Release Notes
For
Switch Software Development Kit

SDK 6.5.20

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Section 1: About This Document

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 6.5.x, as only new features or issues are described in this version of the release notes.

Section 2: Product Documentation

The following documents are available through Broadcom's Customer Support Portal at https://csp.broadcom.com/group/customers/csp. They are the primary source of information and should be referenced when using this release:

Document	***Description***
56XX-PG6520.HTML	This document describes the theory of operations of the API and all existing BCM APIs for this release.
SDK-PG822-R	*Network Switching Software 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. Available through SDS Software Request Portal and must be specifically requested.
56XX-PG-1001-R	*Network Switching SDK CINT Interface for Diagnostic Shell* This guide describes how to use the C interpreter (CINT) that runs under the diagnostic shell (Broadcom Shell utility). Available on docSAFE per request.
StrataXGS-AN300-R	*BCM Diagnostic Shell* This guide describes how to use the diagnostic shell, the primary CLI to the SDK. Available on docSAFE per request.
SDK-6.5.20-HSDK-Getting-Started-Guide	This guide describes how to compile HSDK for BCM56880 device and run it with the BCM56880 XGSSIM, BCMSIM or Broadcom SVK
StrataXGSV-AN101	Using Warm Boot with StrataXGSV Device Drivers

Additionally, please review the RN-SDK65xDNX-R document for DNX Release Notes for SDK 6.5.x. This is a companion guide describing only specific DNX family device changes in this SDK release. Common changes and resolved issues are described within this document which is packaged in the release deliverable itself.

Documents under RELDOCS folder of the release package:

|-- DNXSDK-6.5.20-RELNOTES.pdf

|-- SDK-6.5.20-Device-Matrix.xlsx

|-- SDK-6.5.20-RELNOTES.pdf

|-- SDK-6.5.20-Resolved-Issues-Improvements.xlsx

|-- SDK-6.5.20-Support-Matrix.xls

|-- Network Switching Software Development Kit, Release 6.5.20.html

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” 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. For the full list of Broadcom switch and PHY devices supported in the SDK, please reference the file `SDK-6.5.20-Device-Matrix.xlsx` in the RELDOCS directory in the release package.

Devices in “Preview Switch Devices” 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.

Section 3.1: Newly Supported XGS Switch Devices in this release

Family	*Devices*	*Description*
BCM56470	BCM56470 A0	1700Gb/s Centralized enterprise chassis with advanced telemetry
	BCM56471 A0	1700Gb/s aggregation switch with advanced telemetry
	BCM56472 A0	1700Gb/s Centralized enterprise chassis with advanced telemetry
	BCM56475 A0	
BCM56070	BCM56070 A0	Centralized chassis line card switch with channelization support
	BCM56071 A0	25G Connectivity switch with MACSEC encryption
BCM56275	BCM56575 A1	48 port Front panel Ethernet switch with 24 multi-gigabit-lite port and 24 GE - with Broadscan

Section 3.2: Preview XGS Switch Devices

Family	*Devices*	*Description*
BCM56780	BCM56780 A0	160x50G SerDes with 8.0 Tb/s
	BCM56782 A0	160x50G SerDes with 8.0 Tb/s with MACSEC
BCM56990	BCM56990 A0	64 x 400GbE switch
BCM56996	BCM56996 A0	64 x 400GbE switch
BCM56070	BCM56072 A0	Centralized chassis line card switch with channelization support

BCM56990	BCM56990 B0	64 x 400GbE switch

Section 4: New Features per Device

Section 4.1: BCM56880 (Trident4 X11) B0 GENERAL AVAILABILITY (GA) Support

The Broadcom® BCM56880 family is a class of high performance, non-blocking network switching devices supporting compiler-based programmability of forwarding and instrumentation functions. The device family features up to 256 lanes of 50G PAM4 SerDes and 144 logical ports. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported, without the need for external PHYs. The BCM56880 delivers high bandwidth, glueless network connectivity up to 12.8 Tb/s on a single chip.

Section 4.1.1: SDK Features support

This is a GA version of SDK release for BCM56880 (Trident4 X11) and its variant SKUs (BCM56881/BCM56883). Customers can use this release for production deployment.

This release is based on NPL DNA 4.6.6 flexcode. It is subject to change based on new DNA releases, ongoing software improvements, regression tests, and bug fixes.

The tables below show the status of SDK features supported on BCM56880/1/3 B0 in this release.

Table 1. BCM56880 Legacy Features Maturity Level

Feature	***Maturity***
Linkscan	GA
L2 switching	GA
L3 routing	GA
ALPM	GA
Flex Flow (VxLAN)	GA
IP Tunnel	GA
MPLS	GA
Multicast	GA
IPMC	GA
QoS	GA
ECN	GA
Mirroring	GA
VLAN	GA
STG	GA
Port	GA
Flex Port	GA
Trunk	GA
VPLAG	GA
ECMP	GA
DLB	GA
Cosq	GA
Rate	GA
Failover	GA
Hash output selection	GA

Resilient Hash	GA
HIGIG3	GA
Switch control	GA
MIB counter	GA
Packet I/O	GA
KNET	GA
LED	GA
SER	GA
FP	GA
UDF	GA
PORT	GA
Policer	GA
ETRAP	GA
BFD	GA
Time and SyncE	GA
Warmboot	GA

Table 2. BCM56880 New Features Maturity Level

Feature	***Maturity***
Flex Digest	GA
Flex counter 2.0	GA
Flex State	GA
Trace and drop event counter	GA
Packet trace and DOP	GA
Latency-based ECN	GA
Mirror-on-drop	GA
Event BST	GA
Packet integrity check	GA
Packet protocol control	GA
VxLAN GBP	GA
Access SVP/DVP	GA
AACL	GA
IFA 2.0	Preview

Section 4.1.1.1: Enhancements in this release

Please refer to the below list for some major enhancements included in this release. Note it's not an exhaustive list.

- New UFT mode (16,18,19);
- New set of APIs to support flex counter on VLAN XLATE tables;
- Flex counter enhancements such as new flex counter objects, sources, hint types;
- FP enhancements such as more VFP/IFP/EFP qualifiers, actions, new field group flags etc.;
- Per pipe VLAN XLATE fully supported;
- VxLAN over HG3;
- Route projection APIs implemented;
- Per physical port control of ingress/egress VLAN and STG membership check;
- Miscellaneous L3 enhancements such as per route entry data mode, cascaded egress object in full data mode, new misc_ctrl in L3 forwarding table etc.;
- Increased table scales comparing to 6.5.19:

    - L3 VRF instances increased to 16K;
    - Egress L3 tunnels increased to 4K;
    - Exact match ACL entries increased to 640K (for BCM56880);
    - Increased L2 IPV6 MC table scales in UFT mode 9;
    - Increased ALPM capacity in UFT mode 11;
- Other miscellaneous enhancements in L2, port, mirroring, QoS, protocol control etc. modules.

