



**Add Power to
Your Applications**

Introduction: The World of Applications



A More than ever before, applications have become a critical component to the success of business. In the past, organizations used to have one or two mission-critical applications. Now, organizations have applications for revenue generation, accounting, customer service, logistics, and regulatory compliance all these are critical to businesses performance and revenue.

Gartner has stated that the cost of downtime to an average US business is \$5,600 per minute. That equals over \$330,000 per hour.¹ As technologies such as mobility, big data analytics, and private clouds continue to grow, the cost of poor performance and downtime will only increase.

Organizations want the ability to analyze information and make decisions in real time. According to a study by Accenture, 87% of enterprises believe that big data analytics will redefine the competitive landscape of their industries over the next three years. 89% believe that if they do not adopt big data analytics, they risk falling behind.²

Most organizations are running some of these critical applications. Companies such as Microsoft use Linux to run some of their own operations and offer Linux on their Azure cloud service.³ **This eBook explores how running these critical applications on the right hardware ensures the highest performance and reliability.**

¹ Gartner | <http://blogs.gartner.com/andrew-lerner/2014/07/16/the-cost-of-downtime/>

² Accenture | <http://businessintelligence.com/bi-insights/enterprises-see-big-data-analytics-changing-competitive-landscape-next-year/>

³ Wired | <http://www.wired.com/2015/09/microsoft-using-linux-run-cloud/>

Bringing Applications and Power Together

If you are running Linux, it is likely that you are using an open source operating system running on a commodity x86 server. Traditionally when you need more power to run your mission-critical applications, you add more servers. However, this method is difficult to manage, adds complexity, and increases points of failure.

One solution to consider is IBM Power Systems running Linux as an alternative to adding those additional servers. The key is the POWER8 processor. POWER8 can process 8 threads per core. For a 12-core processor, that equates to 96 simultaneous threads per clock cycle. Compare that to Intel's Xeon E5-2697 that also has 12 cores, but can only process 2 threads per core per clock cycle. That comes to 24 threads.

What does this mean? You can do far more with far less. As an example, for an application like Redis, you can achieve a 24 to 1 reduction in infrastructure, 2x price reduction, 12x less energy consumption, and 6x less rack space.⁴

If you are planning on implementing big data analytics, IBM Power Systems is considered the most viable and cost effective solution. Compared to the best-published x86 results, IBM POWER8 delivers 2.5x the performance when running Hadoop workloads.⁵ Data continues to grow. The ability to perform real-time analytics on that data is becoming increasingly important and the need is not going away.

Another benefit is the reliability that Power Systems offer. With x86 servers, you piece together the hardware and software and rely on multiple vendors for support. IBM Power Systems are factory-integrated, and IBM supports the entire stack. So what that means to the IT staff is this: When patches are pushed out, they are guaranteed not to cause conflicts between the OS and the hardware. Many patches can be applied without rebooting. This alleviates time spent maintaining a system. Your IT staff can focus on more critical infrastructure requirements.



⁴ IBM | <https://www-03.ibm.com/press/us/en/pressrelease/45006.wss>

⁵ IBM | <http://www-03.ibm.com/systems/power/solutions/bigdata-analytics/hadoop/>

Power Makes Financial Sense

Adding more x86 servers to an environment increases the cost and management to run that environment. Forrester estimates that 70 to 75% of a typical IT budget goes toward maintaining current infrastructure.⁶ Unfortunately, because of the costs involved in server sprawl, you are left with little time and budget for more strategic initiatives.

IBM Power Systems can dramatically reduce costs for larger workloads or highly virtualized environments. The additional processing power allows you to do more with fewer servers, lowering your management costs along with your power, cooling, and facility footprint expenses. Many administrative functions can also be automated to further drive down costs.

As servers have become more powerful and virtualization has taken hold, software vendors had to reinvent their pricing models. They moved from per server to per processor system. Increasing the power and capability of each processor by 4x can mean that you can run your software on fewer processors. This can have a dramatic impact on your total cost of ownership.



Let's Get Technical about Power

POWER8 processors utilize a reduced instruction set computing (RISC) architecture. POWER processors excel at powering your commercial workloads, such as SAP and DB2. POWER is also what is behind today's top supercomputers.

Transactional Memory

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For Power Systems, IBM has re-engineered how memory is accessed. Most systems have to lock data every time a thread accesses it so that another thread cannot access the same data. While this preserves the integrity of the data, it also adds a lot of overhead. IBM eliminated the need for this by allowing the hardware to self-monitor the data to maintain integrity. IBM calls this technology transactional memory.

Improved Bandwidth

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With this increased performance at the processor and memory, you do not want bandwidth to become a bottleneck. According to a report from Linley Group, POWER8 provides 205GB/s throughput per processor. By comparison, the Xeon E5-2699v3 is only capable of 68GB/s.⁷

CAPI I/O

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IBM has also implemented a completely new I/O technology. While they provide incredible throughput to high-speed RAM, they now extend that to flash storage. With coherence attached processor interface (CAPI), you access up to 80 TB of flash storage as if it were RAM. This technology takes your real-time analytics to the next level.

⁷Linley Group | <http://www-03.ibm.com/systems/power/advantages/smartpaper/memory-bandwidth.html>

Conclusion: How to Get Started

IBM has made a huge commitment to open source technology. In 2013, they invested \$1 billion in the Linux and open source community.⁸ In addition they founded the OpenPOWER Foundation to progress innovation on the platform.⁹ OpenPOWER currently has over 160 members and growing. It has a bright future.

Running Linux on IBM Power Systems can improve the performance of your applications, increase their reliability, and reduce your total cost. If you are running Linux on x86 today or are looking to add Linux servers, you owe it to yourself and your organization to consider IBM Power Systems.

To assist you with the migration process, IBM has invested in Power Systems Linux Centers. These centers are located across North America, Central America, South America, Europe, Asia, and Africa. So no matter where you are located, IBM has a center close to you.¹⁰



Get started with your Power System running Linux evaluation today.

Contact the Linux experts at Vicom today for a Linux on Power Systems workshop.

⁸ IBM | <http://www-03.ibm.com/press/us/en/pressrelease/41926.wss>

⁹ OpenPOWER | <http://openpowerfoundation.org/>

¹⁰ IBM | <http://www-03.ibm.com/systems/power/software/linux/centers/>

