



## POWER8 – IBM’s billion dollar bet on servers

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Between the Mainframe’s 50th birthday and recent Power Systems Announcements, IBM’s Systems & Technology Group has had a very busy couple of weeks. We expect this to continue with upcoming Watson announcements as IBM continues its significant investment in these platforms. “IBM as a Service” remains a major IBM marketing theme, but the realization of delivery of that service continues to be well-grounded in industry leading infrastructure.

The recent announcements of POWER8 demonstrate a dramatic ramping up of effort intended to significantly increase Power Systems’ server market share. This is a major challenge complicated by the current somewhat stagnant market for infrastructure. To succeed, the Power group uses some successful System z tactics. Two important pieces involve proselytizing Power systems (ala System z) at universities and seriously expanding Linux activities in applications, development, ecosystem and marketing efforts. To succeed, IBM must provide compelling reasons for users to move from very well entrenched architectures (e.g. x86, ARM). Let’s consider what’s needed and is being offered.

Shifting users to the new Power platform will require significant product innovation AND aggressive marketing. The product must deliver impressive functionality and performance (e.g. world class GPU compute capability, networking and switching). At ship date, there must be an extensive, well-integrated development, product and service ecosystem (e.g. OpenPOWER Foundation). The figure below shows how POWER8 technology compares with earlier releases.

	<b>POWER5</b>	<b>POWER6</b>	<b>POWER7</b>	<b>POWER7+</b>	<b>POWER8</b>
<b>Technology Compute</b>	130 SOI	65nm SOI	45nm SOI eDRAM	32nm SOI eDRAM	22nm SOI eDRAM
<b>Cores</b>	2	2	8	8	12
<b>Threads</b>	SMT2	SMT2	SMT4	SMT4	SMT8
<b>Caching</b>					
<b>On-chip</b>	1.9MB	8MB	2+32MB	2+80MB	6+96MB
<b>Off-chip</b>	36MB	32MB	None	None	128MB
<b>Bandwidth</b>					
<b>Sust. Mem.</b>	15GB/s	30GB/s	100GB/s	100GB/s	230GB/s
<b>Peak I/O</b>	3GB/s	10GB/s	20GB/s	20GB/s	48GB/s

IBM will have to establish Power Systems as the most open, collaborative, effective and economical; that it is the best prepared to address IT and enterprise demands for an open, cutting edge platform. It must be recognized as being uniquely designed for support of Big Data/Analytics and optimized to leverage the Cloud, as well as Cloud services.



Finally, it must include attractive financials, easy-upgrades and full backward integration with today's offerings. No surprise, those are the exact messages and proof points IBM underscores in its announcement.

IBM's [Power System website](#)<sup>1</sup> provides full details on the software developed, hardware enhancements and modifications (including switching to little endian support) and ecosystem (OpenStack, Cloud Foundry, Ubuntu, Zend, etc.) initiatives. Begun over a year ago, they represent only a portion of IBM's \$1 Billion dollar spending plan to prepare both the product and the market for the next generation of Power Systems. See some details in the figure below.

We won't rehash all the details, but IBM appears to be going all out in its efforts to produce and

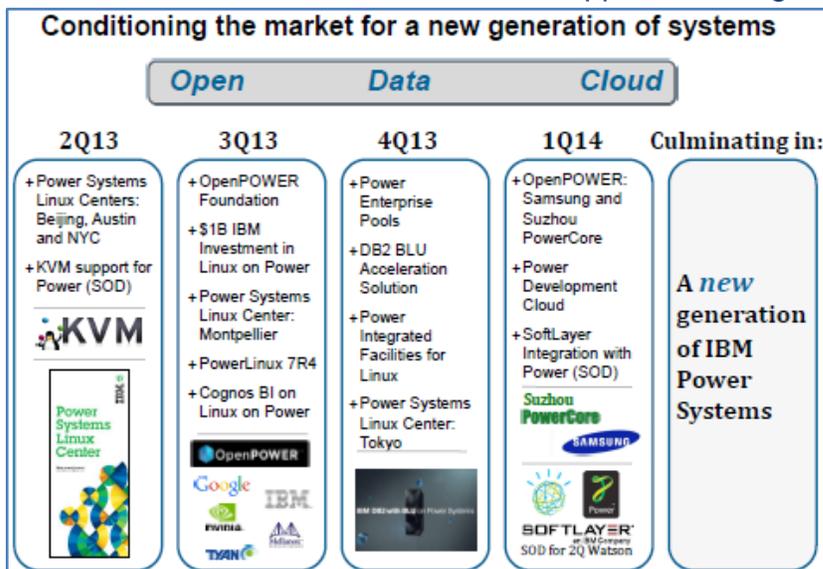


Figure © 2014 IBM Corporation

price their solutions for success. From a coordinated, cascading worldwide series of announcement events to expanded development centers to partner and customer training to new pricing models, IBM is working hard to make POWER8 an attraction that can be neither be ignored nor passed over. They are even expanding their efforts in universities to attract students with new classes and a contest, following the demonstrable ability of System z's "Master the Mainframe" contest to attract participant interest, grow their experience and expand IT literacy.

