ORACLE DATA SHEET

Oracle Server X7-2L

x86 SERVERS

Oracle Server X7-2L 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 102.4 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 X7-2L delivers extreme storage capacity at lower cost when combined with Oracle Solaris and 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.

KEY FEATURES

- Most flash-dense and energy-efficient 2U enterprise-class server
- Highest levels of security enabled out of the box
- Two Intel® Xeon® Processor Scalable Family processors
- Twenty-four DIMM slots with maximum memory of 1.5 TB
- Eleven PCIe Gen 3 slots
- Up to 120 TB SAS-3 disk storage in 12 slots in standard configurations
- Up to 102.4 TB NVM Express high-bandwidth flash storage in the all-flash configuration
- Hot-swappable and redundant disks, cooling fans, and power supply units
- Oracle ILOM

Product Overview

Oracle Server X7-2L is designed and built specifically for the demands of enterprise workloads. It is a crucial building block in Oracle engineered systems and Oracle Public Cloud. Powered by two Platinum, Gold, or Silver Intel® Xeon® Processor Scalable Family processors with up to 24 cores per socket, along with 24 memory slots, this server offers high-performance processors plus the most dense flash storage options in a 2U enclosure. Oracle Server X7-2L is the most balanced and highest performing 2U enterprise server in its class because it offers optimal core and memory density, high I/O throughput, a 355 percent increase in flash capacity, and a 48 percent increase in processing power versus the previous generation.

In addition to optimized processing power and storage density, Oracle Server X7-2L offers 11 PCIe 3.0 expansion slots (one 16-lane and ten 8-lane) for maximal I/O card and port density. This is an 83 percent increase in I/O slot availability as compared to the previous generation, as well as a 39 percent increase in bandwidth. With 192 gigabytes per second of bidirectional I/O bandwidth, Oracle Server X7-2L can handle the most demanding enterprise workloads.

Oracle Server X7-2L offers best-in-class reliability, serviceability, and availability (RAS) features that increase overall uptime of the server. This extreme reliability makes Oracle Server X7-2L 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 offlining 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

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, 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

Oracle Server X7-2L. In 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 X7-2L 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 X7-2L supports up to 12 small form factor NVMe drives and up to four NVMe add-in cards, for a total capacity of 102.4 TB. This massive flash capacity also benefits NoSQL and Hadoop applications, reducing network infrastructure needs and accelerating performance with 25 GB per second of total NVMe bidirectional bandwidth.

For maximizing storage capacity, Oracle Server X7-2L 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 120 TB of direct-attached storage makes Oracle Server X7-2L 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 X7-2L 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 X7-2L ships with the all new Oracle ILOM 4.x, 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. The newest version of 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 X7-2L 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 multiserver management tools in Oracle Enterprise Manager 13c. Oracle Enterprise Manager 13c, a critical component that enables application-to-disk system management, coordinates servers, storage, and networking for a complete cloud infrastructure as a service (IaaS). Oracle Enterprise Manager 13c also features an automated service request capability,

Oracle Server X7-2L is the most storage-dense, 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 2U enclosure.

RELATED PRODUCTS

- Oracle Server X7-2
- Oracle Server X7-8

RELATED SERVICES

The following services are available from Oracle Customer Support:

- Support
- Installation
- Eco-optimization services

whereby potential issues are detected and reported to Oracle's support center without user intervention, assuring the 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, with security-in-depth features layered into these servers, for two reasons: Oracle Public Cloud including infrastructure as a service (IaaS), Bare Metal Cloud Services, platform as a service (PaaS), and software as a service (SaaS), and Oracle engineered systems. At their foundation, these rapidly expanding cloud and 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 codevelopment 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 also 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 X7-2L System Specifications

ARCHITECTURE

Processor

- *One or two processors from the Intel® Xeon® Processor Scalable Family of processors (two processors required for maximum memory and I/O configurations)*
- *Up to 24 cores per processor*
- *Intel® Xeon® Platinum 8168 processor: 2.7 GHz, 24 cores, 205 watts, XCC, 33 MB L3 cache*
- *Intel® Xeon® Platinum 8160 processor: 2.1 GHz, 24 cores, 150 watts, XCC, 33 MB L3 cache*
- *Intel® Xeon® Gold 6140 processor: 2.3 GHz, 18 cores, 140 watts, XCC, 24.75 MB L3 cache*
- *Intel® Xeon® Silver 4114 processor: 2.2 GHz, 10 cores, 85 watts, LCC, 13.75 MB L3 cache*
- *Intel® Xeon® Gold 6128 processor: 3.4 GHz, 6 cores, 115 watts, XCC, 19.25 MB L3 cache*

