

IBM unveils new generation of IBM Power servers for frictionless, scalable hybrid cloud

New IBM Power E1080 server offers 2.5x greater per core performance vs x86-based servers and sets a new world record SAP benchmark for 8-socket systems
Industry-first metering of Red Hat OpenShift and Red Hat Enterprise Linux for on-premises server planned to improve software licensing costs

India, Bengaluru, 8th September 2021 – IBM (NYSE: IBM) today announced the new IBM Power E1080 server, the first in a new family of servers based on the new IBM Power10 processor, designed specifically for hybrid cloud environments. The IBM Power10-equipped E1080 server is engineered to be one of the most secured server platforms and is designed to help clients operate a secured, frictionless^[i] hybrid cloud experience across their entire IT infrastructure.

The IBM Power E1080 server is launching at a critical time for IT. As organizations around the world continue to adapt to unpredictable changes in consumer behaviors and needs, they need a platform that can deliver their applications and insights securely where and when they need them. The [IBM Institute of Business Value's 2021 CEO Study](#) found that, of the 3,000 CEOs surveyed, 56% emphasized the need to enhance operational agility and flexibility when asked what they'll most aggressively pursue over the next two to three years^[ii].

Many see the answer to this need in a hybrid cloud computing model, which combines on-premises resources with cloud-based infrastructure and can offer up to 2.5x greater value than a public cloud-only approach^[iii]. However, not all hybrid cloud models are designed equally.

"When we were designing the E1080, we had to be cognizant of how the pandemic was changing not only consumer behavior, but also our customer's behavior and needs from their IT infrastructure," said Dylan Boday, VP of Product Management for AI and Hybrid Cloud. "The E1080 is IBM's first system designed from the silicon up for hybrid cloud environments, a system tailor-built to serve as the foundation for our vision of a dynamic and secure, frictionless hybrid cloud experience."

The new IBM E1080 was designed to introduce several key features including:

- **Enhancements for hybrid cloud** like planned industry-first, by the minute metering of Red Hat software including Red Hat OpenShift and Red Hat Enterprise Linux, 4.1x greater OpenShift containerized throughput per core vs x86-based servers^[iv], and architectural consistency and cloud-like flexibility across the entire hybrid cloud environment to drive agility and improve costs without application refactoring.
- **New hardware-driven performance improvements** that deliver up to 50% more performance and scalability than its predecessor the IBM Power E980^[v], while also reducing energy use and carbon footprint of the E980, allowing customers to do more with less. The E1080 also features four matrix math accelerators per core, enabling 5x faster inference performance as compared to the E980^[vi].
- **New security tools designed for hybrid cloud environments** including transparent memory encryption so there is no additional management setup, 4x the encryption engines per core, allowing for 2.5x faster AES encryption as compared to the IBM Power E980^[vii], and security software for every level of the system stack.
- **A robust ecosystem of ISVs, Business Partners, and support** to broaden the capabilities of the IBM Power E1080 and how customers can build their hybrid cloud environment, including record-setting

performance for SAP® applications in an 8-socket systemⁱⁱ. IBM is also launching a new tiered Power Expert Care service to help clients as they protect their systems against the latest cybersecurity threats while also providing hardware and software coherence and higher systems availability.

Frictionlessⁱⁱⁱ Hybrid Cloud Experience Drives Modernization on IBM Power E1080

The IBM Power E1080 server helps deliver on the customer demand for a frictionless hybrid cloud experience, with architectural consistency across the entire hybrid cloud estate to simplify management and seamlessly scale applications to meet the dynamic needs of today's world.

"We have been long time IBM Power users and are looking forward to being one of the first organizations to test the new IBM Power10-based E1080 system with our mission-critical applications" said Klaus at Finanz Informatik. "The new server addresses our demands to continue delivering our services at scale with high resiliency requirements, including new levels of security and improved energy-efficiency. We are also keen to see how the new features can accelerate our journey to hybrid cloud and the infusion of AI into our business applications."

When leveraging an IBM Power10-based server, like the E1080, with the cloud-based [IBM Power Virtual Server](#) in a hybrid cloud format, the architectural consistency across resources means the often-bespoke mission-critical applications that tend to reside on-premises can be moved into the cloud as workloads and needs demand. This is designed to help clients avoid the prohibitive costs and time required associated with refactoring for a different architecture.

The IBM Power E1080 also has the capability to scale instantly with Power Private Cloud for Dynamic Capacity, allowing users to scale up and down with unused CPU capacity as needed and only pay extra for the additional resources they used. This can help improve operational efficiency and flexibility while avoiding server sprawl and lengthy procurement processes by bringing a cloud-like payment model to the datacenter.

Further enhancing the cloud-like economics for local hardware, the IBM Power E1080 is the first on-premises system planned to support metering by the minute for both Red Hat Enterprise Linux and Red Hat OpenShift, extending capabilities already available on IBM Power Virtual Server. Together, this is designed for even greater customer control of when, how, and where their applications are deployed.

