



Do You Need to Make Infrastructure Matter? — HP is Making It Happen!

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Management Summary

In an attempt at ridiculous simplification, consider this. People who buy computers fall into one of two categories: either they are driven by the fine print (i.e., the specifications) of what's inside, or they really don't care. Clearly, I care; but I do this for a living. Does that make me right and the others wrong? Not in the least; each group has different priorities and objectives, driven largely by how they plan to use the asset. There are times when what is inside may not matter, like whether your smartphone has 2, 4 or 8 cores inside. A technologist might say that 8 cores always are better than 4 or 2, but where is the measurable proof? What if battery life is your primary concern? This may be compounded by the economics; for example, if 8 cores add measurably to the cost of the smartphone. This leaves us with a two-part question: (a) *What is the discernible difference?* and (b) *What kind of ROI will you get out of that difference?*

When looking for a new car, it is easy to identify the discernible difference that a hybrid provides over a conventionally-powered vehicle – it shows up in the MPG rating. However, that is a potential difference; the actual difference will depend on how you will use the vehicle. If the big MPG difference is in stop-and-go city driving and you spend most of your time on the highway, you may get less of a difference, as measured in improved MPG over a conventional vehicle. Even if you will have a significant discernible difference, how much more did you have to pay to get the improved benefit? Ignoring the social benefit of driving a green vehicle, you want to know the ROI for your measurable benefit. **Technology really matters when it improves the economics and the possible outcomes.** The same is true for IT infrastructure.

Most certainly, some see open system servers as being “generally the same” and being able to “generally do the same”. While most would acknowledge that the processor chip (with a given number of cores and maximum processing speed) and the amount (and speed of) memory do make a difference in server performance, those of us who live deep in the world of IT infrastructure all know that this is not where the story ends; it just is where it begins. Unfortunately, there are many who will never give it a further thought, possibly because they have an application in mind and know that they probably never will test the physical limits of a server. That changes when you are running many applications on a single server, as in a virtualized environment. All of a sudden, now you are concerned with (a) how much work can be done, (b) how much overhead you need to handle the virtualization, (c) how much headroom you must provide to keep from overtaxing the system, (d) how much staff is required to manage this, (e) how much energy is required, etc. In addition to these *how-much questions*, is the “other” how-much question: *how much (more) will it cost for the needed extra capabilities to get more work done more effectively and efficiently?* **What we**

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seek is a measurable or quantifiable difference to which we can compare the difference in cost. If everything costs the same or is capable of doing the same, comparisons would be simpler, but that typically isn't the reality in the data center. **We all know, in our gut, that technology really matters for IT infrastructure. We just need to be more focused on what really matters and what it really costs.**

Just as the friendly poker game down the street requires the player to have "Jacks or better" to open, each server vendor can use generally-available x64 processors to ensure their participation in the game, so that your *Windows* or *Linux* or even *UNIX* application will play on their server, but then they can apply their own added-value hardware, packaging, and management software to distinguish their platform from the rest. **The server vendor's added value almost always is based on making sure that the entire server environment is more effective and cost efficient, that you have the tools necessary to gain increased value from the environment that you are provisioning, and/or perhaps there is a more security and/or energy efficiency – whatever matters most for your enterprise.** In order to make sure that it matters for you, HP uses technology to ensure that the right IT matters for your data center. To learn more about how HP differentiates its server products and how it makes technology matter, please read on.

Today's Open System Data Center

In the 21st Century data center, Open Systems is the catch-phrase. Every data center staff is faced with the choice between very similar architectures. As long as you have an x64¹ architecture, you have access to a set of open systems applications that can enable you to be an effective, and profitable, enterprise. If your application set is running only on *Windows* and/or *Linux* environments, you most likely are using an x64-based architecture with a central processing unit from Intel or AMD, the primary vendors of x64 processors. Intel and AMD both offer a wide variety of CPUs with different clock speeds, different cache sizes, different core counts, etc. Some think that while Intel's higher performance

¹ In casual conversation, we tend to refer to the PC-compatible architecture as *x86*, which goes back to the Intel 8086. However, for today's 64-bit servers and operating systems, that is a bit anachronistic. So, in this paper *x64* will be used to describe the servers based on Intel *Xeon* and AMD *Opteron* processors.

