DNX Release Notes
For
Switch Software Development Kit

SDK 6.5.12

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Section 1: About This Document

These are the Release Notes for the Broadcom Network Switching Software Development Kit Release 6.5.12 specifically for changes to DNX devices only.

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.

Please refer to document RN-SDK6xx-R in the release package for details about the XGS device changes as well as common changes and issues in the SDK release.

Section 2: 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” and “Supported PHYs” have completed the full QA process and are intended for use in production systems. It is expected that customers would integrate the version of the SDK which provides "Supported" status for their use on actual development or production systems.

Devices in “Preview Switch Devices” and “Preview PHYs” 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 2.1: Supported DNX Switch Devices

Family	***Devices***	***Description***
None in this release		

Section 2.2: Preview DNX Switch Devices

Family	***Devices***	***Description***
BCM88790		BCM88790 (Ramon) Fabric Element device.

Section 3: New Features per Device

Section 3.1: **BCM88790-Family**

Section 3.1.1: Important Notes

Section 3.1.2: Validated Features

The features listed below were validated. The testing of all other features were not completed, yet.

1. Traffic:
    - UC and MC continuous, undersubscribed, traffic, over a system with two J+ and Ramon (FE2 only).
2. Phy features:
    - All Ramon SerDes rates.
        - Performances of PAM4 rates are still not optimal.
        - LCPLL_REFCLK should work on bypass mode - see Section 3.1.4: Bug fixes since 6.5.11 release.
    - All Ramon FEC types.
    - Lane swap and polarity.
    - Link training.
    - Tx parameters.
    - SW and HW linkscan.
    - Using 2 VCOs on the same BH (Ramon A1 only). The corresponding API **bcm_port_resource_multi_set** is now supported - see Section 3.1.4: Bug fixes since 6.5.11 release.
3. Device features:
    - Dynamically attach and detach port.
    - Multi pipes and TDM traffic.
    - Packet cell packing.
    - Congestion management: RCI, GCI and admission.
    - Retimer.

4. Infrastructure:
    - Interrupts are working.
    - SER corrective actions are working.
    - Both A0 and A1 are supported.
5. Silicon reliability testing:
    - Mbist.
    - HW snake, including phy loopback and external loopback.
    - PRBS.
6. Diagnostic package:
    - Access tests (TR1-TR8, TR50-TR52).
    - Diag shel diagnostic

Section 3.1.3: Known Issues

1. Phy:
    - The lane number, which is reported by the Phy info diagnostic command, is wrongly modulo 4 (should be modulo of 8).
2. Switch:
    - PRBS SET and CLEAR sequences when mode is MAC:
        - When enabling PRBS in MAC mode, the sequence should be:
            1. Enable PRBS monitor in the RX.
            2. Wait 1 ms.
            3. Enable PRBS generator in the TX.
        - When disabling PRBS in MAC mode, the inverted sequence should be used.
        - When the PRBS is between different ports, it is the user responsibility to follow the above sequences. However, in loopback, user can't follow the above sequence since both Rx and Tx are of the same port. Therefore, it is the SDK responsibility to follow the correct sequence internally. 6.5.12 still doesn't follow the correct sequence so in order to clear the PRBS, user needs to detach and attach the port.
3. Infrastructure:
    - Some corrective actions, of non-SER modules, were still not implemented.

Section 3.1.4: Bug fixes since 6.5.11 release

1. Phy and ports:
    - Ramon A1 is now supporting 2 VCO in the same BH.

- The API **bcm_port_resource_multi_set** is now supported. The API can be used to change the resource properties (speed, fec, link training and phy lane config) of multiple ports at once, therefore, can be used to change PLL VCO rate, when multiple ports are assigned to the PLL, without the need to detach-attach all these ports.
- Phy prbs is working with phy loopback.
- A new Tx FIR API format is preventing intermediate, illegal, set of Tx FIR taps. See Section 3.1.5: Compatibility changes since 6.5.11 release for more details.

2. Switch:
   - HW snake works also with phy loopback and external loopback.
   - “show counter” diagnostic does not require to have a “port” argument anymore. When “port” argument is not specified, “port=all” is the default.
   - ‘deinit’ of single Ramon unit in a multiple unit system is not supported (bcm_init will fail).
   - According to Ramon spec, LCPLL should work on bypass mode. Use the following SOC property to configure the LCPLL to be in bypass mode: **serdes_fabric_clk_freq_out.BCM8879X=bypass.** Therefore, the input reference clock must be set to 312.5MHz.

