FEATURE BRIEF

Service Assurance for Virtualized Networks featuring
Intel® Infrastructure Management Technologies

Reliability, Availability, & Serviceability (RAS) of Intel® Infrastructure Management Technologies Feature Support

Intel® Platform Service Assurance

This feature brief details RAS feature metrics and events provided by Intel Platform Service Assurance for collection and integration to higher-level management applications for improved platform assurance.

Abstract

Introducing Platform Service Assurance support for the reliability, availability and serviceability (RAS) features of a platform. Servers based on Intel® Architecture CPUs are designed for use in mission-critical environments. Platform RAS support is integrated into servers to ensure data integrity, maintain availability, and support system service and repair activities. For example, Intel's Machine Check Architecture (MCA) provides the mechanism to detect memory errors, notify the platform processor, and log the errors for corrective action by higher levels of management software. The RAS features are provided by Intel Run Sure Technology to help increase uptime/availability and protect data integrity (see Ref. 1).

Feature Description

From a service assurance perspective, metric (statistics) collection is available for memory errors only. Other RAS errors include CPU, memory, Intel® QuickPath Interconnect (Intel QPI), PCIe, and system level. These errors are correctable/non-correctable and beyond that, fatal/non-fatal. The reporting of such errors to higher-level metric collection software is key to maintaining the highest level of service availability and quality.

In a Linux OS, if the mcelog daemon is running, all machine check events are logged to /var/log/mcelog, syslog or the journal.

Feature Data Sets

MIB support including:

- IntelMcelog MIB (for memory MCE statistics only)

Machine check errors (mcelog) log file (see Ref. 2).

Some examples of events recorded are as follows (see Ref. 4 for more detail):

- Processor RAS features including error correcting code (ECC) and parity check, CDCM, QPI healing, corrected machine check interrupt (CMCI), MCA, and CPU hot-add.
- Memory RAS features, including memory demand, DRAM single device data correction (SDDC), memory mirroring, scalable memory interconnect (SMI) reliability, and failed DIMM.
- Others include: bad pages, cache errors, input/output errors, thermal events
- RAS features defined in PCIe specifications
- Advanced error report (AER) and advanced error reporting and recovery (AERR) available in most Linux distributions

Open Telemetry Collection Framework Support

The higher-level telemetry agent supported is collectd, a daemon that receives system statistics and makes them available in various ways (see Ref. 4 for details). RAS events and metrics are gathered by mcelog. Collectd can access mcelog using the tail plug-in and collect metrics and report alarms to external interfaces. Collectd then publishes the metrics and events to external management systems.

Configuration

Configuration is achieved as follows:

- RAS features are enabled in the BIOS and supported by Linux
- mcelog is started as a daemon at boot time (see Ref. 3)

External Interface Support

External interfaces supported for the RAS feature set include:

- SNMP support for memory-related errors only
  - Simple Network Management Protocol (SNMP) MIB extensions to retrieve cache and memory bandwidth metrics
- OpenStack* support using Ceilometer, Gnocchi, Aodh, Vitrage and Congress including:
  - OpenStack Ceilometer extensions to retrieve RAS metrics

Feature Dependencies

Platform Service Assurance for RAS features depend on having the following features running on the platform:

- mcelog must be configured to run on the platform in daemon mode; logging capabilities must be enabled
- syslog must be configured to run on the platform
- collectd must be configured on the platform
- collectd for metric delivery to SNMP for memory errors only (not recommended)
- collectd Ceilometer or Gnocchi plug-in for delivery of metrics to OpenStack
- collectd Aodh, Vitrage and Congress plug-ins for use with OpenStack
- collectd tail utility
- SNMP (Ref. 5)

Where to Get More Information

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

REFERENCES

TITLE	LINK
Ref. 1: *Maximize Server Uptime with Intel® Run Sure Technology*	http://www.intel.com/content/www/us/en/architecture-and-technology/intel-run-sure-technology.html
Ref. 2: Machine check error log, mcelog	http://www.mcelog.org/index.html
Ref. 3: Collectd Metrics and Events	https://wiki.opnfv.org/display/fastpath/Collectd+Metrics+and+Events
Ref. 4: Collectd	https://collectd.org/documentation.shtml
Ref. 5: *Intel Platform Service Assurance - SNMP Reporting Feature Brief*	https://networkbuilders.intel.com/network-technologies/serviceassurance

SKU 336202-001 Feature Brief: Reliability, Availability, & Serviceability (RAS) of Intel® Infrastructure Management Technologies Feature Support Intel Platform Service Assurance