

# Oracle Server X9-2L



Oracle Server X9-2L is the ideal 2U platform for databases, enterprise storage, and big data solutions. Supporting the standard and enterprise editions of Oracle Database, this server delivers best-in-class database reliability in single-node configurations. With support for up to 132.8 TB of high-bandwidth NVM Express (NVMe) flash storage, Oracle Database using its Database Smart Flash Cache feature, as well as NoSQL and Hadoop applications can be significantly accelerated. Optimized for compute, memory, I/O, and storage density simultaneously, Oracle Server X9-2L delivers extreme storage capacity at lower cost when combined with Oracle Linux, or Oracle Solaris with ZFS file system compression. Each server comes with built-in, proactive fault detection and advanced diagnostics, along with firmware that is already optimized for Oracle software, to deliver extreme reliability.

## Product Overview

Oracle Server X9-2L is a two-socket server designed and built specifically for the demands of enterprise workloads. It is a crucial building block in Oracle engineered systems and Oracle Cloud Infrastructure. Powered by one Platinum, two Gold, or one Silver Intel® Xeon® Scalable Processor Third Generation models with up to 32 cores per socket, along with 32 memory slots, this server offers high-performance processors plus the most dense flash storage options in a 2U enclosure. Oracle Server X9-2L is the most balanced and highest performing 2U enterprise server in its class because it offers optimal core and memory density combined with high I/O throughput.

In addition to optimized processing power and storage density, Oracle Server X9-2L offers 10 PCIe 4.0 expansion slots (two 16-lane and eight 8-lane) for maximal I/O card and port density. With 576 gigabytes per second of bidirectional I/O bandwidth, Oracle Server X9-2L can handle the most demanding enterprise workloads.

Oracle Server X9-2L offers best-in-class reliability, serviceability, and availability (RAS) features that increase overall uptime of the server. This extreme reliability makes Oracle Server X9-2L the best choice for single-node Oracle Database deployments in remote or branch office locations. Real-time monitoring of the health of the CPU, memory, and I/O subsystems, coupled with off lining capability of failed components, increases the system availability. Building on the firmware-level problem detection, Oracle Linux and Oracle Solaris are enhanced to provide fault detection capabilities when running on Oracle Server X9-2L. In

## Key Features

- Most flash-dense and energy-efficient 2U enterprise-class server
- Two Intel® Xeon® Scalable Processor Third Generation CPUs
- Thirty-two DIMM slots with maximum memory of 2 TB
- Ten PCIe Gen 4 slots
- Up to 216 TB SAS-3 disk storage in 12 slots in standard configurations
- Up to 132.8 TB NVM Express high-bandwidth all-flash configuration
- Oracle Integrated Lights Out Manager (ILOM)

## Key Benefits

- Reduce vulnerability to cyberattacks
- Accelerate Oracle Database, NoSQL, and Hadoop applications using Oracle's unique NVM Express design
- Satisfy demands of enterprise applications with extreme I/O card density
- Increase uptime with built-in diagnostics and fault detection from Oracle Linux and Oracle Solaris
- Increase storage capacity 15x compared to previous generation, combining extreme compute power with Oracle Solaris and ZFS compression
- Maximize system power efficiency with Oracle Advanced System Cooling
- Maximize IT productivity by running Oracle software on Oracle hardware

addition, exhaustive system diagnostics and hardware-assisted error reporting and logging enable identification of failed components for ease of service.

To help users achieve accelerated performance of Oracle Database, Oracle Server X9-2L supports hot-swappable, high-bandwidth flash that combines with Database Smart Flash Cache to drive down cost per database transaction. In the all-flash configuration, with Oracle's unique NVM Express design, Oracle Server X9-2L supports up to 12 small form factor NVMe drives and up to eight NVMe add-in cards, for a total capacity of 132.8 TB. This massive flash capacity also benefits NoSQL and Hadoop applications, reducing network infrastructure needs and accelerating performance with 120 GB per second of total NVMe bidirectional bandwidth.

For maximizing storage capacity, Oracle Server X9-2L is also offered in a standard 12-disk configuration, with 3.5-inch large form factor disk slots accommodating high-capacity hard disk drives (HDDs). A maximum 216 TB of direct-attached storage makes Oracle Server X9-2L ideally suited as a storage server. The compute power of this server can be used to extend storage density even further with Oracle Solaris and ZFS file system compression to achieve up to 15x compression of data without significant performance impact. Oracle Server X9-2L is also well suited for other storage-dense implementations, such as video compression and transcoding, which require a balanced combination of compute power and storage capacity at the same time.

