IBM

ORACLE

IBM LinuxONE servers running Oracle Database 19c on premises on Linux

Put LinuxONE to work for you

Scale and grow Oracle Database 19c applications and data with confidence

Benefit from mission-critical reliability for Oracle Database 19c

Simplify IT operations with advanced virtualization, multi-architecture workload support and operations management capabilities

Minimize network security vulnerabilities and reduce latency

Enterprise leaders need a trusted IT infrastructure that is dynamic, scalable and flexible enough to support mission-critical work and the development and deployment of new workloads. This infrastructure should help decision makers use their company's most valuable asset—their data—with insight rather than hindsight, and the foundation can assist in using IT to gain a competitive edge.

IBM® LinuxONE is a family of systems designed for secure data serving. With LinuxONE, you get a single system engineered for running multiple Linux-based workloads that include Oracle Database 19c, Oracle WebLogic Server and open source, blockchain and other Linux-based commercial software. All these workloads can operate at the same time on the same LinuxONE system.

The LinuxONE III Model LT1 system uses industry-standardized power and networking hardware. Built with a 19-inch frame that flexibly scales from one to four frames, the system can provide advanced performance, security, resiliency, availability and virtualization for a high quality of service. Ideal for larger enterprises that are embracing digital business, LinuxONE III offers massive scalability in a high-volume transaction processing and large-scale consolidation platform.

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Designed for deploying Oracle Database data-serving workloads
LinuxONE III LT1 can deliver outstanding transaction processing and data serving performance for excellent economies of scale and more-efficient use of critical data. It is built for scale, with up to 190 LinuxONE cores, 40 TB of memory and simultaneous multithreading (SMT) support. It delivers flexibility with up to 85 Logical Partitions (LPARs) providing hard partitions for workload isolation. Oracle Database workloads see performance and manageability benefits from its internal high-speed input/output (I/O) fabric, with its thousands of dedicated processors reducing dependency on workload dependent Linux cores. These features make LinuxONE III LT1 ideally suited for consolidating large-scale distributed environments and for adding in-memory, Java workloads and hybrid cloud deployments.

Another system in the family is the IBM LinuxONE III Model LT2. The 19-inch air cooled single-frame system supports SMT, up to 65 Linux cores, 16 TB of memory, 40 LPARs and dedicated I/O processors. The LinuxONE III LT2 is ideal for any growing business that seeks to use LinuxONE technologies' qualities of service, flexibility and performance.

As environmental concerns raise the focus on energy consumption, these LinuxONE systems promote energy efficiency with an ASHRAE Class A3 rating. Their design helps to dramatically reduce energy consumption, with their safety margin for data center cooling and humidity providing for a more efficient IT infrastructure.

Linux and IBM LinuxONE
A Linux infrastructure on LinuxONE provides an enterprise-grade Linux environment. This combination offers the advantages of the LinuxONE hardware servers and leading IBM z/VM® virtualization with the flexibility and open standards of the Linux operating system.
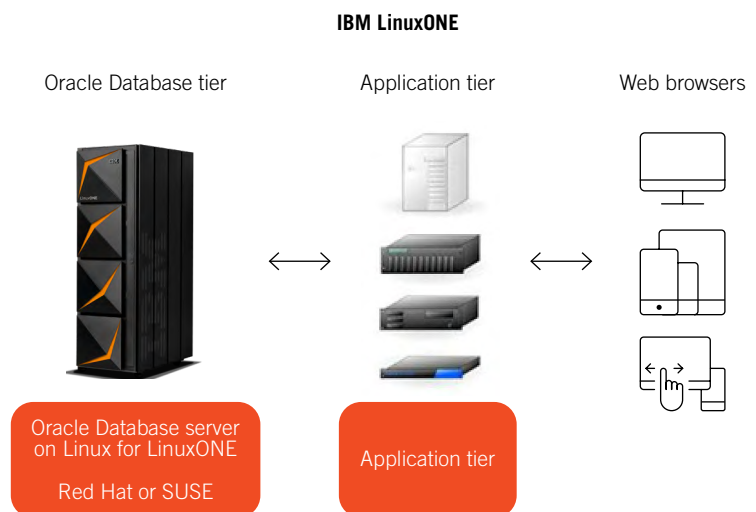
IBM LinuxONE

