

# D48E Ethernet Switch

Enhanced L3 40G Metro-Ethernet Core Switch



## Product Overview

D48E next-generation 40G switch has advanced hardware and software architecture design, built-in modular 1+1 redundant power supplies, 4+1 redundant fans, cross ventilation and wind direction adjustable.

D48E supports IPv6 with the hardware and pass the IPv6 form certification Phase II. With the abundant IPv6 features, the product can also work for next generation network.

D48E is ideal for cloud computing data center server access, core switch of small to medium datacenter. For campus or other large network, D48E could also be deployed at aggregation or core layer as its high performance and reliability.

## Product Description

The Orion Networks© D48E 40G Metro-Ethernet Core Switch supports a number of key features:

- **Performance and Scalability** - With high switching capacity, D48E switch supports wire-speed L2/L3 forwarding and high routing performance for IPv4 and IPv6 protocols. The 10G Ethernet connectivity of D48E is accomplished via a hot-pluggable 10G SFP+ transceiver which supports distance up to 300 meters over multimode fiber and 10 to 80km over single-mode fiber (Distance depends on the chosen optical module).
- **OpenFlow 1.0\*** - D48E supports OpenFlow 1.0 standard protocol. OpenFlow network is increasingly becoming a trend as the core protocol of SDN network. Programming OpenFlow brings the high performance to datacenter users via self-defined network. With OpenFlow, this product is ideal to build SDN test-bed for research institutes and SDN Experimental Bureau for large ISP and operator.
- **Full Optical Port** - D48E supports abundant optical connection ports to construct full optical network and increase the performance of networks. D48E includes 48x10GE SFP+ ports and 4x40G QSFP+ ports.
- **Rich L3 Features\*** - D48E delivers high performance, hardware based IP routing. RIP, OSPF and BGP provide dynamic routing by exchanging routing information with other Layer 3 switches and routers. With D48E, customers could easily achieve Policy Based Routing (PBR), which is important when they need multi exit application.

## Product Description

- **VSF (Virtual Switch Framework)\*** - Virtual Switch Framework could virtualize multiple D48E switches into one logical device, achieves the sharing of information and data tables between different switches. The performance and ports density of virtualized device are greatly enlarged by times under VSF. VSF also provided simplified management work for network administrator and more reliability.
- **Strong Multicast** - D48E switch support abundant multicast features. In Layer 2, such as IGMPv1/v2/v3 snooping and fast leave. L3 multicast protocols such as IGMPv1/v2/v3, PIM-DM, PIM-SM, PIM-SSM and even MSDP\*. With Multicast VLAN Register (MVR), multicast receiver/sender control and illegal multicast source detect functions, D48E provides great application experience for customer.
- **MPLS/VPLS\*** - D48E switch supports MPLS L3 VPN/MPLS L2 VPN (VPLS) and helps customers to construct more secure/extendable network. With max 255 VRF instances, D48E switches could be deployed as P & PE devices, guarantees the variety of services.
- **Easy high reliability network** - MRPP is Multi-layer Ring Protection Protocol. It introduces Layer concept for loop at the basis of traditional loop protect protocol. Each loop layer has multiple same-level Ethernet loop networks. With multi-loop layers, it can achieve quick convergence from core to aggregation. MRPP can get fast recovery for links at different layers. Compared with spanning tree protocol, it has advantages of much faster convergence, simple protocol calculation, little system resources cost, clear networking idea and so on, which can greatly improve the reliability of Ethernet network operation.
- **Comprehensive QoS** - With 8 queues per port, D48E enables differentiated management of up to 8 traffic types. The traffic is prioritized according to IEEE 802.1p, DSCP, IP precedence and TCP/UDP port number, giving optimal performance to real-time applications such as voice and video. D48E also supports Bi-directional rate-limiting, per port or traffic class, preserves network bandwidth and allows full control of network resources.
- **Enhanced security** - IEEE 802.1X port-based access control and MAC-based access control ensure all users are authorized before being granted access to the network. Ingress/Egress Access Control List (ACLs) can be used to restrict access to sensitive network resources by denying packets based on L2/L3/L4 headers information. And for some service is based on time, the product can support time-based ACL to match the requirement. Secure Shell (SSH) encrypts network management information via Telnet providing secure network management. RADIUS Authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration of the switch.
- **Abundant IPv6 Support** - D48E switches supports IPv6 switching and routing based on hardware for maximum performance. With increased network devices growing and the need for larger addressing and higher security becomes critical, D48E switches will be a right product to meet the requirement. D48E switches passed IPv6 form Phase II certification, which is the best proof of the application.

