HP Breathes New Life into AlphaServer

Analyst: David Reine

Management Summary

When a corporate CIO or IT Director commits to a platform for the execution of a mission-critical application, he is also looking for the same commitment from the vendor. He (or she) needs to know that the platform he chooses will still be available and supported in the years to come and that the company he selects will still be there to support that platform.

The CIO is looking for more that just a statement of dedication. For example, if you consider a breakfast of bacon and eggs, it is clear that the chicken was dedicated to providing those eggs, and that the pig was totally committed to the bacon! He gave everything for your satisfaction. In the same fashion, IT, today, is looking for the company, and the platform, that will provide it with the performance and support quoted in the company literature. **IT is also looking for the company that will commit to protecting the investment that you make in their products.** They seek a product with a growth path to provide continued improvement in performance capability and upward mobility that they require.

The individual responsible for enterprise computing needs to *believe* that when there is a problem, it will be fixed. They also need to know that the person on the other end of the line is not just trained superficially, but aware of his importance as a mission-critical part of your business and is able to restore that mission-critical service.

On the other hand, computers become obsolete, technology changes, and, at times, it is easier to switch than fight. Personal computer technology changes every three to six months; it may be less expensive to replace them than try to upgrade. The same is not true for the departmental or enterprise server. The transition to a new platform requires planning in order to ensure enterprise stability. However, that corporation will not be static during the planning and execution of the transition. Growth will continue, as will be the requirement for support for the existing platform. Hewlett-Packard (HP) is currently facing that very issue with an installed base of 400,000 *AlphaServers*. They have announced the introduction of a new platform, *Integrity*, based upon the *Itanium 2* microprocessor, which was developed in partnership with Intel. **Integrity will support both Alpha operating systems, *OpenVMS* and *TRU64* — when the customer is ready to transition.** For those customers who are not ready, HP appears to be quoting Mark Twain regarding Alpha: "The reports of my death have been greatly exaggerated."

To learn more about the impact of the recent HP announcement on the Alpha base, and **why Alpha refuses to go to Omega**, please read on.

Product History

In order to understand the loyalty of the *AlphaServer* customer base, we need to look back to see the origins of the platform. We need to understand the business values accrued to its users, and the faith that they have in the Alpha staff, those individuals who introduced, perfected, and continue to manage the improvements in the Alpha-Server family.

The AlphaServer is the natural descendent of the *VAX11/780*, introduced by Digital Equipment Corporation[1] (DEC) in October 1977. The VAX11 was a powerful 32-bit minicomputer, and represented the first instance of designers building minicomputer hardware and software together. **Enterprises purchased the VAX11 for the business values it presented to them: putting information directly in the hands of the decision-makers, a value that persists today in the AlphaServer.** The VAX11 was noted for its unprecedented levels of reliability, scalability, and flexibility. Applications written for the smallest member of the VAX family could be moved to the largest VAX as additional users required more performance. The performance capability of the VAX in terms of MIPS ranged in value from 5 on the *VAX11/750* to 1,795 on the *VAX7860*. This represents scalability of almost 360X, performance of a mainframe with the interactive capability and flexibility of a minicomputer. Extensions in 1983 with the introduction of clustering provided higher reliability, availability, and scalability, what we refer to today as *RAS*. We saw the last new VAX system introduced in July 1992, with the last VAX system being retired in 2000. **VAX had a life cycle of 23 years.**

With the end of life for the VAX imminent, DEC launched the AlphaServer Family in 1992. Designed to provide an upward transition for VAX customers, the AlphaServer continued the VAX standards for reliability, providing an alternative as VAX users migrated to this new platform.

