

Release Notes For Switch Software Development Kit

SDK 6.5.25

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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
Network Switching Software Development Kit, Release 6.5.25.html	This document describes the theory of operations of the API and all existing BCM APIs for this release.
SDK-PG822-R	<i>Network Switching Software Platform Guide</i> 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	<i>Network Switching SDK CINT Interface for Diagnostic Shell</i> 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	<i>BCM Diagnostic Shell</i> This guide describes how to use the diagnostic shell, the primary CLI to the SDK. Available on docSAFE per request.
SDK-6.5.25-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
56XXX-AN301-R	Kernel Network Driver (KNET), this document describes and usage of KNET kernel driver module

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.

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-6.5.25-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

<i>Family</i>	<i>Devices</i>	<i>Description</i>
BCM56998	BCM56998 A0	32 x 400GbE, 64 x 200GbE, 128 x 100GbE, 128 x 50GbE, 32 x 40GbE, 128 x 25GbE, or 128 x 10GbE ports

Section 3.2: Preview XGS Switch Devices

<i>Family</i>	<i>Devices</i>	<i>Description</i>
BCM56995	BCM56995 A0	glueless network connectivity up to 25.6 Tb/s X 64X400GE lanes on a single chip

SDK Release Package Description Table:

Package	Description
sdk-xgs-6.5.25.tar.gz	SDK source code release for XGS devices
sdk-all-6.5.25.tar.gz	SDK source code release for XGS, and DNX devices
sdk-6.5.25-gpl-modules.tar.gz	SDK gpl versions of kernel module release for XGS and DNX (KNET and BDE)
sdk-6.5.25-dcb-modules.tar.gz	SDK gpl version for DCB
sdk-all-6.5.25-6.5.24.patch.tar.gz	Diff patch file between 6.5.24 and 6.5.25 for sdk-all
sdk-xgs-6.5.25-6.5.24.patch.tar.gz	Diff patch file between 6.5.24 and 6.5.25 for sdk-xgs
hsdk-all-6.5.25.tar.gz	Hsdk source code release
hsdk-6.5.25-gpl.tar.gz	Hsdk gpl versions of kernel module release for XGS (NGKNET and NGBDE)

Section 4: New Features per Device

Section 4.1: BCM56780 (Trident4-X9) A0 GENERAL AVAILABILITY (GA) 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 4.1.1: SDK Features support

This is a GA version of SDK release for BCM56780 (Trident4 X9) and the derived device variants. Customers can use this release for production deployment.

This release is based on NPL DNA 2.8.7.0 flexcode. For the enhancements and bug fixes included in this release, please refer to the table which lists all the resolved issues and improvements.

Please note: SDK will continue to evolve as new DNA versions are developed to accommodate new customer feature requests and bug fixes. ,

Section 4.1.1.1: Feature support maturity

IFA-2.0 is GA.

Section 4.1.1.2: SerDes Feature Support

This release includes TSCBH7 Firmware Version D005_16 and API version A00A_08.

Speed modes supported in this release:

- 1-Lane: 10G, 25G, 50G
- 2-Lane: 50G, 100G
- 4-Lane: 40G, 100G, 200G
- 8-Lane: 400G

Section 4.1.1.3: Things to Note

UFT modes

- Supported UFT modes are 1~13 and 15~21.

QoS

- Refer to section 4.2.3.1 for the same QoS Behavior Changes as Trident4-X11.

Mirror

- With the BCM_MIRROR_DEST_FLAGS2_OVERWRITE for mirror destination replacements, users don't need to detach mirror sources from the old mirror destination and reattach mirror sources to the new overwritten mirror destination. While with the existing BCM_MIRROR_DEST_REPLACE flag, users must do the detach/reattach.

Field

- "bcmFieldQualifyIp4Length" Qualifier change in behavior: For legacy devices, the qualifier is mapped to IPv4 total length as per the qualifier doc grog. However, in Trident-4 pipeline devices, it is wrongly mapped to IPv4 header length. To make it inline with legacy, the mapping is corrected with the new NPL field in the latest NPL. A new qualifier is introduced "bcmFieldQualifyIp4HdrLength" to map it to the existing LT field (to match on IPv4 header length).

Section 4.1.1.4: Known limitations

Tunnel

- The functionality of per NNI port based control for remarking the tunnel header DSCP in VXLAN encapsulation is not yet available, though it is supported for BCM56880 (Trident4-X11) since SDK-6.5.22.

IFA 2.0

- Cannot encap PSAMP IPv6 with outer VLAN when doing IFA 2.0 egress report to collector. There is a limitation for IPv6 encap mirroring to loopback port. As the device encap engine supports to encap upto 80-Byte of header, when loopback header is enabled, adding the outer VLAN tag will lead the encap engine to use more than 80 Bytes. Thus, we cannot encap IPv6 header with outer VLAN and loopback header at the same time.
- For initiator nodes, the source port in the metadata of the IFA probe packet is not the original source port but the loopback port.

Trunk

- Traffic distribution for trunk members is less balanced if the trunk group size is not a power of two

COSQ

- For BCM56780 (Trident4-X9) IDB_OBM[0-4]_MAX_USAGE cannot be written from the SDK.

Section 4.1.2: ISSU support

ISSU is supported from 6.5.23 to 6.5.24 and 6.5.25 with DNA-2.7.6.0

Section 4.2: 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 4.2.1: SDK Features support

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

This release is based on NPL DNA 4.10.5.0 flexcode. For the enhancements and bug fixes included in this release, please refer to the table which lists all the resolved issues and improvements.

The tables below show the maturity level of SDK features supported on BCM56880/1/3 B0 devices..

