



Intel® Open Network Platform Release 2.1 Release Notes

Release Notes

**Document Revision 1.2
May 2016**



Revision History

Date	Revision	Comments
March 31, 2016	1.0	Initial release for Intel® Open Network Platform Release 2.1.
May 6, 2016	1.1	The OpenDaylight version has been updated so that OpenDaylight is downloaded from the permanent release repository.
May 19, 2016	1.2	Documentation of a new limitation during ONP2.1 installation on Fedora. See Item #6 in Table 4-2



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1.0 Introduction

This document describes the Release 2.1 of the Intel® Open Network Platform (Intel® ONP). The Intel® ONP reference architecture provides an engineering guidance and ecosystem support to enable widespread adoption of Software Defined Networking (SDN) and Network Functions Virtualization (NFV) solutions across telecommunications, cloud, and enterprise sectors. The deployment of this reference architecture is done mainly using DevStack. DevStack does not make the deployment production-ready, but it does afford developers a good option to experiment with Intel's software and hardware stack.

The Intel® ONP defines the integration of hardware and software components, providing a framework to deliver many benefits of Intel® Architecture to SDN and NFV. The reference architecture is based on a standard high-volume server (SHVS) and an Intel® ONP open-source software stack. The software stack itself is built on open-source software created by open-standard communities like Open vSwitch (OvS), Data Plane Development Kit (DPDK), OpenDaylight (ODL), OpenStack, and Kernel-based Virtual Machine (KVM). Intel® is working closely with these communities and is contributing to the evolution of their open-standard projects.

The Intel® ONP provides a SDN/NFV reference solution that defines three main network elements: networking compute nodes, ODL controller, and OpenStack manager. An SDN/NFV lab environment comprised of those network elements is the basis for ONP software integration and customer use-case validation.

This document describes the main functionalities contributed by Intel® to open-source community projects that are now integrated into Intel® ONP Release 2.1 and details major solution limitations that remain.



2.0 System Overview

2.1 Release 2.1 Highlights

Intel® Open Network Platform Release 2.1 provides complete integration with the Intel® Xeon® processor E5-2600 v4 product family, codename Broadwell-EP. This new family of server processors increase the core count up to 22 cores per processor and up to 88 threads per dual processor platform.

Intel® ONP Release 2.1 introduces new capabilities, software upgrades, and integration with the following open-source software releases:

- Fedora 23 operating system with 4.3.3-300.fc23.x86_64 kernel version.
- CentOS-7.2 (1511) operating system with 3.10.0-327.el7.x86_64 kernel version.
- Upgrade to the OpenDaylight Beryllium release with features like management of QoS capabilities, ability to operate in clustered mode which enable HA and better performance and a complete support of OvS with DPDK in Netvirt application.
- Upgrade to Open vSwitch version 2.5.90 supporting management of Jumbo-Frame packets and offering Port QoS policy and Interface Rate Limiting features. The update of Open vSwitch with DPDK supports now vhost-user multiple queue.
- Updated OpenStack Liberty Release components offering more stability of whole Intel® ONP software stack.
- Integration with Data Plane Development Kit release 2.2.0 that provides keepalive support to Environment Abstraction Layer (EAL) that allows integration of DPDK into MANO solutions and implements extended statistics API for various poll mode drivers.

New features:

- KVM4NFV for the real time kernel deployments that strive to minimize VNF data-plane latency.
- To continue to improve the latency for VM-VM communication in the networked environment, ONP 2.1 supports the Intel® Resource Director Technology (RDT) on the Intel® Xeon® processor E5-2600 v4 product family. RDT gives additional controls to optimize memory utilization of the Last Level Cache (L3) on the processor and the main DDR memory.

2.2 Intel® ONP Release 2.1 Distribution

Intel® ONP Release 2.1 is delivered in the form of a Reference Architecture Guide and a software set available on 01.org. The Intel® ONP Reference Architecture Guide document provides instructions on how to build and configure Intel® ONP software.

