BROADCOM®

Product Brief

FASTPATH®

Networking Software Release 8.6.1

Key Features

- Production-ready software for managed Ethernet switches
- Multiple management options (including CLI, Web-based, and SNMP)
- • Broad feature set:
  - Layer-2 switching
  - Layer-3 IPv4/IPv6 routing
  - Advanced Quality of Service (QoS) functionality
  - IPv4/IPv6 multicast
  - Metro Ethernet features
  - Data center services
- Scalable
- Fixed or stackable configurations:
  - Up to 48 ports for fixed solutions
  - Up to 384 ports for stacking configurations (8 units × 48 ports)
  - Faster time-to-market
- Modular design for targeted solutions.

Applications

- Enterprise Networking
- Data Centers
- Chassis Solutions
- Carrier Ethernet

The Broadcom® FASTPATH® production-ready networking software helps manufacturers achieve record-setting time-to-market performance for introducing new Ethernet products. In part, this advantage comes from the extensive feature set and integration capabilities that give Broadcom's software unprecedented application flexibility.

The FASTPATH software supports a broad array of field-proven Ethernet solutions, including:

- Fixed and stackable switches for Enterprise network wiring closets
- Blade-server and top-of-rack switches for Enterprise data centers
- 10G/40G/25G/50G/100G switches and ATCA chassis solutions
- Carrier Ethernet solutions for next-generation business and consumer networks

The FASTPATH software operates on the Linux operating system and has been integrated with Broadcom's market-leading switching silicon.

The FASTPATH software supports numerous industry RFCs, standards, and protocols. FASTPATH 8.6.1 includes the following software modules:

- Switching
- Stacking
- Routing
- IPv6 Routing
- Management
- Quality of Service
- Multicast
- BGP4
- Metro
- Data Center
- Service Provider

Standards

The remainder of this software brief lists the protocols, standards, and MIBs that FASTPATH software supports.

Switching

Core Switching Features

- IEEE 802.3: 10BASE-T
- IEEE 802.3u: 100BASE-T
- IEEE 802.3ab: 1000BASE-T
- IEEE 802.3ac: VLAN tagging
- IEEE 802.3ad: Link aggregation
- IEEE 802.3ae: 10GbE
- IEEE 802.3bj–CL91: Forward Error Correction (FEC)
- IEEE 802.1ak: Multiple Registration Protocol (MRP)
- IEEE 802.1as: Timing and Synchronization for Time-Sensitive
- Aplications in Bridged Local Area Networks
- IEEE 802.1s: Multiple Spanning Tree compatibility
- IEEE 802.1w: Rapid Spanning Tree compatibility
- IEEE 802.1D: Spanning Tree Compatibility
- PVSTP: Per VLAN Spanning Tree Protocol
- PVRSTP: Per VLAN Rapid Spanning Tree Protocol
- GARP: Generic Attribute Registration Protocol
- GMRP: Dynamic L2 multicast registration
- GVRP: Dynamic VLAN registration
- VPC: Virtual Port Channel (MLAG)
- IEEE 802.1Q: Virtual LANs with Port-based VLANs
- IEEE 802.1Qat: Multiple Stream Reservation Protocol (MSRP)
- IEEE 802.1Qav: Forwarding and Queuing Enhancements for Time-Sensitive Streams
- IEEE 801.1Qbb: Priority-based Flow Control
- IEEE 802.1v: Protocol-based VLANs
- IEEE 802.1p: Ethernet Priority with User Provisioning and Mapping
- IEEE 802.1X-2010: Port-based Authentication and Supplicant Support
- IEEE 802.3x: Flow Control
- RFC 4541: IGMP Snooping and MLD Snooping
- RFC 5171: Unidirectional Link Detection (UDLD) Protocol
- IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)
- ANSI/TIA-1057: LLDP-Media Endpoint Discovery (MED)