<i>BCM56880 New Features Maturity Level</i>	
Feature	Maturity
IFA 2.0	GA

Section 4.2.2: SerDes Feature Support

This release includes:

- TSCBH7 Firmware Version D005_16 and API version A00A_08
- BCM API support for PRBS functionality

Section 4.2.3: Things to Note

- `bcm_trunk_find` could not find the trunk ID of a member if the member is added with the `BCM_TRUNK_MEMBER_INGRESS_DISABLE` flag. This behavior is by design and consistent with legacy devices. Clarification is added to the API documentation.

Field

- "bcmFieldQualifyIp4Length" Qualifier change in behavior: For legacy devices, the qualifier is mapped to IPv4 total length as per the qualifier doc grog. However, in Trident-4 pipeline devices , it is wrongly mapped to IPv4 header length. To make it inline with legacy, the mapping is corrected with the new NPL field in the latest NPL. A new qualifier is introduced "bcmFieldQualifyIp4HdrLength" to map it to the existing LT field (to match on IPv4 header length).

Section 4.2.4: Known Issues or Limitations

None.

Section 4.2.5: ISSU support

Below cases are supported:

- 6.5.23 ISSU to 6.5.24 or 6.5.25 with DNA 4.9.5.0;

Section 4.3 BCM56995 A0 (Tomahawk4D) Preview Support

The Broadcom® BCM56995 family is a class of high performance, non-blocking network switching devices. The device family features up to 256 lanes of 100G 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 BCM56995 delivers high bandwidth, glueless network connectivity up to 25.6 Tb/s on a single chip.

Section 4.3.1: SDK Features support

The table below shows the status of legacy SDK features supported on BCM56995 A0 in this release. SDK DVAPI regression testing has been ongoing using BCM56995 A0 silicon validation kits. The summary of the current test status as of this release is provided below.

Section 4.3.1.1: Legacy Feature support

BCM56995 A0 Legacy Features Maturity Level	
Feature	Maturity
Linkscan	BU
L2 switching	BU
L3 routing	BU
ALPM	BU
IP tunnel	BU
MPLS	BU
Multicast	BU
IPMC	BU
Qos	BU
ECN	BU
Mirroring	BU
VLAN	BU
STG	BU
Port	BU
Flexport	BU
Trunk	BU
ECMP	BU
DLB	BU
Cosq	BU
Rate	BU
Failover	BU
Resilient Hash	BU
Switch Control	BU
MIB counter	BU
Packet I/O	BU
KNET	BU
SER	BU
FP	BU
UDF	BU
Policer	BU
Etrap	BU
Latency Histogram	BU

Time&SyncE	BU
ECMP	BU
Warmboot	BU

Section 4.3.1.2: New Feature support

The table below shows the status of new BCM56995 A0 SDK features in this release.

BCM56995 B0 <i>New Features Maturity Level</i>	
Feature	Maturity
Flex counter 2.0	BU
AACL	BU
FlexFlow	BU
HECMP	BU
IFA2.0	BU

Section 4.3.1.3: SerDes Feature Support

This release includes:

- Osprey7 Firmware Version D003_00 and API version A00B_01

Please note that this FW version will not interop with older Osprey7 FW versions for Link Training. Moreover, `bcm_port_resource_speed_get()` and `bcm_port_resource_get()` will return valid information only for ports which have been enabled.

Section 4.3.1.4 Feature enhancements

This release includes:

- None

Section 4.3.1.5: Known issue or limitation

- BFD is not supported for BCM56995 A0 in this release. The build option of "BFD" must be removed from the feature list in Make.local when building the image for BCM56995 A0.
- The `IfaMaxLengthValid` qualifier does not work as expected.

Section 4.3.4.5: Things to Note

- None

Section 4.4 BCM56998 (Tomahawk4GT) A0 GENERAL AVAILABILITY (GA) Support

The Broadcom® BCM56998 family is a class of high-radix, high-bandwidth network switching devices supporting up to 32 x 400GbE, 64 x 200GbE, 128 x 100GbE, 128 x 50GbE, 32 x 40GbE, 128 x 25GbE, or 128 x 10GbE ports. The device family features a maximum of 16 integrated Osprey SerDes transceivers and associated PCS for native support of numerous physical connectivity options, enabling a broad range

of media, speed and reach. The BCM56998 delivers high-bandwidth, glueless network connectivity of up to 12.8 Tb/s on a single chip.

Section 4.4.1: SDK Features support

This is a GA version of SDK release for BCM56998 (Tomahawk4GT A0) which can be used for production deployment.

The table below shows the status of legacy SDK features supported on BCM56998 A0 in this release. The summary of the current test status as of this release is provided below.

Section 4.4.1.1: Legacy Feature support

BCM56998 A0 <i>Legacy Features Maturity Level</i>	
Feature	Maturity
Linkscan	GA
L2 switching	GA
L3 routing	GA
ALPM	GA
IP tunnel	GA
MPLS	GA
Multicast	GA
IPMC	GA
QoS	GA
ECN	GA
Mirroring	GA
VLAN	GA
STG	GA
Port	GA
Flexport	GA
Trunk	GA
ECMP	GA
DLB	GA
Cosq	GA
Rate	GA
Failover	GA
Resilient Hash	GA
Switch Control	GA
MIB counter	GA
Packet I/O	GA
FP	GA
UDF	GA
Policer	GA
Etrap	GA
Latency Histogram	GA
Time&SyncE	GA
ECMP	GA
MOD stateless	GA
IFA 2.0	GA

Tail Timestamping	GA
Warmboot	GA
FFB	GA
ISSU	GA

Section 4.4.1.2: New Feature support

The table below shows the status of new BCM56998 B0 SDK features in this device.

