

# Oracle Ethernet Switch ES2-64



Oracle Ethernet Switch ES2-64 is the latest high-performance, low-latency 1U 10/40 Gb/sec Ethernet switch available in both AC and DC flavors. It supports industry-standard Layer 2 and Layer 3 features and new virtualization capabilities such as network overlay. With unified management using Oracle Enterprise Manager, it is the ideal network switch for meeting IT and business requirements in cloud-enabled data centers. Oracle Ethernet Switch ES2-64 has high port density of up to 24x 10 GbE or 6x 40 GbE QSFP+ ports and 40x 10 GBase-T ports. It is designed for deployments as an access or aggregation layer switch. Designed to be attached to Oracle servers, storage, and engineered systems using the 10 GBase-T LOMs, it allows for easy migration from 1 Gb/sec to 10 Gb/sec without having to replace existing copper cabling infrastructure.

## Overview

The Oracle Ethernet Switch ES2-64 switch delivers the high performance and high bandwidth of 1.28 Tb/sec and cut-through switching in 1U, making it ideal for server and storage connectivity in data centers and enterprises. With redundant fans, hot-swappable power supplies, port-side exhaust or port-side intake airflow options, it can be placed in either the server or networking racks. Oracle Ethernet Switch ES2-64 has high port density and is ideal for building scale-out deployments. The industry-standard CLI and unified management enable simple, easy, and dynamic configuration of these switches for network connectivity in virtualized data centers.

## Interfaces

- Six QSFP+ connector ports: Each QSFP+ port can be configured as a single 40 GbE port using straight QSFP+ cables or as 4x 10 GbE ports using splitter cables, resulting in 24x 10 GbE ports.
- Forty 10 GBase-T ports: RJ45 connectors with Cat 6A cables; auto-negotiates to 10 Gbps/1 Gbps.
- Oracle Ethernet Switch ES2-64 has one management port and one serial console port.

## Performance

- Line rate 10 GbE and 40 GbE
- Bandwidth of 1.28 Tb/sec
- Jumbo frames (9,216 bytes) support

## KEY FEATURES

- High-performance, low-latency 1U 10/40 Gb/sec Ethernet switch at the lowest cost
- High port density of up to 24x 10 GbE ports and 40x 10 Gbase-T in AC or DC chassis
- Enterprise-level Layer 2 and Layer 3 features with industry-standard CLI
- Advanced features such as Border Gateway Protocol, overlay with VXLAN at no extra cost
- Oracle Integrated Lights Out Manager for secure and comprehensive local and remote management and switch telemetry

## KEY BENEFITS

- Delivers the latest 10/40 Gb/sec Ethernet switches from Oracle, which support industry standards and are built for cloud-enabled software-defined data centers.
- Provides the ideal network switch for implementing an IaaS/PaaS/SaaS cloud by utilizing the enhanced

virtualization, and Layer 3 features

- Enables unified management across servers, storage, and networking with Oracle Enterprise Manager for a complete cloud IaaS environment.
- Harnesses the full capabilities of Oracle's high-performance engineered systems, servers, and storage with nonblocking, wire-rate, low-latency, cut-through 10 GbE switching
- Reduces CapEx and OpEx by simplifying network connectivity, reducing cables and enabling unified management

- Layer 2 and Layer 3 forwarding at wire speed
- MAC table size of 64 K, IPv4 routing table size of 64 K+ and multicast IPv4 route table of 20 K entries

## Software Features

- Advanced virtualization features including VXLAN gateway, bridging, and routing at no extra cost
- Enterprise-level Layer 2 and Layer 3 features
- Industry-standard CLI

## Management

- Oracle Enterprise Manager coordinates servers, storage, and networking management for a complete cloud IaaS.
- Oracle Integrated Lights Out Manager (Oracle ILOM) provides secure and comprehensive local and remote management and telemetry across Oracle servers, systems, storage, and networking products.
- Industry-standard CLI
- Switch manageability through IPv4/IPv6

## High Availability

- Logical link aggregation for Layer 2
- Equal-cost multi-path routing for Layer 3
- Redundant and hot-swappable power supplies and fans

### LAYER 2 FEATURES

| Feature                | Protocols   |
|------------------------|---|
| Virtual LAN            | IEEE 802.1Q   |
|                        | VLAN stacking (Q-in-Q)                                  |
|                        | Inter VLAN routing                                      |
|                        | GVRP/GMRP for dynamic VLAN management                   |
|                        | GVRP learning based on multiple spanning tree instances |
|                        | EVLAN – exclusive VLAN                                  |
| Link Aggregation       | IEEE 802.3ad Link Aggregation Control Protocol (LACP)   |
|                        | Logical Link Aggregation                                |
|                        | IEEE 802.1AB LLDP, high availability for LLDP           |
| Spanning Tree Protocol | IEEE 802.1D Spanning Tree Protocol                      |
|                        | Rapid Spanning Tree                                     |
|                        | Multiple Spanning Tree (MSTP)                           |
|                        | PVRST+  |
| Forwarding             | 950 million PPS   |
|                        | Jumbo frames (9,216 bytes)                              |