Section 4.1.2: SerDes Feature Support

This release includes:

- TSCBH7 Firmware Version D005_02 and API version A007_01
- BCM API support for collecting FEC statistics

Section 4.1.3: Known issues or Limitations

- When first turning off linkscan on a port which is up, then immediately disables the port, there is a low probability that the port disabling returns failure.
- When adding compressed FP entries in some scenarios(incremental priority FP entries or FP entries with random prefixes), due to the huge number of ALPM entries and FP entries updates, WAL buffer full error is seen.

Section 4.2: BCM56470 (Trident3 X4) A0 Family GA support

The Broadcom BCM56470 family is a class of high-performance, non-blocking network switching devices supporting up to a maximum of 16x (4x25G Serdes core) and various combinations of the port configurations. The BCM56470 delivers high-bandwidth, glueless network connectivity for up to 1.6 Tb/s on a single chip. BCM56470 is an Enterprise Switch for Centralized Chassis and Pizza box Aggregation Device with application and network performance monitoring. This SDK release provides general availability (GA) support for the BCM56470 device. BCM56471 A0, BCM56472 A0 and BCM56475 A0 support is available as part of this release.

Section 4.2.1: SDK Features support

Note this is the GA version release for BCM56470 and it can be used for production deployment.

Section 4.2.1.1: Legacy Feature support

The table below shows the status of legacy SDK features supported on BCM56470 A0 in this release. The features listed in the below table are completed from a development perspective and have passed regression testing and are considered GA level in maturity.

Table 3. BCM56470 *Legacy Features Maturity Level*

Feature	***Maturity***
BROADSCAN 1.0 and 2.0	GA
COSQ	GA
PORT EXTENDER	GA
FAILOVER	GA
FIELD	GA
FLEXFLOW	GA

FLEXRIOT	GA
HASH-UAT	GA
HASH-UFT	GA
HIGIG-PROXY	GA
IPMC	GA
KNET	GA
L2	GA
L2GRE	GA
L3	GA
L3-ALPM	GA
L3-HECMP	GA
L3-LPM	GA
LINKSCAN	GA
MIM	GA
MIRROR	GA
MPLS	GA
MULTICAST	GA
PKT/TX/RX	GA
PORT	GA
PORT-FLEX	GA
PROXY	GA
QoS	GA
RATE	GA
RESILIENT-HASH	GA
RIOT	GA
RTAG7	GA
SER	GA
STACK	GA
STATS	GA
STG	GA
STREAM	GA
RATE	GA
SWITCH	GA
TRUNK	GA
TUNNEL	GA
UDF	GA
VISIBILITY	GA
VLAN	GA
VXLAN	GA
I2C	GA
TR Diags	GA
Warmboot	GA

Section 4.2.1.2: New Feature support

The table below shows the status of new SDK features for BCM56470 A0 in this release.

Table 4. BCM56470 *New Features Maturity Level*

Feature	***Maturity***

Channelization Over Ethernet (COE)	GA
Broadscan 3.0	GA
Channelized HQoS	GA
Channelized congestion management	GA
UTT	GA
AACL	GA

Section 4.3: BCM56070 (Firelight) A0 Family GA support

The Broadcom BCM56070 family is a class of high-performance, non-blocking network switching devices supporting up to a maximum of 3x (4x10Q Serdes core) and 4x (4x25G Serdes core), as well as various combinations of these port configurations. The BCM56070 family delivers high-bandwidth, glueless network connectivity for up to 420 Gb/s on a single chip. BCM56070 family can be used as a channelized adjunct line card port fan-out switch for BCM56470 in a Centralized Ethernet Switching system (CES), as an unchannelized uplink line card for BCM56470, and in a standalone mode. BCM56071/BCM56072 A0 support is available as part of this release.

Section 4.3.1: SDK Features support

As this is the GA version of SDK for BCM56070 (Firelight) and its variant SKUs (BCM56071), customers can use this release for product development. The table below shows the status of BCM56070 A0 family SDK features in this release.

BCM56072 is supported at Preview level for this release.

Table 5. BCM56070 *New Features Maturity Level*

Feature	***Maturity***
COE tag Forwarding	GA
Channelized Flow Control	GA
MACSEC	GA

Table 5. BCM56070 *Legacy Features Maturity Level*

Feature	***Maturity***
L2	GA
VLAN	GA
STG	GA
PORT	GA
PKT/TX/RX	GA
STAT	GA
MULTICAST	GA
MIRROR	GA
VXLAN	GA
PROXY	GA
RATE	GA
QoS	GA
SWITCH	GA
TRUNK	GA

STACK	GA
NIV/PE	GA
MIM LITE	GA
Custom PKT HDR	GA
OAM	GA
ECMP	GA
FIELD	GA
POLICER	GA
L3/IPMC	GA
RTAG7	GA
TSN	GA
SER	GA
KNET	GA
I2C	GA
TIME/TIMESYNC	GA
M0 Firmware For LED and FW Linkscan	GA

Section 4.3.2: MACSEC support

MACSEC software is delivered in the package `xflow-macsec-1.0.11.tar.gz.`

To compile with the SDK:

1. untar `xflow-macsec-1.0.11.tar.gz` in any directory.
2. Add `XFLOW_MACSEC` to the FEATURE_LIST in `$SDK\make\Make.local` file.
3. set the environment variable `XFLOW_MACSEC_HOME` to point to the location of the xflow-macsec directory.

Section 4.4: BCM56990 (Tomahawk4) A0 (Beta) Support

The Broadcom® BCM56990 family is a class of high performance, non-blocking network switching devices. The device family features up to 512 lanes of 50G PAM4 SerDes and 256 logical ports. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported, without the need for external PHYs. The BCM56990 delivers high bandwidth, glueless network connectivity up to 25.6 Tb/s on a single chip.

Section 4.4.1: SDK Features support

The table below shows the status of legacy SDK features supported on BCM56990 A0 in this release. SDK DVAPI regression testing has been ongoing using BCM56990 A0 silicon validation kits. The summary of the current test status as of this release are provided below.

