IBM LinuxONE III

Highlights

- The world's premier system for secure, scalable data serving
- Unmatched security capabilities and data privacy
- Protection from both external and internal threats
- Foundational capabilities for next-generation Open Source applications
- The best of enterprise service agility
- Private, hybrid, or public cloud integration with improved IT economics
- Improved performance and vertical scale within a flexible footprint
- More cores, memory, and enhanced accelerators

We believe your data is yours. We believe the insights you gain from your data are yours to use in the pursuit of your business objectives. We designed the IBM LinuxONE III (LinuxONE III) with this belief at the core.

The world is experiencing a time of exponential growth in the sheer volumes of data, fueled by the digital transformation of systems, services, and interconnected devices that all require strong data serving capabilities. Businesses must be able to manage, store, and, most importantly, protect this information, using it to gain competitive advantage. Technology must create an environment where users have confidence that their data is protected yet available from anywhere and any device. This ability to be fast and flexible in delivery of new services, with insight and security, will differentiate a business.

The IBM LinuxONE III provides unique capabilities to help with that differentiation. IBM LinuxONE III is an all-Linux enterprise platform for open innovation that combines the best of Linux and open technology with the best of enterprise computing in ONE system. It delivers a single system built on a 5.2Ghz processor and is built to be the backbone of the interconnected data-driven era, setting new standards in transaction volume, speed, and trust. The newest member of the IBM LinuxONE family, IBM LinuxONE III, was designed to thoroughly protect the new global currency with speed and agility while delivering differentiated value to protect investments, reduce cost, and enable business growth. By providing a highly securable, massively scalable, data serving platform, LinuxONE III can help any business looking to thrive in a data-centric economy.

Digital technologies are creating profound and accelerated transformations of business activities, processes, competencies and models. To succeed, organizations must embrace the transformation, adopt agile processes and embrace new technologies to deliver services and

experiences that customers and clients demand. They must also ensure they maintain infrastructure security and protect data privacy while providing 24x7 availability. The pressure is on IT to securely deliver services and provide ongoing management and support within tight time and budget constraints.

IBM created the new LinuxONE III platform to deliver the performance, flexibility, availability, protection and agility required to drive digital transformation. With IBM LinuxONE III technology as an infrastructure cornerstone, there is the power to optimize digital services delivery, accelerate business innovation and ultimately improve the bottom line.

IBM LinuxONE III 1-frame system

Empower digital transformation

At the heart of the LinuxONE III is the new processor chip, made with 12-cores and leveraging the density and efficiency of 14nm silicon-on-insulator technology, running at 5.2 GHz, delivering increased performance and capacity across a wide range of workloads. There are up to 190 client configurable cores. The IBM LinuxONE III comes in a single model (Model LT1) with processor capacity represented by feature codes. There are five processor capacity feature codes orderable for the IBM LinuxONE III – Max34, Max71, Max108, Max145 and Max190.

The system offers 8 TB of Redundant Array of Independent Memory (RAIM) per central processing complex (CPC) drawer and up to 40 TB per system. IBM Virtual Flash Memory (VFM) is now located in the RAIM and provides high levels of availability and performance. VFM can help reduce latency for critical paging that might otherwise impact the availability and performance of key workloads. There are up to 6 TB of granular ordering options available for VFM.

The new IBM LinuxONE III platform also integrates new file compression capabilities. This on-chip compression can reduce data storage requirements and costs, as well as increase data transfer rates to boost throughput above comparable x86 CPUs—without adversely impacting response times. This new coprocessor replaces the previous-generation IBM zEDC Express adapter.

Sorting data, including database query processing, utility processing, analytics and batch workloads, makes up a significant part of Linux workloads. The IBM LinuxONE III processor chip provides a new hardware accelerated approach to sorting using a new coprocessor designed to reduce elapsed and CPU times for many database batch workloads[1].

Design flexibility

The IBM LinuxONE III has radically changed the footprint for LinuxONE servers. It is built with a 19" frame that flexibly scales from one to four frames depending on the configuration. This new configuration enables significant floor space reduction for most clients compared to earlier generations of LinuxONE.   Changes to the footprint mean:

• The frame no longer requires the PCIe+ I/O drawers to be locked into fixed locations.

• Support continues for both raised and non-raised floors as well as top and bottom exit I/O and power.

• All cabling is routed to the back of the frame with new brackets to contain cables.

• There are two power options - intelligent power distribution unit (iPDU) and Bulk Power Assembly (BPA).

• The doors are designed for acoustics and optimized for air flow.

• The frame requires 3-phase power.

The use of the intelligent power distribution unit (iPDU) may improve power efficiency and lower overall energy costs dependent on the required configuration.   Any requirement for internal battery feature (IBF) or balanced power will require the selection of bulk power assembly (BPA).

The 19" frame technology supports the A3 operating class as defined by the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE)[2].

A new optional Hardware Management Appliance can be ordered with the IBM LinuxONE III to provide HMC/SE functions within the 19" frame, eliminating the need for a separate HMC outside of the server.

