

**ORACLE WHITEPAPER**  
**SEPTEMBER 2019**

# ORACLE DATABASE APPLIANCE

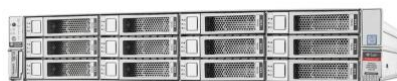
## X8-2S / X8-2M

# Oracle Database Appliance

## X8-2S / X8-2M



Oracle Database Appliance is an Oracle Engineered System that saves time and money by simplifying deployment, management, and support of database solutions for organizations of every size. Optimized for the world's most popular database—Oracle Database—it integrates software, compute, storage, and network resources to deliver database services for a wide range of custom and packaged online transaction processing (OLTP), in-memory database, and data warehousing applications. All hardware and software components are engineered and supported by Oracle, offering customers a reliable and secure system with built-in automation and best practices. In addition to accelerating the time to value when deploying database solutions, Oracle Database Appliance offers flexible Oracle Database licensing options and reduces operational expenses associated with maintenance and support.



### KEY FEATURES

- Fully integrated and complete database appliance
- Oracle Appliance Manager
- Browser User Interface (BUI)
- Oracle Cloud Integration
- Oracle Database Enterprise Edition and Standard Edition
- Single-instance Oracle databases
- Oracle Automatic Storage Management
- Oracle ASM Cluster File System
- Oracle Linux
- Intel® Xeon® Scalable Processor Second Generation CPUs
- 10GBase-T or 10/25 GbE SFP28 networking ports
- NVMe Express (NVMe) solid-state drives

### Fully Integrated System Optimized for Oracle Database

Oracle Database Appliance X8-2S and Oracle Database Appliance X8-2M are engineered as single 2U rack-mountable servers that provide the performance benefits associated with the latest generation Intel® Xeon® Scalable Processor Second Generation CPUs and NVMe Express (NVMe) flash storage. Oracle Database Appliance X8-2S is powered by one 16-core Intel® Xeon® Gold 5218 processor and 192 GB of main memory, expandable to 384 GB. Oracle Database Appliance X8-2M increases the processor and memory resources by offering two 16-core Intel® Xeon® Gold 5218 processors and 384 GB of main memory, expandable to 768 GB. Both systems come configured with 12.8 TB of high-bandwidth NVMe flash for data storage and Oracle Database Appliance X8-2M offers the option to expand the raw storage capacity up to 76.8 TB of NVMe flash. Both systems offer a choice of either a dual-port 25-Gigabit Ethernet (GbE) SFP28 or a quad-port 10GBase-T PCIe network adapter for external networking connectivity with the option to add up to two additional dual-port 25GbE SFP28 or quad-port 10GBase-T PCIe network adapters.

Oracle Database Appliance X8-2S and Oracle Database Appliance X8-2M have Oracle best practices built-in and are optimized for Oracle databases. The number of processor cores, amount of main memory, and NVMe flash storage capacity in each fully integrated system is balanced to provide optimal database performance for a wide range of enterprise applications. Oracle Database sizing templates ensure that the system resources are properly allocated for database workloads running on each system. Oracle Database Appliance X8-2S and Oracle Database Appliance X8-2M also incorporate NVMe flash storage to increase database performance and system

**KEY BENEFITS**

- Oracle Engineered Systems for every organization
- Optimized to run World's #1 database
- Simple, optimized, and affordable
- Integrated hardware and software
- Built-in automation and best practices
- Ease of deployment, patching, management, and diagnostics
- All flash NVMe storage to accelerate database performance
- Capacity-on-demand licensing
- Single-vendor support

reliability. Database workloads can realize a significant improvement in input/output operations per second (IOPS) and bandwidth while achieving extremely low latency and CPU overhead with NVMe flash storage over similar systems configured with conventional SAS solid-state drives.