Section 3.1.5: Compatibility changes since 6.5.11 release

1. Changes in **bcm_port_resource_set**:
   - **BCM_PORT_RESOURCE_PHY_LANE_CONFIG_FORCE_PAM4/NRZ_SET/GET/CLEAR** and **BCM_PORT_RESOURCE_PHY_LANE_CONFIG_PAM4_CHANNEL_LOSS_SET/GET/CLEAR** macros are no longer supported. This configuration is now internal to SDK.
   - **BCM_PORT_RESOURCE_PHY_LANE_CONFIG_FORCE_NS_SET/GET/CLAER** and **BCM_PORT_RESOURCE_PHY_LANE_CONFIG_FORCE_ES_SET/GET/CLEAR**: This configuration is relevant only for PAM4 mode. If link training is active, NS=0 and ES=0 are recommended since they mean auto-detect. If link training is disabled, user should set either NS or ES. For NRZ mode both bits should always be 0.
   - The following APIs are not supported:
     - **bcm_port_speed_set/get**.
     - **bcm_port_interface_set/get**.

     Use **bcm_port_resource_set** API to set the above configurations.
   - The following port control is not supported:
     - **bcmPortControlPCS**.

     Use **bcm_port_resource_set** API to set the above configuration.
   - The following PHY controls are not supported:
     - **BCM_PORT_PHY_CONTROL_CL72**

- **BCM_PORT_PHY_CONTROL_FIRMWARE_BR_DFE_ENABLE**
- **BCM_PORT_PHY_CONTROL_FIRMWARE_LP_DFE_ENABLE**
- **BCM_PORT_PHY_CONTROL_FIRMWARE_DFE_ENABLE**
- **BCM_PORT_PHY_CONTROL_FIRMWARE_CL72_RESTART_TIMEOUT_ENABLE**
- **BCM_PORT_PHY_CONTROL_FIRMWARE_CL72_AUTO_POLARITY_ENABLE**
- **BCM_PORT_PHY_CONTROL_UNRELIABLE_LOS**

Use **bcm_port_resource_set** API to set the above configurations.

2. New SOC property was added to set lane config parameters: **serdes_lane_config**. This SOC property is equivalent of **resource->phy_lane_config** in **bcm_port_resource_set** API. The SOC property has a suffix per parameter. The suffixes and their allowed values are described below:
   - **dfe**: on|off|lp. Note: lp means that both dfe and lp dfe are on
   - **media_type**: backplane|copper|optics
   - **unreliable_los**: 0|1
   - **cl72_auto_polarity_en**: 0|1
   - **cl72_restart_timeout_en**: 0|1
   - **channel_mode**: force_nr|force_er

   Example: For logical port sfi0, specifying **serdes_lane_config_dfe_sfi0=on** will be implying that DFE is on for this port.
   The **serdes_fiber_pref** SOC property is no longer supported. Use **serdes_lane_config_media_type** SOC property to set the media type.
3. **backplane_serdes_encoding** SOC property is no longer supported for Ramon. Instead, a new SOC property was added to set the FEC: **port_fec_<port>**.
4. To prevent intermediate, illegal, set of Tx FIR taps, new APIs to set/get TX FIR parameters were added.
   - **int bcm_port_phy_tx_set(int unit, bcm_port_t port, bcm_port_phy_tx_t* tx);**
   - **int bcm_port_phy_tx_get(int unit, bcm_port_t port, bcm_port_phy_tx_t* tx);**

   These APIs are replacing the following controls of **bcm_port_phy_control_set/get**:
   - **BCM_PORT_PHY_CONTROL_TX_FIR_PRE**
   - **BCM_PORT_PHY_CONTROL_TX_FIR_MAIN**
   - **BCM_PORT_PHY_CONTROL_TX_FIR_POST**
5. **serdes_tx_taps** SoC property usage was modified for the following user-friendly format:
   - **serdes_tx_taps_<port>=<signalling mode>:<pre>:<main>:<post>:[<pre2>:<post2>:<post3>]**

   For example: **serdes_tx_taps_191=pam4:-20:144:-4**.

