# Software Development Kit
# Release Notes
# SDK 6.4.11

March 07, 2016

***Broadcom***
***Network Switching***

# Section 1: About This Document

These are the Release Notes for the Broadcom Network Switching Software Development Kit Release 6.4.11.

This document provides a general description of the release and its new features. It also describes the chips supported by the release, BCM API additions or changes, resolved issues, and any relevant open issues. The reader should refer to prior release notes for 6.4.x, as only new features or issues are described in this version of the release notes.

# Section 2: Product Documentation

The following documents in Product Documentation (page 3) are available through Broadcom's Customer Support Portal, http://support.broadcom.com. They are the primary source of information and should be referenced when using this release:

***Table 1: Product Documentation***

| *Document* | *Description* |
|---|---|
| 56XX-PG6411-R | BCM API Reference Guide. This manual describes the theory of operations of the API and all existing BCM APIs for this release. |
| 56XX-PG707-R | Stacking Software Guide This guide describes how to use the discovery and stacking applications provided in this release. |
| 56XX-PG819-R | Platform Guide This guide describes the SDK source and Makefile structure, abstraction and porting layers, device specific interactions, and the platform/operating system specific features of the SDK. If this is your first time working with the SDK, start with this document. |

# Section 3: New Devices added to this release

For any given SDK release, support for certain devices may be provided in Preview or Supported status. Devices in Supported Switch Devices (page 4) and Supported PHYs (page 4) have completed the full QA process and are intended for use in production systems. It is expected that customers would integrate the version of the SDK which provides "Supported" status for their use on actual development or production systems.

Devices in Preview Switch Devices () and Preview PHYs (page 4) are provided to allow early integration of the customer's application with the SDK APIs that support that device. This software has not been fully tested on the physical target device and should not be expected to fully function.

***Table 2: Supported Switch Devices***

| *Family* | *Devices* | *Description* |
|---|---|---|
| BCM56260 | BCM56233 B0 | 4xGE UNI + 2xGE NNI + 2.5GE to FPGA |
| BCM56960 | BCM56961 B1 | 64x40GbE port configuration |
| | BCM56962 B1 | 24x 100GbE/48x 40GbE Multilayer Switch |
| | BCM56968 B1 | 32x HG[106]/64x HG[42] Multilayer Switch |

***Table 3: Supported PHYs***

| *Device* | *Driver Family* | *Description* | *Switch qualified against* |
|---|---|---|---|
| BCM82864 | 82864 | 40GbE PMA MUX/DEMUX with 100GbE Bypass | BCM56960 |
| BCM82790 A0 | 82790 | 100GbE/OTN CAUI-to-10GbE VSR/CR4/SR4/LR4/KR4 Gearbox PHY | BCM56860 |
| BCM82792 A0 | 82790 | Dual 100G/OTN CAUI-to-100GbE VSR/CR4/SR4/LR4 Gearbox PHY | BCM56860 |
| BCM82796 A0 | 82790 | Dual 100G/Quad 40G VSR/CR4/SR4/LR4 Gearbox PHY | BCM56860 |
| BCM84328 | 84328 | Dual 40GbE/Octal 10GbE QSFP+ XLPPI-to-XLAUI PHY | BCM56860 |
| BCM82328 | 84328 | Dual 40GbE/Octal 10GbE QSFP+ XLPPI-to-XLAUI PHY | BCM56860 |

***Table 4: Preview PHYs***

| *Device* | *Driver Family* | *Description* | *Switch qualified against* |
|---|---|---|---|
| BCM82332 | 82332 | 1x 100G/3x 40G/12x 10G Ethernet PHY | BCM56860 |
| BCM82793 | 82332 | 100G Gearbox for 100GBASE CR4/SR4/LR4 & SR10 | BCM56860 |

# Section 4: New Features per Device

# BCM56860 UPDATES

## ADDITIONAL FEATURES SUPPORTED

This release adds GA functionality for RioT support on VPLS and Beta functionality for RioT support on L2GRE.

# BCM88670-FAMILY GA RELEASE

This release is for the BCM88370-Family and BCM88670-Family product lines. Compared to 6.4.10, the 6.4.11 release delivers increased quality as well as introducing new features.

The subsequent sections describe the increment in available features compared to 6.4.11, major bug-fixes and known issues.

## IMPORTANT NOTES

- Release is aligned with KBP-SDK 1.3.12 for external TCAM and KAPS.
- Scheduled Warmboot is supported
- ERSPAN header encapsulation is now changed: In the GRE header, the K flag is reset and the S flag is set (aligned to ERSPAN type2 RFC).
- P2P traffic set packets now to be considered as Known-DA, in previous versions it was set as unknown-DA. This influence for example: Ethernet policer functionality and Egress filtering according to DA-type. Note: PON application still consider P2P traffic as Known-DA (see errata).
- In system mode where `bcm886xx_vlan_translate_mode` soc property is set to 0, packets with IVE command 0 (NOP action) will have now PPH increased by 3 bytes in order to pass important information such as In-LIF filtering resolution at the egress and allow Up-MEP OAM functionality
- Qualifier bcmFieldQualifyOutPort is blocked for 88670 (since it does not have a 'core' bit). Use bcmFieldQualifyDstPort instead.

## BCM88670-FAMILY B0 REVISION SUPPORT

Following is the list of the expected bug fixes and enhancements that require SDK support and its timeframe.

***Table 5: BCM88670-Family B0 revision support status***

| *Feature/Bug fix* | *SDK JIRA* | *Documentation* | *Timeframe* | *Comments* |
|---|---|---|---|---|
| OAM UP-MEP LIF-profile | SDK-87294 | Errata#1 | 6.5.4 | |
| ETPP Counter Pointer by OutLIF | SDK-76171 | Errata#3 | 6.4.10 | Completed |
| Hierarchical FEC Does Not Work When the 1st FEC Hierarchy is Unprotected | SDK-75505 | Errata#17 | 6.4.9 | Coding & Validation completed |
| OAM Classifier Can Not Count Per Priority | SDK-84890 | Errata#18 | 6.4.11 | |

*Table 5: BCM88670-Family B0 revision support status*

| *Feature/Bug fix* | *SDK JIRA* | *Documentation* | *Timeframe* | *Comments* |
|---|---|---|---|---|
| ROO remarking of Native IP Header | SDK-76172 | Errata#19 | 6.4.11 | 6.4.9 coding is done. Completed validation in 6.4.11. |
| Routing out of Mac-in-MAC Tunnel (part of ROO SPB) | SDK-76178 | Errata#20 | 6.4.10 | |
| IP-MC Fallback to Bridge PCP/DEI | SDK-76174 | Errata#21 | 6.4.10 | |
| MPLS LSR EXP remark | SDK-76175 | Errata#22 | 6.5.3 | |
| GLEM Trap is Not Reliable | SDK-75507 | Errata#23 | 6.4.10 | |
| Mapping TC-DP to EXP/TOS at the ETPP is using wrong profile | SDK-88249 | Errata#33 | 6.4.11 | Most coding in 6.4.9. Validation completed in 6.4.11. |
| Egress VLAN Editing (EVE) Used to Remove VLAN Tags Causes Outbound Mirroring to Work Improperly | SDK-76177 | Errata#34 | 6.4.10 | Implemented and validated |
| MPLS EEDB Utilization Improvement, MPLS PUSH2SWAP | SDK-81282 | Section in 88670-AG304-R document | 6.4.10 | |
| Forwarding and Link-Layer MTU per Out-LIF | SDK-76184 | Section in 88670-AG304-R document | TBD | |
| Egress VLAN Membership Check | SDK-76177 | Section in 88670-AG304-R document | 6.4.10 | Implemented and validated |
| 14 MPLS Push Commands | SDK-79923 | Section in next 88670-AG304-R document (not published yet) | 6.4.10 | |
| LB Key Enhancements | SDK-82302 | Section in next 88670-AG304-R document (not published yet) | 6.4.11 | |

## VALIDATED FEATURES

Basic data path, connectivity and Traffic Management features:

- Packet size mechanism for Metering
- SAT Frame Delay
- Header compensation for E2E Scheduler and CRPS
- NIF Priority Drop

Packet Processing:

- PON (including ARM)
- OAM: SAT Up-MEP LBM/TST
- L3 LPM(KAPS) now supports single DB mode. The value 0 for the soc property `public_ip_frwrd_table_size` is now valid.
- Routing over AC `(cint_route_over_ac.c)`
- Support SLM transmission through the OAMP
- MPLS TUNNEL (B0 only): One egress encapsulation entry can be used for both push and swap commands,

according to the incoming packet parameter (forwarding protocol and the entry location in the EE stack). In case forwarding protocol is MPLS and the entry is the innermost encapsulation, SWAP will be performed. Otherwise PUSH command will be executed. To enable this functionality soc property `mpls_encapsulation_action_swap_or_push_enable` should be set to 1 and `bcm_tunnel_initiator_create` action should be set to `BCM_MPLS_EGRESS_ACTION_SWAP_OR_PUSH`.

- For L3VPN application, tunnels that were terminated according to DIP, SIP &VRF are now terminated according to DIP, SIP, VRF, IP Protocol and GRE Protocol Type (where applicable). IP Protocol & GRE Protocol Type are set according to a Tunnel type value.

## NEW FEATURES

- Added new API procedures (`bcm_field_action_width_set()`, `bcm_field_action_width_get()`) to control number of bits (width) required per action. Details are in the updated 88X7X-PG1XX Programmer's Guide document.
- BCM88670 ITMH is only parsed when SOC property `itmh_programmable_mode_enable` is set to '0'. For BCM88670 to parse ITMH header of BCM88660 correctly, user should set `itmh_programmable_mode_enable=1` and `itmh_arad_mode_enable=1`.
- The qualifier bcmFieldQualifyOutPort may not be used on BCM88670. Instead, user should take bcmFieldQualifyDstPort.

## MAJOR BUGFIXES

The list below refers to major bugfixes, and does not provide a comprehensive coverage of various bugfixes on all levels.

Basic data path, connectivity and Traffic Management features:

- ROP fix for Jericho`MX B0.

Packet Processing:

- In FCoE, delete and get LPM route (using flag `BCM_FCOE_DOMAIN_ROUTE`) failed due to internal error. Issue fixed and now it is possible to get and delete LPM entries.
- In L3, when calling `bcm_l3_host_traverse()`, only up to 129 entries were handled by the callback function, even if more hosts reside in the host table.
- In L3, when setting the SOC property `"bcm886xx_l3_ingress_urpf_enable=1"`, a bit was allocated in the inLIF profile for uRPF handling (as in ARAD+). This behavior is correct only for ARAD+, because in Jericho, the inRIF profile controls the uRPF behavior. All redundant LIF configurations related to uRPF have been removed for Jericho.
- P2P traffic set packets to be considered as Unknown-DA while it is expected to be Known-DA. This influence for example: Ethernet policer functionality and Egress filtering according to DA-type. This is now fixed.
- When using the API `bcm_l2_replace()` with the flag `BCM_L2_REPLACE_MIGRATE_PORT`, the destination was not properly updated
- Tunnel termination mode 6 (DIP,SIP,VRF) did not relate to TunnelType
- The creation of multiple endpoints using `bcm_oam_endpoint_create`, `bcm_oam_endpoint_action_set` run time was improved by an order of magnitude.
- ERSPAN IP Length was fixed for IP routed packets.
- IPv4 tunnel termination was not terminated correctly when `bcm886xx_ipv6_tunnel_enable` was set to '0'. There was wrong processing in Tunnel Termination micro-code.
- Outbound mirroring for out-port has been fixed. Extended API (`bcm_mirror_port_vlan_destination_add()`) now updates profile corresponding to `'mirror_dest'`.

## ERRATA

The list below relates to major open bugs that are not resolved:

Packet Processing:

- OAMP report mode is not supported
- OAM server is not supported
- BFD: Remote Multiplier detection is not functional
- OAM/BFD statistics is not functional
- When UDH is enabled in the system (User-define-header) following OAM/BFD applications are not functional: MAID 11B, BFD echo, BFD PWE GAL, Micro-BFD
- PON application consider P2P traffic as known DA instead of unknown DA.

## FEATURE STATUS

***Table 6: Features Status***

| ***Features*** | ***Status*** |
|---|---|
| Initialization sequence, Register Access, PCID, Access TR Tests | GA |
| ARAD+ : Base Legacy Features (L2, L3, STG, MPLS, COSQ,QOS, RX/TX) | GA |
| FP (PMF) | GA |
| Ports and Interfaces | |
| 10GE KR/XFI | GA |
| 10GE RXAUI | GA |
| 10GE XAUI | GA |
| 40GE XLGE | GA |
| 40GE XLGE-2 | GA |
| 100GE CGE | GA |
| SGMII | GA |
| QSGMII | GA |
| ILKN-12 | GA |
| ILKN-24 | GA |
| Eyescan | GA |
| Autoneg (CL72/73/93...) | GA |
| LinkScan | GA |
| NL12 | GA |
| Statistics/Counting | |
| MIB counters | GA |
| Statistics Interface | GA |
| Counter Processor | GA |
| CPU/Access | |
| Packet DMA (CPU RX/TX) | GA |
| RCPU | GA |
| Fabric | |
| TDM | GA |
| Pipes: single, dual, triple | GA |
| Cell packing | GA |
| Repeater link | GA |

*Table 6: Features Status*

| *Features* | *Status* |
|---|---|
| Reachability enhancements: routing bitmap, links to destination | GA |
| Fabric RX/TX FIFO Scheduling | GA |
| Fabric RX FC, Drop & RCI | GA |
| Link Level FC | GA |
| Mesh Connectivity | GA |
| Source Routed Cells | GA |
| Live card Insertion/removal | GA |
| Fabric Isolation | GA |
| Traffic Management and Queuing | |
| Basic UC/MC | GA |
| MC double-CUD | GA |
| Mirroring | GA |
| Recycling | GA |
| VSQ | GA |
| SYSTEM RED | GA |
| Other Legacy Features (Routing & Tunneling & Leased svcs) | |
| TRILL | GA |
| LAG | GA |
| Tunnel | GA |
| MIM | GA |
| FCOE | GA |
| Cell-packing | GA |
| VPLS | GA |
| FEC Management | GA |
| Vxlan | GA |
| Vswitch | GA |
| ECMP | GA |
| Flow Control | |
| Inband Link level | GA |
| Inband PFC | GA |
| Inband ILKN | GA |
| OOB ILKN | GA |
| HCFC | GA |
| SPI | GA |
| COE | GA |
| FC Generation (based on VSQ/Ing. Resources) | GA |
| New or Enhanced Features | |
| Policer | GA |
| Routing | |
| MPLS Enhancements | GA |
| Hierarchical-FEC L3 | GA |
| VRRP Enhancements | GA |
| RIOT/ROO (Unicast) | GA |
| TDM | GA |
| IPV4 (LPM) | GA |
| IPV6 (LPM) | GA |
| H-FEC VPLS | GA |
| MPLS/VPLS Multicast | GA |

*Table 6: Features Status*

| *Features* | *Status* |
|---|---|
| Routing Improvements | GA |
| Overlay/ROO/RIOT MC | GA |
| Routing over Trill | GA |
| DCB | |
| ECN | GA |
| 802.1BR, UC L2 bridging only | GA |
| Miscellaneous | |
| Interrupts | GA |
| External PHY (mechanism only, each specific phy/retimer requires dedicated interop | LGA |
| Dynamic Port Provisioning | GA |
| HiGig | GA |
| SER Protection | GA |
| SyncE | GA |
| Protection improvements : Coupled-mode OutLIF | GA |
| EVPN | GA |
| Ingress Congestion Management | GA |
| Ingress Shaping | GA |
| SAT | Beta |
| OAM & Access | |
| Ethernet OAM over LAG | GA |
| OAM (ARAD+ compatible) | GA |
| BFD (ARAD+ compatible) | GA |
| OAM/BFD enhancements | GA |

# BCM88770 (FE3600) RELEASE

The Broadcom BCM88770 (formerly named BCM88950) is the fourth generation in the Dune product line of Fabric Element (FE) devices.

This is a sustain release of BCM88950 driver, with all major features supported.

# BCM88660 (ARAD+) RELEASE

This is a sustain release of BCM88660 driver, with all major features supported.

## MAJOR BUGFIXES

- OAMP server: destroying, updating Up MEP failed.

# NEW EXTERNAL PHY SUPPORT

## BCM8279X ADDITIONAL SUPPORT

The BCM82792/6 is a dual 100Gbps Gearbox PHY that multiplexes and demultiplexes eight 25Gbps channels to/from twenty 10Gbps channels supporting Ethernet and Optical Transport Networking(OTN). The BCM82792/796 is compli-

ant with the IEEE 802.3ba standard for 100GbE and ITU OTL4.4 signaling, as well as 40GbE, OTL 3.4, and OTL 4.10. The Lane interface supports four bidirectional lanes at 25.78125/27.952493 Gbps for 100GbE/OTL4.4 applications.

This release is considered GA for BCM8279x. Additional functionality supported in this release:

- HIGIG2
- All flexport modes including these added in the release: 100G GB to 40G Mux 100G GB to 10G PT Enzo mode 40G Mux to 100G 10G PT Enzo mode to 100G GB 40G PT Enzo mode to 40G Mux

Limitations:

- Chip reset will reset all the ports that share the same PHY-ID (MDIO ADDR).

## BCM82864 ADDITIONAL SUPPORT

The BCM82864 is a 40Gbps PMA Gearbox phy that demultiplexes eight 20Gbps channels to sixteen 10Gbps channels supporting Ethernet and Optical Transport Networking(OTN). Additionally the device will operate in 100GbE mode where the BCM82864 supports two full-duplex 100Gbps ports.

This release is considered GA for BCM82864. Additional features supported in this release:

- LR2/SR2/CR2/KR2 are supported in this release.
- CAUI4, CAUI-C2C, CAUI-C2M interfaces are supported in this release
- Retimer is supported in this release.

Driver Limitations:

- Chip reset will reset all the ports that share the same PHY-ID (MDIO ADDR).
- Flexport and Higig are supported at Beta level in this release.

## BCM82328/BCM84328 SUPPORT

BCM82328 is a low power, low latency PHY integrating retime and equalizer functions supporting 40-GbR and 10GbE applications. In 40G mode it supports two full-duplex 40GbE ports (XLPPI-to-XLAUI/KR4) for SR4, LR4, and copper CR4 QSFP+ line-card applications. In 10G mode, it supports eight full-duplex 10GbE ports (SFI-to-XFI/KR) for SR, LR and copper CR SFP+ line-card applications. Operates with with the following reference clocks: Single 156.25 MHz differential clock for 1.25 Gbps, 10.3125 Gpbs and 11.5 Gbps Functionality Supported:

- Link status
- Speed and Interface configuration
- port enable/disable
- Duplex set/get
- Polarity inversion
- Power set/get
- PRBS
- Loopback set/get
- Diagnostics
- Tx set/Get
- Rx set/Get
- Auto negotiation
- Reg read/write
- PHY Reset
- I2C module controller

- Auto module detect
- Probe

Driver Limitations:

- Repeater mode only, no retimer operation
- Clause 73 only for starting Clause 72 and requesting FEC. No speed resolution performed. No Clause 73 in 11.5 Gbps line rate, only Clause 72 supported. Clause 72 may be enabled standalone for close systems. Clause 37 is not supported. No on-chip FEC encoding/decoding, but shall pass-through FEC-encoded data.

BCM84328 is a low power, low latency PHY integrating retime and equalizer functions supporting 40-GbR and 10GbE applications. In 40G mode it supports two full-duplex 40GbE ports (XLPPI-to-XLAUI/KR4) for SR4, LR4, and copper CR4 QSFP+ line-card applications. In 10G mode, it supports eight full-duplex 10GbE ports (SFI-to-XFI/KR) for SR, LR and copper CR SFP+ line-card applications. Operates with the following reference clocks: Single 156.25 MHz differential clock for 1.25 Gbps, 10.3125 Gpbs and 11.5 Gbps. Functionality Supported:

- Link status
- Speed and Interface configuration
- port enable/disable
- mdix set/get
- Polarity inversion
- Power set/get
- PRBS
- Loopback set/get
- Diagnostics
- Tx set/Get
- Rx set/Get
- Auto negotiation
- Reg read/write
- PHY Reset
- Probe
- I2C module controller
- Auto module detect

Driver Limitations:

- Repeater mode only, no retimer operation.
- Clause 73 only for starting Clause 72 and requesting FEC. No speed resolution performed. No Clause 73 in 11.5 Gbps line rate, only Clause 72 supported. Clause 72 may be enabled standalone for close systems. Clause 37 is not supported. No on-chip FEC encoding/decoding, but shall pass-through FEC-encoded data

# Section 5: Things to note

This section lists items that require special attention that are new to this release. Please see prior 6.4.x release notes for a list of older items that should also be noted.

## ALERT ON END OF MAINTENANCE RELEASE CYCLE FOR SDK 6.4

This SDK 6.4.11 release is the last official maintenance release under the SDK 6.4 delivery stream. For new designs or software releases, customers should plan on moving to the upcoming SDK 6.5.3 release.

## ROUTE INSTALLATION CONSIDERATIONS ON BCM56960 IN ALPM MODE

In BCM56960, due to the relatively small size of UFT and the design of sharing one UFT bucket between multiple pivots, the bcmSwitchObjectL3RouteV4RoutesMax, bcmSwitchObjectL3RouteV6Routes64bMax and bcmSwitchObjectL3RouteV6Routes128bMax in ALPM mode return the number of maximum possible routes that could be installed respectively. The actual number of routes that could be installed may be smaller than those objects.

## BCM56860 FLEXPORT MAXIMUM NUMBER LOGICAL PORTS WHEN SUPPORTING PORT

BCM56860 supports only up to 44 logical ports per pipeline (i.e. 88 for entire device) when system is configured for port speeds >= 100GE.

## SLIGHT DEVIATION OF TRAFFIC DISTRIBUTION ACCURACY ON BCM56860

BCM56860 customers may see some slight deviations with the accuracy of traffic distribution in MMU. The amount of deviation is less than 1%, and depends on the packet size and traffic conditions. The issue will remain intermittent until Broadcom completes internal verification and tuning of MMU parameters as a part of BCM56860 PRA preparation.

Once optimized MMU settings become available, they will be integrated into a future SDK release

## MINIMUM VXLAN VPN ID FOR BCM56860 AND BCM56960

VPN ID 0x7000 is allowed when calling `bcm_vxlan_vpn_create` with `BCM_VXLAN_PORT_WITH_ID` on BCM56850. It is not allowed for BCM56860 and BCM56960 due to VPN ID 0x7000 is reserved on those devices.

## BCM56960 - MIX OF AUTONEG AND FORCED SPEED PORTS

# WITHIN A SINGLE FALCON

Due to a single PLL constraint inside the Falcon, a mix of both autoneg and forced speed on a single core is currently not supported. All the ports on a single core should be all in autoneg or forced speed mode. The first port of a core doing autoneg will disable the rest of the forced speed ports on the same core. Once the first port on a core completes autoneg and the VCO is locked, the rest of ports on the same core can only do autoneg with the same VCO.

# CHANGES IN TRUNK FIELD ACTION IN BCM56960

BCM56960 supports only RoundRobin and Random hashing unlike older devices. Hence, Field actions - bcmFieldActionDynamicHgTrunkCancel, bcmFieldActionTrunkLoadBalanceCancel, bcmFieldActionEcmpLoadBalanceCancel, which were used to disable dynamic hashing are not supported on BCM56960. These are updated to new field actions bcmFieldActionHgTrunkRandomRoundRobinHashCancel, bcmFieldActionTrunkRandomRoundRobinHashCancel, bcmFieldActionEcmpRandomRoundRobinHashCancel which can be used to disable HG Trunk load balancing, Trunk load balancing and ECMP load balancing respectively.

# SPN_PHY_PORT_PRIMARY_AND_OFFSET CONFIG PROPERTY IS REQUIRED FOR NEW PHYS

Setting of the config property `spn_PHY_PORT_PRIMARY_AND_OFFSET` is absolutely required for the following PHYs. BCM54880E BCM54680E BCM54682E BCM54685E BCM54640E BCM542XX

# POTENTIAL BCM MODULE DETACH ISSUE IN THE RELEASES PRIOR TO 6.4.7

In pre-6.4.7 releases, during bcm detach, UDF module is detached even before field module. In addition, during Field detach, there is deference to UDF module elements which got freed earlier. This was causing segmentation fault.

If the segmentation fault issue is seen during `bcm_detach,` patch from SDK-76765 needs to be applied.

*Table 7: Potential Impacts*

| *Scenarios* | *Devices* |
|---|---|
| Warmboot<br>Applications need detaching BCM modules | • BCM56240<br>• BCM56260<br>• BCM56340<br>• BCM56440<br>• BCM56450<br>• BCM56530<br>• BCM56545<br>• BCM56630<br>• BCM56640<br>• BCM56840_PLUS<br>• BCM56850<br>• BCM56860<br>• BCM56960<br>• BCM56260<br>• BCM56460 |

# BCM82780 INTERFACE CONSIDERATIONS

If using BCM82780 40G mode with interface type CR4/LR4/SR4/KR4, it is required to set the system interface config side to XLAUI/KR4.

For example:

```
phy_sys_interface_xe0=15   /* to set it to XLAUI */
```

If using BCM82780 10G mode, it is required to set the external PHY primary core number config variable in the config file. If the MDIO address of the first port for a given core is 0x20.., the config variable should be set as follows:

```
Xphy_primary_core_num_32=0x20
Xphy_primary_core_num_33=0x20
Xphy_primary_core_num_34=0x20
Xphy_primary_core_num_35=0x20
```

The syntax is : Xphy_primary_core_num_<mdio address in decimal>=<primary port mdio address> In BCM82780 if the port is in KR4 mode, should the user intend to change the interface the command needs to be executed twice:

```
>port xe0,xe1 if=xlaui sp=40000 an=0
>port xe0,xe1 if=xlaui sp=40000 an=0 /* to change interface from KR4 to XLAUI
*/
```

# RECENT PHY INTERFACE LIBRARY CHANGES

The 100G interface for BCM56860, BCM86375, and BCM88560 devices required extensive changes to the interface library called "Portmod". In SDK 6.4.8, BCM5686x operations for "Portmod" with BCM8279x family was verified. BCM8279x is GA quality in release SDK 6.4.9. For legacy 10G/40G devices, the "Portmod" changes required the shim layer to be created to enable the drivers to connect to the Falcon and Eagle cores. This work was completed in SDK 6.4.8, and thus made these legacy PHYs operational with the Portmod capable switches noted above.