## Ease of Deployment, Management, and Support

To help customers easily deploy and manage their databases, Oracle Database Appliance features Appliance Manager software to simplify the administration and diagnosis of the system. The Appliance Manager feature greatly simplifies the deployment process and ensures that the system and database configuration adheres to Oracle's best practices. The browser user interface quickly gathers all the configuration parameters to streamline both system and database provisioning with a few easy steps. The Appliance Manager also drastically simplifies maintenance by patching the entire appliance, including all firmware and software, using an Oracle-tested patch bundle engineered specifically for the appliance. Simply select the appropriate patch bundle in the browser user interface to validate it and update the entire system. Database backup and recovery is integrated into the Appliance Manager with the option to backup locally, to external storage, or to the Oracle Cloud directly through the browser user interface. The Appliance Manager also tracks system and database information, and displays the information in the browser user interface. Built-in diagnostics continually monitor the appliance and detect component failures, configuration issues, and deviations from best practices. In addition, Oracle Database Appliance Auto Service Request (ASR) feature can automatically log service requests with Oracle Support to help speed resolution of issues.

## Flexible Oracle Database Software Licensing

Oracle Database Appliance X8-2S and Oracle Database Appliance X8-2M support both Oracle Database Enterprise Edition and Standard Edition. Enterprise deployments that require the enhanced feature set of Oracle Database Enterprise Edition can take advantage of a unique capacity-on-demand database software licensing model to quickly scale utilized processor cores without any hardware upgrades. Customers can deploy the system and license as few as 2 processor cores in the appliance, and incrementally scale up to the maximum physical processor cores in each system. This enables customers to deliver the performance and reliability that enterprise business users demand, and align software spend with business growth. Small enterprises, line-of-business departments, and branch office deployments that don't require enterprise class features can license Oracle Database Standard Edition, allowing them to realize the benefits of Oracle Database Appliance to reduce costs and improve productivity.

## Solution-In-A-Box Through Virtualization

Oracle Database Appliance X8-2S and Oracle Database Appliance X8-2M enable customers and ISVs to quickly deploy both database and application workloads on a single appliance by running applications in KVM-based virtual machines using Oracle Linux. Support for virtualization adds additional flexibility to the already complete and fully integrated database solution by providing isolation between database and application instances.

## Oracle Database Appliance X8-2S / X8-2M Specifications

### ARCHITECTURE

#### System

- One 2U X8-2L server per system

#### Processor

- One Intel® Xeon® processor for Oracle Database Appliance X8-2S
  - Intel® Xeon® Gold 5218 2.3 GHz, 16 cores, 125 watts, XCC, 22 MB L3 cache
- Two Intel® Xeon® processors for Oracle Database Appliance X8-2M
  - Intel® Xeon® Gold 5218 2.3 GHz, 16 cores, 125 watts, XCC, 22 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

- 192 GB (6 x 32 GB) for Oracle Database Appliance X8-2S
  - Optional memory expansion to 384 GB (12 x 32 GB)
- 384 GB (12 x 32 GB) for Oracle Database Appliance X8-2M
  - Optional memory expansion to 768 GB (24 x 32 GB)

### INTERFACES

#### Standard I/O

- One GbE port and one serial RJ45 port (management ports)
- Two USB 3.0 ports (one rear, one internal)
- Oracle Database Appliance X8-2S:
  - PCIe slot 7: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card
  - PCIe slot 8: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card (Optional)
  - PCIe slot 10: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card (Optional)
- Oracle Database Appliance X8-2M:
  - PCIe slot 7: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card
  - PCIe slot 2: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card (Optional)
  - PCIe slot 10: Choice of quad-port 10GBase-T card or dual-port 10/25 GbE (SFP28) card (Optional)
- Note: All PCIe network cards must be the same type and no additional PCIe cards can be added in the non-mentioned slots

### STORAGE

- Oracle Database Appliance X8-2S / X8-2M
  - Two internal 480 GB M.2 SSDs (mirrored) for Operating System and Oracle Database software
  - Two NVMe SSDs (6.4 TB per drive) for data storage
- Oracle Database Appliance X8-2M Only
  - Optional expansion up to twelve total NVMe SSDs (6.4 TB per drive) for data storage