6. New PHY control was added **BCM_PORT_PHY_CONTROL_RX_LANE_SQUELCH**. This control reset the RX path: Squelch enable means to put rx path in reset while squelch disable means to release rx reset.
7. **serdes_driver_current** SOC property is no longer supported. This feature is not applicable for Ramon.
8. **Precoder:**
    - API: Setting/getting LP precoder by bcm_port_resource_set/get API is no longer supported.
        - To enable pre-coding on TX side, use **bcm_port_phy_control_set** API, with the control **BCM_PORT_PHY_CONTROL_TX_PAM4_PRECODER_ENABLE**.
        - To enable decoding on RX side (when precoding is enabled on TX of link partner device), use **bcm_port_phy_control_set** API, with **BCM_PORT_PHY_CONTROL_LP_TX_PRECODER_ENABLE** control.
        - **bcm_port_phy_control_get** with the above controls is also supported.
    - SOC Property
        - New SOC property was added to enable pre-coding on TX side: **port_tx_pam4_precoder**. For example: **port_tx_pam4_precoder_sfi0=enable** will imply that precoding is enabled on TX side of logical port 0.
        - New SOC property was added to enable decoding on RX side (while precoding is enabled on TX of link partner device): **port_lp_tx_precoder**. For example: **port_lp_tx_precoder_sfi0=enable** will imply that decoding is enabled on TX side of the peer device of logical port 0.
9. Rx parameters VGA and TAP1-5 can either be all set or all released. Therefore, the following PHY controls are no longer supported:
    - **BCM_PORT_PHY_CONTROL_RX_VGA_RELEASE**
    - **BCM_PORT_PHY_CONTROL_RX_TAP1_RELEASE**
    - **BCM_PORT_PHY_CONTROL_RX_TAP2_RELEASE**
    - **BCM_PORT_PHY_CONTROL_RX_TAP3_RELEASE**
    - **BCM_PORT_PHY_CONTROL_RX_TAP4_RELEASE**
    - **BCM_PORT_PHY_CONTROL_RX_TAP5_RELEASE**

    Use the PHY control **BCM_PORT_PHY_CONTROL_RX_ADAPTATION_RESUME** to release VGA and taps 1-5, at a single step.
10. Linkscan diagnostic. Legacy link scan diagnostic was supporting bitmap as the logical bitmap argument (for example, 0xf). Instead, 6.5.12 version is supporting

logical port id (for example: 1, 2, or 1-4). Other bitmap formats (i.e. names like ‘xe13’, types like ‘xe’ and ‘all’ or ‘none’) – remain supported.

11. Phy dump diagnostic command **phy diag <port> dsc** was modified, to be more user friendly, as follows:
    - **phy diag <port> dsc** should print the simple DSC dump, including lane and core info. This log is recommended for normal usage.
    - **phy diag <port> dsc state** should print the detailed DSC dump, include lane info, core info and lane event log. This log is recommended when sending dsc dump file to Broadcom SerDes team for debugging.

Section 3.5: BCM88470 (Qumran) family General Availability (GA) Release

This release is the GA version for the BCM88470 Family product line, following previously released 6.5.11 GA version. The subsequent sections describe the increment in available features compared to 6.5.11, major bug-fixes and known issues.
It is extremely important to review “Backward compatible important notes” section before starting the integration of the new release.

Section 3.5.1: Backward compatibility important notes

See Section 3.6.1: BCM88670 Family “Backward compatible important notes” section.

Section 3.5.2: New Features

See Section 3.6.2: BCM88670 Family “New Features” section.

- SDK-73438 Added support for 1DM through OAMP

Section 3.5.3: Major Bug fixes

Packet Processing:

See Section 3.6.3: BCM88670 Family “Major Bug fixes” section.

Section 3.5.5: Known issues

Network Interface:

Packet Processing:

OAM**:**

See Section 3.6.4: BCM88670 Family “Errata” section.

Section 3.5.6: BCM88470 Family B0 revision support

BCM88470 Family B0 revision introduces bug fixes. For full information see:

Section 3.5.7: Important Notes

Section 3.6: BCM88670 Family GA Release

This release is for the BCM88370-Family and BCM88670-Family product lines.
In the continued SDK support, all features introduced in SDK 6.5.11 are also supported in SDK 6.5.12. The subsequent sections describe the increment in available features compared to 6.5.11, major bug-fixes and known issues.
It is extremely important to review “Backward compatible important notes” section before starting the integration of the new release.

Section 3.6.1: Backward compatible important notes:

Section 3.6.1.2: SW compatibility guidelines 6.5.X (which is not 6.5.11) to 6.5.12

It is extremely important to read backward compatible important notes section over all SDK releases till 6.5.12. For example, in case upgrade from 6.5.9 to 6.5.10 is required, it is important to read backward compatible important notes

section over SDK releases 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.12 (this document Section 3.6.1.3).

