OF-DPA 2.0 GA Release Notes

Version 1.0

13-Feb-2016

Contents

1   Overview

OF-DPA is a software component that provides a hardware adaption layer between OpenFlow and Broadcom switch ASICs.

OF-DPA 2.0 GA is the next major release after OF-DPA1.0,. This version adds the following new features:

- SDK 6.4.7
- MPLS-TP VPWS
- MPLS LSR
- MPLS L3 VPN
- MPLS LSR ECMP
- MPLS ACL
- MPLS 1:1 protection
- Bridging and Routing QoS
- MPLS QoS
- Policy ACL Meters
- L2 Policer Meters
- Ethernet Service OAM
- G.8113.1 OAM for MPLS-TP
- Section OAM
- VLAN translation, Ingress and Egress.
- Egress PCP-DSCP Remark Table
- Color Blind actions in Policy ACL table
- Platform support for:
  - BCM956960K Tomahawk
  - BCM956260K Saber2
  - BCM956150K Hurricane2
  - BCM956340K Helix4 (BCM56547 only)
  - BCM956450K Katana2
  - BCM956540K Apollo2
  - BCM956643K Triumph3
  - BCM88375 (Qumran MX) (limited support)
  - Accton AS6700
  - LY8 (Rangeley and Ivy Bridge)
  - LY2R
  - Celestica Redstone XP
- Fixes to issues found in earlier releases

Qumran platform support continues to be of EA3 quality. Support is available for L2, L3 and ACL with the following limitations:

- The output to CONTROLLER instruction is not supported.
- A goto table of zero is not supported (except on the Policy ACL flow table which requires a goto table of zero)
- The Clear Actions instruction is not supported.
- ECMP for L3 forwarding is not supported.

OAM support also continues to be of EA3 quality.

2   Deliverables

2.1 Date of Delivery
02/16/16

2.2 Distribution Method
GitHub.

2.3 Items included in delivery
Following are the items included in this delivery:

- OF-DPA 2.0 GA Software (includes Indigo OpenFlow agent)
- OF-DPA 2.0 GA Doxygen Documentation
- OF-DPA 2.0 GA Release Notes

2.4 OpenFlow Controllers and Agents
The following OpenFlow Controllers were used for limited testing of this release:
- RYU extensions, EA quality (fork from v3.26)
- dpctl extensions, EA quality (fork from v1.3.0)
- Open Daylight; EA quality (Helium SR3 version 3.0.1)

The following OpenFlow Agents are supported in this release:
- Indigo 2.0 extensions to support OF-DPA 2.0 Experimenter protocol definitions.

3   Platform Support
This release contains support for the following platforms:

- Accton AS6700
- Celestica Redstone XP
- LY2
- LY2R
- LY8 (Rangeley and Ivy Bridge)
- The following SVKs:
    - BCM956150K Hurricane2
    - BCM956340K Helix4 (BCM56547 only)
    - BCM956450K Katana2
    - BCM956540K Apollo2
    - BCM956643K Triumph3
    - BCM956846K Trident+
    - BCM956850K Trident2
    - BCM988375K QumranMX (EA quality)
    - BCM956960K Tomahawk
    - BCM956260K Saber2

3.1 Platform support matrix

Release	OF-DPA 2.0 GA							
Switch chip	VXLAN tunneling	ACL on IPv6 and MAC	Termination MAC Flow Table	MPLS Flow Table	MPLS 0 Flow Table	MPLS ECMP Groups	OAM	L2 Policer Flow Table
Trident+	No	No	Yes	Yes	No	No	No	No
Trident2	Yes	Yes	Yes	Yes	No	No	No	No
Katana2	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Triumph3	No	No	Yes	Yes	Yes	Yes	No	Yes
Helix4	No	No	Yes	Yes	Yes	Yes	No	Yes
Hurricane2	No	No	Yes	Yes	No	No	No	No
Apollo2	No	No	Yes	Yes	No	No	No	No
Qumran	No	No	Yes	No	No	No	No	No
Saber2	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Tomahawk	Yes	No	Yes	Yes	No	No	No	No

3.2 Supported Features

The following table identifies which features are supported on which platforms in OF-DPA 2.0 GA.