3.0 Reference Architecture

3.1 Reference Architecture Environment

The Intel® ONP Reference Architecture defines a test environment composed of the server, a control layer, and an OpenStack layer as presented in [Figure 3–1](#). OpenStack and OpenDaylight provide the management and controller platforms. The compute nodes consist of network interface controller cards, the Open vSwitch functionality, DPDK, and supplier-specific applications executing in virtual machines.

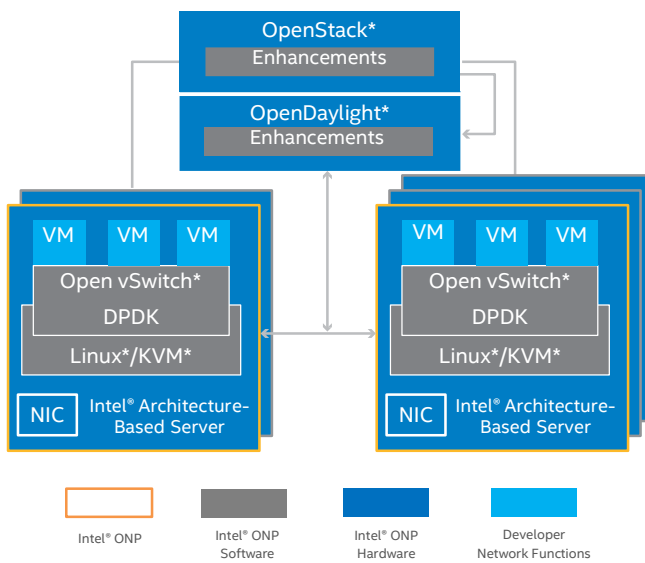


Figure 3–1 Intel® ONP test and validation environment



3.2 Reference Platform Hardware

Table 3-1 Intel® Xeon® processor E5-2600 v3 and Intel® Xeon® processor E5-2600 v4 product family-based platforms - hardware used in integration tests

Item	Description	Notes
Platform	Intel® Server Board S2600WTT	Formerly Wildcat Pass Intel® Xeon® processor-based DP server 2 x 10GbE integrated LAN ports based on Intel® Ethernet Controller X-540
	Intel® Server Board S2600WT2	Formerly Wildcat Pass Intel® Xeon® processor-based DP server 2 x 1 GbE integrated LAN ports based on Intel® Ethernet Controller I350-AM2
Processors	Dual Intel® Xeon® processor E5-2658 v3	Formerly Haswell-EP 12 cores, 24 threads, 2.2 GHz, 105 W, 30 MB Intel® Smart cache per processor, 9.6 GT/s QPI, DDR4-1600/1866/2133, 24 hyper-threaded cores per CPU for 48 total cores. Supports CAT/CMT
	Dual Intel® Xeon® processor E5-2697 v3	Formerly Haswell-EP 14 cores, 28 threads, 2.6 GHz, 145 W, 35 MB total cache per processor, 9.6 GT/s QPI, DDR4-1600/1866/2133, 28 hyper-threaded cores per CPU for 56 total cores.
	Dual Intel® Xeon® processor E5-2699 v3	Formerly Haswell-EP 18 cores, 36 threads, 2.3 GHz, 145 W, 45 MB total cache per processor, 9.6 GT/s QPI, DDR4-1600/1866/2133, 36 hyper-threaded cores per CPU for 72 total cores.
	Dual Intel® Xeon® processor E5-2699 v4	Formerly Broadwell-EP 22 cores, 44 threads, 2.2 GHz, 145 W, 55 MB total cache per processor, 9.6 GT/s QPI, DDR4-1600/1866/2133/2400, 44 hyper-threaded cores per CPU for 88 total cores. Supports CAT/CMT
Memory	64 GB total; Crucial CT8G4RFS4213	8x DDR4 RDIMM 2133 MHz, 8 GB
	64 GB total; Kingston KVR21R15S4/8	8x DDR4 RDIMM 2133 MHz, 8 GB
Intel® QuickAssist Technology	Intel® QuickAssist Adapter 8950	Formerly Walnut Hill Provides IPSec, SSL Acceleration and Compression services Support for SR-IOV PCIe Gen 3 (8 GT/s)
Local Storage	Intel® SSD DC S3500 Series	Formerly Wolfsville SSDSC2BB120G4 120 GB SSD 2.5in SATA 6 Gb/s