Xeon processor might deliver a little better server performance, AMD's low-cost *Opteron* might enable a little less expensive server.²

Server vendors constantly address the battle between technology cost and workload performance. It is up to each server vendor to package up their system with the right technology, including processor, RAM, hard disk drives (HDDs), solid state disks (SSDs) and I/O, and more, to deliver the performance that the enterprise applications require to be effective (with respect to getting workloads executed) and efficient (in terms of cost). **Whenever someone tells you "All of the servers are the same", it is time to remind them that this is an incorrect metaphor. Better technology likely will deliver better benefits,** and the more likely it is that your data center will be able to create more value for its employees and customers.

For open system enterprise data centers, the added value can make a difference in satisfying mission-critical requirements, whether done in-house or remotely in the cloud. **The servers' added value may be (and probably is) a significant differentiator in providing a competitive advantage for your enterprise over your competitors using less innovative environments.** Two categories of these competitive advantages are:

- **Functionality** – the ability to do something better, including faster, and
- **Economic** – lowering the cost of doing it.

There are three very important enterprise priorities that need to be addressed to enable the enterprise to gain a competitive advantage:

- **Integrating data and processes** across the business,
- **Applying the right resources** where and when they are needed, and
- **Finding economies of scale** to make a noticeable difference at the right place (internally and externally) and time can manifest itself in profitability on the bottom line.

Enterprise Requirements in an Open Systems Era

What are the major issues keeping your

² If you are using both *UNIX* and *Linux*, then you may be playing in a different arena where IBM *Power Systems* (with *AIX*), HP *Integrity* using Intel *Itanium* (with *HP-UX*), and Oracle *SPARC* (with *Solaris*) hold sway.

enterprise CIO up at night?

- ***How to ingest and process the TBs of Big Data being created throughout the enterprise?*** How do you store and analyze all of the video content, geophysical data, social networking streams, et al, that have been created?
- ***Perhaps your biggest question is: “To Cloud or not to Cloud?”*** Do you deploy a private cloud or do you risk the perils of a public cloud, trusting the quality and reliability of application processing and storage to others? Perhaps a hybrid cloud is in your future, deploying mission-critical systems within your domain while taking advantage of perceived cost savings for non-critical systems or archiving?
- ***Is your user base connected to the home office via mobile devices and does this present a brand new set of concerns?*** Smart phones, tablets, and other devices with sensors capturing important data are now prevalent in every enterprise. Exactly how can the enterprise extract value from these devices safely and securely?
- ***How do you reduce the total cost of ownership (TCO) of the IT infrastructure?*** How do you make servers, storage, and communications links more efficient, reducing waste? Do you address the task of virtualizing each individual element of your environment or do you deploy a converged environment, with the virtualization features already built-in?

If your enterprise is committed to the simplicity that open systems servers can provide, what additional features or technological innovations do you need in order to address the issues above to improve application performance, increase business agility, lower cost, and reduce risk?

Certainly, you will need scalable storage capacity, with data deduplication to reduce replication of data. You also will need multiple tiers of storage, including high-performance devices to provide mission-critical data quickly while, at the same time, you are deploying low-cost storage for long-term data preservation and use. You will need to improve your application density by increasing the number of VMs per server. This may require a platform with more processors, more cores, and more memory than “standard”, in order to increase the number of VMs that each platform can support. Unless the IT staff wants to throw out earlier generations of their enterprise

servers and storage, an open approach that can encompass a heterogeneous environment probably needs to be deployed. This means integrating older enterprise infrastructure into a single, manageable network that can span existing server and storage islands and silos.

