Clipper Notes™

VENDOR-AGNOSTIC EXPLANATIONS AND ADVICE
FOR THE INFORMATION TECHNOLOGY BUYER

Navigating Information Technology Horizons^{SM}
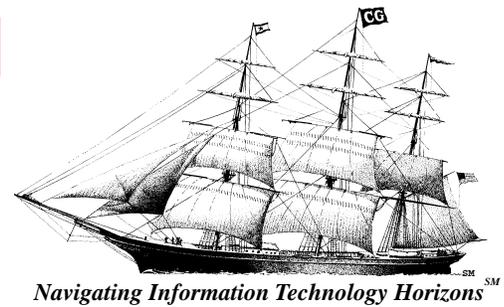
Migrate from a Proprietary Server Architecture?
— Open Systems Provide Way to Exit Money Pit

Analyst: David Reine

Management Summary

If it ain't broke, don't fix it! How many times have we heard that old saw? A common example of this is the family automobile. Most new cars come with at least a 3 year, 36,000 mile warranty. We expect no major maintenance hits to our wallets during the warranty period outside of the periodic oil change and 6,000 mile checkups. After the warranty expires, however, normal maintenance can get expensive, as is extending the warranty. Without the extension, however, finding a shop to even work on an old car can become an adventure.

We have a decision to make: *do we keep on driving "old reliable" or do we make a major investment in a new ride?* Making a major investment seems like a hurdle that we do not want to face, especially in a down economy, even though a new car has much to offer. Unfortunately, if you need that old car to commute to work, it becomes mission-critical. However, as maintenance bills grow, how much will you spend on "normal" maintenance before that proverbial hammer hits you on the head? Then you have to address the subject of the price of gas and a mileage rating of 15 to 18 MPG. Today cars can get better than 30 MPG and are environmentally friendly. *What is it costing to keep on doing the same thing?* Eventually, the time and money spent in the garage and at the gas station will convince you when it is time to replace your car.

A similar, and more profound, scenario is playing out in the data center of every enterprise, large or small, that has a proprietary legacy server infrastructure in place. These servers may only be three or five years old, or they could be 15 years old. They just sit there in the data center, or in the corner of an office, and purr away. The IT department may not even know what they are costing the company in terms of real dollars. The accounting department pays the maintenance bills, as they have since the warranty expired. Okay, the bills have gone up 5% every year, but what hasn't?

Unfortunately, other invisible costs of inefficiency are associated with "staying the course". Does anyone know how old the applications are or the continuing costs of support? How many lines of code are running your sensitive mission- and business-critical applications with no one around to change a single line when a policy change forces an update to the application? What is the cost to maintain the applications? Moreover, what is the impact of your IT infrastructure on the monthly energy bill? Systems designed before the energy crisis and the advent of multi-core CPUs did not account for the cost of electricity in their design specs. **In this down economy, now is the time to examine the total cost of ownership (TCO) of your proprietary server infrastructure and migrate to a more cost-effective open systems platform designed for tomorrow.** If this hits home for you, please read on.

The Legacy Data Center Money Pit

The data center of many enterprises contains a heterogeneous mix of both proprietary and open systems platforms. The open systems servers, many of them less than three years old, usually are based on Intel's x86 architecture and consist of a mix of servers based upon Intel® Xeon® processors or AMD Opteron™. Many of these systems could be classified as *infrastructure servers*, running under Microsoft® Windows® or a variant of Linux®. These servers typically were used a few years ago as file, print, and web servers, but now have found their way into database, ERP, and business intelligence processes.

Some open systems servers now are used for more mission- or business-critical roles, but many of these have been served by older, proprietary application servers, which for decades have been running some variant of the UNIX® operating system on a RISC[1] platform. The majority of these would include servers based on Sun SPARC® technology, HP PA-RISC®, or IBM® POWER® architecture. All of these date back over 20 years, with many data centers still using platforms at least three years old.

HP, IBM, and Sun continue to maintain and support the platforms built around their RISC architectures. However, many of them, including HP PA-RISC, Alpha, and MIPS, have reached end-of-life status and should be considered obsolete, with no new development or manufacturing planned[2]. IBM continues to develop new POWER servers for their AIX operating system, with more performance and more scalability, but the news does not look as promising for SPARC.