BCM56998 A0 <i>New Features Maturity Level</i>	
Feature	Maturity
TC bit support	GA
ALPM Aggregate Host Route Support	GA
Hash bin changes	GA
2 Level ECMP Failover Protection	GA

Section 4.4.1.3: SerDes Feature Support

This release includes:

- OSPREY Firmware Version D003_00 and API version A00B_01
- 100G SerDes: 400G/200G/100GPAM4
- 50G SerDes: 400G/200G/100G/50G PAM4
- 25G SerDes: 100G/50G/25G NRZ
- 10G SerDes: 40G/10G

Please note that this FW version will not interop with older Osprey7 FW versions for Link Training. Moreover, `bcm_port_resource_speed_get()` and `bcm_port_resource_get()` will return valid information only for ports which have been enabled.

- Osprey SerDes firmware silicon validation is still ongoing.

Section 4.4.1.4 Feature enhancements

This release includes:

- None.

Section 4.4.1.5: Known issue or limitation

- None

Section 4.4.4.5: Things to Note

- None

Section 4.5: BCM56780 (Trident4-X9) A0 and BCM56880 (Trident4) B0 HNA GENERAL AVAILABILITY (GA) Support

The Broadcom® BCM56780 and BCM56880 families are a class of high performance, non-blocking network switching devices supporting compiler-based programmability of forwarding and instrumentation functions. The device families feature up to 160 and 256 lanes of 50G PAM4 SerDes and 72 and 144 logical ports, respectively. Port speeds of 10, 25, 40, 50, 100, 200, and 400GE can be simultaneously supported without the need for external PHYs. The BCM56780 and BCM56880 deliver high bandwidth, glueless network connectivity up to 8.0 Tb/s and 12.8 Tb/s on a single chip, respectively.

Section 4.5.1: SDK Features support

This is a GA version of SDK HNA release for BCM56780 (Trident4 X9) and BCM56880 (Trident4) and is based on NPL HNA 1.0.2.0 flexcode for BCM56780 and HNA 1.0.3.0 flexcode for BCM56880. The supported features are listed in the below tables.

For the enhancements and bug fixes included in this release, please refer to the table which lists all the resolved issues and improvements.

Please note: SDK will continue to evolve as new HNA versions are developed to accommodate new customer feature requests and bug fixes.

Section 4.5.1.1: Feature support maturity

The tables below show the status of SDK features supported on BCM56780 and BCM56880 in this release respectively.

BCM56780 A0 Legacy Features Maturity Level	
Feature	Maturity
Linkscan	GA
L2 switching	GA
L3 routing	GA
ALPM	GA
Flex Flow (VxLAN)	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
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
Time and SyncE	GA
Flex Digest	GA
Flex counter 2.0	GA
Flex State	GA
Warmboot	GA
FFB	GA
ISSU	Not supported
Weighted ECMP	GA
Stateless Mirror-on-drop (IPIPE, EPIPE, MMU)	GA
Flowtracker*	GA
Stateless Latency Monitoring	GA
MACSEC/IPSEC (56782, 56786, 56787, 56788)	Beta
ALPM over FORTE (56785, 56787, 56788, 56789)	GA
IFA 2.0	Preview

* The export and aging of flows are up to the flow monitoring application and outside of the SDK support.

BCM56880 Legacy Features Maturity Level

Feature	Maturity
Linkscan	GA
L2 switching	GA
L3 routing	GA
ALPM	GA
Flex Flow (VxLAN)	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
Switch control	GA
MIB counter	GA
Packet I/O	GA
KNET	GA
LED	GA
SER	GA
FP	GA
UDF	GA
Policer	GA
ETRAP	GA
Time and SyncE	GA
Flex Digest	GA
Flex counter 2.0	GA
Warmboot	GA
FFB	GA
ISSU	Not supported
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

Section 4.5.1.2: New Feature support

The table below shows the status of new HNA SDK features in this release for both BCM56780 and BCM56880 devices.

BCM56780 and BCM56880 HNA New Features Maturity Level

Feature	Maturity
RIOT VPLAG at underlay ECMP	GA
SVP assignment with SIP+DIP as key for VxLAN	GA
PCP copying from Inner tag to Outer tag	GA
DSCP remarking precedence over ToS (EFP)	GA

QinQ egress action enhancement w/ delete and replace	GA
VxLAN DCI gateway enhancement	GA

Section 4.5.2: Things to Note

Flex counter 2.0

- In BCM56880 HNA, the IFP opaque objects bcmFlexctrObjectInglfpOpaqueObj1_0/1/2/3 are not supported and replaced by bcmFlexctrObjectInglfpOpaqueObj1.

Egress VLAN Translation

- For BCM56780 HNA, egress vlan translation with key type bcmVlanTranslateEgressKeyVpnPortGroupIngressPort only supports global mode in this release.

Defeature contrast to DNA variant

- HIGIG3, IP Tunnel, MPLS

Section 4.5.3: Known Issues or Limitations

- N/A

Section 4.6: ISSU vs non-ISSU Premium CANCEL

By default, Premium CANCELs are only tested against the one specific SDK release in which they are introduced. For example, the Trident3-X7 Premium CANCEL B870.6.8.0 that is introduced in this SDK 6.5.24 release is ONLY tested against 6.5.24, and cannot be used with any other SDK release either before or after 6.5.24.

For Trident3-X7, Trident3-X5 and Trident3-X3, Broadcom designated the associated Premium CANCELs introduced in SDK 6.5.20 as ISSU-supported. This means that Broadcom will test ISSU upgrades of the SDK from 6.5.20 to 6.5.24 against those Premium CANCELs. Please note: Broadcom only tests ISSU based on a selected set of test cases. Any issues customers encountered, should be reported to Broadcom. Please test your ISSU upgrades thoroughly in the lab prior to doing an ISSU in a production environment.

