REPRINTED *from*

COMPUTERWORLD®

THE VOICE OF IT MANAGEMENT ■ WWW.COMPUTERWORLD.COM NOVEMBER 1, 2004 ■ VOL. 38 ■ NO. 44

TECHNOLOGY

OpenVMS SURVIVES AND THRIVES

The 'legacy' operating system maintains a substantial base in large organizations, and there's promise of new interest as it moves to 64-bit Itanium. **By Drew Robb**

OpenVMS was supposed to have died a slow and unheralded death sometime during the 1990s. Labeled passé by analysts and "legacy" by Windows and Unix enthusiasts in the wake of the distributed computing boom of the '90s, it hardly merits a mention in the computer press. Yet the operating system has stubbornly refused to go away.

Digital Equipment Corp. developed the Virtual Memory System in 1977 for VAX hardware as a multiuser, multitasking operating system. (Digital was eventually absorbed by Compaq Computer Corp., which merged with Hewlett-Packard Co. in 2001.) OpenVMS is a later version that runs on VAX and Alpha and will soon be available on HP Integrity servers, part of the company's 64-bit Itanium line.

One of the perceived drawbacks contributing to the aura of doom around OpenVMS was the operating system's tie to expensive proprietary hardware — first VAX, then Alpha. But now that Integrity servers — which also support HP-UX, Linux and Windows — run OpenVMS, its users will benefit from the same manufacturing economies of scale that users of those other operating systems do.

Even now, however, annual OpenVMS-related hardware, software and services earn in excess of $2 billion annually for HP, and more than 400,000 VMS systems are still operating worldwide, according to a source at the company. Those numbers are backed up by Ken Farmer at OpenVMS.org, an independent Web site dedicated to OpenVMS users. He estimates that there are 10 million users worldwide and hundreds of thousands of installations of OpenVMS.

"Our intention is to keep on using VMS until doomsday, as long as it keeps innovating and providing the highest standards in the IT world.

DANIEL SANCHEZ REINA, IT MANAGER, SONY CORP.'S BARCELONA CENTER FOR DISTRIBUTION

"There were about 456,000 VMS systems almost a decade ago, and after a slight yearly decline for a few years, the operating system is now staging a revival," says high-performance computing guru Terry Shannon, a 22-year VMS veteran in Amarillo, Texas, who wrote the original VMS user guide. "Some of the folks who drank the Windows Kool-Aid and dumped VMS for Windows are now coming back."

When the Chips Are Down

OpenVMS/Alpha systems are commonly used by financial services, health care, manufacturing and aerospace companies, as well as utilities and state lotteries and other government agencies. HP says that 50% of major telecommunications providers and 80% of chip manufacturers use OpenVMS. Users say that they've stuck with OpenVMS because the operating system has provided all of the features they've needed, along with tested stability.

"We chose VMS due to reliability, availability, solid performance, the fact that it's mature and proven, and the stability of both the hardware and software," says Joseph Stenz, senior systems programmer/administrator at Albert Einstein Healthcare Network in Philadelphia. "There were some IBM mainframe and Windows solutions offered, but they didn't justify moving off of Alpha."

Einstein Healthcare will be installing a new AlphaServer ES47 this fall. It will be the third VMS/Alpha system within the 6,000-employee campus encompassing six major facilities. Einstein Healthcare also has over 100 Windows NT/2000 servers in an enterprise LAN/WAN (frame relay/Asynchronous Transfer Mode) environment.

Einstein Healthcare's Alpha-based systems include an ES47 Model 2 OpenVMS machine with two 1-GHz Alpha EV7 processors with 1.75MB Level 2 cache (four-processor capable) and 4GB of error checking and correcting memory. There's also an HP AlphaServer ES47 Model 2 OpenVMS enterprise server with a memory expansion up to 8GB, and an HP AlphaServer ES47 Model 2 OpenVMS enterprise server with memory expansion up to 8GB and optional RAID memory support.

Einstein hasn't clustered its Alpha environment, which also includes two HP MSA1000 Fibre Channel storage arrays.

