

# Oracle Server X5-2



Oracle Server X5-2 is designed from the ground up to be the best two-socket server for running Oracle Database in a clustered configuration and also for high-density virtualization environments that require an optimal balance between core density, memory footprint, and I/O bandwidth. With support for up to four high-bandwidth NVM Express (NVMe) flash drives, Oracle Database can be accelerated using Database Smart Flash Cache, a feature of Oracle Database. 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 for enterprise workloads. Allowing for more than 1,500 cores and 34 TB of memory in a single rack, the compact 1U chassis provides 50 percent more cores and 50 percent more memory compared to the previous generation.



## KEY FEATURES

- Compact and energy-efficient 1U enterprise-class server
- Two Intel® Xeon® processor E5-2600 v3 product family CPUs
- Twenty-four DIMM slots with maximum memory of 768 GB
- Four PCIe Gen 3 slots plus four 10GBase-T ports
- Four NVM Express SSD-enabled slots, for high-bandwidth flash
- Hot-swappable and redundant disks, cooling fans, power supply units
- Oracle ILOM and Oracle System Assistant

## KEY BENEFITS

- Accelerate Oracle Database with hot-swappable flash using Oracle's unique NVM Express design
- Improve reliability with built-in diagnostics and fault detection from

## Product Overview

Oracle Server X5-2 is powered by two Intel® Xeon® processor E5-2600 v3 product family CPUs and 24 memory slots. With up to 18 cores per socket, this server supports the highest performing processor and delivers extreme compute density in a compact 1U enclosure. When compared with the previous-generation server, this system increases memory capacity by 50 percent, to 768 GB, and increases memory bandwidth by 33 percent. With more than 50 percent increase in processing power and 17 percent increase in I/O bandwidth versus the previous generation, Oracle Server X5-2 provides the optimal balance of cores, memory, and I/O throughput, making it the highest performing server in its class for enterprise applications.

Built for the demands of enterprise and virtualization workloads, this server offers four PCIe 3.0 expansion slots (two 16-lane and two 8-lane). The four embedded 10GBase-T ports free up PCIe slots for additional network and storage connectivity. Each Oracle Server X5-2 includes a SAS3 (12 Gbps) RAID controller in one of the 8-lane PCIe slots and includes eight small form factor drive bays. The server can be configured with up to 9.6 TB of hard disk drive capacity or up to 3.2 TB of conventional solid state drive flash capacity.

Designed as an optimal server for running Oracle Database in a clustered configuration, Oracle Server X5-2 can be combined with Oracle Real Application Clusters (Oracle RAC) to achieve high availability, performance, and agility. In order to achieve accelerated performance for Oracle Database, Oracle Server X5-2 introduces hot-swappable, high-bandwidth flash that is ideal as Database Smart Flash Cache. Using Oracle's unique NVM Express design, Oracle Server X5-2 supports up to four small

#### Oracle Linux and Oracle Solaris

- Maximize I/O bandwidth for VM consolidation of enterprise applications
- Achieve highest level of cable aggregation and increased VM density with Oracle Virtual Networking
- Maximize system power efficiency with Oracle's optimized memory implementation
- Reduce energy consumption with Oracle Advanced System Cooling
- Maximize IT productivity by running Oracle software on Oracle hardware

form factor NVMe drives for a total capacity of 6.4 TB.

With 106 GB/sec of bidirectional I/O bandwidth, combined with the high core and memory density, Oracle Server X5-2 is an ideal server for consolidating enterprise virtual machines. With a standard, efficient power profile, Oracle Server X5-2 can be deployed easily into existing data centers as the building block of a private cloud or infrastructure-as-a-service (IaaS) implementation. When combined with Oracle Fabric Interconnect and Oracle SDN, Oracle Server X5-2 server packs in the most VMs per rack while enabling faster live migration and cable consolidation.

Oracle Server X5-2 includes reliability, availability, and serviceability (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 the system availability. Building on the firmware-level problem detection, Oracle Linux and Oracle Solaris have been enhanced to provide fault detection capabilities when running on Oracle Server X5-2. In addition, exhaustive system diagnostics and hardware-assisted error reporting and logging enable identification of failed components for ease of service.

All Oracle servers ship with full-function server management tools at no additional cost. Oracle Integrated Lights Out Manager (Oracle ILOM) utilizes industry-standard protocols to provide secure and comprehensive local and remote management. Oracle ILOM capabilities also include power management and monitoring, fault detection, and notification. The integrated Oracle System Assistant guides system administrators through rapid server deployment, firmware updates, hardware configuration, and operating system installation with hardware drivers certified by Oracle.