Customers who are using one of these three 6.5.20 Premium CANCELs can ISSU to 6.5.24 as long as the Premium CANCEL image is NOT changed. **Any CANCEL change requires a coldboot.**

NOTE: Though the ISSU Premium CANCEL version number does not change across SDK releases, the actual CANCEL programming image file that is loaded by the SDK in an ISSU Warmboot does have some minor internal-only changes to allow it to be loaded under the new SDK. Customers must use the ISSU Premium CANCEL provided in this SDK release and NOT the version provided with a previous SDK release.

Section 4.7: 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.

SRv6 feature is added in this release. SRv6 feature is in the preview state and is in the active testing phase. The API definition and behavior can change until they reach the GA state in the next release.

Section 4.7.1: CANCUN support

Device & CANCUN Profile #	TD3-X5 BCM5677x (Maverick2) B770.x.y.z							
CANCUN Change List	KB0028824							
Premium CANCUN	4.2.1	4.3.2	4.4.1	4.5.0	4.6.0	4.7.0	4.8.0	4.9.0
Premium CANCUN ISSU	---	---	---	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1
Base CANCUN	3.1.2r1	3.1.2r3	3.1.2r4	3.1.2r4	3.1.2r4	3.1.2r4	3.1.2r4	3.1.2r4
Intro in SDK	6.5.18	6.5.19	6.5.20	6.5.21	6.5.22	6.5.23	6.5.24	6.5.25

Section 4.7.2 :BCM56770 6.5.25 Premium CANCUN upgrades

To upgrade to CANCUN B770.4.9.0, please use the instructions below:

1. CANCUN binaries are available at \$SDK/rc/flex/bcm56770_a0_premium/b770.4.9.0 directory. Please use "cancun_dir" config variable to point to your desired location of B770.4.8.0 binaries
2. Issue a Cold Boot to load the updated CANCUN (Warm boot not possible with new CANCUN)
3. Use the instructions mentioned in **Section 4.7.4** to verify the new CANCUN is loaded.

Section 4.7.3: BCM56770 6.5.20 Premium CANCUN ISSU

To continue using the 6.5.20 Premium CANCUN B770.4.4.1 and ISSU to SDK 6.5.25, please use the instructions below:

1. CANCUN binaries are available at \$SDK/rc/flex/bcm56770_a0_premium_issu/b770.4.4.1 directory. Please use "cancun_dir" config variable to point to your desired location of B770.4.4.1 binaries
2. Issue a warmboot to update the SDK to the latest version
3. Use the instructions mentioned in **Section 4.7.4** to verify the new CANCUN is loaded.

Section 4.7.4: Steps to verify CANCUN version

Go to the BRCM CLI and type in the following command :

```
CLI%> cancun stat
```

The output will be the following:

```
CLI%> #cancun stat
UNIT0 CANCEL:
CIH: LOADED
Ver: 04.09.00. <<<<< This indicates premium cancun version 4.9.0 for
56770 device
```

Section 4.7.5: CANCEL feature

For full details on a list of all bugs fixed and new features added across both Base and Premium CANCELs, please refer to the appropriate KM article - [KB0028824](#).

Section 4.8: BCM56870 (Trident3-X7) 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.

SRv6 feature is added in this release. SRv6 feature is in the preview state and is in the active testing phase. The API definition and behavior can change until they reach the GA state in the next release.

This SDK release package contains CANCEL 5.3.3. To upgrade to premium CANCEL, please use “cancun_dir” config variable to point to the binaries in the directory \$SDK/rc/flex/bcm870_a0.

Section 4.8.1: CANCEL support

Device & CANCEL Profile #	TD3-X7 BCM5687x (Trident3) B870.x.y.z							
CANCEL Change List	KB0027417							
Premium CANCEL	6.2.3	6.3.3	6.4.1	6.6.1	6.7.1	6.8.0	6.9.1	6.10.0
Premium CANCEL ISSU	---	---	---	6.4.1	6.4.1	6.4.1	6.4.1r1	6.4.1r1
Base CANCEL	5.3.3r1	5.3.3r3	5.3.3r4	5.3.3r4	5.3.3r4	5.3.3r4	5.3.3r4	5.3.3r4
Intro in SDK	6.5.18	6.5.19	6.5.20	6.5.21	6.5.22	6.5.23	6.5.24	6.5.25

Section 4.8.2 :BCM56870 6.5.25 Premium CANCUN upgrades

To upgrade to CANCUN B870.6.10.0, please use the instructions below:

1. CANCUN binaries are available at \$SDK/rc/flex/bcm56870_a0_premium/b870.6.10.0 directory. Please use “cancun_dir” config variable to point to your desired location of B870.6.10.0 binaries
2. Issue a Cold Boot to load the updated CANCUN (Warm boot not possible with new CANCUN)
3. Use the instructions mentioned in **Section 4.8.4** to verify the new CANCUN is loaded.

Section 4.8.3: BCM56870 6.5.20 Premium CANCUN ISSU

To continue using the 6.5.20 Premium CANCUN B870.6.4.1 and ISSU to SDK 6.5.25, please use the instructions below:

1. CANCUN binaries are available at \$SDK/rc/flex/bcm56870_a0_premium_issu/b870.6.4.1 directory. Please use “cancun_dir” config variable to point to your desired location of B870.6.4.1 binaries
2. Issue a warmboot to update the SDK to the latest version
3. Use the instructions mentioned in **Section 4.8.4** to verify the new CANCUN is loaded.