Oracle Database tier   Application tier   Web browsers

Oracle Database server on Linux for LinuxONE

Red Hat or SUSE

Application tier

Figure 1: Oracle Database 19c on LinuxONE III

IBM LinuxONE virtualization technology

During spikes in demand, the LinuxONE systems can quickly redistribute system resources and scale up, scale out, or both. These capabilities can make the difference between flawless execution or costly and slow response times and system crashes for your enterprise.
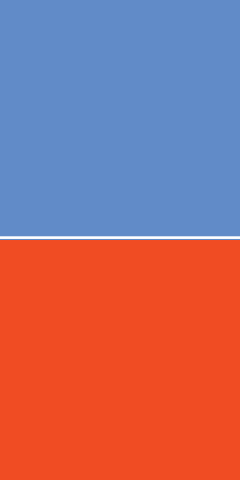
You can further improve the virtualization management capabilities of Linux and z/VM by using the intelligent visualization, simplified monitoring and unified management features of IBM Infrastructure Suite for z/VM and IBM Dynamic Partition Manager. These solutions are designed to help simplify everyday administrative and configuration tasks and help you transform your Linux environment to a virtualized private cloud.

The enterprise-grade Linux infrastructure on LinuxONE is designed to bring unique business value in operational efficiency, scalability, autonomic workload management, reliability, business continuance and security. Linux on LinuxONE solutions can further benefit from the following IBM technologies to enhance this infrastructure:

• The IBM Spectrum® Scale high-performance data and file management solution provides high availability capabilities based on the IBM General Parallel File System (GPFS). This solution is a cluster file system that provides access to storage. IBM Spectrum Scale can deliver additional speed, flexibility, cost efficiency and security by using built-in encryption and data protection capabilities.
• IBM GDPS® (Geographically Dispersed Parallel Sysplex) Virtual Appliance provides near-continuous availability and disaster recovery by extending GDPS capabilities for Linux guests on z/VM environments. It can help substantially reduce recovery time, recovery point objectives and complexity associated with manual disaster recovery.

Oracle Database 19c and IBM LinuxONE

Oracle Database 19c enables customers to make more efficient use of their IT resources. Oracle Database 19c is the long-term support release of the Oracle Database 12c and 18c family of products. Oracle Database 19c builds upon key architectural, performance and distributed data innovations successfully established in Oracle Database 12c and 18c releases including Multitenant, In-Memory, JSON support, Sharding and many other features.

Multitenant architecture

Oracle's multitenant database offers a unique architecture that simplifies consolidation and delivers the high density of schema-based consolidation, but without requiring changes to existing applications. It delivers isolation, agility and economies of scale. A multitenant container database can hold many pluggable databases. An existing database can simply be adopted with no application changes required. Oracle Multitenant fully complements other options, including Oracle Real Application Clusters and Oracle Active Data Guard.

Database In-Memory

Oracle Database In-Memory provides a unique dual-format architecture that enables tables to be simultaneously represented in memory using traditional row format and a new in-memory column format. The Oracle SQL Optimizer automatically routes analytic queries to the column format and OLTP queries to the row format, transparently delivering best-of-both-worlds performance. Oracle Database automatically maintains full transactional consistency between the row and the column formats, just as it maintains consistency between tables and indexes today. The new column format is a pure in-memory format and is not persistent on disk, so there are no additional storage costs or storage synchronization issues.

High availability

Oracle offers customers a comprehensive set of database high availability capabilities that seamlessly work together to help reduce both planned and unplanned downtime. Oracle Database 19c goes beyond the limitations of basic high availability which are further enhanced by the hardware features provided by IBM storage devices and LinuxONE servers.

Reducing planned downtime

Planned downtime for essential maintenance such as hardware upgrades, software upgrades and patching are part and parcel of every IT operation. Oracle Database 19c offers a number of capabilities to help customers reduce the amount of planned downtime required for maintenance activities, including:

• Hardware Maintenance and Migration Operations to Oracle Database 19c infrastructure can be performed without taking users offline. Using Automatic Storage Management, disks can be added or removed online and the data is automatically rebalanced.
• Online Patching of database software can be applied to server nodes in a 'rolling' manner using Oracle Real Application Clusters. Users are simply migrated from one server to another; the server is quiesced from the cluster, patched, and then put back online.
• Rolling Database Upgrades Oracle Data Guard or Oracle Active Data Guard enables upgrading of a standby database, testing of the new (upgraded) environment and then switching users to the new environment, without any downtime.