Integrating a heterogeneous environment with a variety of architectures, old and new, from HP, IBM, or anyone else, including Windows and Linux, into a single, cohesive processing environment can add magnitudes of complexity to data center operations. Reversing this trend and increasing simplicity is vital to getting more for your data center expenditures. The IT staff needs to focus on reducing head count and improving quality of service (QoS), both of which can contribute to lower costs. Simplifying the building blocks of your data center may make a big difference in procurement, management, and use optimization, especially when the pieces are designed for integration into larger solutions. A converged infrastructure, integrated at the factory, enables the enterprise to maximize their investment in new, strategic deployments. This includes servers, storage, networking, management, facilities, and security. **The more efficient data center cannot afford to be dealing in piece parts – it needs a total, integrated solution.**

Deploying the new applications that are necessary to remain competitive requires the data center to reduce provisioning time, taking it from days or weeks to hours or minutes. To achieve this goal requires a comprehensive solution, so that the IT staff can align the appropriate infrastructure and capabilities to meet the needs of the enterprise for faster deployment of business solutions, whether big data, cloud, social networking, or mobile. **It may be highly advantageous for new systems components to be acquired with a converged infrastructure consisting of servers, data storage devices, networking equipment and software for IT infrastructure management and automation, uniting these infrastructure components into a single, optimized computing solution.**

This applies to both your own data center and the remote cloud. Both of these environments provide a standards-based approach, to simplify the access to a heterogeneous infrastructure with the delivery of open APIs. This enables the data center to automate the orchestration of applications and simplify the deployment of new solutions.

HP Makes Technology Matter for You

Converged Infrastructure

The majority of enterprise data centers have been gradually evolving to an Open Systems environment to handle at least some of their mission- and business-critical enterprise workloads. In an attempt to leverage existing infrastructures, the IT staff increasingly looks toward x64 architectures to deploy a standards-based architecture and to converge that environment with new requirements to respond to the ever-increasing demand for more performance and capacity, while enjoying the benefits of lower costs. **One integral factor in deploying such as environment is to simplify the management of a legacy infrastructure into a single converged system with both local and remote administration consolidated onto a single pane of glass.**

The IT staff increasingly is looking toward the ability to pool all of these resources together in order to allocate them on as-needed basis. It is critical to the IT staff to verify that this converged infrastructure will operate efficiently with a broad selection of operating systems, such as Windows and Linux, existing and planned mission-critical applications, and optimized for consolidation and virtualization. This requires an infrastructure consisting of the latest in a variety of multi-core, multi-CPU x64 systems. *Where can the advanced data center go to find this well-converged infrastructure? **How about HP!***

ProLiant x64 systems, based upon both Intel's Xeon and AMD's Opteron, provide the high-performance processing required for mission-critical applications. The added value that HP has implemented for data center convergence³ provides the data center with the technology they need, in terms of integrating the servers with storage, networking, and systems management that is required to make these critical systems even more valuable to the enterprise. *HP is delivering infrastructure that matters to the enterprise.*

Itanium Servers

In order to keep up with an ever-increasing demand for performance and capacity, while (of course) maintaining control over costs, the enterprise requires the latest innovations in infrastructure and technology services to process an ever-

increasing workload in all environments, not just for their Windows and Linux applications. (If you have UNIX needs, wouldn't it be better if they were part of the same converged infrastructure?). This requires an infrastructure consisting of the latest in a variety of multi-core, multi-CPU systems, not only the x64 processors mentioned above, but also processors, such as Intel's *Itanium*. *Where can the advanced data center go to find this well-converged infrastructure? **How about HP!***

Itanium processors, as found in HP's *Integrity* and *Superdome* servers, provide high-performance processing for mission-critical applications, as well as the high reliability of systems, such as HP's *Non-Stop* systems. Itanium provides the data center with added value, in terms of availability, reliability, and systems management required to make these critical systems even more valuable to the enterprise. *HP is delivering infrastructure that matters to the enterprise.*

