ORACLE SWITCH ES1-24: 10 GIGABIT ETHERNET TOP-OF-RACK SWITCH

The Oracle Switch ES1-24, a part of Oracle’s 10 Gigabit Ethernet switch portfolio, is designed specifically as a top-of-rack (ToR) server access switch with comprehensive Layer 2 and 3 features and wire-speed switching for high performance. In a compact half-width 1U with 20 RJ45 ports of 1/10GBase-T and 4 ports of 1/10 GbE SFP+, it enables easy migration from a 1 Gbps to 10 Gbps infrastructure by reusing existing copper cabling. It provides for redundant architecture in 1U rack space using two adjacent units and rapid failover with logical link aggregation capability.

Overview

Because 10 Gigabit Ethernet provides improvements in application performance with higher bandwidth, scaling, and reliability, it has become the interconnect choice in data centers. The Oracle Switch ES1-24 is an enterprise-class and full-featured data center 1/10 Gigabit Ethernet switch that delivers high performance, supports layer 2/3, with auto-negotiating 1/10GBase-T ports with standard RJ45 connectors and SFP+ uplink ports. It is ideal for a high-availability configuration of server and storage clustering. The switch supports redundant hot-swappable power and cooling and comes in both front-to-rear and rear-to-front airflow direction and therefore can be positioned in server, storage, and network racks. The switch enables coexistence and seamless migration from existing Gigabit Ethernet-based servers and storage to 10 Gigabit Ethernet-based high-performance servers and storage, enabling transition to virtualized environments.

Oracle Switch ES1-24 Specifications

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>Network</th>
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</thead>
<tbody>
<tr>
<td>•</td>
<td>Twenty 10GBase-T ports with RJ45 connectors: Each port auto-negotiates between 10 Gbps/1 Gbps/100 Mbps</td>
</tr>
<tr>
<td>•</td>
<td>Four 10 GbE SFP+ ports: can be configured for 1 GbE</td>
</tr>
<tr>
<td>•</td>
<td>One serial service port (RJ45)</td>
</tr>
<tr>
<td>•</td>
<td>One 1000Base-T out-of-band management port</td>
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</tbody>
</table>

| Performance | Line-rate 10 Gbps, low-latency cut-through design in each port, non-blocking 10 Gbps |
|            | Layer 2 hardware forwarding at 480 Gbps or 357 million packets per second (mpps) |
|            | MAC address table of 16 k |
|            | Load distribution feature for enhancing server performance |
### High Availability
- 1U half-width compact switch size enables two switches to be mounted in 1U space for high availability
- Redundant hot-swappable power supplies and fans
- Logical link aggregation (LLA) for active-active switch deployment with increased bandwidth and fast failover

### Layer 2 Features

#### VLAN support
- IEEE 802.1Q VLAN encapsulation
- IEEE 802.1D GVRP/GMRP support for dynamic VLAN management
- IEEE 802.1ad provider bridging (Q-in-Q)
- Up to 4,094 VLAN entries
- XVLAN – exclusive VLAN

#### Spanning Tree
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1w Rapid Reconfiguration Spanning Tree
- IEEE 802.1s Multiple Spanning Tree
- PVRST+

#### Link Aggregation
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.1Qbg – Ethernet Virtual Bridging (EVB) bridge support for stations running Oracle Solaris OS:
- DCBX – Data Center Bridging Exchange Protocols Management:
  - Support for Ethernet MIB (RFC 2665)
  - RMON (1, 2, 3, and 9 groups), RFC 2819

### Layer 3 Features

#### IP Routing
- Static routing
- RIP v1/v2 – RFC 1058 2453
- OSPF v2 – RFC 2328
- VRRP – RFC 2338

#### IPv6 Routing
- Static routing
- RIPng – RFC 2080
- OSPFv3 – RFC 5340

#### IP Multicast
- PIM-SM RFC 2362
- IGMP snooping
- IGMP: v1/v2/v3

#### IPv6 Multicast
- PIMv6-SM RFC 4061
- MLD snooping

### Security and Priority
- IEEE 802.1x port-based authentication with EAP
- DHCP server RFC 2131
- DHCP relay agent RFC 2131
IEEE 802.1p priority-based class of service (CoS)
- Rate control per port
- Port mirroring
- Broadcast storm control

**Quality of Service (QoS)**
- IEEE 802.1p
- Per-port QoS configuration: Eight hardware queues per port
- CoS assignment with egress queuing
- Egress port-based scheduling: Strict priority queuing, weighted deficit round robin (WDRR)

**Access Control Lists (ACL)**
Port-based ingress and egress ACLs (standard and extended):
- Layer 2 ACLs: MAC addresses, VLAN
- Layer 3 to 4 ACLs: IPv4, IPv6, Internet Control Message Protocol (ICMP), TCP, User Datagram Protocol (UDP), Port #, etc.

