

# Oracle Server X9-2



Oracle Server X9-2 is designed for maximum security, reliability, and performance for Oracle Database, and it is an ideal building block for running Oracle software in the cloud. Oracle Server X9-2 is engineered for running Oracle Database in deployments using SAN/NAS, and for delivering infrastructure as a service (IaaS) in cloud and virtualized environments that require an optimal balance among core density, memory footprint, and I/O bandwidth. With support for up to 27.2 TB of high-bandwidth NVMe Express (NVMe) flash drives, Oracle Server X9-2 can store either the entire Oracle Database in flash for extreme performance or accelerate I/O performance using Database Smart Flash Cache, a feature of Oracle Database. Each server includes built-in proactive fault detection and advanced diagnostics to deliver extreme reliability for Oracle applications. With a compute capacity of over 2,600 cores and 86 TB of memory in a single rack, this compact 1U server is an ideal framework for standing up density-efficient compute infrastructure without compromising reliability, availability, and serviceability (RAS).

## Product Overview

Oracle Server X9-2 is a two-socket system with 32 memory slots, powered by either one Platinum, two Gold, or one Silver Intel® Xeon® Scalable Processor Ice Lake SP Third Generation models. With up to 32 cores per socket, it delivers extreme compute density in a compact 1U enclosure. Oracle Server X9-2 provides the optimal balance of cores, memory, and I/O throughput for enterprise applications.

Built for the demands of enterprise and virtualization workloads, this server offers three PCIe 4.0 16-lane expansion slots. Each Oracle Server X9-2 includes four small form factor SFF/U.2 drive bays. This system can be configured with up to four 6.8 TB NVMe Express SSDs, for a total capacity of 27.2 TB of low-latency, high-bandwidth flash. In addition, Oracle Server X9-2 supports 480 GB of optional on-board M.2 SATA storage for OS boot.

Designed as an optimal server for running Oracle Database with existing SAN/NAS storage solutions, customers can reap the benefits of Oracle's investments in engineering Oracle Server X9-2 with Oracle's operating systems and database. Oracle Server X9-2 systems can be combined with Oracle Real Application Clusters (RAC) to enable high availability and scalability. In order to achieve accelerated performance for Oracle Database, Oracle Server X9-2 uses

## Key Features

- Compact and energy-efficient 1U enterprise-class server
- Highest levels of security enabled out of the box
- Two Intel® Xeon® Scalable Processor Third Generation CPUs
- Thirty-two DDR4 memory module (DIMM) slots with maximum memory of 2 TB
- Three PCIe Gen 4.0 slots
- Four NVMe Express (NVMe) SSD-enabled drive bays, for high-bandwidth flash
- Oracle ILOM

## Key Benefits

- Accelerate Oracle Database with hot-swappable flash using Oracle's unique NVMe Express design
- Build a more secure cloud and prevent cyber attacks
- Improve reliability with built-in diagnostics and fault detection from Oracle Linux and Oracle Solaris
- Maximize I/O bandwidth for VM consolidation of enterprise applications
- Reduce energy consumption with Oracle Advanced System Cooling
- Maximize IT productivity by running Oracle software on Oracle hardware

hot-pluggable, high-bandwidth flash that is engineered to work together with Oracle's Database Smart Flash Cache.

With up to 320 GB/sec of bidirectional I/O bandwidth, combined with the high core and memory density, Oracle Server X9-2 is an ideal server for standing up enterprise applications in a virtual environment.

With a standard, efficient power profile, Oracle Server X9-2 can be deployed easily into existing data centers as the building block of a private cloud or IaaS implementation.

Oracle Linux and Oracle Solaris operating systems running on Oracle Server X9-2 include RAS features that increase overall server uptime. Real-time monitoring of the health of the CPU, memory, and I/O subsystems, coupled with off lining capability of failed components, increases system availability. These are driven by firmware-level problem detection capabilities that are engineered into Oracle Integrated Lights Out Manager (Oracle ILOM) and the operating systems. In addition, exhaustive system diagnostics and hardware-assisted error reporting and logging enable identification of failed components for ease of service.

Oracle Server X9-2 ships with the 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 enabling 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 using 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.

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 machines, databases, storage, and enterprise-wide networking 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 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

### Key Value

Oracle Server X9-2 is the most versatile two-socket compact server for the enterprise data center, packing the optimal balance of compute power, memory capacity, and I/O capacity into an energy-efficient 1U enclosure.