Additional Layer-2 Functionality APR Guard

- Authentication, Authorization, and Accounting (AAA)
- Broadcast/Multicast/Unicast storm recovery
- Cut-through Switching Support
- Double VLAN/VMAN tagging
- Independent VLAN Learning (IVL) support
- IPv6 Classification APIs
- ISDP (CDP-interoperability)
- Jumbo Ethernet Frames
- Port Mirroring
- Flow-based Port Mirroring
- Static MAC Filtering
- IGMP and MLD Snooping Querier
- Multicast VLAN Registration (MVR)
- Port MAC Locking
- VLAN MAC Locking
- Protected Ports
- Voice VLANs
- IP Subnet-based VLANs
- MAC-based VLANs
- DHCP Snooping (IPv4 and IPv6)
- Selectable LAG hashing algorithm
- Dynamic Load Balancing
- IP Source Guard (IPv4 and IPv6)
- Dynamic ARP Inspection
- MAC Authentication Bypass
- RSPAN
- ERSPAN
- MGMD Snooping SSM
- Switchport mode configuration
- Link Dependency
- IPv6 RA Guard (Stateless)
- STP Features:
- Root guard
  - BPDU guard
  - TCN guard
  - Loop guard
  - BPDU filter
  - BPDU flood
- MLAG – RPVST+
- L2 Loop Protection
- Link Debounce Feature
- Private VLANs
  - Isolated private VLAN trunk port
  - Promiscuous private VLAN trunk port
- ARP guard

Switching MIBs

- RFC 1213: MIB II
- RFC 1493: P-Bridge MIB
- RFC 1612: DNS Resolver MIB Extensions
- RFC 1643: Ethernet-like MIB
- RFC 2011: IP MIB
- RFC 2233: Interfaces Group MIB Using SMI v2
- RFC 2613: SMON MIB
- RFC 2618: RADIUS Authentication Client MIB

- RFC 2620: RADIUS Accounting MIB
- RFC 2674: Q-Bridge-MIB
- RFC 2737: Entity MIB version 2
- RFC 2819: RMON groups 1, 2, 3, and 9
- RFC 2863: IF-MIB
- RFC 2925: Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
- RFC 3273: RMON Groups 1, 2, and 3
- RFC 3291: INET-ADDRESS-MIB
- RFC 3434: RMON Groups 1, 2, and 3
- RFC 4022: TCP-MIB
- RFC 4113: UDP-MIB
- IEEE 802.1X: MIB (IEEE 802.1-PAE-MIB 2004 Revision)
- IEEE 802.1AB: LLDP MIB
- ANSI/TIA-1057: LLDP-MED MIB
- FASTPATH Enterprise MIBs Supporting Switching Features