Section 4.8.4: Steps to verify CANCUN version

Go to the BRCM CLI and type in the following command :

```
CLI%> cancun stat
```

The output will be the following:

```
CLI%> #cancun stat
UNIT0 CANCUN:
  CIH: LOADED
  Ver: 06.10.00. <<<<< This indicates premium cancun version 6.10.0 for
56870 device
```

Section 4.8.5: CANCUN feature

For full details on a list of all bugs fixed and new features added across both Base and Premium CANCUNs, please refer to the appropriate KM article - [KB0027417](#).

Section 4.9: BCM56370 (Trident3-X3) 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 4.9.1: CANCUN support

Device & CANCUN Profile #	TD3-X3 BCM5637x (Helix5) B370.x.y.z					
CANCUN Change List	KB0028070					
Premium CANCUN	4.2.1	4.3.0	4.4.0	4.5.0	4.6.0	4.6.0
Premium CANCUN ISSU	---	4.2.1	4.2.1	4.2.1	4.2.1r1	4.2.1r1
Base CANCUN	3.0.5r3	3.0.5r3	3.0.5r3	3.0.5r3	3.0.5r3	3.0.5r3
Intro in SDK	6.5.20	6.5.21	6.5.22	6.5.23	6.5.24	6.5.25

Section 4.9.2 :BCM56370 6.5.25 Premium CANCUN upgrades

There is no new Premium CANCUN for TD3-X3 in 6.5.25. The Premium CANCUN 4.6.0 from 6.5.24 is pulled through to this release.

Section 4.9.3: BCM56370 6.5.20 Premium CANCUN ISSU

To continue using the 6.5.20 Premium CANCUN B370.4.2.1 and ISSU to SDK 6.5.25, please use the instructions below:

1. CANCUN binaries are available at \$SDK/rc/flex/bcm56370_a0_premium_issu/b370.4.2.1 directory. Please use "cancun_dir" config variable to point to your desired location of B370.4.2.1 binaries
2. Issue a warmboot to update the SDK to the latest version
3. Use the instructions mentioned in **Section 4.9.4** to verify the new CANCUN is loaded.

Section 4.9.4: Steps to verify CANCUN version

Go to the BRCM CLI and type in the following command :

```
CLI%> cancun stat
```

The output will be the following:

```
CLI%> #cancun stat
UNIT0 CANCUN:
  CIH: LOADED
  Ver: 04.06.00 <<<<< This indicates premium cancan version 4.6.0 for
56370 device
```


Section 4.9.5: CANCUN feature

For full details on a list of all bugs fixed and new features added across both Base and Premium CANCUNs, please refer to the appropriate KM article -[KB0028070](#)

Section 4.10: BCM56470 (Trident3-X4) Updates

Section 4.10.1: CANCUN support

Device & CANCUN Profile #	TD3-X4 BCM5647x (Firebolt6) B470.x.y.z					
CANCUN Change List	KB0029338					
Premium CANCUN	---	4.0.0	4.1.0	4.2.0	4.2.0	4.2.0
Premium CANCUN ISSU	---	---	---	---	---	---
Base CANCUN	3.0.10	3.0.10	3.0.10	3.0.10	3.0.10	3.0.10
Intro in SDK	6.5.20	6.5.21	6.5.22	6.5.23	6.5.24	6.5.25

Section 4.10.2 :BCM56470 6.5.25 Premium CANCUN upgrades

There is no new Premium CANCUN for TD3-X4 in 6.5.25. The Premium CANCUN 4.2.0 from 6.5.24 is pulled through to this release.

Section 4.10.3: Steps to verify CANCUN version

Go to the BRCM CLI and type in the following command :

```
CLI%> cancun stat
```

The output will be the following:

```
CLI%> #cancun stat
UNIT0 CANCUN:
  CIH: LOADED
  Ver: 04.02.00 <<<<< This indicates premium cancun version 4.2.0 for
56470 device
```

Section 4.10.4: CANCUN feature

For full details on a list of all bugs fixed and new features added across both Base and Premium CUNCUNs, please refer to the appropriate KM article [KB0029338](#)

Section 4.11: BCM56275/BCM56175 (Trident3-X2/X1) Updates

Section 4.11.1: CUNCUN support

Device & CUNCUN Profile #	TD3-X2/X1 BCM5627x/17x (Hurricane4) B275.x.y.z						
CUNCUN Change List	KB0029180						
Premium CUNCUN	---	---	4.0.0	4.1.0	4.2.0	4.2.0	4.2.0
Premium CUNCUN ISSU	---	---	---	---	---	---	---
Base CUNCUN	3.0.13	3.1.0	3.1.0	3.1.0	3.1.0	3.1.0	3.1.0
Intro in SDK	6.5.19	6.5.20	6.5.21	6.5.22	6.5.23	6.5.24	6.5.25

Section 4.11.2 :BCM56275 6.5.25 Premium CUNCUN upgrades

There is no new Premium CUNCUN for TD3-X2/X1 in 6.5.25. The Premium CUNCUN 4.2.0 from 6.5.24 is pulled through to this release.