Section 3.6.1.3: SW compatibility guidelines 6.5.11 to 6.5.12

Module	JIRA	Description	Devices affected
KBP/KAPS	SDK-136145	SDK is aligned to KBPSDK 1.4.16 KAPS and NL12K/OP (Optimus Prime) are functional with KBPSDK 1.4.16	All DNX devices (Jericho and above)
			All DNX devices
			All DNX devices
			All DNX devices
			All DNX devices

Section 3.6.2: New Features

Packet Processing:

Section 3.6.2.1:

- Support Public-Private with External KBP. For more information see SDK-132986

High Availability:

Section 3.6.3: Major Bug fixes

The list below refers to major bugfixes, and does not provide a comprehensive coverage of various bugfixes on all levels.
Basic data path, connectivity and Traffic Management features:

OAM:

- Global variables in OAMP-PE were moved to be per unit

High Availability:

Section 3.6.4: Errata

The list below relates to major open bugs that are not resolved:
Basic data path, connectivity and Traffic Management features:

Packet Processing:

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Section 3.6.5: Important Notes

Section 3.6.6: Connectivity with KBP Optimus Prime (OP) GA release

Section 3.7: BCM88680 (Jericho+) Family GA Release

This release is a Sustain version for the BCM88680-Family product line, following previously released GA versions. The subsequent sections describe the increment in available features compared to 6.5.11, major bug-fixes and known issues.
It is extremely important to review “Backward compatible important notes” section before starting the integration of the new release.

Section 3.7.1: Backward compatible important notes

See Section 3.6.1: BCM88670 Family “Backward compatible important notes” section.

Section 3.7.2: New Features

Packet Processing:

See Section 3.6.2: BCM88670 Family “New Features” section.
In addition:

Section 3.7.3: Major Bug fixes

Packet Processing:

See Section 3.6.3: BCM88670 Family "Major Bug fixes" section.

- Few bugs fixes in VXLANv6 in specific support now load-balancing correctly

Section 3.7.4: Known issues

Traffic Management and Data Path:

Packet Processing:

See BCM88670, BCM88470 families Known issues section

Section 3.8: BCM88770 (FE3600) Release

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

This is a sustaining release for BCM88950 driver, with all major features supported.

Section 3.8.1: Important Notes

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Section 3.8.2: Major Bugfixes

Changed the Memory BIST test to prevent false failures when running multiple times on some devices.

Section 3.9: BCM88270 (Qumran-UX) Family GA Release

The subsequent sections describe the features validated for this release, known issues and bring-up guidelines.
It is extremely important to review “Backward compatible important notes” section before starting the integration of the new release.

Section 3.9.1: Backward compatible important notes

- SDK-126418 - Due to a HW bug, the device only supports LMM based LM or SLM based LM. In BCM88470 this was done per LIF. A new soc property has been added: ***oam_slm_lm_mode***. Note that using the action ***bcmOAMActionSLMEnable*** in ***bcm_oam_endpoint_action_set()*** is now disallowed, since this action is determined via soc property.
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See BCM88670-Family “Backward compatible important notes” section.

Section 3.9.2: New Features

See Section 3.5.2: BCM88470 Family “New Features” section.

Section 3.9.3: Major Bug fixes

See Section 3.5.3: BCM88470 Family “Major Bug fixes” section.

- SDK-132435 EM hashing:
  After creating ACs up to full capacity, some ACs can’t be deleted.
  After creating outLIFs up to full capacity, some GLEM entries can’t be hit.
  These two issues have been addressed by updating STEP tables for EM tables.

Section 3.9.4: Known issues

See Section 3.5.5: BCM88470 Family “Known issues” section.

Section 3.10: BCM88660 (ARAD+), BCM88650 (ARAD) Release

This is a sustain release of BCM88660, BCM88650 driver, with all major features supported.

Section 3.10.1: Important notes

See BCM88670-Family GA release section, SW compatible important notes

Section 3.10.2: Major Bugfixes

- Mirror port+vlan delete:
  After port+vlan mirror rule deletion "bcm_mirror_port_vlan_dest_delete()", untagged traffic did not mirrored according default rule.
  This is fixed by updating the HW with default mirror rule of the port.

Section 3.10.3: Errata

None

Section 3.10.4: New features

None