With an advanced cooling system unique to Oracle, Oracle Server X5-2 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 have been designed into key areas of this server to ensure efficient fan usage by organizing all major subsystems into cooling zones. This capability helps reduce energy consumption in a way that other servers cannot.

Oracle Premier Support customers have access to My Oracle Support and multiserver management tools in Oracle Enterprise Manager Ops Center. Oracle Enterprise Manager Ops Center, a critical component that enables application-to-disk system management, coordinates servers, storage, and networking for a complete cloud IaaS. Oracle Enterprise Manager Ops Center also features an automated service request capability, whereby potential issues are detected and reported to Oracle's support center without user intervention, assuring the maximum service levels and simplified support.

Oracle's x86 systems are the best enterprise x86 platforms for running Oracle software. They provide optimal performance and reliability based on an integrated and fully supported Oracle stack, as well as everything you need for a cloud deployment. Every x86 system from Oracle comes complete with virtualization, choice of operating systems, cloud provisioning, and Oracle's unique application-to-disk management environment—all at no extra charge. Oracle's x86 systems also serve as a key building block for Oracle's engineered systems, such as Oracle Exadata, which have achieved a 10x performance gain through integration and optimization.

## Oracle Server X5-2 System Specifications

### Processor

- One or two processors from the Intel® Xeon® processor E5-2600 v3 product family (two processors required for maximum memory and I/O configurations)
- Up to 18 cores per processor

### Cache

- Level 1: 32 KB instruction and 32 KB data L1 cache per core
- Level 2: 256 KB shared data and instruction L2 cache per core
- Level 3: Up to 45 MB shared inclusive L3 cache per processor

### Main Memory

- Twenty-four DIMM slots provide up to 768 GB of DDR4 ECC DIMM memory
- RDIMM options: 8 GB at DDR4-2133 and 16 GB at DDR4-2133
- Load-reduced DIMM option: 32 GB at DDR4-2133

### INTERFACES

#### Standard I/O

- Four onboard auto-sensing 100/1000/10000 Base-T Ethernet ports
- USB: Six 2.0 USB ports (two front, two rear, two internal)
- Expansion bus: Four PCIe 3.0 slots: two x16 and two x8 (one internal) slots
- Supports LP-PCIe cards including Ethernet, InfiniBand, FC, FCoE, and SAS HBAs

#### Storage

- Eight 2.5-inch front hot-swappable disk bays and optional DVD-RW drive
- All 2.5-inch disk bays can be populated with either HDDs or conventional SSDs
- 12 Gbps RAID HBA supporting levels: 0, 1, 5, 6, 10, 50, 60 with 1 GB of DDR3 onboard memory with flash memory backup via embedded internal SAS3 HBA PCIe Card

#### High-Bandwidth Flash

- Uses Oracle-unique NVMe Express (NVMe) design that allows for flash to be front accessible and hot swappable
- Up to four small form factor NVMe drives (6.4 TB total capacity)
- Four of the disk drive bays are predesignated as NVMe enabled
- NVMe functionality requires an Oracle NVMe enabling kit that consumes one PCIe slot

#### Graphics

- VGA 2D graphics controller embedded: 8MB
- Resolution: 1,600 x 1,200 x 16 bits @ 60 Hz via the rear HD15 VGA port (1,024 x 768 when viewed remotely via Oracle ILOM)

### SYSTEMS MANAGEMENT

#### Interfaces

- Dedicated 10/100/1000 Base-T network management port
- In-band, out-of-band, and side-band network management access
- RJ45 serial management port

#### Service Processor

Oracle Integrated Lights Out Manager (Oracle ILOM) provides:

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

Oracle Server X5-2 is the most versatile two-socket server for the enterprise data center, packing the optimal balance of compute power, memory capacity, and I/O capacity into a compact and energy-efficient 1U enclosure.