Section 4.11.3: Steps to verify CUNCUN version

Go to the BRCM CLI and type in the following command :

```
CLI%> cancun stat
```

The output will be the following:

```
CLI%> #cancun stat
UNIT0 CUNCUN:
  CIH: LOADED
  Ver: 04.02.00 <<<<< This indicates premium cancun version 4.2.0. for
56275 device
```

Section 4.11.4: CUNCUN feature

For full details on a list of all bugs fixed and new features added across both Base and Premium CANCUNs, please refer to the appropriate KM article [KB0029180](#)

Section 4.12: HGOE CANCUN updates

<i>Trident3-X7 (BCM56870) Support Matrix</i>	
CANCUN firmware load	Supported SDK release
B870-HGOE.6.8.0	6.5.25
<i>Trident3-X5 (BCM56770) Support Matrix</i>	
CANCUN firmware load	Supported SDK release
B770-HGOE.4.7.0	6.5.25
<i>Trident3-X3 (BCM56370) Support Matrix</i>	
CANCUN firmware load	Supported SDK release
B370-HGOE.4.5.0	6.5.25
<i>Trident3-X2 (BCM56275) Support Matrix</i>	
CANCUN firmware load	Supported SDK release
B275-HGOE.4.2.0	6.5.25

Section 4.13: Embedded Applications Updates

Section 4.13.1: Timing applications

- BroadSync on BCM56070 (Firelight UM)
- Onesync on BCM88270(QUX)

Section 4.13.2: Telemetry Applications

- Flowtracker on BCM56960, BCM56970, BCM56980, BCM56870, BCM56770

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

Section 4.14: EDK

This section explains the releases pertaining to EDK framework and EDK applications (firmware) developed and supported by Broadcom.

Section 4.14.1: EDK framework

EDK framework has two major components i.e. EDK-Host and EDK-Firmware. EDK-Host runs on the HOST CPU along with the SDK and EDK firmware runs on embedded R5 CPU.

EDK framework is a collection of FreeRTOS, various drivers, APIs and utilities that help users/ customers to develop, build and deploy their own high performance, latency sensitive and 'differentiator' applications on Broadcom switches.

EDK framework is a source release, hence please get in touch with your Broadcom business PoC for more details on the availability, licensing and roadmap.

Currently EDK release is available on below devices

Device	EDK release (GA / EA)	EDK version	SDK version
BCM56870	GA	1.0.0	6.5.23
BCM56980	GA	1.0.0	6.5.23
BCM88690	GA	1.0.0	6.5.23
BCM88806	EA	1.1.0	6.5.24
BCM88480	EA	1.1.0	6.5.24
BCM88800	GA	1.1.0GA	6.5.25
BCM88480	GA	1.1.0GA	6.5.25

Section 4.14.2: EDK applications

EDK applications are developed by Broadcom over the EDK framework.

EDK-Host component is released as source code whereas the EDK firmware is released in binary form. Hence customers can directly integrate the application into their SW stack via the API.

Currently below EDK applications are available

Device	EDK application	EDK release (GA / EA)	EDK version	SDK version
BCM56780	BFD	EA	1.1.0	6.5.24
BCM56780	Broadsync	EA	1.1.0	6.5.24
BCM56990	Broadsync	EA	1.1.0GA	6.5.25
BCM56780	Broadsync	EA	1.1.0GA	6.5.25

EDK applications are licensed, hence please get in touch with your Broadcom business PoC for more details on the availability, licensing and roadmap.

Section 4.15: MACSEC support

MACSEC software is delivered in the package `xflow-macsec-1.0.16.tar.gz`.

To compile with the SDK:

1. `untar xflow-macsec-1.0.16.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 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

The following releases are out of active engineering development support:

- SDK 6.5.x releases: 6.5.19, 6.5.18, 6.5.17, 6.5.16, 6.5.15, 6.5.14, 6.5.13, 6.5.12, 6.5.11, 6.5.10, 6.5.9, 6.5.8, 6.5.7, 6.5.6, 6.5.5, 6.5.4, 6.5.3, 6.5.2, 6.5.1, 6.5.0, 6.4.x and 6.3.x

Customers are recommended to use this release for new product development or sustaining releases. Per Broadcom policy, as older devices are discontinued due to end of life (EOL), their SW support is also deprecated in SDK releases beyond the device EOL date.

Section 5.2: ISSU 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 5.2.1: Validated ISSU 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 6.5.21 to 6.5.22 has been validated on specific silicon validation kits (SVKs) in this release.

Section 5.2.2: Upgrade considerations

None.

Section 5.3: Known issues

None.

Section 5.4: ISSU Feature support

ISSU auto detect function has been enhanced and stabilized in this release.

Building with ISSU Auto Detect

During compilation, the SDK build system will decide if a new version is needed by comparing the current ISSU DB to the latest version of existing ISSU DB. If a new version is required, it will increase the version number in the VERSION file under the local build directory. Note the RELEASE file will remain unchanged.

This functionality is triggered only when the user doesn't specify the SDK/SDKLT start and current versions. In this case, the current version comes from the new VERSION file, and the start version is the oldest version in the ISSU DB root directory.

ISSU without Specifying Versions

During coldboot, the current version is stored in HA, which will be used as the START version in the following warmboot.

During warmboot, if the START version and the TO version are not specified as boot options, obtain the START version from HA which was stored in the previous run, and the TO version comes from the current version of the new image.

If the START version can't be fetched from HA, or the START version and the TO version are the same, fall back to warmboot. Otherwise, start the ISSU.

Please note the ISSU auto detect feature works starting from 6.5.23.

Section 5.5: Fast Fastboot Feature support on HSDK

Fast Fast Boot (FFB) is a new mode of invoking a BCM SDK based application introduced since 6.5.23. In a FFB startup, all port links are kept up and flex port configurations are retained, like a "warm boot". Port configurations such as MTU settings are set to default along with the rest of the system (both

hardware and software), similar to a “cold boot”. To minimize the traffic disruption, the hardware retains previous configuration until the application completes reinitialization of the SDK software, at which time the SDK state is pushed to the hardware in one shot. This allows the application to reinitialize the device and reload/upgrade their application with minimal traffic disruption and without flapping the links.