Oracle Server X9-2L ships with Oracle ILOM 5.0, a cloud-ready service processor designed for today's security challenges. Oracle ILOM provides real-time monitoring and management of all system and chassis functions as well as enables remote management of Oracle servers. Oracle ILOM uses advanced service processor hardware with built-in hardening and encryption as well as improved interfaces to reduce the attack surface and improve overall security. Oracle ILOM has improved firmware image validation through the use of improved firmware image signing. This mechanism provides silicon-anchored service processor firmware validation that cryptographically prevents malicious firmware from booting. After Oracle ILOM's boot code is validated by the hardware, a chain of trust allows each subsequent firmware component in the boot process to be validated. Finally, with a focus on security assurance, using secure coding and testing methodologies, Oracle is able to maximize firmware security by working to prevent and remediate vulnerabilities prior to release.

With advanced system cooling that is unique to Oracle, Oracle Server X9-2L achieves system efficiencies that result in power savings and maximum uptime. Oracle Advanced System Cooling utilizes remote temperature sensors for fan speed control, minimizing power consumption while keeping optimal temperatures inside the server. These remote temperature sensors are designed into key areas of this server to ensure efficient fan usage by organizing all major subsystems into cooling zones. This technology helps reduce energy consumption in a way that other servers cannot.

Oracle Premier Support customers have access to My Oracle Support and multi-server management tools in Oracle Enterprise Manager, a critical component that enables application-to-disk system management including servers, virtual

### Key Value

Oracle Server X9-2L is the most storage-dense, versatile two-socket server in its class for the enterprise data center, packing the optimal balance of compute power, memory capacity, and I/O capacity into a compact and energy-efficient 2U enclosure.

### Related products

- Oracle Server X9-2
- Oracle Server X8-8

### Related services

The following services are available from Oracle Customer Support:

- Support
- Installation
- Eco-optimization services

machines, databases, storage, and networking enterprise wide in a single pane of glass. Oracle Enterprise Manager enables Exadata, database, and systems administrators to proactively monitor the availability and health of their systems and to execute corrective actions without user intervention, enabling maximum service levels and simplified support.

With industry-leading in-depth security spanning its entire portfolio of software and systems, Oracle believes that security must be built in at every layer of the IT environment. In order to build x86 servers with end-to-end security, Oracle maintains 100 percent in-house design, controls 100 percent of the supply chain, and controls 100 percent of the firmware source code. Oracle's x86 servers enable only secure protocols out of the box to prevent unauthorized access at point of install. For even greater security, customers running Oracle Ksplice on Oracle's x86 servers will benefit greatly from zero downtime patching of the Oracle Linux kernel.

Oracle is driven to produce the most reliable and highest performing x86 systems in its class, with security-in-depth features layered into these servers, for two reasons: Oracle Cloud Infrastructure and Oracle Engineered Systems. At their foundation, these rapidly expanding cloud and converged infrastructure businesses run on Oracle's x86 servers. To ensure that Oracle's SaaS, PaaS, and IaaS offerings operate at the highest levels of efficiency, only enterprise-class features are designed into these systems, along with significant co-development among cloud, hardware, and software engineering. Judicious component selection, extensive integration, and robust real-world testing enable the optimal performance and reliability critical to these core businesses. All the same features and benefits available in Oracle's cloud are standard in Oracle's x86 standalone servers, helping customers to easily transition from on-premises applications to cloud with guaranteed compatibility and efficiency.

### Oracle Server X9-2L System Specifications

SPECIFICATIONS	
<b>Architecture</b>	<p><b>Processor</b></p> <ul style="list-style-type: none"> <li>• One or two processors from the Intel® Xeon® Scalable Processor Third Generation CPUs (two processors required for maximum memory and I/O configurations)</li> <li>• Up to 32 cores per processor</li> <li>• Intel® Xeon® Platinum 8358 processor: 2.6 GHz, 32 cores, 250 watts, XCC, 48 MB L3 cache</li> <li>• Intel® Xeon® Gold 5318Y processor: 2.1 GHz, 24 cores, 165 watts, HCC, 36 MB L3 cache</li> <li>• Intel® Xeon® Gold 6354 processor: 3.0 GHz, 18 cores, 205 watts, XCC, 39 MB L3 cache</li> <li>• Intel® Xeon® Silver 4314 processor: 2.4 GHz, 16 cores, 135 watts, HCC, 24 MB L3 cache</li> </ul>