# ENGINEERING SUPPORT STATEMENT FOR OLDER XGS SDK RELEASES

The following releases are now out of XGS engineering support since they are older than 12 months since release:

- SDK 6.4.x releases: 6.4.4, 6.4.3, 6.4.2, 6.4.1, 6.4.0
- SDK 6.3.x releases: 6.3.11 and older
- All 6.2.x and older releases.

Service impacting defects will be reviewed and potentially addressed on these older releases. Support for non-service impacting defects will only be provided to customers running a SDK release that is less than 12 months old.

The following table Resolved issues and improvements per older XGS device family (page 16) shows the number of issues and improvements that have been added to our supported SDK releases by device over the past 12 months. While the table shows individual devices, many issues and improvements will apply to multiple products, e.g. BCM56850 and BCM56860, or all XGS products.

***Table 8: Resolved issues and improvements per older XGS device family***

| *Device specific issues* | *Bugs resolved in the past 12 months* | *Improvements added in the past 12 months* |
|---|---|---|
| BCM56850 family | 348 | 167 |
| BCM56840_PLUS | 69 | 10 |
| BCM56340 family | 73 | 15 |
| BCM56640 family | 148 | 36 |
| BCM56450 family | 226 | 67 |
| BCM56150 family | 28 | 2 |
| BCM56440 family | 61 | 10 |
| BCM53440 family | 44 | 30 |

# NOTES AND CONSIDERATIONS OF WARMBOOT FOR SPECIFIC DEVICES AND FEATURES

## WARMBOOT: VALIDATED WARMBOOT UPGRADES

Following warmboot upgrades in Warmboot: Validated Warmboot upgrades (page 17) have been validated in this release.

*Table 9: Warmboot: Validated Warmboot upgrades*

| *Software upgrade* | *Supported* |
|---|---|
| 6.4.10 to 6.4.11 | Yes |
| 6.3.12 to 6.4.11 | Yes |

Warmboot testing and issue resolution has focused on the following family of devices:

- BCM53400/BCM56060
- BCM56150
- BCM56220
- BCM56340
- BCM56440
- BCM56450
- BCM56640
- BCM56840
- BCM56850
- BCM56860
- BCM56960

## WARMBOOT SUPPORT FOR EMBEDDED APPLICATIONS

This section describes warmboot support and procedures for associated firmware supported in SDK 6.4.x. Below are the various embedded applications (FW) available and supported with SDK 6.4.x

- BFD
- BHH LM/DM
- MPLS LM/DM
- ETH LM/DM
- Broadsync
- 1588/PTP

All applications support warmboot with the exception of 1588/PTP. Warmboot for the above apps follows the same process like any other module on SDK side. Eapps warmboot support is through Level-2 warmboot i.e. requires information to be stored in sCache.

SDK warmboot doesn't affect execution of embedded applications (except 1588/PTP firmware) on internal ARM cores and they keep running as is and maintain their state.

### *Warmboot procedures*

- Users are expected to invoke "sc ControlSync=1" command in the BCM diag-shell to store the information in sCache
- The corresponding API is `bcm_switch_control_set(int` unit, `bcm_switch_control_t` type, `int` arg)
- Note: Typically, storing of information in sCache is required when there is a module or session or context creation on SDK side. Calling of the `bcm_switch_control_set()` API is left to the discretion of user/customer depending on their system requirements for example, after each session creation or module init or before the warmboot procedure initiation

- Free up the resources attached to the unit by calling below API equivalent of "exit clean" BCM shell command. i.e, `"soc_shutdown` (int unit)" Note: Broadsync warmboot procedure mandates usage of the above API. As part of API, SDK informs the embedded ARM core about the warmboot process initiation so that BroadSync FW waits for the SDK warmboot procedure to complete for further communication

***Steps to follow during the SDK warmboot***

Below is an example sequence of diag-shell commands executed (through reload.soc) as part of the SDK warmboot sequence for initializing SDK HOST and firmware communication

- MCSMsg INIT;
- MCSMsg 0;
- MCSMsg 1;
- "MCSMsg INIT" and "MCSMsg x" commands invokes the below APIs respectively:
- `soc_cmic_uc_msg_start(int` unit) /* Allocates Messaging resources/Mutexes */
- `soc_cmic_uc_msg_uc_start(int` unit, `int` uc) /* Starts Messaging with specific core.*/

Customers have to include the above calls in their SW.

## COSQ WARMBOOT

The scache file, which is used to store software data related to COSq during level-2 Warmboot for BCM56640 and related SKUs, has a different data structure between 6.3.x releases and 6.4.x releases. However, the data structure difference cannot be distinguished, because they are marked with the same warmboot version number.

If level-2 warmboot is used to upgrade from release 6.3.3 and later to release 6.4.x, the COSq module will be restored with incorrect data. Starting from 6.4.7, the `num_cosq` field has now been added the in Scache which is later retrieved during WarmBoot and used.

## WARMBOOT COSQ CONSIDERATION FOR BCM56340

In BCM56340 device family, CosQNew implementation was not incorrect in previous version.This programming error has been corrected using SDK-82083/SDK-83152 in 6.5.2 and 6.4.8.

Due to this while upgrading from older version, CosQNew action will be recovered as UcastCosQNew.

## FLEXHASH WARMBOOT

Flex hash warmboot was implemented in SDK-6.4.7. If level-2 warmboot is used to upgrade from release 6.3.12, the Flex hash will be restored with incorrect data.

## POTENTIAL WARMBOOT ISSUE IN 6.3.12 TO 6.4.7 ON BCM56450 DEVICE FAMILY

In 6.3.12 and earlier releases, the scheduling node properties were programmed in the wrong node for HiGig and loopback ports. This was corrected in 6.4.5 and later releases. If the configuration was done on 6.3.12, it was configured incorrectly. After the Warmboot upgrade is performed and a read is issued, the reading is taken from the correct node and the comparison test fails for mismatched values.

The values don't match and it is causing failure in some of tests which read back and compare the values.

- 6.3.12 -> 6.3.12 -> Passes - value is configured and read from wrong node. Comparison test passes due to wrong reason.
- 6.4.5/6/7-> 6.4.5/6/7 -> Passes -> Value is configured and read from correct node.
- 6.3.12-> 6.4.7 -> Fails -> Value configured on wrong node, but read from right node. Comparison test fails since

value does not match.

The fix has to go into 6.3.12. Patch is available for 6.3.x related branches. It is recommended to patch this in 6.3.12, if scheduling node properties of HG or loop back ports are modified in 6.3.12.

## POTENTIAL WARMBOOT ISSUES IN 6.3.12 TO 6.4.7 ON BCM56850 DEVICE FAMILY

In SDK-6.4.6 and SDK-6.3.12 releases, the port index used to store and recover E2ECC configuration during Warmboot synchronization and recovery was incorrect. This issue has been fixed in SDK-6.4.7. As a result, some 6.3.12/6.4.6 -> 6.4.7 warmboot test cases would fail since the port index value doesn't match after the warmboot. To get the case working, customers will require patching the code changes attached in SDK-79646 to SDK-6.4.6 or SDK-6.3.12. Releases starting with SDK-6.4.7 have no such problem.

SDK-6.4.6 and SDK-6.3.12 releases didn't include Warmboot support for the global configuration variable `_soc_td2_mmu_traffic_ctrl` which is used to control whether the traffic to a port should be enabled or not. This would potentially cause traffic to a port to be dropped after system Warmboot-upgrades to SDK-6.4.7. To get the case working, customers will require patching the code changes committed in SDK-77046 to SDK-6.4.6 or SDK-6.3.12. Releases starting with SDK-6.4.7 have no such problem.

In SDK-6.3.12 release, the value of the enum `BCM_PORT_PHY_CONTROL_PARALLEL_DETECTION` was different from that in SDK-6.4.X releases. This would cause the enum value saved in SDK 6.3.12 to not be interpreted correctly in SDK 6.4.7. To get the case working, customers will require patching the code changes attached in SDK-80136 to SDK-6.3.12. SDK-6.4.X releases have no such problem.

SDK-6.3.12 release didn't include Warmboot support for WRED Time Domain Configuration. This would cause the scache data structure mismatch between SDK-6.3.12 and SDK-6.4.7. To get the case working, customers will require patching the code changes attached in SDK-72889 to SDK-6.3.12. SDK-6.4.X releases have no such problem.

## POTENTIAL WARMBOOT ISSUE UPGRADING TO 6.4.10 FROM RELEASES OLDER THAN 6.4.8

Warm-boot upgrades to release 6.4.10 from releases older than 6.4.8 could fail during "warm-boot sync", to avoid this, a patch would need to be applied before starting the warm-boot.

## WARMBOOT CONSIDERATIONS FOR BCM56860 DEVICE FAMILY

In this release, support has been added for 2.5G speed in the BCM56860 devices. Therefore the AN capabilities for this release would have this additional capability and upgrading from SDK 6.4.8 should accommodate for this requirement.

## WARMBOOT CONSIDERATION FOR BCM56860 DEVICE FAMILY

The warmboot function for `VLAN_VP_INFO(Software` book keeping for VLAN virtual port information) on BCM56850 was added on version 6.4.10. So warmboot case `AT_WarmBoot_123_Check` would be failed when upgrade from 6.4.9 to 6.4.10.

## SCACHE SIZE REQUIREMENTS FOR BCM56960

In BCM56960 the field related software data structures is saved into the s-cache and software recovers and link them back after warm boot. The s-cache size needs to be increased to save all the data structures available in field module. Software depends only on the saved data for the recovery of IFP configurations after warm boot in BCM56960.

The total scache required for IFP in worst case configuration is around 36 MB and total scache requirement is around 40 MB.

## SCACHE SIZE REQUIREMENTS FOR DEVICES IN LEGACY IFP SUPPORT

In warmboot design, the software data structures are saved into the sCache during warmboot sync. When the SDK boots in warmboot mode, it recovers the data structures from sCache and initializes the structures. The sCache size is calculated based on total size of various data structures, considering the max value of every field in the data structure.

In BCM56260, the total scache required for all modules together is 573408 bytes

In BCM53400, the total scache required for all modules together is 380188 bytes

## INCREASE IN WARMBOOT SCACHE FILE SIZE FOR BCM56860 UPGRADE

Due to changes and/or fixes starting in SDK 6.4.11 in feature sets such as Mirroring and Policer, the minimum required scache file size has increased to 5169152 bytes. If the file size is overridden using manual configuration, it must be a size of at least 5169152 bytes else the warmboot upgrade to SDK 6.4.11 might fail.

# Section 6: Summary of BCM API changes and enhancements

This section summarizes BCM API changes in this release. Complete documentation will be available in the Network Switching Software Programmer's Guide newer than 56XX-PG6411-R. (See section 2 earlier in this document for availability).

## CLASS OF SERVICE QUEUE CONFIGURATION

New COSq statistics object is added as shown in `bcm_cosq_stat_t` (page 21) for `bcm_cosq_stat_getXX()` and `bcm_cosq_stat_setXX()` APIs. This is applicable to StrataXGS-III devices only.

***Table 10: bcm_cosq_stat_t***

| *Name* | *Description* |
|---|---|
| bcmCosqStatHOLDropPackets | Per COSQ HOL drop packet count. |

New COSq control types are added in this release as shown in `CoSQ Control Type Values` (page 21) for `bcm_cosq_control_set/get()`.

***Table 11: CoSQ Control Type Values***

| *Value* | *Description* |
|---|---|
| `bcmCosqControlIngressPortDropTpid1` | `cosq` ingress port drop global TPID 1. |
| `bcmCosqControlIngressPortDropTpid2` | `cosq` ingress port drop global TPID 2. |
| `bcmCosqControlIngressPortDropUntaggedPCP` | `cosq` ingress port drop untagged PCP |

New BCM COSQ APIs are introduced in this release.

### bcm_cosq_gport_pkt_size_adjust_set

The purpose of this API is to configure a delta value for a source or enable/disable a certain compensation type.

#### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_gport_pkt_size_adjust_set(
intunit,
bcm_cosq_pkt_size_adjust_info_tadjust_info,
intdelta);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |
| adjust_info(IN) | bcm_cosq_pkt_size_adjust_info structure |
| delta(IN) | delta value |

### Description

The purpose of this API is to configure a delta value for a source or enable/disable a certain compensation type.

```
/* cosq_pkt_size_adjust_info structure */
typedef struct bcm_cosq_pkt_size_adjust_info_s {
    uint32 flags;                       /* flags */
    bcm_gport_t gport;                  /* gport value */
    bcm_cos_queue_t cosq;               /* bcm_cos_queue_t */
    /* adjust source (see BCM_COSQ_CONTROL_table)*/
    bcm_cosq_pkt_size_adjust_source_info_t source_info;
} bcm_cosq_pkt_size_adjust_info_t;

/* cosq_pkt_size_adjust_source_info structure */
typedef struct bcm_cosq_pkt_size_adjust_source_info_s {
   bcm_cosq_pkt_size_adjust_source_t source_type; /* compensation source */
    uint32 source_id;                   /* command id: 0,1 */
} bcm_cosq_pkt_size_adjust_source_info_t;
```

***Table 12: Type of a resource allocated.***

| *Types* | *Description* |
|---|---|
| bcmCosqPktSizeAdjustSourceScheduler | source is Scheduler |
| bcmCosqPktSizeAdjustSourceCrpsInPP | source is CRPS in PP |
| bcmCosqPktSizeAdjustSourceCrpsInTM | source is CRPS in TM |
| bcmCosqPktSizeAdjustSourceStatReportIn | source is Stat Report In |
| bcmCosqPktSizeAdjustSourceStatReportOut | source is Stat Report Out |

### Returns

BCM_E_NONE
BCM_E_XXX

## bcm_cosq_gport_pkt_size_adjust_get

The purpose of this API is to get the delta value configured for a certain compensation type

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_gport_pkt_size_adjust_get(
intunit,
```

```
bcm_cosq_pkt_size_adjust_info_tadjust_info,
int *delta);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |
| adjust_info(IN) | bcm_cosq_pkt_size_adjust_info structure |
| delta(OUT) | received delta value |

### Description

The purpose of this API is to get the delta value configured for a certain compensation type

### Returns

```
BCM_E_NONE
BCM_E_XXX
```

## bcm_cosq_pkt_size_adjust_delta_map_set

Scheduler final delta mapping API

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_pkt_size_adjust_delta_map_set(
    int unit,
    int delta,
    int final_delta);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |
| delta(IN) | delta |
| final_delta(IN) | final delta |

### Description

Scheduler final delta mapping API

### Returns

```
BCM_E_NONE
BCM_E_XXX
```

## bcm_cosq_pkt_size_adjust_delta_map_get

get the final delta mapping

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_pkt_size_adjust_delta_map_get(
    int unit,
    int delta,
    int *final_delta);
```

### Parameters

| | |
|---|---|
| `unit` | BCM device number |
| `delta(IN)` | delta |
| `final_delta(OUT)` | get the final delta |

### Description

get the final delta mapping

### Returns

```
BCM_E_NONE
BCM_E_XXX
```

## bcm_cosq_ingress_port_drop_enable_set bcm_cosq_ingress_port_drop_enable_get

set/get enable/disable cosq ingress port drop

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_ingress_port_drop_enable_set(
intunit,
bcm_port_t port,
uint32 flags,
int enable);

int bcm_cosq_ingress_port_drop_enable_get(
```

```
intunit,
bcm_port_t port,
uint32 flags,
int *enable);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |
| bcm_port_t(IN) | port |
| flags(IN) | flags |
| enable(IN)(for "_set") | TRUE to enable, FALSE to disable |
| enable(OUT)(for "_get") | TRUE to enable, FALSE to disable |

### Description

enable/disable cosq ingress port drop

### Returns

BCM_E_NONE
BCM_E_XXX

---

## bcm_cosq_ingress_port_drop_threshold_set bcm_cosq_ingress_port_drop_threshold_get

set/get cosq ingress port drop thresholds

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_ingress_port_drop_threshold_set(
intunit,
bcm_port_t port,
uint32 flags,
bcm_color_t color,
uint32 value);

int bcm_cosq_ingress_port_drop_threshold_get(
intunit,
bcm_port_t port,
uint32 flags,
bcm_color_t color,
uint32 *value);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |
| bcm_port_t(IN) | port |
| flags(IN) | flags |
| color(IN) | color |
| value(IN)(for "_set") | the required value |
| value(OUT)(for "_get") | the required value |

### Description

The available flags are Ingress Port Drop Flags (page 26)

*Table 13: Ingress Port Drop Flags*

| *Flag* |
|---|
| BCM_COSQ_INGRESS_PORT_DROP_FLAGS_THRESHOLD_PRECENT |

get/set cosq ingress port drop thresholds

### Returns

BCM_E_NONE
BCM_E_XXX

## bcm_cosq_ingress_port_drop_map_set bcm_cosq_ingress_port_drop_map_get

set/get cosq ingress port drop map value

### Syntax

```
#include <bcm/cosq.h>
int bcm_cosq_ingress_port_drop_map_set(
intunit,
bcm_port_t port,
uint32 flags,
bcm_cosq_ingress_port_drop_map_t map,
uint32 key,
bcm_color_t color);

int bcm_cosq_ingress_port_drop_map_set(
intunit,
bcm_port_t port,
uint32 flags,
bcm_cosq_ingress_port_drop_map_t map,
uint32 key,
```

bcm_color_t *color);

### Parameters

| | |
|---|---|
| unit | BCM device number |
| bcm_port_t(IN) | port |
| flags(IN) | flags |
| map(IN) | map |
| key(IN) | key |
| color(IN)(for | "_set") color |
| color(OUT)(for | "_get") color |

The available flags are Ingress Port Drop Flags (page 26) The available values for map are:

We may use these macros for the key parameter:

#define BCM_COSQ_INGRESS_PORT_DROP_ETH_MAP_KEY(pcp, dei) ( ((pcp << 1) | dei) & 0xF ) #define BCM_COSQ_INGRESS_PORT_DROP_TM_MAP_KEY (tc, dp) ( ((tc << 2) | dp) & 0x3F )

### Description

set/get cosq ingress port drop map value

### Returns

BCM_E_NONE
BCM_E_XXX

# FIELD PROCESSOR

New field actions are defined as Field Actions for bcm_field_action_add (page 27) in this release.

***Table 14: Field Actions for bcm_field_action_add***

| *Action* | *Description* | *param0* | *param1* |
|---|---|---|---|
| bcmFieldActionStatAndPolicer | Activates both Stat and Policer actions | Stat + Meter Id | n/a |
| bcmFieldActionSnoopAndTrap | Activates both Snoop and Trap actions | Snoop + Trap GPort | n/a |
| bcmFieldActionIEEE1588 | Setting varoius parameters for 1588 frames | Packet-is-IEEE-1588(1 Bit); IEEE-1588-Update-Time-Stamp(1 Bit) ; IEEE-1588-Command, (2 Bit) ; IEEE-1588-Encapsulation(1 bits) ; IEEE-1588-Header-Offset(7 bits) | n/a |

New field match rules for OAM are shown in the table Match rule value used by OAM CCM Embedded App to indicate MEP type through bcmFieldActionCopyToCpu Action (page 28) .

*Table 15: Match rule value used by OAM CCM Embedded App to indicate MEP type through bcmFieldActionCopyToCpu Action*

| BCM_FIELD_OAM_MATCHED_RULE_xxx | Description |
|---|---|
| BCM_FIELD_OAM_MATCHED_RULE_ETHERNET_PORT | Match rule values used by OAM CCM Embedded App to indicate Port MEP type |
| BCM_FIELD_OAM_MATCHED_RULE_ETHERNET_INNER_VLAN | Match rule values used by OAM CCM Embedded App to indicate Inner vlan MEP type |
| BCM_FIELD_OAM_MATCHED_RULE_ETHERNET_OUTER_VLAN | Match rule values used by OAM CCM Embedded App to indicate Outer vlan MEP type |
| BCM_FIELD_OAM_MATCHED_RULE_ETHERNET_INNER_PLUS_OUTER_VLAN | Match rule values used by OAM CCM Embedded App to indicate Inner + Outer vlan MEP type |

# LAYER 2 ADDRESS MANAGEMENT

A new BCM L2 learning event flag for the new L2 learn distribution is added in this release as shown in L2 Learning events flags (page 28) .

*Table 16: L2 Learning events flags*

| Name | Purpose |
|---|---|
| BCM_L2_ADDR_DIST_ACK_EVENT | Acknowledge event |

New BCM L2 replace flag BCM_L2_REPLACE_MATCH_AGE is introduced in this release as shown in L2 Replace Flags (page 28) .bcm_l2_replace

*Table 17: L2 Replace Flags*

| Flags | Description |
|---|---|
| BCM_L2_REPLACE_MATCH_AGE | L2 replace will be performed on L2 entries of a given age state |

New BCM L2 APIs are added as following.

## bcm_l2_learn_limit_enable
## bcm_l2_learn_limit_disable

Enable/Disable BCM L2 learn limit subsystem.

### Syntax

```
#include <bcm/l2.h>
int bcm_l2_learn_limit_enable(int unit);
int bcm_l2_learn_limit_disable(int unit);
```

### Parameters

| | |
|---|---|
| unit | BCM device number |

### Description

Enable/Disable BCM L2 learn limit subsystem

### Returns

BCM_E_XXX

# L2GRE MANAGEMENT

New MPLS port match criteria is as shown in MPLS Port Match Criteria (page 29) added in this release.

*Table 18: MPLS Port Match Criteria*

| Name | Purpose |
|---|---|
| BCM_L2GRE_PORT_MATCH_SHARE | Shared logic port |

# LAYER 3 MANAGEMENT

A new L3 flag for bcm_l3_egress_create regarding next hop index and none ECMP overlap.

*Table 19: BCM Layer 3 Flags2*

| Name | Purpose |
|---|---|
| BCM_L3_FLAGS2_NO_ECMP_OVERLAP | Allocate next hop indexes without overlapping ECMP indexes. This flag is applied to bcm_l3_egress_create only and should not be used together with BCM_L3_WITH_ID. |

# MAC-IN-MAC MANAGEMENT

A new field protocol_pkt of data structure bcm_mim_vpn_config_t is added in this release for the MAC-in-MAC VPN attributes.

It allows the application to configure different broadcast, multicast and unknown unicast groups.

```
    typedef struct bcm_mim_vpn_config_s {
        ...
      bcm_vlan_protocol_packet_ctrl_t protocol_pkt; /* Protocol packet control
*/
    } bcm_mim_vpn_config_t;
```

# MIRRORING

New BCM Mirroring flags are added for ingress port untagged/tagged traffic respectively as show in BCM Mirroring Flags (page 30) .

*Table 20: BCM Mirroring Flags*

| Name | Description |
|---|---|
| BCM_MIRROR_PORT_UNTAGGED_ONLY | Enable Ingress mirroring for Untagged traffic only |
| BCM_MIRROR_PORT_TAGGED_DEFAULT | Enable Ingress mirroring for Tagged traffic with unspecified VID |

# MPLS MANAGEMENT

Two new fields are added in bcm_mpls_port_t data structure in this release.

```
    typedef struct bcm_mpls_port_s {
        ...
       bcm_failover_t ingress_failover_id;         /* Ingress Failover Object
Identifier. */
        bcm_gport_t ingress_failover_port_id;       /* Ingress Failover MPLS
Port Identifier. */
        ...
    } bcm_mpls_port_t;
```

# OPERATIONS, ADMINISTRATION, AND MAINTENANCE

A new OAM event type is introduced in this release in OAM Event Types (page 30) .

*Table 21: OAM Event Types*

| Event type | Description |
|---|---|
| bcmOAMEventBHHCCMTimeoutClear | Timeout has been cleared on BHH CCM endpoint |

New OAM control formats are added in this release as shown in OAM Control Formats (page 30) .

*Table 22: OAM Control Formats*

| Control Format Type | Description |
|---|---|
| bcmOamControlSrcMacLsbReserve | Reserve Src-Mac LSB value to be used for OAM endpoints (resource shared with BFD endpoints) |
| bcmOamControlSrcMacLsbUnReserve | Unreserve Src-Mac LSB value (resource shared with BFD endpoints) |
| bcmOamControlLmPcpCounterRangeMax | lm_counter_base_ids between Max and Min will count by priority |
| bcmOamControlLmPcpCounterRangeMin | lm_counter_base_ids between Max and Min will count by priority |
| bcmOamControlOampPuntPacketIntPri | Bits [1:0] of given value determine the color (DP), bits [4:2] determine the Traffic Class |
| bcmOamControlOampCCMWeight | Given may be between 0 and 6 |
| bcmOamControlOampSATWeight | Given may be between 0 and 6 |

*Table 22: OAM Control Formats*

| Control Format Type | Description |
|---|---|
| bcmOamControlOampResponseWeight | Given may be between 0 and 6 |

New fields have been added in the `bcm_oam_endpoint_info_t` data structure for OAM endpoint sessions.

```
typedef struct bcm_oam_endpoint_info_s {
    ...
   uint32 session_id;               /* OAM session id for packet processing
                        in BTE. In FP based OAM - This will
                        indicate flex counter base ID */
   uint8 session_num_entries;        /* Number of entries that can result in
                        same session ID. In FP based OAM -
                        This will indicate number of flex
                        counter entries corresponding to same
                        OAM session */
} bcm_oam_endpoint_info_t;
```

Two new fields are added in `bcm_oam_ais_t` data structure for OAM AIS (alarm indication signal) objects.