Much of the news surrounding Sun recently had been grim, ending with the announcement of an acquisition by Oracle. The future for SPARC is uncertain, at best. Fujitsu, the only significant SPARC development partner for Sun, has already indicated that while they will continue to support their SPARC customers, all new developments will be based on Intel's Xeon microprocessor. As yet, Oracle's plans for SPARC-based servers are unclear.

Those customers with 3-year-old and older SPARC servers now face a serious decision. They can do nothing, retaining the performance that they have today, along with the same performance per watt achieved today, or they can invest in an upgrade to current SPARC offerings. However, knowing that there may be no, or limited, enhancements in the future, a migration to another proprietary system, or to an open system, may be required in the not-too-distant future. A third alternative is to migrate to an open system today, even sooner than might have been considered a few months ago.

Doing nothing is not an acceptable option for those data centers stretched to capacity in terms of power, cooling, and for floor space. The operating cost for your proprietary infrastructure is consuming a disproportionate share of your IT budget, and thus may be limiting the capability of the enterprise to invest in new solutions and business innovation, especially as yearly maintenance to support legacy servers increases.

Data center managers know that these systems, and, more importantly, the applications that they run, are critical to the day-to-day operation of their enterprises and fear pending platform obsolescence. Moreover, they are aware that the company, or the in-house personnel, that wrote and support the solution could go away.

Changing the Data Center Paradigm

For years now, many data center managers have operated on an "it ain't broke" philosophy and continue to pay monthly maintenance bills with their standard 5-to-10% annual increases, with little regard for the other operational costs that continue to climb; costs such as software licensing, administration, energy and floor space for systems based on old-to-very-old technology. These data center managers also may have ignored the impact these proprietary RISC systems have on the growth of the enterprise. Because of the increase in operating costs, these systems may be consuming a disproportionate share of the data center budget, limiting investment in new applications, and inhibiting growth as management tries to respond to a changing business climate.

Due to rising energy costs and the recent drastic downturn in the economy, the IT staff has had to rethink the way that the enterprise, and the data center, operates. **The visibility of the TCO of the IT infrastructure has risen to the highest levels of management and it requires the IT staff to change the data center paradigm**. While energy conservation, in general, has risen to the level of "save the planet",

---

[1] Reduced Instruction Set Computing.
[2] In fact, HP has moved the application support for its UNIX servers to Intel® Itanium® processor architecture under its Integrity line.

reversing the rise in energy use in the data center could be classified as "save the enterprise", or even, "save *my* job".

What has kept proprietary systems alive in the data center? The answer to that one is simple: the mission- and business-critical applications that drive the enterprise and the fear of the costs and risks to migrate them to another platform.

What has now changed to create a sense of urgency in the data center to replace, or possibly upgrade, these systems? One possibility is that the deployed RISC platform has maxed out in terms of application scalability or response time. If your server is based on PA-RISC or MIPS, a migration to an open architecture is mandatory. If you based your environment on SPARC, you could take advantage of binary compatibility and upgrade to a newer, more scalable SPARC model as a short-term fix, but what about the long-term?

Is the acquisition of another SPARC server simply an intermediate step to eventually going to an open solution? What is the prognosis for Sun under Oracle, let alone SPARC? Even more important, what is the projected lifespan of your applications? And then, there are the costs.

If your mission-critical application set was written in-house, you may still have the source code for it. Then again, it may be so old that you do not. You may have an entire staff assigned to the care and maintenance of these applications. Then again, there may be only that lone analyst in the corner who is even vaguely familiar with its roots. In either case, the cost or the risk of doing nothing is too great. With the availability of thousands of open systems applications, **now may be the best time to port your old application or find a new application to handle the changes in business processes to see you into the next era for your enterprise.**

Many enterprises are already using third-party applications on their mission-critical UNIX servers. Many of these applications are operational in a Linux environment or, if the data center is operating in a Sun environment, may have been ported to an x86 architecture running under Solaris®. However, with the future of Sun's servers in question, does staying with Solaris make any more sense than staying with SPARC in the first place? Well, maybe.

