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VSI to Port OpenVMS to x86 November 2015

The OpenVMS Sunset



OpenVMS users were disheartened in mid-2013 when HP announced a future end-of-support date for the revered OpenVMS operating system. Even though the latest version of OpenVMS, Version 8.4, would be fully supported until 2020 and supported without sustaining engineering until 2025 (with some hope for an extension), companies could not plan to bring new OpenVMS applications online. And what about long-term plans for current OpenVMS applications? Port them to another platform? Run them in emulation mode on a commodity platform? No long-term option was very appealing.

New Life for OpenVMS

A year later, in mid-2014, HP corrected this situation to the relief of all OpenVMS users. HP completed a perpetual and exclusive licensing agreement with VMS Software, Inc. (VSI) to extend indefinitely the lifespan of OpenVMS. Under the licensing agreement, VSI will be the sole developer of future versions of OpenVMS. It will continue to support OpenVMS on HP Itanium systems and, of special note, it will port OpenVMS to x86-64 servers.

Headquartered in Bolton, Massachusetts, U.S.A., VSI was created exclusively to carry on OpenVMS development and support. It was formed in May 2014 by a group of investors, executives, and developers from Nemonix, a company that had provided OpenVMS services for older VAX and Alpha systems for three decades.

VSI to the Rescue

VSI immediately tackled the task of bringing OpenVMS forward. For a small company with only a few dozen developers, it has laid out an aggressive roadmap and is planning to expand aggressively to meet this roadmap. It expects to double its number of developers by the end of 2015 and to have 100 developers on staff by the end of 2016.

VSI made its first deliverable within a year, OpenVMS Version 8.4-1H1. This version included upgrades and bug fixes to Version 8.4 and is compatible with HP Integrity i2 and Integrity i4 Itanium-based servers.

Of major interest to OpenVMS users is VSI's plan to port OpenVMS to x86-64 servers. This will open up a whole new set of opportunities to make economical and powerful use of the OpenVMS operating system.

OpenVMS on x86-64 Servers

At the OpenVMS Boot Camp 2015, organized by Connect, the HP Business Technology User Group, and held in Nashua, New Hampshire, U.S.A. in September 2015, VSI laid out its plans for porting OpenVMS to x86-64. VSI's roadmap shows it delivering OpenVMS on x86-64 servers by 2018. There is a massive amount of work to do to accomplish this, and many of the features in the new operating system are still being determined. We review below the current efforts being made by VSI to determine just what features it will support on x86-64.

The x86-64

The x86-64 is primarily available from Intel as the Xeon microprocessor and from AMD as the Opteron microprocessor. It currently has the bulk of the microprocessor market place, with USD \$31 billion in revenues achieved from the shipment of almost 10 million units in 2013. This represents about 70% of the market in terms of revenue and 95% of the market in terms of units shipped.

The x86-64 is based on a CISC (complex instruction set computing) architecture with over 600 instructions. A fifteen-core chip contains about 5.6 billion transistors.

Languages

VSI plans to support the following languages with OpenVMS on x86-64:

- C
- BLISS
- FORTRAN
- BASIC
- COBOL
- PASCAL
- MACRO
- C++
- Ada

VSI will use the LLVM open-source compiler. VSI's initial language efforts will focus on C, BLISS, and MACRO.

Memory

VSI's x86-64 port will support 4 KB, 2 MB, and 1 GB page sizes. The x86-64 has four memory-protection modes. OpenVMS will run in two of these modes – Unprivileged (0) and Privileged (3). The Supervisor mode (1) and Exec mode (2) will be implemented in software.

Virtualization

VSI is investigating the option of allowing an OpenVMS virtual machine to run as a guest operating system under the VMware, kvm, and/or xen hypervisors. VSI is currently using CentOS-7/kvm on an HP ProLiant DL380 Gen8 as a development platform

Clouds

Various cloud-application interfaces are being considered, including AWS, OpenStack, Rackspace, and Apache clouds.

Encryption

Planning for potential encryption services for data-at-rest and data-in-motion is underway.

Platforms

The initial platforms being considered include HP and Dell x86-64 servers. Support for HP x86 blades is a distinct possibility. Ports to ARM and PowerPC RISC (reduced instruction set computing) microprocessors may be considered later.

Databases

VSI is considering OpenVMS support for the Hadoop database manager.

Versions

VSI's OpenVMS Version 9 will run on both Itanium and x86-64 processors.

Summary

VSI's planned port of OpenVMS to the x86-64 microprocessor will open a broad market for OpenVMS. With HPE's port of its NonStop fault-tolerant operating system to its x86 blades (now the NonStop X), VSI's port will give mission-critical applications another hardened operating system to run on commodity servers.

Acknowledgements

Information for this article was taken from the following sources:

OpenVMS Future Product Directions, VSI; OpenVMS Boot Camp 2015.

Porting OpenVMS to x86-64, VSI; OpenVMS Boot Camp 2015.

Introduction to the x86 Architecture, VSI; OpenVMS Boot Camp 2015.

OpenVMS Rolling Roadmap, VSI; OpenVMS Boot Camp 2015.

HP Clarifies the Future of OpenVMS, *Availability Digest*; July 2013.

OpenVMS Support To Continue Indefinitely, *Availability Digest*; August 2014.

VSI Releases First New Version of OpenVMS, *Availability Digest*; June 2015.