## Features

|                                |  |
|--------------------------------|--|
| <b>Switching mode</b>          | Store and forward mode<br>Non-blocking switching   |
| <b>VLAN</b>                    | IEEE 802.1Q VLAN: 4K active VLANs<br>Port-based VLAN, MAC VLAN, Voice VLAN, PVLAN, Protocol VLAN, Multicast VLAN<br>GVRP   |
| <b>Storm Control</b>           | Broadcast/multicast/unicast/DLF storm control  |
| <b>Multicast</b>               | IGMP Snooping V1/V2/V3 and L2 query, ND Snooping, MLD V1/V2 Snooping<br>IGMP Proxy, Static Multicast Route, Multicast Recieve Control<br>DVMRP, PIM-DM, PIM-SM, PIM-SSM, Anycast, RP, MSDP<br>Illegal Multicast Source Detection<br>IPv6 Multicast VLAN, PIM-SM/DM for IPv6, IPv6 Anycast RP |
| <b>Mirroring</b>               | N-to-1 Port Mirroring<br>RSPAN<br>ERSPAN   |
| <b>IPv4 Functions</b>          | Static Routing, RIP V1/V2, OSPFv2, BGP4, OSPFv3, BGP4+, OSPF Multiple Process, LPM<br>Routing, Policy-Based Routing (PBR), VRRP, URPF, ECMP, BFD<br>ARP Guard, Local ARP Proxy, Proxy ARP, ARP Binding, Gratuitous ARP, ARP Limit<br>Anti ARP/NDP Cheat, Anti ARP/NDP Scan<br>DNS Client     |
| <b>IPv6 Functions</b>          | 6-to-4 Tunnel, Configured Tunnel, ISATAP Tunnel, GRE Tunnel<br>ICMPv6, ND, DNSv6<br>IPv6 LPM Routing, IPv6 Policy-Based Routing (PBR), IPv6 VRRPv3, IPv6 URPF, IPv6 RA,<br>RIPng, OSPFv3, BGP4+, IPv6 ACL, IPv6 QoS  |
| <b>MPLS</b>                    | MPLS, VRF, LDP, MPLS L3 VPN, MPLS L2 VPN (VPLS), VPWS  |
| <b>Port Loopback Detection</b> | Supported  |
| <b>MAC Address Table</b>       | 128K MAC Address Table   |
| <b>Q-in-Q</b>                  | Q-in-Q, Selective Q-in-Q, Flexible Q-in-Q<br>N-to-1 VLAN Translation   |
| <b>Link Aggregation</b>        | 802.3ad LACP, max 128 group trunk with max 8 ports for each trunk<br>LACP Load Balance   |
| <b>Flow Control</b>            | HOL<br>IEEE802.3x  |