```
/* OAM AIS (alarm indication signal) object. */
typedef struct bcm_oam_ais_s {
    ...
    uint8 pkt_pri;                  /* Egress marking for outgoing AIS
messages. */
    uint8 drop_eligible;            /* Drop Eligibility for AIS. */
} bcm_oam_ais_t;
```

# POLICER

A new policer flag as shown in `Policer Flags` (page 31) is introduced with regarding to header truncate adjustment.

*Table 23: Policer Flags*

| Name | Purpose |
|---|---|
| `BCM_POLICER_PKT_ADJ_HEADER_TRUNCATE` | Indicates that this Policer needs to be considerate of header truncate adjustment. |

The new variables `actual_ckbits_sec, actual_ckbits_burst, actual_pkbits_sec, actual_pkbits_burst` in data structure `bcm_policer_config_t` represent actual hardware values configured based on granularity for the given packet rates. These are read-only and will be updated only after field entry install.

```
typedef struct bcm_policer_config_s {
    ...
   /* Granularity adjusted committed rate in kbps or packets per second. */
    uint32 actual_ckbits_sec;
    /* Granularity adjusted committed burst size in kbits or number of
packets. */
```

```
        uint32 actual_ckbits_burst;
        /* Granularity adjusted peak rate in kbps or packets per second. */
        uint32 actual_pkbits_sec;
       /* Granularity adjusted peak burst size in kbits or number of packets. */
        uint32 actual_pkbits_burst;
    } bcm_policer_config_t;
```

New BCM Policer API is introduced in this release.

### bcm_policer_group_mode_attr_selector_t_init

Initialize a policer group attribute selector structure.

#### Syntax

```
#include <bcm/policer.h>
void bcm_policer_group_mode_attr_selector_t_init(
 bcm_policer_group_mode_attr_selector_t *pol_group_mode_attr_selector)
```

#### Parameters

`pol_group_mode_attr_selector` Pointer to policer group attribute selector structure to initialize.

#### Description

Initialize a policer group attribute selector structure.

#### Returns

None.

# PORT CONFIGURATION

***Table 24: New bcm_port_phy_control_t***

| *Control Type* | *Description* |
|---|---|
| `BCM_PORT_PHY_CONTROL_FORWARD_ERROR_CORRECTION_CL91` | FEC CL91 on/off on PM 4x25 portmacro |
| `BCM_PORT_PHY_CONTROL_SHORT_CHANNEL_MODE_STATUS` | Get the configured status of short channel mode on a port |

# PRECISION TIME PROTOCOL

New `BCM_PTP_SERVO_PHASE_HOLDOVER` bit flag is added in this release in addition to the bit flags as shown in `Bits in servo configuration flags.` (page 33) .

*Table 25: Bits in servo configuration flags.*

| *Bit flags* | *Description* |
|---|---|
| BCM_PTP_SERVO_PHASE_ONLY | Phase-only bit. |
| BCM_PTP_SERVO_LOCK_SWITCH_FREQ | Switch-frequency lock bit. |
| BCM_PTP_SERVO_IGNORE_FREQ | Ignore-frequency bit. |
| BCM_PTP_SERVO_PHASE_HOLDOVER | Servo phase holdover bit. |

# RATE LIMITING

BCM_RATE_PKT_ADJ_HEADER_TRUNCATE rate limit flag is added in Rate Control Flags (page 33) that lists the flags for the rate-limiting functions.

*Table 26: Rate Control Flags*

| *Name* | *Purpose* |
|---|---|
| BCM_RATE_PKT_ADJ_HEADER_TRUNCATE | Indicates that this Eth. Policer needs to be considerate of header truncate adjustment |

# SWITCH CONTROL

New field pkt_trace_drop_reason is added in bcm_switch_pkt_trace_info_t data structure with the BCM_SWITCH_PKT_TRACE_DROP_REASON_MAX=4 in this release. The detailed drop reasons are listed in bcm_switch_pkt_trace_drop_reason_t.

```
typedef struct bcm_switch_pkt_trace_info_s {
    ...
    uint32 pkt_trace_drop_reason[BCM_SWITCH_PKT_TRACE_DROP_REASON_MAX];
    ...
} bcm_switch_pkt_trace_info_t;

typedef enum bcm_switch_pkt_trace_drop_reason_e {
    bcmSwitchPktTraceNoDrop = 0,
    bcmSwitchPktTraceDropReasonInternal = 1,
    bcmSwitchPktTraceDropReasonMplsLabelLookupMiss = 2,
    bcmSwitchPktTraceDropReasonMplsInvalidAction = 3,
    bcmSwitchPktTraceDropReasonMplsInvalidPayload = 4,
    bcmSwitchPktTraceDropReasonMplsTtlCheckFail = 5,
    bcmSwitchPktTraceDropReasonMplsInvalidControlWord = 6,
    bcmSwitchPktTraceDropReasonL2greSipLookupMiss = 7,
    bcmSwitchPktTraceDropReasonL2greVpnLookupMiss = 8,
    bcmSwitchPktTraceDropReasonL2greTunnelError = 9,
    bcmSwitchPktTraceDropReasonVxlanSipLookupMiss = 10,
    bcmSwitchPktTraceDropReasonVxlanVnidLookupMiss = 11,
    bcmSwitchPktTraceDropReasonVxlanTunnelError = 12,
    bcmSwitchPktTraceDropReasonVlanNotValid = 13,
    bcmSwitchPktTraceDropReasonIngressPortNotInVlanMember = 14,
    bcmSwitchPktTraceDropReasonTpidMismatch = 15,
    bcmSwitchPktTraceDropReasonIpv4ProtocolError = 16,
```