Comments from various industry sources about the POWER8 are quite positive:

- On memory and bandwidth: *"The POWER8 specs are mind boggling...IBM's newest server processor will smash existing performance records, particularly for memory-intensive applications"* - "Linley Group microprocessor report.
- On performance: *"it most certainly does belong in a badass server, and POWER8 is by far one of the most elegant chips that Big Blue has ever created"* – The Register
- On I/O, Bandwidth, Value: *"IBM preps its massive 12-headed Power 8 chip"* – TechInvestor/VentureBeat

IBM's software organization is also deeply involved in the efforts by providing and building on a comprehensive base of open system software. Power Systems run over 150 Linux products, along

<sup>1</sup> [ibm.com/power](http://ibm.com/power)



with 360+ AIX products. It provides a strong, open applications environment by leveraging Cognos, WAS, DB2 BLU and BigInsights to support IT staff efforts in development, operations and analytics. ISV's, Channel and business partners can access a variety of programs, solutions, applications, tools, training and marketing incentives, specifically designed to make the move to Power faster, easier and more financially attractive.

### POWER8 supports over twice the users per x86 core

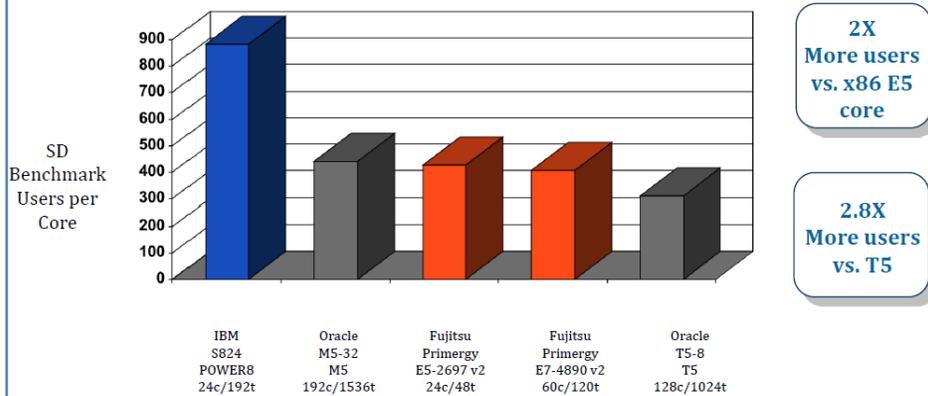


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Performance comparisons are hard to generalize and notoriously short-lived. However, by many accepted measures<sup>2</sup>, POWER8 beats the competition. The performance results (at left) show the results of the two-tier SAP SD standard application benchmark running SAP enhancement package 5 for the SAP ERP 6.0 application. IBM results are valid as of 3/24/14 and 4/23/14 for all other systems<sup>3</sup>.

IBM's stated goal is to have Power Systems recognized for their ability to *"help clients convert data into insights by managing increasingly complex and data intensive workloads"* by positioning it as an *"open alternative to PC-era technology...ideal for clients building contemporary IT infrastructures.... offering advanced technology that represents significant progress compared to x86, creating a processing platform available to technology providers as the catalyst for innovation, flexibility, and diverse capability across the computing ecosystem."*

We think IBM makes abundantly clear their commitment to a truly open server market. A commitment implemented not simply as a platform provider, but even more so as a builder, enabler and supplier of software and services in support of a development and operations environment able to address customer and partner needs.

We've sat through the presentations, examined programs and compared incentives. This is one of the most comprehensive, end-to-end marketing and product efforts we've seen. We think IBM is prepared to do whatever it takes to make this program succeed. It will take time for the market's

<sup>2</sup> See benchmark performance details at: <http://www.ibm.com/systems/power/hardware/benchmarks/>

<sup>3</sup> See test results at: <http://www.sap.com/benchmark>.



response and level of acceptance to be made clear. With what we've heard and seen so far, we expect to write a lot more on these topics in coming months.

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