Item	Description	Notes
NICs	Intel® Ethernet Converged Network Adapter X710-DA4	Formerly Fortville Intel® Ethernet Controller XL710-AM1 4x 10 GbE ports Firmware version 4.53 Tested with Intel® FTLX8571D3BCV-IT and AFBR-703sDZ-IN2 transceivers
	Intel® Ethernet Converged Network Adapter XL710-QDA2	Formerly Fortville Intel® Ethernet Controller XL710-AM2 2 x 40 GbE ports Firmware version 4.53 Tested with Intel® E40QSFPSR transceiver
	Intel® Ethernet Converged Network Adapter X540-T2	Formerly Twinville Intel® Ethernet Controller X540-BT2 2 x 10 GbaseT ports
	Intel® Ethernet Converged Network Adapter X520-SR2	Formerly Niantic Intel® 82599ES 10 Gigabit Ethernet Controller 2 x 10 GbE ports Tested with Intel® FTLX8571D3BCV-IT transceiver
BIOS	<p>Servers with Intel® Xeon® processor E5-2600 v3 product family:</p> <ul style="list-style-type: none"> • SE5C610.86B.01.01.0009.060120151350 Release date: 06/01/2015 • SE5C610.86B.01.01.0011.081020151200 Release date: 08/10/2015 <p>Servers with Intel® Xeon® processor E5-2600 v4 product family:</p> <ul style="list-style-type: none"> • GRRFCRB1.86B.0267.R00.1509110656 RC revision 2.4.0 Release date: 09/11/2015 	<p>Hyper-Threading enabled</p> <p>Intel® Virtualization Technology (Intel® VT-x) enabled</p> <p>Intel® VT for Directed I/O (Intel® VT-d) enabled</p> <p>Turbo Boost enabled</p>



Table 3-2 Intel® Xeon® processor D-1500 family-based SoC platforms - hardware used in integration tests

Item	Description	Notes
Platform	SuperMicro SuperServer 5018D-FN4T	Intel® Xeon® processor-based server Motherboard: SuperMicro X10SDV-8C-TLN4F Dual LAN via onboard Intel® i350-AM2 Gigabit Ethernet Dual LAN via SoC 10GBase-T
Processors	Intel® Xeon® processor D-1540	Formerly Broadwell-DE 8 cores, 16 threads, 2.00 GHz, 12 MB cache Single Socket FCBGA 1667 supported CPU TDP 45W System-on-Chip
	Intel® Xeon® processor D-1520	Formerly Broadwell-DE 4 cores, 8 threads, 2.20 GHz, 6 MB cache Single Socket FCBGA 1667 CPU TDP 45W System-on-Chip
Memory	32 GB total; Kingston KVR21R15S4/8	4x DDR4 RDIMM 2133 MHz, 8 GB
Intel® QuickAssist Technology	Intel® QuickAssist Adapter 8950	Formerly Walnut Hill Provides IPSec, SSL Acceleration and Compression services Support for SR-IOV PCIe Gen 3 (8 GT/s)
Local Storage	Seagate Barracuda ST500DM002	500 GB HDD 3.5in SATA 6 Gb/s 7200RPM 16MB
BIOS	AMIBIOS Version: 1.0a Release Date: 05/27/2015	Hyper-Threading enabled Intel® Virtualization Technology (Intel® VT-x) enabled Intel® VT for Directed I/O (Intel® VT-d) enabled