"Red Hat has long been committed to delivering choice to our customers, a critical component in how these organizations approach open hybrid cloud deployments. Our collaboration with IBM on Power10 will serve as a continuation of this commitment to support a broad range of architectures," said Stefanie Chiras, senior vice president, Platforms Business Group, Red Hat. "As an architectural foundation for Red Hat Enterprise Linux and Red Hat OpenShift deployments on-premises metering, IBM Power will offer the scale and flexibility to help customers realize the benefits of open hybrid cloud."

Through the close synergy with Red Hat, the IBM Power E1080 offers 4.1x greater OpenShift containerized throughput per core vs compared x86-based servers^{vi}, allowing for more workloads to be deployed simultaneously within a single system.

The Power of Ten for Efficiency, Security, and Enterprise AI

The IBM Power E1080 server is built around the revolutionary IBM Power10 processor. Designed by IBM and manufactured by Samsung using 7nm EUV process technology, IBM Power10 is IBM's first commercially available 7nm processor.

With IBM Power10 at the heart of the system, the IBM Power E1080 server can deliver up to 30% more performance per core and over 50% better total capacity at the socket and system level as compared to the previous generation IBM Power E980 server^{vii}. This translates to 33% lower energy consumption for the same workload on the IBM Power E1080 as compared to the IBM Power E980^{viii}, giving customers the platform to consolidate workloads and save on hardware and software costs. For example, an IBM Power customer projected that they could consolidate an industry-standard transactional database running across 126 x86-based servers down to two IBM Power E1080 servers. This projection would translate to an 80% reduction in server energy use and a 70% reduction in per-core software licenses for the customer.

IBM Power10 also provides new enhancements for securing consolidated workloads. The Power10 processor has the capability to scale with transparent^{ix} memory encryption, which is designed to simplify and support end-to-end security without impacting performance. Compared to IBM Power9, accelerated encryption performance is enabled by IBM Power10 having 4x the number of encryption engines per core, and translates into a 2.5x faster per core performance for AES encryption compared to the previous generation of IBM Power servers^{ix}.

IBM offers security control solutions at every level of the system stack, from the foundational hardware like the processor and memory, to key software like the operating system, hypervisor, and applications. The E1080 uses IBM PowerVM as its built-in hypervisor, which has significantly fewer Common Vulnerabilities and Exposures (CVE) than competitive hypervisors as catalogued by the US Government National Institute of Standards and Technology's National Vulnerabilities Database (NVD)^x.

Finally, the IBM Power E1080 server and Power10 processor bring new enterprise AI capabilities right to where the data resides, on the server. IBM Power10's four Matrix Math Accelerator (MMA) engines per core that can drive up to 5x improvements for AI inference as compared to the IBM Power E980 server^{xiii}. While the new increased MMAs provide hardware-focused improvement, the IBM Power E1080 also supports bring-your-own-model capabilities with IBM Auto-AI and "no-code" tools. The IBM Power E1080 also supports the Open Neural Network Exchange, or ONNX. Trained AI models available on ONNX, using some of the most popular frameworks like TensorFlow, PyTorch, and more, can be deployed on the IBM Power E1080 from x86-based servers with no code changes required.

Ecosystem of ISVs and Channel Partners Enhance Capabilities for IBM Power E1080 and IBM Power10

The new IBM Power10 family is supported by a wide range of ISVs, IBM Business Partners, and other external stakeholders that recognize the value of the new platform's capabilities for their customers.

Leveraging the SAP Application Performance Standard values benchmark, which measures performance for key SAP applications, the IBM Power E1080 has set a record for an 8-socket system, achieving over 174,000 2-tier benchmark users, 40% greater than the closest x86-based platform^{xiv}.

"The IBM Power10-based E1080 is an ideal platform for clients looking to modernize by running SAP applications in hybrid cloud environments," said Lalit Patil, CTO, Enterprise Cloud Services & HANA Enterprise Cloud, SAP. "With the E1080's record-setting SAPS benchmark score, we look forward to continuing to expand our relationship with IBM to better serve our mutual customers."

In addition to SAP, several other ISVs that provide a wide range of services including databases, secure medical records processing, security, AI, and more have announced support for IBM Power10. To read more of their perspectives on this new announcement, please go to: <http://www.ibm.com/blogs/systems/innovating-with-isv->

[partners/](#)

To help these services get into the hands of customers, IBM is working closely with our channel partners so that they can work closely with customers and build solutions that work for them.

"As one of the leading IBM Power Business Partners in Europe, we recognize the differentiated value that IBM Power can deliver to our customers," said Udo Sachs, Head of Competence Center for Power Systems at SVA. "In addition to increased performance, the IBM Power10-based E1080 server is designed to help our clients take their core business applications to new levels of security and allow for much more energy efficiency. Both are very critical issues for our customers in today's world."

IBM is taking orders for the IBM Power E1080 now, with shipments expected to begin before the end of the month. IBM is also introducing Power Expert Care, which offers a tiered approach to service including Advanced and Premium Expert Care tiers. The simple service tiers and pricing facilitate straight-forward support options for the IBM Power E1080 server, and additional add-ons such as hardware and software system health checks and regular security updates are designed to ensure that the systems stay protected against the latest cybersecurity threats, while also providing software and hardware coherence and higher systems availability.