### Related products

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

### Related services

The following services support Oracle Server X9-2:

- Support
- Installation
- Eco-optimization services

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, 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 X9-2 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 ECC DIMM memory</li><li>• RDIMM options: 32 GB and 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>• Optional mezzanine dual port 100Gb/sec Ethernet adapter with QSFP connectors</li> <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: three PCIe 4.0 x16 slots</li> <li>• Supports LP-PCIe cards including Ethernet, FC and SAS</li> </ul> <p><b>Storage</b></p> <ul style="list-style-type: none"> <li>• Four 2.5-inch front hot-swappable disk bays supporting PCIe 4.0 NVMe SSD</li> </ul> <p><b>High-Bandwidth Flash</b></p> <ul style="list-style-type: none"> <li>• Uses NVM Express (NVMe) design that allows for flash to be front accessible and hot swappable</li> <li>• Up to four small form factor NVMe drives (6.8 TB or 3.84 TB per drive)</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> <li>• Full remote management through command-line, IPMI, and browser interfaces</li> <li>• Remote media capability (USB, DVD, CD, and ISO image)</li> <li>• Advanced power management and monitoring</li> <li>• Active Directory, LDAP, and RADIUS support</li> <li>• Dual Oracle ILOM flash</li> <li>• Direct virtual media redirection</li> <li>• FIPS 140-2 mode using OpenSSL FIPS certification (#1747)</li> </ul> <p><b>Monitoring</b></p> <ul style="list-style-type: none"> <li>• Comprehensive fault detection and notification</li> <li>• In-band, out-of-band, and side-band SNMP monitoring v2c and v3</li> <li>• Syslog and SMTP alerts</li> </ul>

	<ul style="list-style-type: none"> <li>• Automatic creation of a service request for key hardware faults with Oracle automated service request (ASR)</li> </ul> <p><b>Oracle Enterprise Manager</b></p> <ul style="list-style-type: none"> <li>• Advanced monitoring and management of hardware and software</li> <li>• Deployment and provisioning of databases</li> <li>• Cloud and virtualization management</li> <li>• Inventory control and patch management</li> <li>• OS observability for performance monitoring and tuning</li> <li>• Single pane of glass for management of entire Oracle deployments, including on premises and Oracle Cloud</li> </ul>
<b>Software</b>	<p><b>Operating Systems</b></p> <ul style="list-style-type: none"> <li>• Oracle Linux</li> <li>• Oracle Solaris</li> </ul> <p><b>Virtualization</b></p> <ul style="list-style-type: none"> <li>• Oracle KVM</li> </ul> <p>For the latest information on supported software go to: <a href="#">Oracle Server X9-2 Options &amp; Downloads</a></p>
<b>Operating Environment</b>	<ul style="list-style-type: none"> <li>• Ambient Operating temperature: 5°C to 40°C (41°F to 104°F)</li> <li>• Ambient Non-operating temperature: -40°C to 68°C (-40°F to 154°F)</li> <li>• Operating relative humidity: 10% to 90%, noncondensing</li> <li>• Non-operating relative humidity: up to 93%, noncondensing</li> <li>• 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</li> <li>• Non-operating altitude: up to 39,370 feet (12,000 m)</li> <li>• Acoustic noise: <ul style="list-style-type: none"> <li>– Maximum condition: 7.1 Bels A weighted</li> <li>– Idle condition: 7.0 Bels A weighted</li> </ul> </li> </ul>
<b>Power</b>	<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> </ul>

	<ul style="list-style-type: none"> <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 X9-2 Base Part Numbers (With A271 Power Supplies)</b></p> <ul style="list-style-type: none"> <li>• Oracle Server X9-2- <a href="#">7606559</a></li> <li>• Oracle Server X9-2, TAA Compliant- <a href="#">7606562</a></li> </ul> <p><b>Oracle Server X9-2 Base Part Numbers (With A269.2 Power Supplies)</b></p> <ul style="list-style-type: none"> <li>• Oracle Server X9-2- <a href="#">7601361</a></li> <li>• Oracle Server X9-2, TAA Compliant- <a href="#">7602917</a></li> </ul> <p>For more information on power consumption, go to: <a href="#">Oracle Server X9-2 Power Calculator</a></p>
<p><b>Certifications</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: 42.6 mm (1.7 in.)</li> <li>• Width: 436.5 mm (17.2 in.) / Maximum overall installation Width: 483.2 mm (19.02 inches)</li> <li>• Depth: 737.0 mm (29.0 in.) / Maximum overall installation Depth: 772 mm (30.04 inches)</li> </ul>

	<ul style="list-style-type: none"> <li>Weight: 18.1 kg (40.0 lb.) fully populated / Maximum overall installation Weight: 20.41 kg (45 lbs.)</li> </ul> <p><u>Note:</u> Overall installation dimensions include latches and handles.</p>
<b>Included Installation Kits</b>	<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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