System Facilities

- Autoinstall
- Cable Test
- CPU Rate Limiting
- Dynamic Link Detection
- DNS Client
- Event and Error Logging Facility
- Run-time and Configuration Download Capability
- Events-based Interface Shutdown and Recovery
- Friendly Port Naming
- Network and Host DoS Protection
- IP Address Conflict Notification
- Email Alerts
- PING Utility
- Xmodem
- Traceroute Utility
- Authentication Tiering
- FTP Transfers via IPv4/IPv6
- Malicious Code Detection
- RFC 768: UDP
- RFC 783: TFTP
- RFC 791: IP
- RFC 792: ICMP
- RFC 793: TCP
- RFC 826: Ethernet ARP
- RFC 894: Transmission of IP Datagrams over Ethernet Networks
- RFC 896: Congestion Control in IP/TCP Networks
- RFC 951: BootP
- RFC 1034: Domain Names – Concepts and Facilities
- RFC 1035: Domain Names – Implementation and Specification
- RFC 1321: Message Digest Algorithm
- RFC 1534: Interoperation between BootP and DHCP
- RFC 2021: Remote Network Monitoring Management Information Base v2
- RFC 2030: Simple Network Time Protocol (SNTP) v4 for IPv4, IPv6, and OSI
- RFC 2131: DHCP Client/Server
- RFC 2132: DHCP options and BootP Vendor Extension
- RFC 2347: TFTP Option Extension
- RFC 2348: TFTP Block Size Option
- RFC 2819: Remote Network Monitoring Management Information Base
- RFC 2830 – TLS Support for LDAP
- RFC 2865: RADIUS Client
- RFC 2866: RADIUS Accounting
- RFC 2868: RADIUS Attributes for Tunnel Protocol Support
- RFC 2869: RADIUS Extensions – Support for Extensible Authentication Protocol (EAP)
- RFC 3162: RADIUS and IPv6
- RFC 3164: The BSD syslog Protocol
- RFC 3580: IEEE 802.1X RADIUS Usage Guidelines
- RFC 4511 – LDAP Protocol
- RFC 4515 – Lightweight Directory Access Protocol (LDAP): String Representation of Search Filters
- RFC 5176: Dynamic Authorization Server (Disconnect-Request Processing Only)
- RFC 5424: The Syslog Protocol
- TACACS+: Client with Support for IPv4 and IPv6 Functionality.
- sFlow Version 5: Industry Standard for sFlow Implementation
- sFlow LAG Counters Structure: Standard to Export LACP Counters in the sFlow Counter Sample for a Port that is a Member of a LAG
- IEEE 1588v2: Precision Time Protocol (PTP – BC, TC)
- Synchronous Ethernet (SyncE)
- Dying Gasp Notifications
- Tracking of LAG Flaps

Stacking

Stacking Features

- Redundant Management Unit Support
- Single IP Address Management
- Automatic Election of Management Control Unit
- Distribution of Code and Configuration throughout Stack
- Hot-plug Support: Optional Modules and Stack Units
- Offline Configuration of Modules and Stack Units

- Stack Template Manager to Enable Stacking Switches with Differing Hardware Capabilities

Routing

Routing Features

- ECMP
- ICMP Throttling
- Loopback Interfaces
- Multinetting
- OSPF
- ARP and Proxy ARP
- RIP
- Route Redistribution Across RIP, OSPF, and BGP
- Static Routing
- VLAN and Port-based Routing
- VRRP
- UDP Relay/IP Helper
- Policy-Based Routing
- Virtual Route Forwarding
- VRF-Lite
- Bidirectional Forwarding Detection
- Algorithmic Longest Prefix Match (ALPM)
- Configurable Routing Limits
- OSPF Interface Flap Dampening /31 subnets
- Static Routes on Management Interface
- OSPF LSA Flooding Reduction
- IP Unnumbered Interface
- VRF Awareness for BGP Extended Communities
- VRF awareness for BGP Route Leaking
- VRF awareness for BGP Dynamic Neighbors
- Microsoft Network Load Balance (MS NLB)
- IP SLA

- RFC 1027: Using ARP to Implement Transparent Subnet Gateways (Proxy ARP)
- RFC 1256: ICMP router discovery messages
- RFC 1519 – CIDR
- RFC 1765: OSPF database overflow
- RFC 1812: Requirements for IP version 4 Routers
- RFC 2082: RIP-2 MD5 Authentication
- RFC 2131: DHCP Relay
- RFC 2328: OSPFv2
- RFC 2370: OSPF Opaque LSA Option
- RFC 2453: RIP v2
- RFC 3021: Using 31-Bit Prefixes on IPv4 Point-to-Point Links
- RFC 3046: DHCP/BootP relay
- RFC 3101: The OSPF "not so stubby area" (NSSA) Option
- RFC 3137: OSPF Stub Router Advertisement
- RFC 3623: Graceful OSPF Restart
- RFC 3704: Ingress Filtering for Multihomed Networks (uRPF)
- RFC 3768: Virtual Router Redundancy Protocol (VRRP) version 2
- RFC 5798: Virtual Router Redundancy Protocol (VRRP) version 3
- RFC 5880: Bidirectional Forwarding Detection
- RFC 5881: BFD for IPv4 and IPv6 (Single Hop)
- RFC 6860: Hiding Transit-Only Networks in OSPF