## Features

|                                  |  |
|----------------------------------|--|
| <b>STP</b>                       | STP, RSTP & MSTP<br>Root Guard, BPDU Guard, BPDU Tunnel  |
| <b>Digital Diagnostic (DDMI)</b> | Supported  |
| <b>System Management</b>         | CLI/Telnet/SNMP/Web management through IPv4 and IPv6<br>RMON1, 2, 3 & 9, Syslog sna external syslog server, HTTP SSL, SNMP MIB, SNMP TRAP, FTP/TFTP, SNTNTP, Authentication by RADIUS, SSH V1/V2, Dual firmware images / configuration files, 802.3ah OAM, 802.1ag OAM*  |
| <b>QoS</b>                       | 8 queues per port<br>SWRR, SP, WRR, DWRR, SDWRR, WRED<br>Traffic classification based on 802.1p CoS, ToS, DiffServ DSCP, ACL, port number<br>Traffic Shaping<br>PRI Mark/Remark  |
| <b>ACL</b>                       | IP ACL, MAC ACL, IP-MAC ACL<br>Standard and expanded ACL based on source/destination IP or MAC, IP protocol, TCP/UDP port, DSCP, ToS, IP Precedence, VLAN, Tag/Untag, CoS<br>Redirect and accounting based ACL<br>Rules can be configured to port, VLAN, VLAN routing interface<br>Time-ranged ACL   |
| <b>Security</b>                  | 802.1x AAA, Port, MAC-based authentication<br>Accounting based on time length and traffic<br>Guest-VLAN and Auto-VLAN<br>RADIUS for IPv4 and IPv6, TACACS+ for IPv4 and IPv6<br>MAB  |
| <b>DHCP</b>                      | DHCP Server/Client for IPv4 and IPv6<br>DHCP Relay/Option 82<br>DHCP Snooping/Option 82  |
| <b>Traffic Monitor</b>           | IP FIX traffic monitor, 1:1*<br>sFlow traffic analysis   |
| <b>Data Center Features*</b>     | FCoE (Fiber Channel over Ethernet)<br>TRILL (Transparent Interconnection of Lots of Links)<br>DCB (Data Center Bridging)<br>802.1Qbb - Priority-based Flow Control (PFC)<br>802.1Qaz - Enhanced Transmission Selection (ETS and DCBX)<br>802.1Qau - Congestion Notification (CN/QCN)<br>IEEE VEPA (Virtual Ethernet Port Aggregator)<br>VSF (Virtual Switch Framework) |

The contents marked with «\*» need future upgrade or are under development

## Specifications

|                           |   |
|---------------------------|---|
| <b>Performance</b>        | Switching fabric: 1280Gbps<br>Throughput: 960Mpps<br>MAC Address Table: 128K<br>Routing Table: 16K, L3 Table: 16K |
| <b>Physical interface</b> | 48 x 10G SFP+, 4 x 40G QSFP+  |
| <b>FC port*</b>           | First 16 ports could be configured as SFP+, SFP GE, FC<br>FC port supports 1/2/4/8G mode                          |
| <b>Management port</b>    | 1 x Console (RJ45), 1 x USB2.0 Management port<br>1 x 10/100/1000Base-T RJ45 Ethernet Management port             |
| <b>Power Specs</b>        | AC: 100~240V, 50~60Hz<br>Full load: ≤281.0W   |
| <b>MTBF</b>               | ≥200000 Hours   |
| <b>Usage Conditions</b>   | Operating temp: 0~40 °C (32~104 °F)<br>Storage temp: -40~70 °C (-40~158 °F)<br>Humidity: 15~85% non condensing    |
| <b>Dimensions</b>         | 440(L) x 408(W) x 44(H) mm  |
| <b>Weight</b>             | ≤ 9.5Kg   |

## Compliances

|                                  |   |
|----------------------------------|---|
| <b>Standards &amp; Protocols</b> | IEEE 802.1Q VLAN, IEEE 802.3ad Link Aggregation, IEEE 802.1ad QinQ, IEEE 802.1D Spanning Tree, IEEE 802.1w RSTP, IEEE 802.1s MSTP, IEEE 802.1x Security, IEEE 802.1p CoS Prioritization, IEEE 802.3x Flow Control, IEEE 802.3ah OAM, IEEE 802.1ag Connectivity Fault Management, ITU Y.1731 Services OAM, Static Routing, IGMP v1/v2/v3, RMON I and II standards, SNMPv1/v2/v3, MEF9, MEF14 |
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