The ES47 supports several applications that demand reliability and high availability: Siemens Document Imaging 23.4 for billing purposes; IDXtend 9.0 for physician billing and scheduling; and McKesson/HBOC Trendstar for decision support and cost accounting.

Einstein Healthcare isn't the only user gravitating toward Alpha. Annual sales of Alpha hardware add up to several hundred million dollars, according to HP.

Move to Itanium . . . or Not

MANY ORGANIZATIONS USING VMS have a mix of Alpha as well as aging VAX hardware to deal with. So, with HP porting VMS to Itanium 2 for its Integrity server line, companies must decide which way to go. Soldier on with VAX despite the lack of reseller support and a diminishing pool of spare parts, or port to Alpha? Retain Alpha systems for the seven remaining years HP promises to support them (HP says it will likely support Alpha until at least 2011), and then see where to go from there? Or move everything to Itanium and scrap a significant investment in VAX/Alpha-based VMS systems? Here are a few rules of thumb for the various scenarios.

1. **Stay with VAX if you're constrained by hardware or software issues** such as lost source code, special I/O hardware or large amounts of handcrafted assembler code.
2. **"Consider emulation of VAX – preferably on an Alpha/VMS platform, not Windows –** if the performance characteristics and availability requirements of the application allow you to," says Colin Butcher, a systems architect at XDelta.
3. **Move from VAX to Itanium for "general purpose" applications without hardware constraints, but don't rush it.** Spend time testing carefully, especially in high-availability and business-critical environments. But if you're moving to Itanium, then port from VAX to Alpha first in order to debug any 32-/64-bit problems and get the code through the compilers.
4. **If your Alpha machines have room for growth in terms of performance** (for adding CPUs or memory), then staying with them while you spend a couple of years planning and testing your port makes sense.
5. **If you're about to buy new Alpha hardware, buy with room for growth so that you don't back yourself into a corner** later on if your porting plans don't work out as intended. Such systems work well and are a known technology. "Alpha purchases are estimated to still be in the double-digit thousands of units sold each year," says consultant Terry Shannon.
6. **Move from Alpha to Itanium-based systems if you gain advantages,** such as performance (that's probably a few years away) and consolidation. Also be aware of support costs for Alpha, which will probably rise above those for Itanium boxes. However, don't rush to be the first to use the new systems unless you have some pretty good reasons to do so. "Most applications will migrate to Itanium with a minimum of effort, mainly recompilation," says Bob Gezelter, a software consultant in New York. "Programs which contain special Alpha- or VAX-specific code typically require modest changes."
7. **If everything you need is supported on Itanium, then consider using it from Day 1,** but be aware that you'll be among the first to use it in a production environment. "It's all about assessing risk and striking an appropriate balance between risk and costs," says Butcher.

Why OpenVMS Hasn't Faded Away

Performance
OpenVMS can handle 3,000 simultaneous active users and almost 2 million database transactions per minute on Oracle.

Uptime
It's quite normal for VMS cluster uptimes to be measured in years. User after user has verified this.

Clustering
OpenVMS offers shared-everything clustering, i.e., applications running on 96 servers can simultaneously write to the same files on shared disks. If one server goes down, there's no data loss, and the application stays up. Similarly, two physically separate data centers can be part of a single VMS cluster. This feature kept several Wall Street firms in business on Sept. 11, 2001.

Disk Mirroring
Known as volume shadowing on VMS, this feature mimics disk drives for applications using a set of virtual devices. Synchronously mirrored write operations are transparent to users.

Maximum Nodes
OpenVMS can run a maximum of 96 nodes in one cluster, far more than any Unix or Windows-based systems. That equates to over 3,000 processors.

Intersite Distance Limit
The maximum distance allowed between disaster recovery sites is 800 kilometers on OpenVMS, compared with 100 kilometers at best on other systems.

Security
Open VMS is "virtually unhackable," says Ken Farmer of OpenVMS.org. Indeed, at the DefCon 9 Hacker Conference a couple of years ago, OpenVMS beat out Windows NT and XP, Solaris, Linux, BSD and others and was graded as unhackable by the best hackers in the business, according to Farmer.