- Online Redefinition Oracle Database can reduce maintenance downtime by allowing changes to a table structure while continuing to support an online production system, and data files and partitions may be moved around storage devices while users continue to access underlying data.
- Edition Based Redefinition enables online application upgrades. Using edition-based redefinition, changes to program code can be made in the privacy of a new edition within the database, separated from the current production edition.

Enhancing database availability
- Data Guard provides the management, monitoring, and automation software to create and maintain one or more synchronized copies of a production database to protect Oracle data from failures, disasters, human error, and data corruptions while providing high availability for mission critical applications.
- Data Guard Far Sync provides zero data loss protection for a production database by maintaining a synchronized standby database located at any distance from the primary location, without impacting database performance and with minimal cost or complexity.
- Global Data Services provides inter-region and intra-region load balancing across Active Data Guard and Golden Gate replicated databases. It effectively provides Real Application Cluster failover and load balancing capabilities to Active Data Guard and Golden Gate distributed databases.
- Zero-Downtime Oracle Grid Infrastructure Patching enables patching of Oracle Grid Infrastructure on clustered architectures without interrupting database operations. This is achieved in a similar manner to rolling database patching, by applying patches out-of-place in a rolling fashion, with one node being patched at a time.
- Active standby DML Redirect is a popular feature of Active Dataguard with its ability to make use of standby databases for reporting and backups.

Simplifying analysis of Big Data
Oracle's stated goal is to help lower total cost of ownership (TCO) by delivering customer requested product features, minimizing customizations and providing pre-built integration to other Oracle solutions. These Oracle Database benefits further complement the IT infrastructure TCO savings gained by implementing Oracle Database on a LinuxONE server.

Oracle Database on a LinuxONE server

The enterprise-grade Linux on LinuxONE solution is designed to add value to Oracle Database solutions, including the new functions Oracle Database 19c introduces. Oracle Database on LinuxONE includes the following benefits:

- Offers innovative technologies through LinuxONE servers that consolidate workloads with mature virtualization and hardware partitioning capabilities
- Provides high levels of security with the industry-leading Evaluation Assurance Level (EAL5+) and virtualization ratings and high quality of service
- Optimizes performance by deploying powerful database hardware engines available on LinuxONE systems
- Improves performance by using the specialized dedicated LinuxONE I/O processors
- Achieves greater flexibility through the LinuxONE workload management capability by allowing the Oracle Database environment to dynamically adjust to user demand
- Reduces TCO by using the specialized LinuxONE cores that run the Oracle Database and management of the environment

Sizing and capacity planning for Oracle Database 19c on IBM LinuxONE

By working together, IBM and Oracle have developed a capacity estimation capability to aid in designing an optimal configuration for each specific Oracle Database 19c client environment. You can obtain a detailed sizing estimate customized for your environment from the IBM Digital Techline Center, which is accessible through your IBM or IBM Business Partner representative.

The IBM and Oracle alliance

Since 1986, Oracle and IBM have provided clients with compelling joint solutions, combining Oracle's technology and application software with IBM's complementary hardware, software and services solutions. More than 100,000 joint clients benefit from the strength and stability of the Oracle and IBM alliance. Through this partnership, Oracle and IBM offer technology, applications, services and hardware solutions designed to mitigate risk, boost efficiency and lower TCO.

IBM is a Platinum level partner in the Oracle Partner Network

IBM delivers a combination of industry insight, extensive real-world Oracle applications experience, deep technical skills and high-performance servers and storage to create an optimized business solution. From application selection, purchase and implementation to upgrades and maintenance, IBM representatives help organizations reduce the TCO and complexity of managing their Oracle solutions environment while building a solid base for business growth.

For more information

For more information about joint solutions from IBM and Oracle, please contact an IBM sales representative at 1-866-426-9989.

For more information about IBM LinuxONE, visit ibm.com/LinuxOne

For more information about Oracle Database 19c, visit oracle.com/database/technologies