```
    bcmSwitchPktTraceDropReasonHigigLoopback = 17,
    bcmSwitchPktTraceDropReasonHigigMirrorOnly = 18,
    bcmSwitchPktTraceDropReasonHigigUnknownHeader = 19,
    bcmSwitchPktTraceDropReasonHigigUnknownOpcode = 20,
    bcmSwitchPktTraceDropReasonLagFailLoopback = 21,
    bcmSwitchPktTraceDropReasonL2SrcEqualL2Dst = 22,
    bcmSwitchPktTraceDropReasonIpv6ProtocolError = 23,
    bcmSwitchPktTraceDropReasonNivVntagPresent = 24,
    bcmSwitchPktTraceDropReasonNivVntagNotPresent = 25,
    bcmSwitchPktTraceDropReasonNivVntagFormat = 26,
    bcmSwitchPktTraceDropReasonTrillErrorFrame = 27,
    bcmSwitchPktTraceDropReasonBpdu = 28,
    bcmSwitchPktTraceDropReasonBadUdpChecksum = 29,
    bcmSwitchPktTraceDropReasonTunnlDecapEcnError = 30,
    bcmSwitchPktTraceDropReasonIpv4HeaderError = 31,
    bcmSwitchPktTraceDropReasonIpv6HeaderError = 32,
    bcmSwitchPktTraceDropReasonParityError = 33,
    bcmSwitchPktTraceDropReasonRpfCheckFail = 34,
    bcmSwitchPktTraceDropReasonCount = 35
} bcm_switch_pkt_trace_drop_reason_t;
```

# Section 7: Test Statistics

## HOW TO READ THE DATA

The tables below represent a spread of data gathered per-device, per-suite, per-release. The percentages represent the aggregate rate of failure for that suite when run against all variants of the family of devices.

## OVERVIEW

Each suite listed below is indicative of a specific module. Golden refers to a suite of tests that takes representation across multiple modules and serves as a sanity regression. Each suite contains tests of various types, loosely categorized as shown in Suite Test Types (page 35)

***Table 27: Suite Test Types***

| *Test Categories* | *Description* |
|---|---|
| Configuration Tests | Tests that verify that each API functions appropriately and can configure the device as expected. |
| Functionality Tests | Tests that further validate each of the API through functional use often requiring traffic to be run through the system. |
| Semantic Tests | Tests that ensure that the proper error handling mechanisms are working and users cannot crash the device through the API. |

### LINUX KERNEL VERSIONS USED IN THIS RELEASE

In SDK 6.4.x, the following Linux kernel versions were used in our development and regression cycles with these main CPUs:

- BCM9XLP208XMC (WRX): 3.10.59
- BCM958625XMC (RSX): 3.6.5
- BCM98548PPCXMC (GTO): 2.6.21.7
- BCM98548PPCXMC (X86): 3.14

Please refer to the Broadcom Network Switching Software Platform Guide for more details about these CPUs.

## TOTAL TESTS

The below data in Tests per Module (page 36) represents the number of unique cases for each release.

Note that although a particular test case will execute for each and every chip, it's only counted once.

*Table 28: Tests per Module*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 153 | 153 | 153 |
| warmboot | 950 | 902 | 864 |
| auth | 17 | 17 | 17 |
| bfd | 37 | 37 | 37 |
| bhh | 45 | 45 | 45 |
| chip | 9 | 9 | 9 |
| cint | 73 | 73 | 69 |
| coe | 568 | 568 | 568 |
| cosq | 532 | 532 | 514 |
| custom | 7 | 7 | 7 |
| ea | 108 | 108 | 108 |
| eav | 19 | 19 | 19 |
| extender | 49 | 49 | 45 |
| fabric | 7 | 7 | 7 |
| failover | 8 | 8 | 8 |
| fcoe | 37 | 37 | 37 |
| field | 1311 | 1307 | 1307 |
| higigproxy | 129 | 129 | 129 |
| infra | 114 | 114 | 114 |
| ipfix | 17 | 17 | 17 |
| ipmc | 119 | 119 | 116 |
| l2 | 331 | 331 | 330 |
| l2gre | 13 | 13 | 13 |
| l3 | 481 | 481 | 473 |
| l3.alpm | 456 | 456 | 440 |
| link | 26 | 26 | 26 |
| mim | 28 | 28 | 19 |
| mirror | 171 | 171 | 171 |
| misc | 20 | 20 | 20 |
| mpls | 374 | 374 | 363 |
| multicast | 25 | 25 | 25 |
| niv | 65 | 64 | 58 |
| oam | 284 | 272 | 271 |
| pkt | 44 | 44 | 44 |
| port | 367 | 366 | 361 |
| proxy | 37 | 37 | 37 |
| ptp | 115 | 115 | 115 |
| qos | 13 | 13 | 13 |
| rate | 21 | 21 | 21 |
| rtag7 | 43 | 43 | 42 |
| rx | 25 | 25 | 25 |
| ser | 157 | 157 | 157 |
| stack | 117 | 117 | 117 |
| stat | 332 | 332 | 326 |
| stg | 42 | 42 | 42 |
| switch | 197 | 197 | 197 |
| time | 33 | 33 | 33 |
| tlvMsg | 13 | 13 | 13 |

*Table 28: Tests per Module*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| trill | 40 | 40 | 40 |
| trunk | 223 | 223 | 219 |
| tunnel | 133 | 133 | 123 |
| subport | 31 | 31 | 31 |
| vlan | 228 | 228 | 228 |
| vxlan | 186 | 184 | 174 |
| wlan | 17 | 17 | 17 |
| Test Suite Total | 8997 | 8929 | 8774 |

# API TEST RESULTS

The tables below show percentages of failures for corresponding test suites per SDK release.

## ALL DEVICES

Note: This section represents aggregate results for all devices in the release.

*Table 29:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.1 % | 0.2 % | 0.1 % |
| warmboot | 0.1 % | 0.2 % | 0.3 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.bfd | 0.0 % | 0.0 % | 0.0 % |
| bcm.bhh | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.coe | 0.1 % | 0.0 % | 0.2 % |
| bcm.cosq | 0.1 % | 0.1 % | 0.2 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.2 % | 0.2 % | 0.3 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.1 % | 0.1 % | 0.2 % |
| bcm.ipmc | 0.1 % | 0.1 % | 0.1 % |
| bcm.l2 | 0.1 % | 0.1 % | 0.2 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.1 % | 0.1 % | 0.1 % |
| bcm.l3.alpm | 0.0 % | 0.1 % | 0.1 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.3 % | 0.3 % | 0.2 % |

*Table 29:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.misc | 0.0 % | 0.0 % | 0.1 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.1 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.2 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.4 % | 0.5 % | 0.6 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.1 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.1 % | 0.2 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.1 % | 0.1 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.2 % | 0.2 % | 0.1 % |
| bcm.stg | 0.0 % | 0.1 % | 0.0 % |
| bcm.switch | 0.0 % | 0.1 % | 0.1 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.1 % | 0.2 % | 0.2 % |

## TRIDENT2

*Table 30:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.0 % | 0.0 % | 0.0 % |
| warmboot | 0.0 % | 0.1 % | 0.1 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.bfd | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.cosq | 0.0 % | 0.0 % | 0.0 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |

*Table 30:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.field | 0.1 % | 0.1 % | 0.1 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2 | 0.0 % | 0.1 % | 0.1 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3.alpm | 0.0 % | 0.0 % | 0.0 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.0 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.0 % | 0.0 % | 0.0 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.2 % | 0.0 % | 0.0 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.0 % | 0.1 % | 0.1 % |

## TRIUMPH3

*Table 31:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.1 % | 0.1 % | 0.1 % |
| warmboot | 0.0 % | 0.0 % | 0.0 % |

*Table 31:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.bfd | 0.0 % | 0.0 % | 0.0 % |
| bcm.bhh | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.cosq | 0.0 % | 0.0 % | 0.0 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.1 % | 0.1 % | 0.1 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.1 % | 0.1 % | 0.1 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.1 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 1.0 % | 1.0 % | 1.3 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.0 % | 0.0 % | 0.0 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |

*Table 31:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| Test Suite Total | 0.1 % | 0.2 % | 0.2 % |

## KATANA2

*Table 32:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.1 % | 0.1 % | 0.0 % |
| warmboot | 0.1 % | 0.1 % | 0.1 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.bfd | 0.0 % | 0.0 % | 0.0 % |
| bcm.bhh | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.coe | 0.1 % | 0.1 % | 0.1 % |
| bcm.cosq | 0.0 % | 0.0 % | 0.0 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.2 % | 0.2 % | 0.3 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.0 % | 0.0 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.0 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.4 % | 0.6 % | 0.8 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |

*Table 32:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.1 % | 0.0 % | 0.0 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.1 % | 0.2 % | 0.2 % |

## GREYHOUND

*Table 33:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.0 % | 0.0 % | 0.0 % |
| warmboot | 0.1 % | 0.2 % | 0.5 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.coe | 0.0 % | 0.0 % | 0.0 % |
| bcm.cosq | 0.0 % | 0.0 % | 0.0 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.0 % | 0.0 % | 0.1 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.0 % | 0.0 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.3 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |

*Table 33:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.0 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.6 % | 0.4 % | 0.4 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.0 % | 0.0 % | 0.0 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.1 % | 0.2 % | 0.1 % |

## TOMAHAWK

*Table 34:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.0 % | 0.0 % | 0.1 % |
| warmboot | 0.1 % | 0.1 % | 0.1 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.bfd | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.cint | 0.0 % | 0.0 % | 0.0 % |
| bcm.coe | 0.0 % | 0.0 % | 0.0 % |
| bcm.cosq | 0.2 % | 0.2 % | 0.2 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.ea | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.7 % | 0.7 % | 0.5 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |

*Table 34:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.infra | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.1 % | 0.2 % |
| bcm.l2 | 0.0 % | 0.1 % | 0.1 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3.alpm | 0.0 % | 0.0 % | 0.0 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.0 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.0 % | 0.1 % | 0.1 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.1 % | 0.1 % | 0.1 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.tlvMsg | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.2 % | 0.2 % | 0.2 % |

## TRIDENT2+

*Table 35:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.0 % | 0.0 % | 0.0 % |
| warmboot | 0.0 % | 0.2 % | 0.3 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |

*Table 35:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.coe | 0.0 % | 0.0 % | 0.1 % |
| bcm.cosq | 0.0 % | 0.1 % | 0.3 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.0 % | 0.1 % | 0.1 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.2 % |
| bcm.l2 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3.alpm | 0.0 % | 0.0 % | 0.0 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.0 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.0 % | 0.0 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.0 % | 0.0 % | 0.0 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.1 % | 0.1 % | 0.1 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.0 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.1 % | 0.1 % | 0.0 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.0 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.vxlan | 0.0 % | 0.1 % | 0.1 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.0 % | 0.2 % | 0.2 % |

## SABER2

*Table 36:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| golden | 0.1 % | 0.1 % | 0.1 % |
| warmboot | 0.1 % | 0.1 % | 0.3 % |
| bcm.auth | 0.0 % | 0.0 % | 0.0 % |
| bcm.chip | 0.0 % | 0.0 % | 0.0 % |
| bcm.coe | 0.1 % | 0.1 % | 0.2 % |
| bcm.cosq | 0.1 % | 0.0 % | 0.0 % |
| bcm.custom | 0.0 % | 0.0 % | 0.0 % |
| bcm.eav | 0.0 % | 0.0 % | 0.0 % |
| bcm.extender | 0.0 % | 0.0 % | 0.0 % |
| bcm.fabric | 0.0 % | 0.0 % | 0.0 % |
| bcm.failover | 0.0 % | 0.0 % | 0.0 % |
| bcm.fcoe | 0.0 % | 0.0 % | 0.0 % |
| bcm.field | 0.1 % | 0.3 % | 0.3 % |
| bcm.higigproxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipfix | 0.0 % | 0.0 % | 0.0 % |
| bcm.ipmc | 0.0 % | 0.0 % | 0.1 % |
| bcm.l2 | 0.1 % | 0.1 % | 0.1 % |
| bcm.l2gre | 0.0 % | 0.0 % | 0.0 % |
| bcm.l3 | 0.0 % | 0.1 % | 0.1 % |
| bcm.link | 0.0 % | 0.0 % | 0.0 % |
| bcm.mim | 0.0 % | 0.0 % | 0.0 % |
| bcm.mirror | 0.0 % | 0.0 % | 0.0 % |
| bcm.misc | 0.0 % | 0.0 % | 0.0 % |
| bcm.mpls | 0.0 % | 0.0 % | 0.1 % |
| bcm.multicast | 0.0 % | 0.0 % | 0.0 % |
| bcm.niv | 0.0 % | 0.0 % | 0.0 % |
| bcm.oam | 0.0 % | 0.1 % | 0.2 % |
| bcm.pkt | 0.0 % | 0.0 % | 0.0 % |
| bcm.port | 0.3 % | 0.4 % | 0.6 % |
| bcm.proxy | 0.0 % | 0.0 % | 0.0 % |
| bcm.ptp | 0.0 % | 0.0 % | 0.0 % |
| bcm.qos | 0.0 % | 0.0 % | 0.0 % |
| bcm.rate | 0.0 % | 0.0 % | 0.0 % |
| bcm.rtag7 | 0.0 % | 0.0 % | 0.0 % |
| bcm.rx | 0.0 % | 0.0 % | 0.0 % |
| bcm.ser | 0.0 % | 0.0 % | 0.0 % |
| bcm.stack | 0.0 % | 0.0 % | 0.0 % |
| bcm.stat | 0.0 % | 0.0 % | 0.0 % |
| bcm.stg | 0.0 % | 0.0 % | 0.0 % |
| bcm.switch | 0.0 % | 0.0 % | 0.1 % |
| bcm.time | 0.0 % | 0.0 % | 0.0 % |
| bcm.trill | 0.0 % | 0.0 % | 0.0 % |
| bcm.trunk | 0.0 % | 0.0 % | 0.1 % |
| bcm.tunnel | 0.0 % | 0.0 % | 0.3 % |
| bcm.subport | 0.0 % | 0.0 % | 0.0 % |
| bcm.vlan | 0.0 % | 0.0 % | 0.1 % |

*Table 36:*

| | *sdk-6.4.11* | *sdk-6.4.10* | *sdk-6.4.9* |
|---|---|---|---|
| bcm.vxlan | 0.0 % | 0.0 % | 0.0 % |
| bcm.wlan | 0.0 % | 0.0 % | 0.0 % |
| Test Suite Total | 0.1 % | 0.2 % | 0.2 % |

# PHY TEST RESULTS

Starting from SDK-6.4.8, we have increased our focus and coverage on testing specific PHY and switch combinations in order to improve our quality in this area. The tables below represent specific results from our interoperability and regression testing for the release. We have been continually working to improve our results and coverage in ongoing releases.

## SQA EXTERNAL PHY

*Table 37: PHY Suite*

| *Switch Device* | *External Phy Device* | *Total Tests* | *% Fail* |
|---|---|---|---|
| 56639_A0 | phy8747_phy8728__10G | 145 | 2.07% |
| 56846_A0 | Warpcore 40G/20G/10G | 145 | 2.07% |
| 56850_A2 | phy84856_phy84858_10G | 145 | 4.83% |
| 56960_A0 | 100GFuria_40GMuxSesto | 145 | 0.69% |
| 56960_A0 | 10GFuria_10GSesto | 145 | 0.69% |
| 56860_A1 | phy84856_phy84858_10G | 145 | 0.69% |
| 56860_A0 | 10GQuadra28 | 145 | 0.69% |
| 56860_A0 | 40GQuadra28 | 145 | 2.07% |
| 56860_A0 | 100GSesto | 145 | 2.07% |
| 56867_A1 | phy82764_10G | 145 | 1.38% |
| 56867_A1 | phy82764_40G | 145 | 1.38% |
| 56960_B0 | phy82864_100G | 145 | 3.45% |
| 56960_B0 | phy82864_100G_alt | 145 | 4.83% |
| 56960_B0 | phy82864_40GPt | 145 | 3.45% |
| 56960_B0 | phy82864_40GPt_alt | 145 | 6.21% |
| 56960_B0 | phy82864_10G | 145 | 4.83% |
| 56960_B0 | phy82864_10G_alt | 145 | 5.52% |
| 56960_B0 | phy82864_11G | 145 | 4.14% |
| 56960_B0 | phy82864_11G_alt | 145 | 4.83% |
| 56960_B0 | phy82864_42GPt | 145 | 2.76% |
| 56960_B0 | phy82864_42GPt_alt | 145 | 4.83% |
| 56960_B0 | phy82864_106G | 145 | 4.83% |
| 56960_B0 | phy82864_106G_alt | 145 | 4.83% |
| 56960_B0 | phy82864_40G2x20 | 145 | 6.21% |
| 56960_B0 | phy82864_40G2x20_alt | 145 | 6.90% |
| 56960_B0 | phy82864_42G2x20 | 145 | 8.97% |

*Table 37: PHY Suite*

| Switch Device | External Phy Device | Total Tests | % Fail |
|---|---|---|---|
| 56960_B0 | phy82864_42G2x20_alt | 145 | 5.52% |
| 56960_B0 | phy82864_40GMux | 145 | 4.83% |

## INTEROP EXTERNAL PHY

*Table 38: P2P Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56860_A0 | XE_QD28_82780_40G | 141 | 0.00% |
| 56860_A0 | XE_QD28_82780_10G | 171 | 0.00% |
| 56860_A0 | XE_SESTO_82764_40G_MUX | 125 | 3.20% |
| 56860_A0 | CE_SESTO_82792_100G_343 | 244 | 1.23% |
| 56860_A0 | XE_SESTO_82764_40G_PT | 192 | 1.04% |
| 56860_A0 | XE_SESTO_82764_10G_PT | 168 | 1.19% |
| 56860_A0 | XE_G28_82322_10G | 410 | 3.17% |
| 56860_A0 | XE_G28_82322_40G | 344 | 1.74% |
| 56860_A0 | XE_G40_84328_10G | 429 | 1.63% |
| 56860_A0 | XE_G40_84328_40G | 360 | 0.56% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_PT | 60 | 0.00% |
| 56960_A0 (repeater) | CE_MADURA_82864_100G_ALT | 189 | 0.00% |
| 56960_A0 (repeater) | XE_MADURA_82864_10G | 135 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_DUAL_ALT | 60 | 0.00% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_PT_ALT | 132 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_PT_ALT | 60 | 0.00% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_MUX | 108 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_11G | 60 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_106G_ALT | 87 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_MUX | 60 | 0.00% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_DUAL | 102 | 6.86% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_DUAL | 48 | 8.33% |
| 56960_A0 (repeater) | XE_MADURA_82864_10G_ALT | 108 | 0.00% |

*Table 38: P2P Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56960_A0 (repeater) | HG_MADURA_82864_11G_ALT | 60 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_106G | 69 | 17.39% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_DUAL_ALT | 108 | 0.00% |
| 56960_A0 (repeater) | CE_MADURA_82864_100G | 165 | 6.06% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_PT | 132 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_PT | 90 | 0.00% |
| 56960_A0 (retimer) | CE_MADURA_82864_100G_ALT | 235 | 0.43% |
| 56960_A0 (retimer) | XE_MADURA_82864_10G | 162 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_DUAL_ALT | 90 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_PT_ALT | 90 | 0.00% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_MUX | 162 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_11G | 90 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_106G_ALT | 127 | 0.79% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_MUX | 90 | 0.00% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_DUAL | 138 | 5.80% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_DUAL | 66 | 12.12% |
| 56960_A0 (retimer) | XE_MADURA_82864_10G_ALT | 162 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_11G_ALT | 90 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_106G | 87 | 19.54% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_DUAL_ALT | 162 | 0.00% |
| 56960_A0 (retimer) | CE_MADURA_82864_100G | 219 | 9.13% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_PT | 372 | 1.08% |

*Table 39: Loopback Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56860_A0 | XE_QD28_82780_40G | 47 | 0.00% |

*Table 39: Loopback Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56860_A0 | XE_QD28_82780_10G | 62 | 0.00% |
| 56860_A0 | XE_SESTO_82764_40G_MUX | 25 | 0.00% |
| 56860_A0 | CE_SESTO_82792_100G_343 | 47 | 0.00% |
| 56860_A0 | XE_SESTO_82764_40G_PT | 30 | 0.00% |
| 56860_A0 | XE_SESTO_82764_10G_PT | 30 | 0.00% |
| 56860_A0 | XE_G28_82322_10G | 30 | 3.33% |
| 56860_A0 | XE_G28_82322_40G | 25 | 0.00% |
| 56860_A0 | XE_G40_84328_10G | 66 | 0.00% |
| 56860_A0 | XE_G40_84328_40G | 55 | 0.00 |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_PT | 44 | 9.09% |
| 56960_A0 (repeater) | CE_MADURA_82864_100G_ALT | 77 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_10G | 55 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_DUAL_ALT | 44 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_PT_ALT | 44 | 9.09% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_PT_ALT | 44 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_MUX | 44 | 9.09% |
| 56960_A0 (repeater) | HG_MADURA_82864_11G | 44 | 0.00% |
| 56960_A0 (repeater) | HG_MADURA_82864_106G_ALT | 55 | 9.09% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_MUX | 44 | 2.27% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_DUAL | 44 | 9.09% |
| 56960_A0 (repeater) | HG_MADURA_82864_42G_DUAL | 44 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_10G_ALT | 44 | 2.27% |
| 56960_A0 (repeater) | HG_MADURA_82864_11G_ALT | 44 | 2.27% |
| 56960_A0 (repeater) | HG_MADURA_82864_106G | 55 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_DUAL_ALT | 44 | 6.82% |
| 56960_A0 (repeater) | CE_MADURA_82864_100G | 55 | 9.09% |
| 56960_A0 (repeater) | XE_MADURA_82864_40G_PT | 44 | 9.09% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_PT | 66 | 9.09% |

*Table 39: Loopback Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56960_A0 (retimer) | CE_MADURA_82864_100G_ALT | 99 | 8.08% |
| 56960_A0 (retimer) | XE_MADURA_82864_10G | 66 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_DUAL_ALT | 66 | 3.03% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_PT_ALT | 66 | 9.09% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_PT_ALT | 66 | 9.09% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_MUX | 66 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_11G | 66 | 1.52% |
| 56960_A0 (retimer) | HG_MADURA_82864_106G_ALT | 99 | 7.07% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_MUX | 66 | 0.00% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_DUAL | 66 | 9.09% |
| 56960_A0 (retimer) | HG_MADURA_82864_42G_DUAL | 66 | 4.55% |
| 56960_A0 (retimer) | XE_MADURA_82864_10G_ALT | 66 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_11G_ALT | 66 | 0.00% |
| 56960_A0 (retimer) | HG_MADURA_82864_106G | 99 | 12.12% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_DUAL_ALT | 66 | 3.03% |
| 56960_A0 (retimer) | CE_MADURA_82864_100G | 99 | 6.06% |
| 56960_A0 (retimer) | XE_MADURA_82864_40G_PT | 66 | 9.09% |

## INTEROP INTERNAL PHY

*Table 40: P2P Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56860_A0 | HG_32X42 | 36 | 0.00% |
| 56860_A0 | XE_32X40 | 99 | 0.00% |
| 56860_A0 | HG_8x100_343 | 36 | 0.00% |
| 56860_A0 | CE_8X100_343_IEEE | 72 | 0.00% |
| 56860_A0 | HG_104x10 | 16 | 25.00% |
| 56860_A0 | XE_104x10 | 51 | 15.69% |
| 56860_A0 | CE_8x100_442 | 72 | 0.00% |

*Table 41: Loopback Suite*

| Switch Device | Port Macro | Total Tests | % Fail |
|---|---|---|---|
| 56860_A0 | HG_32X42 | 11 | 0.00% |
| 56860_A0 | XE_32X40 | 22 | 0.00% |
| 56860_A0 | HG_8x100_343 | 11 | 0.00% |
| 56860_A0 | CE_8X100_343_IEEE | 11 | 0.00% |
| 56860_A0 | HG_104x10 | 11 | 45.45% |
| 56860_A0 | XE_104x10 | 22 | 45.45% |
| 56860_A0 | CE_8x100_442 | 11 | 0.00% |

# STATIC CODE ANALYSIS

In early 2015 we upgraded our static analysis code tool to a version with many new checkers and have been steadily working down the backlog of issues. Below Static Code Analysis Summary (page 52) shows the progress in the ensuing 6.4.x releases:

*Table 42: Static Code Analysis Summary*

| Line Of Business | Initial Reported Issues | New baseline as of 1/31/15 | Open Issues SDK 6.4.5 | Open Issues SDK 6.4.6 | Open Issues SDK 6.4.7 | Open Issues SDK 6.4.8 | Open Issues SDK 6.4.9 | Open Issues SDK 6.4.10 | Open Issues SDK 6.4.11 |
|---|---|---|---|---|---|---|---|---|---|
| DNX | 664 | 450 | 295 | 168 | 113 | 108 | 58 | 22 | 4 |
| XGS | 271 | 500 | 229 | 116 | 9 | 11 | 4 | 4 | 13 |
| SBX | 600 | 650 | 156 | 77 | 23 | 23 | 1 | 0 | 0 |
| SerDes | 147 | 100 | 59 | 49 | 58 | 23 | 21 | 5 | 6 |
| Common | 2827 | 400 | 155 | 133 | 29 | 24 | 9 | 10 | 3 |
| Total | 4509 | 2100 | 894 | 543 | 232 | 189 | 93 | 41 | 26 |

# Section 8: Service Impacting Defects

A Service Impacting Defect (SID) is any defect (internal or external) that has high potential to severely disrupt network operations in a deployed system. This section lists the SIDs that have been identified since last release in Resolved Service Impacting Defects (page 53) .

***Table 43: Resolved Service Impacting Defects***

| Number | Chips | Affected versions | Errata Synopsis | Details |
|---|---|---|---|---|
| SDK-89279 | 56850_A2<br>56860_A1 | 6.4.4, 6.4.5, 6.4.6, 6.4.7, 6.4.8, 6.4.9 | Customers running BCM56850 or BCM56860 with SDK release 6.4.4 through 6.4.9 have a risk of seeing ALPM failures and traffic drops in their system. | This issue was introduced by an improvement to the 'raw bucket split' introduced in SDK 6.4.4 and having L3RouteCache set to 1. ALPM IPv6 did not invalidate corresponding memory's cache for old bucket. Both ALPM IPv4 and IPv6 did not invalidate corresponding memory's cache for new bucket.<br>Solution: Set L3RouteCache to 0, thus disabling ALPM memory caching or apply patch for SDK-89279. |
| SDK-91799 | All devices | 6.4.9 | Potential memory leak with regard to the features that use internal shr_htbl_destroy function | All customers and all devices running Switch SDK might have a risk of encountering table a memory leak. The memory leak appears whenever shr_htbl_destroy was used. Memory leak was observed in DNX OAM/BFD interrupt context. This issue may also occur in BCM56450 OAM, BCM56260 OAM/SAT, BCM56640 OAM, BCM88030 L2/allocator/MPLS/OAM, and BCM88020 MPLS/OAM/L2.<br>Fix of shr_htb_destroy(): Memory freeing performed with a while loop, instead of the for loop which didn't free all of the buffers |

# Section 9: Resolved Issues for 6.4.11

The following issues are resolved in version 6.4.11 of the SDK.

***Table 44:***

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| PHY-2154 | 1007470 | 56860_A0 56860_A1 | Flag is set to system side before setting TX filter taps. |
| PHY-2172 | 1012223 | 56548_A0 | Added support to CL37 autoneg. To enable CL37 user need to enable auto negotiation on 1G SR mode. |
| SDK-48834 | | 56334_A0 56334_B0 AllChips | 1. with config variable sw_timestamp_fifo_enable=0 2. counter thread doesn't read the timestamp fifo 3. API directly access the timestamp fifo. ( there will be no delay ) 4. **** for link down event, fifo needs to be flushed. **** |
| SDK-73323 | 910638 | 88650_B1 88660_A0 | Fixed RFCS and RERPKT error on RXAUI port when traffic is 10G or almost 10G, and packet size is 1518 byte. |
| SDK-75174 | 903355 | 88660_A0 | For BCM88650 and BCM88660 the meter id will be only 14 bits since 15 bit overlap in HW with out register Note that bit 15 is allways set hence the values of possible meter id are:16383 - 32767 |
| SDK-76878 | 930295 | 88670_A0 | added support for phyctrl in diag nif |
| SDK-80663 | 950370 | 88670_A0 | Interface to bcm_petra_mirror_port_destination_add() has been extended so that, on BCM88670, PMF egress mirroring is activated and assigned strength for 'copy' and for 'forward' |
| SDK-80991 | 947340 | 88670_A0 88670_B0 AllChips | Fixed presentation of range qualifier in bcm_field_group_dump |
| SDK-81010 | 953251 | 88670_A0 | Added an alias for IRR_FABRIC_MC_BASE_QUEUEr for BCM88650. |
| SDK-81138 | 911055 | 88670_A0 88670_B0 | SDK initialization with no ports on core 1 is now possible. |
| SDK-81250 | 936854 | 88670_A0 | OAM: Occasionally a dynamic table will not get cleared correctly on init, causing the OAMP to pump garbage packets. |
| SDK-81642 | 945034 | 88650_B1 88660_A0 | Unexpected error log was removed from code |
| SDK-81670 | 938722 | 88650_B1 88660_A0 | packets in certain sizes may cause faulty ECC errors in the first 2k packets sent. this fix prevents those errors from occurring |
| SDK-81937 | 959373 | 88660_A0 | CRPS: case of ING_PP, FULL COLOR - problem was found while reading a specific counter set which is being split between 2 engines. issue fixed |
| SDK-82951 | 965831 | 88670_A0 | Using cascaded entries does not require any special custom flags now. |
| SDK-83206 | | 88670_A0 | In earlier releases the callback for interrupts was skipped by wrong judgement on BCM88675. In this release, the judgement has been corrected on BCM88675. |
| SDK-83233 | 968261 | 88650_B1 88660_A0 88670_A0 | TXRX: When setting SOC tm_port_header_type_out to CPU, internal dune header will be inserted before packet data. In previous release, 1) internal dune header was treated as part of packet, which cause decoder in packetwatcher work wrongly. 2) packet total length was gotten from internal dune header, which is not correct. In this release, 1) decoder skip internal dune header when parsing packet. 2) packet totol length is gotten from DCB. |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-83850 | 972446 | 88670_A0 | In earlier releases interrupt names did not have interface id for BCM88670. In this release, added interface id to interrupt names for BCM88670. |
| SDK-83938 | | 88670_A0 | When systems are over-subscribed, packets might be corrupted or lost due to XLMAC TX_PKT_UNDERFLOW. In that cases, increasing TX_START_TX_THRESHOLD_QMLF_N field of the NBIH_TX_QMLF_CONFIG and NBIL_TX_QMLF_CONFIG registers will solve the problem, with the cost of some packet delay. For that, a custom feature was added to control the TX_START_TX_THRESHOLD_QMLF_N field of the NBIH_TX_QMLF_CONFIG and NBIL_TX_QMLF_CONFIG registers.<br>Details about the custom feature: Name: custom_feature_mac_fifo_start_tx_thrs Default value: 4 Functionality: The value from custom_feature_mac_fifo_start_tx_thrs is written to TX_START_TX_THRESHOLD_QMLF_N field of all NBIH_TX_QMLF_CONFIG and NBIL_TX_QMLF_CONFIG registers! |
| SDK-83982 | 940778 | 88660_A0 | The default behavior for DNX FAP devices, is that ingress resource (buffer descriptors) reservation take precedence over discard decisions (WRED, tail drop. FADT) only for DP 0 (green). This means that for DP 1-3 discards were still applied for packets in the reserved/guaranteed resource range.<br>A new soc property is added to control the precedence of guarantee over admit was added. It can be used without a DP to specify all DPs, or with a specific DP: cosq_admission_preference={ADMIT_OVER_GUARANTEE,ADMIT_OVER_GUARANTEE} cosq_admission_preference_[0-3]={ADMIT_OVER_GUARANTEE,ADMIT_OVER_GUARANTEE} |
| SDK-84267 | 973697 | 56850_A0 56850_A1 56850_A2 | Added the support to set individual lane firmware mode |
| SDK-84290 | 974520 | 88670_A0 | Now Egress PMF actions will appear in diag field res |
| SDK-84600 | 975898 | 88670_A0 | 'bcmFieldQualifyOutPort' does not have a 'core' bit and may, therefore, not be used on BCM88670 and up since pp_port is ambiguous. Use bcmFieldQualifyDstPort instead |
| SDK-84945 | 966743 | 53288_A0 | API bcm_trunk_set doesn't clear load balancing key of previous setting if existed. This was fixed. |
| SDK-85216 | | 88670_A0 88670_B0 | ILKN quad memory resources were not verified when dynamically adding a new non-ILKN port. Now, these resources are verified when dynamically adding non-ILKN port. |
| SDK-85454 | 981222 | 88670_A0 | Added support for bcmRxTrapEgTxMtuFilter, bcmRxTrapEgTxDiscardFrameTypeFilter and bcmRxTrapEgTxSplitHorizonFilter traps |
| SDK-85770 | 979673 | 88660_A0 AllChips | The feature is redesigned. New PAPI is added for now. |
| SDK-86453 | 987959 | 56960_A0 56960_B0 | For BCM56960 IFP, group QSET update after group is created is supported . |
| SDK-87036 | 992120 | 53415_A0 53416_A0 | To avoid wrong ext-phy driver been hooked up and wrong phy setting been applied to incorrect ext-phy once user miss the assignment on phy address for a specific port. |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-87502 | 989710 | 88670_A0 | CRPS performance issue: when calling bcm_cosq_gport_statistic_multi_get(), the driver pull all CRPS DB from the SW state and at the end of the procedure, it store it back to the SW state. This operation takes a lot of time. In order to short the time of the bcm_cosq_gport_statistic_multi_get(), the driver will pull from SW state (and store back) only the parameters that required for this procedure. |
| SDK-87772 | 950925 | 56840_A0 56850_A0 56850_A1 | When ser parity error occurs on the memories which cannot be accessed by cpu, sdk miss reporting an event to application. Now in this release, sdk will report an event when this case happens. |
| SDK-87932 | 994401 | 56460_A0 | Following are the fixes for this Jira 1. Lock both the h/w semaphores on the host(SDK), before resetting any of the cores uC1/uC2. Implemented the timeout mechanism for acquiring these semaphores so as to avoid deadlock 2. Before actually resetting the PTP-core, ensure that the "in_use" flag is set, to ensure that PTP is configured and SDK knows the PTP-core 3. Disable Timesync interrupts as done in SDK-88764 for mhost reset of uC1 |
| SDK-88141 | 997203 | AllChips | If disabling a combo port, power down both copper & fiber media. |
| SDK-88316 | 997786 | 56860_A0 | To enable the 1G AN on the PHY84328, the PHY should be programmed at 1G forced speed first, then AN should be enabled. PHY84328 supports only cl37 (no SGMII AN) at 1G speed. |
| SDK-88338 | 992728 | 88660_A0 | api bcm_l2_cache_get did not update bellow flags even if they were set: BCM_L2_CACHE_TRUNK BCM_L2_CACHE_SUBTYPE Now the flags updated in case they are set. |
