



Research Report

The Power Systems Renaissance

Executive Summary

IBM's Power Systems have just exited their three year revenue doldrums. In Q1, 2015, IBM reported that revenue increased by 1% as compared with Q1, 2014 (yes, we know this is a small increase, but it is a huge step in the right direction). Much of the revenue growth came from market sectors that play to Power System strengths (analytics, mobile, and cloud) – and we believe that due to technical strengths in analytics processing power combined with the enrichment of the Power Systems cloud portfolio, Power Systems are now poised to see continual growth.

What is important about this 1% increase is that the sources of revenue have changed. IBM is now seeing double digit growth in POWER-based cloud computing, mobile and Big Data analytics markets (these are markets where IBM has strong strategic focus). We see this strong growth as proof that IBM's realignment of Power Systems is working – and gaining traction in the markets IBM has targeted.

A Closer Look at Power Systems Growth

As we look more closely at the Power Systems product roadmap, we see the potential for continued strong growth in both the cloud and analytics markets. Here's why:

- IBM is releasing its SoftLayer cloud on Power Systems this quarter. SoftLayer has helped make IBM a cloud computing leader (contributing heavily to the company's \$7.7 billion in cloud revenues). With SoftLayer on Power Systems, IBM customers will be able to integrate their x86 clouds with Power Systems clouds – simplifying resource virtualization, provisioning and management. (Also, SoftLayer will enable Power Systems to provision bare metal servers);
- We've noticed that Rackspace and Google are members of the [OpenPOWER Foundation](#) (a consortium of vendors that are building POWER-based system solutions). Rackspace and Google are leading cloud service providers – and if these companies embrace and deploy Power Systems, the cloud computing market will change (the arrival new, more efficient, Big Data cloud that include large numbers of Power Systems will very significantly lower cloud computing costs for data intensive workloads); and,
- IBM's analytics and Big Data messaging is starting to resonate with IT buyers. As we described in this [report](#), IBM's POWER architecture is far superior to x86-based servers when it comes to processing data intensive workloads. And given the strong growth in the Big Data marketplace (including the growth of Watson cognitive systems that are based exclusively on Power Systems); given Power Systems access to massive amounts of memory (16 TB in large systems and access to hundreds of TB of memory in solid state cache); and given IBM's broad and deep analytics/data management/database software portfolio – we believe that sales will continue to accelerate in the Power Systems analytics/Big Data space.

IBM's Power Systems are in the midst of a renaissance. The low-end has been revamped; high-end capacity has been increased (while using fewer cores to deliver more throughput and lower

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software costs); the Linux-on-Power program has been greatly improved with new Linux-focused servers and a greatly expanded application portfolio (now that Power Systems can recompile Linux applications in either “little endian” or “big endian” byte orders); and system design offerings have been expanded (with a new converged system design [PurePower], and with more powerful “in-memory” offerings).

To any naysayer who claims that Power Systems are an architecture of the past, we say: “think again”. Power Systems are back – industry leaders are actively embracing POWER and Power Systems are poised to redefine the cloud and analytics marketplaces.

Four Important Changes in Power Systems That Will Drive Future Revenue

Power Systems are still, and will remain, the market leader in Unix servers. But as the Unix market gives way to Linux servers, expect four important initiatives to drive the lion’s share of future Power Systems revenues:

1. Linux growth;
2. Analytics;
3. Cloud computing; and,
4. Open Systems.

Linux Growth

As we reported in this [report](#) in January, 2014, IBM planned to offer its integrated facility for Linux (IFL) on Power Systems. Shortly thereafter IBM released its Power Systems IFLs. In this report we argued that IFLs would be very well received on Power Systems for two reasons: 1) historical precedence; and, 2) the need for richer Quality-of-Service (QoS) than offered on x86-based Linux server implementations:

- *Historical precedence* – since the introduction of IFLs on mainframes, IBM has seen a steady rise in IFL usage (last we checked, 36% of IBM System z users were making use of IFLs — and this number is growing steadily). This strong adoption rate shows that the value proposition of IFLs clearly resonates with mainframe users – and we expect it to also do so with Power Systems users.
- *The need for more powerful/richer RAS/richer QoS enterprise-class Linux servers* –As applications running on Linux move from the edge-of-the-network (such as file serving, Web, and email) into the enterprise-class (mainstream business applications such as SAP, mobile, social, Oracle, business analytics, etc.), information technology executives know that they will need “enterprise class” servers that offer higher performance, greater scalability, higher reliability, availability, and serviceability (RAS), richer virtualization, and better security than has typically been found on x86-based servers. Power Systems are an excellent example of this type of RAS/QoS-rich enterprise-class system environment.