3.3 Reference Platform Software

Table 3-3 Compute Node Software

Software Component	Function	Version/Configuration
Fedora 23	Host Operating System	Fedora 23 Server x86_64 Kernel version: 4.3.3-300.fc23.x86_64
CentOS-7.2	Host Operating System	CentOS-7.2 (1511) x86_64 DVD ISO Kernel version: 3.10.0-327.el7.x86_64
KVM4NFV Real-Time Kernel	Targeted towards low latency Telco environment	KVM4NFV Real-Time Kernel version: 4.1.10-rt10
QEMU-KVM	Virtualization technology	Fedora 23: <ul style="list-style-type: none">• qemu-kvm version: 2.4.1-7.fc23.x86_64• libvirt version: 1.2.18.2-2.fc23.x86_64 CentOS-7.2: <ul style="list-style-type: none">• qemu-kvm version: 1.5.3-105.el7_2.3.x86_64• libvirt version: 1.2.17-13.el7.x86_64
DPDK	Network stack bypass and libraries for packet processing; includes user space vhost drivers	DPDK 2.2.0
Open vSwitch	vSwitch	Open vSwitch 2.5.90 Commit ID 1589ee5ae97c3f71c50413db64ddd0546daeccc0 used for: <ul style="list-style-type: none">• Open vSwitch (non-DPDK nodes)• Open vSwitch with DPDK
Intel® Ethernet Drivers	Ethernet drivers	ixgbe-4.3.13 <ul style="list-style-type: none">• Intel® Ethernet Server Adapter X520 Series• Intel® Ethernet Converged Network Adapter X540-T2• Intel® Xeon® processor D-1500 family deployments i40e-1.4.25 <ul style="list-style-type: none">• Intel® Ethernet Converged Network Adapters XL710-QDA2 and X710-DA4
Cache Allocation Technology (CAT) / Cache Monitoring Technology (CMT)	Intel® Resource Director Technology (RDT) components	Intel-cmt-cat Commit ID: db381ce554528d96f394863aab6e985f5171cff9



Table 3-4 Controller Node Software

Software Component	Function	Version/Configuration
Fedora 23	Host Operating System	Fedora 23 Server x86_64 Kernel version: 4.3.3-300.fc23.x86_64
CentOS-7.2	Host Operating System	CentOS-7.2 (1511) x86_64 DVD ISO Kernel version: 3.10.0-327.el7.x86_64
KVMforNFV Real-Time Kernel	Targeted towards low latency Telco environment	KVMforNFV Real-Time Kernel version: 4.1.10-rt10
QEMU-KVM	Virtualization technology	Fedora 23: <ul style="list-style-type: none"> • qemu-kvm version: 2.4.1-7.fc23.x86_64 • libvirt version: 1.2.18.2-2.fc23.x86_64 CentOS-7.2: <ul style="list-style-type: none"> • qemu-kvm version: 1.5.3-105.el7_2.3.x86_64 • libvirt version: 1.2.17-13.el7.x86_64
DPDK	Network stack bypass and libraries for packet processing; includes user space vhost drivers	DPDK 2.2.0
Open vSwitch	vSwitch	Open vSwitch 2.5.90 Commit ID 1589ee5ae97c3f71c50413db64ddd0546daeccc0 used for: <ul style="list-style-type: none"> • Open vSwitch (non-DPDK nodes) • Open vSwitch with DPDK
OpenStack	SDN orchestrator	OpenStack Liberty Release (see Table 3-5)
OpenDaylight	SDN controller	OpenDaylight beryllium-0.4.0
Intel® Ethernet Drivers	Ethernet drivers	ixgbe-4.3.13 <ul style="list-style-type: none"> • Intel® Ethernet Server Adapter X520 Series • Intel® Ethernet Converged Network Adapter X540-T2 • Intel® Xeon® processor D-1500 family deployments i40e-1.4.25 • Intel® Ethernet Converged Network Adapters XL710-QDA2 and X710-DA4
Cache Allocation Technology (CAT) / Cache Monitoring Technology (CMT)	Intel® Resource Director Technology (RDT) components	Intel-cmt-cat Commit ID: db381ce554528d96f394863aab6e985f5171cff9