Data Storage	Quantity	Raw Capacity	Usable Capacity (Double Mirroring)	Usable Capacity (Triple Mirroring)
Base System	2 x 6.4 TB NVMe	12.8 TB	6.4 TB	NA
Plus 2 NVMe SSDs (X8-2M Only)	4 x 6.4 TB NVMe	25.6 TB	12.8 TB	8.5 TB
Plus 2 NVMe SSDs (X8-2M Only)	6 x 6.4 TB NVMe	38.4 TB	19.2 TB	12.8 TB
Plus 2 NVMe SSDs (X8-2M Only)	8 x 6.4 TB NVMe	51.2 TB	25.6 TB	17.1 TB
Plus 2 NVMe SSDs (X8-2M Only)	10 x 6.4 TB NVMe	64 TB	32 TB	21.3 TB
Full System (X8-2M Only)	12 x 6.4 TB NVMe	76.8 TB	38.4 TB	25.6 TB

- Storage capacity is based on storage industry conventions where 1 TB equals 1,000<sup>4</sup> bytes

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## SYSTEMS MANAGEMENT

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### Interfaces

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

### Service Processor

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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

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- 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's automated service request (ASR)
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## SOFTWARE

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### Operating Systems

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- Oracle Linux (Pre-Installed)
- Oracle Appliance Manager (Pre-Installed)

### Oracle Database Software (Licensed Separately)

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- Choice of Oracle Database software
  - Oracle Database 19c Enterprise Edition, Standard Edition 2
  - Oracle Database 18c Enterprise Edition, Standard Edition 2
  - Oracle Database 12c Enterprise Edition Release 1, Release 2, Standard Edition 2
  - Oracle Database 11g Enterprise Edition Release 2, Standard Edition, Standard Edition One
- Support for:
  - Oracle Database options
  - Oracle Enterprise Manager Management Packs for Oracle Database Enterprise Edition

### Capacity-On-Demand Software Licensing for Oracle Database Enterprise Edition

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- Enable and license 2, 4, 6, 8, 10, 12, 14, or 16 cores per processor
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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: 8.1 Bels A-weighted operating, 5.8 Bels A-weighted idling
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## POWER

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- 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 X8-2L Power Calculator](#)

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## REGULATIONS

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- *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: EM55024, KN35*
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## CERTIFICATIONS<sup>1</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)*
  - *Morocco*
  - *Republic of Srpska*
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## EUROPEAN UNION DIRECTIVES

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

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- *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*
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## INCLUDED INSTALLATION KITS

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- *Tool-less rackmounting slide rail kit*
  - *Cable management arm*
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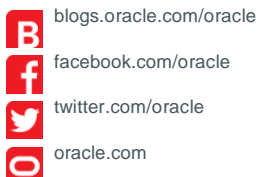
<sup>1</sup> All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative. Other country regulations/certifications may apply.



## CONTACT US

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

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## Integrated Cloud Applications & Platform Services

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Das Karlsruher Systemhaus HUNKLER wurde 1988 erster offizieller Partner von Oracle in Deutschland. Ein Team von rund 20 Mitarbeitern unterstützt Kunden aus Industrie, öffentlicher Verwaltung, Gesundheits- und Finanzwesen mit Beratung, Lösungsentwicklung und Managed Services.

Im Fokus von HUNKLER stehen leistungsfähige, wirtschaftliche Infrastrukturen für Oracle-datenbanken mit den Schwerpunkten Hochverfügbarkeit, Ausfallsicherheit und Zero Downtime Migration. Die integrierten Komplettlösungen der Produktfamilie Oracle Engineered Systems sowie der Datenbank-/Anwendungsbetrieb in der Oracle Cloud sind weitere Themenfelder, die das Unternehmen umfassend abdeckt.

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