# IBM to Launch the Next Generation Intel® Xeon® Scalable Processors in the Cloud

## - IBM will be the first major cloud provider to launch bare metal servers powered by new Intel Xeon Scalable processors globally.

ARMONK, N.Y., July 11, 2017 /PRNewswire/ -- IBM (NYSE:IBM) today announced that it will be the first major cloud provider to launch bare metal servers powered by the next generation Intel Xeon Scalable processors globally on the IBM Cloud. New IBM Cloud bare metal servers powered by the Intel Xeon Silver 4110 processor and Intel Xeon Gold 5120 and 6140 processors will be designed to help deliver greater performance and generate faster insights from big data workloads, and will offer the global reach and security-rich environment of the IBM Cloud.

Data is quickly becoming one of the greatest competitive differentiators for enterprises across industries including financial services, manufacturing and healthcare. IDC estimates that by 2020, organizations that are able to analyze all relevant data and deliver actionable information will achieve an extra $430 billion in productivity benefits over their peers [1]. As the volume of data grows rapidly, enterprises require higher levels of performance and efficiency to quickly and easily generate these valuable insights.

New IBM Cloud bare metal servers will be powered by the latest Intel Xeon Scalable processors and are designed to help enterprises run high performance computing workloads such as complex financial simulations, manufacturing design simulations or genomic analysis faster than previous generation processors, and to decrease the time it takes to deliver insights from mission-critical data. According to Intel, the new processor technology can accelerate insights up to 2.3 times faster for financial services workloads, up to 1.5 times faster for manufacturing workloads and up to 1.7 times faster for life sciences workloads [2].

In addition to increased performance, the new bare metal deployment options will also provide a dedicated, security-rich environment that is highly customizable for a client's most sensitive big data workloads. To help clients gain new insights into their data, the IBM Cloud provides seamless access to more than 160 APIs and services ranging from cognitive and analytics to blockchain and IoT. IBM is committed to delivering the fastest and most comprehensive technology to the cloud including POWER-based offerings for data-intensive workloads, and GPUs for cognitive and high performance computing. For enterprises leveraging private or hybrid cloud environments, IBM utilizes multiple platforms including IBM Power Systems and Z Systems.

"IBM Cloud provides the foundation that enterprises need so that they can fully harness data for better decision-making and transformative growth," said John Considine, general manager for cloud infrastructure services, IBM. "The launch of Intel Xeon Scalable processors on the IBM Cloud is another milestone in IBM's commitment to providing access to the latest infrastructure technology so clients can continue to generate greater value from their data."

IBM Cloud bare metal servers powered by Intel Xeon Scalable processors will be available in IBM Cloud data centers in the United States, United Kingdom, Germany and Australia in Q3 2017.

To learn more, please visit: https://www.ibm.com/cloud-computing/bluemix/Intel

**Footnotes/References:**

[1] IDC FutureScape: Worldwide Big Data and Analytics 2016 Predictions http://www.idc.com/getdoc.jsp?containerId=259835

[2] Up to 1.6x Gains based on Geomean of Weather Research Forecasting - Conus 12Km, HOMME, LSTCLS-DYNA Explicit, INTES PERMAS V16, MILC, GROMACS water 1.5M_pme, VASPSi256, NAMDstmv, LAMMPS, Amber GB Nucleosome,

Binomial option pricing, Black-Scholes, Monte Carlo European options. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to http://www.intel.com/performance/datacenter.