**Management**
Oracle's standard server management interface: Oracle Integrated Lights Out Manager (Oracle ILOM v3):
- SNMP v1/v2c/v3 – RFC 1905 3411 3412 and CLI support
- CLI
- SSH
- Web interface for Oracle ILOM
- In-band management

**Regulatory Compliance**
**Regulations**
- Immunity: EN 55024:2010; ETSI EN 300 386 V1.6.1 (2012-09)

**Certifications**
- Safety: UL/cUL, CE, BSMI, GOST R, CSA C22.2 No. 60950-1-07 2nd Ed, CCC
- EMC: CE, FCC, VCCI, ICES, KCC, GOST R, BSMI Class A, AS/NZ 3548, CCC

**Other**

**Operating Environment**
- Voltage: AC input (120V: 60Hz: 8.8A max)
- Operating temperature: 5°C to 35°C (41°F to 95°F)
- Operating humidity: 10% to 90% relative humidity, noncondensing, 27°C maximum wet bulb
- Operating altitude: Up to 3,000 m, max. ambient temperature is derated by 1°C per 300 m above 900 m
- Nonoperating temperature: -40°C to 65°C (-40°F to 149°F)
- Nonoperating humidity: Up to 93% relative humidity, non-condensing, 38°C maximum wet bulb
- Nonoperating altitude: Up to 12,000 m

**Power, Dimensions, and Weight**
ORACLE DATA SHEET

RELATED PRODUCTS
Oracle’s Sun Network 10 GbE Switch 72p (1U) provides 72 ports of fully non-blocking, wire-rate, low-latency, cut-through 10 GbE switching to Oracle’s Sun servers and storage. This ultra-dense switch simplifies IT infrastructure and reduces network costs by using fewer devices and cables, eliminating complex interconnect, and simplifying management.

Embedded in Oracle’s Sun Blade 6000 chassis, Oracle’s Sun Blade 6000 Ethernet Switched NEM 24p 10 GbE provides non-blocking, wire-rate, low-latency, cut-through 10 GbE switching to Oracle’s blades.

RELATED SERVICES
The following services are available from Oracle Advanced Customer Support Services:
- Installation
- Maintenance

- Power maximum: 227 watts
- Power idle: 91 watts
- Form factor: Half width
- Height: 43 mm (1.69 in.)
- Width: 217 mm (8.54 in.)
- Depth: 610 mm (24.0 in.)
- Weight (full assembled chassis): 5.7 Kg (12.5 lb.)

<table>
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<th>Transceivers and Cables</th>
</tr>
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<tbody>
<tr>
<td>Distance Supported on Twisted Pair Cables</td>
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<tr>
<td>Category 6a and Category 7 cabling up to 100 m</td>
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<tr>
<td>Category 5e and Category 6 cabling with distances up to 55 m</td>
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<tr>
<th>Transceivers</th>
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<tbody>
<tr>
<td>(X) 2129A-N SFP+ Short Range (SR) Transceiver (for use with 850 nm multimode fiber [MMF] cable with LC connector; cable is industry standard and not supplied by Oracle.)</td>
</tr>
<tr>
<td>(X) 5562A-N SFP+ Long Range (LR) Transceiver (for use with 1310 nm single mode fiber [SMF] cable with LC connector; cable is industry standard and not supplied by Oracle)</td>
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<tr>
<th>Direct-Attach TwinX passive Copper Cables</th>
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<tbody>
<tr>
<td>(X)2130A-1M TwinX Passive Copper Cable: 1 meter</td>
</tr>
<tr>
<td>(X)2130A-3M TwinX Passive Copper Cable: 3 meter</td>
</tr>
<tr>
<td>(X)2130A-5M TwinX Passive Copper Cable: 5 meter</td>
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</tbody>
</table>

Note: Transceivers should not be used with the above TwinX cables.

<table>
<thead>
<tr>
<th>Marketing Part Numbers</th>
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<tbody>
<tr>
<td>7105443 Oracle Switch ES1-24 front-to-rear airflow (commonly used with network rack), for factory installation</td>
</tr>
<tr>
<td>7105444 Oracle Switch ES1-24 rear-to-front airflow (commonly used with server and storage rack), for factory installation</td>
</tr>
<tr>
<td>7105446 Rack Rail Kit Option (can mount up to two Oracle Switch ES1-24 switches), for factory installation</td>
</tr>
<tr>
<td>7107048 Rack Rail Kit Option (can mount up to two Oracle Switch ES1-24 switches)</td>
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</table>
Warranty
Please visit oracle.com/sun/warranty for Oracle’s global warranty support information on Sun products.

Services
Visit oracle.com/sun/services for information on Oracle’s service program offerings for Sun products.

Contact Us
For more information about the Oracle Switch ES1-24, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.