Features supported in OF-DPA2.0 GA												
	Spec v1.75 Section		TD2	AP2	HU2	HX4	TR3	TD+	TH	KT2	SB2	QMX	Comments
Bridging and Routing	3.2	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	EA	Q-MX ECMP support deferred
Policy ACL	3.2	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	EA	
Policy ACL MAC + IPv6 wide match	3.2		GA										
Data center overlay tunnels (VxLAN)	3.3		GA										
MPLS ECMP Groups		GA	GA	GA		GA	GA	GA	GA	GA	GA		
MPLS-TP VPWS PE	3.4.1									GA	GA		
MPLS L3 VPN LER	3.5	GA	GA	GA		GA	GA	GA	GA	GA	GA		MPLS 0 in KT2, TR3, HX4 only
MPLS LSR	3.6	GA	GA	GA		GA	GA	GA	GA	GA	GA		MPLS 0 in KT2, TR3, HX4 only
MPLS 1:1 Protection	3.7									EA	EA		Both PW and LSP in KT2
Bridging and Routing QoS	3.8.3	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA		
MPLS QoS - Trust Tables	3.8.5	GA	GA	GA		GA	GA	GA	GA	GA	GA		
L2 Policer Meters	3.8.5									GA	GA		
Ethernet Service OAM	3.9.3.1									EA	EA		
Section OAM	3.9.3.2									EA	EA		
G.8113.1 OAM	3.9.3.2									EA	EA		
Congestion Management													Implementation deferred to

& Scheduling (Tail Drop,WRED) support												future release
Single level and multi-level protection										EA	EA	Only support a single level of protection per group chain
VLAN translate		GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	
Egress PCP DSCP Remark Table		GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	

4   Testing

GA level testing has been done for all features with the exceptions below for which only development level testing has been done and claimed to be at par with EA3 quality:

- Platform support for Qumran
- OAM feature support
- DPCTL (v1.3.0)
- RYU (v3.26)
- OpenDaylight Controller (Helium SR3 v 3.0.1)

5   Known Issues

The following table lists the known issues with this release.   Additional platform related feature support limitations are located in the Doxygen documentation.

Key	Summary	Customer Experience	Workaround Available	Frequency, Likelihood, Severity?
FP-237308	Wrong "outPort" detail is displayed in ./client_flowtable_dump of Termination MAC flow entry when action as Copy to Controller port is applied .	Display issue in debug command	No	Only display issue. No functionality impact.
FP-237134	Incorrect lmCounters.tNFLR value in Loss measurement counters	Incorrect Loss measurement counter calculation	No	Happens all the time. OAM support only EA3 quality.
FP-236909	Traffic is not forwarding to configured Queue with Policy ACL on LY2R Quanta platform	Traffic will not be forwarded to configured queue resulting in default QoS behavior	No	Happens all the time
FP-236701	IP Multicast packets are not routed when egressing an MPLS L3 VPN tunnel	Failure in IP Multicast routing for packets egressing MPLS L3 VPN	No	Happens all the time.
FP-236473	LM Counters are not incremented in ETHERNET-OAM, if we remove "oamLmRxCountAction" from Egress Maintenance Point Flow Table.	LM functionality for Ethernet OAM will not work	No	Happens all the time. Qumran OAM support only EA3 quality.
FP-236371	OFDPA: ECN value set in IPV6 Policy ACL flow entry is not getting marked in the egress packet on Tomohawk platform.	Policy ACL QoS action fails on IPv6 egress packet	No	Happens all the time.
FP-236209	OFDPA: Port mapping speed mismatch for QumranMx platform	Actual ports speeds not in sync with documentation	No	No functionality impact.