- **PERMAS by INTES** is an advanced Finite Element software system that offers a complete range of physical models at high performance, quality, and reliability. It plays a mission-critical role in the design process at customers from automotive, ship design, aerospace, and more. E5-2697 v4: 2S Intel® Xeon® processor E5-2697v4, 2.3GHz, 18 cores, turbo on, HT off, NUMA on, BIOS 338.R00, 256 GB total memory (8x 32GB w/ 2400 MT/s, DDR4 LRDIMM), 4x Intel® SSD DC P3600 2 TB in RAID 0 (stripe size 64k). CentOS Linux* release 7.2, kernel 3.10.0-327.13.1.el7.x86_64. Intel® Composer 2015.5.223. INTES PERMAS V16.00. Gold 6148: Intel® Xeon® Gold 6148 processor, 2.4 GHz, 20 cores, turbo on, HT off, NUMA on, BIOS SE5C620.86B.01.00.0412.020920172159, 384 GB total memory (12x 32GB w/ 2400 MT/s, DDR4 LRDIMM), 3x Intel® SSD DC P3600 2 TB in RAID 0 (stripe size 64k), CentOS* Linux* release 7.3, kernel 3.10.0-514.10.2.el7.x86_64. Intel® Composer 2015.7.235. INTES PERMAS V16.00.
- **LS-DYNA** is the leading product in the crash simulation market. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries in worldwide. Workload: 2M elements Car2car model with 120ms simulation time. LS-DYNA explicit standard benchmarks tested by Intel, March 2017. E5-2697 V4: 2S Intel® Xeon® processor E5-2697 v4, 2.3GHz, 18 cores, turbo and HT on, BIOS SE5C610.86B.01.01.0016.033120161139, 128GB total memory, 8 memory channels / 8x16GB / 2400 MT/s / DDR4, Red Hat Enterprise Linux* 7.3 kernel 3.10.0-229.20.1.el6.x86_64.knl2. GOLD 6148: 2S Intel® Xeon® Gold 6148 processor, 2.4GHz, 20 cores, turbo and HT on, BIOS version 412, 192GB total memory, 12 memory channels / 12x16GB / 2400 MT/s / DDR4, Red Hat Enterprise Linux* 7.3 kernel 3.10.0-514.el7.x86_64.
- **Binomial option pricing** is a lattice-based approach that uses a discrete-time model of the varying price over time of the underlying financial instrument. This is compute bound, double precision workload. FSI Binomial workload. OS: Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Testing by Intel March 2017. E5-2697 v4: 2S Intel® Xeon® processor CPU E5-2697 v4 , 2.3GHz, 36 cores, turbo and HT on, BIOS 86B0271.R00, 128GB total memory, 8 slots / 16GB / 2400 MT/s / DDR4 RDIMM, 1 x 1TB SATA, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: Intel® Xeon® Gold 6148 processor, 2.4GHz, 40 cores, turbo and HT on, BIOS 86B.01.00.0412, 192GB total memory, 12 slots / 16 GB / 2666 MT/s / DDR4 RDIMM, 1 x 800GB INTEL SSD SC2BA80, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327.
- **Monte Carlo** is a numerical method that uses statistical sampling techniques to approximate solutions to quantitative problems. In finance, Monte Carlo algorithms are used to evaluate complex instruments, portfolios, and investments. This is compute bound, double precision workload. FSI Monte Carlo workload. OS: Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Testing by Intel March 2017. E5-2697 v4: 2S Intel® Xeon® processor CPU E5-2697 v4 , 2.3GHz, 36 cores, turbo and HT on, BIOS 86B0271.R00, 128GB total memory, 8 x16GB 2400 MHz DDR4 RDIMM, 1 x 1TB SATA, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: Intel® Xeon® Gold 6148 processor@ 2.4GHz, H0QS, 40 cores 150W. QMS1, turbo and HT on, BIOS SE5C620.86B.01.00.0412.020920172159, 192GB total memory, 12 x 16 GB 2666 MHz DDR4 RDIMM, 1 x 800GB INTEL SSD SC2BA80, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327
- **Black-Scholes** is a popular mathematical model used in finance for European option valuation. This is a double precision version. E5-2697 v4: 2S Intel® Xeon® processor CPU E5-2697 v4 , 2.3GHz, 36 cores, turbo and HT on, BIOS 86B0271.R00, 128GB total memory, 8 x16GB 2400 MHz DDR4 RDIMM, 1 x 1TB SATA, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: Intel® Xeon® Gold 6148 processor@ 2.4GHz, H0QS, 40 cores 150W. QMS1, turbo and HT on, BIOS SE5C620.86B.01.00.0412.020920172159, 192GB total memory, 12 x 16 GB 2666 MHz DDR4 RDIMM, 1 x 800GB INTEL SSD SC2BA80, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327