| SDK-88395 | 991918 | 88660_A0 | bcm_field_qualify_SrcPort_get will not return error, so this field can be used for ACL |
| SDK-88545 | 1001654 | 88670_A0 | Added a condition to return the default value of the DEFAULT_CPU_TRAP_CODE field in IHP_PINFO_LLR memory when we call bcm_port_force_forward_set() with enable=0. |
| SDK-88614 | 1002100 | 88660_A0 | tr 50 changed to skip write only memories. |
| SDK-88713 | 993663 | 88670_A0 88670_B0 88950_a0 | Configuring "serdes_firmware_mode" explicitly might mistakenly override other SerDes UCODE configuration.Fixed However, It is recommended to use dedicated control for the required property and not to use SerDes firmware mode control. For example: SerDes DFE on should be enable by: "bcm_port_phy_control_set(unit, port, BCM_PORT_PHY_CONTROL_FIRMWARE_DFE_ENABLE, value):" And not by: "bcm_port_phy_control_set(unit, port, BCM_PORT_PHY_CONTROL_FIRMWARE_MODE, value):" |
| SDK-88783 | 1002625 | 56850_A0 56850_A1 56850_A2 56851_A0 56851_A1 56851_A2 56851P_A1 56851P_A2 56852_A0 56852_A1 56852_A2 56853_A0 56853_A1 56853_A2 56854_A0 56854_A2 56854_B0 56855_A0 56855_A2 | In previous releases, port could stop egressing if lower WRED thresholds with traffic on the fly. This has been addressed by removing WRED refresh operations when changing drop profile. |

*Table 44:*

| Number | CSP | Chips | Release Notes For 6.4.11 |
|---|---|---|---|
| SDK-88808 | 956238 | 88670_A0 88670_B0 | MPLS PORT: added support for ingress 1+1 & Egress 1:1 protection. |
| SDK-88908 | 996575 | 88660_A0 | Bug fix: Parsing of frwrd_type field for mirror packet. |
| SDK-88967 | 1003430 | 88670_B0 | added the support of FEC cl91 set/get function into bcm api. |
| SDK-89079 | 997816 | 88670_A0 | Confusion between logic port and TM port when getting tdm packet port was fixed. |
| SDK-89127 | 1000525 | AllChips AllChips | In earlier releases the flag BCM_QOS_MAP_L2_VLAN_PCP was missed when getting qos egrss pcp vlan flags. In this release, the flag BCM_QOS_MAP_L2_VLAN_PCP has been added. |
| SDK-89144 | 999992 | 88670_A0 | dynamic port multiple cycles of add and remove ports is fixed. |
| SDK-89261 | 1005946 | 56340_A0 | Updated initialization of EFP keys in the order such that all L2 keys goes into a single slice which would allow to qualify for all types of packets. Order of keys now is KEY4, KEY 1, KEY1_NO_V4,KEY2,KEY3. |
| SDK-89312 | 1003606 | 88660_A0 | Added a program which supports Up tx packets on LAG port. |
| SDK-89323 | 1006297 | 56860_A0 56860_A1 | bcm port api support is added to provide dynamically switch between CI37, CI37BAM, cl73 and CI73BAM |
| SDK-89327 | 1004665 | AllChips | In previous releases, there was a miss of a lock in the internal function _bcm_xgs3_tbl_add, which might lead to the incorrect NHI reference counts. In this release, this issue has been addressed. |
| SDK-89328 | 1006503 | 88670_A0 88670_B0 | ERSPAN Mirroring modified to coinside with the standard - so that in the GRE header, the K flag is reset and the S flag is set. |
| SDK-89409 | 1005606 | 88670_A0 | Dynamically adding logical port with id above the id of the max existing logical port at power-up - was causing a memory leak. Issue is now fixed and counters database is now allocated according to the maximum ports allowed. Moreover, connecting port with logical id beyond the maximum allowed (dynamically or statically) will lead to a BCM error. |
| SDK-89414 | | 88670_A0 88670_B0 | bcm_multicast_delete fixed for 2 CUD case. |
| SDK-89443 | 1004266 | 56060_A0 | When bcm_stat_sync_get() API is used, the counter value is fetched from the hardware and the software copy of the counter s also updated, so that the count accumulation done by counter thread does not go out of sync. For 32-bit counter registers, the update to the software copy of the count was being done for wrong indexes causing wrap arounds to be detected.<br>The above problem will be seen only in conjunction with counter thread running at very short interval and calling bcm_atat_sync_get() API in another thread context. |
| SDK-89496 | | AllChips | Logic added to check the array size before writing to it. |
| SDK-89515 | 1003217 | 53400_A0 | bcm_time_capture_get() called with TIME_CAPTURE_MODE_IMMEDIATE will return the timestamp data |
| SDK-89519 | 1007400 | 56860_A0 56860_A1 56864_A1 | In previous releases, configuring bcmSwitchMeterAdjust and bcmSwitchShaperAdjust for front panel ports would not take effect in BCM56864. This has been addressed by disabling the soc_feature_egr_lport_tab_profile check in the APIs. |
| SDK-89541 | 1007523 | 88670_B0 | move all the logics for the interface get from glue code to phymod api |
| SDK-89590 | 989748 | 88470_A0 88660_A0 88670_A0 | Create HiGiG port with bcm_port_add always fail, fixed. |

*Table 44:*

| Number | CSP | Chips | Release Notes For 6.4.11 |
|---|---|---|---|
| SDK-89626 | 1001265 | 56440_A0 56440_A1 56440_B0 | In the current SDK for 56440/56450 devices the RX CPU queues are being initialized before completing the DMA configuration. Moved the code for enabling CPU queues after the DMA channel configuration. |
| SDK-89663 | 1007804 | 56450_A0 56450_B0 56450_B1 | As part of this jira, a fix is added to lookup ipmc repl tables correctly for matching interface bitmaps. |
| SDK-89731 | 990804 | AllChips | update _tx_dv_free() function |
| SDK-89737 | 1005911 | 88670_A0 88670_B0 | In the previous release, the 1588 timestanmping mode on QSGMII port was 48-bit by default. In this release, this mode is set to 32-bit. |
| SDK-89758 | 1006088 | AllChips | In previous releases, routine bcm_rpc_setup might result in memory write overflow. So "ASSERT" had been added to this routine, when there was memory write overflow in the routine, SDK would be stopped. |
| SDK-89777 | | 88670_A0 88670_B0 | Strength bit is not updated correctly, since length of half lif entry is taken incorrectly.This is fixed. |
| SDK-89941 | 1009295 | 56460_A0 56460_B0 | Port, Vlan and Level parameters are not required in oam endpoint add CLI for REMOTE endpoints. But this was enforced in the CLI. This has been fixed. |
| SDK-89942 | 1009233 | 56260_A0 56260_B0 | Calling bcm_oam_opcode_group_set() was creating a gap between default oam opcode control profile and opcode group mapping. Fixed the issue by refreshing default oam opcode control profile based on new opcode group mapping. |
| SDK-89978 | 1009133 | 56850_A0 56850_A1 56850_A2 | In previous releases, after synchronizing MMU traffic flag of one port to WarmBoot cache, there was a chance that the port link status could be changed from UP to DOWN. As a result, the MMU traffic flag was changed, but the new flag was not saved to WarmBoot cache. So when system Warm booted next time, SDK would use old value of the flag which could result in traffic lost. This issue have been solved now. |
| SDK-90020 | 1008887 | 56260_A0 | An index allocated from BHH pool was not released when returned with failure. This caused running out of BHH pool indexes after multiple failures.<br>This has been fixed by releasing the BHH pool indexes when endpoint create fails. |
| SDK-90056 | | 88670_A0 | Single Core can be set to ANY FAP ID (and not only even) |
| SDK-90070 | 1004651 | 88670_A0 | When working with ILKN, ref_clock of 125MHz and data-rate of 11500, there were two issues: Functional issue with 4x10 port leading to wrong SerDes rate and diag issue in 4x25 port, leading to 0.5 factor in SerDes display (SerDes rate was OK). Both issue were fixed and correct rate is displayed for ILKN with ref_clock of 125MHz and data rate of 11500, both PML and PMH ports. |
| SDK-90073 | 1009403 | 88670_A0 | setting different speeds to QSGMII ports resides on the same lane is now supported. |
| SDK-90080 | 1009568 | 56850_A0 56850_A1 56850_A2 | In previous releases, L3_IIF_PROFILE.TRUST_DSCP_PTR was not retained with the original value and L3_IIF.L3_IIF_PROFILE_INDEX would be modified when bcm_vlan_control_vlan_set was invoked. This has been addressed in this release by correctly getting trust-qos-map-id in _bcm_tr_l3_ingress_interface_get(). |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-90092 | | 56850_A1 | In previous releases, bcm_vxlan_port_add didn't check the egress object that was created without BCM_L3_VXLAN_ONLY flag. In this release, bcm_vxlan_port_add will return a BCM_E_CONFIG error if the passed in egress object is created without BCM_L3_VXLAN_ONLY flag. |
| SDK-90111 | 999796 | 56960_A0 56960_B0 56960_B1 | Since mode id is released twice, we could make a code change to release mode id for custom mode and then release mode id for regular mode only if it is not custom mode. |
| SDK-90132 | 1003575 | 56960_A0 56960_B0 56960_B1 | In previous release,usage of bcmPortControlMmuTrafficEnable & bcmPortControlMmuDrain sequence for down ports will set link bit in LED_DATA_RAM. In this release,it has been fixed. |
| SDK-90151 | | 88670_A0 | Changed wrong "DIAG oam" comment in "Diag buffers" command. |
| SDK-90170 | 1009880 | 88670_A0 88670_B0 | Learn Data was not filled for the BCM88670 learn format was not supported before, currently, the Learn Data is enabled for the BCM88670 learn format(FEC+EEI) is right now. |
| SDK-90218 | 1010399 | 56854_A0 56854_A2 56854_B0 | In previous releases, port control flag bcmPortControlLLFCTransmit was not explained in detail, i.e. for StrataXGS devices, LLFC flags are used to control SAFC other than 802.3x PAUSE, while PFC flags instead are used for PAUSE configuration. This has been addressed by adding extra notes for these flags. |
| SDK-90271 | 970603 | 88670_A0 88670_B0 | QSGMII CRC errors were seen sometimes on random links is fixed |
| SDK-90272 | 1010782 | 56850_A0 56850_A1 56850_A2 56860_A0 56860_A1 | The PVTMON8 register has been enabled back in the TD2/ TD2+ code to display the temperature as it was ignored previously due to the wrong temperature readings shown by it. |
| SDK-90277 | 1011273 | 56850_A0 56850_A1 56850_A2 | In previous releases, ecmp_refcnt in _bcm_xgs3_l3_reinit() was a static variable and could cause problem in multiunit parallel warm boot initiation. This has been addressed in this release. |
| SDK-90281 | 1011271 | 56840_A0 | In this release, invalid mem check has been added in SER correction to prevent device from crash. |
| SDK-90294 | 969667 | 88670_A0 88670_B0 | Injecting packets through PWE outlif (directed to PWE network) can be counted using soc property custom_feature_eg_pwe_counting. CCM packets should be injected with PWE label. Second PWE label which will be generated, will be removed by a PRGE program. Note: In this case MPLS tunnel cannot be encapsulated in the same EEDB entry with the PWE.<br>For LMMs they have to add an OAM-TS and the outlif should be the LSP outlif (or whichever outlif comes after the PWE). |
| SDK-90297 | 1011195 | 56260_A0 56260_B0 | There was missing cleanup in case bcm_oam_endpoint_create() was called with invalid parameter. Now SDK is modified to carry out proper cleanup in case there is a failure in bcm_oam_endpoint_create() |
| SDK-90302 | 1009375 | 88670_A0 | Dynamically detaching ILKN port puts all its PMs out of bypass mode. When a PM is being shared between two (or more) ILKN ports, detach leads to bypass mode change of an active PM. This issue is fixed. |
| SDK-90328 | 1010022 | 88670_A0 | assert while calling bcm_cosq_port_mapping_set, because trying to configure IRR_DESTINATION_TABLE per core, but the table is common for both cores. Solution: configure the table only once, using the relevant MACRO |

*Table 44:*

| Number | CSP | Chips | Release Notes For 6.4.11 |
|---|---|---|---|
| SDK-90369 | 1006454 | 88660_A0 | Meter ( and also Ethernet policer in BCM88X7X) caused data lost in specific rates and bursts configuration. Meter's bucket configured to be smaller than the amount of credit in a given chunk of credits. Issue was fixed by adding verification of the minimum bucket size according to the given rates. By using bcm_policer_get() we will return the actual configured bucket size, which can be slight larger in such immoderate configurations. |
| SDK-90389 | 1011916 | 88670_A0 88670_B0 | 88675: Fixed an issue where creating a symmetric global lif and then a non symmetric global lif in the same 4k range would make it impossible to delete the non symmetric lif. |
| SDK-90392 | 1011831 | 56440_A0 56440_A1 56440_B0 | The field entry dump command is modified to not remove the loopback ports in entry port bitmap mask. |
| SDK-90458 | | AllChips | bcmOAMEventBHHCCMTimeoutClear event will be issued when timeout is cleared on an BHH endpoint. |
| SDK-90460 | | 88670_A0 | Fixed presentation of PMF_DATA qualifier in diag field last |
| SDK-90479 | 1010074 | 56850_A0 56850_A1 56850_A2 | In previous releases, the API bcm_l3_host_travers would stop getting the routing information once the reference count of an egress object in use was set to zero incorrectly. In this release, this issue has been addressed. |
| SDK-90489 | 1008068 | 88660_A0 88670_A0 | In earlier releases SER handler for the memory IRR_MCDB was not right. In this release, SER handler has been corrected. |
| SDK-90492 | 1012578 | 56450_A0 56450_B0 56450_B1 | In earlier releases, build issue is seen in non-posix OS due to presence of signal API in DDR test. This has been fixed in this release. |
| SDK-90497 | 1012570 | 56450_A0 56450_B0 56450_B1 | Wrong device type check function was used to identify the PCI device when using the "dump pci" cli command . Correct the PCI device identity check with bus type get function in this release. |
| SDK-90502 | 996365 | 88670_A0 88670_B0 | soft reset for single core mode is fixed. |
| SDK-90508 | 1001311 | 88670_A0 | Global VSQ flow control thresholds was set to 0 be default. Meaning global flow control is always asserted, causing for lossless VSQs not using their shared memory space. The global flow control default was set to maximum value by default. Note that in addition FC thresholds should be configured to be larger than 0 when allocating lossless VSQs. |
| SDK-90530 | 1013040 | 56850_A0 56850_A1 56850_A2 | In previous releases, the warm boot of multicast module took too much time. In this release, the time has been reduced. |
| SDK-90566 | 1012499 | 56850_A0 56850_A1 56850_A2 | In the previous releases, extender gport was not available for egress VLAN translation. It has been added in this release. |
| SDK-90599 | 1012045 | 56850_A0 56850_A1 56850_A2 | Used the correct index style for obtaining the HW index for a given port/cosq. |
| SDK-90607 | 1013571 | 56850_A0 56850_A1 56850_A2 | The internal function of getting the ecmp member count was not implemented correctly. When the ecmp group only had one member, SDK missed to handle this scenario. The issue has been fixed in this release. |
| SDK-90612 | 998428 | 88670_A0 88670_B0 | modify the description of itmh.base.jer_dest_info |
| SDK-90627 | 1011441 | 88670_A0 88670_B0 | Now a pw can be updated even the mpls_tunnel for it has been removed. |
| SDK-90710 | 988545 | 88670_A0 88670_B0 | In L2, when using the API bcm_l2_replace() with the flag BCM_L2_REPLACE_MIGRATE_PORT, the destination was not properly updated in the matching MAC table entries. This flag support is now corrected and when used, destination is updated as expected. |
| SDK-90741 | 1013393 | 56340_A0 | BCM56345 will use a specified array for flex port interface, and this will not share with other chips. |

*Table 44:*

| Number | CSP | Chips | Release Notes For 6.4.11 |
|---|---|---|---|
| SDK-90765 | 1010634 | 56960_A0 56960_B0 56960_B1 | In previous releases, setting bcmCosqControlEgressUCQueueSharedLimitBytes and bcmCosqControlEgressUCQueueMinLimitBytes to zero didn't disable the queue. This has been fixed.<br>bcm_cosq_control_set(0, gport, 3, bcmCosqControlEgressUCQueueSharedLimitBytes, 0);<br>bcm_cosq_control_set(0, gport, 3, bcmCosqControlEgressUCQueueMinLimitBytes, 0); |
| SDK-90770 | 1014368 | 88670_A0 88670_B0 | MPLS PORT: failover_id and network_group_id replace operation for pw created with ingress_only flag is now supported. |
| SDK-90808 | 1012945 | 88660_A0 | OAM: when adding an RMEP in the OAMP while traffic is running spurious timeouts may occur. |
| SDK-90820 | 1008304 | 88670_B0 | In the previous release, auto-neg can not work well on 100G tscf port and 40G tsce port. In this release, auto-neg work well on both 100G tscf port and 40G tsce port. |
| SDK-90830 | 1011600 | 88670_A0 | In L3, when setting the SOC property "bcm886xx_l3_ingress_urpf_enable=1", a bit was allocated in the inLIF profile for uRPF handling (as in BCM88660). This behavior is correct only for BCM88660, because in BCM88670, the inRIF profile controls the uRPF behavior. All redundant LIF configurations related to uRPF have been removed for BCM88670. |
| SDK-90843 | 1014201 | 56850_A0 | The NEW_INT_PRI field of EGR_IM_MTP_INDEX table isn't configured with right value when adding mirror source port after performing warmboot. The root cause is the element int_pri of mirror destination doesn't get recovered during warmboot. Now in this version, this issue is fixed. |
| SDK-90844 | 1014681 | 56850_A0 56850_A1 56850_A2 | In previous releases, when the feature of directed flexible mirroring was enabled, the reference counters for ingress and egress MTP index wouldn't be updated correctly. This issue has been fixed in this release. |
| SDK-90879 | 1007353 | 88670_A0 88670_B0 | In L3, when calling bcm_l3_host_traverse(), only up to 129 entries were handled by the callback function, even if more hosts reside in the host table. This is fixed so that all configured hosts will be handled when calling bcm_l3_host_traverse(). |
| SDK-90887 | 1006296 | 56960_A0 56960_B0 56960_B1 | In previous release ,the API bcm_cosq_gport_discard didn't apply to the device-wide discard settings. In this release,it has been fixed. |
| SDK-90975 | 1015450 | 56960_A0 56960_B0 56960_B1 | In previous releases, creating an L3 egress object with MPLS port was not supported. This has been implemented in this release. |
| SDK-90987 | 1015596 | 56850_A0 56850_A1 56850_A2 | Parameters to TimeStampToCpu and its coloured variants are not properly read from the correct fields after warmboot. Fixed the same. |
| SDK-91003 | 1015512 | 56850_A0 56850_A1 56850_A2 | In previous releases, warmboot function of BST module was not implemented. This has been added in this release. |
| SDK-91008 | 1013968 | 88660_A0 | default for use_trunk_as_ingress_mc_destination soc property was changes in the following way: for BCM88650 the default is 0 for BCM88660 and BCM88670 the default is 1 this JIRA cause problems with stacking due to new default in BCM88670 and BCM88660. to prevent problems with stacking, use previous default - use_trunk_as_ingress_mc_destination=0<br>this default change meaning is that adding trunk destinations to mc group must be done in the new way (add trunk id gport to mc group) in relevant devices (Jericho and Arad Plus ) |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-91011 | | 56850_A0 56850_A1 56850_A2 | In warmboot recovery, calling right group entry recovery method for EFP expanded slices and updated internal variable initializations |
| SDK-91024 | 1015667 | 56850_A0 56850_A1 56850_A2 | The port number validation for qualifier bcmFieldQualifyDstPort and bcmFieldQualifySrcPort in a multi module system is set to appropriate value based on the chip. |
| SDK-91037 | 1013249 | 56860_A0 56860_A1 | VLAN tagged packet drop issue should not be seen now as the HG port is been added properly the existing VLANs. |
| SDK-91072 | 1017510 | AllChips | None |
| SDK-91124 | 1013840 | 88660_A0 | Fix issue with 100G ports counters showing bad values after port disable-enable. |
| SDK-91138 | 1016489 | 56260_A0 56260_B0 | Addressed the issues in bhh pool index free during endpoint create failure cases |
| SDK-91148 | 1016552 | 56850_A0 56850_A1 56850_A2 | Syncing and recovering RedirectIpmc Action Type to set the parameters to right type after warmboot |
| SDK-91174 | 1015571 | 56850_A0 56850_A1 56850_A2 | In previous releases, soc_mem_alpm_lookup could cause infinite loop and if there was a parity error in pipe_y then the function _soc_mem_alpm_ser_correction was unable to correct it. Now this has been fixed. |
| SDK-91178 | 1012350 | 56850_A0 56850_A1 56850_A2 | Before SDK_6_4_8 releases, the initial index of led data RAM was "1". However, in SDK_6_4_8 release, the initial index was changed as "0". So there was mismatch in led port order remap. Now the initial index is reset as "1". |
| SDK-91214 | 1011941 | 88670_A0 88670_B0 | Removing or adding dynamically a port will cause for MC packet to be dropped due to wrong CGM configuration. Fixed |
| SDK-91216 | 1002182 | 88670_A0 | In KBP , to reduce the initialization time, the flag KBP_DEVICE_PROP_INST_LATENCY was removed for BCM88670 devices. This flag was added since the advanced instructions were sometimes causing ROP error due to flow control. The property disables the advanced instructions which will increase the update rate. this property is not needed in BCM88670. |
| SDK-91222 | 1015642 | 88670_A0 | DNX configures autoneg mode in soc/dpp level (jer_nif.c). Autoneg configuration was added to portmod, which overrun DNX configuration.<br>AUTONEG_CONFIG_SKIP flag added to portmod_port_add_info_t to enable skipping autoneg configuration in portmod. This flag is set on DNX (jer_nif.c) |
| SDK-91231 | 1014185 | 88670_A0 | EVPN: No LSP tunnel configuration between PEs is now supported. Note: in this case PMF egress PE pre-selection cannot be done according to TT Termination |
| SDK-91348 | 1015662 | 88650_B1 88660_A0 88670_A0 | DNX: Fixed an issue where writing to ESEM without a SW shadow may return success even if the writing was unsucessful. |
| SDK-91384 | 1017345 | 88660_A0 | in IPMC, when the API bcm_ipmc_add() was called without setting the flag BCM_IPMC_REPLACE, "Entry not found" message was printed, as the new entry did not exist. Now the API bcm_ipmc_add() prints the error only in case BCM_IPMC_REPLACE is set. Also, the API bcm_ipmc_find() does not print an error message in case an entry is not found, but returns "entry not found" code value for further use. In API bcm_ipmc_remove() an error is printed if the entry does not exist. |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-91385 | 1016558 | 56850_A0 56850_A1 56850_A2 | In previous releases, the DMA memory space used for packet sending was not freed by "bcmTX" in time, which resulted in DV allocation failures in the next attempt of sending packets by other threads. Now the pending DMA memory space is freed in time. |
| SDK-91395 | 1015021 | 88470_A0 88650_B1 88660_A0 88670_A0 88670_B0 | In the previous release, SAV TT program used invalid key constructions and prefix value. In this release, this issue has been addressed by using correct key constructions and prefix value for DHCP IPv4 SAV TT program. |
| SDK-91411 | 1016304 | 56260_A0 56260_B0 | Issue: The queues mapped to disabled ports are in enable state after flex operation. This is caused by the race condition between linkscan and port enable function during linkup sequence of flex operation.<br>Solution: The link up sequence of flex operation is modified to enable the linkscan first and then enable/disable port based on default config. |
| SDK-91421 | 1017467 | AllChips | Calling the API bcm_rx_init() fails on device 56224, starting the SDK Release 6.5.1. This is due calling an internal routine, which is not supported on BCM56224. Added a check to prevent calling the internal routine on unsupported devices. |
| SDK-91426 | 1017726 | 88670_B0 | In previous release, auto-neg does not work well on 1G eagle port with cl37 mode. In this release, auto-neg does work well on 1G eagle port with cl37 mode. |
| SDK-91431 | 1012177 | AllChips | bcm_field_qualify_L3Ingress API accepted only a 12bit inRif value, while the in-RIF range was extended to 15 bits in BCM88670. This qualifier was adjusted to accommodate the full range. |
| SDK-91432 | 1017957 | 56860_A0 56860_A1 | Moved the ing_attr pointer into the ingress mode part and adding similar attribute egr_attr and setting the total counter values for the egress mode. |
| SDK-91446 | 1016916 | 88670_A0 88670_B0 | In FCoE, delete and get LPM route (using flag BCM_FCOE_DOMAIN_ROUTE) failed due to internal error. Issue fixed and now it is possible to get and delete LPM entries. |
| SDK-91447 | 1013585 | 88660_A0 | OAM: The API bcm_oam_delay_get() returns incorrect nanoseconds in delay_min, delay_max, delay fields. Actual nanoseconds value is 4 times greater than the returned value. |
| SDK-91506 | | 88670_A0 | Minor bug fix. The following API may have been malfunctioning regarding order of entries on data base if flag BCM_FIELD_GROUP_CREATE_INSERTION_ORDER_LOOSE has been used: bcm_field_group_config_create(). Note that there was no effect on bcm_field_group_create_id() |
| SDK-91518 | 1018043 | 56960_A0 56960_B0 56960_B1 | the sentence of #if 0 is added for TD2P DEV branch by Wilson, maybe in order to see some intermittent error with BCMSIM, then merged to master branch, It should be moved. |
| SDK-91553 | 1017189 | 56460_A0 56460_B0 | 1) Incorrect modid and port was used to construct gport in case of CoE subport . 2) Also subport port gport was not constructed during warmboot.<br>The above issues have been fixed. |
| SDK-91564 | 1018613 | 56460_A0 56460_B0 | In KT2/SB2 EFP Byte counter is 36 bits and IFP Byte counter is 35 bits. Used the corresponding counter update for updating the SW counter as per the stage. |
| SDK-91598 | 1017914 | 56340_A0 | In previous releases, the _soc_hx4_age_timer_get API could return enable=1 and age_seconds=0. This issue has been fixed in this release. |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-91657 | 1019274 | 56960_A0 56960_B0 56960_B1 | Issue: IFP entries are used in BCM56960 and L2 entries are used in BCM56860 to assign session id to non-zero discriminator BFD packets. This needs to be removed as per customer's requirements.<br>Fix: This is fixed by adding a new config property called "bfd_use_endpoint_id_as_discriminator". When this config property is configured (enabled by setting to 1), the local_discriminator value in the endpoint_info during bfd endpoint create will be ignored and discriminator is arrived at by adding a +1 to the session/endpoint_id. Hence there exists a direct linear mapping between session id and discriminator and those IFP/L2 entries are not required. The +1 is done to avoid zero endpoint_id/session_id giving out zero discriminator. |
| SDK-91680 | 1017339 | AllChips | Phase holdover mode support is indicated as part of ptp servo config command |
| SDK-91751 | 1015676 | 56850_A0 56850_A1 56850_A2 | For legacy flex stat modes, counter attribute information is not saved / retrieved from scache after warm boot. This causes new modes to be created for every user request, after warm boot, due to which the system runs out of HW counter modes (0-3). |
| SDK-91759 | 1019317 | 88670_B0 | Sergey created a new label for BCM88670 B0 and I updated the mcmrelease wit the correct BS_PLL_CFG_RESET_B<173> and BS_PLL_CFG_POST_RESET_B<174> in ECI_BS_PLL_CONFIG for BCM88670 B0. |
| SDK-91761 | 1016153 | 88670_A0 | The diagnostics command "diag dbal lp " caused a SDK crash. The issue happens only when the packet was using LPM lookup. This issue caused by incorrect use of signal value. This issue is fixed now. |
| SDK-91796 | 1019327 | 56460_A0 56460_B0 | Problem: pinfo->vlan_prot_ptr and vp entry is not recovered correctly after warmboot.<br>Solution: Vp entry and Vlan protocol data index (vlan_prot_ptr ) are storied in scache and retrieve back during warm boot. |
| SDK-91799 | 1018239 | AllChips AllChips | All customers and all devices running Switch SDK within the "Affected Versions" have a risk of encountering table a memory leak. The memory leak appears whenever shr_htbl_destroy was used. Memory leak was observed in DNX OAM/BFD interrupt context. This issue may also occur in BCM56450 OAM. BCM56260 OAM and SAT, BCM56640 OAM, BCM88030 l2, BCM88030 allocator, BCM88030 mpls, BCM88030 oam, BCM88020 mpls, BCM88020 oam, BCM88020 l2. |
| SDK-91824 | 1019661 | 56440_A0 56440_A1 56440_B0 | In KT EFP Byte counter is 36 bits and IFP Byte counter is 35 bits. Used the corresponding counter update for updating the SW counter based on the stage. |
| SDK-91852 | 1017672 | AllChips | Problem: If we try to configure both AN(true) and Speed or duplex of a port via a single call of bcm_port_selective_set, the API returns success but the AN status set back to false. This is because as part of speed or duplex config the AN gets disabled.<br>Solution: In case both AN (true) and Speed setting together then forced speed we allow only if AN disabled. If AN enabled for speed configure return param error. In case both AN (true) and duplex setting together then AN we enable and allow duplex to get auto-detected. For duplex configure return param error. |

*Table 44:*

| Number | CSP | Chips | Release Notes For 6.4.11 |
|---|---|---|---|
| SDK-91858 | 1016677 | 88670_A0 88670_B0 | In L3, API bcm_l3_route_add() returned the error code BCM_E_INTERNAL (-1) for all error cases. Now BCM_E_FULL error code is returned in case the route DB has reached its limit. |
| SDK-91895 | 1019454 | 88470_A0 88670_A0 88670_B0 | Updated the error msg to the correct one. |
| SDK-91936 | 1019593 | 56860_A0 56860_A1 | In this release, improved the time performance of API bcm_mpls_port_add() with flags BCM_MPLS_PORT_REPLACE and BCM_MPLS_PORT_EGRESS_TUNNEL specified for non failover port. |
| SDK-91939 | 1020205 | 88670_A0 88670_B0 | Tunnel according DIP+SIP+vrf supported together with tst2 custom feature |
| SDK-91955 | 1019524 | 56860_A0 56860_A1 | MY_MODID is the global parameter for the device. But it resides in PORT_TABm. When flexport is executed, the new entry will be created in PORT_TABm. As part of flexport sequence, current MY_MODID needs to be set to PORT_TABm.MY_MODIDf. |
| SDK-92025 | 1020140 | 88660_A0 | OAM: destroying/updating OAM server on server side may fail. |
| SDK-92029 | 1011827 | 88670_A0 88670_B0 | cint_route_over_ac.c fixed: 1. EVE is configured for tag_format 0 (since L2 header is terminated) 2. ecmp_intf is used (instead of fec_id) in l3_host_create API (LEM entry size limitation) |
| SDK-92052 | 1009057 | AllChips | Fix to handle PTP master's port re-configuration with new IP address. |
| SDK-92057 | 1020287 | 88670_A0 | Now when using the bcm_l3_intf_get the Forwarding MTU will be updated if it was set (the mtu_advanced_mode SOC is mandatory for this) |
| SDK-92065 | 1019467 | 88670_A0 88670_B0 | check resilient_hash_enable soc in init, if its enabled on non supported device an error is thrown |
| SDK-92068 | 1020449 | 56640_A0 56640_A1 56640_B0 | Issue ==== During warmboot recover, control pool info related to slice was not getting updated properly. In TR3, when a stat is create, one of the counter pool is reserved for that slice. In the given configuration after 2 group with entries are created. Pool id 0 was reserved for entries in slice 0 or group 14 & FP_POLICY_TABLE.ipipe0[0]: COUNTER_SET=0x54000,> // COUNTER_POOL_NUMBER=0 & COUNTER_POOL_INDEX=0 Pool id 1 was reserved for entries in slice 1 or group 20 FP_POLICY_TABLE.ipipe0[512]: COUNTER_SET=0x54200,COUNTER_POOL_NUMBER=1, > // COUNTER_POOL_NUMBER=1 & COUNTER_POOL_INDEX=0 During warmboot recovery, while recovering entries, SW link between counter pool and slice idx was not update properly, due to this SW info says all the counter are free. When a new entry is created for slice 1 or group 20, and stat is attached for it. SW tries to allocated pool id 0 for slice 1. Ideally it should have allocated from pool id 1 as it was reserved for slice 1. Fix == Updated slice id mapping in counter pool during stat recover. |
| SDK-92081 | 1014514 | 88660_A0 | CRPS issue: time of bcm_field_stat_multi_get API is too long. the reason is that there are many reading from SW DB. Solution: reduce the number of times reading parameters from SW DB. |
| SDK-92120 | 1020402 | 56960_A0 56960_B0 56960_B1 | bcm_field_stat_id_get will not fail even if some entries the group have no stats attached to it. |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-92160 | 1019858 | 56860_A0 56860_A1 | An error in soc_td2p_mmu_flexport_allocate_deallocate_ports() where physical ports were being indexed from 0-127 rather than 1-128, which caused MMU Ports to be improperly marked as free (physical port 128's MMU Port was never marked as in use because of this off by one). Thus, two ports were being assigned the same MMU Port and therefore the same queues. |