	<p><b>Cache</b></p> <ul style="list-style-type: none"> <li>• Level 1: 32 KB instruction and 32 KB data L1 cache per core</li> <li>• Level 2: 1 MB shared data and instruction L2 cache per core</li> <li>• Level 3: up to 1.375 MB shared inclusive L3 cache per core</li> </ul> <p><b>Main Memory</b></p> <ul style="list-style-type: none"> <li>• Thirty-two DIMM slots provide up to 2 TB of DDR4 DIMM memory</li> <li>• RDIMM options: 32 GB or 64 GB at DDR4-3200 dual rank</li> </ul>
<p><b>Interfaces</b></p>	<p><b>Standard I/O</b></p> <ul style="list-style-type: none"> <li>• One 1000BASE-T network management Ethernet port</li> <li>• One 1000BASE-T host management Ethernet port</li> <li>• One RJ-45 serial management port</li> <li>• One rear USB 3.0 port</li> <li>• Expansion bus: 10 PCIe 4.0 slots, two x16 and eight x8 slots</li> <li>• Supports LP-PCIe cards including Ethernet, FC, SAS and flash</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>• Twelve 3.5-inch front hot-swappable disk bays plus two internal M.2 boot drives</li> <li>• Disk bays can be populated with 3.5-inch 18 TB HDDs or 2.5-inch 6.8 or 3.84 NVMe solid-state drives (SSDs)</li> <li>• PCIe flash</li> <li>• Sixteen-port 12 Gb/sec RAID HBA supporting levels: 0, 1, 5, 6, 10, 50, and 60 with 1 GB of DDR3 onboard memory with flash memory backup via SAS-3 HBA PCIe card</li> </ul> <p><b>High-Bandwidth Flash</b></p> <ul style="list-style-type: none"> <li>• All flash configuration—up to 132.8 TB in the all-flash configuration (maximum of 12 hot-swappable 6.8 TB NVMe SSDs and eight 6.4 TB NVMe PCIe cards) <ul style="list-style-type: none"> <li>– NVMe functionality in 3.5-inch disk bays 8-11 requires an Oracle NVMe retimer that is installed in PCIe slot 10</li> </ul> </li> </ul>
<p><b>Systems Management</b></p>	<p><b>Interfaces</b></p> <ul style="list-style-type: none"> <li>• Dedicated 1000BASE-T network management Ethernet port (10/100/1000 Gb/sec)</li> <li>• One 1000BASE-T host management Ethernet port (10/100/1000 Gb/sec)</li> <li>• In-band, out-of-band, and side-band network management access</li> <li>• One RJ-45 serial management port</li> </ul> <p><b>Service Processor</b></p> <p>Oracle Integrated Lights Out Manager (Oracle ILOM) provides:</p> <ul style="list-style-type: none"> <li>• Remote keyboard, video, and mouse redirection</li> </ul>

- Full remote management through command-line, IPMI, and browser interfaces
- Remote media capability (USB, DVD, CD, and ISO image)
- Advanced power management and monitoring
- Active Directory, LDAP, and RADIUS support
- Dual Oracle ILOM flash
- Direct virtual media redirection
- FIPS 140-2 mode using OpenSSL FIPS certification (#1747)

### Monitoring

- Comprehensive fault detection and notification
- In-band, out-of-band, and side-band SNMP monitoring v2c and v3
- Syslog and SMTP alerts
- Automatic creation of a service request for key hardware faults with Oracle automated service request (ASR)

### Oracle Enterprise Manager

- Advanced monitoring and management of hardware and software
- Deployment and provisioning of databases
- Cloud and virtualization management
- Inventory control and patch management
- OS observability for performance monitoring and tuning
- Single pane of glass for management of entire Oracle deployments, including on premises and Oracle Cloud

## Software

### Operating Systems

- Oracle Linux
- Oracle Solaris

### Virtualization

- Oracle KVM

For more information on software go to: [Oracle Server X9-2L Options & Downloads](#)