FFB can work in either warmboot or ISSU scenario. When the start version and the target version are the same, it triggers a FFB warm boot. Otherwise, it performs a FFB ISSU.

The boot flag `BOOT_F_FAST_REBOOT` or `0x2000000` in `SOC_BOOT_FLAGS` is used to specify a FFB startup.

Note ISSU auto detect function is supported in FFB case. This is a change made in 6.5.24.

Section 5.6 FLTG Build process

SDKLT contains tools and the data files required to regenerate the released auto generated code files. The SDKLT has a global checksum(`tools/ltg/ltt.sum`) to check the integrity of the code with the data files; if a mismatch is found, the SDKLT build will start the regeneration process. SDKLT auto generation tools are written mostly in Perl and have the following prerequisites.

Tool	Version	Modules/Libraries
Perl	5.14.1 or higher	"Carp", "Clone", "Cwd", "Data::Compare", "Data::Dumper", "English", "File::Basename", "File::Find", "File::Temp", "FindBin", "Getopt::Std", "Hash::Merge", "List::MoreUtils", "Math::BigInt", "Moose", "Moose::Role", "Scalar::Util", "Storable", "YAML", "YAML::Any", "YAML::XS", "integer", "namespace::autoclean", "strict", "warnings"
gcc	4.5.4 or higher	
bison	2.4.2 or higher	
flex	2.5.35 or higher	

For further questions, do contact the Broadcom support team.

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 6.5.25.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/RELDPCS 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 require 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-6.5.25	sdk-6.5.24	sdk-6.5.23	sdk-6.5.22
golden	153	153	153	153
warmboot	9074	9074	8460	8443

auth	17	17	17	17
bfd	169	143	143	136
bhh	159	159	159	159
chip	10	10	10	10
coe	803	803	803	803
cosq	869	867	855	838
custom	7	7	7	7
ea	108	108	108	108
eav	19	19	19	19
extender	84	72	67	62
fabric	7	7	7	7
failover	17	17	17	15
fcoe	37	37	37	37
field	1872	1870	1869	1867
higigproxy	129	129	129	129
infra	114	114	114	114
ipfix	17	17	17	17
ipmc	156	145	145	138
knet	328	308	308	292
l2	547	541	539	535
l2gre	35	33	33	33
l3	726	711	701	693
l3.alpm	838	834	820	816
link	27	27	27	27
linkphy	46	46	46	46
linkscan.cabled	104	104	99	99
mim	63	63	61	61
mirror	623	623	609	584
misc	28	28	28	28
mpls	781	769	758	753
multicast	73	71	71	67
niv	84	84	84	84
oam	423	417	417	413
pkt	74	74	74	74

policer	141	141	141	141
port	625	622	617	600
proxy	49	49	49	49
ptp	147	147	147	147
qos	128	128	126	115
rate	26	26	26	26
rtag7	95	93	92	92
rx	65	65	65	65
ser	309	307	307	306
stack	130	130	130	130
stat	949	941	927	895
stg	42	42	42	42
switch	337	335	324	320
time	67	67	67	67
tlvMsg	13	13	13	13
trill	51	51	51	51
trunk	332	319	311	295
tunnel	215	214	204	202
subport	31	31	31	31
udf	286	286	286	284
vlan	430	425	416	349
vxlan	397	394	394	384
wlan	17	17	17	17
Test Suite Total	23503	23344	22594	22305

Section 7.4: API Test Results

In this release, all tested devices passed DVAPI regressions with 100% 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.

Test Suite	Total Tests	% Pass
minigolden	1	100%
warmboot	32	100%
cosq	268	100%
e2ecc	5	100%
ea	6	100%
eav	16	100%
extender	3	100%
fabric	4	100%
fcoe	3	100%
field	26	100%
fieldScale	2	100%
higigproxy	43	100%
l2	69	100%
l3	30	100%
l3.alpm	258	100%
linkphy	7	100%
mim	1	100%
mirror	42	100%
mpls	33	100%
multicast	2	100%
oam	1	100%
oobfc	12	100%
packing	2	100%
policier	13	100%
port	107	100%
proxy	7	100%
ptp	80	100%
qos	6	100%
riot	49	100%
rtag7	2	100%
rx	27	100%
sat	29	100%
stat	53	100%

stg	13	100%
switch	23	100%
time	18	100%
trill	3	100%
trunk	67	100%
tunnel	21	100%
subport	7	100%
udf	6	100%
vlan	125	100%
vxlan	101	100%
Security Totals	1623 tests	100% 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 6.5.25	Open Issues SDK 6.5.24	Open Issues SDK 6.5.23	Open Issues SDK 6.5.22	Open Issues SDK 6.5.21
DNX	0	0	1	0	0
XGS	14	7	66	15	15
SerDes	4	5	19	3	3
Common	18	32	60	6	4
Total	36	44	144	24	22

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-276342	56780_A0	6.5.21 6.5.22 6.5.23 6.5.24	KNET Tx hangs on all netifs.	There is race condition on netif Tx suspend and resume operations. If Tx resume is done in NAPI Tx ring cleanup before suspend is called by stack packet transmission, the netif Tx will hang.
SDK-276106	56850_A0, 56860_A0, 56870_A0, 56970_A0, 56980_A0	Release prior to 6.5.25	When SER error occurs on IS_TDM_CALENDAR0/1, the traffic is stopped after SER error correction.	The CACHEABLE flag wasn't set for IS_TDM_CALENDAR memory. This will result in the corrupted table entry being cleared when an SER error occurs in the memory, and the entry clearing will cause the traffic to be dropped.
SDK-275758	56960_B1	Release prior to 6.5.25	When SER error occurs on IS_TDM_CALENDAR0/1, the traffic is stopped after SER error correction.	The CACHEABLE flag wasn't set for IS_TDM_CALENDAR memory. This will result in the corrupted table entry being cleared when an SER error occurs in the memory, and the entry clearing will cause the traffic to be dropped.