| SDK-92183 | 1020413 | 56860_A0 56860_A1 | We are setting the PGW_LED_CHAIN_OUT_CONFIG register for all the PGW blocks irrespective of whether it is active or not. |
| SDK-92280 | 1021062 | 88670_A0 | MPLS: If the result of MPLS label lookup in the forwarding stage is FEC+Outlif, the following configuration should be used in bcm_mpls_tunnel_switch struct: egress_if - outlif value encoded as BCM interface of type OutLif port - FEC value encoded as BCM gport of type forwarding port |
| SDK-92310 | 1021225 | 56340_A0 | Threshold settings for SC and QM queues (queue number 8 and 9) were blocked in the SDK. These have now been enabled. |
| SDK-92345 | 1021506 | 56334_A0 56334_B0 | Issue: Wrongly calculating the trunk member due to that failed to initialize the mirror module after disabling the trunk members.<br>Solution: Retrieving the right active members during the mirror initialization. |
| SDK-92463 | 1017019 | 88670_A0 | Full range of MC ID may be used up to defined in the system |
| SDK-92492 | 1021749 | 88670_A0 | In the previous release, the API bcm_port_timesync_config_set can't disable 1588 mac function on port. In this release, this issue has been addressed by setting the value of field 'IEEE_1588_MAC_ENABLEf' to 0. |
| SDK-92625 | 1021903 | 88950_a0 | In earlier releases there was no recover action when initiate FE3200 RTP ECC error. In this release, added recover action for FE3200 RTP ECC. |
| SDK-92676 | 1022834 | AllChips | IBOD WAR is being executed on the INVALID ports as well. VALID ports check fix the issue. |
| SDK-92697 | 1022680 | 88670_A0 88670_B0 | When a fid is disconnected from a learn profile and it was the last fid using the profile, this profile is cleaned. In case the same fid immediately gets the same profile in _bcm_dpp_am_template_l2_learn_profile_exchange, this profile should not be cleared. Now the learn profile is not cleared in this case |
| SDK-92782 | 1023464 | 88670_A0 88670_B0 | In the previous release, aging configuration was updated incorrectly. In this release, this issue has been addressed by not updating the aging configuration when bcm_vlan_control_vlan_set() is called without aging profile and configuration. |
| SDK-92875 | 1022739 | 88660_A0 | When SOC property bcm886xx_ipv6_tunnel_enable was set to '0', VXLAN or any IP tunnel type was not terminated properly, due to wrong processing in the tunnel termination stage. The tunnel termination ucode has been changed to support correct handling when bcm886xx_ipv6_tunnel_enable is set to '0' or '1'. |
| SDK-92891 | 1025033 | 56850_A0 56850_A1 56850_A2 | In previous releases, parity error in the memory MMU_WRED_UC_QUEUE_TOTAL_COUNT_X_PIPE would not be corrected. This issue has been addressed in this release. |
| SDK-92901 | 1023462 | 88670_A0 88670_B0 | When setting itmh_programmable_mode_enable=0 and itmh_arad_mode_enable=1 on BCM88670, Arad-format ITMH header is now parsed properly. |
| SDK-93012 | 1022525 | 88650_B1 | Actions setup for Arad is now operational (Could fail depending on random value on stack). Could fail in bcm_field_group_action_set() |

*Table 44:*

| *Number* | *CSP* | *Chips* | *Release Notes For 6.4.11* |
|---|---|---|---|
| SDK-93253 | | `88670_A0` | When setting `ilkn_tdm_dedicated_queueing=1` soc property device fails during init. Fixed |

# Section 10: Unresolved Issues for 6.4.11

The following open Urgent priority issues are unresolved in version 6.4.11 of the SDK.

***Table 45:***

| *Number* | *CSP* | *Chips* |
|---|---|---|
| SDK-81696 | 957889 | 56960_A0 |
| SDK-87026 | 992730 | 56960_A0 56960_B0 |
| SDK-88872 | 1003096 | 56860_A0 56860_A1 |
| SDK-89832 | 1006412 | 56860_A0 56860_A1 |
| SDK-90885 | 1008608 | 56340_A0 |
| SDK-92245 | 1009233 | 56260_A0 56260_B0 |
| SDK-92356 | 1020879 | 88660_A0 |
| SDK-92983 | 1026411 | AllChips |

# Section 11: Device and Platform Support

The section describes all devices, platforms, and operating systems that are supported by this release.

## SWITCH DEVICES

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| BCM5389 | BCM5389 A0 | 8-Port GbE Switch with Integrated SerDes |
| | BCM5389 A1 | 8-Port GbE Switch with Integrated SerDes |
| BCM5396 | BCM5396 A0 | 16-Port GbE Switch with Integrated SerDes |
| BCM53010 | BCM53010 A0 | 5-Port Gigabit Ethernet Managed Switch integrated with single core ARM Cortex-A9 processor |
| | BCM53010 A2 | |
| | BCM53011 A0 | 5-Port Gigabit Ethernet Managed Switch integrated with dual cores ARM Cortex-A9 processor |
| | BCM53011 A2 | |
| | BCM53012 A0 | 5-Port Gigabit Ethernet Managed Switch with one RGMII I/F integrated with dual cores ARM Cortex-A9 processor |
| | BCM53012 A2 | |
| BCM53018 | BCM53017 A0 | 2-Port Gigabit Ethernet Managed Switch with one RGMII I/F integrated with dual cores ARM Cortex-A9 processor |
| | BCM53018 A0 | 5-Port Gigabit Ethernet Managed Switch with one RGMII I/F integrated with dual cores ARM Cortex-A9 processor |
| | BCM53019 A0 | 5-Port Gigabit Ethernet Managed Switch integrated with dual cores ARM Cortex-A9 processor |
| BCM53020 | BCM58522 A0 | 5-Port Gigabit Ethernet Managed Switch integrated with 2 PHYs, ARM Cortex-A9 processor and macsec cores |
| | BCM58525 A0 | 5-Port Gigabit Ethernet Managed Switch integrated with 2 PHYs, SGMII I/F, ARM Cortex-A9 processor and macsec cores |
| | BCM58622 A0 | 8-Port Gigabit Ethernet Managed Switch integrated with 5 PHYs, ARM Cortex-A9 processor and macsec cores |
| | BCM58623 A0 | 8-Port Gigabit Ethernet Managed Switch integrated with 5 PHYs, ARM Cortex-A9 processor and macsec cores |
| | BCM58625 A0 | 8-Port Gigabit Ethernet Managed Switch integrated with 5 PHYs, SGMII I/F, ARM Cortex-A9 processor and macsec cores |
| BCM53101 | BCM53101 A0 | 5-Port Fast Ethernet Managed Switch + 1 Fast Ethernet WAN port |
| | BCM53101 B0 | |
| BCM53115 | BCM53115 A0 | 5-Port GbE Managed Switch + 1 Gigabit WAN port with integrated SerDes |
| | BCM53115 A1 | |
| | BCM53115 B0 | |
| | BCM53115 B1 | |
| | BCM53115 C0 | |
| BCM53118 | BCM53118 A0 | 8-Port Gigabit Ethernet Switch |
| | BCM53118 B0 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM53118 B1 | |
| BCM53125 | BCM53125 A0 | 5-Port Gigabit Ethernet Switch with 1 Gigabit WAN port and 8051 processor |
| | BCM53125 B0 | |
| BCM53128 | BCM53128 A0 | 8-Port Gigabit Ethernet Switch with embedded 8051 processor |
| | BCM53128 B0 | |
| BCM53242 | BCM53242 A0 | Managed Switch with 24 FE Ports + 2 GbE Interface |
| | BCM53242 B0 | |
| | BCM53242 B1 | |
| | BCM53262 A0 | Managed Switch with 24 FE Ports + 4 GbE Interface |
| | BCM53262 B0 | |
| | BCM53262 B1 | |
| BCM53280 | BCM53282 A0 | 8-Port Fast Ethernet + 2-Port Gigabit Ethernet Multilayer Switch |
| | BCM53282 B0 | |
| | BCM53282 B1 | |
| | BCM53282 B2 | |
| | BCM53283 A0 | 16-Port Fast Ethernet + 2-Port Gigabit Ethernet Multilayer Switch |
| | BCM53283 B0 | |
| | BCM53283 B1 | |
| | BCM53283 B2 | |
| | BCM53284 A0 | 24-Port Fast Ethernet + 2-Port Gigabit Ethernet Multilayer Switch |
| | BCM53284 B0 | |
| | BCM53284 B1 | |
| | BCM53284 B2 | |
| | BCM53286 A0 | 24-Port Fast Ethernet + 4-Port Gigabit Ethernet Multilayer Switch |
| | BCM53286 B0 | |
| | BCM53286 B1 | |
| | BCM53286 B2 | |
| | BCM53288 A0 | 24-Port Fast Ethernet + 2-Port Gigabit Ethernet Multilayer Switch with one 2.5GbE Uplink Port |
| | BCM53288 B0 | |
| | BCM53288 B1 | |
| | BCM53288 B2 | |
| BCM53300 | BCM53300 A0 | Managed 24-port L2 Switch |
| | BCM53300 A1 | |
| | BCM53301 A0 | Managed 16-port L2 Switch |
| | BCM53301 A1 | |
| | BCM53302 A0 | Managed 24-port L2 Switch |
| | BCM53302 A1 | |
| BCM53310 | BCM53312 A0 | BCM53312 Integrated Multilayer Switch and CPU |
| | BCM53312 B0 | |
| | BCM53313 A0 | BCM53313 Integrated Multilayer Switch and CPU |
| | BCM53313 B0 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM53314 A0 | BCM53314 Integrated Multilayer Switch and CPU |
| | BCM53314 B0 | |
| BCM53320 | BCM53322 A0 | BCM53322 Integrated Multilayer Switch and CPU |
| | BCM53323 A0 | BCM53323 Integrated Multilayer Switch and CPU |
| | BCM53324 A0 | BCM53324 Integrated Multilayer Switch and CPU |
| BCM53400 | BCM53365 A0 | 16-port 1GbE/2.5GbE/10GbE Multilayer Ethernet Switch |
| BCM53400 | BCM53402 A0 | 8 x 1G/2.5G/5G/10G |
| BCM53400 | BCM53405 A0 | 16-port 10GbE Multilayer Ethernet Switch |
| | BCM53406 A0 | 12-port 10GbE plus 8-port 2.5GbE and 4-port 5GbE/2.5GbE Multilayer Ethernet Switch |
| | BCM53412 A0 | 8 x 1G/2.5G/5G/10G |
| | BCM53415 A0 | 16-port 10GbE Multilayer Ethernet Switch with integrated CPU |
| | BCM53416 A0 | 12-port 10GbE plus 8-port 2.5GbE and 4-port 5GbE/2.5GbE Ethernet Switch with integrated CPU |
| | BCM53422 A0 | 8 x 1G + 2 x 1G/2.5G/5G/10G |
| | BCM53424 A0 | 4 x QSGMII + 8 x 1G + 4 x 1G/2.5G/5G/10G (option1) |
| | BCM53424 A0 | 4 x QSGMII + 8 x 1G + 2 x 10G + 2 x HiGigDuo[13] (option2) |
| | BCM53424 A0 | 2 x QSGMII + 16x1G + 4 x 1G/2.5G/5G/10G (option3) |
| | BCM53426 A0 | 20 x 1G + 4 x 1G/2.5G/5G/10G |
| | BCM53454 A0 | 20 x 1G/2.5G + 4 x 1G/2.5G/5G/10G |
| | BCM53455 A0 | 20 x 1G/2.5G + 4 x 1G/2.5G/5G/10G with embedded ARM A9 processor |
| | BCM53456 A0 | 4 x QSGMII + 8 x 1G/2.5G + 4 x 1G/2.5G/5G/10G (option1) |
| | BCM53456 A0 | 4 x QSGMII + 8 x 1G/2.5G + 2 x 10G + 2 x HiGigDuo[13] (option2) |
| | BCM53456 A0 | 2 x QSGMII + 16 x 1G/2.5G + 4 x 1G/2.5G/5G/10G (option3) |
| | BCM53457 A0 | 4 x QSGMII + 8 x 1G/2.5G + 4 x 1G/2.5G/5G/10G with ARM A9 (option1) |
| | BCM53457 A0 | 4 x QSGMII + 8 x 1G/2.5G + 2 x 10G + 2 x HiGigDuo[13] with ARM A9 (option2) |
| | BCM53457 A0 | 2 x QSGMII + 16 x 1G/2.5G + 4 x 1G/2.5G/5G/10G with ARM A9 (option3) |
| BCM53600 | BCM53602 A0 | 8-Port Fast Ethernet + 3-Port Gigabit Ethernet Switch with one 1/2G-EPON ONU MAC/SerDes and embedded 600MHz MIPS32 74K processor |
| | BCM53603 A0 | 16-Port Fast Ethernet + 3-Port Gigabit Ethernet Switch with one 1/2G-EPON ONU MAC/SerDes and embedded 600MHz MIPS32 74K processor |
| | BCM53604 A0 | 24-Port Fast Ethernet + 3-Port Gigabit Ethernet Switch with one 1/2G-EPON ONU MAC/SerDes and embedded 600MHz MIPS32 74K processor |
| | BCM53606 A0 | 24-Port FE with S3MII interface + 3-Port Gigabit Ethernet Switch with one 1/2G-EPON ONU MAC/SerDes and embedded 600MHz MIPS32 74K processor |
| BCM89500 | BCM89500 A0 | 4-Port Integrated Dedicated BRPHY + 3-Port Gigabit Ethernet Switch with embedded ARM processor |
| | BCM89500 B0 | |
| BCM89500 | BCM89501 A0 | 4-Port Integrated Dedicated BRPHY + 1-Port Integrated Dual-Mode BRPHY + 2-Port Gigabit Ethernet Switch with embedded ARM processor |
| | BCM89501 B0 | |
| BCM89500 | BCM89200 A0 | 1-Port Integrated Dedicated BRPHY + 1-Port Integrated Dual-Mode BRPHY + 2-Port Gigabit Ethernet Switch with embedded ARM processor |
| | BCM89200 B0 | |
| BCM53710 | BCM53714 A0 | BCM56714 Integrated Multilayer Switch and CPU |
| | BCM53714 A1 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM53714 A2 | |
| | BCM53716 A0 | BCM56716 Integrated Multilayer Switch and CPU |
| | BCM53716 A1 | |
| | BCM53716 A2 | |
| | BCM53718 A0 | BCM56718 Integrated Multilayer Switch and CPU |
| | BCM53718 A1 | |
| | BCM53718 A2 | |
| BCM53720 | BCM53724 A0 | Managed 24-port L2 Switch with Integrated CPU |
| | BCM53724 B0 | |
| | BCM53726 A0 | Managed 24-port L2 Switch with Integrated CPU |
| | BCM53726 B0 | |
| BCM56010 | BCM56014 A0 | 24-Port Integrated Multilayer Switch and CPU |
| | BCM56014 A1 | |
| | BCM56014 A2 | |
| | BCM56018 A0 | 48-Port Integrated Multilayer Switch and CPU |
| | BCM56018 A1 | |
| | BCM56018 A2 | |
| | BCM56018 A1 | 48-Port Integrated Multilayer Switch and CPU |
| BCM56020 | BCM56024 A0 | 24-Port Integrated Multilayer Switch and CPU |
| | BCM56024 B0 | |
| | BCM56025 A0 | 24-Port Integrated L2 Switch and CPU |
| | BCM56025 B0 | |
| | BCM56026 A0 | 24-Port Integrated L2 Switch and CPU |
| | BCM56026 B0 | |
| BCM56060 | BCM56060 A0 | 16-port 10GbE Multilayer Ethernet Switch with integrated CPU |
| BCM56060 | BCM56062 A0 | 2 x QSGMII + 16 x 1G/2.5G + 4 x 1G/2.5G/5G/10G (option1) |
| | BCM56062 A0 | 2 x QSGMII + 8 x 1G/2.5G + 2 x XAUI + 4 x 1G/2.5G/5G/10G (option2) |
| | BCM56062 A0 | 2 x QSGMII + 16 x 1G/2.5G + 4 x 1G/2.5G/5G/10G (option3) |
| | BCM56063 A0 | 16-port 1GbE (QSGMII) plus 4-port 1G/2.5G/5G/10G (XFI) Multilayer Switch with integrated CPU |
| | BCM56064 A0 | 24-port GbE (4xQSGMII, 8xSGMII) plus 4-port 10GbE Multilayer Managed Switch with HiGig Uplinks and integrated CPU |
| | BCM56064 A0 | 4 x QSGMII, 8 x 1GbE, 4 x 10GbE (option1) |
| | BCM56064 A0 | 4 x QSGMII, 8 x 1GbE, 2 x 10Gbe, 2 x HiGigDuo[13] (option2) |
| | BCM56065 A0 | 12 x 1G/2.5G/5G/10G + 12 x 1G/2.5G |
| BCM56100 | BCM56100 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch |
| | BCM56100 A1 | |
| | BCM56101 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch with One 10-Gigabit Ethernet/HiGig Port |
| | BCM56101 A1 | |
| | BCM56102 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch with Two 10-Gigabit Ethernet/HiGig Ports |
| | BCM56102 A1 | |
| | BCM56105 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56105 A1 | |
| | BCM56106 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch with One 10-Gigabit Ethernet/HiGig Port |
| | BCM56106 A1 | |
| | BCM56107 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch with Two 10-Gigabit Ethernet/HiGig Ports |
| | BCM56107 A1 | |
| BCM56110 | BCM56110 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch |
| | BCM56111 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch with One 10-Gigabit Ethernet/HiGig Port |
| | BCM56112 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Multilayer Switch with Two 10-Gigabit Ethernet/HiGig Ports |
| | BCM56115 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch |
| | BCM56116 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch with One 10-Gigabit Ethernet/HiGig Port |
| | BCM56117 A0 | 24-Port Fast Ethernet and 2-Port Gigabit Ethernet Layer 2 Switch with Two 10-Gigabit Ethernet/HiGig Ports |
| BCM56130 | BCM56132 A0 | 24-Port Fast Ethernet Multilayer Switch with Two 10-GbE/HiGig2 and Two 1G/2.5Gb Uplink Ports |
| | BCM56132 B0 | |
| | BCM56132 B1 | |
| | BCM56134 A0 | 24-Port Fast Ethernet Multilayer Switch with four 1G/2.5Gb Uplink Ports |
| | BCM56134 B0 | |
| | BCM56134 B1 | |
| BCM56140 | BCM56140 A0 | 24-Port Gigabit Ethernet/6-Port SGMII GbE Multilayer switch with combination of two/four 1G/2.5/HiGig2 Uplink Ports |
| | BCM56142 A0 | 24-Port Gigabit Ethernet Multilayer switch with combination of two/four 1G/2.5/HiGig2 Uplink Ports |
| | BCM56143 A0 | 24-Port Gigabit Ethernet Multilayer switch with combination of two/four 1G/2.5/HiGig2 Uplink Ports |
| | BCM56144 A0 | 16-Port Gigabit Ethernet Multilayer switch with four 1G/2.5HG Uplink Ports |
| | BCM56146 A0 | 24-Port Fast-Ethernet Multilayer switch with four 2.5HG Uplink Ports |
| | BCM56147 A0 | 24-Port Fast-Ethernet Multilayer switch with combination of one/two/four 1G/2.5G/10/12/13HG Uplink Ports |
| BCM56150 | BCM56150 A0 | 24-port GbE Managed Switch with 4-port 10 GbE uplinks, integrated CPU and 16 copper PHYs |
| | BCM56151 A0 | 24-port GbE Managed Switch with 4-port 10 GbE uplinks, integrated CPU (without PHYs) |
| | BCM56152 A0 | 24-port GbE plus 2-port GbE and 2-port 1GbE/13GbE uplinks Managed Switch, integrated CPU and 16 copper PHYs |
| | BCM53342 A0 | 8-port GbE Multilayer WebSmart Switch with Integrated CPU and Copper PHYs |
| | BCM53343 A0 | 16-port GbE plus 4-port GbE uplinks Multilayer WebSmart Switch with Integrated CPU and 16 Copper PHYs |
| | BCM53344 A0 | 24-port GbE plus 2-port GbE and 2-port 1GbE/13GbE uplinks WebSmart Switch, integrated CPU and 16 copper PHYs |
| | BCM53346 A0 | 24-port GbE Multilayer WebSmart Switch with 4-port 10 GbE uplinks, integrated CPU and 16 copper PHYs |
| | BCM53347 A0 | 24-port GbE Multilayer WebSmart Switch with 6xQSGMII + 4x1/10G |
| | BCM53393 A0 | 14-port GbE Multilayer Embedded Switch with integrated CPU (without PHY) |

*Table 46: Switch Devices*

| *Family* | *Devices* | *Description* |
|---|---|---|
| | BCM53394 A0 | 10-port GbE Multilayer Embedded Switch with 4-port 10 GbE uplinks, integrated CPU (without PHY) |
| BCM56210 | BCM56212 A0 | |
| | BCM56212 A1 | |
| | BCM56212 A2 | |
| | BCM56213 A0 | |
| | BCM56213 A1 | |
| | BCM56213 A2 | |
| | BCM56214 A0 | BCM56214 Integrated Multilayer Switch and CPU |
| | BCM56214 A1 | |
| | BCM56214 A2 | |
| | BCM56215 A0 | |
| | BCM56215 A1 | |
| | BCM56215 A2 | |
| | BCM56216 A0 | BCM56216 Integrated Multilayer Switch and CPU |
| | BCM56216 A1 | |
| | BCM56216 A2 | |
| | BCM56217 A0 | |
| | BCM56217 A1 | |
| | BCM56217 A2 | |
| | BCM56218 A0 | BCM56218 Integrated Multilayer Switch and CPU |
| | BCM56218 A1 | |
| | BCM56218 A2 | |
| | BCM56219 A0 | BCM56219 Integrated Multilayer Switch and CPU |
| | BCM56219 A1 | |
| | BCM56219 A2 | |
| BCM56220 | BCM56224 A0 | 24 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56224 B0 | 24 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56225 A0 | 24 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| | BCM56225 B0 | 24 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| | BCM56226 A0 | 16 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56226 B0 | 16 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56227 A0 | 16 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| | BCM56227 B0 | 16 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| | BCM56228 A0 | 8 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56228 B0 | 8 GbE + 4 x 1 Gb/2.5 Gb, L3/L2+ |
| | BCM56229 A0 | 8 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| | BCM56229 B0 | 8 GbE + 4 x 1 Gb/2.5 Gb, L2+ |
| BCM56230 | BCM56230 B1 | 12-Port GbE Multilayer Switch |
| | BCM56231 B1 | 6-Port GbE Multilayer Switch |
| BCM56260 | BCM56233 B0 | 4xGE UNI + 2xGE NNI + 2.5GE to FPGA |
| BCM56260 | BCM56260 A0 | 50 Gbps Integrated Lower Power Carrier Ethernet Access Switch |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56262 A0 | 20 Gbps Integrated Lower Power Carrier Ethernet Access Switch |
| | BCM56263 A0 | 12x 1GbE Port Integrated Low-Power Carrier Ethernet Access Switch with 4x 1GbE Uplinks, Stacking, additional external packet buffer, and Integrated CPU |
| | BCM56265 A0 | 52 Gbps Integrated Lower Power Carrier Ethernet Access Switch without external packet buffer |
| | BCM56267 A0 | 20 Gbps Integrated Lower Power Carrier Ethernet Access Switch without external packet buffer |
| | BCM56268 A0 | 16 Gbps Integrated Lower Power Carrier Ethernet Access without external packet buffer |
| | BCM56260 B0 | 52 Gbps Integrated Lower Power Carrier Ethernet Access Switch |
| | BCM56262 B0 | 20 Gbps Integrated Lower Power Carrier Ethernet Access Switch |
| | BCM56263 B0 | 12x 1GbE Port Integrated Low-Power Carrier Ethernet Access Switch with 4x 1GbE Uplinks, Stacking, additional external packet buffer, and Integrated CPU |
| | BCM56265 B0 | 52 Gbps Integrated Lower Power Carrier Ethernet Access Switch without external packet buffer |
| | BCM56267 B0 | 20 Gbps Integrated Lower Power Carrier Ethernet Access Switch without external packet buffer |
| | BCM56268 B0 | 16 Gbps Integrated Lower Power Carrier Ethernet Access without external packet buffer |
| BCM56260 | BCM56460 A0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks |
| | BCM56461 A0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks without iHost support |
| | BCM56463 A0 | 34 Gbps Throughput Integrated Low-Power Carrier Ethernet Access Switch |
| | BCM56465 A0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks without external packet buffer |
| | BCM56466 A0 | 24x 1GbE Port Integrated Low-Power Carrier Ethernet Access Switch with 4x 10GbE/HGs[11] Uplinks and Stacking |
| | BCM56468 A0 | 34 Gbps Throughput Integrated Low-Power Carrier Ethernet Access Switch without external packet buffer |
| | BCM56460 B0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks |
| | BCM56461 B0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks without iHost support |
| | BCM56463 B0 | 34 Gbps Throughput Integrated Low-Power Carrier Ethernet Access Switch |
| | BCM56465 B0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplinks without external packet buffer |
| | BCM56466 B0 | 24x 1GbE Port Integrated Low-Power Carrier Ethernet Access Switch with 4x 10GbE/HGs[11] Uplinks and Stacking |
| BCM56300 | BCM56300 A0 | 24-Port Gigabit Ethernet Multilayer Switch |
| | BCM56300 A1 | |
| | BCM56300 B0 | |
| | BCM56300 B1 | |
| | BCM56301 A0 | Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56301 A1 | |
| | BCM56301 B0 | |
| | BCM56301 B1 | |
| | BCM56302 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Two 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56302 A1 | |
| | BCM56302 B0 | |
| | BCM56302 B1 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56303 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Three 10 Gigabit Ethernet/ HiGig+ Ports |
| | BCM56303 A1 | |
| | BCM56303 B0 | |
| | BCM56303 B1 | |
| | BCM56304 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56304 A1 | |
| | BCM56304 B0 | |
| | BCM56304 B1 | |
| | BCM56305 A0 | 24-Port Gigabit Ethernet Multilayer Switch |
| | BCM56305 A1 | |
| | BCM56305 B0 | |
| | BCM56305 B1 | |
| | BCM56306 A0 | 16 Port Gigabit Ethernet Switch |
| | BCM56306 A1 | |
| | BCM56306 B0 | |
| | BCM56306 B1 | |
| | BCM56307 A0 | 24-Port GE L2 Switch with Two 10 GE/HiGig+ Ports |
| | BCM56307 A1 | |
| | BCM56307 B0 | |
| | BCM56307 B1 | |
| | BCM56308 A0 | 24-Port GE L2 Switch with Three 10 GE/HiGig+ Ports |
| | BCM56308 A1 | |
| | BCM56308 B0 | |
| | BCM56308 B1 | |
| | BCM56309 A0 | 24-Port GE L2 Switch with Four 10 GE/HiGig+ Ports |
| | BCM56309 A1 | |
| | BCM56309 B0 | |
| | BCM56309 B1 | |
| BCM56310 | BCM56310 A0 | BCM56310 Series 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig+ Uplink Ports |
| | BCM56311 A0 | Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56312 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Two 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56313 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Three 10-Gigabit Ethernet/ HiGig+ Ports |
| | BCM56314 A0 | 24-Port Gigabit Ethernet Multilayer Switch with Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56315 A0 | BCM56310 Series 24-Port GbE Layer 2 Switch with Four 10-GbE/HiGig+ Uplink Ports |
| | BCM56316 A0 | Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56317 A0 | 24-Port Gigabit Ethernet Layer 2 Switch with Two 10-Gigabit Ethernet/HiGig+ Ports |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56318 A0 | 24-Port Gigabit Ethernet Layer 2 Switch with Three 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56319 A0 | 24-Port Gigabit Ethernet Layer 2 Switch with Four 10-Gigabit Ethernet/HiGig+ Ports |
| BCM56320 | BCM56320 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56320 B0 | |
| | BCM56320 B1 | |
| | BCM56321 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56321 B0 | |
| | BCM56321 B1 | |
| BCM56330 | BCM56331 A0 | 24-Port GbE Multilayer Switch with Four 2.5GbE Uplink Ports |
| | BCM56331 B0 | |
| | BCM56331 B1 | |
| | BCM56333 A0 | 16-Port GbE Multilayer Switch |
| | BCM56333 B0 | |
| | BCM56333 B1 | |
| | BCM56334 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56334 B0 | |
| | BCM56334 B1 | |
| | BCM56338 A0 | 8-Port GbE Multilayer Switch with two 10-GbE/HiGig2 Uplink Ports |
| | BCM56338 B0 | |
| | BCM56338 B1 | |
| BCM56340 | BCM56040 A0 | 1xF.QSGMII + 3xF.HG[42] + 1GE |
| | BCM56041 A0 | BCM56040 device, meant for embedded connectivity supports 1Ge (port 49), 2 X GE (iPROC), Flex 4x10G, 3 X 4 X 10G |
| | BCM56042 A0 | 12x2.5GE/1GE + 12x2.5GE/1GE + 1GE |
| | BCM56340 A0 | 12xF.QSGMII + Flex[4x10] + 2xHG[21] + 1GE, 12xF.QSGMII + 4xSGMII + 2xXFI + 2xHGd[21] + 1GE |
| | BCM56342 A0 | 7xF.QSGMII + Flex[4x10] + 2xHG[21] + 1GE |
| | BCM56344 A0 | 10xF.QSGMII + 3xFlex[4x10] + 1GE |
| BCM56340 | BCM56547 A0 | 10xF.QSGMII + 3xF.HG[42] + 1GE, 12xF.QSGMII + 2xF.HG[42] + 1GE, 12xF.QSGMII + F.HG[42] + 2xHG[42] + 1GE |
| BCM56340 | BCM56548 A0 | 7xF.QSGMII + 3xF.HG[42] + 1GE |
| | BCM56548H A0 | 5xF.QSGMII + Flex[4x10] + 2xHGd[21]/4xHGs[11/10] + 2xHGd[21]/4xHGs[11/10] + 1GE |
| BCM56440 | BCM56440 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/Hig2 Uplink ports |
| | BCM56440 B0 | |
| | BCM56441 A0 | 8-Port GbE Multilayer Switch with Two 10-GbE/Hig2 Uplink ports |
| | BCM56441 B0 | |
| | BCM56442 A0 | 16-Port GbE Multilayer Switch |
| | BCM56442 B0 | |
| | BCM56443 A0 | 8-Port 2.5GbE Multilayer Switch with Two 10-GbE/Hig2 Uplink ports |
| | BCM56443 B0 | |
| | BCM56445 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/Hig2 Uplink ports pin compatible with BCM56334 |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56445 B0 | |
| | BCM56446 A0 | 8-Port GbE Multilayer Switch with Two 10-GbE/Hig2 Uplink ports pin compatible with BCM56338 |
| | BCM56447 A0 | 16-Port GbE Multilayer Switch pin compatible with BCM56333 |
| | BCM56447 B0 | |
| | BCM56448 A0 | 24-Port GbE Multilayer Switch with Four 1GbE/ One 2.5G Uplink ports |
| | BCM56448 B0 | |
| BCM56450 | BCM56248L B0 | 11xGE + 8x2.5G |
| BCM56450 | BCM56450 A0 | 24-port GbE Multilayer Switch with 4-port 10 GbE uplinks, stacking, integrated CPU and Traffic Manager |
| BCM56450 | BCM56450 B0 | BCM56450 Access 1 x XAUI + 8 x GE without L3 routing and MPLS features |
| BCM56450 | BCM55450 B0 | BCM56450 Access-8 FX + 2 F-HG |
| BCM56450 | BCM56450 B1 | 24-port GbE Multilayer Switch with 4-port 10 GbE uplinks, stacking, integrated CPU and Traffic Manager |
| BCM56450 | BCM56452 B0 | 24xGE + 4xF.XAUI |
| BCM56450 | BCM56454 B0 | 8xGE + 2 x F.XAUI |
| | BCM56455 A0 | 2 x 20GE (G.INT) + 2 x HG13 |
| | BCM56455 B0 | 2 x 20GE (G.INT) + 2 x HG13 |
| BCM56450 | BCM56456 A0 | 24x GE + 4x F.XAUI |
| BCM56450 | BCM56456 B0 | 24x GE + 4x F.XAUI |
| | BCM56456 B0 | 1 x XAUI + 8 x GE |
| BCM56456 | BCM56456 B0 | 9xFXAUI + 1 x XAUI + 1x2.5GbE |
| BCM56456 | BCM56458 B0 | 8xGE + 2xF.XAUI |
| BCM56460 | BCM56460 A0 | 24-Port 1GbE Multilayer Switch with Four 10GbE/HiGig Uplink |
| | BCM56461 A0 | 24 x GE + 4 x HGs11 |
| BCM56500 | BCM56500 A0 | 24-Port Gigabit Ethernet Multilayer Switch |
| | BCM56500 A1 | |
| | BCM56500 B0 | |
| | BCM56500 B1 | |
| | BCM56500 B2 | |
| | BCM56501 A0 | Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56501 A1 | |
| | BCM56501 B0 | |
| | BCM56501 B1 | |
| | BCM56501 B2 | |
| | BCM56502 A0 | 24-Port GbE Multilayer Switch with Two 10-GbE/HiGig+ Ports |
| | BCM56502 A1 | |
| | BCM56502 B0 | |
| | BCM56502 B1 | |
| | BCM56502 B2 | |
| | BCM56503 A0 | 24-Port GbE Multilayer Switch with Three 10-GbE/HiGig+ Ports |
| | BCM56503 A1 | |
| | BCM56503 B0 | |
| | BCM56503 B1 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56503 B2 | |
| | BCM56504 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig+ Ports |
| | BCM56504 A1 | |
| | BCM56504 B0 | |
| | BCM56504 B1 | |
| | BCM56504 B2 | |
| | BCM56505 A0 | 24-Port GbE Layer 2 Switch |
| | BCM56505 A1 | |
| | BCM56505 B0 | |
| | BCM56505 B1 | |
| | BCM56505 B2 | |
| | BCM56506 A0 | Four 10-Gigabit Ethernet/HiGig+ Ports |
| | BCM56506 A1 | |
| | BCM56506 B0 | |
| | BCM56506 B1 | |
| | BCM56506 B2 | |
| | BCM56507 A0 | 24-Port GbE Layer 2 Switch with Two 10-GbE/HiGig+ Ports |
| | BCM56507 A1 | |
| | BCM56507 B0 | |
| | BCM56507 B1 | |
| | BCM56507 B2 | |
| | BCM56508 A0 | 24-Port GbE Layer 2 Switch with Three 10-GbE/HiGig+ Ports |
| | BCM56508 A1 | |
| | BCM56508 B0 | |
| | BCM56508 B1 | |
| | BCM56508 B2 | |
| | BCM56509 A0 | 24-Port GbE Layer 2 Switch with Four 10-GbE/HiGig+ Ports |
| | BCM56509 A1 | |
| | BCM56509 B0 | |
| | BCM56509 B1 | |
| | BCM56509 B2 | |
| BCM56510 | BCM56510 A0 | 24-Port Gigabit Ethernet Multilayer Switch |
| | BCM56511 A0 | Four-Port 10-GbE/HiGig+ Multilayer Switch |
| | BCM56512 A0 | 24-Port GbE Multilayer Switch With Two 10-GbE/HiGig+ Ports |
| | BCM56513 A0 | 24-Port GbE Multilayer Switch With Three 10-GbE/HiGig+ Ports |
| | BCM56514 A0 | 24-Port GbE Multilayer Switch With Four 10-GbE/HiGig+ Ports |
| BCM56520 | BCM56520 A0 | 24-Port GbE Multilayer Switch |
| | BCM56520 B0 | |
| | BCM56522 A0 | 24-Port GbE Multilayer Switch with Two 10-GbE/HiGig2 Uplink Ports |
| | BCM56522 B0 | |
| | BCM56524 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56524 B0 | |
| | BCM56526 A0 | 28-Port GbE Multilayer Switch with Six 10-GbE/HiGig2 Uplink Ports |
| | BCM56526 B0 | |
| BCM56530 | BCM56534 B0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56538 B0 | 48-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| BCM56540 | BCM56540 A1 | 48xGE + 2xHG[42] + 2xHG[21] + 1GE, 48xGE + 4xXFI + 2xHG[42] + 1GE, 48xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56540 B0 | |
| | BCM56541 A1 | 28xGE + 2xHG[42] + 2xHG[21] + 1GE, 28xGE + 4xXFI + 2xHG[42] + 1GE, 28xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56541 B0 | |
| | BCM56542 A1 | 28xGE + 2xF.XAUI/2x10GE + 2xF.HG[42] + 2xF.HG[21] + 1GE, 28xGE + 8xGE/ 8x2.5GE + 2xHG[42] + 2xHG[21] + 1GE Multilayer Ethernet Switch |
| | BCM56544 A1 | 10xF.XAUI + 4xHG[21] + 1GE, 10xF.XAUI + 4xXFI, 10xF.XAUI + 2xHG[42], 4xXAUI + 12xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56544 B0 | 10xF.XAUI + 4xHG[21] + 1GE, 10xF.XAUI + 4xXFI, 10xF.XAUI + 2xHG[42], 4xXAUI + 12xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56545 A1 | 48xGE + 2xHG[42] + 2xHG[21] + 1GE, 48xGE + 4xXFI + 2xHG[42] + 1GE, 48xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56545 B0 | 48xGE + 2xHG[42] + 2xHG[21] + 1GE, 48xGE + 4xXFI + 2xHG[42] + 1GE, 48xGE + 8xXFI + 1GE, 24xGE + 4xXAUI + 2xXFI + 2xHG[12] + 1GE Multilayer Ethernet Switch |
| | BCM56546 A1 | 28xGE + 2xHG[42] + 2xHG[21] + 1GE, 28xGE + 4xXFI + 2xHG[42] + 1GE, 28xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56546 B0 | 28xGE + 2xHG[42] + 2xHG[21] + 1GE, 28xGE + 4xXFI + 2xHG[42] + 1GE, 28xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| BCM56580 | BCM56580 A0 | 16 x 2.5 GbE + 4 x 10 GbE Ethernet Multilayer Switch |
| BCM56620 | BCM56620 A0 | |
| | BCM56620 A1 | |
| | BCM56620 B0 | |
| | BCM56620 B1 | |
| | BCM56620 B2 | |
| | BCM56624 A0 | 49 port 1-GbE Multilayer Ethernet Switch with 4 x 10-GbE/HiGig2 Uplink ports and External Table Expansion |
| | BCM56624 A1 | |
| | BCM56624 B0 | |
| | BCM56624 B1 | |
| | BCM56624 B2 | |
| | BCM56626 A0 | 25 port 1-GbE Multilayer Ethernet Switch with 6 x 10-GbE/HiGig2 Uplink ports and External Table Expansion |
| | BCM56626 A1 | |
| | BCM56626 B0 | |
| | BCM56626 B1 | |
| | BCM56626 B2 | |
| | BCM56628 A0 | 8 port 10-GbE/HiGig2 Multilayer Ethernet Switch with External Table Expansion |
| | BCM56628 A1 | |
| | BCM56628 B0 | |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56628 B1 | |
| | BCM56628 B2 | |
| | BCM56629 B0 | 25 port 1-GbE Multilayer Ethernet Switch with 8 x 10-GbE/HiGig2 Uplink ports and External Table Expansion |
| | BCM56629 B1 | |
| | BCM56629 B2 | |
| BCM56630 | BCM56630 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56630 B0 | |
| | BCM56634 A0 | 48-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56634 B0 | |
| | BCM56636 A0 | 24-Port GbE + 2-Port 10-GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56636 B0 | |
| | BCM56638 A0 | 4-Port 10-GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56638 B0 | |
| | BCM56639 A0 | 24-Port GbE + 4-Port 10-GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56639 B0 | |
| BCM56640 | BCM56044 | BCM56044 SKU - 100G + 3xF.HG[42] + 1GE |
| BCM56640 | BCM56045 B0 | 3xF.40GE + 3xF.HG[42] + 1GE |
| | BCM56046 B0 | 3xF.40GE + 2xF.HG[42] + 1GE |
| | BCM56640 A1 | 1x100GE + 1xHG[127], 1x100GE + 4xHG[32], 1x100GE + 8xHGd[16], 3xF.HG[42] + 1xHG[127], 3xF.HG[42] + 4xHG[32], 3xF.HG[42] + 8xHGd[16], 3xF.HG[42] + 3xF.HG[42] Multilayer Ethernet Switch |
| | BCM56640 B0 | |
| | BCM56643 A1 | 48xGE + 4xXFI + 4xHG[42] + 1GE Multilayer Ethernet Switch |
| | BCM56643 B0 | |
| | BCM56644 A1 | 48xGE + 2xHG[25] + 2xHG[25] + 1GE Multilayer Ethernet Switch |
| | BCM56644 B0 | |
| | BCM56648 A1 | 48xGE + 2xHG[42] + 2xHG[21] + 1GE, 48xGE + 4xXFI + 2xHG[42] + 1GE, 48xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56648 B0 | |
| | BCM56649 A1 | 28xGE + 2xHG[42] + 2xHG[21] + 1GE, 28xGE + 4xXFI + 2xHG[42] + 1GE, 28xGE + 8xXFI + 1GE Multilayer Ethernet Switch |
| | BCM56649 B0 | |
| BCM56640 | BCM56545K | 48-port GE switch + 4x10GE + 4xHG[42] / 40GE |
| BCM56640 | BCM56546K | 28-port GE switch + 4x10GE + 4xHG[42] / 40GE |
| BCM56680 | BCM56680 A0 | 25 port 1-GbE/2.5GbE Multilayer Ethernet Switch with 4 x 10-GbE/HiGig2 Uplink ports |
| | BCM56680 A1 | |
| | BCM56680 B0 | |
| | BCM56680 B1 | |
| | BCM56684 A0 | 24 port 1-GbE/2.5GbE Multilayer Ethernet Switch with 4 x 10-GbE/HiGig2 Uplink ports |
| | BCM56684 A1 | |
| | BCM56684 B0 | |