Routing MIBs

- RFC 1724: RIP v2 MIB extension
- RFC 1850: OSPF MIB
- RFC 2096: IP Forwarding Table MIB
- RFC 2787: VRRP MIB
- RFC 3636: MAU MIB
- RFC 6527: VRRPv3 MIB
- FASTPATH Enterprise MIB Supporting Routing Features

IPv6 Routing

IPv6 Routing Features

- RFC 1981: Path MTU for IPv6
- RFC 2460: IPv6 Protocol Specification
- RFC 2464: IPv6 over Ethernet
- RFC 2711: IPv6 Router Alert
- RFC 3056: Connection of IPv6 Domains via IPv4 Clouds
- RFC 3306: Unicast Prefix-based IPv6 Multicast Addresses
- RFC 3315: Dynamic Host Configuration Protocol for IPv6 (DHCPv6) (includes support for both Stateful and Stateless mechanisms)
- RFC 3484: Default Address Selection for IPv6
- RFC 3493: Basic Socket Interface for IPv6
- RFC 3513: Addressing Architecture for IPv6
- RFC 3542: Advanced Sockets API for IPv6
- RFC 3587: IPv6 Global Unicast Address Format
- RFC 3633: IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6
- RFC 3736: Stateless DHCPv6
- RFC 4213: Basic Transition Mechanisms for IPv6
- RFC 4291: Addressing Architecture for IPv6
- RFC 4443: ICMPv6
- RFC 4861: Neighbor Discovery
- RFC 4862: Stateless Autoconfiguration
- RFC 5187: OSPFv3 Graceful Restart

- RFC 5340: OSPF for IPv6
- RFC 5549: Advertising IPv4 Network Layer Reachability Information with an IPv6 Next Hop
- RFC 5798: Virtual Router Redundancy Protocol (VRRP) version 3
- RFC 5881: BFD for IPv4 and IPv6 (Single Hop)
- RFC 6164 – Using 127-Bit IPv6 Prefixes on Inter-Router Links
- RFC 6583 — Operational Neighbor Discovery Problems
- Dual IPv4/IPv6 TCP/IP Stack Operation
- ICMPv6 Throttling
- 6to4 Automatic Tunnels
- DNSv6
- IPv6 Negative ARPs
- IPv6/127 Support
- Stateful DHCPv6 Server
- IPv6 Server Lists
- OSPFv3 Stub Router
- OSPFv3 LSA Group Pacing
- OSPFv3 Timers Throttle
- OSPFv3 Bundle Direct ACKs

IPv6 Routing MIBs

- RFC 2465: IPv6 MIB
- RFC 2466: ICMPv6 MIB
- RFC 3419: Transport Address MIB
- RFC 5643: Management Information Base for OSPFv3 for IPv6