Section 4.4.1.1: Legacy Feature support

Table 6. BCM56990 *Legacy Features Maturity Level*

Feature	***Maturity***
Linkscan	Beta
L2 switching	Beta
L3 routing	Beta
ALPM	Beta

IP tunnel	Beta
MPLS	Beta
Multicast	Beta
IPMC	Beta
Qos	Beta
ECN	Beta
Mirroring	Beta
VLAN	Beta
STG	Beta
Port	Beta
Flexport	Beta
Trunk	Beta
ECMP	Beta
DLB	Beta
Cosq	Beta
Rate	Beta
Failover	Beta
Resilient Hash	Beta
Switch Control	Beta
MIB counter	Beta
Packet I/O	Beta
KNET	Beta
SER	Beta
FP	Beta
UDF	Beta
Policer	Beta
Etrap	Beta
Latency Histogram	Beta
Time&SyncE	Preview
ECMP	Preview
Warmboot	Preview

Section 4.4.1.2: New Feature support

The table below shows the status of new BCM5990 A0 SDK features in this release.

Table 7. BCM56990 *New Features Maturity Level*

Feature	***Maturity***
Flex counter 2.0	Beta
AACL	Preview
INT2.0	Preview

Section 4.4.1.3: SerDes Feature Support

This release includes:

- TSCBH7 Firmware Version D005_03 and API version A007_01
- BCM API support for collecting FEC statistics

Section 4.4.1.4: Things to note

- EFP multiple keytype per group is not supported. Applications will have to create multiple groups with the same priority for these use cases.
- API flow for compressing the qualifiers is changed with respect to TH3. Users can compress the qualifier using simpler alternate API.

Section 4.4.1.5: Known issues or Limitations

- FP Show diagnostics shell command is not supported in this release.
- Auto expansion is not supported for FP groups which have flex stats attached.
- BFD is not supported for BCM56990 A0 in this release. The build option of “BFD” must be removed from the feature list in Make.local when building the image for BCM56990 A0.
- EBST is not supported for BCM56990 A0 in this release.

Section 4.5: BCM56996 (Tomahawk4G) A0 (Preview) Support

The Broadcom® BCM56996 family is a class of high performance, non-blocking network switching devices. The device family supports 100G SerDes lanes and features up 256 logical ports. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported, without the need for external PHYs. The BCM56990 delivers high bandwidth, glueless network connectivity up to 25.6 Tb/s on a single chip.

Section 4.5.1: SDK Features support

SDK DVAPI regression testing has been ongoing using BCM56996 A0 BCMSIM simulator. While the device regressions are still in progress, the summary of the current test status as of this release are provided below. Test development is ongoing and coverage will improve through to the SDK GA.

Section 4.5.1.1: Legacy Feature support

Table 1. BCM56996 *Legacy Features Maturity Level*

Feature	***Maturity***
Linkscan	Preview
L2 switching	Preview
L3 routing	Preview
ALPM	Preview
IP tunnel	Preview
MPLS	Preview
Multicast	Preview
IPMC	Preview
Qos	Preview
ECN	Preview
Mirroring	Preview
VLAN	Preview
STG	Preview
Port	Preview
Flexport	Preview

Trunk	Preview
ECMP	Preview
DLB	Preview
Cosq	Preview
Rate	Preview
Failover	Preview
Resilient Hash	Preview
Switch Control	Preview
MIB counter	Preview
Packet I/O	Preview
KNET	Preview
SER	Preview
FP	Preview
UDF	Preview
Policer	Preview
Etrap	Preview
Latency Histogram	Preview
Time&SyncE	Preview
ECMP	Preview
Warmboot	Preview

Section 4.5.1.2: New Feature support

The table below shows the status of new BCM5996 A0 SDK features in this release.

Table 8. BCM56996 *New Features Maturity Level*

Feature	***Maturity***
Flex counter 2.0	Preview
AACL	Preview
INT2.0	Preview
FlexFlow	Preview
HECMP	Preview

Section 4.5.1.3: SerDes Feature Support

This release includes:

- TSCBH7 Firmware Version D005_03 and API version A007_01
- BCM API support for collecting FEC statistics

Section 4.5.1.4: Known issues or Limitations

- BFD is not supported for BCM56996 A0 in this release. The build option of “BFD” must be removed from the feature list in Make.local when building the image for BCM56996 A0.
- EBST is not supported for BCM56996 A0 in this release.

Section 4.6: BCM56990 (Tomahawk4) B0 (Prev) Support

The Broadcom® BCM56990 B0 family is a class of high performance, non-blocking network switching devices. The device family features up to 512 lanes of 50G PAM4 SerDes and 256 logical ports. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported, without the need for external PHYs. The BCM56990 B0 delivers high bandwidth, glueless network connectivity up to 25.6 Tb/s on a single chip.

Section 4.6.1: SDK Features support

SDK DVAPI regression testing has been ongoing using BCM56990 B0 BCMSIM simulator. While the device regressions are still in progress, the summary of the current test status as of this release are provided below. Test development is ongoing and coverage will improve through to the SDK GA.

Section 4.6.1.1: Legacy Feature support

Table 1. BCM56990 B0 *Legacy Features Maturity Level*

Feature	***Maturity***
Linkscan	Preview
L2 switching	Preview
L3 routing	Preview
ALPM	Preview
IP tunnel	Preview
MPLS	Preview
Multicast	Preview
IPMC	Preview
Qos	Preview
ECN	Preview
Mirroring	Preview
VLAN	Preview
STG	Preview
Port	Preview
Flexport	Preview
Trunk	Preview
ECMP	Preview
DLB	Preview
Cosq	Preview
Rate	Preview
Failover	Preview
Resilient Hash	Preview
Switch Control	Preview
MIB counter	Preview
Packet I/O	Preview
KNET	Preview
SER	Preview
FP	Preview
UDF	Preview
Policer	Preview
Etrap	Preview
Latency Histogram	Preview
Time&SyncE	Preview

ECMP	Preview
Warmboot	Preview

Section 4.6.1.2: New Feature support

The table below shows the status of new BCM5990 B0 SDK features in this release.

Table 9. BCM56990 B0 *New Features Maturity Level*

Feature	***Maturity***
Flex counter 2.0	Preview
AACL	Preview
INT2.0	Preview
FlexFlow	Preview
HECMP	Preview

Section 4.6.1.3: SerDes Feature Support

This release includes:

- TSCBH7 Firmware Version D005_03 and API version A007_01
- BCM API support for collecting FEC statistics

Section 4.6.1.4: Known issues or Limitations

- BFD is not supported for BCM56990 B0 in this release. The build option of “BFD” must be removed from the feature list in Make.local when building the image for BCM56990 B0.
- EBST is not supported for BCM56990 B0 in this release.