To further improve its Linux positioning, last year IBM announced that it would support both big endian and little endian byte modes on Power Systems. This announcement has enabled IBM to greatly expand the number of Linux applications that can now run on Power Systems (to tens-of-thousands).

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IBM also recently announced its intention to support Docker on Linux, enabling developers to more easily deploy application containers on Power Systems.

Analytics

Not long ago Power Systems could be classified as traditional, vertically scaled, Unix-based business application servers. And today, they still serve this need. But, with the introduction of the POWER8 processor (which can process 8 threads per core) and support for vast amounts of memory and cache, IBM's Power Systems have become particularly strong analytics servers.

In the analytics marketplace IBM has a very broad and deep portfolio of software offerings including products for analytics, for data management and for database acceleration. This portfolio compliments IBM's scalable Power Systems server line which now include a new high-end, 192 core system (the Power E880), as well as a new 4 socket offering (the Power E850). IBM is expanding its portfolio through the analytics ecosystem with new offerings from SAP including Power Systems pre-packaged and integrated "Power Systems Solutions Editions for SAP HANA" offerings and support for SAP HANA Business Warehouse (which is now generally available).

Power Systems have been "designed for data" with access to vast amounts of main memory and cache, with large levels 1, 2 and 3 cache – and with superfast memory bandwidth (230 GB/s). Considering that Power Systems offer perfect linear scalability on systems up to 16 sockets with 192 cores – and that IBM can significantly accelerate DB2 database performance using its DB2 BLU acceleration solution, Power Systems should be a slam dunk for IT buyers looking for fast, real-time analytics results.

Another factor that will help drive IBM Power Systems analytics sales is that in-memory systems are more affordable than ever before. As we describe in this [report](#), a typical in-memory x86 environment with associated back-up storage for persistence, 12 TB of DRAM (memory), two 1U switches and load balancing software costs about \$24/user. This compares with an IBM Power System solution with 12 TB of Flash used as memory cache that costs about \$7.50 per user. What this means is that ***a Power Systems solution can cost 3.2x less than an x86-based in-memory solution.***

Also noteworthy, IBM has also announced updates for its IBM Data Engine for Analytics (offering improved support for BigInsights, Red Hat RHEL7BE, Streams and Watson Explorer workloads); and has improved its Elastic Storage server with new, denser 6 TB drives). Both of these enhancements should make Power Systems even more appealing for analytics workloads.

Cloud Computing

Two factors will add to IBM's impetus in Power Systems cloud computing: 1) the availability of IBM's SoftLayer environment on Power Systems; and, 2) market recognition that multi-platform clouds can deliver cloud services for tremendously less money.

As we stated in this [blog](#) (entitled "Comments on IBM's Q1, 2015 Earnings Report"), we see SoftLayer as a major contributing factor to IBM's growth in the cloud marketplace (IBM claims that its cloud portfolio is contributing \$7.7 billion dollars to the company's bottom line – making IBM the largest cloud software/cloud service provider in the industry). As of this quarter (Q1, 2015), SoftLayer is now available for Power Systems. We believe that there is pent-up demand for a consistent cloud management environment that can unite and integrate x86 servers with Power Systems – and we think SoftLayer represents this consistent cloud environment.

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Further, we think that the market is about to enter a new phase in cloud computing – the multi-platform cloud phase. As we show in this [report](#), savings for enterprises and managed service providers (MSPs) can be huge (potentially up to 40% in terms of hardware and software acquisition and management costs) when deploying multi-platform solutions. IBM recognizes this and has interwoven Power Systems into its cloud managed services offerings (enabling the company to garner more profit margin than x86-only cloud competitors).