As with the VAX, the AlphaServer provided the enterprise with outstanding reliability and scalability. Before this most recent announcement, the range went from a relative Transaction per Second (TPS) rating of **176** on a mono-processor *AlphaServer 400* to **90,300** on a 32-way *GS320*. **This represents a factor of 513X of scalability, even better than the VAX.**

With reports of an end-of-life for the AlphaServer, HP announced the *Alpha RetainTrust Program* in 2001. This program identified a smooth transition path to the *Itanium 2* microprocessor on the *Integrity* Platform[2], announced earlier this year. At the same time, HP announced continued development for the Alpha technology through 2004, with continued production through 2006. **All of these servers will continue to be supported through 2011, creating an AlphaServer life cycle of almost 20 years**, continuing the tradition started with the VAX of protecting the investment made in HP technology. In support of this life cycle, a new family of AlphaServer platforms, based upon the EV7 chip technology, is now available, with EV7 representing the next step, but not the last step, in the eventual evolution to Itanium-based systems. This new family consists of three models: *ES47*, *ES80*, and *GS1280*.

A Breath of Fresh Air

On July 30th, HP announced the availability of the expandable, enterprise level, 32-processor AlphaServer GS1280. **If you look at HP's new AlphaServer announcement as just a new high end to the Alpha line, it is significant. Even more significant, however, is the message that HP is sending to their extensive base.** HP intends to honor the commitment made to their loyal customers in the RetainTrust Program: continuing to improve the performance, scalability, reliability, manageability, and availability of the family.

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[1] Digital Equipment Corporation was acquired by Compaq in 1998, which then merged with HP in 2001.

[2] See *HP Takes First Step (Supersized) Toward Product Line Consolidation (Simplification)* in **The Clipper Group Navigator** dated July 29, 2003 at http://www.clipper.com/research/TCG2003034.

This commitment includes a 64-processor GS1280 by the end of 2003 and extensions to the microprocessor, in the form of EV79, in 2004.

GS1280

The GS1280, as announced, establishes a new ceiling for Alpha performance with a TPS rating of 120,000. **This is 33% higher than the previous best for an Alpha-Server, 30,000 TPS[3] higher than the GS320**, with both servers tested at 32 processors. This provides Alpha customers with the ideal platforms for enhancing individual system capacity or providing the vehicle to consolidate multiple Alpha systems onto a single platform.

The GS1280 is highly configurable, allowing from 2 to 64 1.15 GHz CPUs, with up to 4GB of memory per processor[4], and up to 768 I/O slots. The GS1280 is partitionable, with each partition as small as two CPUs. As with all AlphaServers, the GS1280 uses redundant components with optional RAID memory to enhance its RAS features, and supports *TRU64 UNIX v5.18* and *OpenVMS v7.3-1*. It replaces the AlphaServer *GS80, GS160* and *GS320*.

ES47

This announcement complements the January 2003 announcement for the ES47 and ES80, also based upon the EV7 technology. The ES47 supports up to four 1.0GHz Alpha CPUs, with up to four GB of memory per CPU[4]. This system replaces the *AlphaServer ES45*, which continues in the product set for customers who require previous versions of the operating system.

ES80

The ES80 supports up to eight 1.0 GHz Alpha CPUs, with up to four GB of memory per CPU[4]. It replaces the *AlphaServer GS80* with improved commercial, database, and technical application performance.

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[3] It is important to note that these ratings do not represent transactional performance as specified by the Transaction Performance Council.

[4] All new models will support up to 8GB/CPU in the fall of 2003 and 16GB/CPU in 2004.

The EV7 Technology and Beyond

With this new series of AlphaServers, HP introduces the EV7 technology, including a new microprocessor and a new IO subsystem – IO7. Development of EV7 progressed on the foundation of EV68, recognized as an exceptional computational processor. HP determined that, **in addition to enhancements to EV68, the best way to improve overall application performance was to reduce the amount of time that applications spent waiting for disk and memory transfers.** Therefore, the changes to the microprocessor involve the functions that improve:

- Data transfers from memory to L2 cache,
- Transfers from L2 cache into the processor, and
- Inter-Processor communications.

