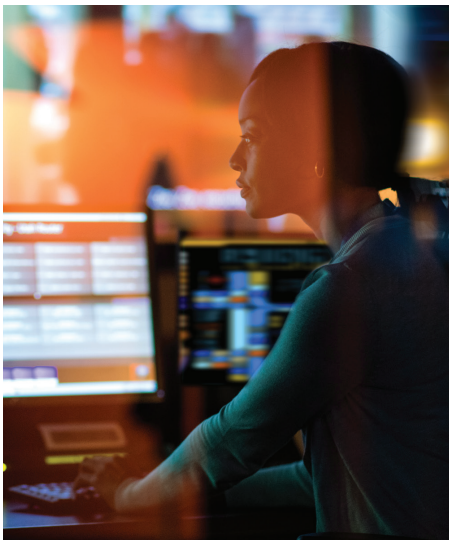
FEATURE BRIEF

Service Assurance for Virtualized Networks featuring
Intel® Infrastructure Management Technologies

Huge Page Usage

Intel® Platform Service Assurance

This feature brief describes the huge page metrics provided by Intel for collection and integration with higher-level management applications to ensure platform service assurance.



Abstract

This feature brief describes the huge page metrics provided by Intel for collection and integration with higher-level management applications. Huge pages allow the OS to support memory pages that are larger than the default 4k pages. Huge pages can be either 2 MB or 1 GB in size. Huge pages are used as a memory backing for high performance applications such as DPDK applications or VMs. Huge pages improve application performance by reducing the number of translation lookaside buffer (TLB) lookups. As the page size increases from 4 KB to 2 MB or 1 GB, the number of TLB lookups reduces. See Ref. 1 and Ref. 2 for more detail.

Feature Description

The OS provides information on huge pages configured on the system, such as the total number of huge pages and how many are free, as well as other metrics. This feature exposes this telemetry to higher level management systems.

A running kernel maintains huge page information in directories. Each supported huge page size has its own directory. That directory includes a set of files that contain information on huge page usage. The huge page usage feature probes these files to retrieve metrics on the number of used or available huge pages.

Feature Data Sets

Huge page usage metrics collected include:

- Per non-uniform memory access (NUMA) node on a NUMA system
- Overall huge page statistics across the platform regardless of NUMA configuration

Open Management Interface Support

Open management interface support includes:

- SNMP MIB extensions to retrieve huge page metrics
- OpenStack Ceilometer and Gnocchi extensions to retrieve huge page metrics

Configuration

Configuration of the huge page metrics collection process includes:

- Enabling or disabling the collection of per-node huge page metrics
- Enabling or disabling the collection of overall huge page metrics
- Reporting usage values as the number of pages (default), the number of bytes, or a percentage value

Open Telemetry Collection Framework Support

The huge pages usage feature uses a collectd plug-in called hugepages that collects huge pages usage metrics and provides them to higher-level management systems (see Ref. 3 for details on collectd).

Feature Dependencies

Feature dependencies include:

- Linux operating system kernel support (see Ref. 4 for configuration)
- collectd for metric delivery to SNMP; alternatively, snap can be used
- collectd Ceilometer[1] and Gnocchi plugins for delivery of metrics to OpenStack
- SNMP feature (see Ref. 5 for SNMP management interfaces)

Where to Get More Information

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

REFERENCES

TITLE	LINK
Ref. 1: *Huge pages* overview from OpenStack documentation	http://docs.openstack.org/admin-guide/compute-huge-pages.html
Ref. 2: *Intel Platform Service Assurance - DPDK Interface Monitoring Feature Brief*	https://networkbuilders.intel.com/network-technologies/serviceassurance
Ref. 3: collectd	https://collectd.org/documentation.shtml
Ref. 4: *DPDK Getting Started Guide for Linux*	http://dpdk.org/doc/guides/linux_gsg/sys_reqs.html
Ref. 5: *Intel Platform Service Assurance - SNMP Reporting Feature Brief*	https://networkbuilders.intel.com/network-technologies/serviceassurance
Ref. 6: OpenStack Ceilometer, Gnocchi, and Aodh	https://wiki.openstack.org/wiki/Telemetry

SKU 336166-001 Feature Brief: Huge Pages Usage Intel Platform Service Assurance

[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. 6 for details.