Management

Management Features

- RFC 854: Telnet
- RFC 855: Telnet Option Specifications
- RFC 1155: SMI v1
- RFC 1157: SNMP
- RFC 1212: Concise MIB Definitions
- RFC 1867: HTML/2.0 Forms with File Upload Extensions
- RFC 1901: Community-based SNMP v2
- RFC 1908: Coexistence between SNMP v1 and SNMP v2
- RFC 2068: HTTP/1.1 Protocol as Updated by draft-ietf-http-v11-spec-rev-03
- RFC 2271: SNMP Framework MIB
- RFC 2295: Transparent Content Negotiation
- RFC 2296: Remote Variant Selection; RSVA/1.0 State Management "Cookies" – draft-ietf-http-state-mgmt-05
- RFC 2576: Coexistence between SNMP v1, v2, and v3
- RFC 2578: SMI v2
- RFC 2579: Textual Conventions for SMI v2
- RFC 2580: Conformance Statements for SMI v2
- RFC 2616: HTTP/1.1
- RFC 3410: Introduction and Applicability Statements for Internet-Standard Management Framework
- RFC 3411: An Architecture for Describing SNMP Management Frameworks
- RFC 3412: Message Processing and Dispatching for SNMP
- RFC 3413: SNMP v3 Applications
- RFC 3414: User-Based Security Model for SNMP v3
- RFC 3415: View-Based Access Control Model for SNMP
- RFC 3416: Version 2 of the Protocol Operations for SNMP
- RFC 3417: Transport Mappings for SNMP
- RFC 3418: Management Information Base for SNMP
- RFC 6020: A Data Modeling Language for NETCONF
- RFC 6022: YANG Module for NETCONF Monitoring
- RFC 6241: Network Configuration Protocol (NETCONF)
- RFC 6242: Using the NETCONF Protocol over Secure Shell (SSH)
- RFC 6415: Web Host Metadata
- RFC 6536: NETCONF Access Control Model
- RFC 7223: YANG Data Model for Interface Management
- RFC 7277: YANG Data Model for IP Management
- RFC 7317: YANG Data Model for System Management
- Configurable Management VLAN
- SSL 3.0, TLS 1.0, TLS 1.1, and TLS 1.2:
  - RFC 2246: The TLS Protocol, version 1.0
  - RFC 2818: HTTP over TLS
  - RFC 3268: AES Cipher Suites for Transport Layer Security
  - RFC 4346: The Transport Layer Security (TLS) Protocol Version 1.1
  - RFC 5246: The Transport Layer Security (TLS) Protocol Version 1.2
- • SSH 2.0:
  - RFC 4251: SSH Protocol Architecture
  - RFC 4252: SSH Authentication Protocol
  - RFC 4253: SSH Transport Layer Protocol
  - RFC 4254: SSH Connection Protocol
  - RFC 4716: SECSH Public Key File Format
  - RFC 4419: Diffie-Hellman Group Exchange for the SSH Transport Layer Protocol
  - RFC 6668: SHA-2 Data Integrity Verification for the Secure Shell (SSH) Transport Layer Protocol

- HTML 4.0 Specification, December 1997
- Java Plug-in 1.6.0_01 and JavaScript 1.3
- RESTCONF: https://tools.ietf.org/html/draftietf-netconf-restconf-04
- draft-ietf-netmod-syslog-model-03
- draft-ietf-netconf-yang-library-00
- draft-ietf-httpauth-basicauth-update-03
- draft-ietf-netmod-yang-json-05
- broadcom-synce
- draft-jlx-tictoc-1588v2-yang-03
- Bonjour Service
- Dual Software Images
- Management Port Access Control
- Password Management (history)
- Strong Passwords
- RESTful APIs
- Management vis NetSNMP

Advanced Management Features

- Industry-standard CLI with the Following Features:
  - Scripting capability
  - Command completion
  - Context-sensitive help
- Optional User Password Encryption
- Multisession Telnet Server
- Secure Copy Server
- Command Authorization
- Port Locator
- Dynamic/prescriptive Topology Map
- Management Access Control and Administration List