Depending upon application availability, it may make sense to develop a two-stage migra-

tion plan: (1) move to an open platform running your mission- and business-critical applications under Solaris in the short run, (2) while looking for, or writing your own, permanent solution under Linux. Or, it may make sense to simply migrate to x86 and Linux directly. Here's why.

Fixing an aging x86 server environment is relatively easy. There have been continual improvements to the processing power and energy efficiency of the Intel Xeon processor. In fact, you can replace a three-year-old single-core x86 architecture with servers based on the latest Intel Xeon processor 5500 sequence (formerly known as Nehalem-EP), with an ROI of eight months, based on savings from improved performance and server utilization, maintenance, energy, and floor space. And improved virtualization capabilities allow you to consolidate multiple servers onto a single dual-processor platform.

However, what can you do about proprietary RISC systems that are still running enterprise mission-critical applications? Can the enterprise lower capital expenditures and operating expenses for their RISC servers? The answer to this for end-of-life RISC platforms is – the enterprise is stuck; **there is nothing they can do!** In fact, in order to position the data center for higher productivity and lower costs for the years ahead, **the data center must migrate**.

Migration Benefits

If you decide to migrate an existing RISC platform to open systems, you will discover that it is neither as difficult nor time consuming as imagined. The **outstanding performance** of open systems is better than it ever has been and the platforms are as **reliable** as those they are replacing. In addition to the performance, and more important to some, is the outstanding **price/performance** available from open systems, as well as the **performance/watt** provided by the latest x86 architectures. Combined with significantly lower software licensing costs and a reduction in the administrative staff as a result of consolidation and virtualization, the enterprise will experience a significantly lower TCO for their new infrastructure. The TCO is further reduced as a result of the elimination of maintenance charges for an expensive RISC environment, replaced by the warranty for the new, standard environment.

Performance

Regarding performance, we can start by comparing the relative performance of the

newest servers utilizing the Intel Xeon processor 5500 series, and comparable Sun SPARC servers. As of May 20, 2009, a server with two Intel Xeon X5570 processors (8 cores) running at 2.93GHz had a SPECint_rate2006 value of **260**. A Sun Fire™ V490 server with four Ultra-SPARC™ IV+ CPUs and eight cores had a SPECint_rate2006 value of **78**[3]. Sun's latest 2 socket SPARC server, the Sun SPARC Enterprise™ T5240 with 2 CPUs and 8 cores per chip (16 cores) had a score of **157**. On a per core basis, the latest Intel Xeon processor-based servers have over 3.3 times the performance of the SPARC based servers. As many of the SPARC servers that might be replaced will be older than two years, you can expect even better ratios. When you incorporate the energy efficiency of the newer platforms, along with the other TCO advantages, the benefits really begin to add up.

Reliability and Availability

In terms of reliability, open systems have optimized availability. Reliability features of Intel Xeon processor-based platforms include the same features that exist on RISC servers: ECC, DDR3 memory, hot-plug disk drives, hot-plug and redundant power supplies and fans, dual embedded NICs with failover and load balancing, RAID support with battery-backup cache, and other features to ensure system availability. Put into a clustered or high-availability configuration, these industry standard servers can deliver availability levels at or above most RISC-based systems.

Other variables need to be considered in upgrading the data center's legacy environment, especially the UNIX variant, the application set, and the database management system. Have the application set and database been ported to Linux already? If not, you face a migration. What is the best Linux variant for your data center? Of the many variants of Linux, there are two enterprise options, Red Hat® Enterprise Linux® (RHEL) from Red Hat and SUSE® Enterprise Linux from Novell. The one best for you will depend upon your applications and the features, functions, and support provided. All of these factors need to be considered to determine the TCO implications of a migration. You can be confident, however, that Linux is enterprise-ready.

Linux became a commercially-viable solution before the beginning of this decade. During the economic crisis of 2001-2002, Linux gained increased popularity with many data centers shifting their RISC-based UNIX servers toward more open platforms with a Linux operating system. Quite clearly, this second-generation of major releases from the various Linux distributors is bestowing an increased level of confidence in the maturity of Linux as an enterprise-level operating environment. Combined with the second recession of this decade, Linux is becoming more popular than ever. **With presence on every major architecture from the desktop to the mainframe, Linux is the most widely-available operating environment that you can find.** Today's enterprise-ready versions feature more management tools and integrated virtualization than ever, along with a portfolio of applications growing in size and selection every day. With increased availability of resilient and high-performance hypervisors in support of Linux, the IT staff can reduce the TCO of the IT infrastructure with Linux. Today's Linux also features improved interoperability with other enterprise-level IT solutions.