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.

Security Vulnerabilities

<i>Reference</i>	<i>Chips</i>	<i>Affected Versions</i>	<i>Errata Synopsis</i>	<i>Details</i>
None				

Please check the following link -

https://www.cvedetails.com/vulnerability-list/vendor_id-5420/Broadcom.html

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

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	8.3.0	Broadcom XLDK 6.1.0	5.4.2
XLR	4.1	8.3.0	Broadcom XLDK 6.0.0	5.4.2
GTS	4.1	8.3.0	Broadcom XLDK 6.0.0	5.4.2
sim	4.1	7.1.0	RHEL 6	2.6.32
iProc64	4.1	8.3.0	Broadcom XLDK 6.1.0	5.4.2

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 a best-effort basis.

If there are any issues with running or compiling SDK with linux versions other than what is listed above, such issues should be reported via Broadcom Customer Support for evaluation. SDK is OS agnostic. Broadcom provides BDE and SAL reference code for customers to adapt to their OS of choice. Broadcom will provide best effort support to resolve any issues related to the SDK interface.

Broadcom only supports gmake versions as noted above if there are any issues with running or compiling SDK with any other versions, such issues should be reported via Broadcom Customer Support for evaluation, and will be supported on best effort basis.

Section 11: Resolved and Unresolved Issues for 6.5.25

Section 11.1: Resolved Issues and Improvements

For the full resolved list, please reference the file *SDK-6.5.25-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 6.5.25. These are in process of being evaluated for inclusion in a future SDK release:

Number	CSP	Chips	Errata For 6.5.25
SDK-265903	CS00012198873	56640_A0, 56640_A1	SchanTimeOut error, system crashed after memscan
SDK-275429	CS00012212725	56275_A1	Changing port MTU for MACSec enabled ports has no effect (old MTU is still being used)
SDK-276178	CS00012214143	56980_B0	Port macro (PM8x50) interrupt handler keeps getting called non-stop, potentially triggered by 400G AN done in software with the presence of traffic.
SDK-278868	CS00012215059	56270_A0	LSR Tx stats not working on Metrolite devices

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-6.5.25	SDK-6.5.24	SDK-6.5.23	SDK-6.5.22	SDK-6.5.20	SDK-6.5.19	SDK-6.5.18
4.3.19	BCM56780						
4.3.18		BCM56070 BCM53460					
4.3.17			BCM56880 BCM56870 BCM56770 BCM56270 BCM88375 BCM56070 BCM56960 BCM56970 BCM56980 BCM56070 BCM88270				
4.3.16				BCM56880 BCM56670			
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

Section 12.2: BMACSEC SDK Compatibility Matrix

Switch SDK Release	BMACSEC Release
6.5.18	4.20
6.5.19	4.20
6.5.20	4.20
6.5.21	4.21
6.5.22	4.21
6.5.23	4.22
6.5.24	4.22
6.5.25	4.22

Section 12.3: iMACSEC SDK Compatibility Matrix

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

Switch SDK Release	iMACSEC Release
6.5.18	1.3
6.5.19	1.3

6.5.20	1.3
6.5.21	1.3
6.5.22	1.3
6.5.23	1.4
6.5.24	1.4
6.5.25	1.4

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	6.5.19 Firmware Versions	6.5.20 Firmware Versions	6.5.21 Firmware Versions	6.5.22 Firmware Versions	6.5.23 Firmware Versions	6.5.24 Firmware versions	6.5.25 Firmware versions
Falcon	D10B_1F	D10B_23	D10B_23	D10B_23	D10B_23	D10B_23	D10B_23
Falcon dual PLL	D10B_22	D10B_22	D10B_24	D10B_24	D10B_24	D10B_24	D10B_24
Falcon16	D103_13	D103_13	D103_18	D103_18	D103_18	D103_18	D103_18
Eagle	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
Merlin16	D102_09	D102_09	D102_09	D102_09	D102_09	D102_09	D102_09
Merlin7	D000_02	D000_02	D000_02	D000_02	D000_02	D000_02	D000_02
Blackhawk	A0: D003_0C B0: D100_0B	A0: D003_0C B0: D100_0E	A0: D003_0C B0: D100_0E	A0: D003_0C B0: D100_0E	A0: D003_0C B0: D100_0E	A0: D003_0C B0: D100_0E	A0: D003_0C B0: D100_0E
Blackhawk7 Dual PLL	D005_02	D005_02	D005_09	D005_09	D005_09	D005_16	D005_16
Blackhawk7 Single PLL	D004_09	D005_03	D005_0B	D005_0B	D005_0B	D005_0B	D005_0B
Osprey7 Single PLL	N/A	N/A	D001_01	D002_00	D002_02	D003_00	D003_00
Osprey7 Dual PLL	N/A	N/A	N/A	N/A	N/A	D003_00	D003_00

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
6.5.18	1.0.18
6.5.19	1.0.19
6.5.20	1.0.20
6.5.21	1.0.21
6.5.22	1.0.22
6.5.23	1.0.23
6.5.24	
6.5.25	

Section 12.6: SDK and PCIe FW Compatibility Matrix

Below table shows the firmware version compatible with which SDK release.

Switch SDK Release	PCIe FW version
6.5.25	2.10
6.5.24	2.10
6.5.23	2.10
6.5.22	2.10
6.5.21	2.9

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 it 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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-

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/libxml2-2.9.10.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

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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.

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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 permission.

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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.