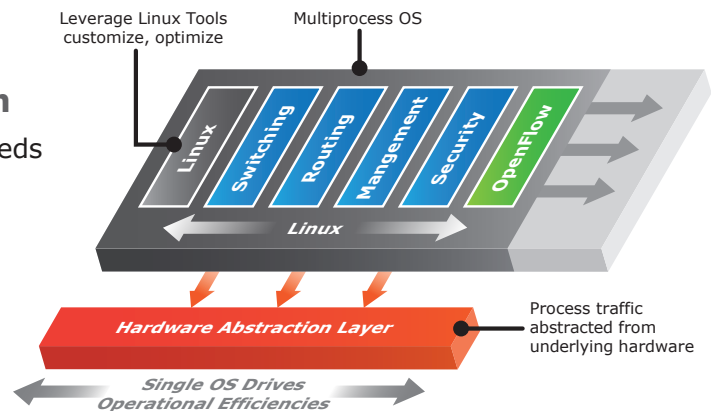


**The first Open Switch for open networks leveraging unique hardware-agnostic operating system**

Two powerful modes of operation to suit your needs

- ➔ **Open vSwitch (OVS) Mode:** providing Industry leading OpenFlow support & integration with CloudStack or OpenStack
- ➔ **Layer-2/Layer-3 Mode:** enabling seamless integration into existing networks



**Overview**

Pica8 is the first to offer hardware-independent open switches. Physical "white box" switch hardware run PicOS™, an open network operating system that supports standards-based Layer 2/Layer 3 protocols with OpenFlow support.

**What makes PicOS open?**

- PicOS is hardware independent: the operating system is not tightly coupled to switching ASICs, CPU or memory hardware.
- We expose Debian Linux, so you can use your existing tools for programming and optimizing Pica8 open switches to support your network.
- PicOS has the most complete OpenFlow support, through Open vSwitch (OVS) integration

**Leverage Pica8’s operating system – PicOS – with two powerful modes of operation**

	Layer-2 / Layer-3 Mode	Open vSwitch (OVS) Mode
OPEN	<ul style="list-style-type: none"> <li>● Switching platform with Debian Linux on board and accessible</li> <li>● Programmable and customize by leveraging vast high-quality Linux tools</li> </ul>	<ul style="list-style-type: none"> <li>● Industry-leading OpenFlow 1.3 support through Open vSwitch (OvS) 1.9 integration</li> <li>● Leverage production ready OVS switches for your CloudStack / OpenStack projects</li> </ul>
FLEXIBLE	<ul style="list-style-type: none"> <li>● High-performance Layer 2 / Layer 3 switching platform for both IPv4 and IPv6 networks, seamlessly integrating into existing architectures</li> <li>● Tune the fabric to meet your application needs, selectable store-forward or cut-through switching modes for ultra-low latency</li> </ul>	<ul style="list-style-type: none"> <li>● Interoperable with multiple open-source OpenFlow controllers (Ryu, Floodlight, NOX, Trema)</li> <li>● Leverage different controllers and reference architectures</li> </ul>
ADAPTIVE	<ul style="list-style-type: none"> <li>● PicOS a multiprocess OS, ensures each process has independent memory space, thread control, and interrupt handling for improved feature scaling</li> </ul>	<ul style="list-style-type: none"> <li>● Seamlessly add new protocols to PicOS, a multiprocess OS</li> <li>● Investment protection as your application needs change</li> </ul>

# PROTOCOLS & STANDARDS SUPPORTED



## Layer 2 Features

- Jumbo frames up to 9,216 bytes
- Provide non-blocking wire speed L2 switching
- 128K MAC address entries (32K for the P-3290 and P-3295)
- Flow Control
  - IEEE802.3x for full duplex mode
  - Back-Pressure flow control in half duplex mode
- Provide Broadcast, Unicast, Multicast storm protection
- IGMP snooping, up to 1K groups
- VLAN Support
  - IEEE 802.1Q VLAN
  - 4094 VLANs
  - Port-based VLAN
  - VLAN Trunking Protocol
- Spanning Tree
  - STP, IEEE 802.1d
  - RSTP, IEEE 802.1w
  - MSTP, IEEE 802.1s
- Link Aggregation
  - Up to 24 trunk groups
  - Up to 8 ports per trunk group
  - 802.3ad Link Aggregation & LACP
- Provide Port Mirror (many-to-1)
- LLDP
- Q-in-Q

## Layer 3 Routing Features

- Maximum Routes (IPv4, IPv6): 12,000
- ECMP: 32
- RIP v2
- OSPF v2
- OSPF/ECMP
- VLAN routing
- VRRP
- IP routing
- DHCP-Relay

## Layer 3 Multicast

- PIM-SM
- IGMP v1/v2

## IPv6 Layer 3 Routing Features

- RIPng
- OSPFv3
- IPv6 Routing

## Security

- User/Password protected system management
- L2/L3/L4 ACL
- TACACS+ AAA
- SSH v1/v2
- SSL v3/TLS v1
- Denial of Service

## Quality of Service

- 802.1p based CoS
- 8 priority queues per port
- DSCP based CoS
- Policy based Diffserv
- IPFIX/sFlow

## Network Management

- Command Line Interface (CLI) via console port
- Telnet remote login through IP management port
- SNMP v1/v2c

## Open vSwitch (OVS) 1.9

- Compatible with OpenFlow 1.3 specification
- Interoperate with RYU, Floodlight, Trema and NOX
- Support GRE/MPLS/OpenFlow (MPLS support on P-3780 & P-3920 only)

## Standards Compliance

- 802.1d Bridging and Spanning Tree Protocol
- 802.1s Multiple Spanning Tree Protocol
- 802.1w Rapid Spanning Tree Protocol
- 802.1p QOS/COS
- 802.1Q VLAN Tagging
- 802.3ad Link Aggregation with LACP

- 802.3ab 1000Base-T
- 802.3z Gigabit Ethernet
- 802.3ae 10 Gigabit Ethernet
- 802.3ba 40 Gigabit Ethernet

## RFCs & MIBs

- RFC-1157 SNMPv1
- RFC-1212 Concise MIB definition
- RFC-1213 MIB II
- RFC-1215 SNMP traps
- RFC-1256 ICMP router discovery
- RFC-1493 Bridge MIB
- RFC-1573 Interface Evolution MIB
- RFC-1643 Etherlike MIB
- RFC-1757 RMON1 MIB
- RFC-1901 Community based SNMPv2
- RFC-1905 Protocol Operations for SNMPv2
- RFC-1906 Transport Mappings for SNMPv2
- RFC-1907 Management Information Base for SNMPv2
- RFC-1908 Coexistence between SNMPv1 and SNMPv2
- RFC 1997 BGP Communities Attribute
- RFC-2021 RMON2 probes
- RFC-2096 IP Forwarding table MIB
- RFC-2233 The Interface Group MIB using SNMPv2
- RFC 2439 BGP Route Flap Damping
- RFC 2545 Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- RFC-2665 Ethernet-like Interfaces
- RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP
- RFC 3065 Autonomous System Confederations for BGP
- RFC 3392 Capabilities Advertisement with BGP-4
- RFC 4893 BGP Support for Four-octet AS Number Space
- Pica8 private MIB

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