– Drew Robb

Rising to the Challenge

A major impetus behind the VMS/Alpha revival appears to be its performance during the Sept. 11 attacks on New York's World Trade Center.

According to David Freund, an analyst at IT research firm Illuminata Inc. in Nashua, N.H., several financial services businesses in the towers and numerous others in the immediate vicinity had OpenVMS disaster-tolerant clusters with backup sites outside the area. Every one of them had their operations running just moments after the catastrophe, says Freund.

Following that awful day, OpenVMS seems to have gained new prominence. In some IT circles, it's now regarded as the crème de la crème in disaster recovery and high availability, according to users and analysts.

"OpenVMS uptimes can be measured in years," says Stenz. "This is certainly preferable to a culture of rebooting and disruption that plagues other platforms due to viruses, Trojans, denial-of-service attacks and endless patching of systems."

OpenVMS Globalization

It isn't just U.S. companies that are remaining on or rediscovering OpenVMS. The operating system has maintained a strong hold overseas, according to Colin Butcher, a systems architect at systems integrator XDelta Ltd. in Bristol, England, who has 20 years' experience on OpenVMS for clients such as HP, Ikea International AS, the U.K.'s air traffic control service and the U.K. National Health Service.

When Sony Corp. opened its Barcelona Center for Distribution (BCD) in Spain 12 years ago, it trusted its business-critical systems to VAX/VMS. The facility is highly automated and runs 24 hours a day, six days a week in order to keep up with tight deadlines for the distribution of Sony and Aiwa products throughout southern Europe.

Daniel Sanchez Reina, BCD's IT manager, lists the usual reasons for choosing the operating system: its robustness, reliability, powerful features, high performance and memory management.

"You get true clustering on VMS as the number of machines becomes transparent to you; they work as a single unit," says Sanchez Reina. "This is made possible by the fast, powerful and clusterwide lock manager."

In 1998, BCD ported VMS from VAX to Alpha. It now runs a three-machine Alpha/VMS cluster in conjunction with a customs system and optical archive running on Windows 2000 Server, an HP StorageWorks EVA 5000 storage array and an Oracle Corp. database.

Future Plans

How much longer will OpenVMS remain viable?

"Our intention is to keep on using VMS until doomsday, as long as it keeps innovating and providing the highest standards in the IT world," says Sanchez Reina. "We have no plans to migrate to VMS on Itanium, at least for now."

That seems to be the consensus among IT shops: Stay on Alpha, milk it for all it's worth, and keep a close eye on developments in the VMS/Integrity server space.

Like BCD and many other users, Einstein Healthcare has no immediate plans to migrate. Stenz says he has a four-year lease on Alpha hardware and is unlikely to change during that period.

"We are going to adopt a wait-and-see approach to developments on Itanium and VMS," he says.

Meanwhile, HP has had OpenVMS Version 8.1 in field testing on Itanium for many months. At the recent HP World Conference, it released Version 8.2 for testing. The company expects the first shipments of OpenVMS/Integrity servers either late this year or early next year.

Few anticipate significant problems in the system or in porting applications from Alpha to Itanium.

"The OpenVMS APIs are so correct architecturally that the operating system has not required substantial change since its original design in 1977," says Bob Gezelter, a software consultant in New York who has tested the new system. "OpenVMS on Integrity is a case of seamlessly assimilating a new processor, not using a high-tech shoehorn to force an old architecture into an ill-fitting shoe."

XDelta's Butcher has also tested Itanium/VMS. Other than needing some time to figure out the console interface, he says he found that VMS seemed to run and behave just as it always does.

Butcher does, however, express some reservations. "Performance might be an issue at the moment," he says. "The big Alphas probably outperform the larger Itanium boxes, but that will change with time."

Few Alpha users are in a hurry to make the switch.

"After seeing where the market and technology direction is heading, we may adjust our direction after the third year of our lease," says Einstein Healthcare's Stenz. "Depending on how things play out on Itanium 64 and VMS, we could very well then migrate to that architecture or extend/augment our ES47."