FP-236024	Rule - 10 in vlan flow table - Priority tagged traffic is getting dropped at ingress port.	Priority tagged traffic dropped at ingress on a VPWS tunnel.	Yes. use MPLS L2 Allow All Traffic on Port flows in the VLAN table.	Workaround available to be used.
FP-236020	Rule - 9 in vlan flow table - Untagged traffic is getting dropped at ingress port.	. Untagged traffic dropped at ingress on a VPWS tunnel.	Yes. use MPLS L2 Allow All Traffic on Port flows in the VLAN table.	Workaround available to be used.
FP-235931	OFDPA-QumranMx: Untagged VLAN traffic is not forwarding to the egress port	Untagged traffic is dropped	No	Happens all the time. Qumran support only EA3 quality.
FP-235720	OFDPA-Qumran: Traffic is not forwarded to the egress port for double vlan tagged Ethernet traffic in L2 bridging.	Double VLAN tagged ethernet packets are not forwarded	No	Happens all the time. Qumran support only EA3 quality.
FP-235703	OFDPA-Qumran: Policy ACL Flow creation with action as L2 Rewrite group is getting failed.	ACL redirect action to L2 Rewrite group fails	No	Happens all the time. Qumran support only EA3 quality.
FP-235691	OFDPA-Qumran: Policy ACL Flow creation for IPV6 ethertype with L4 Port qualifiers is getting failed.	ACL redirect action to L3 Unicast group fails	No	Happens all the time. Qumran support only EA3 quality.
FP-235638	OFDPA- Qumran: In PACKET IN message header, the fields 'Table Id' and 'Reason' are displayed incorrectly while using Policy ACL flow entry.	Incorrect table Id and Reason codes in a Packet In message	No	Happens all the time. Qumran support only EA3 quality.
FP-234078	OFDPA: QOS fields- Vlan PCP, Vlan DEI, DSCP fields remarking is not done properly using Egress DSCP PCP remark actions in Hurricane 2	Egress DSCP table does not match on non zero traffic class values.	No	Platform specific issue with a non lead platform on particular configuration. This works fine on our lead platforms.
FP-234074	OFDPA: In Ethernet OAM during CCM packet exchange, port rx packets count is not incrementing	CCMs will not update the packet counters	No	Happens all the time. OAM support only EA3 quality.

FP-233687	Qumran: Getting unwanted logs while DUT is booting up with latest ofdpa image.	Error logs during bootup.	No	Happens all the time. Qumran support only EA3 quality.
FP-233599	Agent sent OFPT_ERROR messages in reply to OFPT_MULTIPART_REQUEST OFMP_TABLE_FEATURES message",	The expected info is returned to the controller, so not a functionality issue, just an incorrect msg type.	No	Display message issue. Overall functionality is fine.
FP-233354	OFDPA: QOS fields remarking of Egress DSCP PCP actions are overridden by QOS field actions in Policy ACL flow entry.	ACL actions will have higher priority over Egress DSCP table actions for the same action fields	Yes. Use either ACL or Egress DSCP table to configure egress packet header fields	Customer would need to use the work-around
FP-233278	OFDPA: Traffic belonging to a certain traffic class is not flowing through the mapped egress CoS queue in L2 and L3 Multicast	Traffic Class to cos queue mapping fails.	No	LY2R Platform specific issue which is a non lead platform on particular configuration. This works fine on our lead platforms.
FP-232409	Ipv4 traffic (with increment in Src ip address) is not getting load balanced to ECMP paths.	Traffic will not be load balanced with ECMP in TD+	No	Problem occurs only on TD+ all the time.
FP-232332	OFDPA: Ports are not UP when we connect Saber 2 back to back with Trident 2 / Trident Plus platforms	Specific cable issue.	Yes. Use a different cable. Ports link up with DAC, Avago transceivers and a fiber cable .	Appears to be specific to a cable. Other cables work.
FP-231728	Loss Measurement counters are not updated as expected	Incorrect updates of LM counters	No	Happens all the time. OAM support only EA3 quality.

FP-231698	OFDPA: OAM endpoint creation fails when MPLS flow entry for Tunnel OAM is created without any PW flows.	Tunnel OAM will not work on LSRs.	No	Happens all the time. OAM support only EA3 quality.
FP-230159	TSR Originated: OF-DPA/Indigo group all delete functionality.	Group delete all fails	Yes. Groups can be deleted one at a time.	Customer would need to use the work-around
FP-228756	LBR is not received when LBM is initiated with lbpacket length greater than 1493	Loopback test fails with LBM packet greater than 1493 bytes	Yes. Smaller LBM packet needs to be used.	Customer would need to use the work-around
FP-228712	MIP creation with the same MEG index as MEP is failing with error code -32.	For BHH, we cannot have MIPs and MEPs with the same MEG on a single switch.	No	Happens all the time. OAM support only EA3 quality.
FP-228573	OFDPA: ACL flow entry creation failed driverPolicyAclEntryAddToUnit: bcm_field_action_mac_add failed, unit = 0, action = SrcMacNew, rc = -16 (Feature unavailable). when an L2 Rewrite group is configured as action to ACL on QumranMx Switch	ACL redirect action to L3 Multicast group fails	No	Happens all the time. Qumran support only EA3 quality.
FP-228571	OFDPA: Traffic is not forwarding to egress ports when we configure L2 Bridging and ACL with action as L2 Multicast group on QumranMx switch	Traffic does not get forwarded with ACL redirect action to L2 Multicast group	No	Happens all the time. Qumran support only EA3 quality.
FP-228541	OFDPA: Traffic is not forwarding to egress ports with IPV6 L3 Multicast scenario on QumranMx switch	IPv6 Multicast forwarding does not work	No	Happens all the time. Qumran support only EA3 quality.
FP-228431	OFDPA: Traffic is not forwarding when we created termination MAC flow entry with action as copy to cpu on QumanMx Switch	Traffic does not get forwarded nor gets copied to CPU with output to controller action configured in	No	Happens all the time. Qumran support only EA3 quality.