Quality of Service

DiffServ Policies and ACLs

- RFC 1858: Security Considerations for IP Fragment Filtering
- RFC 2474: Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 headers
- RFC 2475: An Architecture for Differentiated Services
- RFC 2597: Assured Forwarding Per Hop Behavior (PHB) group
- RFC 2697: Single-Rate Policing
- RFC 2698: A Two-Rate, Three-Color Marker
- RFC 3246: An Expedited Forwarding PHB
- RFC 3260: New Terminology and Clarifications for DiffServ
- Permit/deny Actions for Inbound or Outbound IP (IPv4 and IPv6) Traffic Classification Based on:
  - Type of Service (ToS) or Differentiated Services (DS) DSCP field
  - Source IP address
  - Destination IP address
  - TCP/UDP source port
  - TCP/UDP destination port
  - IP protocol number
  - IPv6 flow label
- Permit/deny Actions for Inbound or Outbound Layer-2 traffic Classification Based on:
- Source MAC address
  - Destination MAC address
  - Ethertype
  - IEEE 802.1p user priority (outer and/or inner VLAN tag)
  - VLAN identifier value or range (outer and/or inner VLAN tag)
- DiffServ and ACL Actions:
  - Assign matching traffic flow to a specific queue
  - Specific-port redirect or mirror matching traffic flow
  - Generate trap log entries containing rule hit counts

Class of Service

- AutoVoIP: Automatic VoIP Class of Service (CoS) Settings
- Direct User Configuration of the Following:
  - IP DSCP to traffic class mapping
  - IP precedence to traffic class mapping
  - Interface trust mode: IEEE 802.1p, IP precedence, IP DSCP, or untrusted
  - Interface traffic shaping rate
  - Minimum and maximum bandwidth per queue
  - Strict priority versus weighted – WRR/WFQ) scheduling per queue
- Tail drop versus Weighted Random Early Detection (WRED) queue depth management

Quality of Service MIBs

- RFC 3289: MIB for the Differentiated Services Architecture (read only)
- FASTPATH Enterprise MIB Supporting DiffServ, ACL and CoS Functionality

Multicast

Core Multicast Features

- RFC 1112: Host Extensions for IP Multicasting
- RFC 2236: Internet Group Management Protocol (IGMP) v2
- RFC 2365: Administratively Scoped Boundaries
- RFC 2710: Multicast Listener Discovery (MLD) for IPv6
- RFC 3376: IGMPv3
- RFC 3810: Multicast Listener Discovery Version 2 (MLDv2) for IPv6
- RFC 3973: Protocol Independent Multicast – Dense Mode (PIM-DM) (supports both IPv4 and IPv6)

- RFC 4601: Protocol Independent Multicast -Sparse Mode (PIM-SM) (supports both IPv4 and IPv6)
- draft-ietf-idmr-dvmrp-v3-10: Distance Vector Multicast Routing Protocol (DVMRP)
- draft-ietf-magma-igmp-proxy-06: IGMP/MLD-based Multicast Forwarding (IGMP/MLD proxying)
- draft-ietf-magma-igmpv3-and-routing-05: IGMPv3 and Multicast Routing Protocol interaction
- draft-ietf-pim-sm-bsr-05: Bootstrap Router (BSR) Mechanism for PIM
- draft-ietf-ssm-arch-05: Source-Specific Multicast (SSM) for IP
- Static RP Configuration
- MLD Proxy
- IGMPv3 proxy
- IP Multicast Traceroute
- Multihop RP

Multicast MIBs

- RFC 2932: IPv4 Multicast Routing MIB
- RFC 2933: IGMP MIB
- RFC 5060: PIM Standard MIB
- RFC 5519: Multicast Group Membership Discovery MIB
- draft-ietf-idmr-dvmrp-mib-11: DVMRP Standard MIB
- draft-ietf-magma-mgmd-mib-05 Multicast Group Membership Discovery MIB
- draft-ietf-pim-bsr-mib-06: PIM Bootstrap Router MIB
- FASTPATH Enterprise MIB Supporting Multicast Features