- **Amber*** is a suite of programs for classical molecular dynamics and statistical analysis. The main MD program is PMEMD (Particle Mesh Ewald Molecular Dynamics) employs two separate algorithms for implicit- and explicit-solvent dynamics. Here performance for explicit solvent (PME) is presented. Amber: Version 16 with all patches applied at December, 2016. Workloads: PME Cellulose NVE(408K atoms), PME stmv(1M atoms), GB Nucleosome (25K), GB Rubisco (75K). No cut-off was used for GB workloads. Compiled with -mic2_spdp –intelmpi - openmp, –DMIC2 * defined. Tests performed on March 2017. E5-2697 v4: Executed with 36 MPI, 2 OpenMP. 2S Intel® Xeon® processor E5-2697 v4, 2.3GHz, 36 cores, turbo and HT on, BIOS 86B0271.R00, 8x16GB 2400MHz DDR4, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: Executed with 40 MPI and 2 OpenMP. 2S Intel® Xeon® Gold 6148 processor, 2.4GHz, 40 cores, turbo on, HT on, BIOS 86B.01.00.0412.R00, 12x16GB 2666MHz DDR, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327.
- **VASP** CONFIGURATION: The Vienna Ab initio Simulation Package (VASP) is a computer program for atomic scale materials modeling and performs electronic structure calculations and quantum-mechanical molecular dynamics from first principles. VASP provides scientists with fast and precise calculation of materials properties covering wide range of MD methods from DFT, DFT-HF to Random-Phase approximation (GW, ACDFT). Beta VASP, a release candidate for v6.0. Developer branch provided as "Package" included with download: https://github.com/vasp-dev/vasp-knl. AVX512: Intel® Compiler 17.0.1.132, Intel® MPI 2017u1, ELPA 2016.05.004. Optimization Flags: "-O3 -xCORE-AVX512". AVX2: Intel® Compiler 17.0.1.132, Intel® MPI 2017u1, ELPA 2016.05.004. Optimization Flags: "-O3 -xCORE-AVX2". E5-2697 v4: 2S Intel® Xeon® processor E5-2697 v4 2.3 GHz , 18 Cores/Socket, 36 Cores, 72 Threads, HT on, turbo off, BIOS 86B0271.R00, 128GB total memory, 2400 MT/s DDR4 RDIMM, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: Dual Socket Intel® Xeon® processor Gold 6148 2.4 GHz , 20 Cores/Socket, 40 Cores, 80 Threads, HT on, turbo off, BIOS 86B.01.00.0412, 192GB total memory, 2666 MT/s / DDR4 RDIMM, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327.
- **NAMD**: NAMD, recipient of a 2002 Gordon Bell Award, is a parallel molecular dynamics code designed for high-performance simulation of large biomolecular systems. Based on Charm++ parallel objects, NAMD scales to hundreds of cores for typical simulations and beyond 200,000 cores for the largest simulations. Version 2.12 Dec2016. Workloads: apoa1(92K atoms), stmv(1M atoms). Compiled with –DNAMD_KNL* define. Tests performed on March 2017. E5-2697 v4: 2S Intel® Xeon® processor E5-2697 v4, 2.3GHz, 36 cores, turbo and HT on, BIOS 86B0271.R00, 8x16GB 2400MHz DDR4, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Compiler option "-xCORE-AVX2". Gold 6148: 2S Intel® Xeon® Gold 6148 processor, 2.4GHz, 40 cores, turbo on, HT on, BIOS 86B.01.00.0412.R00, 12x16GB 2666MHz DDR, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Compiler option "-xCORE-AVX512".
- **LAMMPS**: LAMMPS is a classical molecular dynamics code, and an acronym for Large-scale Atomic/Molecular Massively Parallel Simulator. It is used to simulate the movement of atoms to develop better therapeutics, improve alternative energy devices, develop new materials, and more. E5-2697 v4: 2S Intel® Xeon® processor E5-2697 v4, 2.3GHz, 36 cores, Intel® Turbo Boost Technology and Intel® Hyperthreading Technology on, BIOS 86B0271.R00, 8x16GB 2400MHz DDR4, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327. Gold 6148: 2S Intel® Xeon® Gold 6148 processor, 2.4GHz, 40 cores, Intel® Turbo Boost Technology and Intel® Hyperthreading Technology on, BIOS 86B.01.00.0412.R00, 12x16GB 2666MHz DDR4, Red Hat Enterprise Linux* 7.2 kernel 3.10.0-327.
- **GROMACS** is a versatile package to perform classical Molecular Dynamics simulations. Heavily optimized for most modern platforms and provides extremely high performance. GROMACS AVX2 CONFIGURATION: Version 2016.3: ftp://ftp.gromacs.org/pub/gromacs/gromacs-2016.3.tar.gz , Intel® Compiler 17.0.1.132, Intel® MPI 2017u1. Optimization Flags: "-O3 -xCORE-AVX2". Cmake options: "-DGMX_FFT_LIBRARY=mkl -DGMX_SIMD=AVX2_256". GROMACS AVX512 CONFIGURATION: Version 2016.3: ftp://ftp.gromacs.org/pub/gromacs/gromacs-2016.3.tar.gz , Intel® Compiler 17.0.1.132, Intel® MPI 2017u1. Optimization Flags: "-O3 -xCORE-AVX512". Cmake options: "-DGMX_FFT_LIBRARY=mkl -DGMX_SIMD=AVX_512". E5-2697 V4: GROMACS AVX2 binary, Dual Socket Intel® Xeon® processor E5-2697 v4 2.3 GHz, 18 Cores/Socket, 36 Cores, 72 Threads (HT on, Turbo on), DDR4 128GB, 2400 MHz, Red Hat 7.2. Gold 6148: GROMACS AVX512 binary, Dual Socket Intel® Xeon® processor Gold 6148 2.4 GHz , 20 Cores/Socket, 40 Cores, 80 Threads (HT on, Turbo on), DDR4 192GB, 2666 MT/s DDR4 RDIMMs, Red Hat 7.2.

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