Table 3-5 Commit IDs for major OpenStack components

OpenStack Component	Referenced Version (i.e. tag at release)	Commit ID
OpenStack Cinder	7.0.1	stable/liberty f51ffea673de5395aee6c789b07fb44d9e801b88
OpenStack Glance	11.0.1	stable/liberty 7296a5302b00bd066ddf6b14c7d5a9afb3b88e70
OpenStack Heat	5.0.1	stable/liberty dc8ccd8ee15bb336c4704ac1ff628bfb245a5593
OpenStack Horizon	8.0.1	stable/liberty fa47798f38b2a58514b93b6613129b0dfca18f36
OpenStack Ironic	4.2.2	stable/liberty 6eb970b71cb6ae629b733ced84917d9db5afc78a
OpenStack Keystone	8.1.0	stable/liberty c665080d4a700b6d92f29c40621d83bd7365de34
OpenStack Neutron	7.0.3	stable/liberty 197b188ea8bfdfd023b2da3b7572e9387568c500
OpenStack Nova	12.0.2	stable/liberty aa4edd349dde73739527ab793ff6209fe1907e2c
OpenStack Swift	2.5.0	stable/liberty 47eb6a37f86f29c355297b556c2ff898c98da9b2
OpenStack Requirements		stable/liberty f8579e166f45f6a580ef56cd3c0e734c03ae2f76
OpenStack Tempest		stable/liberty 271b3405729778a5bdb71004b8fa27484524295c
OpenStack noVNC		stable/liberty b403cb92fb8de82d04f305b4f14fa978003890d7
OpenStack networking-odl		stable/liberty 9adb4907d8c542a31c4dd4a4f2219adb2b95ed7a
OpenStack networking-ovs-dpdk		stable/liberty 3b800fea6255d2209565d0330c0ab73356f729d7



4.0 Functionality Highlights and Limitations

4.1 New Functionalities Contributed by Intel® to Open-Source Projects Introduced in Intel® ONP Reference Architecture Release 2.1

Table 4-1 summarizes new software features/bug fixes that Intel has contributed to open-source projects included in Intel® ONP Release 2.1, along with commit IDs. Upstreamed commit IDs are shown in the last column.

Table 4-1 New features/bug fixes included in Intel® ONP Release 2.1

No.	Feature Name	Category	Ingredient	Description	IA Value	Commit ID if Upstreamed, Link if Posted as Patch
1.	DPDK 2.2 Support	Feature	vSwitch	Update to use the latest 2.2 version of DPDK.	This allows users to take advantage of the latest DPDK features and performance improvements.	de658847fd5703ac7ac6413ec29ecf7f4db91421 49bbbfdd5d562b271a4c4ee9a8799e69448afa4 02ab4b1a6a173979a51cabd7000a34546d517e60 http://openvswitch.org/pipermail/dev/2015-December/063742.html
2.	Bug fix/doc update	Performance improvement	vSwitch	<ul style="list-style-type: none"> • Fix Multi-Queue Documentation. • Fix dpdk_watchdog failure to quiesce. • Fix IPv6 tunneling feature. 	Show the best possible performance on Intel® Architecture.	db6e138362b805e87e2d99853e2771b8d9d7953d afee281f7f4f4b477e5c12bf18fe00d097ce8e96 http://openvswitch.org/pipermail/dev/2016-January/064348.html



No.	Feature Name	Category	Ingredient	Description	IA Value	Commit ID if Upstreamed, Link if Posted as Patch
3.	QoS	Feature	vSwitch	OvS/DPDK implementation of a QoS algorithm in user space: 'egress-policer' used to drop egress packets at a configurable rate. Changes in INSTALL.DPDK.md guide to provide an example configuration of 'egress-policer' QoS.	Adds following capabilities: <ul style="list-style-type: none"> • Interface Rate Limiting: a rate and a burst can be assigned to an interface. • Port QoS policy. 	http://openvswitch.org/pipermail/dev/2016-February/065424.html
4.	Jumbo-Frame	Feature	vSwitch	OvS with DPDK capability to pass large packets (up to 13k) through vSwitch forwarding path, vhost-user ports, physical ports, ring ports.	Allows OvS data path to manage Jumbo-Frame packets.	http://openvswitch.org/pipermail/dev/2016-February/066405.html
5.	Various improvements and fixes	Bug fix	OpenStack networking-ovs-dpdk	Bug fixes to documentation and deployment code.	More stable OvS-DPDK operation in integrated stack with OpenStack	https://review.openstack.org/264149 https://review.openstack.org/241916 https://review.openstack.org/250717 https://review.openstack.org/245061
6.	Improvements and fixes	Bug fix	OpenStack networking-odl	Bug fixes to documentation and deployment code	More stable OpenDaylight operation in integrated stack with OpenStack	https://review.openstack.org/253738 https://review.openstack.org/259655 https://review.openstack.org/253735 https://review.openstack.org/252972
7.	OvS with DPDK support	Feature	OpenDaylight Netvirt	Bug fixes for OpenDaylight Netvirt application L3 support	Enables more complete support of OvS with DPDK in Netvirt application.	6989a273149b5908fb2c2ae56d8f9fdb01cd05e0 e4783a5d2eca5670253b8251d62258edb01eb477
8.	Standalone SFC Classifier	Feature	OpenDaylight SFC	Added support for SFC classifier in the SFC project.		2998950f5bd34cacf3e79f921ced58571ef760df
9.	NSH support	Feature	OpenDaylight SFC	Various NSH support added to ODL - C3 C4 Move action - NSH test tool - Eth+NSH encap support - set NSH action.	Enables IETF based SFC.	a7500c12616fc19affde08b37847c0f33767464b