#### RELATED PRODUCTS

- Oracle Server X5-2L
- Oracle's Sun Server X4-4
- Oracle's Sun Server X4-8

#### RELATED SERVICES

The following services are available from Oracle:

- Support
- Installation
- Eco-optimization services

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**Installation**

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- Oracle System Assistant provides:
    - Task-driven hardware updating and configuration
    - OS installation
    - Simple download of latest Oracle firmware, drivers, tools, and documentation
  - Cross-OS command-line tools for RAID, BIOS, and Oracle ILOM configuration
  - Cross-OS firmware updating tool
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**Monitoring**

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- Comprehensive fault detection and notification
  - In-band, out-of-band, and side-band SNMP monitoring v1, v2c, and v3
  - Syslog and SMTP alerts
  - Automatically create a service request for key hardware faults with Oracle's automated service request (ASR)
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**Oracle Enterprise Manager Ops Center**

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- Deployment and provisioning of server bare metal
  - Cloud and virtualization management
  - Inventory control and patch management
  - OS observability for performance monitoring and tuning
  - Automated service request (ASR) generation
  - Connects to Oracle Enterprise Manager Cloud Control application management
  - Enables control of native Oracle Solaris, Oracle Linux, Red Hat Linux, SUSE Linux, and Microsoft Windows when running in virtual machines
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**SOFTWARE**

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**OPERATING SYSTEMS**

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- Oracle Solaris (preinstalled option)
- Oracle Linux (preinstalled option)
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- Microsoft Windows Server

For more information on software go to: [Systems Wiki](#)

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**VIRTUALIZATION**

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- Oracle VM (preinstalled option)
  - VMware
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**ENVIRONMENT**

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- Operating temperature: 5°C to 35°C (41°F to 95°F)
  - Nonoperating temperature: -40°C to 70°C (-40°F to 158°F)
  - Operating relative humidity: 10% to 90%, noncondensing
  - Nonoperating relative humidity: Up to 93%, noncondensing
  - Operating altitude: up to 9,840 feet (3,000 m\*) maximum ambient temperature is derated by 1°C per 300 m above 900 m (\*except in China where regulations may limit installations to a maximum altitude of 6,560 feet or 2,000 m)
  - Nonoperating altitude: up to 39,370 feet (12,000 m)
  - Acoustic noise: 7.0 Bels A-weighted operating, 7.0 Bels A-weighted idling
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**POWER**

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- Two hot-swappable and redundant power supplies, rated 91% efficiency
- Rated line voltage: 100 to 240 VAC
- Rated input current 100 to 127 VAC 7.2 A and 200 to 240 VAC 3.4 A

For more information on power consumption, go to: [Oracle Server X5-2 Power Calculator](#)

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**REGULATIONS<sup>1,2</sup>**

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- Product safety: UL/CSA-60950-1, EN60950-1-2006, IEC60950-1 CB scheme with all country
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<sup>1</sup> All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative.

<sup>2</sup> Other country regulations/certifications may apply.

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- differences*
- EMC
    - Emissions: FCC CFR 47 Part 15, ICES-003, EN55022, EN61000-3-2 and EN61000-3-3
  - Immunity: EM55024
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#### **CERTIFICATIONS<sup>1,2</sup>**

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- North America Safety (NRTL)
  - European Union (EU)
  - International CB Scheme
  - BIS (India)
  - BSMI (Taiwan)
  - RCM (Australia)
  - CCC (PRC)
  - MSIP (Korea)
  - VCCI (Japan)
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#### **EUROPEAN UNION DIRECTIVES**

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- 2006/95/EC Low Voltage Directive
  - 2004/108/EC EMC Directive
  - 2011/65/EU RoHS Directive
  - 2012/19/EU WEEE Directive
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#### **DIMENSIONS AND WEIGHT**

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- Height: 42.6 mm (1.7 in.)
  - Width: 436.5 mm (17.2 in.)
  - Depth: 737.0 mm (29.0 in.)
  - Weight: 18.1 kg (40.0 lb.) fully populated
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#### **INCLUDED INSTALLATION KITS**

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- Tool-less rackmounting slide rail kit
  - Cable management arm
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## Warranty

The Oracle Server X5-2 system comes with a one-year warranty. For more information, visit [oracle.com/sun/warranty](http://oracle.com/sun/warranty) for Oracle's global warranty support.

## Services

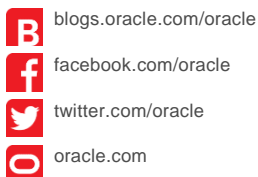
Only Oracle offers a single point of accountability and complete, integrated support for the entire Oracle stack including 24/7 hardware service, expert technical support, proactive tools, and software updates. Visit [oracle.com/sun/services](http://oracle.com/sun/services) for information on Oracle's service program offerings for Oracle's products.



### CONTACT US

For more information about Oracle Server X5-2, visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.

### CONNECT WITH US



### Hardware and Software, Engineered to Work Together

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