*Table 46: Switch Devices*

| *Family* | *Devices* | *Description* |
|---|---|---|
| | BCM56684 B1 | |
| BCM56685 | BCM56685 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56685 B0 | |
| | BCM56689 A0 | 24-Port GbE Multilayer Switch with Four 10-GbE/HiGig2 Uplink Ports |
| | BCM56689 B0 | |
| BCM56700 | BCM56700 A0 | 16-Port, 192-Gbps Lossless Switch Fabric |
| | BCM56701 A0 | 12-Port, 144-Gbps Lossless Switch Fabric |
| BCM56720 | BCM56720 A0 | 16 Port, 16-Gbps HiGig2 Switch Fabric |
| | BCM56721 A0 | 12 Port, 16-Gbps HiGig2 Switch Fabric |
| BCM56725 | BCM56725 A0 | 8 Port, 20-Gbps + 4 Port, 16-Gbps HiGig2 Switch Fabric |
| BCM56740 | BCM56743 A0 | 480 Gbps Switch fabric |
| | BCM56743 A1 | |
| | BCM56743 A2 | |
| | BCM56743 A3 | |
| | BCM56743 A4 | |
| | BCM56743 B0 | |
| | BCM56743 B1 | |
| | BCM56745 A0 | 640 Gbps Switch fabric |
| | BCM56745 A1 | |
| | BCM56745 A2 | |
| | BCM56745 A3 | |
| | BCM56745 A4 | |
| | BCM56745 B0 | |
| | BCM56745 B1 | |
| BCM56740 PLUS | BCM56744 A0 | 480 Gbps Switch fabric |
| | BCM56744 A1 | |
| | BCM56746 A0 | 640 Gbps Switch fabric |
| | BCM56746 A1 | |
| BCM56800 | BCM56800 A0 | 20-Port 10-Gigabit Ethernet Multilayer Switch |
| | BCM56801 A0 | 10-Port 10-Gigabit Ethernet and 8-Port HiGig2/10GbE Multilayer Switch |
| | BCM56802 A0 | 16-Port 10-GbE/HiGig2 Multilayer Switch |
| | BCM56803 A0 | 12 Port 10GE/HiGig2 Multilayer Switch |
| BCM56820 | BCM56820 A0 | 24 x 10-GbE + 4 x 1-GbE Multilayer Ethernet Switch |
| | BCM56820 B0 | |
| | BCM56821 A0 | 12 x 10-GbE + 8 x HiGig2 + 4 x 1-GbE Multilayer Ethernet Switch |
| | BCM56821 B0 | |
| | BCM56822 A0 | 12 x 10-GbE + 4 x 20-Gbps HiGig2 + 4 x 1-GbE Multilayer Ethernet Switch |
| | BCM56822 B0 | |
| | BCM56823 A0 | 8 x 10-GbE + 4 x 20-Gbps HiGig2 + 4 x 1-GbE Multilayer Ethernet Switch |
| | BCM56823 B0 | |
| | BCM56825 B0 | 16 x 10-GbE + 8 x 20-Gbps HiGig2 + 1 x 1-GbE Multilayer Ethernet Switch |
| BCM56740 | BCM56743 A0 | 480 Gbps Switch fabric |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56743 A1 | |
| | BCM56743 A2 | |
| | BCM56743 A3 | |
| | BCM56743 A4 | |
| | BCM56743 B0 | |
| | BCM56743 B1 | |
| | BCM56745 A0 | 640 Gbps Switch fabric |
| | BCM56745 A1 | |
| | BCM56745 A2 | |
| | BCM56745 A3 | |
| | BCM56745 A4 | |
| | BCM56745 B0 | |
| | BCM56745 B1 | |
| BCM56740 PLUS | BCM56744 A0 | 480 Gbps Switch fabric |
| | BCM56744 A1 | |
| | BCM56746 A0 | 640 Gbps Switch fabric |
| | BCM56746 A1 | |
| BCM56840 | BCM56841 A0 | 320 Gbps Ethernet Multilayer Switch |
| | BCM56841 A1 | |
| | BCM56841 A2 | |
| | BCM56841 A3 | |
| | BCM56841 A4 | |
| | BCM56841 B0 | |
| | BCM56841 B1 | |
| | BCM56843 A0 | 480 Gbps Ethernet Multilayer Switch |
| | BCM56843 A1 | |
| | BCM56843 A2 | |
| | BCM56843 A3 | |
| | BCM56843 A4 | |
| | BCM56843 B0 | |
| | BCM56843 B1 | |
| | BCM56845 A0 | 640 Gbps Ethernet Multilayer Switch |
| | BCM56845 A1 | |
| | BCM56845 A2 | |
| | BCM56845 A3 | |
| | BCM56845 A4 | |
| | BCM56845 B0 | |
| | BCM56845 B1 | |
| BCM56840 PLUS | BCM56842 A0 | 320 Gbps Ethernet Multilayer Switch |
| | BCM56842 A1 | |
| | BCM56844 A0 | 480 Gbps Ethernet Multilayer Switch |

*Table 46: Switch Devices*

| Family | Devices | Description |
|---|---|---|
| | BCM56844 A1 | |
| | BCM56846 A0 | 640 Gbps Ethernet Multilayer Switch |
| | BCM56846 A1 | |
| BCM56846 | BCM56831 | 24-port 10GE switch with 40GE support for embedded applications |
| BCM56846 | BCM56835C | (64 x 10 GbE) + (4 x 1 GbE) |
| BCM56846 | BCM56847 | (64 x 10 GbE) + (4 x 1 GbE) |
| BCM56846 | BCM56849 | (56 x 1GbE/2.5GbE) + (8 x 10GbE) |
| BCM56850 | BCM56751P A1 | 1.28Tbps I/O, 960Gbps Core Ethernet Switch Fabric |
| BCM56850 | BCM56751P A2 | 1.28Tbps I/O, 960Gbps Core Ethernet Switch Fabric |
| BCM56850 | BCM56830 A1 | 960Gbps Ethernet Switch |
| BCM56850 | BCM56830 A2 | 960Gbps Ethernet Switch |
| BCM56850 | BCM56834 | High density 10G and 40G switch for embedded applications |
| BCM56850 | BCM56838 | 72/320G Devices with 1.25/3.125/6.25G SerDes and 4 SFIs |
| BCM56850 | BCM56850 A1 | 1.28Tbps I/O, 1Tbps Core Ethernet Switch |
| | BCM56852 A2 | 100x10G, 960Gbps Multilayer Switch |
| | BCM56854 A1 | |
| BCM56851 | BCM56751 A2 | 1.28Tbps I/O, 960Gbps Core Ethernet Switch Fabric |
| BCM56860 | BCM56860 A1 | 104x 10GbE/32x 40GbE/8x 100GbE Multilayer Switch |
| | BCM56861 A1 | 32 x 40GbE/104 x 10GbE Multilayer Switch |
| | BCM56862 A1 | 96 x 10GbE/24 x 40GbE/8 x 100 GbE Multilayer Switch |
| | BCM56864 A1 | 72 x 10GbE/18 x 40GbE Multilayer Switch |
| | BCM56865 A1 | 72 x 10GbE/18 x 40GbE/4 x 100GbE Multilayer Switch |
| | BCM56866 A1 | 104 x 10GbE/32 x 40GbE/8 x 100GbE Multilayer Switch |
| | BCM56867 A1 | 104x 10GbE/32x 40GbE/8x 100GbE Multilayer Switch |
| | BCM56868 A1 | 8 x HG127/32 x HG42 |
| BCM56860 | BCM56832 A1 | 27 x 20GbE |
| | BCM56833 A1 | 32 x 40GbE/104 x 10GbE |
| | BCM56836 A1 | 8 x 100GbE/32 x 10GbE/32 x 40GbE/104 x 10GbE |
| BCM56960 | BCM56960 A0 | 32x100 GbE/64x40GbE/128x10 GbE Multilayer Switch |
| | BCM56960 B0 | 32x100 GbE/64x40GbE/128x10 GbE Multilayer Switch |
| | BCM56960 B1 | 32x100 GbE/64x40GbE/128x10 GbE Multilayer Switch |
| | BCM56961 A0 | 64x40GbE port configuration |
| | BCM56961 B1 | 64x40GbE port configuration |
| | BCM56962 B0 | 24x 100GbE/48x 40GbE Multilayer Switch |
| | BCM56962 B1 | 24x 100GbE/48x 40GbE Multilayer Switch |
| | BCM56963 B0 | 6x 100GbE + 48x 25GbE Multilayer Switch |
| | BCM56968 B0 | 32x HG[106]/64x HG[42] Multilayer Switch |
| | BCM56968 B1 | 32x HG[106]/64x HG[42] Multilayer Switch |
| | BCM56930 A0 | 130-Port RoHS-compliant, high-capacity, 3.2Tbps Switch device with 10/25/40/100G support. |
| | BCM56930 B0 | 130-Port RoHS-compliant, high-capacity, 3.2Tbps Switch device with 10/25/40/100G support. |
| | BCM56930 B1 | 130-Port RoHS-compliant, high-capacity, 3.2Tbps Switch device with 10/25/40/100G support. |
| BCM88732 | BCM88732 B2 | Eight-Port 10 GbE or 2-Port 40 GbE MAC Aggregation Switch with 80 Gbps Uplink Capacity |

*Table 46: Switch Devices*

| *Family* | *Devices* | *Description* |
|---|---|---|
| BCM88020 | BCM88020 A0 | XGS Core (XCore/SBX) Fully Programmable Carrier Packet Processor with 24 GbE Ports, 2 10GbE Ports and 2 SPI Interfaces |
| | BCM88020 A1 | |
| | BCM88020 A2 | |
| BCM88025 | BCM88025 A0 | XGS Core (XCore/SBX) Fully Programmable Carrier Packet Processor with 24 GbE Ports, 2 10GbE Ports and 2 SPI Interfaces |
| BCM88030 | BCM88030 A0 | XGS Core (XCore/SBX) Scalable Switching 100 Gbps Fully Programmable Carrier Packet Processor |
| BCM88130 | BCM88130 A0 | XGS Core (XCore/SBX) 630 Gbps Bandwidth Manager and Switching Engine |
| | BCM88130 A1 | |
| BME-3200 | BME-3200 A0 | XGS Core (XCore/SBX) Fabric Bandwidth Manager with 32 SCI control ports and up to 40 SFI data ports |
| | BME-3200 B0 | |
| QE-2000 | QE-2000 A1 | XGS Core (XCore/SBX) Fabric Queuing Engine with 49 SPI 4.2 subports |
| | QE-2000 A2 | |
| | QE-2000 A3 | |
| | QE-2000 A4 | |
| BCM88230 | BCM88230 A0 | XGS Core (XCore/SBX) Fabric Queuing Engine with Integrated Traffic Management with 4 HiGig2 ports, 50Gbps |
| | BCM88230 B0 | |
| | BCM88235 A0 | XGS Core (XCore/SBX) Fabric Queuing Engine with Integrated Traffic Management with 4 HiGig2 ports, 80Gbps |
| | BCM88235 B0 | |
| | BCM88231 A0 | XGS Core (XCore/SBX) Traffic Manager with 4 HiGig2 ports, 50Gbps |
| | BCM88231 B0 | |
| | BCM88236 A0 | XGS Core (XCore/SBX) Traffic Manager with 4 HiGig2 ports, 80Gbps |
| | BCM88236 B0 | |
| BCM56930 | BCM56931 A0 | XGS pass-through and standalone Traffic Manager, 4 HiGig2 ports, 50Gbps |
| | BCM56931 B0 | |
| | BCM56936 A0 | XGS pass-through and standalone Traffic Manager, 4 HiGig2 ports, 80Gbps |
| | BCM56936 B0 | |
| BCM88640 | BCM88640 A0 | DNX 100G Flexible Packet Processor with Integrated Traffic Management |
| | BCM88640 B0 | |
| BCM88650 | BCM88650 A0 | DNX 200G Flexible Packet Processor with Integrated Traffic Management |
| | BCM88650 B0 | |
| | BCM88650 B1 | 200 Gbps DNX Traffic Manager and Packet Processor |
| BCM88660 | BCM88660 A0 | DNX 200G Flexible Packet Processor with Integrated Traffic Management |
| BCM88750 | BCM88750 A0 | DNX 1600 Gbps Switch Fabric |
| | BCM88750 B0 | |

# PHYS

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM5218 | 522x | 10/100Base-TX/FX Octal-PHY(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5220 | 522x | 10/100BASE-TX/FX Mini-F(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5221 | 522x | 10/100BASE-TX/FX Mini-F(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5226 | 522x | 10/100 BASE- TX/FX Hex-PHY(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5228 | 522x | 10/100BASE-TX/FX Octal-F(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5238 | 522x | 10/100BASE-TX OCTAL-f(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5248 | 522x | 10/100BASE-TX Octal-F(tm) Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM52681E A1 | 54680 | Octal 10/100 Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5401 | 5401 | 10/100/1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5402 | 5402 | 10/100/1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5404 | 5404 | Quad-Port 10/100/ 1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5424 | 5424 | Quad 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5434 | 5424 | Quad 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5411 | 5411 | 10/100/1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5421 | 5421S | 10/100/1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5421S | 5421S | 10/100/1000BASE-T Gigabit Copper Transceiver with SerDes | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5461 | 5464 | 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5464 | 5464 | Quad-Port 10/100/ 1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM5464R | 5464 | Quad-Port 10/100/ 1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5464S | 5464 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5464SR | 5464 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5466 | 5464 | Quad-Port 10/100/ 1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5466R | 5464 | Quad-Port 10/100/ 1000BASE-T Gigabit Copper Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5466S | 5464 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5466SR | 5464 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5482 | 5482 | Dual-Port 10/100/ 1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM5488 | 5464 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54210SE B0 | 54210 | Single Copper/Fiber Gigabit Ethernet Transceiver. 1588 not yet supported | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54220SE B0 | 54220 | Dual Copper/Fiber Gigabit Ethernet Transceiver. 1588 not yet supported | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54240 C0 | 54280 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54240 C1 | 54280 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54280 A0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54280 C0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54280 C1 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54282 A0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54282 C0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54282 C1 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM54285 C0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54285 C1 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54290 A0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (1588 feature is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54292 A0 | 54280 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (1588 feature is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54294 A0 | 54280 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver (1588 feature is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54295SE B0 | 54295 | Octal Copper/Quad Fiber Gigabit Ethernet Transceiver -1588 not yet supported | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54296SE B0 | 54296 | Quad Copper/Fiber Gigabit Ethernet Transceiver - 1588 not yet supported | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54340 B0 | 54380 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54340 C0 | 54380 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54340 C1 | 54380 | Quad 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54380 B0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54380 C0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54380 C1 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM54382 B0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54382 C0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54382 C1 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54385 B0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54385 C0 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54385 C1 | 54380 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54616 A0 | 54616 | Single-Chip 10/100/ 1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54640 | 54640 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54640E A1 | 54640 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54640E B0 | 54640 | Quad-Port Gigabit Copper Transceiver with Copper/ Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54680 A0 | 54680 | Octal-Port 10/100/ 1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54680E A1 | 54680 | Octal-Port 10/100/ 1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54680E B0 | 54680 | Octal-Port 10/100/ 1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54682E A1 | 54682 | Octal-Port 10/100/ 1000BASE-T Gigabit Ethernet Transceiver with 2 Copper/Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM54682E B0 | 54682 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver with 2 Copper/Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54684 D0 | 54684 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54684E B0 | 54682 | 10/100/1000 Octal (65nm) QSGMII-Copper/Fiber(2) with EEE | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54685 | 54682 | Octal QSGMII to 10/100/1000BaseT or Fiber Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54685E A1 | 54682 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver with Copper/Fiber Media Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54810 A0 | 54880 | BroadR-Reach Single-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54880 A0 | 54880 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver with BroadR-Reach support | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54880 B0 | 54880 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver with BroadR-Reach support | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54880E A1 | 54680 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54880E B0 | 54680 | Octal-Port 10/100/1000BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54881 B0 | 54880 | Octal 10/100Base/Tx Ethernet BroadReach Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54942 A0 | 84728 | Quad-Channel 10GbE XAUI-to-XFI PHY. Firmware version 0124 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54980 B2 | 54980 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54980 C0 | 54980 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM54980 C1 | 54980 | Octal 1000/100/10BASE-T Gigabit Ethernet Transceiver | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM8040 A2 | 8040 | Eight-Channel Multirate 1-Gbps - 3.2-Gbps Retimer/Switch | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, not supported with 5696X, 56930, 8867X, 8837X |
| BCM8073 A0 | 8072 | Dual-Channel Serial 10-GbE BASE-KR to XAUI Transceiver. Firmware version d502. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available 8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM8074 A0 | 8072 | Quad-Channel Serial 10-GbE BASE-KR to XAUI Transceiver. Firmware version 010C. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8704 | 8703 | Serial 10-Gigabit Ethernet/ Fibre Channel Transceiver with XAUI Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8705 | 8705 | Serial 10-Gigabit Ethernet/ Fibre Channel Transceiver with WIS Layer and XAUI Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8725 | 8705 | Dual Serial 10-Gigabit Ethernet/Fibre Channel Transceiver with WIS Layer and XAUI Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8726 A0 | 8706 | Dual Serial 10-Gigabit Ethernet/Fibre Channel Transceiver with XAUI Interface | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8726 B1 | 8706 | Dual Serial 10-Gigabit Ethernet/Fibre Channel Transceiver with XAUI(TM) Interface. Firmware version 0x0127 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8727 B0 | 8706 | Dual Serial 10-Gigabit Ethernet/Fibre Channel Transceiver with XAUI Interface. Firmware version 0406. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8727 C0 | 8706 | Dual Serial 10-Gigabit Ethernet/Fibre Channel Transceiver with XAUI Interface. Firmware version 050D. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84727 A0 | 84728 | Dual SFI to XAUI with 1588 (Firmware version 0x124. Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8728 A0 | 8706 | Dual-Channel 10-GbE SFI-to-XAUI(TM) Transceiver with EDC. Firmware version 0511. (Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8742 | 8706 | Quad-Channel 10-GbE SFI-to-XAUI(TM) Transceiver. Firmware version 0511. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8747 A0 | 8706 | Quad-Channel 10-GbE SFI-to-XAUI(TM) Transceiver with EDC. Firmware version 0511. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8750 A0 | 8750 | Dual-Channel 10 GbE SFI-to-XFI PHY with EDC | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8752 A0 | 8750 | Dual-Channel 10 GbE SFI-to-XFI PHY with EDC | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8754 A0 | 8750 | Quad-Channel 10 GbE SFI-to-XFI PHY with EDC. Firmware version 0411. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM8481 B0 | 8481 | 10GBASE-T Transceiver (Firmware version B0 02.10) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM8481 C0 | 8481 | 10GBASE-T Transceiver (Firmware version C0 02.13) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84164 | BCM84740 | Quad 10GBASE-KR-to-XFI or 40GBASE-KR4-to-XLAUI Transceiver Firmware version 0x128 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84168 | BCM84740 | Octal 10GBASE-KR-to-XFI or Dual 40GBASE-KR4-to-XLAUI Transceiver Firmware version 0x128 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84318 A0 | 84740 | 10.3 Gbps Octal Port CDR/ Retimer with EDC. Firmware version D007 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82072 | 82072 | CAUI4-TO-KR4 NRZ BACKPLANE PHY/OCTAL 25G BACKPLANE RETIMER. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82073 A1 | 82073 | CAUI4-to-KR4 NRZ Backplane PHY/Octal 25G Backplane Retimer with 2x2 Crosspoint | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82322 B0 | 82328 | 1x 100G/3x 40G/12x 10G Ethernet/FC PHY. Firmware version D | Beta with Legacy switches Prior to 534XX with 40G/ 100G support Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82328 A0 | 82328 | Dual 40 GbE/Octal 10 GbE QSFP+ XLPPI-to-XLAUI PHY. Firmware version 9 "(Bring-up) | Beta with Legacy switches Prior to 534XX with 40G/ 100G support Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82328 B0 | 82328 | Dual 40 GbE/Octal 10 GbE QSFP+ XLPPI-to-XLAUI PHY. Firmware version D | Beta with Legacy switches Prior to 534XX with 40G/ 100G support Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM82328F B0 | 82328 | Dual 40GbE/Octal 10GbE QSFP+ XLPPI-to-XLAUI PHY | Beta - with Legacy switches Prior to 534XX with 40G/ 100G support ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84328 A0 | 84328 | Dual 40 GbE/Octal 10 GbE QSFP+ XLPPI-to-XLAUI PHY. Firmware version D026 | Beta - with Legacy switches Prior to 534XX with 40Gbe support ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84328 B0 | 84328 | Dual 40 GbE/Octal 10 GbE QSFP+ XLPPI-to-XLAUI PHY. Firmware version D026 | Beta - with Legacy switches Prior to 534XX with 40Gbe support ; Bringup with 5686X, Beta support with 5696X, 56930. Not available yet -8867X, 8837X |
| BCM84333 B1 | 8481 | Quad 10GBASE-T Transceiver. Firmware version 1.69 (Bring-up) (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84334 B1 | 8481 | Quad 10GBASE-T Transceiver. Firmware version 1.69 (Bring-up) (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM84336 B1 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 1.69 (Bring-up) (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84793 A0 | 84793 | 100GbE/OTN 4x25/28G VSR28 to 10x10/11G CAUI Gearbox PHY. Firmware version 0xD009 (Bring-up - Mode-1 and Mode-3) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Not available yet -8867X, 8837X |
| BCM84812 A0 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 2.13 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84821 A0 | 8481 | 10GBASE-T Transceiver. Firmware version 2.13 (Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84822 A0 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 3.02 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84823 A0 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 3.02 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84823 B0 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 4.02 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84823 B1 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 4.02 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84833 B1 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 1.69(Driver support for IEEE 1588 features are Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84834 B1 | 8481 | Quad 10GBASE-T Transceiver. Firmware version 1.69(Driver support for IEEE 1588 features are Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84836 B1 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 1.69(Driver support for IEEE 1588 features are Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84844 A0 | 8481 | Quad 10GBASE-T Transceiver. Firmware version 1.07.11(Driver support is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84846 A0 | 8481 | Dual 10GBASE-T Transceiver. Firmware version 1.07.11(Driver support is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84848 A0 | 8481 | Quad 10GBASE-T Transceiver. Firmware version 1.07.11(Driver support is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM84728 A0 | 84728 | Dual-Channel 10 GbE SFI-to-XAUI LAN/WAN PHY with 1588. Firmware version 0124 (Driver support for IEEE 1588 features is Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84729 A0 | 84729 | Dual-Channel SFI to XAUI with Macsec, 1588 (Firmware version 0x124. Driver support for IEEE 1588 features are Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84740 A0 | 84740 | 40 GbE PPI-to-XLAUI PHY with EDC. Firmware version D106. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84741 B0 | 84756 | 40GbE XLPPI-to-XLAUI/ Quad 10G with IEEE MACsec/1588 Firmware version 0x0128 [Bring-up] | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84747 A0 | 84728 | Quad SFI to XAUI with 1588 (Firmware version 0x124. Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84748 A0 | 84728 | Quad SFI to XAUI with WAN/1588 (Firmware version 0x124. Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84749 A0 | 84749 | Quad SFI to XAUI with Macsec, 1588 (Firmware version 0x124. Driver support for IEEE 1588 features are Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84752 A0 | 84740 | Dual-Channel 10 GbE SFI-to-XFI PHY with EDC. Firmware version D105. (Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84753 A0 | 84740 | Quad-Channel 10 GbE SFI-to-XFI PHY with EDC. Firmware version D105. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84754 A0 | 84740 | Quad-Channel 10 GbE SFI-to-XFI PHY with EDC. Firmware version D105. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84756 A0 | 84756 | Quad SGMII/XFI to SGMII/ SFI Transceiver Firmware version D105. (Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84756 B0 | 84756 | Quad SGMII/XFI to SGMII/ SFI Transceiver Firmware version 0x0128(Needs additional software component) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84756 C0 | 84756 | Quad SGMII/XFI to SGMII/ SFI Transceiver Firmware version 0x0128(Needs additional software component) [Bring-up] | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84758 | 84740 | 10GbE Quad SFI-XFI PHY with IEEE 1588 Firmware version 0x128 | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |

*Table 47: PHYs*

| Device | Driver Family | Description | Quality Level |
|---|---|---|---|
| BCM84759 A0 | 84756 | Quad SGMII/XFI to SGMII/ SFI Transceiver Firmware version D105. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84759 C0 | 84756 | Quad SGMII/XFI to SGMII/ SFI Transceiver Firmware version 0x0128. (Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84780 A0 | 84740 | Octal-Channel 10 GbE SFI-to-XFI PHY with 1588. Firmware version 0x128 (Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84784 A0 | 84740 | Dual 40GbE/Octal 10GbE QSFP+ XLPPI-to-XLAUI PHY. Firmware version 0x125 (Bring-up) | Beta - with Legacy switches Prior to 534XX with 40Gbe Suuport ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84764 A0 | 84728 | Quad SFI to RXAUI with 1588 (Firmware version 0x124. Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available-8867X, 8837X |
| BCM84064 A0 | 84740 | Quad 10G-KR-to-XFI or 40G-KR4-to-XLAUI Transceiver. Firmware version 0108. | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. Not available - 8867X, 8837X |
| BCM84074 A0 | 84728 | Quad KR to XAUI (Firmware version 0x124. Bring-up) | Beta - with Legacy switches Prior to 534XX ; Bringup with 5686X, Beta support with 5696X, 56930. |
| BCM82381 A2 | 82381 | Dual 100GbE CAUI4-to-CAUI4 PHY/Octal 25G Retimer | Bringup with 5686X. GA support with 5696X, 56930. not available yet-with 8867X, 8837X |
| BCM82764 A2 | 82764 | Quad 40 GbE PMA MUX/ DEMUX | Bringup with 5686X. GA support with 5696X, 56930. Not available yet for 8867X, 8837X |
| BCM84858 A0 | 84858 | Quad 10GBASE-T Transceiver. Firmware version 1.01.04 - Beta | GA - with Legacy switches Prior to 534XX ; GA with 5686X, GA support with 5696X, 56930. Not available yet for 8867X, 8837X - TBD |
| BCM84858 B0 | 84858 | Quad 10GBASE-T Transceiver. Firmware version 1.02.02 - Beta | GA - with Legacy switches Prior to 534XX ; GA with 5686X, GA support with 5696X, 56930. Not available yet for 8867X, 8837X |
| BCM84856 B0 | 84856 | Dual 10GBASE-T Transceiver. Firmware version 1.02.02 - Beta | Beta - with Legacy switches Prior to 534XX ; GA with 5686X, GA support with 5696X, 56930. Not available yet for 8867X, 8837X |
| BCM82792 | 82792 | Dual 100G/OTN CAUI-to-100GbE VSR/CR4/SR4/LR4 Gearbox PHY | Beta with 5686X, 56930. Not available yet for 8867X, 8837X |
| BCM82780 | 82870 | 10G Octal SFI-XFI PHY with 10GbE and IEEE 1588 Support | Beta - with Legacy switches Prior to 534XX ; GA with 5686X, 56930. Not available yet for 8867X, 8837X |
| BCM82780F | 82780 | 10G Octal SFI-XFI PHY with 10GbE/40GbE | Beta - with Legacy switches Prior to 534XX ; GA with 5686X, 56930. Not available yet for 8867X, 8837X |
| BCM82752 | 82752 | 10G Dual SFI-XFI PHY with 10GbE IEEE 1588 Support | Beta - with Legacy switches Prior to 534XX ; GA with 5686X, 56930. Not available yet for 8867X, 8837X |
| BCM82758 | 82758 | 10G Quad SFI-XFI PHY with 10GbE/40GbE and IEEE 1588 Support | Beta - with Legacy switches Prior to 534XX ; GA with 5686X, 56930. Not available yet for 8867X, 8837X |

# Section 12: Compatibility

## BROADCOM TASK ENGINES (BTE) FIRMWARE COMPATIBILITY MATRIX

The following table SDK Firmware Compatibility Matrix (page 96) shows compatibility between different versions of SDK and Firmware releases. Please refer to the appropriate Network Switching SDK Firmware release notes publication (56XX0_88XX0_FW-RNxxx-R) for the indicated version below.

***Table 48: SDK Firmware Compatibility Matrix***

| | *SDK-6.4.11* | *SDK-6.4.10* | *SDK-6.4.9* | *SDK-6.4.8* | *SDK-6.4.7* | *SDK-6.4.6* | *SDK-6.4.5* |
|---|---|---|---|---|---|---|---|
| 4.2.7 | BCM56230<br>BCM56260<br>BCM56460<br>BCM56445<br>BCM56450 | BCM56260<br>BCM56460<br>BCM56445<br>BCM56450 | | | | | |
| 4.2.6 | | | BCM56260<br>BCM56450<br>BCM56640<br>BCM56860<br>BCM88370<br>BCM88650<br>BCM88670 | | | | |
| 4.2.5 | | | | BCM56450<br>BCM56260<br>BCM56860<br>BCM88660<br>BCM88375<br>BCM88675 | | | |
| 4.2.4 | | | | | BCM56260<br>BCM56960<br>BCM53903 | | |
| 4.2.3 | | | | | | BCM88650<br>BCM88370<br>BCM88670 | |
| 4.2.2 | | | | | | BCM53400<br>BCM56150<br>BCM56440<br>BCM56450<br>BCM56640<br>BCM56850<br>BCM88030<br>BCM56260<br>BCM56340 | BCM88650 |

*Table 48: SDK Firmware Compatibility Matrix*

| SDK-6.4.11 | SDK-6.4.10 | SDK-6.4.9 | SDK-6.4.8 | SDK-6.4.7 | SDK-6.4.6 | SDK-6.4.5 |
|---|---|---|---|---|---|---|
| 4.2.0 | | | | | | BCM53400<br>BCM56150<br>BCM56440<br>BCM56450<br>BCM56640<br>BCM56850<br>BCM56260 |

# BMACSEC SDK COMPATIBILITY MATRIX

*Table 49: BMACSEC SDK Compatibility Matrix*

| Switch SDK Release | BMACSEC SDK Release |
|---|---|
| 6.4.5 | 4.13 |
| 6.4.6 | 4.14 |
| 6.4.7 | 4.14 |
| 6.4.8 | 4.15 |
| 6.4.9 | 4.15 |
| 6.4.10 | 4.15 |
| 6.4.11 | 4.15 |

# PHY FIRMWARE COMPATIBILITY MATRIX

The following table PHY Firmware Compatibility Matrix (page 97) identifies changes in PHY firmware for newer PHY devices.

*Table 50: PHY Firmware Compatibility Matrix*

| PHY Core | 6.4.6 Firmware Versions | 6.4.7 Firmware Versions | 6.4.8 Firmware Versions | 6.4.9 Firmware Versions | 6.4.10 Firmware Versions | 6.4.11 Firmware Versions |
|---|---|---|---|---|---|---|
| BCM84834/36/38 | | | 01.69.00 | 01.69.00 | 01.69.00 | 01.69.00 |
| BCM84848 | | | 01.08.01 | 01.08.01 | 01.08.04 | 01.08.04 |
| BCM84858/56 | 01.02.02 | 01.02.02 | 01.02.10 | 01.02.10 | 01.02.10 | 01.02.10 |
| BCM84861/64/68 | 00.00.09 | 00.00.10 | 00.00.10 | 00.00.10 | 00.00.10 | 00.00.10 |
| BCM84328 | R027 | R027 | R027 | R027 | R029 | R029 |
| BCM84744 | 0xD105(A0)/ 0x0128(B0/C0) | 0xD105(A0)/ 0x0128 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) |
| BCM84757 | 0xD105(A0)/ 0x0128(B0/C0) | 0xD105(A0)/ 0x0128 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) | 0x0132 (B0/C0) |
| BCM82322/28 B1 | 0xD | 0xF | 0xF | 0xF | 0xF | 0xF |
| BCM82780/52/58 | 0x22 | 0x22 | 0x23 | 0x23 | 0x23 | 0x23 |
| BCM82764 | D00B | D00F | D011 | D015 | D016 | D017 |

*Table 50: PHY Firmware Compatibility Matrix*

| *PHY Core* | *6.4.6 Firmware Versions* | *6.4.7 Firmware Versions* | *6.4.8 Firmware Versions* | *6.4.9 Firmware Versions* | *6.4.10 Firmware Versions* | *6.4.11 Firmware Versions* |
|---|---|---|---|---|---|---|
| BCM82790/92/96 | D00B | D00F | D011 | D015 | D016 | D017 |
| BCM82381 | D00E | D011 | D011 | D011 | D011 | D012 |
| BCM82209 | D00E | D011 | D011 | D011 | D011 | D012 |
| BCM82073 | D00E | D011 | D011 | D011 | D011 | D012 |
| BCM82380 | | | D011 | D011 | D011 | D012 |
| BCM82071 | | | D011 | D011 | D011 | D012 |
| BCM82385 | | | D011 | D011 | D011 | D012 |
| BCM82864 | | | D004 | D005 | D008 | D00A |
| BCM82332 | | | | | D002 | D004 |
| Eagle | D10E_04 | D10F_03 | D10F_03 | D10F_07 | D10F_0D | D10F_0D |
| Falcon | D10A_02 | D10A_02 | D10A_06 | D10B_00 | D10B_00 | D10B_07 |

# Section 13: SDK Externally Licensed Software Components

SDK contains a number of third-party externally licensed software components. This appendix contains information regarding these components, the license for each of these components, and where these components are used in SDK.

*Table 51: EXTERNALLY LICENSED SOFTWARE COMPONENTS*

| *Component* | *Origin* | *Location in Source Tree* | *License Terms and Conditions* |
|---|---|---|---|
| EDITLINE | /afs/athena.mit.edu/contrib/sipb/src/editline | src/sal/appl/editline | See (EDITLINE License terms and conditions) (page 99) |
| ED Editor | USENET comp.sources.misc Volume 9, Issue 36 | src/appl/diag/edline.c | See (ED Editor License terms and conditions) (page 101) |
| CINT | http://www.gnu.org/software/bison/ | src/appl/cint/cint_parser.[ch] | See (CINT parser license terms and conditions) (page 101) |
| BIGDIGITS | David Ireland, copyright (c) 2001-11 by D.I. Management Services Pty Limited <www.di-mgt.com.au> | src/soc/dpp/SAND/Utils/sand_u64.c | See (BIGDIGITS license terms and conditions) (page 102) |
| APIMODE | http://www.gnu.org/software/bison/ | src/appl/diag/api/api_grammar.tab.[ch] | See (APIMODE parser license terms and conditions) (page 103) |
| VxWorks | Wind River Systems, Inc. | systems/vxworks | See (Wind River Systems license terms and conditions) (page 103) |

## EDITLINE LICENSE TERMS AND CONDITIONS