No.	Feature Name	Category	Ingredient	Description	IA Value	Commit ID if Upstreamed, Link if Posted as Patch
10.	OVSDB clustering	Feature	OpenDaylight OVSDB	Added device ownership capability to OVSDB plugin for clustering support.	Enables OpenDaylight to support HA and performance by operating in a clustered mode.	82f28e03944e854df852dcc5824b71324ca39df5 7929d631bad65da4f846a7cf696f0416f21c91d3
11.	OVSDB QoS	Feature	OpenDaylight OVSDB	Added support to the OVSDB southbound plugin to manage QoS and Queue tables on Ovs hosts.	Enables OpenDaylight to manage QoS capabilities.	6f88e57f42cbe67e1a0cdba8e741ec81bfb2149d b5e07f995cbb87476c784c6ab45f98790c43777f fe755734e89e28ebe22ed5ad783d303e7d4ae08e e5a8cc51d71e35e0db268bf3ecf141d1c0a70679 ccc09694a98686163433e26fb2ef7db93a00a00b



12.	Tempest API Tests	Bug fix	OpenDaylight Neutron / Netvirt	Bug fixes to enable OpenDaylight as ML2 provider to pass the Tempest API tests.	Enables OpenDaylight to operate as more stable element in an integrated stack with OpenStack.	811dfecc6053f9d27cd2e94e305423a21965ed6c 235320f1eef27f7b9a9ad85043fc26f98816f982 14dc16c209ef4eaaae9a76f31519bb9872330a29 ee571fa37fbd4028e2b5ebef0896d45c5a654b98 cea77b9242c28556ab63723ec5deceb9f0e9bdab 074ebd98bdce1c9b2a401d6aca9341a3420f4f71 8859004b1170b3c3bc48a667b71f2aaaaf3ba876 8f43dc56a5e2684ffcc2de4435e87d8ea68a06e6 1ff904a5e97fa14ce9592e6be8ea9ea8357521e9 87e8ab8edf9febe7f1d0d4251143d2a364d46061 81b36893bffcd989dcc6adc707bc11d78b146747 ffae71305b80d2484f8d65b2fa41fbf51e33a216 4f24f7e2623090a9dfe46c013ffae423b8445a8f 6705960c26baa3e0f8b4478792d9e860218d0233 b88f3f63c70ec60302155d7b51f6df090a3206c3 97e32416dcccddad208aa55ebda709bb7dad2c3f9 445690e94dd990ad6d117b4d7c86e95b8bf9392b 5866c3e43ad5a9730825d1cdf91806
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No.	Feature Name	Category	Ingredient	Description	IA Value	Commit ID if Upstreamed, Link if Posted as Patch
						560b001e24 91c60b1487a030998d7d9fd6989f1d c4d0445269 82bc8d9b594e17a904c4a72dd251b8 86e4698fc7 682c05fb853ec1684264f7f237bd4d4 3261e83a4
13.	OpenDaylight performance and scalability	CI improvement	OpenDaylight S3P	Improve OpenDaylight continuous integration framework to support controller performance tests. Initial performance tests for OVSDB performance and scalability.		d2bd1354122f0a953151c98bbda4f5 36902336f5 5e515a6a2f30af005e94586cd37199b defec67e1 e7ad8721a8442bcf8b1272e26885ae 0fb0b4332e
14.	Added keepalive support to EAL	Feature	DPDK	Allows external monitoring of a DPDK process by a watchdog process.	Allows integration of DPDK into MANO solutions.	e64833f2273ac67becbca10d9f2f159 8872dc99e
15.	Added vhost-user multiple queue support	Performance improvement	DPDK	Allow OvS to take advantage of multiple queue support in DPDK.	Show the best possible performance on Intel® Architecture.	19d4d7ef2a216b5418d8edb5b004d1 a58bba3cc1
16.	Added additional extended statistics support	Feature	DPDK	The xstats API allows DPDK apps to gain access to extended statistics from each port on a NIC.	Allows better statistics gathering from DPDK applications.	b291f3f96db5b135b37ff3d32eab37d c6601fe97