Cache

- *Level 1: 32 KB instruction and 32 KB data L1 cache per core*
- *Level 2: 1 MB shared data and instruction L2 cache per core*
- *Level 3: up to 1.375 MB shared inclusive L3 cache per core*

Main Memory

- *Twenty-four DIMM slots provide up to 1.5 TB of DDR4 DIMM memory*
- *RDIMM options: 16 GB at DDR4-2666 and 32 GB at DDR4-2666*
- *LRDIMM option: 64 GB at DDR4-2666*

INTERFACES

Standard I/O

- *One 1 Gb Ethernet port and one serial RJ-45 port*

- *Two USB 3.0 ports (one rear, one internal)*
- *Expansion bus: 11 PCIe 3.0 slots, 1 x16 and 10 x8 slots*
- *Supports LP-PCIe cards including Ethernet, InfiniBand, FC, SAS HBAs, and flash*

Storage

- *Twelve 3.5-inch front hot-swappable disk bays plus two internal M.2 boot drives*
- *Disk bays can be populated with 3.5-inch 10 TB HDDs or 2.5-inch NVMe solid-state drives (SSDs)*
- *PCIe flash*
- *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 embedded internal SAS-3 HBA PCIe card*
- *Eight-port 12 Gb/sec SAS HBA with direct access to up to eight internal SAS-3 HDDs (two per system required)*

High-Bandwidth Flash

- *All flash configuration—up to 102.4 TB in the all-flash configuration (maximum of 12 hot-swappable 6.4 TB NVMe SSDs and four 6.4 TB NVMe PCIe cards)*
  - *NVMe functionality in 3.5-inch disk bays requires an Oracle NVMe enabling kit that consumes one PCIe slot for every three NVMe devices (maximum of four kits)*
- *Standard configuration: up to 51.2 TB in the standard configuration (maximum of eight 6.4 TB NVMe PCIe cards)*

SYSTEMS MANAGEMENT

Interfaces

- *Dedicated 10/100/1000 Base-T network management port*
- *In-band, out-of-band, and side-band network management access*
- *RJ-45 serial management port*

Service Processor

Oracle Integrated Lights Out Manager (Oracle ILOM) provides:

- *Remote keyboard, video, and mouse redirection*
- *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

- *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*
- *Single pane of glass for management of all Oracle deployment whether on premises or in Oracle Cloud*

SOFTWARE

OPERATING SYSTEMS

- *Oracle Solaris*
- *Oracle Linux*

For more information on software go to: Oracle Server X7-2L Options & Downloads

VIRTUALIZATION

- *Oracle VM*

For more information on software go to: *Oracle Server X7-2L Options & Downloads*

ENVIRONMENT

- *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: 8.1 Bels A-weighted operating, 5.8 Bels A-weighted idling*

POWER

- *Two 1,200 watt hot-swappable and redundant power supplies, rated 96% 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 X7-2L Power Calculator

REGULATIONS

- *Product safety: UL/CSA-60950-1, EN60950-1-2006, IEC60950-1 CB scheme with all country differences*
- *EMC*
  - *Emissions: FCC CFR 47 Part 15, ICES-003, EN55022,EN55032, KN32, EN61000-3-2, and EN61000-3-3*
- *Immunity: EN55024, KN35*

CERTIFICATIONS[1]

- *North America Safety (NRTL)*
- *European Union (EU)*
- *International CB Scheme*
- *BIS (India)*
- *BSMI (Taiwan)*
- *RCM (Australia)*
- *CCC (PRC)*
- *MSIP (Korea)*
- *VCCI (Japan)*
- *Morocco*
- *Republic of Srpska*

EUROPEAN UNION DIRECTIVES

- *2014/35/EU Low Voltage Directive*
- *2014/30/EU EMC Directive*
- *2011/65/EU RoHS Directive*
- *2012/19/EU WEEE Directive*

DIMENSIONS AND WEIGHT

- *Height: 86.9 mm (3.4 in.)*
- *Width: 445.0 mm (17.5 in.)*
- *Depth: 759.4 mm (29.9 in.)*
- *Weight: 28.6 kg (63 lb.) fully populated*

[1] 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.

INCLUDED INSTALLATION KITS

- *Tool-less rackmounting slide rail kit*
- *Cable management arm*

CONTACT US

For more information about Oracle Server X7-2L, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

CONNECT WITH US

blogs.oracle.com/oracle

facebook.com/oracle

twitter.com/oracle

oracle.com

Integrated Cloud Applications & Platform Services