Also noteworthy in cloud computing, IBM has just introduced its IBM PurePower System line – pre-configured, pre-packaged, turnkey secure, quick-to-deploy converged infrastructure/cloud solutions. This system offers greater workload density than x86 cloud servers and comes with a hypervisor that has no documented vulnerabilities – a three year search on PowerVM finds zero vulnerabilities – see https://web.nvd.nist.gov/view/vuln/search-results?query=powervm&search_type=last3years&cves=on.

Simplifying the deployment of Power Systems-based clouds should also help drive Power System sales. Further, IBM announced an update to its Hybrid Cloud: IBM Cloud Management with OpenStack and Solution Edition for Cloud offerings.

Open Systems

As we state in this [report](#), the POWER8 architecture is now open – fostering innovation through a large and growing ecosystem of simpatico vendors (there are now 120 members of the OpenPOWER Foundation), and making it possible for Power Systems to expand into new markets (which may help IBM stimulate Power Systems growth in currently soft Europe, Middle East, Far East and South American markets).

Several OpenPOWER foundation members have told us that they are strongly interested in using POWER8-based solutions to build alternative-to-x86 environments. To be more specific, several Chinese systems manufacturers told us at the recent OpenPOWER Summit that they want to reduce their reliance on x86 servers; they want to manufacture their own “known-good” server environments; and that they plan to help drive Power System sales into other foreign markets.

We are particularly interested in the activities of two OpenPOWER Foundation members: Rackspace and Google. Both companies are leading x86 cloud service providers – but both are working with IBM and other vendors on Power Systems configurations. At the OpenPOWER Summit, Rackspace overtly declared that it makes strong economic sense to embrace Power Systems (and added that Power Systems will also help them address cloud scalability issues). For more information on Rackspace’s view on cloud economics see this [report](#).

Summary Observations

IBM was slow to respond to the Linux challenge to Unix-based Power Systems – and this contributed heavily to IBM’s Power System revenue decline. By placing IFLs on Power Systems – and by supporting both big endian and little endian byte orders, IBM has been able to help Power System buyers reposition their deployments around Linux (if they so desire – many are still using IBM’s AIX Unix).

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Two years ago IBM changed the Power Systems management team. This team has adapted Power Systems to attack new, high growth markets – particularly analytics and cloud markets. IBM's analytics offerings are deep and broad (we see IBM as the most potent analytics hardware/software maker in the industry). In the cloud marketplace, IBM has greatly improved its virtualization and provisioning offerings – and, with the introduction of SoftLayer on Power Systems, IBM is now positioned to offer a unified, multi-platform cloud. This new cloud should have strong appeal to IBM customers and MSPs who are looking to very significantly lower their cloud computing costs.

As was the case three years ago, Intel processors and servers are continuing to get better. Expect new generation of Haswell x86 processors/servers to be released shortly – and expect that new generation to still be at a performance disadvantage when compared to POWER8-based servers. Early estimates indicate that POWER8-based servers will offer twice the performance per core of new generation Haswell processors – and this means that Power Systems buyers will be able to get more work done more quickly while saving huge amounts of money on software acquisition costs (software is usually priced per core – and fewer cores means significantly less costs). Further, as we have stated in this [report](#), this [report](#) and this [report](#) – the ability to drive innovation with processors is starting to diminish. To accelerate performance, more innovative systems designs with faster busses, new interfaces (like IBM's Coherence Attached Processor Interface – CAPI), and better networking is required. New advanced systems designs are also using multiple different types of processors to execute various elements of workloads (such as graphical processing units and field programmable gate arrays). Intel may be delivering more and more cores, but the big gains in system performance are resulting from better overall systems designs...

It is our belief that IBM's Power Systems are now correctly positioned for solid revenue growth in Linux, analytics and cloud markets. With huge investments in Power Systems (\$1 billion), in microprocessor design (\$3 billion), in Linux \$1 billion – IBM is clearly demonstrating that it is very committed to the future of Power Systems. Power Systems are here to stay and can be expected to gain even more ground in multi-platform cloud and analytics markets

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