Section 4.7: BCM56780 (Trident4-x9) A0 (Prev) Support

The Broadcom® BCM56780 family is a class of high performance, non-blocking network switching devices supporting compiler-based programmability of forwarding and instrumentation functions. The device family features up to 160 lanes of 50G PAM4 SerDes and 72 logical ports. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported without the need for external PHYs. The BCM56780 delivers high bandwidth, glueless network connectivity up to 8.0 Tb/s on a single chip.

Section 4.7.1: SDK Features support

This release is based on NPL DNA 2.4.13 flexcode. Features listed in below tables are previewed in this release.

Please note as DNA will be continuing to evolve to accommodate new customer requests and fix existing issues, SDK will evolve as well to support the new DNA versions, provide new features and bug fixes.

Section 4.7.1.1: Legacy Feature support

The table below shows the status of legacy SDK features supported on BCM56780 A0 in this release.

Table 10. BCM56780 A0 *Legacy Features Maturity Level*

Feature	***Maturity***

Linkscan	Preview
L2 switching	Preview
L3 routing	Preview
ALPM	Preview
Flex Flow (VxLAN)	Preview
IP Tunnel	Preview
Multicast	Preview
IPMC	Preview
QoS	Preview
ECN	Preview
Mirroring	Preview
VLAN	Preview
STG	Preview
Port	Preview
Flex Port	Preview
Trunk	Preview
VPLAG	Preview
ECMP	Preview
DLB	Preview
Cosq	Preview
Rate	Preview
Failover	Preview
Hash output selection	Preview
Resilient Hash	Preview
HIGIG3	Preview
Switch control	Preview
MIB counter	Preview
Packet I/O	Preview
KNET	Preview
LED	Preview
SER	Preview
FP	Preview
UDF	Preview
PORT	Preview
Policer	Preview
ETRAP	Preview
Time and SyncE	Preview
Flex Digest	Preview
Flex counter 2.0	Preview
Flex State	Preview
Mirror-on-drop (IPIPE, MMU)	Preview
Warmboot	Preview

Section 4.7.1.2: New Feature support

The table below shows the new features of BCM56780 A0 SDK as well as MPLS that will be supported in upcoming releases.

Table 11. BCM56780 A0 *New Features Maturity Level*

Feature	***Maturity***

Flex counter 2.0 enhancement	6.5.21
Flex State enhancement	6.5.21
Weighted ECMP	6.5.21
ALPM over MTOP	6.5.21
IFA 2.0	6.5.21
Mirror-on-drop (EPIPE)	6.5.21
MPLS	6.5.22

Section 4.7.1.3: SerDes Feature Support

This release includes TSCBH7 Firmware Version D005_02 and API version A007_01.

Speed modes supported in this release:
- 1-Lane: 10G, 25G, 50G
- 2-Lane: 50G, 100G
- 4-Lane: 40G, 100G, 200G
- 8-Lane: 400G

Section 4.8: BCM56770 (Trident3 X5) Family Updates

The Broadcom® BCM56770 family is a class of high-performance,non-blocking network switching devices supporting up to a maximum of 20x100GbE, as well as various combinations of these port configurations. The device family features a maximum of 20 integrated high speed SerDes cores,each with four integrated 25G SerDes transceivers and associated PCS for native support of a multitude of 10G,25G,40G,50G, and 100G standards without requiring external PHYs, and Broadcom's proprietary HiGig2. BCM56770 delivers high bandwidth, glueless network connectivity for up to 2.0 Tb/s.

Section 4.8.1: CANCUN Feature support

Please refer to Section 4.11 for further details on CANCUN features support.

Section 4.9: BCM56870 (Trident3 X7) Family Updates

The Broadcom® BCM56870 family is a class of high-performance, non-blocking network switching devices supporting up to a maximum of 128x 25GbE, 64x 50GbE, or 32x 100GbE, as well as various combinations of these port configurations. The BCM56870 delivers high-bandwidth, glueless network connectivity up to 3.2 Tbps on a single chip.

This SDK release packages contains CANCUN 5.3.3. To upgrade to premium CANCUN, please use "cancun_dir" config variable to point to the binaries in the directory $SDK/rc/flex/bcm870_a0.

Section 4.9.1: ISSU

SDK 6.5.18 no longer supports ISSU for CANCUN 5.1.8 upgrading from earlier SDK releases. Customers using CANCUN 5.1.8 must upgrade to CANCUN 5.3.3 through cold boot. ISSU to future SDK releases using CANCUN 5.3.3 will be supported. To take advantage of CANCUN bug fixes in the future SDK releases, cold boot is required.

Section 4.9.2: CANCUN Feature support

Please refer to Section 4.11 for further details on CANCUN features support. No new features/bug fixes are part of this release.

Section 4.10: BCM56370 (Trident3 X3) Family Updates

The Broadcom BCM56370 family is a class of high-performance, non-blocking network switching devices supporting up to a maximum of 3x (4x25G Serdes core), 5x (4x10G Serdes core) and 3x (4x10Q Serdescore), as well as various combinations of these port configurations. The BCM56370 delivers high-bandwidth, glueless network connectivity for up to 540 Gb/s on a single chip.

Section 4.10.1: CANCUN Feature support

Please refer to Section 4.11 for further details on CANCUN features support.No new features/bug fixes are part of this release.

Section 4.11: Trident3 Family CANCUN updates

Section 4.11.1: CANCUN support matrix

BCM56870, BCM56770, BCM56370 and BCM56470 are programmable devices released with flexible firmware. Below is the matrix of support between SDK version and Cancun load:

Table 12. Trident3 X7 Support Matrix

Cancun firmware load	***Supported SDK release***
B870.5.0.7	6.5.12
B870.5.1.8	6.5.13
B870.5.1.8 B870.5.2.3	6.5.14
B870.5.1.8 B870.5.3.3	6.5.15
B870.5.1.8 B870.5.3.3	6.5.16
B870.5.1.8 B870.5.3.3	6.5.17
B870.5.3.3-rev1	6.5.18
B870.5.3.3-rev3	6.5.19
B870.5.3.3- rev4	6.5.20

Table 13. Trident3 X5 (BCM56770) Support Matrix

Cancun firmware load	***Supported SDK release***
B770.3.0.0	6.5.14
B770.3.1.2	6.5.15

B770.3.1.2	6.5.16
B770.3.1.2	6.5.17
B770.3.1.2-rev1	6.5.18
B770.3.1.2-rev3	6.5.19
B770.3.1.2- rev4	6.5.20

Table 14. Trident3 X3 (BCM56370) Support Matrix

Cancun firmware load	***Supported SDK release***
B370.3.0.5	6.5.15
B370.3.0.5	6.5.16
B370.3.0.5	6.5.17
B370.3.0.5-rev1	6.5.18
B370.3.0.5-rev1	6.5.19
B370.3.0.5-rev3	6.5.20

Table 15. Trident3 X2 (BCM56275) Support Matrix

Cancun firmware load	***Supported SDK release***
B275.3.0.13	6.5.19
B275.3.1.0	6.5.20

Table 16. Trident3 X4 (BCM56470) Support Matrix

Cancun firmware load	***Supported SDK release***
B470.3.0.10	6.5.20

NOTE: The CANCUN loads B870.5.3.3-rev4,B770.3.1.2-rev4 and B370.3.0.5-rev3 are updated versions with limited bug fixes.These limited bug fixes are SDK-agnostic and are also drop-in compatible with older SDK releases, so the CANCUN version number for these does not change. These Bug Fix Base CANCUNs are also available to all customers separately in docSAFE as standalone files which can be used with older SDK versions.