Converged Cloud

IT is responsible for the quality of the delivery of these services to employees, customers, and vendors, alike. With the arrival of "The Cloud", IT services are more important than ever as we navigate the differences and advantages of a public cloud, private cloud, or hybrid cloud for every enterprise. IT is the glue that enables your business to run efficiently and securely. IT enables the data center staff with the features necessary to control and manage the operation of the infrastructure. HP's Converged Cloud has been integrated to provide the consistency that a common architecture can provide, along with the portability, heterogeneous extensibility, security, management, and automation. HP's Converged Cloud enables cross-platform access to multiple hypervisors, such as *VMware* and *Hyper-V*. *HP is delivering infrastructure that matters to the enterprise.*

3PAR Storage

The IT staff needs to be able to embed high-performance flash memory within the server platform, when necessary, to integrate the most reliable solid-state technology available, and deploy high-capacity disks and tape for the long-term storage of data. The system must encompass the IT which includes the integration and virtualization of all system components – processor, storage, and communications – along with the reliability necessary to keep those mission-critical applications on-line 7x24x365. The availability

³ See [The Clipper Group Navigator](http://www.clipper.com/research/TCG2012029.pdf) entitled *Location, Location, Location – HP Brings the Data Center Closer* dated November 30, 2012, and available at <http://www.clipper.com/research/TCG2012029.pdf>.

of non-stop servers to enable business continuity in this arena is vital. The acquisition and integration of infrastructure companies such as 3PAR has enabled HP to enhance the infrastructure with a variety of innovations, using SSDs to maximize capacity utilization within storage arrays, increasing workload performance AND reducing over-provisioning through data center storage convergence⁴. HP has also worked to improve media endurance by reducing wear, providing longer life for their SSDs. This helps to lower the TCO by reducing waste as it improve storages efficiency. *HP is delivering infrastructure that matters to the enterprise.*

Tiers of Storage

HP also has been expanding their infrastructure through acquisitions such as 3PAR, enabling HP to stay on the leading edge of storage efficiency, adding even more value to their standard platforms. Based upon the 3PAR platform, HP has provided the data center with the capability to deploy reliable, long-term data retention platforms such as *StoreServ* and *StoreAll*, with petabyte scalability. HP has also converged data storage with their *StoreEver* libraries⁵, based upon open systems *LTO-6* tape technology, along with *HP Data Protector* and *StoreOnce* for data protection and disaster recovery. These products may be deployed with many of the leading third-party backup software applications, adding value by creating a multi-tiered storage architecture. This seamless integration enables the data center to deploy an active archive. As a voting member of the *Active Archive Alliance*, HP is well positioned to take advantage of the growth of big data by simplifying data storage and eliminating redundant data. *HP is delivering infrastructure that matters to the enterprise.*

Communications

Today's highly distributed workforce has created complex infrastructure challenges for organizations that existing networks cannot support. This has driven organizations to implement new communication tools to support voice, video, instant messaging and shared desktop capabilities that deliver seamless, effective communi-

cation across multiple applications and geographies. HP's solutions enable organizations to create a highly collaborative, productive environment with unified communications, delivering a superior experience no matter what or where the device is used. HP has integrated multi-services routers to improve communications between employees, customers, and partners, creating a highly collaborative, simplified work environment with easy to use and manage solutions, designed to improve communications among employees, customers and partners, from HP Networking, HP Technology Services and HP Enterprise Services. *HP is delivering infrastructure that matters to the enterprise.*

New Architectures

HP has been expanding their infrastructure capabilities with internal programs, such as *Project Moonshot*, designed to shrink the server in this new age of extreme-scale computing. Moonshot is HP's first low-power server for hyperscale computing environments, designed to reduce energy consumption by 90%. This is a low-power server based on an alternative to the Xeon CPU that has been used in the largest data centers. Originally designed for an ARM-based processor, the current version, *Gemini*, is based on Intel's *Atom* CPU. *HP is delivering infrastructure that matters to the enterprise.*

Big Data Solutions

HP has been incorporating more than just hardware technologies. Ingesting and analyzing the *Big Data* that is being generated from all sources is rapidly filling up every storage device available, is clearly a responsibility of IT. At HP, the acquisition and integration of products such as *Autonomy* and *Vertica* is providing the IT that the data center needs to tame the bull in their data shop.