The IO7 functionality delivers higher bandwidth with low-latency, high-volume I/O to the EV7 microprocessor. Each microprocessor can have a directly attached ASIC connected through a dedicated I/O port. Each IO7 offers a 3.2 GB/sec full duplex I/O to the EV7 microprocessor and is sharable within the partition. Significantly, the integration of the L2 cache, memory controller, and inter-processor communications into the EV7 technology have no adverse effect on application compatibility. **By improving I/O between processors and reducing the number of components between them, HP has greatly increased multi-CPU performance, scalability and system reliability.**

Because of the slightly higher processor speed of that microprocessor, a few single CPU computational benchmarks for the EV68 remain higher than for the first version of the EV7. However, HP's multi-CPU benchmarks show that the EV7 version comes out a clear winner.

For those looking to the future of the RetainTrust Program, the Itanium 2 processor running at 1.5GHz provides the needed headroom as capacity requirements increase. See Tables 1 and 2 for comparative

AlphaServer Mono Benchmarks			
Model	MHz	CINT2000	CFP2000
ES45	1250	928	1365
GS80	1224	833	1014
GS160	1224	833	1014
GS320	1224	833	1014
ES47	1000	761	1288
ES80	1000	761	1288
GS1280	1150	877	1482
rx5760	1500	1312	2108
Table 1			

AlphaServer Multiprocessor Benchmarks			
	# of	CINT2000	CFP2000
Model	CPUs	rate	rate
ES45	**4**	**42**	**50**
GS80	8	76.4	81
GS160	16	148	161
GS320	32	296	320
ES47	**4**	**34.6**	**58.9**
ES80	8	68.9	117
GS1280	8	80.7	133
GS1280	16	162	274
GS1280	32	313	536
rx5670	**4**	**60**	**66.4**
Table 2			

performance for the SPEC benchmarks.

Table 1 shows that, in monoprocessor mode, the speed of the microprocessor is more important than the evolutionary technology. Even at a slower processor speed, however, **the GS1280 is superior to the EV68 platforms it is replacing in the floating-point computations**. Even more significant, The Itanium 2 based rx5760 running at 1.5 GHz is 50% faster than the GS1280, providing plenty of headroom for those transitioning to the RetainTrust Program. The multi-CPU benchmarks in Table 2 show the impact of EV7/IO7 in delivering overall numerical superiority, especially in the floating-point space.

The HP website reflects a similar story for the GS1280 in the internal TPS Benchmarks, updated in April:

- 33% faster than the GS320 for 32P
- 43% faster than the GS160 for 16P
- 44% faster than the GS80 for 8P

HP is planning one more improvement to the Alpha technology for 2004, with the scheduled availability of EV79 the final upgrade to Alpha on the migration path to Integrity. **AlphaServer owners should also take note that HP is committed to supporting the AlphaServer operating system capabilities on the new Integrity servers. HP has ported OpenVMS to Itanium, with production versions available by the end of 2004. Plans are in place to merge the best features of TRU64**

UNIX with *HP-UX on Itanium* **in a release that is also scheduled for the end of 2004.** Transition tools and services are already available to ease the move from TRU64 UNIX to HP-UX[5].

Conclusion

The continued development and production of the AlphaServer protects the investment that HP's customers have made in Alpha technology, data and training. With trade-in programs, lease agreements, and upgrades available, there is no compelling reason to accelerate the migration to Integrity and the Itanium 2 architecture. **HP has proven their commitment to its customers' continuity via enhanced performance, reliability, resiliency, and scalability to a proven technology. HP's customers have a green light for growth from the AlphaServer platform —** *when they are ready to proceed.*

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[5] **Upgrades to TRU64 will be delivered only in the HP-UX versions for Integrity after 2004**.

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➢ *The Clipper Group can be reached at 781-235-0085 and found on the web at* **www.clipper.com.**

About the Author

David Reine is a Senior Contributing Analyst for The Clipper Group. Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. He joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and a MBA from Northeastern University.

➢ *Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 37. (Please dial "1-37" when you hear the automated attendant.)*

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