# IBM Power E1080

Engineered for agility

**Highlights**

Scale efficiently and reduce
energy consumption

Help protect data with
faster AES encryption

Streamline insights and
automation with five times
faster in-core inferencing
compared to POWER9

Deliver two times better
memory reliability and
availability than industry-
standard DIMMs

The core applications, data stores and processes that run your business
simply cannot go down, no matter what. With accelerated digital adoption,
the demands on these applications are increasing, along with the related
security risks. To stay ahead of the curve, your IT system needs to be
modernized to meet the challenges of today. This requires an infrastructure
platform that efficiently scales to meet new demands, helps protect your
applications and data with pervasive and layered defenses, and enables
you to transform data into insights quickly.

The IBM® Power® E1080 server, the first in a generation of servers built on
Power10 processors, is engineered for agility. It delivers on key enterprise
needs, allowing organizations to respond faster to business demands with
world record performance scalability for core enterprise workloads and an
agile hybrid cloud experience. The server helps businesses protect data from
core to cloud with accelerated encryption and new in-core defense against
return-oriented programming attacks. The Power E1080 server streamlines
insights and automation with in-core AI inferencing and machine learning.
The server maximizes reliability and availability with open memory interface
(OMI) attached memory DIMMs.

IBM Power E1080

**Scale efficiently and lower energy consumption**
The IBM Power E1080 server delivers scalable and efficient performance with world record benchmark:

– World record SPEC CPU 2017 benchmark result, providing 2.5x greater efficiency per core than x86 Intel Xeon Platinum[1]

You can receive this improved performance while lowering your energy footprint. With the revolutionary 7 nm Power10 processor, workloads that run on a Power E1080 server will consume 33% less energy than a Power E980 server[2].

**Help protect data from core to cloud**
With data residing in increasingly distributed environments, you cannot set a perimeter to it anymore. This reinforces the need for layered security across IT stack. The Power10 family of servers introduces a new layer of defense with transparent memory encryption. With this feature, all stored data remains encrypted when in transit between the memory storage and processor. Since this capability is enabled at the silicon level, there is no additional management setup and performance impact. Power10 servers also includes four times more crypto engines in every core compared to IBM Power9® servers to help accelerate encryption performance across the stack. For example, the widely-used AES encryption performance is improved by two and a half times over the Power E980 server[3].

These innovations, along with new in-core defense for return-oriented programming attacks and support for post quantum encryption and fully homomorphic encryption, makes one of the most secure server platforms even better.

IBM Power E1080

# ↓ 25%

IBM Power has been leading the industry in infrastructure reliability with 25% lower downtime compared to similar high-end servers.

# ↓ 33%

The IBM Power E1080 server enables you to lower energy consumption by 33% for the same workload over Power E980.

**Streamline insights and automation**

As more AI models are deployed in production, the challenges around AI infrastructure are beginning to increase. A typical AI deployment involves sending data from an operational platform to a GPU system. This usually induces latency and may even increase security risks by leaving more data in-network. Power10 addresses this challenge with in-core AI inferencing and machine learning. The Matrix Math Accelerators (MMAs) in Power10 cores provide the computational strength to tackle demanding AI inferencing and machine learning at multiple levels of precision and data bandwidth. The Power E1080 server delivers five times faster AI inferencing per socket compared to the Power E980 server[4].

**Maximize reliability and availability**

IBM Power has been providing best-in-class infrastructure reliability for 15 years with 25% lower downtime compared to similar high-end servers[5]. Power E1080 makes the most reliable server platform in its class even better with advanced recovery, diagnostic capabilities, and OMI-attached advance memory DDIMMs. The continuous operations of today's in-memory systems depend on memory reliability because of their large memory footprint. Power10 DDIMMs deliver two times better memory reliability and availability than industry-standard DIMMs[6].

**Conclusion**

Companies want IT infrastructure to help them be agile and flexible, efficient, and cyber resilient. The IBM Power E1080 server is designed to address these requirements and enables you to:

– Scale efficiently with two and a half times more performance per core than Intel Xeon Platinum
– Lower energy consumption by 33% for the same workload over Power E980
– Help protect data with two and a half times faster AES encryption of data at rest and in use compared to Power E980
– Defend against return-oriented programming attacks with new in-core defense
– Run AI where the data resides with five times faster in-core AI inferencing compared to Power E980

**Why IBM?**

IBM provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit IBM Global Financing.

**For more information**

To learn more about IBM Power E1080 server, please contact your IBM representative or IBM Business Partner, or visit ibm.com/products/power-e1080.

