FEATURE BRIEF

Service Assurance for Virtualized Networks featuring
Intel® Infrastructure Management Technologies

DPDK Interface Monitoring

Intel® Platform Service Assurance

This feature brief describes the key indicator metrics and events provided by DPDK for collection and reporting to higher-level management applications to support platform service assurance.

Abstract

The Data Plane Development Kit (DPDK) is a set of libraries and drivers for fast packet processing. For platform service assurance, DPDK exposes statistics and events relevant to DPDK interfaces and packet processing cores. (See Ref. 1 for details on DPDK.)

Feature Description

The DPDK interface monitoring feature uses the DPDK standard API and the DPDK extended statistics API to retrieve metrics. The DPDK standard API enables the collection of generic, aggregated packet-forwarding statistics that are common across all network interface cards (NICs). The DPDK extended statistics API enables the collection of NIC-specific metrics over and above the generic statistics from an individual NIC driver.

Statistics are also monitored, but separately from events due to the stringent timing requirements for event failover. The DPDK interface monitoring feature includes the ability to detect and report the failure of a DPDK packet processing core and the link status (up/down) of DPDK ports. This objective is achieved by monitoring the DPDK keep alive (KA) feature. The KA feature can detect when a packet processing core is unresponsive to a regular monitoring event.

Packet processing cores that are unresponsive to keep alive messages are detected and reported as part of the support for event detection.

DPDK Interface Monitoring Feature Data Sets

NIC packet-forwarding statistics monitored include:

- A set of Ethernet and L3-related statistics that are common to all NICs, including packets sent, packets received, bytes sent, bytes received.
- Additional Ethernet and other statistics that provide additional counters supported by specific NICs.

DPDK monitored events recorded include:

- DPDK application packet processing core status changes, which are monitored using the DPDK's keep alive (KA, or heartbeat) capability, and port link status changes.

MIB support:

- None

Configuration

DPDK supports two process types:

- Primary processes that configure and initialize the system and forward packets.
- Secondary processes that can run alongside a primary process after the that process has configured them.

The DPDK Interface Monitoring feature implements two plug-ins, dpdkstat and dpdkevents, as DPDK secondary processes.

DPDK interface statistics are configured in the dpdkstat plug-in section of the telemetry plug-in configuration file.

Telemetry Collection Framework Support

The DPDK Interface Monitoring feature uses a collectd plug-in called dpdkstat to collect packet forwarding statistics and provide them to higher-level management systems (see REF 2 for details on collectd).

External Interface Support

External interface support for the DPDK interface monitoring feature includes:

- OpenStack* - All metrics and events collected by the DPDK Interface Monitoring feature are available through OpenStack telemetry services: Gnocchi, Ceilometer, and Aodh (see REF 3).

Feature Dependencies

The DPDK interface monitoring feature depends on having the following features running on the platform:

- DPDK (see Ref. 1 for details)
- Collectd or snap
- Collectd Ceilometer, Gnocchi, Aodh, Vitrage and so on[1] plug-ins for delivery of metrics to OpenStack* (see Ref. 3 for details)

Where to Get More Information

For more information, visit https://networkbuilders.intel.com/network-technologies/serviceassurance

REFERENCES

TITLE	LINK
Ref. 1: Data Plane Development Kit Wiki	https://en.wikipedia.org/wiki/Data_Plane_Development_Kit
Ref. 2: collectd	https://collectd.org/documentation.shtml
Ref. 3: OpenStack Ceilometer, Gnocchi, and Aodh	https://wiki.openstack.org/wiki/Telemetry

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[1] The Ceilometer interface is being deprecated. Platform telemetry will be delivered directly to OpenStack Gnocchi, and events will be delivered to OpenStack Aodh. See Ref. 3 for details.