For Trident3 X2 (BCM56275),customers have to do coldboot since B275.3.0.13 support is removed from SDK-6.5.20.

Section 4.11.2: CANCUN release notes

Details on features supported for programmable devices can be referenced via the CANCUN feature list documentation posted on docSAFE.

Please refer to the resolved issues (Section 11) for the details of SDK features and bugs fixes that are part of 6.5.20 release.

Section 4.12: Embedded Applications Updates

Section 4.12.1: Broadsync and KNETSync

- Frequency profile and APTS features enabled on BCM88270
- Broadsync support is introduced for BCM56070
- IFA2.0 support is introduced for BCM56870
- KNETSync 1-step support is introduced for BCM56960, BCM56850

Please reach out to Broadcom business PoC for more info about the feature delivery

Section 5: Things to note

This section lists items that require special attention that are new to this release. Please see prior 6.5.x release notes for previously reported items that should also be noted.

Section 5.1: SDK releases out of active engineering support

Please refer to KB0028368 regarding the SDK release that is out of active engineering support.

Section 5.3: Warmboot Notes and Considerations

This section is to give information about warmboot specific activity in this release. In this case, warmboot allows for quick reboot by reinitializing the necessary components and processes.
Please note that the warmboot scache size requirements for a device for a particular release can be found by running the `warmboot storage` command at the BCM prompt.

It is recommended that any customer perform their own warmboot testing for their specific environment and use these results and information as guidance only. Note: Warmboot downgrade is not supported.

Section 5.3.1: Validated Warmboot upgrades

Warmboot like-to-like testing and issue resolution is focused on a majority of recently supported devices and is performed with a limited set of test cases. Warmboot testing is not complete on devices which have not yet reached supported status. Warmboot testing is not performed with PHY devices attached.

In-service software upgrade (ISSU) allows upgrade of SDK software from one version to a different version without impacting packet forwarding. This type of SDK warmboot upgrade from 6.5.19 to 6.5.20 has been validated on specific silicon validation kits (SVKs) in this release.

Section 5.3.2: Upgrade considerations

- In this release, SDKLT-based devices are not compiled into default binary. Upgrading on a legacy device from 6.5.19 (using a binary that does not include SDKLT-based devices) to a 6.5.20 binary that includes SDKLT-based devices is not supported in this release (SDK-211718/SDK-212734).

- In BCM5637x devices while setting the profile for the bid bcmBstStatIdUcast there was an issue with Q_WM_MAX_THRESHOLD field programming in memory MMU_THDU_CONFIG_QUEUE. That has been fixed in this release.SDK-216382
- In previous release, BST profile configuration for bcmBstStatIdUcast is done at invalid queue index. That has been fixed in this release 6.5.20.While doing warmboot upgrade from 6.5.19 to 6.5.20 testing the profile set at 6.5.19 and get the profile value at 6.5.20 will not work because in 6.5.19 profile set is done at invalid index and in 6.5.20 profile get tries to get the info at valid index. (SDK-222979)

Section 5.3.3: L2 Address Management considerations

On BCM5687X, BCM5677X, BCM5637X and BCM5627X family devices, when operating in a L2 MOD FIFO mode for L2 address management, when a station-move occurs, the learnt old L2 address can be corrupted. This has been corrected in this release by caching the learnt L2 addresses in software and recovering the learnt L2 address from the software cache when station-move occurs for that L2 address. For this correction to be applicable the 'spn_MEM_CACHE_ENABLE' SOC property needs to be enabled by the application. Note: This soc property is enabled by default in SDK software.

This behavior applies to the BCM5647X family of devices as well.

Section 5.3.4: Add about HR4 new SKU

BCM56575 A1 SKU support was added and GAed in this release.

Section 5.3.4: 4 new port configs added on Helix-5

BCM56370_A0-17.config,BCM56370_A0-18.config,BCM56371_A0-12.config,BCM56372_A0-04.config added as part of SDK-208208

Section 6: Summary of BCM API changes and enhancements

Complete BCM API documentation is available in the Network Switching Software Programmer's Guide number `Network Switching Software Development Kit, Release 6.5.20.html`. BCM API changes in this release are no longer found in this document. Please refer to Appendix B: Summary of BCM API changes and enhancements in this release for further details.

For the full list of API support by Broadcom device, please reference the file `SDK-6.5.x-Support-Matrix.xls` in the sdk/RELDOCS directory in the release package. The API support matrix is not maintained for DNX devices, thus DNX devices are excluded from `SDK-6.5.x-Support-Matrix.xls`.

Broadcom does not guarantee API default values set within the SDK and changes to default values may be made between releases. If an API default value is required for application software to work properly, it must be explicitly set.

Refer to Summary of BCM API changes and enhancements for the API changes specific to this release.

Section 7: Test Statistics

Section 7.1: How to read the data

In cases where tables are shown below, the tables represent a spread of data gathered per device, per suite, and per release. The percentages represent the aggregate rate of failure for that suite when run against all variants of the family of devices. This data does not include results from DNX device regressions.

The below data is not meant to be a precise indication of quality but instead serves as a guideline for improvements release-over-release. Additionally, although some cells show 0% failures, this does not necessarily mean the feature is supported in the device - tests are run to validate the appropriate SDK support even for unsupported features on older devices to ensure graceful handling of all APIs. Finally, some devices have fewer columns listed if they were introduced recently.

Section 7.2: 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 follows:

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.