```
This package was obtained from the following location, and was modified
for purposes of inclusion into the SOC diagnostics shell.

Removed files:
        MANIFEST Make.os9 Makefile os9.h sysos9.c testit.c unix.h

Added files:
        sysvxworks.c Makefile

Changed functionality:
        Merged unix.h into editline.h
        M-P and M-N now behave like tcsh.
        list_history(count) routine displays history
        Commented out completion
        Changed rl_complete and rl_list_possib into caller-settable
                global functions
        Don't ring bell on TAB if word is already complete

--------------------------------------------------------------------------------
```

```
Index of /afs/athena.mit.edu/contrib/sipb/src/editline

[     ] Name                    Last modified     Size  Description
  ---------------------------------------------------------------------------

 [DIR]  Parent Directory       11-May-99 03:40      -
 [   ]  MANIFEST               07-Jul-97 11:20     1k
 [   ]  Make.os9               07-Jul-97 11:20     1k
 [   ]  Makefile               01-Sep-97 00:34     2k
 [   ]  complete.c             07-Jul-97 11:20     4k
 [   ]  editline.3             07-Jul-97 11:20     5k
 [   ]  editline.c             07-Jul-97 11:20    25k
 [   ]  editline.h             07-Jul-97 11:20     2k
 [   ]  os9.h                  07-Jul-97 11:20     1k
 [   ]  sysos9.c               07-Jul-97 11:20     1k
 [   ]  sysunix.c              07-Jul-97 11:20     3k
 [   ]  testit.c               07-Jul-97 11:20     1k
 [   ]  unix.h                 07-Jul-97 11:20     1k

  ---------------------------------------------------------------------------

$Revision: 1.7 $

This is a line-editing library.  It can be linked into almost any
program to provide command-line editing and recall.

It is call-compatible with the FSF readline library, but it is a
fraction of the size (and offers fewer features).  It does not use
standard I/O.  It is distributed under a "C News-like" copyright.

Configuration is done in the Makefile.  Type "make testit" to get
a small slow shell for testing.

This contains some changes since the posting to comp.sources.misc:
    -   Bugfix for completion on absolute pathnames.
    -   Better handling of M-n versus showing raw 8bit chars.
    -   Better signal handling.
    -   Now supports termios/termio/sgttyb ioctl's.
    -   Add M-m command to toggle how 8bit data is displayed.
The following changes, made since the last public release, come from
J.G. Vons <vons@cesar.crbca1.sinet.slb.com>:
    -   History-searching no longer redraws the line wrong
    -   Added ESC-ESC as synonym for ESC-?
    -   SIGQUIT (normally ^) now sends a signal, not indicating EOF.
    -   Fixed some typo's and unclear wording in the manpage.
    -   Fixed completion when all entries shared a common prefix.
    -   Fixed some meta-char line-redrawing bugs.

Enjoy,
        Rich $alz
        <rsalz@osf.org>

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```

```
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4. This notice may not be removed or altered.
```

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```
 ed - standard editor
 ^^
   Authors: Brian Beattie, Kees Bot, and others

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 TurboC mods and cleanup 8/17/88 RAMontante.
 Further information (posting headers, etc.) at end of file.
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Modification log:
25Aug92  (W.Metzenthen) Changed malloc() call to calloc() in makebitmap()
         to remove bugs under Linux. Changed a few '^' to the correct '~'.
         General tidying. Recognize Linux via the __linux__ symbol.
         Main change based upon suggestion by Wolfgang Thiel.
07Sep99  Changed large amounts of stuff to simplify  --Curt McDowell
```

# CINT PARSER LICENSE TERMS AND CONDITIONS

```
The C code for the CINT parser was generated by using GNU Bison parser
generator from the file cint_grammar.y   CINT is an optional diagnostic
tool that can be included in your system  by adding CINT to the
FEATURE_LIST in SDK compilation flags.

Removed files:
        None
```

```
Added files:
        None

Changed functionality:
        None

-------------------------------------------------------------------------------
/* A Bison parser, made by GNU Bison 2.4.1.  */

/* Skeleton implementation for Bison's Yacc-like parsers in C

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   along with this program.  If not, see <http://www.gnu.org/licenses/>.  */

/* As a special exception, you may create a larger work that contains
   part or all of the Bison parser skeleton and distribute that work
   under terms of your choice, so long as that work isn't itself a
   parser generator using the skeleton or a modified version thereof
   as a parser skeleton.  Alternatively, if you modify or redistribute
   the parser skeleton itself, you may (at your option) remove this
   special exception, which will cause the skeleton and the resulting
   Bison output files to be licensed under the GNU General Public
   License without this special exception.

   This special exception was added by the Free Software Foundation in
   version 2.2 of Bison.  */

/* C LALR(1) parser skeleton written by Richard Stallman, by
   simplifying the original so-called "semantic" parser.  */
```

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```
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The C code for the APIMODE parser was generated by using GNU Bison parser generator from the file api_grammar.y  APIMODE is an optional diagnostics shell interface that can be included in your system  by adding APIMDOE to the FEATURE_LIST in SDK compilation flags.

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