Most major software companies now develop first on Linux and then port to Windows or UNIX variants; this includes Oracle and SAP. This provides a tremendous infrastructure for choice and for support. For example, there are over 16,000 supported configurations of servers and storage for Red Hat Enterprise Linux, alone.

For the enterprise looking to reduce TCO, "It ain't broke" is not good enough. Just because RISC engines can run a scale-up architecture may no longer be a sufficient financial justification to maintain the current paradigm. You may need to look for a better way to run the mission- and business-critical applications driving the enterprise. **Migrating to a more powerful, open system is easier, offers more performance, and is more cost-effective than ever**.

Migrating from Proprietary to Open

For the enterprise that has already made the decision to deploy an open systems architecture for all *new* applications, the decision to migrate from proprietary to a standards-based environment for both mission- and business-critical and infrastructure applications is a relatively easy one. As we stated earlier, the operating costs of the older legacy infrastructure probably have long-since begun to constrain business efficiency and growth. With the acceleration of business growth of prime concern, you are looking

---

[3] See www.spec.org for more details.

for ways to improve service, reduce cost, and manage risk. With costs rising and budgets shrinking, something has to be done now. Once you accept the fact that the cost to maintain a proprietary environment is not going down, the decision to transition to an open environment becomes easy.

There are two aspects to migrating off of your legacy architecture onto a new one: (1) determining the physical environment and (2) selecting the best operating environment. The motivation for superior performance and qualities of service that led your predecessors to deploy a RISC environment is no longer valid. **Over the past decades, the performance and reliability of x86 processor-based systems have increased dramatically, as have the features, manageability and reliability of enterprise Linux**. Additionally, the cost to administer an open systems network is significantly less than the cost to manage a legacy environment, with all of the special skills and administrative attention required.

Benefits of an x86 Architecture

First, and foremost, the latest iterations of the x86 architecture have eliminated the biggest hurdle for the IT staff in determining the right platform for their mission- and business-critical applications. With the continuing higher performance and reliability of x86 CPUs, there is a most viable alternative to UNIX on RISC for the deployment of enterprise and mission-critical scale-up applications and scale-out workloads such as web and IT infrastructure.

With quad-core processors designed with integrated virtualization capabilities and a multi-threaded architecture, the data center can deploy servers with the highest benchmark ratings, enabling the consolidation of a virtualized IT infrastructure and a reduction in operating costs. With more scalability than the legacy platforms they are replacing, the data center can operate with fewer administrative personnel, yet still provide faster response time than the existing RISC platforms. In fact, these servers use less energy consumption and floor space than the existing infrastructure, lowering the TCO of the data center. For example, the low-power version of the newest Intel Xeon processor 5500 series consumes only 60 watts, while the high-performance version of this processor consumes only 90 watts, and this includes Intel's Turbo Boost technology, providing additional performance on-demand.

Benefits of UNIX-to-Linux Migration

As standards-based operating systems and applications evolve and continue to provide more features and functionality, the reasons for migrating from a UNIX environment to enterprise Linux increase dramatically. **Migrating to enterprise Linux can help you to reduce data center dependency on complex and costly proprietary systems** by taking advantage of the low-cost, multi-vendor, high-performance x86 architecture supporting multiple enterprise Linux variants. An open scenario also allows the data center to take advantage of a rapidly evolving **open source development model** to increase enterprise flexibility and serviceability to meet evolving needs as business requirements change.

Migrating to x86/Linux will enable the enterprise to:
- **Improve application performance**;
- **Lower the TCO for IT**;
- **Leverage existing IT skills**;
- **Standardize the environment**; **and**
- **Enhance system security and scalability**.

An open-source operating environment enables the IT staff to develop and deploy better software, faster, in collaboration with a worldwide development community on a variety of platforms, from desktop, to workstation, to server, and even to mainframe. Also, the enterprise is not restricted to a single vendor, enabling the enterprise to eliminate vendor lock-in and retain control of infrastructure selection. The Open Source community distributes both source and binaries, enabling a vast network of developers and administrators to make modifications and improve the solution, increasing productivity.