4.2 Release 2.1 Limitations

Table 4-2 Intel® ONP Release 2.1 Limitations

No.	Open Software	Limitation
1.	OpenStack	<p>After the OpenStack installation is successful on the controller and compute nodes, when the user logs in to the OpenStack UI to spawn the VM an error displays: Failed to connect to server (code 1006).</p> <p>The workaround is to flush the iptables on the Compute Node with the following command as stack user:</p> <pre>\$ sudo iptables -F</pre>
2.	NIC Driver	<p>With kernels older than 3.18, adapters formerly known as Fortville will occasionally fail to bind to the kernel i40e driver after they have been unbound from DPDK igb_uio driver. Intel® Open Network Platform Reference Architecture (Release 2.1) support for CentOS-7.2 is based on the 3.10 kernel.</p>
3.	NIC Driver	<p>The network controller available with Intel® Xeon® processor D-1500 family-based SoC platforms will occasionally fail to claim SWFW semaphore resources, which results in failed initialization when bringing up the interface. If this occurs, shutdown the system, remove power from the board for 10 seconds and then restore power and restart the system.</p>
4.	NIC Firmware	<p>NICs formerly Fortville may have factory released firmware vision 4.21. A newer version (4.53 onwards) is required. NICs with older firmware may experience:</p> <ul style="list-style-type: none">• Dropped packets when bound to DPDK igb_uio driver• Occasional loss of operational state.
5.	OpenStack-Dev	<p>After DevStack is installed, user will be prompted to update pip version (see <i>example</i> below). User should continue with pip version 7.1.2. Do not update.</p> <pre>You are using pip version 7.1.2, however version 8.0.0 is available. You should consider upgrading via the 'pip install --upgrade pip' command.</pre>
6.	Openstack installation in Fedora 23	<p>The selinux is not disabled by the script automatically. The user needs to install the libselinux-python module in controller and compute nodes before installing Openstack which will take care of disabling selinux.</p> <pre>#yum install libselinux-python</pre>



5.0 Node Software Installation

Intel® ONP software stack can be installed using scripts associated with this release. Download the Intel® ONP Release 2.1 Scripts from 01.org. The scripts bundle contains the files shown in the table below.

Table 5-1 Intel® ONP Release 2.1 Scripts

Files	Description	Notes
prepare_system.yml	The ansible playbook that prepares the nodes to run DevStack, i.e. configures network interfaces, services, kernel, pulls necessary system updates, creates DevStack configuration file local.conf, etc.	Do not edit
prepare_stack.yml	The ansible playbook run by DevStack after system configuration is completed. It executes DevStack installer script, configures OvS and DPDK, finalizes network settings and captures log files from all the nodes.	Do not edit
onps_config.yml	Configuration file available for user to choose the type of Intel® ONP deployment.	
onps_commit_ids.yml	List of commit IDs of the various open source repositories used for this release.	
README.md	Provides instructions on how to update onps_config.yml configuration file and run ansible.	
tests/*	A catalog with examples of local.conf files – DevStack configuration files used for OpenStack services' setup and configuration for various combinations of deployments.	

More details can be found in Intel® ONP 2.1 Reference Architecture Guide available at 01.org.



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