BGP4

Core BGP4 Features

- RFC 1997: BGP Communities Attribute
- RFC 2385: Protection of BGP Sessions via the TCP MD5 Signature Option
- RFC 2545: BGP-4 Multiprotocol Extensions for IPv6 Inter-domain Routing
- RFC 2918: Route Refresh Capability for BGP-4
- RFC 3107: Carrying Label Information in BGP-4
- RFC 4271: A Border Gateway Protocol 4 (BGP-4)
- RFC 4360: BGP Extended Communities Attribute
- RFC 4456: BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)
- RFC 4486: Subcodes for BGP Cease Notification Message
- • RFC 4724: Graceful Restart
- RFC 4760: Multiprotocol Extensions for BGP-4
- RFC 5492: Capabilities Advertisement with BGP-4
- RFC 6793: BGP Support for Four-Octet Autonomous System (AS) Number Space
- RFC 7432: BGP MPLS-Based Ethernet VPN (Spine solution)
- Neighbor-specific route maps
- Peer Templates
- RTO Full Condition Handling
- BGP Communities
- IPv6 Support
- BGP IPv6 Transport
- Stripping of Private AS Numbers

BGP4 MIBs

- RFC 4273: Definitions of Managed Objects for BGP-4.
- FASTPATH: Enterprise MIB Supporting BGP Features.

Metro

Core Metro Features

- IEEE 802.1ad draft 6: Double VLAN tagging (in compliance with TR-101)
- IEEE 802.1ag draft 8.1: Connectivity Fault Management (CFM)
- IEEE 802.3ah draft 1.9 (clause 57) Operations, Administration, and Maintenance (OAM)
- DSL Forum TR-069: CPE WAN Management Protocol (supports objects from TR-098)
- Layer-2 Protocol Tunneling (L2PT)

Metro MIBs

- IEEE8021-CFM-MIB: Connectivity Fault Management MIB
- draft-squirehubmib-efmmib-00.txt: Ethernet in the First Mile (EFM) Common MIB
- Private MIBs:
  - FASTPATH-METRODOT1AD-PRIVATE-MIB
  - FASTPATH-TR069-PRIVATE-MIB
  - FASTPATH-METRODOT1AG-PRIVATE-MIB

Data Center

Core Data Center Features

- IEEE 802.1Qau: Virtual Bridged Local Area Networks Amendment 13: Congestion Notification (Draft 2.4)
- IEEE 802.1Qaz: Enhanced Transmission Election for Bandwidth Sharing between Traffic Classes (Draft 2.4)
- ANSI/INCITS Fibre Channel Backbone-5 (FC-BB-5) Rev 2.0.0 – FIP Snooping Bridge

- OpenFlow Switch Specification, Version 1.0.0 (Wire Protocol 0x01) and Version 1.3.4
- RFC 7047: Open vSwitch Database Management Protocol

Data Center MIBs

- IEEE 802.1:
  - Congestion Management MIB(IEEE8021-CN-MIB)
  - Textual Conventions MIB (IEEE8021-TC-MIB)
  - LLDP V2 TC MIB

Service Provider

Core Service Provider Features

- MEF 6.2: Ethernet Services Definitions
- MEF 10.3: Ethernet Services Attributes
- MEF CE 2.0: Carrier Ethernet 2.0Certification
- IEEE 802.1ah: Provider Backbone Bridges
- ITU-T G.8031(01/15): Ethernet Linear Protection
- ITU-T G.8032(08/15): Ethernet ring protection Switching
- Ethernet Virtual Connection (EVC) for E-LINE, E-LAN, and E-TREE Services
- Unified OAM Infrastructure
  - IEEE 802.1ag (CFM)
  - Y.1731 (Ethernet OAM)
- Service Provider MIBs
- IEEE8021-PBB-MIB: The Provider Backbone Bridge (PBB) MIB
- IEEE8021-CFM-MIB: IEEE 802.1ag CFM MIB
- IEEE8021-CFM-V2-MIB: Connectivity Fault Management V2 Module for Managing IEEE 802.1ag-2007
- MEF-SOAM-FM-MIB: MEF ETHERNET SERVICE OAM (SOAM) MIB for Fault Management (FM)
- FASTPATH-OAM-PRIVATE-MIB: The Broadcom Private MIB for FASTPATH OAM
- FASTPATH-EVC-MIB: Broadcom FASTPATH Ethernet Virtual Circuit MIB

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