## Operating Environment

- Ambient Operating temperature: 5°C to 40°C (41°F to 104°F)
- Ambient Non-operating temperature: -40°C to 68°C (-40°F to 154°F)
- Operating relative humidity: 10% to 90%, noncondensing
- Non-operating relative humidity: up to 93%, noncondensing
- Operating altitude: Maximum ambient operating temperature is derated by 1°C per 300 m of elevation beyond 900 m, up to a maximum altitude of 3000 m
- Non-operating altitude: up to 39,370 feet (12,000 m)
- Acoustic noise-
  - Maximum condition: 7.1 Bels A weighted
  - Idle condition: 7.0 Bels A weighted

<p><b>Power</b></p>	<p>Oracle Server X9-2 and Oracle Server X9-2L support hot-swappable and highly redundant power supplies models A271 and A269.2 on the back panel.</p> <p><b>A271 Power Supply Specification</b></p> <ul style="list-style-type: none"> <li>• Two 1,400 watt hot-swappable and redundant power supplies, rated 96% efficiency</li> <li>• Voltage (nominal) 200 to 240 VAC</li> <li>• Input current (maximum) 200 to 240 VAC 10.0 A</li> <li>• Frequency (nominal) 50/60 Hz (47 to 63 Hz range)</li> <li>• Maximum power consumption 1400W at AC 200V-240V</li> <li>• Maximum heat output 11,600 BTU/Hr</li> </ul> <p><b>A269.2 Power Supply Specification</b></p> <ul style="list-style-type: none"> <li>• Two 1,200 watt hot-swappable and redundant power supplies, rated 96% efficiency</li> <li>• Voltage (nominal) 100 to 127 VAC; 200 to 240 VAC</li> <li>• Input current (maximum) 100 to 127 VAC 10.0 A; and 200 to 240 VAC 7.0 A</li> <li>• Frequency (nominal) 50/60 Hz (47 to 63 Hz range)</li> <li>• Maximum power consumption 800W at AC 100V-127V; 1200W at AC 200V-240V</li> <li>• Maximum heat output 11,600 BTU/Hr</li> </ul> <p><b>Oracle Server X9-2L Base Part Numbers (With A271 Power Supplies)</b></p> <ul style="list-style-type: none"> <li>• Oracle Server X9-2L- <a href="#">7606561</a></li> <li>• Oracle Server X9-2L, TAA Compliant- <a href="#">7606563</a></li> </ul> <p><b>Oracle Server X9-2L Base Part Numbers (With A269.2 Power Supplies)</b></p> <ul style="list-style-type: none"> <li>• Oracle Server X9-2L- <a href="#">7601424</a></li> <li>• Oracle Server X9-2L, TAA Compliant- <a href="#">7602920</a></li> </ul> <p>For more information on power consumption, go to: <a href="#">Oracle Server X9-2L Power Calculator</a></p>
<p><b>Certifications<sup>1</sup></b></p>	<ul style="list-style-type: none"> <li>• NRTL (North America Safety)</li> <li>• CE (European Union)</li> <li>• International CB Scheme</li> <li>• BIS (India)</li> <li>• BSMI (Taiwan)</li> <li>• CCC (PRC)</li> <li>• EAC (EAEU including Russia)</li> <li>• KC (Korea)</li> <li>• RCM (Australia)</li> <li>• VCCI (Japan)</li> <li>• UKCA (United Kingdom)</li> </ul>

	<p>For regulatory compliance information, please consult the “Safety and Compliance Guide” available in the product’s documentation library at <a href="http://docs.oracle.com">http://docs.oracle.com</a>.</p> <p><sup>1</sup>All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative. Other country regulations/certifications may apply.</p>
<p><b>Dimensions and Weight</b></p>	<ul style="list-style-type: none"> <li>• Height: 86.9 mm (3.4 in.)</li> <li>• Width: 445.0 mm (17.5 in.) / Maximum overall installation Width: 482 mm (18.97 inches)</li> <li>• Depth: 759.4 mm (29.9 in.) / Maximum overall installation Depth: 772 mm (30.04 inches)</li> <li>• Weight: 28.6 kg (63 lb.) fully populated / Maximum overall installation Weight: 33.11 kg (73 lbs.)</li> </ul> <p><u>Note:</u> Overall installation dimensions include latches and handles.</p>
<p><b>Included Installation Kits</b></p>	<ul style="list-style-type: none"> <li>• Tool-less rack mounting slide rail kit</li> <li>• Cable management arm</li> </ul>

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