Section 7.3: Total Tests

The data below represents the number of unique cases for each release. The goal is to increase test coverage release over release but there may be instances where tests are consolidated which may yield a net reduction from one version to the next. Note that although a particular test case will execute for each and every chip, it is only counted once.

	sdk-6.5.20	***sdk-6.5.19***	***sdk-6.5.18***	***sdk-6.5.17***
golden	153	153	153	153

warmboot	8305	8061	7408	7408
auth	17	17	17	17
bfd	124	124	123	123
bhh	159	159	159	159
chip	10	10	10	10
coe	803	777	711	668
cosq	838	838	838	838
custom	7	7	7	7
ea	108	108	108	108
eav	19	19	19	19
extender	61	61	61	61
fabric	7	7	7	7
failover	15	15	15	14
fcoe	37	37	37	37
field	1853	1852	1852	1852
higigproxy	129	129	129	129
infra	114	114	114	114
ipfix	17	17	17	17
ipmc	138	138	138	138
l2	498	497	487	487
l2gre	33	33	33	33
l3	670	666	660	656

l3.alpm	771	771	732	724
link	27	27	27	27
mim	61	61	61	61
mirror	402	402	400	362
misc	28	28	28	28
mpls	737	705	694	694
multicast	64	60	54	52
niv	84	84	84	84
oam	402	402	402	402
pkt	70	70	70	70
port	589	582	568	559
proxy	49	49	49	49
ptp	141	140	140	140
qos	107	100	99	99
rate	21	21	21	21
rtag7	92	92	92	92
rx	65	65	65	65
ser	300	299	297	296
stack	130	130	130	126
stat	785	694	677	602
stg	42	42	42	42
switch	306	296	291	286

time	51	35	35	35
tlvMsg	13	13	13	13
trill	51	51	51	51
trunk	286	286	283	267
tunnel	200	196	194	175
subport	31	31	31	31
vlan	330	315	310	301
vxlan	383	383	383	383
wlan	17	17	17	17
Test Suite Total	20750	20286	19443	19209

Section 7.4: API Test Results

In this release, all tested devices passed DVAPI regressions with over 99.8% passing rate.

Section 7.5: Security Vulnerability Test Results

These are scaling and semantic testing which verify that we properly handle errors and scaling to the limits. The table below shows the passing rate on the security suite.

	Total Tests	***% Pass***
minigolden	1	100%
warmboot	164	100%
cosq	267	100%
e2ecc	5	100%
ea	6	100%

eav	16	100%
fabric	4	100%
fcoe	3	100%
field	26	100%
fieldScale	2	100%
higigproxy	43	100%
l2	136	100%
l3	30	100%
l3.alpm	248	100%
linkphy	7	100%
mim	1	100%
mirror	39	100%
mpls	32	100%
multicast	2	100%
oam	1	100%
oobfc	12	100%
packing	2	100%
policier	13	100%
port	105	100%
proxy	7	100%
ptp	77	100%
qos	6	100%

riot	49	100%
rtag7	2	100%
rx	27	100%
sat	29	100%
stat	53	100%
stg	13	100%
switch	22	100%
time	15	100%
trill	3	100%
trunk	65	100%
tunnel	19	94.74%
subport	7	100%
udf	6	100%
vlan	116	100%
vxlan	100	100%
Security Totals	1781 tests	99.94% pass rate

Section 7.6: Static Code Analysis

NOTE: Starting with SDK 6.5.17, the “pass by value” alert threshold was changed from 128 bytes to 160 bytes. This was required in order to accommodate the greater number of ports available in new Broadcom devices. Customers running their own version of Static Code Analysis need to make adjustments in their environment accordingly in order to avoid false positives.

The table below shows the SDK static analysis backlog for this release:

Section 7.6.1: Unresolved Static Code Analysis Issues

Area	*Open Issues SDK 6.5.20*	*Open Issues SDK 6.5.19*	*Open Issues SDK 6.5.18*	*Open Issues SDK 6.5.17*	*Open Issues SDK 6.5.16*	*Open Issues SDK 6.5.15*	*Open Issues SDK 6.5.14*	*Open Issues SDK 6.5.13*	*Open Issues SDK 6.5.12*	*Open Issues SDK 6.5.11*	*Open Issues SDK 6.5.10*	*Open Issues SDK 6.5.9*
DNX	2	0	2	57	12	5	3	11	1	0	7	8
XGS	18	5	6	31	9	14	8	13	1	2	12	6
SerDes	3	3	4	14	3	5	3	4	5	6	6	10
Common	4	2	5	11	5	9	2	10	3	3	4	8
Total	27	10	17	116	29	33	16	38	10	11	29	32

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. The following table lists SIDs identified since our last SDK release.

Reference	*Chips*	*Affected Versions*	*Errata Synopsis*	*Details*
SDK-221245	All chips	6.5.14, 6.5.19	In previous releases, once ser error occurs on memory which SER_RESPONSE is SER_WRITE_CACHE_RESTORE, the other indices may also report SER errors.	The memory which SER_RESPONSE is SER_WRITE_CACHE_RESTORE means this table has configuration and HW updated fields. During SER correction, in order to get the corrupted data, we disable/re-enable SER protection of the memory, so if HW updates the dynamic fields during this time gap, the parity/ecc bit won't be updated, so SER error will be reported after re-enabling SER protecting.
SDK-218585	56980_B0	6.5.16	In previous releases, once 1bit error occurred on DLB_ECMP_FLOWSET_TIMESTAMP_PAGE, the error couldn't be corrected. In this release, this issue has been fixed.	Do not tread DLB_ECMP_FLOWSET_TIMESTAMP_PAGE as counter table

SDK-213475	56850_A0, 56850_A1, 56850_A2, 56960_A0, 56970_A0	6.5.16	In previous releases, in ALPM combined mode, there was an issue that after warmboot, the next hop information for certain IPv6 128B routes was corrupted. It has been addressed in this release.	Update bkt_ptr for default route during warmboot.
SDK-210773	56880_A0, 56880_B0	6.5.19	In the flooding test, traffic flows on different ports and triggers L2 addresses moved frequently. During L2 hit bit set, eflex stats write function allocates certain amount of memory, but doesn't free corresponding amount of it, which leads to memory leak. This issue has been fixed in this release.	This could cause memory leak and system stuck with flooding flow. This affects TD4 device.
SDK-209676	All chips	6.5.18 6.5.19	Fix a problem with ALPM hit bit propagation process.	Skip updating MC route when performing hit bit propagation.

Section 9: Potential Security Vulnerabilities

Broadcom treats security vulnerability issues reported by customer Product Security Incident Response Teams (PSIRT) with very high importance and urgency. Please ensure that any such issues reported and filed by your organization through the Broadcom customer support portal specifically use the acronym “PSIRT” in the CSP case summary and/or description. This will allow the Broadcom engineering teams to track, analyze, and address these issues as quickly as possible.