		the Termination MAC table		
FP-228429	OFDPA: Traffic is forwarding to egress ports when we configure Termination MAC flow entry with discard on Qumran Mx switch	Matching traffic is not discarded when discard action is configured in the Termination MAC table	No	Happens all the time. Qumran support only EA3 quality.
FP-228401	OFDPA: Traffic is not getting dropped at ingress port when we configure L2 Flood Bridging with action as discard on QumranMx switch	Matching traffic is not discarded when discard action is configured with L2 flooding in the bridging table	No	Happens all the time. Qumran support only EA3 quality.
FP-228399	OFDPA: Traffic is not forwarding to egress port when we configure L3 multicast routing with ACL action as L3 Multicast group on QumranMx Switch	ACL redirect action to L3 Multicast group fails	No	Happens all the time. Qumran support only EA3 quality.
FP-228329	OFDPA: Traffic is not forwarding to egress port in IPV4 Unicast routing with multiple flows (Host entry) on QumranMx switch	IPv4 routing fails with multiple flows	No	Happens all the time. Qumran support only EA3 quality.
FP-228286	OFDPA: Bridging flow entry creation is failed when set field output port to OFDPA_PORT_CONTROLLER on QumranMx switch	Output to Controller action not supported in the Bridging flow in Qumran	No	Happens all the time. Qumran support only EA3 quality.
FP-228095	lbrInOutOfOrder received when loopback discovery is initiated from MEP1 device to MEP2 with a MIP device in between with LSP OAM config.	Loopback reply counters behave inconsistently	No	Happens all the time. OAM support only EA3 quality.
FP-228054	Loopback reply not sent from MIP when Loopback test is initiated from MEP device with destination as MIP.	Loopback test fails	No	Happens all the time. OAM support only EA3 quality.

FP-227537	Proactive lm counters are not reset after stop and start of loss measurement.	Proactive LM counters will behave inconsistently	No	Happens all the time. OAM support only EA3 quality.
FP-226147	OFDPA: Memory issue while loading python after installing latest OFDPA build on LY2R platform.	Configuration using local python scripts is not possible due to the unavailability of python on the switch.	Yes. Use Indigo agent and a Controller to configure OF-DPA.	OF-DPA functionality is not impacted.
FP-225913	Service Metering is not working for Yellow and Red traffic.	Color Aware Service meter does not consider incoming packet color in this particular sequence of configuration	Yes. The ingress port trust flow entry should be configured before any MPLS configurations	Customer would need to use the work-around
FP-225838	OFDPA: VLAN tagged priority traffic is not forwarding to configured port queue	Traffic is directed through default queue. May be an issue during congestion.	No	Issue appears only on a particular platform, Hurricane2.
FP-225568	TrafficClass in MPLS flow table when applied in "mpls l2 vpn flow" doesn't work due to SDK issue	Egress ethernet traffic is not marked with appropriate qos header fields in the termination direction.	No	Happens all the time.
FP-224988	OFDPA: Only one port(10G mode) is coming up, when we connecting back to back link between TD2 and TD+ with 40G Fiber DAC cable.	Only one of the 4 physical ports come up.	No	Happens only on the TD+ which is not a lead platform for this release. Other platfoms work fine.
FP-224500	LY2R - QSFP LEDs do not work correctly.	Port LEDs only work on SFP+ ports.	No	Cannot monitor QSFP port status by observing the