Deliver with confidence

IBM LinuxONE machines have delivered the industry's highest reliability levels for over a decade, with up to six-nines—or greater—availability. In addition, LinuxONE can avoid and recover from failures for minimal business disruption with concurrent replace, repair, and upgrade functions for processors, memory, drawers, and I/O.[3] On premises or in the cloud, IT resiliency is the ability to adapt to planned or unplanned events while keeping services and operations running continuously. IT resilience means:

- Data loss is rare

- Applications can operate, even during an outage

- Hardware, middleware and workloads are available

- Service disruptions are mitigated

Strengthen data security

IBM introduced pervasive encryption to the Linux server market with the IBM LinuxONE Emperor II. Pervasive encryption is a consumable approach to enable extensive encryption of data in-flight and at-rest to substantially simplify it and reduce costs associated with protecting data and achieving compliance mandates. It allows businesses to defend and protect critical assets with encryption and intelligent data monitoring—without compromising transactional throughput or response times. IBM LinuxONE has taken the next step of the journey with the IBM LinuxONE III by extending this data protection throughout the enterprise. The goal is protection of data beyond the platform and into distributed and hybrid cloud environments.

The new IBM Data Privacy Passports offering, in conjunction with the IBM LinuxONE III, is designed to enforce security and privacy protections of data across an organization's multi-platform environment. It provides a data-centric security solution which increases organizational control of data by allowing data protection to remain with the data as it is moved from its data source and proliferated across an enterprise. IBM Data Privacy Passports provides policy-based fine-grained data privacy protection throughout the lifecycle of the data. As a result, only the authorized application or user can only view entitled subset of the data. This solution allows the IBM LinuxONE III to enable data protection that can span hybrid and multi-

party computing environments, including data stored in public cloud deployments or shared with third parties.

These enhancements supported by the IBM LinuxONE III allow an organization to prove that all data originating from their system of record is secured throughout their enterprise and eco-system meeting all company policies and regulatory requirements with configurable and verifiable automation.

Fast, secure and flexible access to data

The processor chip and memory enhancements over prior LinuxONE generations make the IBM LinuxONE III perfectly optimized for data serving. It is well understood that data is the crown jewels of any organization. However, being able to protect, optimize and manage data can slow down an organization and make it difficult to take advantage of the power of the data.

High-speed connectivity to data is critical to achieve exceptional transaction throughput. The IBM LinuxONE III will support the FICON Express16S+. The IBM LinuxONE III supports a new set of OSA-Express7S adapters that meet the increased networking bandwidth demands driven by high speed processors and faster network-attached storage devices. Some older adapters can be carried forward.

IBM LinuxONE offers memory-to-memory communications using high speed protocols and direct memory placement of data for faster communications. Shared Memory Communications—Direct Memory Access (SMC-D) does not require any additional physical hardware and can be implemented to communicate between logical partitions on a single server. In addition, Shared Memory Communication - Remote (SMC-R) uses sockets over RDMA communications protocol and supports cross-CEC connectivity of Linux running in LPAR and z/VM, using RoCE Express cards (currently Mellanox PCI) without significant TCP/IP processing costs.

Protect against attacks and malware

IBM Secure Boot for Linux brings boot integrity to the LinuxONE platform– a complete chain of trust from trusted source to boot loader. IBM Secure Boot for Linux protects your system from root level attacks and viruses that target vulnerabilities during the boot process. This capability checks images at boot time for a vendor signature to verify the image is from an official provider and validates that images have not been tampered with or replaced by malicious 3rd parties.

IBM Secure Boot for Linux also opens the door for Common Criteria certification under the National Information Assurance Partnership (NIAP) OS Protection Profile v4.2. The Common Criteria enable an objective evaluation to validate that a particular product or system satisfies a defined set of security requirements. Satisfy Common Criteria compliance standards and ensure OS boot integrity for all IBM supported Linux distributions running in all LPAR, KVM and z/VM

environments.

Maximize the bottom line

Success in modern markets demands organizations rapidly evolve new capabilities across systems of engagement and systems of record to take advantage of cutting-edge analytics, cloud, mobile and social applications. This rapid evolution requires integrated infrastructure that possesses a unique combination of performance, flexibility, availability, protection and agility.

Capabilities like consolidating hundreds of x86 cores onto a single platform for Linux deployments shrink the server footprint, decreasing space and operational costs. While automated at rest and inflight data encryption helps strengthen security without adversely impacting transaction speeds and the revenues that come from those transactions.

These examples illustrate the IBM commitment to a cohesive infrastructure approach. The new IBM LinuxONE III leads that approach—delivering the power and speed users demand, the security-rich environment businesses and regulators require and the efficiencies that lower operational expenditures. As a result, a comprehensive cost analysis can clearly show a lower total cost of ownership, which maximizes the enterprise bottom line.

[1]Results may vary by customer based on individual workload, configuration and software levels

[2]ASHRAE Thermal Guideline Classes for IT Equipment Spaces, 4th Edition, ASHRAE, 2015

[3] IBM Power Systems, Lenovo System x and ThinkSystem, HPE Integrity and Huawei KunLun Top ITIC 2019 Server Reliability Poll, Information Technology Intelligence Consulting, 28 March 2019

Why IBM?

IBM has been committed to Linux since 1999. As you transform your business and differentiate yourself in a trust economy, IBM remains your partner. We have the total expertise—in systems, software, delivery, support and financing—to help you create a secure, open, and intelligent foundation for the future. Our experts can help you configure, design and implement a solution optimized for the needs of your business.

Next steps

→ Detailed System Specifications

For more information

Contact your IBM representative or IBM Business Partner, or visit:

ibm.com/marketplace/linuxone-iii

Additionally, IBM Global Financing 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.com/financing