**IBM Power E1080 Model 980-HEX**

| Configuration options | One system node | Four system nodes (maximum) |
| --- | --- | --- |
| Microprocessors | 4 Power10 processors 10, 12 or 15 cores each | 16 Power10 processors 10, 12 or 15 cores each |
| Threads per core | 8 | |
| Cores | 40, 48 or 60 | 160, 192 or 240 |
| Level 2 (L2) cache per core | 2 MB | |
| Level 3 (L3) cache per core | Up to 120 MB shared L3 cache (8 MB per core) | |
| Enterprise memory | 64 DIMM slots Up to 16 TB buffered DDR5 DDIMMs | 256 DIMM slots Up to 64 TB buffered DDR5 DDIMMs |
| USB ports | USB PCIe adapter must be used for enabling USB access 1 x USB 3.0 in System Control Unit | |
| Internal storage | 4 slots for non-volatile memory express (NVMe) | 16 slots for non-volatile memory express (NVMe U.2) |
| DVD | External DVDs (optional) may be attached via USB | |
| Integrated PCIe adapter slots | 8 PCIe Gen5 | 32 PCIe Gen5 |
| PCIe I/O expansion drawers | Up to 4 (12 PCIe adapter slots each) | Up to 16 (12 PCIe adapter slots each) |
| System control unit | 1 | |
| Flexible service providers | 2 | |
| HMC ports | 2 | |
| POWER Hypervisor | PowerVM Enterprise integrated | |

| Reliability, Availability and Serviceability (RAS) features | – First failure data capture |
|---|---|
| | – Processor instruction retry |
| | – L2 and L3 cache ECC protection with cache line-delete |
| | – Core checkstops |
| | – Dynamic processor deallocation |
| | – Chipkill protection for x4 DDIMMs, with DRAM sparing |
| | – Processor fabric and memory buses retry with data lane sparing and ½ bandwidth mode |
| | – High-speed internode cables, with passive components and advanced fault isolation diagnostic capabilities |
| | – Guided FSP and SMP cable installation |
| | – Concurrent repair of external SMP cable |
| | – Redundant phase and spare phase for voltage regulator modules (VRMs) supplying processors |
| | – Spare Power Management Integrated Circuit (PMIC) for DDIMM power regulation |
| | – Redundant system clocks with dynamic failover |
| | – Redundant, hit-swappable power supplies and cooling fans |
| | – Concurrent add or repair of I/O drawers |
| | – Extended error handling on PCIe slots |
| | – Hot-plug and blind-swap PCIe adapter slots |
| | – Concurrent repair of Op-Panel |
| | – Concurrent repair of Time of Day Battery |
| | – Selective dynamic firmware updates |

| Operating systems | AIX, IBM i and Linux for Power (RHEL or SLES) |
|---|---|

| Power requirements | Operating voltage: 200 to 240V AC |
|---|---|

| System dimensions | | System control unit | System node | PCIe expansion drawer |
|---|---|---|---|---|
| | Width | 445.6 mm (17.54 in.) | 445 mm (17.51 in.) | 482 mm (19 in.) |
| | Depth | 779.7 mm (30.7 in.) | 866.95 mm (34.13 in.) | 902 mm (31.6 in.) |
| | Height | 86 mm (3.39 in.) | 217.25 mm (8.55 in.) | 173 mm (6.8 in.) |
| | EIA units | 2 EIA units (2U) | 5 EIA units (5U) | 4 EIA units (4U) |

| Warranty | 1 year, 24x7 same day response; onsite (varies by country) IBM Power Expert Care Warranty Service Upgrade and additional maintenance service options are available. |
|---|---|

1. All results can be found at https://www.spec.org/cpu2017/results/ res2021q1/cpu2017-20210118-24814.html and are valid as of 02/02/2021.

   SPECInt Math:
   (Power10 2170 peak /120 core)/(1620 peak/224 cores)=2.5Max System SPECint

   IBM Power E1080 (3.55-4,0 GHz, Power10) 120 Cores, 8 CPUs,
   SPECint Score 2170, per CPU Score 271.25, per core score 18.08
   Date: Audit submitted

   Hewlett Packard Enterprise Superdome Flex 280
   (2.90 GHz, Intel Xeon Platinum 8380H),
   224 Cores, 8 CPUs Intel Xeon
   Platinum 8380H Speed 2900 MHz
   SPECint Score 1620.00, per CPU Score 202.50, per Core Score 7.23
   Date: Feb-2021

   SPEC CPU 2017 Integer Rate Result: Hewlett Packard Enterprise Superdome Flex 280
   (2.90 GHz, Intel Xeon Platinum 8380H)

2. Power9 (12c) is 5081 rPerf @ 16,520 Watts (0.31 rPerf/Watt), Power10 (15c) is 7998 rPerf @ 17,320 Watts (0.46rPerf/Watt). 0.46 / 0.31 = 1.48 More rPerf/Watt. Based on IBM internal testing. Individual results may vary.

3. AES-256 in both GCM and XTS modes runs about 2.5 times faster per core when comparing Power10 E1080 (15-core modules ) vs. Power9 E980 (12-core modules) according to preliminary measurements obtained on Red Hat® Enterprise Linux® 8.4 and the OpenSSL 1.1.1g FIPS library. Based on IBM internal testing. Individual results may vary.

4. 5 times 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 and OpenBLAS on the same BERT Large with SqUAD v1.1 data set. Based on IBM internal testing. Individual results may vary.

5. ITIC 2023 Global Server Hardware, Server OS Reliability Report, ITIC, August 2023

6. Based on IBM's internal analysis of the IBM product failure rate of DDIMMS versus industry-standard DIMMs. Individual results may vary.

**IBM**