Autonomy, acquired by HP in October 2011, is a global leader in application software for searching big data, providing the enterprise with additional value that may be hidden or hard-to-find. Enabled to also operate smoothly with public, private, and hybrid clouds, *Autonomy* can process human information, or unstructured data, including social media, email, video, audio, text, and web pages, etc. *Autonomy's* powerful management and analytic tools for structured information, together with its ability to extract meaning in real time from all forms of information regardless of format, is a powerful tool for companies seeking to get the most out of their data. *Autonomy's* feature set enables any enterprise to

⁴ See [The Clipper Group Navigator](#) dated January 15, 2013, entitled *The Right Storage for the Midsized Data Center – HP Delivers Enterprise Functionality, Midrange Price*, available at <http://www.clipper.com/research/TCG2013001.pdf>.

⁵ See [The Clipper Group Navigator](#) dated January 30, 2013, entitled *Storing More Data Forever Than Ever Before? HP Introduces StoreEver for Long-Term Storage*, available at <http://www.clipper.com/research/TCG2013002.pdf>.

engage in enterprise search analytics and business process management. Autonomy also offers information governance solutions in areas such as eDiscovery, content management, and compliance, as well as marketing solutions that help companies increase revenue, such as web content management, online marketing optimization, and rich media management.

HP's Vertica is an example of applying IT to real world challenges to solve real world problems. It is a purpose-built analytics platform designed to enable the enterprise to monetize their data at the speed and scale they need to thrive in today's economic climate. It doesn't simply store data; it assists the enterprise in realizing the potential that the data offers. With Vertica, an enterprise now is able to scan social media, such as Facebook and Twitter, to collect information and gain insight on any specific topic by analyzing it and applying that knowledge to be on the cutting edge, able to supply products or services based on current trends.

Since acquiring Vertica in March 2011, HP has used it to expand its information optimization, business intelligence, and analytics product set for both enterprises and the public sector, providing significant added value in these areas. The need for analytical tools is even greater today, as the ever increasing mass of data places even greater challenges on application scalability and flexibility. Vertica transforms open systems platforms with:

- **Real-time insight into data** – enabling executives to consume, analyze, and make informed decisions at the speed of business;
- **Fastest time to value** – making it possible to monetize data in a matter of minutes; and
- **Maximized performance** – providing the data center with maximized value from its infrastructure investments.

This innovative IT can help financial institutions and insurance companies to eliminate fraud. It can provide retail enterprises with the predictive tools that they need to identify consumer trends. These analytics enable the data center to extract data in context, leveraging unstructured data, and helping to weave together big data and analytics into the fabric of the enterprise to improve performance management and risk analysis in an age where mobile devices are inundating the data center with valuable data. *HP is delivering infrastructure that matters to the enterprise.*

Conclusion

If all that your job entails is to run standard Windows or Linux applications, then any “white box” may be good enough. If, on the other hand, your job includes the responsibility to manage large volumes of data, and to analyze that data, and to turn it into useful information for the profitability of your enterprise, then a server with a significant added value infrastructure environment is a must. You will need the latest technology to turn that information into innovation.

Do you need to track social media to find out what the consumer is looking for or what he is thinking about your products? With that information, you might be able to identify negative sentiment *before* it becomes widespread. In order to achieve success, you probably need to use every bit of data available. You will need a server platform with more added value technology than your competition, because in fact, IT does matter.

It is obvious that HP is “*delivering infrastructure that matters to the enterprise*”. Today, HP is providing data centers around the globe with complete open systems solutions, and more, using the latest and greatest commodity microprocessors, the most price/performant storage and networking platforms, along with innovative software to provide an enterprise with the tools that it needs for success. If you are looking for forward-looking infrastructure for your enterprise, then you owe it to yourself to look into the open systems servers from HP with infrastructure that really matters.



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