **frame-pointer-based stacks analysis** on FreeBSD, see product help topic “*Remote Performance Analysis Workflow for Linux Systems*” for detailed description of each mode:

1. **Remote CLI (amplxe-cl) or GUI (amplxe-gui)** for remote analysis from Linux, Windows or OS X host to FreeBSD x86_64 target
2. **Native CLI** with running collection via **amplxe-cl** directly on a FreeBSD system. Results can be viewed via **amplxe-cl** or **amplxe-gui** on a host system.
3. **Native SEP** with running **sep** directly on a FreeBSD system. Results can be imported and viewed via **amplxe-cl** or **amplxe-gui** on a host system.

The steps you need to take to configure your FreeBSD target for EBS analysis:

1. Copying data collectors

Copy and unpack the **vtune_amplifier_2016_*_for_systems_FreeBSD_zip.gz** target package archive to the target device using ftp, sftp or scp.

2. Building and Installing the SEP driver

In the unpacked FreeBSD target package on the device:

1. Build the sep and pax device drivers
 - a. `cd sepdk/fbsd_kernel/modules`
 - b. `make`
 - c. `make install`
2. Install the drivers
 - a. You need to install the drivers as root
 - b. `kldload sep pax`
 - i. If you need to unload a driver the command is `kldunload sep pax`

3. Configure and run EBS analysis by following instructions in the VTune Amplifier help depending on chosen mode:

- Native Sampling Collector (SEP) Usage mode
- Remote Performance Analysis Workflow for Linux Systems

Additional tips

By default sep put temporary files in /tmp. The files can get quite large during sampling. Users can specify SEP_TMP_DIR to specify a different temp file directory.

5 Technical Support

If you did not register your product during installation, please do so at the [Intel® Software Development Products Registration Center](#). Registration entitles you to free technical support, product updates and upgrades for the duration of the support term.

For information about how to find Technical Support, Product Updates, User Forums, FAQs, tips and tricks, and other support information, please visit <http://www.intel.com/software/products/support/>

Note: If your distributor provides technical support for this product, please contact them for support rather than Intel.

6 Installation Notes for Linux*, Windows* and OS X* hosts

If you are installing the product for the first time, please be sure to have the product serial number available so you can type it in during installation. A valid license is required for installation and use.

This product package can be used to install the software on both IA-32 systems and Intel® 64 systems. The installer determines the system architecture and installs the appropriate files.

For installation on Linux, Windows or OS X host follow the VTune Amplifier *Installation Guide*.

7 Issues and Limitations

Known Issues and Limitations

- **Attaching to a process on FreeBSD* OS depends on procfs (process file system) mounting (200568444)**
 - VTune Amplifier fails to attach to a process on FreeBSD if *procfs* is not mounted.
To resolve that, mount the */proc* file system using the following command:

```
mount -t procfs proc /proc'
```
- **Running time is attributed to the next instruction (200108041)**
 - To collect the data about time-consuming running regions of the target, the VTune™ Amplifier interrupts executing target threads and attributes the time to the context IP address.

- Due to the collection mechanism, the captured IP address points to an instruction AFTER the one that is actually consuming most of the time. This leads to the running time being attributed to the next instruction (or, rarely to one of the subsequent instructions) in the Assembly view. In rare cases, this can also lead to wrong attribution of running time in the source - the time may be erroneously attributed to the source line AFTER the actual hot line.
- In case the inline mode is ON and the program has small functions inlined at the hotspots, this can cause the running time to be attributed to a wrong function since the next instruction can belong to a different function in tightly inlined code.
- **An application that allocates massive chunks of memory may fail to work under VTune Amplifier (200083850)**
 - If a 32-bit application allocates massive chunks of memory (close to 2 GB) in the heap, it may fail to launch under the VTune Amplifier while running fine on its own. This happens because the VTune Amplifier requires additional memory when profiling an application. The workaround could be in using larger address space (for example, converting the project to 64-bit).
- **Running other PMU-based tools simultaneously with hardware event-based sampling collection is not supported (200166101)**
 - The Sampling Driver requires exclusive use of the PMU resources. Running multiple PMU based tools will cause incorrect results and/or system instability.
- **Attaching the VTune Amplifier to a process may take some time (200276420)**
 - Your target application may complete before the data collection starts, so the VTune Amplifier may report an error. Increase the duration of your test application if necessary.
- **VTune Amplifier user APIs are not supported for static binaries (200279211)**
 - To use ITT and JIT APIs with software based collectors (Hotspots, Concurrency, Locks and Waits) user needs to link their application dynamically. Otherwise ITT and JIT API notifications will be missing in the result.
- **Hardware event-based analysis doesn't work if more than 128 events are gathered simultaneously (200293868)**
 - Decrease number of PMU events in analysis settings to resolve it.

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/* zlib.h -- interface of the 'zlib' general purpose compression library
version 1.2.3, July 18th, 2005

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*/

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```
pci.ids

#
# List of PCI ID's
#
# Version: 2014.11.23
# Date: 2014-11-23 03:15:02
#
# Maintained by Martin Mares <mj@ucw.cz> and other volunteers from the #
PCI ID Project at http://pci-ids.ucw.cz/.
#
# New data are always welcome, especially if they are accurate. If you have
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