## LAYER 3 FEATURES

| Feature                              | Protocols   |
|--------------------------------------|---|
| Static Routing                       | IPv4 and IPv6 static routing  |
| Dynamic Routing                      | BGP   |
|                                      | RIP v1/v2, RIPv6 – support for route maps   |
|                                      | OSPFv2, OSPFv3  |
|                                      | RIPng   |
|                                      | IPv6 default router preference  |
|                                      | Route redistribution  |
|                                      | BFD for IPv4/IPv6   |
| Virtual Routing                      | OSPF – virtual routing  |
|                                      | RIP – virtual routing   |
|                                      | VRRP  |
|                                      | Port sharing across virtual switch contexts   |
|                                      | DVMRP   |
| Equal Cost Multipath Routing         | 32-way ECMP   |
|                                      | L2-L4 load distribution including ECMP  |
| Dynamic Host Configuration Protocol  | DHCP client   |
|                                      | DHCP server   |
|                                      | DHCP relay agent  |
| IP Multicast                         | IGMPv3 snooping   |
|                                      | IGMP proxy, IGMP proxy reporting and message suppression with IGMP snooping                           |
|                                      | MLD snooping  |
|                                      | IGMP querier, IGMP snooping – explicit host tracking, IGMP snooping based on (physical port + C-VLAN) |
|                                      | IGMP filtering  |
| Protocol Independent Multicast (PIM) | PIM-SM (software mode)  |
|                                      | PIM-DM (software mode)  |
|                                      | PIM for IPv4 – hot standby redundancy   |
|                                      | PIM for IPv6 – hot standby redundancy   |
|                                      | PIM-SM for IPv6 multicast routing   |
|                                      | PIM-DM for IPv6 multicast routing   |

## VIRTUALIZATION AND OVERLAY FEATURES

| Feature                            | Protocols |
|------------------------------------|-----------|
| Virtualization and Network Overlay | VXLAN     |

## SECURITY AND QUALITY OF SERVICE (QOS)

| Feature              | Protocols   |
|----------------------|---|
| User Authentication  | LDAP, LDAP over SSL   |
|                      | Radius-based authentication   |
|                      | 802.1x authentication through Tacacs+                               |
| User Access Security | Secure FTP (SFTP) for image upgrade and configuration file transfer |
|                      | Multiple CLI sessions through Telnet, ssh                           |
|                      | Inactivity timeout for CLI login through telnet, ssh                |
|                      | Protection of locally stored passwords with encryption              |
| Security             | Layer 2 and Layer 3 packet filters – ACL                            |
|                      | Port-based authentication with EAP                                  |
|                      | DiffServ support  |
|                      | Policy-based F/W rules  |
|                      | Firewall and DoS attack protection in control stack                 |
|                      | Log of all SNMP and CLI configurations                              |
|                      | Logfile upload to remote system                                     |
|                      | Auto reboot after software upgrade                                  |
| QoS                  | QoS (ingress and egress)  |
|                      | Priority-based switching  |
|                      | Port mirroring  |
|                      | Storm broadcast control   |
|                      | IEEE 802.1Qaz DCBx support (IEEE standard)                          |
|                      | In-line fault diagnostic/debugging                                  |
| Load Distribution    | Layer 4 server load balancing                                       |

## SNMP, MONITORING, AND MANAGEMENT

| Feature    | Protocols                                    |
|------------|--|
| SNMP       | SNMPv1/2/3                                   |
|            | Configuration save/restore through TFTP      |
|            | Support for LAN, Ethernet MIBs               |
|            | TCP and UDP MIB for new standards compliance |
|            | Enterprise OID support                       |
|            | IP forwarding MIB                            |
|            | DiffServ MIB for RFC 3289 compliance         |
|            | Upgrade to IPv4 multicast MIB                |
| Monitoring | RMON (1,2,3, and 9 groups)                   |
|            | RMON MIB extension for DiffServ              |
|            | RMON2  |

|            |  |
|------------|--|
|            | BSD syslog protocol                          |
|            | Traffic monitoring with sFlow                |
| Management | IPv6 management                              |
|            | Multiple simultaneous web and CLI sessions   |
|            | Multiple levels of user privileges – CLI/web |