Table 17: Security Vulnerabilities

Reference	*Chips*	*Affected Versions*	*Errata Synopsis*	*Details*
None identified in this release				

Section 10: GNU tools versions

Broadcom uses GNU tools, specifically “gmake”, “gcc”, several Linux distributions and Linux kernel versions for SDK build and validation in-house. The following table summarizes the tools used in this release

Table 18: GNU tools versions

CPU	*gmake*	*gcc*	*Operating System*	*Linux Kernel*
SLK	4.1	4.9.2	Broadcom LDK 4.1.10	3.14.65
iProc	4.1	6.3.0	Broadcom XLDK 5.1.1	4.14.48
XLR	4.1	5.4.0	Broadcom XLDK	4.19.1
GTS	4.1	5.4.0	Broadcom XLDK	4.19.1
sim	4.1	7.1.0	Native	
iProc64	4.1	6.3.0	Broadcom XLDK 5.1.1	4.14.48

In this release we performed code optimizations to support a more recent version of gcc. This version of SDK compiled cleanly with gcc 7.1.0 for the systems/sim target.

If there are any issues with running or compiling SDK with GCC versions higher than what is listed above, such issues should be reported via Broadcom Customer Support for evaluation. If the issue is caused by SDK coding or logic error, it will be resolved in a subsequent SDK release.

However, if the issue is caused by the nature of how new versions of GCC handle compilation and is not directly related to SDK coding or logic errors, it will be fixed on best-effort basis.

Section 11: Resolved and Unresolved Issues for 6.5.20

Section 11.1: Resolved Issues and Improvements

For the full resolved list, please reference the file `SDK-6.5.20-Resolved-Issues-Improvements.xlsx` in the RELDOCS directory in the release package.

Section 11.2: Unresolved Issues

The following open Urgent priority issues remain unresolved in SDK 6.5.20. These are in process of being evaluated for inclusion in a future SDK release:

Number	*CSP*	*Chips*	*Errata For 6.5.20*
SDK-196869	CS9185857	56870_B0	Customer is using 6.5.13 with the attached patches on top. They are seeing this issue where tagged packets are not matched. We have 3 triple width TCAM groups (gid=3, 4,6) installed in the following order. Group 4 & 6 has same priority and preselector enabled.
SDK-213470	CS10293747	56980_A0, 56980_B0	Queue level WRED has to be enabled always. Only when queue level enable, pool level, port pool level WRED can take effect. When entering the specified port+cosq to update service pool wred, queues in other service pool were involved to update.
SDK-220114	CS00010576585	56870_A0, 56870_B0	Registered BST callback is not triggered when HW snapshot occurs
SDK-221525	CS00010004828	56670_A0	When running in locked mode (A port is connected to SyncE1 input) the TDPLL reports that the input source is no longer valid (bcmTdpllCallbackTypeNotification, with prior_selected_clock=6 and selected_clock=-1) and reports monitor values (bcmTdpllCallbackTypeMonitor) with softWarning, hardAccept and hardReject. The frequency measured by TDPLL is large, in order or 100s of ppm.
SDK-221835	CS00010654441	56870_A0	Customer is trying a scaled L2 scenario. In customer setup, switch control "HashMultiMoveDepthVlanTranslate1" is set to 8. VPs are created using bcm_flow_match_add() API using BCM_FLOW_MATCH_CRITERIA_PORT_VLAN as match criteria. Please see ProgramMatchL2SubIf() in the attached CINT for more info.
SDK-223420	NA	56670_C0	In certain GDPLL usecase 2A scenarios involving RC reinitialization, there could be a situation where TDPLL tries to configure CPRI presentation timestamps with invalid port ID
SDK-223444	NA	56470_A0	Doing flexport operations along with warmboot and iterating this process multiple times may lead to intermittent stack corruption. Watch out for the patch on this JIRA when it gets resolved.

Section 12: Compatibility

Section 12.1: Broadcom Embedded Applications Firmware Compatibility Matrix

The following table shows new feature support added in Firmware releases for switch devices compatible with the corresponding SDK release. Please get in touch with Broadcom marketing on the delivery of firmware GA release

	SDK-6.5.20	SDK-6.5.19	SDK-6.5.18	SDK-6.5.17	SDK-6.5.16	SDK-6.5.15	SDK-6.5.14	SDK-6.5.13
4.3.14	BCM88270 BCM56670 BCM56070 BCM56980 BCM56770							
4.3.13		BCM56870 BCM56970 BCM56980 BCM56670 BCM56880 BCM88480 BCM88800						
4.3.12 (planned)			BCM56670 BCM56960 BCM56850					
4.3.11				BCM56670 BCM56770 BCM56980 BCM56970				

4.3.10					BCM56980 BCM88690			
4.3.9						BCM88470 BCM88270 BCM56870 BCM56980 BCM56970		
4.3.8							BCM88375	
4.3.7								BCM56870 BCM56970

Section 12.2: BMACSEC SDK Compatibility Matrix

Switch SDK Release	*BMACSEC Release*
6.5.7	4.16
6.5.8	4.16
6.5.9	4.16
6.5.10	4.16
6.5.11	4.17
6.5.12	4.17
6.5.13	4.17
6.5.14	4.18
6.5.15	4.19
6.5.16	4.20

6.5.17	4.20
6.5.18	4.20
6.5.19	4.20
6.5.20	4.20

Section 12.3: iMACSEC SDK Compatibility Matrix

This software is specifically for use with the BCM54190 integrated PHY driver.

Switch SDK Release	*iMACSEC Release*
6.5.7	1.0
6.5.8	1.1
6.5.9	1.1
6.5.10	1.2
6.5.11	1.2
6.5.12	1.2
6.5.13	1.3
6.5.14	1.3
6.5.15	1.3
6.5.16	1.3
6.5.17	1.3
6.5.18	1.3
6.5.19	1.3
6.5.20	1.3

Section 12.4: PHY Firmware Compatibility Matrix

The following table identifies changes in PHY firmware for newer PHY devices and for the serdes core. For a view of supported switch and PHY combinations, please review the `SDK-6.5.x-Device-Support.xls` spreadsheet.