				LEDs.
FP-223361	Python installation is getting failed in LY2 DUT because of memory problems.	Configuration using local python scripts is not possible due to the unavailability of python on the switch.	Yes. Use Indigo agent and a Controller to configure OF-DPA.	OF-DPA functionality is not impacted.
FP-223187	OFDPA: When client_cfg_purge command is issued, clear or disable all tests and session on a given MEP before deleting MEP config.	Customer might see some OAM traffic for some time even after deleting MEG/MEP/MIP configuration and it happens all the time.	Yes. Disable all running tests before clearing configuration.	Customer would need to use the work-around
FP-223008	Observing ECC errors messages on console after execute the loopback script.	Packet transmission on port 10 will not work and it happens all the time.	Yes. Use Port 9 instead of Port 10	Customer would need to use the work-around
FP-222598	Green, Red and Yellow packets(egress) ordering is not in sequence in Policy metering.	Sequence of packets marked with different colors is unpredictable.	No	Overall packet metering functionality works fine
FP-222331	Inconsistency in field names of Loss measurement counters in OFDPA spec and OFDPA 2.0 reference manual.	Inconsistent field names seen	No	This is a Cosmetic issue. No functionality impact.
FP-221898	OFDPA - Maximum VLAN flow entries configuration result in error on Helix4	Maximum flow entries will not be configured.	No	Overall functionality is not affected. Can't scale to max entries.
FP-221842	Why group bucket modification is not supported for "MPLS Label Group", also the error code provide while trying to modify it is not correct.	Unable to modify MPLS label group	Yes. To modify group bucked, it needs to be deleted and added again.	Customer would need to use the work-around

FP-221743	MPLS_LSR - PW Ethernet CW and sequence number are set even though these are not configured.	Ccntrol Word is seen in the packet.	No	Control word will be handled by the receiver. No major functionality impact.
FP-221311	Accton-6700:while booting got the warning like "WARNING: (usb2_off) could not find compatible node fsl-usb2-dr: FDT_ERR_NOTFO	Harmless error message.	No	Overall functionality is not affected.
FP-220872	OFDPA - Getting a message while transferring the required files using tftp for the first time.	Harmless message.	No	Message shows up on console.
FP-214835	LY8 LEDs turn off when sending traffic on a port	Display issue. No major functionality impact.	No	Inability to detect traffic through port LEDs.
FP-194036	OF-DPA:ACL redirect issues on tunnel port	Policy ACL redirection does not work correctly with Overlay Tunnels	No	Happens all the time.
FP-192796	OF-DPA: On modifying the physical port number in tunnel next hop flow ,packets other than UDP (IP,VLAN,ETHERNET) are also r	Malformed packets seen at egress on next hop flow modification	Yes. Use delete and add tunnel_next_hop instead of modifying it	Customer would need to use the work-around
FP-192368	OF-DPA: Traffic does not hash between the VTEPs with incrementing source mac.	Doesn't prevent traffic from flowing. Only an issue if one physical link is saturated	No	Possible degraded performance in this situation
FP-185121	OF-DPA: Encapsulated packet does not come out with new multicast address after modification of tunnel next-hop	Incorrect multicast address in egress packet	Yes. The caller should delete the VXLAN endpoint port and reconfigure it with the new mcast next hop information.	Customer would need to use the work-around

FP-185080	OF-DPA:Traffic still received on the egress ports of tunnel though bridging entry is deleted.	It is not that a functionality is 'not working'	No	In specific configurations, user could see traffic received on the egress ports of the tunnel when the bridging entry is deleted

6   Issues Fixed Since OF-DPA 1.0.0.1

The following issues were fixed since release 1.0.0.1:

Key	Summary
FP-184285	OFDPA:Traffic is not distributed according to the configured minrate and max rates to the queues on egress port.
FP-184170	Received packets counter is not incrementing if the received packet frame size is > 64 bytes.
FP-183886	Get and clear port queue stats fails on TD+.
FP-183818	Able to configure invalid values for port advertising feature.

7   Previous Releases

Date	Release Number	Feature Set
4/8/2014	OF-DPA 1.0	ACL, Bridging, Unicast Routing (Ipv4/IPv6), Multicast Routing (IPv4, IPv6), Packet-In, Packet-Out, VxLAN, Port events, Flow age events, Indigo OpenFlow Agent, Interop with RYU Controller

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