For more information please visit: <http://www.ibm.com/it-infrastructure/power/power10>.

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[i] IBM Power help deliver a frictionless experience in extending mission-critical workloads across hybrid cloud, without requiring additional middleware or application refactoring

[ii] <https://www.ibm.com/thought-leadership/institute-business-value/report/ceo>

[iii] <https://www.ibm.com/downloads/cas/QMRQEROB>

[iv] 1. Based on IBM internal testing of Red Hat OpenShift Container Platform 4.8.2 worker nodes running 80 pods each with 10 users using the Daytrader7 workload (<https://github.com/WASdev/sample.daytrader7/releases/tag/v1.4>) accessing AIX Db2 databases. Average cpu utilization for the OCP worker nodes is > 95%. Comparison: E1080 running OCP accessing AIX Db2 on an S922 versus OCP on Cascade Lake accessing AIX Db2 on the same S922. Valid as of 8/26/2021 and conducted under laboratory conditions. Individual result can vary based on workload size, use of storage subsystems & other conditions. 2. IBM Power E1080 (40 cores/3.8 GHz/2 TB memory) in maximum performance mode, 25 Gb two-port SRIOV adapter, 1 x 16Gbs FCA, with PowerVM. E1080 configuration consists of 2 OCP worker lpar each with 10 cores running SMT8 with 256GB of memory and a VIOS lpar with 4 cores and 8GB of memory. PowerVM LPARs were also affinity-tied on their respective sockets/NUMA nodes. IBM Power E1080 worker nodes run CoreOS Linux 4.18.0-305.10.2.el8_4. CentOS based DayTrader7 containers with Open Liberty 21.0.0.6, IBM Semeru Runtime Open Edition (build 1.8.0_302-

b08) Eclipse OpenJ9 VM (build openj9-0.27.0, JRE 1.8.0 Linux ppc64le-64-Bit Compressed References 20210728_167 (JIT enabled, AOT enabled), JVM flag within jvm.options file within containers when starting JVM-->“-XX:-PortableSharedCache”. 3.Competitive system: Intel(R) Xeon(R) Gold 6248 CPU (Cascade Lake) in performance mode, 40 cores/3.9GHz/512GB memory), 25Gb two-port SRIOV adapter, 1 x 16Gbps FCA, RHEL 8.4 KVM. Cascade Lake competitive configuration of 2 KVM guests as OCP worker nodes with 20 cores running hyperthreading (HT) with 256GB of memory. SRIOV device passthrough from host to KVM guest. The KVM guest’s CPU & memory are pinned to host’s CPU with respect to their associated NUMA nodes. Cascade Lake worker nodes run worker node OS CoreOS Linux 4.18.0-305.10.2.el8_4. CentOS based DayTrader7 containers with Open Liberty 21.0.0.6, IBM Semeru Runtime Open Edition (build 1.8.0_302-b08) Eclipse OpenJ9 VM (build openj9-0.27.0, JRE 1.8.0 Linux amd64-64-bit Compressed References 20210723_193 (JIT enabled, AOT enabled) JVM flag within jvm.options file within containers when starting JVM-->“-XX:-PortableSharedCache. 4.Database system S922: Model 9009-22G with 22 cores (2400 MHz) and 1TB of memory. S922 configuration consists of 2 AIX lpar each with 8 cores running SMT8 with 131GB of memory, and a VIOS lpar with 2 cores and 16GB of memory.

[v] Based on published rPerf results for Power E980/12 core compared to IBM Internal rPerf measurements (using the same methodology) for Power E1080/15 core

[vi] 5x improvement in per socket inferencing throughput for large size 32b floating point inferencing models from Power9 E980 (12-core modules) to Power10 E1080 (15-core modules). Based on IBM testing using Pytorch, OpenBLAS on the same BERT Large with SqUAD v1.1 data set.

[vii] AES-256 in both GCM and XTS modes runs about 2.5 times faster per core when comparing Power E1080 (15-core modules) vs. Power E980 (12-core modules) according to preliminary measurements obtained on RHEL Linux 8.4 and the OpenSSL 1.1.1g library.

[viii] Power9 (12c) is 5081 rPerf @ 16,520 Watts (0.31 rPerf/Watt), Power10 (15c) is 7998 rPerf @ 17,320 Watts (0.46 rPerf/Watt)

[ix] Transparent Memory encryption means that the capability does not need any user configuration

[x] Based on results for keyword “powervm” in National Institute of Standards and Technology’s (NIST) “National Vulnerability Database

xiv. HPE Superdome Flex; two-tier SAP SD standard application benchmark running SAP ERP 6.0 EHP5; Intel Xeon Platinum 8380H 2.9 GHz, 8p/224c/448t, 122,300 SD benchmark users (670,830 SAPS), Windows Server 2016 and Microsoft SQL Server 2012, Certification # 2021006.

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