With over 2000 certified vendors for RHEL, and over 2800 certified applications for SUSE Enterprise Linux, Linux has seen rapid enhancements in functionality, performance, reliability, and security. These are enhancements that take years to develop in a proprietary environment. However, you need to remember that while it is UNIX-like, *Linux is not UNIX*. Few of these differences have a significant impact on application functionality, but it is important to understand what differentiates Linux from UNIX to help determine where to utilize it in the data center. If your application has not already been ported to Linux on x86, there may be some hand-tailoring required. However, most data centers can leverage off-the-shelf applications to

eliminate the need to port and recompile, by running new software on an x86 architecture. This will also enable the I.T. staff to retire inefficient old source code and replace it with open source alternatives.

Like UNIX, **Linux comes with a vast offering of built-in applications to provide the high-level functionality that the enterprise data center has come to expect from the proprietary UNIX operating systems.** Linux also comes with a wide assortment of open source software applications that have proven to be adequate replacements for third-party tools that had to be purchased in a UNIX environment. In addition, simplified management tools accelerate deployments, simplify operations, ensure data availability, and maximize the efficiency of the IT staff. This can lower the software-licensing burden on the data center significantly, reducing TCO.

Managing a Linux-only environment will cost less than managing UNIX *and* Linux. Eliminating the proprietary UNIX environment will enable the data center to simplify infrastructure administration and reduce administrative headcount, lowering software licensing charges and operating expenses.

Conclusion

As Detroit automotive executives have learned recently, there is a limit to their financial excesses. Arriving in the Capitol in separate private jets was too much for the public and Congress to ignore. Financial controls are essential to the operation of any enterprise. The same is true for the CxO managing an enterprise data center. S/he has a Board of Directors to report to; s/he cannot afford to pour good money after bad into a proprietary money pit.

There is tremendous risk in continuing to operate a proprietary, legacy environment. The costs of maintaining old RISC servers with an outdated operating system release and old mission-critical applications are increasing. The penalties of having either of them become obsolete could be the death knell for your enterprise. Complaints from customers that your infrastructure can no longer meet agreed upon SLAs and the cost of finding replacements for an aging programming or administrative staff could be

crippling to your enterprise. It is now time to modernize your data center with a new open systems platform with new mission-critical applications in order to gain control of data center TCO.

The enterprise can reduce TCO for both the server network and the data center by migrating completely to an open platform of x86 servers and Linux operating environment. You can reduce operating costs by eliminating high maintenance bills, proprietary software licensing, and RISC/UNIX staffing. The data center can limit complexity, increase flexibility, and take advantage of technology innovation by consolidating multiple applications in a single, open, virtualized environment, optimized to take advantage of available IT resources. **The ROI of moving to an open environment makes this a logical move for the short-term health of the enterprise as well as long-term growth.**

If you are concerned about the future of your proprietary RISC platform, you need to consider a migration from proprietary to open, from UNIX to Linux while you still have options. You do not want to be forced to pour good money after bad upgrading an obsolete architecture in order simply to stay afloat.

About The Clipper Group, Inc.

The Clipper Group, Inc., is an independent consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

➢ *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 Director, Enterprise Systems 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 an MBA from Northeastern University.

➢ *Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 123. (Please dial "123" when you hear the automated attendant.)*

Regarding Trademarks and Service Marks

The Clipper Group Navigator, **The Clipper Group Explorer**, **The Clipper Group Observer**, **The Clipper Group** *Captain's Log*, **The Clipper Group Voyager**, **Clipper Notes**, and *"clipper.com"* are trademarks of The Clipper Group, Inc., and the clipper ship drawings, *"Navigating Information Technology Horizons"*, and *"teraproductivity"* are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

Disclosure

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.

Regarding the Information in this Issue

The Clipper Group believes the information included in this report to be accurate. Data has been received from a variety of sources, which we believe to be reliable, including manufacturers, distributors, or users of the products discussed herein. The Clipper Group, Inc., cannot be held responsible for any consequential damages resulting from the application of information or opinions contained in this report.