PHY Core	6.5.13 Firmware Versions	6.5.14 Firmware Versions	6.5.15 Firmware Versions	6.5.16 Firmware Versions	6.5.17 Firmware Versions	6.5.18 Firmware Versions	6.5.19 Firmware Versions	6.5.20 Firmware Versions
BCM84888	A0: 1.01.06 B0: 2.01.06	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07	A0: 1.01.07 B0: 2.02.07
BCM84858	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04
BCM84856	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04	01.03.04
Falcon	D10B_14	D10B_14	D10B_1F	D10B_1F	D10B_1F	D10B_1F	D10B_1F	D10B_23
Falcon dual PLL	D10B_1C	D10B_1C	D10B_1C	D10B_1C	D10B_1C	D10B_1C	D10B_22	D10B_22
Falcon16	D103_04	D103_0A	D103_0D	D103_0D	D103_11	D103_13	D103_13	D103_13
Eagle	D10F_13	D10F_13	D10F_13	D10F_13	D10F_13	D10F_13	D10F_13	D10F_13
Eagle dual PLL	D10F_17	D10F_17	D10F_17	D10F_17	D10F_17	D10F_17	D10F_17	D10F_17
Merlin16	D101_0C	D102_09	D102_09	D102_09	D102_09	D102_09	D102_09	D102_09
Merlin7	N/A	N/A	N/A	N/A	N/A	N/A	D000_02	D000_02
Blackhawk	D02_007	A0: D003_06 B0:	A0: D003_06 B0:	A0: D003_06 B0:	A0: D003_0A B0: D100_06	A0: D003_0C B0:	A0: D003_0C B0:	A0: D003_0C B0:

		D004_00	D100_02	D100_04		D100_0A	D100_0B	D100_0E
Blackhawk 7	N/A	N/A	N/A	N/A	N/A	N/A	D005_02	D005_02
Blackhawk 7 single PLL	N/A	N/A	N/A	N/A	N/A	N/A	D004_09	D005_03

Section 12.5: SDK and BCM88060 FW Compatibility Matrix

The firmware binary is part of the SDK release. Below table shows the firmware version compatible with which SDK release.

Switch SDK Release	*88060 FW version*
6.5.10	1.0.10
6.5.11	1.0.11
6.5.12	1.0.12
6.5.13	1.0.13
6.5.14	1.0.14
6.5.15	1.0.15
6.5.16	1.0.16
6.5.17	1.0.17
6.5.18	1.0.18
6.5.19	1.0.19
6.5.20	1.0.20

Section 13: SDK Externally Licensed Software Components

The 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.

Component	*Origin*	*Location in Source Tree*
EDITLINE	/afs/athena.mit.edu/contrib/sipb/src/ editline	src/sal/appl/editline
LIBXML2	http://xmlsoft.org/downloads.html	src/shared/libxml
ED Editor	USENET comp.sources.misc Volume 9, Issue 36	src/appl/diag/edline.c
BITMAP	USENET comp.sources.misc Volume 9, Issue 36	src/appl/diag/edline.c
CINT	http://www.gnu.org/software/bison/	src/appl/cint/cint_parser.[ch]
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
APIMODE	http://www.gnu.org/software/bison/	src/appl/diag/api/api_grammar.tab.[ch]
SFlow	http://www.inmon.com/technology/sflowlicense.txt	N/A - see Section 13.8

Section 13.1: EDITLINE License terms and conditions

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


This package was obtained in 1999 and modified to fit the Broadcom
SDK. In 2015 is was modified further to perform terminal I/O through
call-backs, and several unused FSF compatibility functions were
removed. For SDK purposes, the library can still be replaced by the
FSF readline library.


The original library is maintained at GitHub:
https://github.com/troglobit/editline
```

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

ORIGINAL DESCRIPTION

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.

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

ORIGINAL COPYRIGHT

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    credits must appear in the documentation.
```

```
 3. Altered versions must be plainly marked as such, and must not be
    misrepresented as being the original software.  Since few users
    ever read sources, credits must appear in the documentation.
 4. This notice may not be removed or altered.
```

Section 13.2: LIBXML2 - XML C parser terms and conditions

Package was obtained from http://xmlsoft.org/ and is used by diagnostics tool for miscellaneous input/output tasks

This README is part of SDK under src/shared/libxml and is as follows:

```
/*
 * $Id$
 *
 * $Copyright: (c) 2011 Broadcom Corporation
 * All Rights Reserved.$
 */

This package was obtained from http://xmlsoft.org/downloads.html
(ftp://xmlsoft.org/libxml2/libxml2-2.7.2.tar.gz)
and was modified for purposes of inclusion into the SOC diagnostics shell.

Only certain portion of package was included in SDK in 2 places:
    Under srs/shared/libxml
        chvalid.c, config.h, dict.c, encoding.c, entities.c, error.c
        globals.c, hash.c, libxml.h, list.c, Makefile, parser.c
        parserInternals.c, SAX2.c, threads.c, tree.c, uri.c, valid.c
        xmlIO.c, xmlmemory.c, xmlsave.c, xmlstring.c, xmlunicode.c
    Under include/shared/libxml
```

```
catalog.h, chvalid.h, debugXML.h, dict.h, DOCBparser.h
encoding.h, entities.h, globals.h, hash.h, HTMLparser.h
HTMLtree.h, list.h, parser.h, parserInternals.h, pattern.h
relaxng, SAX2.h, threads.h, tree.h, uri.h, valid.h, xinclude.h
xlink.h, xmlautomata.h, xmlerror.h, xmlexports.h, xmlIO.h
xmlmemory.h, xmlmodule.h, xmlregexp.h, xmlsave.h, xmlstring.h
xmlunicode.h, xmlversion.h, xpath.h, xpathInternals.h, xpointer.h
```

```
No functionality was changed, but there were modifications to match SDK
requirements
```

```
Copyright
```

```
Except where otherwise noted in the source code (e.g. the files hash.c,
list.c and the trio files, which are covered by a similar licence but
with different Copyright notices) all the files are:
```

```
 Copyright (C) 1998-2003 Daniel Veillard.  All Rights Reserved.
```

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nished to do so, subject to the following conditions:
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be used in advertising or otherwise to promote the sale, use or other deal-
ings in this Software without prior written authorization from him.
```

Section 13.3: 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

      Copyright (C) 1984, 1989, 1990, 2000, 2001, 2002, 2003, 2004, 2005, 2006
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   (at your option) any later version.

   This program is distributed in the hope that it will be useful,
```

```
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   GNU General Public License for more details.

   You should have received a copy of the GNU General Public License
   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.  */
```

Section 13.4: BIGDIGITS license terms and conditions

```
Contains BIGDIGITS multiple-precision arithmetic code originally
written by David Ireland, copyright (c) 2001-11 by D.I. Management
Services Pty Limited <www.di-mgt.com.au>, and is used with
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not use the software.
```

Section 13.5: APIMODE parser license terms and conditions

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

See “CINT parser license terms and conditions” for the Bison licence.

Section 13.6: SFlow license terms and conditions

Broadcom provides several API modules that refer to SFlow by name, specifically Field, Mirror, Port, and Switch. All are implemented as per IETF RFC-3176. Please review the separate sflowlicense.txt file for terms of the agreement used by Broadcom in our implementation.