## REGULATORY COMPLIANCE

| Feature                     | Protocols   |
|-----------------------------|---|
| Regulations <sup>1,2</sup>  | <ul style="list-style-type: none"> <li>Product Safety: UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences</li> <li>EMC <ul style="list-style-type: none"> <li>Emissions: FCC 47 CFR 15, ICES-003, EN55022, EN61000-3-2, EN61000-3-3</li> <li>Immunity: EN55024</li> </ul> </li> </ul> |
| Certifications <sup>2</sup> | <ul style="list-style-type: none"> <li>North America Safety (NRTL)</li> <li>European Union (EU)</li> <li>International CB Scheme</li> <li>Out of scope (India)</li> <li>BSMI (Taiwan)</li> <li>RCM (Australia)</li> <li>CCC (PRC)</li> <li>MSIP (Korea)</li> <li>VCCI (Japan)</li> </ul>                          |
| European Union Directives   | <ul style="list-style-type: none"> <li>2014/35/EU Low Voltage Directive</li> <li>2014/30/EU EMC Directive</li> <li>2011/65/EU RoHS Directive</li> <li>2012/19/EU WEEE Directive</li> </ul>  |

<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.

## Operating Environment

- Voltage: AC input 100-120/200-240 V; 9.0A max; 50/60 Hz. DC input -48 V to -60 V, 19 A max.
- Operating temperature 5° C to 40° C (41° F to 104° F). \*Short term: -5° C to 50° C (23° F to 122° F).
- Operating humidity 5% to 85% relative humidity, noncondensing. \* Short term: 5% to 90%, but not to exceed 0.024 kg water/kg of dry air.
- Operating altitude up to 40 C/1800 m, 30 C/4000 m, maximum ambient temperature is derated by 1° C per 300 m above 900 m.
- Nonoperating temperature -40° C to 70° C (-40° F to 158° F).
- Nonoperating humidity up to 93% relative humidity, noncondensing, 38° C maximum wet bulb.
- Nonoperating altitude up to 12,000 m.

\*Short term refers to a period of not more than 96 consecutive hours and a total of not more than 15 days in one year. (This refers to a total of 360 hours in any given year, but no more than 15 occurrences during that one-year period.)

## Power, Dimensions, and Weight

- Maximum power drawn: 625 watts
- Form Factor: 1U
- Height: 1.6 in.
- Width: 17.2 in.
- Depth: 24 in.
- Weight (fully assembled chassis): 25 lb.

## Cabling Options

### Optical Transceiver Options

**(X)2124A-N** QSFP Optical SR (supports multimode cables, MPO connector up to 100 m)

**7114094** QSFP+ parallel fiber optics long wave transceiver

### Optical Cable Options

**7105199** High-bandwidth QSFP optical cable: 5 meters, MPO to MPO

**7102869** High-bandwidth QSFP optical cable: 10 meters, MPO to MPO

**7102870** High-bandwidth QSFP optical cable: 20 meters, MPO to MPO

**7102871** High-bandwidth QSFP optical cable: 50 meters, MPO to MPO

**7105206** High-bandwidth QSFP optical cable: 100 meters, MPO to MPO

### Optical Splitter Cable Options

**X2127A-10M** MPO to 4LC Optical splitter cable, 10 meter, multimode

**X2127A-20M** MPO to 4LC Optical splitter cable, 20 meter, multimode

**X2127A-50M** MPO to 4LC Optical splitter cable, 50 meter, multimode

### QSFP to QSFP Direct-Attach Passive Copper Cable Options

**X2121A-1M-N** QSFP to QSFP passive copper cable, 1 meter

**X2121A-2M** QSFP to QSFP passive copper cable, 2 meters

**X2121A-3M-N** QSFP to QSFP passive copper cable, 3 meters

**X2121A-5M-N** QSFP to QSFP passive copper cable, 5 meters

### QSFP to 4 SFP+ Passive Copper Splitter Cable Options

**X2125A-1M-N** QSFP to 4 SFP+ passive copper splitter cable, 1 meter

**X2125A-3M-N** QSFP to 4 SFP+ passive copper splitter cable, 3 meters

**X2125A-5M-N** QSFP to 4 SFP+ passive copper splitter cable, 5 meters

## Marketing Part Numbers

**7110614** Oracle Ethernet Switch ES2-64 with 40 ports of 1/10 GBase-T and 6 QSFP ports. Includes 2 AC power supply units and rack rail kit. Requires one option: fans with "front-to-rear" or "rear-to-front" airflow direction

**7112329** Oracle Ethernet Switch ES2-64 with 40 ports of 1/10 GBase-T and 6 QSFP ports. Includes 2 DC power supply units and rack rail kit. Requires one option: fans with "front-to-rear" or "rear-to-front" airflow direction

**7110594** Five fans with front-to-rear airflow (for factory installation)

**7110595** Five fans with rear-to-front airflow (for factory installation)

When the switch is installed in a rack with nothing directly above or below it, the air duct will help mitigate hot air re-circulation.

**7114071** Air duct (for factory installation)





**7114070** Air duct

### CONTACT US

For more information about Oracle Ethernet Switch ES2-64, visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.

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